

STATE OF DELAWARE

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THE PROPOSAL IN ORDER
TO SUBMIT A BID.



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201106803.01

MICROSURFACING CENTRAL AND SOUTH, FY 2011

KENT COUNTY

Completion Date 180 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
DELAWARE DEPARTMENT OF TRANSPORTATION
AUGUST 2001

Bids will be received in the Bidder's Room (B1.11.01), Transportation Administration Center, 800 Bay Road,

Dover, Delaware until 2:00 P.M. local time March 8, 2011

Contract No.T201106803.01

**MICROSURFACING CENTRAL AND SOUTH, FY 2011
KENT COUNTY**

LOCATION

These improvements are located in KENT County more specifically shown on the Location Map(s) of the enclosed Plans.

DESCRIPTION

The improvements consist of furnishing all materials for MICROSURFACING CENTRAL AND SOUTH, FY 2011, and other incidental construction in accordance with the location, notes and details shown on the plans and as directed by the Engineer.

COMPLETION DATE

All work on this contract must be complete within 180 Calendar Days .

ELECTRONIC BIDDING

This project incorporates the electronic bidding system Expedite 5.2b. Bidder wishing to use the electronic bidding option should request a bid file disk and installation CD.

PROSPECTIVE BIDDERS NOTE:

No retainage will be withheld on this contract.

The Department has adopted an External Complaint Procedure. The procedure can be viewed on our website at; <http://www.deldot.gov/information/business/>, or you may request a copy by calling (302) 760-2555.

**STATE OF DELAWARE
CONSTRUCTION ITEMS UNITS OF MEASURE**

English Code	English Description	Multiply By	Metric Code	Metric Description	Suggested CEC Metric Code
ACRE	Acre	0.4047	ha	Hectare	HECTARE
BAG	Bag	N/A	Bag	Bag	BAG
C.F.	Cubic Foot	0.02832	m ³	Cubic Meter	M3
C.Y.	Cubic Yard	0.7646	m ³	Cubic Meter	M3
EA-DY	Each Day	N/A	EA-DY	Each Day	EA-DY
EA-MO	Each Month	N/A	EA-MO	Each Month	EA-MO
EA/NT	Each Night	N/A	EA-NT	Each Night	EA/NT
EACH	Each	N/A	EA	Each	EACH
GAL	Gallon	3.785	L	Liter	L
HOUR	Hour	N/A	h	Hour	HOUR
INCH	Inch	25.4	mm	Millimeter	MM
L.F.	Linear Foot	0.3048	m	Linear Meter	L.M.
L.S.	Lump Sum	N/A	L.S.	Lump Sum	L.S.
LA-MI	Lane Mile	1.609	LA-km	Lane-Kilometer	LA-KM
LB	Pound	0.4536	kg	Kilogram	KG
MFBM	Thousand Feet of Board Measure	2.3597	m ³	Cubic Meter	M3
MGAL	Thousand Gallons	3.785	kL	Kiloliter	KL
MILE	Mile	1.609	km	Kilometer	KM
S.F.	Square Foot	0.0929	m ²	Square Meter	M2
S.Y.	Square Yard	0.8361	m ²	Square Meter	M2
SY-IN	Square Yard-Inch	0.8495	m ² -25 mm	Square Meter-25 Millimeter	M2-25 MM
TON	Ton	.9072	t	Metric Ton (1000kg)	TON
N.A.*	Kip	4.448	kN	Kilonewton	N.A.*
N.A.*	Thousand Pounds per Square Inch	6.895	MPa	Megapascal	N.A.*

*Not used for units of measurement for payment.

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GENERAL NOTICES

SPECIFICATIONS:

The specifications entitled "Delaware Standard Specifications, for Road and Bridge Construction, August, 2001", hereinafter referred to as the Standard Specifications, Supplemental Specifications issued as of the advertisement date of this proposal, the Special Provisions, notes on the Plans, this Bid Proposal, and any addenda thereto shall govern the work to be performed under this contract.

CLARIFICATIONS:

Under any Section or Item included in the Contract, the Contractor shall be aware that when requirements, responsibilities, and furnishing of materials are outlined in the details and notes on the Plans and in the paragraphs preceding the "Basis of Payment" paragraph in the Standard Specifications or Special Provisions, no interpretation shall be made that such stipulations are excluded because reiteration is not made in the "Basis of Payment" paragraph.

ATTESTING TO NON-COLLUSION:

The Department requires as a condition precedent to acceptance of bids a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract. The form for this sworn statement is included in the proposal and must be properly executed in order to have the bid considered.

REQUIREMENT BY DEPARTMENT OF LABOR FOR SWORN PAYROLL INFORMATION

Delaware Code, Title 29, Chapter 69, Section 6960, Paragraph (c)

"(c) Every contract based upon these specifications shall contain a stipulation that certified sworn payroll reports be maintained by every contractor and subcontractor performing work upon the site of construction. The contractor and subcontractor shall keep and maintain the sworn payroll information for a period of two (2) years from the last day of the work week covered by the payroll. A certified copy of these payroll reports shall be made available:

1. For inspection or furnished upon request to a representative of the Department of Labor;
2. Upon request by the public or for copies thereof. However, a request by the public must be made through the Department of Labor. The requesting party shall, prior to being provided the records, reimburse the costs of preparation by the Department of Labor in accordance with the Department's copying fee policy. The public shall not be given access to the records at the principal office of the contractor or subcontractor; and
3. The certified payroll records shall be on a form provided by the Department of Labor or shall contain the same information as the form provided by the Department and shall be provided within ten (10) days from receipt of notice requesting the records from the Department of Labor."

Contractor may contact:

Department of Labor
Division of Industrial Affairs
4425 No. Market Street
Wilmington, DE 19802

Telephone (302) 761-8200

PREFERENCE FOR DELAWARE LABOR:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (4)b

"In the construction of all public works for the State or any political subdivision thereof, or by firms contracting with the State or any political subdivision thereof, preference in employment of laborers, workmen or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State. Each public works contract for the construction of public works for the State or any political subdivision thereof shall contain a stipulation that any person, company or corporation who violates this section shall pay a penalty to the Secretary of Finance equal to the amount of compensation paid to any person in violation of this section."

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (7)

"a. As a condition of the awarding of any contract for public works financed in whole or in part by State appropriation, such contracts shall include the following provisions:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex or national origin. The contractor will take positive steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex or national origin.'

TAX CLEARANCE:

As payments to each vendor or contractor aggregate \$2,000, the Division of Accounting will report such vendor or contractor to the Division of Revenue, who will then check the vendor or contractor's compliance with tax requirements and take such further action as may be necessary to insure compliance.

LICENSE:

A person desiring to engage in business in this State as a contractor shall obtain a license upon making application to the Division of Revenue. Proof of said license compliance to be made prior to, or in conjunction with, the execution of a contract to which he has been named.

DIFFERING SITE CONDITIONS,

SUSPENSIONS OF WORK and SIGNIFICANT CHANGES IN THE CHARACTER OF WORK:

Differing site conditions: During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the engineer will investigate the conditions, and if he/she determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance

of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The engineer will notify the contractor of his/her determination whether or not an adjustment of the contract is warranted.

No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.

No contract adjustment will be allowed under their clause for any effects caused on unchanged work.

Suspensions of work ordered by the engineer: If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated, customary or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

Upon receipt, the engineer will evaluate the contractor's request. If the engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The engineer will notify the contractor of his/her determination whether or not an adjustment of the contract is warranted.

No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time prescribed.

No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other term or condition of this contract.

Significant changes in the character of work: The engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.

The term "significant change" shall be construed to apply only to the following circumstances:

- (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction or
- (B) When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

PREVAILING WAGES

Included in this proposal are the minimum wages to be paid various classes of laborers and mechanics as determined by the Department of Labor of the State of Delaware in accordance with Title 29 Del.C. §6960, relating to wages and the regulations implementing that Section.

Title 29 Del.C. §6960 relating to wages further stipulates "that the employer shall pay all mechanics and laborers employed directly upon the site of the work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment,

computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics", and ... "that the scale of wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work, and that there may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay to laborers and mechanics employed by the employer the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims."

Bidders are specifically directed to note the Department of Labor's regulations implementing §6960 relating to the effective date of the wage rates, at Part VI., Section C., which in relevant part states:

"Public agencies (covered by the provisions of 29 Del.C. §6960) are required to use the rates which are in effect on the date of the publication of specifications for a given project. In the event that a contract is not executed within one hundred twenty (120) days from the date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project."

STATE OF DELAWARE PREVAILING WAGES

PREVAILING WAGE DETERMINATION - Highway Construction

Delaware Department of Labor
Division of Industrial Affairs
Office of Labor Law Enforcement
Phone: 302 451-3423

Mailing Address:
225 Corporate Boulevard
Suite 104
Newark, DE 19702

Located at:
225 Corporate Boulevard
Suite 104
Newark, DE 19702

Prevailing Wages for **HIGHWAY CONSTRUCTION** Effective March 15, 2010

<u>Classification</u>	<u>New Castle County</u>	<u>Kent County</u>	<u>Sussex County</u>
Bricklayers	\$43.48	\$43.48	\$14.51
Carpenters	\$40.35	\$47.56	\$37.87
Cement Finishers	\$31.04	\$26.13	\$23.29
Electrical Line Workers	\$34.29	\$54.05	\$54.05
Electricians	\$55.35	\$55.35	\$55.35
Iron workers	\$42.20	\$22.98	\$25.35
Laborers	\$23.81	\$23.89	\$23.73
Millwrights	\$16.11	\$15.63	\$13.49
Painters	\$51.47	\$51.47	\$51.47
Piledrivers	\$59.23	\$23.75	\$26.95
Power Equip. Operators	\$33.37	\$27.59	\$27.95
Sheetmetal Workers	\$22.75	\$20.31	\$18.40
Truck Drivers	\$26.19	\$20.81	\$19.79

CERTIFIED: January 5, 2011

BY: Signature on file

ANTHONY J DELUCA, ADMINISTRATOR
LABOR LAW ENFORCEMENT SECTION

NOTICE TO CONTRACTORS

1. These rates are promulgated and enforced pursuant to the Prevailing Wage Regulations adopted by the Department of Labor on April 3, 1992.
2. Classifications of workers are determined by the Department of Labor. For assistance in classifying workers, or for a copy of the regulations or classifications, phone (302)451-3423.
3. Nonregistered apprentices must be paid the mechanic's rate.

Contract No. T201106803.01

**SUPPLEMENTAL SPECIFICATIONS
TO THE
AUGUST 2001
STANDARD SPECIFICATIONS**

**EFFECTIVE AS OF THE ADVERTISEMENT
DATE OF THIS PROPOSAL
AND INCLUDED BY REFERENCE**

**The Supplemental Specifications can be viewed and printed from
the Department's Website.**

To access the Website;

- in your internet browser, enter; <http://www.deldot.gov>
- on the left side of the page under 'INFORMATION', Click; 'Publications'
- scroll down under 'MANUALS' and Click; "Standard Specifications 2001"

The full Website Link is;

http://www.deldot.gov/information/pubs_forms/manuals/standard_specifications/index.shtml

Printed copies of the Supplemental Specifications are available upon request. A printed copy of the above referenced Supplemental Specifications will be included in the final contract documents upon award.

The Contractor shall make himself aware of these revisions and corrections (Supplemental Specifications), and apply them to the applicable item(s) of this contract.

SPECIAL PROVISIONS

CONSTRUCTION ITEM NUMBERS

All construction pay items are assigned a six (6) digit number, shown as Item Number on the Plans and/or in the Special Provisions, and shall be interpreted in accordance with the following:

Standard Item Number:

The first three digits of the construction item numbers indicates the Section number as described in the Standard Specifications, and all applicable requirements of the Section shall remain effective unless otherwise modified by the Special Provisions. The last three digits of the construction item identifies the item by sequential number under that Section. Sequential numbers for all items covered under Standard Specifications range from 000 to 499. A comprehensive list of construction item numbers begins on page 421 of the Standard Specifications. Additions to this list will be made as required.

Special Provisions Item Number:

The first three digits of the construction items, covered under Special Provisions, indicates the applicable Section number of the Standard Specifications, and shall be governed fully by the requirements of the Special Provisions. The last three digit of the items covered under Special Provisions identifies the item by sequential number. Sequential numbers for Special Provision items, range from 500 to 999.

Examples

Standard Item Number - 202000 Excavation and Embankment

202 Indicates Section Number

000 Indicates Sequential Number

Special Provision Item Number - 202500 Grading and Reshaping Roadway

202 Indicates Section Number

500 Indicates Sequential Number

401502 - ASPHALT CEMENT COST ADJUSTMENT

For Sections 304, 401, 402, 403, 404, and 405, payments to the Contractor shall be adjusted to reflect increases or decreases in the Delaware Posted Asphalt Cement Price when compared to the Project Asphalt Cement Base Price, as defined in these Special Provisions.

The Delaware Posted Asphalt Cement Price will be issued monthly by the Department and will be the industry posted price for Asphalt Cement, F.O.B. Philadelphia, Pennsylvania.

The Project Asphalt Cement Base Price will be the anticipated Delaware Posted Asphalt Cement Price expected to be in effect at the time of receipt of bids.

All deviations of the Delaware Posted Asphalt Cement Price from the Project Asphalt Cement Base Price are eligible for cost adjustment. No minimum increases or decreases or corresponding percentages are required to qualify for cost adjustment.

Actual quantity of asphalt cement qualifying for any Asphalt Cement Cost Adjustment will be computed on the basis of weight tickets and asphalt percentage from the approved job mix formula.

For Recycled Hot-Mix the asphalt percentage eligible for cost adjustment shall be only the new asphalt cement added to the mix.

There shall be no separate payment per ton (metric ton) cost of asphalt cement. That cost shall be included in the various unit prices bid per ton (metric ton) for those bid items that contain asphalt cement (mentioned above).

The Asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price for the project will be \$480.00 per ton (\$529.11 per metric ton).

If the Contractor exceeds the authorized allotted completion time, the price of asphalt cement on the last authorized allotted work day, shall be the prices used for cost adjustment during the time liquidated damages are assessed. However, if the industry posted price for asphalt cement goes down, the asphalt-cement cost shall be adjusted downward accordingly.

NOTE

Application of Asphalt Cement Cost Adjustment requirements as indicated above shall apply only to those contracts involving items related to bituminous base and pavements, and with bitumen, having a total of 1,000 tons (1,000 metric tons) or more of hot-mix bid quantity in case of Sections 401, 402 and 403; and 15,000 gallons (60 000 liters) or more in case of Sections 304, 404 and 405.

403510 - POLYMER-MODIFIED EMULSION MICRO-SURFACING (SQUARE YARDS)
403511 - POLYMER-MODIFIED EMULSION MICRO-SURFACING (TON)
403512 - POLYMER-MODIFIED EMULSION MICRO-SURFACING, ROLLED (SQUARE YARDS)

Description:

This work consists of furnishing and constructing a polymer-modified emulsion paving system on a properly prepared foundation to create a durable, smooth-riding, skid-resistant, free-draining roadway surface.

In general, item 403511 is used where a variable thickness of material is required such as a leveling course; and item 403510 and 403512 is used where a uniform thickness of material is to be placed.

Materials:

Coarse Aggregate. Coarse aggregate shall conform to Section 805. The use of gravel or crushed gravel will not be permitted.

Fine Aggregate. Fine aggregate shall conform to Section 804 except for the gradation requirements.

Mineral Filler. Mineral filler shall be used by the Contractor. It shall be non-air-entrained Portland cement or hydrated lime conforming to AASHTO M17, Mineral Filler for Bituminous Paving Mixtures.

Bituminous Material. Bituminous material shall be polymer-modified, cationic, emulsified asphalt. The polymer modifier shall be milled into the asphalt or blended into the emulsifier prior to the emulsification process. The type and percentage of modifier shall be identified (such as natural latex rubber, styrene-butadiene rubber, styrene-butadiene-styrene, or ethylene-butadiene-styrene) on the certificate of analysis. The modifier shall make an emulsion mix which accelerates curing in order to allow traffic to be placed on the material within one hour, without damage occurring to the surface.

The minimum amount and type of polymer modifier shall be determined by the laboratory performing the mix design. The minimum amount required will be based on asphalt weight content and will be certified by the emulsion supplier. In general, a three percent (3%) polymer solids, based on asphalt weight, is considered minimum.

The emulsion modifier shall be adjusted at the emulsion manufacturer's facility.

The Contractor shall certify that the bituminous material (with the polymer) conforms to AASHTO M208 CSS-1h, with the following modifications:

AASHTO Test Specifications

T49	@ 77° F; 40-90
T59	62 % (minimum)
T53	140° F (minimum)

Each shipment of emulsified asphalt shall be accompanied with a certificate of analysis/ compliance from the manufacturer.

The emulsified asphalt shall be homogeneous, show no signs of separation, and at no time shall the temperature of the material exceed 120°F.

The specific gravity of each shipment of bituminous material shall be determined by the Contractor and provided with each shipment.

Field Control Additive. At the option of the Contractor, an additive may be added to the mixture in order to provide an altered set time. The additive must be identified (such as the emulsifier type) and be included as part of the mix design submission. The Contractor shall certify that the additive was tested and demonstrated compatibility with all the other components of the mixture.

Water. Water shall conform to Section 803 of the Standard Specifications.

Mixture Properties:

Each Contractor-proposed mix design (percentages of each aggregate type, mineral filler, emulsion, water, and field control additive; target combination gradations; and the design cure time) shall be approved by the Engineer prior to placement. The exact proportions used in the preparation of the micro-surfacing shall be determined by a testing laboratory, experienced in micro-surfacing mix design procedures, and approved by the Engineer. The proportions and gradations of all component materials for the target mix design shall be identified with a single percentage. When tested in accordance with AASHTO T27 (ASTM C136) and AASHTO T11 (ASTM C117), the target (mix design) aggregate gradation (including the mineral filler) shall be within one of the following bands:

Sieve	Type II	Type III	STOCKPILE TOLERANCE
3/8"	100	100	
#4	90 - 100	70 - 90	± 5%
#8	65 - 90	45 - 70	± 5%
#16	45 - 70	28 - 50	± 5%
#30	30 - 50	19 - 34	± 5%
#50	18 - 30	12 - 25	± 4%
#100	10 - 21	7 - 18	± 3%
#200	5 - 15	5 - 15	± 2%

The job mix (target) gradation shall be within the gradation band for the desired type. After the target gradation has been submitted (this should be the gradation that the mix design is based on), then the percent passing each sieve shall not vary by more than the stockpile tolerance shown in the above table for each individual sieve, and still remain within the gradation band. It is recommended that the percent passing shall not go from the high end to the low end of the range for any two consecutive screens.

Screening shall be required at the stockpile prior to delivery to the paving machine if there are any problems created by having oversize material in the mix. Type II gradations shall be screened through a 3/8-inch screen. Type III gradation shall be screened through a 1/2-inch screen.

The target mix design quantity of the bituminous material shall be identified with a single percentage value which shall be within the range of 6.5 to 8.0 percent of the total weight of the aggregate. The allowable production tolerance for the bituminous material asphalt residue shall be 0.4 percent of the total weight of the aggregate.

The amount of field control additive, when used, shall be identified with a single percentage value. If the amount is expected to change to another value for specific conditions anticipated on the project site, the mix proportions and the auxiliary value shall be considered a separate mix design. The specific conditions that will cause a change to the auxiliary mix design shall be identified with the submission of the proposed mix design. The allowable production tolerance for the amount of field control additive shall be based on acceptable performance in the field.

Water shall be added during the material mixing to produce the needed mix consistency. The optimum amount of water can be determined during mix design, however, it is understood that this value may be changed in the field due to ambient humidity, wind, air temperature, moisture absorbed by the pavement, etc. The mixture shall be homogeneous, free of excess water or emulsion, free of segregation of emulsion, and free of segregation of aggregate sizes.

Laboratory test results shall be provided by the Contractor that show that the proposed mixture conforms to the following requirements when testing according to the following referenced International Slurry Surfacing Association standard test methods:

Test Method	Property	Requirements
TB100	Wet Track Abrasion Loss - 1 hour soak	50 g/ft ² max
	Wet Track Abrasion Loss - 6 day soak	75 g/ft ² max
TB102	Mixing, Setting, and Water Resistance	10 minute, maximum, clear water set time
TB113	Mix Time 77°F (25°C)	Controllable to 120 seconds, minimum
TB114	Wet Stripping	Pass, 90% minimum
TB139	Wet Cohesion - 30 Minutes	12 kg-cm, minimum
	Wet Cohesion - 60 Minutes	20 kg-cm, minimum
TB144	Classification Compatibility	11 grade points, minimum
TB147A	Loaded Wheel Test	5% lateral displacement, maximum 2.10 compacted specific gravity

The mixture shall also have satisfactory workability and performance when placed in a test strip. Requirements for the test strip construction are in the Preparations and Limitations section of this specification. If a change occurs in the source or the qualities of the component materials, a revised target mix design shall be submitted. When unsatisfactory results or other conditions make it necessary, a revised mix design shall be developed and submitted by the Contractor.

Equipment:

The mixing and placement equipment must be approved prior to use. The material shall be mixed by an automatically sequenced, self-propelled machine; it shall be capable of accurately proportioning and delivering all component materials to a revolving multi-blade twin shaft pug mill type mixer; thoroughly mixing the component materials; and it shall be capable of discharging the mixture on a continuous flow basis.

The rate of water and field control additive shall be easily adjusted. Sufficient storage capacity shall be provided on the equipment for aggregates, bituminous material, mineral filler, field control additive, and water of adequate supply to the proportioning devices to maintain a continuous operation.

The mixing equipment shall also have an attached spreader box which is equipped with augers that agitate and spread the material evenly throughout the box. A front seal shall be provided to insure no loss of the mixture at the road contact point. A rear seal shall act as final strike-off and shall be height-adjustable. The spreader box and rear strike-off shall be designed so that a uniform pavement surface consistency is achieved; these shall be clean and not excessively worn. The spreader box shall be kept clean and buildup of asphalt and aggregate on the box shall not be permitted.

A secondary strike-off shall be provided to improve surface texture. The secondary strike-off shall have the same adjustments as the spreader box.

Preparations and Limitations:

The mixing machine shall be calibrated, at a DelDOT approved location; to the job mix proportion targets in the presence and to the satisfaction of the Engineer prior to the start of the work, and shall be checked whenever there is a question about the accuracy of the proportioning. Documentation is to be generated for the Engineer, including individual calibrations of each material at various settings. A minimum of 3 runs for each material shall be performed. During calibration of the aggregate and the asphalt emulsion a minimum of 250 pounds of each material shall be dispensed continuously for each of the calibration runs. The controls for proportioning the mixture, including the components of water and field control additive, shall be readily visible to the Engineer in order evaluate whether a change to the calibrated settings has occurred.

For each combination of equipment and mixture design, prior to performing work measured for payment, an approved test strip shall be constructed. To be approved the test strip shall be of minimum size and shall demonstrate the required performance. The minimum size of the test strip for each combination

must be of 100' long, and 12' wide. It shall be placed in the same number of passes and at a minimum spread rate specified for each location. The test section shall be placed using the same equipment, methods, and mixes as scheduled for use on the Contract. If a test section proves to be unsatisfactory, the necessary adjustments to the mix design, equipment, and placement methods shall be made. Additional test sections, as required, shall be constructed and evaluated for conformance to the specifications. The maximum clear water set time shall be 10 minutes. Traffic shall be able to be on it, without material pickup, within one hour after its placement.

The surface shall be cleared of vegetation, dirt, mud, free water, and any other loose or detrimental materials prior to placing the mixture. Vegetation and debris shall also be cleared from the edges of the road. Areas impregnated with grease, oil, or fuel shall be cleaned by grinding. Traffic paint not tightly bonded to the surface or has excessive build up, and any thermoplastic markings shall be removed by grinding or other method approved by the Engineer.

Paving shall not be performed if either the pavement or air temperature is below 50°F, if rain is imminent within 12 hours, or if the temperature is expected to drop below 40°F within 24 hours after application.

The bituminous material shall be less than 120°F and gently agitated before use.

Construction Methods:

The mixture shall be uniformly spread at a final total mix application rate of a minimum of 30 lbs/yd². This may be accomplished by placing two separate layers of material with each layer being placed on the same or successive days at the sole discretion of the Engineer. When necessary, the materials shall be spread in variable thick cross sections, to fill in ruts and minor deformations, and to create a smooth-riding, high skid-resistant, roadway surface having a well-draining cross-slope.

Any area of the constructed surface which has a deviation, higher or lower, that is greater than 3/16" from a 10' straightedge placed on the surface is unacceptable. No streaks, scratch marks, drag marks, tears, rippling, streaks, lumps, segregation, or other surface irregularities will be acceptable.

Handwork will be permitted only for those areas that cannot be reached with the mixing machine. Handwork must produce a surface finish and appearance similar to that produced by the spreader box.

Longitudinal joints shall be tight without gaps or excessive buildups. Transverse joints shall appear neat and uniform. The edge lines shall be straight, no more than 2 inch variance in any 100' length.

The mix shall be placed to allow traffic on the constructed pavement surface within one hour without any pick up of material by the traffic. At intersections, or other points requiring earlier opening, the Contractor shall shorten the road closure time to a maximum of 15 minutes; a different amount of field control additive in the mixture may be used by the Contractor to meet this requirement.

The Contractor shall submit the following signed, written reports to the Engineer for each staging location:

1. A report indicating the amount of aggregate and emulsion delivered, aggregate and emulsion used on the project, and the amount of area in square yards completed.
2. A report indicating the percentage of emulsion used to aggregate used and the application rate in pounds of aggregate applied per square yard of area covered. This report will verify compliance with the mixture of materials to the mix design and the specified aggregate application rate.

The Contractor shall submit to the Engineer from the aggregate and emulsion suppliers an original copy of the bill of lading weekly for each delivery of material to be used on the project. The Contractor shall submit with each emulsion bill of lading a certificate of analysis from the emulsion supplier verifying that each delivery of emulsion is in compliance with the contract requirements. Micro-surfacing placed using item 403512 – Polymer-Modified Micro-Surfacing, Rolled shall be compacted with a smooth pneumatic tire roller with a minimum weight of 4 tons. Rolling shall start when the micro-surfacing has set sufficiently to prevent

any pickup of material and rolled a minimum of 3 coverages by the roller or until a uniform surface is obtained.

Method of Measurement:

The quantity of item 403510 - Polymer-Modified Emulsion Micro-Surfacing and 403512 - Polymer-Modified Emulsion Micro-Surfacing, Rolled will be measured as the actual number of square yards of polymer-modified emulsion micro-surfacing placed and accepted. The quantity will be determined by computations based on field measurements taken on and along the completed finished surfaces and verified by items 1 and 2 in the construction methods section. Multiple layers will not be measured separately.

The quantity of item 403511 - Polymer-Modified Emulsion Micro-Surfacing will be measured as the actual number of tons of polymer-modified emulsion micro-surfacing placed and accepted. The quantity will be based on the combined tonnage of aggregate, mineral filler, and emulsion used and accepted in place. The quantities will be computed as follows:

1. Aggregate. Measure the quantity of aggregate using the calibrated, dry weight of aggregate control device.
2. Mineral Filler. Compute this quantity from a count off the calibrated metering device for mineral filler.
3. Emulsion. Compute the quantity of polymer-modified asphalt emulsion by weight used, as determined by the calibrated metering device.

The amount of field control additive will not be measured separately. Materials and work for the test strip will not be measured for payment. Required repairs will not be measured for payment.

Basis of Payment:

The quantity of item 403510 - Polymer-Modified Emulsion Micro-Surfacing and 403512 - Polymer-Modified Emulsion Micro-Surfacing, Rolled will be paid for at the Contract unit price per square yard. The quantity of item 403511 - Polymer-Modified Emulsion Micro-Surfacing will be paid for at the Contract unit price per ton. Price and payment will constitute full compensation for designing the mixture; mobilizing and furnishing all equipment, materials, and labor; preparing the foundation (removing traffic striping, cleaning the roadway surface, and clearing the debris from the edge of the road); placing the materials; protecting and repairing damage to the surface; and for all labor, equipment, tools and incidentals necessary to complete the work.

NOTE:

The Asphalt Cement Cost Adjustment for this item will be applied when the total emulsified asphalt used exceeds 15,850 gal. This note supersedes the Note with item 401502 - Asphalt Cement Cost Adjustment.

12/1/09

743501 - WARNING LIGHTS, TYPE B
743504 - WARNING SIGNS
743507 - TEMPORARY BARRICADES, TYPE III
743525 - TEMPORARY WARNING SIGNS

Description:

This work consists of furnishing, installing and maintaining these temporary traffic control devices in accordance with the contract documents and with the latest edition of the manual titled "Delaware Manual on Uniform Traffic Control Devices (MUTCD)," hereafter referred to as the "Delaware MUTCD", including all revisions as of the date of the advertisement of this Contract and as directed by the Engineer.

As required under the section entitled "Certification" temporary traffic control devices shall be crashworthy in accordance with the National Cooperative Highway Research Program (NCHRP) Report 350, the memorandum issued August 28, 1998 by The USDOT Federal Highway Administration, and/or in accordance with the latest edition of the Manual for Assessing Safety Hardware (MASH), published by the American Association of State Highway and Transportation Officials (AASHTO). In case of conflict between the Delaware MUTCD and the requirements of NCHRP Report 350 and/or MASH, the requirements of NCHRP Report 350 and/or MASH shall govern.

Materials and Construction Methods:

Materials and construction of all signs and barricades shall meet all requirements including retroreflectorization of the Delaware MUTCD.

Unless specified on the Plans, all temporary traffic control devices shall be either new or restored to a satisfactory condition. All reconditioned and/or restored temporary traffic control devices must be approved by the Engineer before their use. Bases of warning signs, when required, shall be weighted with sandbags to resist overturning.

Lane closures necessary for the installation of barricades and the placement of other temporary traffic control devices shall be in accordance with the requirements of the Delaware MUTCD. Type III barricades shall have a minimum width of 4' and shall be placed in accordance with the applicable sections of the Delaware MUTCD. Type B warning lights with yellow lenses shall be placed above all diversion barricades as shown on the plans or as directed by the Engineer. Type B warning lights with red lenses shall be placed above all closure barricades as shown on the plans or as directed by the Engineer. Type B warning lights shall not be used for any other purpose except as described above.

Temporary traffic protection devices shall be suitably maintained at all times. Such maintenance shall include washing sign faces, replacing deficient batteries and lights, aligning lights properly, replacing retroreflective materials, relocating barriers, and any other maintenance of traffic protection devices deemed necessary by the Engineer to maintain traffic in a safe and effective manner.

Warning signs and temporary warning signs shall be retroreflective and shall have rounded corners as per FHWA publication "Standard Highway Signs". Warning signs shall be installed in accordance with the applicable sections of the Delaware MUTCD.

For purposes of measurement and payment the following definitions for signs shall apply:

Warning Signs (Item 743504) are those signs that are generally permanently installed at the beginning of a sustained construction phase (i.e., a construction phase exceeding 24 hours) and/or at the beginning of the project and shall remain in place for the duration of the sustained phase and/or project.

Temporary Warning Signs (Item 743525) are those signs erected for a particular operation or phases of the project that do not exceed 24 hours and may remain in place just during working hours such as "Flagger Ahead" signs.

Any permanent warning signs used on the project shall be securely mounted on break away supports such that the supports are installed in the ground per the sign post manufacturers recommendations. Permanent warning signs shall not be mounted on portable sign stands except in the following situations:

- Any signs that are placed on a concrete island in the median of a divided highway may be mounted on portable sign stands with proper ballasting material in order to avoid drilling through the concrete to ground mount the sign.
- If a documented utility conflict exists and field adjustments to the sign location cannot be made, the sign may be mounted on a portable sign stand with proper ballasting material. Documentation of the utility conflict shall be provided to the Engineer.

All holes or trenches within paved roadways or sidewalks which could not be practically backfilled and paved prior to restoring the area to traffic, shall be covered by protective covers consisting of temporary steel plates, furnished, installed and secured in place by the Contractor at no extra cost to the Department.

All temporary traffic control work and related items shall either be performed entirely by the Contractor's own organization or totally subcontracted. Maintenance of the equipment shall not be subject to this requirement.

Certification:

Temporary traffic control devices used on all highways open to the public in this State shall conform to the Delaware MUTCD. All devices shall be crashworthy in accordance with the National Cooperative Highway Research Program (NCHRP) Report 350, the memorandum issued August 28, 1998 by The USDOT Federal Highway Administration, and/or in accordance with the latest edition of the Manual for Assessing Safety Hardware (MASH), published by the American Association of State Highway and Transportation Officials (AASHTO).

The Contractor shall submit certification for temporary traffic control devices used specifically on this project at or prior to the pre-construction meeting.

Certification of compliance with NCHRP report 350 and/or MASH is required for the following categories of temporary traffic control devices:

Category I contains small and lightweight channelizing and delineating devices, which includes cones, tubular markers, flexible delineator posts and drums, all without any accessories or attachments.

Category II includes temporary traffic control devices that are not expected to produce significant vehicular velocity changes to impacting vehicles. These devices, which shall weigh 45 kg (100 lbs.) or less, include Type III barricades, portable sign supports with signs, and intrusion alarms. Also included are drums, cones, and vertical panels with accessories or attachments.

For Category I devices, the manufacturer or Contractor may self-certify that the devices meet the NCHRP-350 and/or MASH criteria. The Contractor shall supply the Federal Highway Administration 2000, that have not been crash tested in accordance with NCHRP that falls under Category II and III devices.

Method of Measurement:

Temporary Barricades, Type III erected by the Contractor shall be measured in unit of L.F./Day furnished and used as required and approved by the Engineer.

Warning Lights, Type B will be measured in units of Each/Day furnished and used, and approved by the Engineer.

Warning Signs shall be furnished and erected by the Contractor and measurement shall be made per Each for the duration of the sustained phase and/or project. Temporary Warning Signs shall be measured in unit of Each/Day furnished and erected.

Basis of Payment:

The number of temporary barricades measured as described above, shall be paid for at the Contract unit price bid per L.F./Day barricade for the item "Temporary Barricades, Type III" which prices and payments shall be full compensation for providing certification, furnishing, placing, maintaining, and relocating the barricades as required, all labor, equipment, tools, and all incidentals necessary to complete the work. Barricades stolen or damaged shall be replaced at the Contractor's expense.

The number of each type of warning lights measured as described above shall be paid for at the Contract unit price bid per Each/Day for the item, "Warning Lights, Type B" as required by the Contract, which prices and payments shall be full compensation for providing certification, furnishing, placing, maintaining and relocating the lights, all labor, equipment, tools, and all incidentals necessary to complete the work. Warning lights stolen or damaged shall be replaced at the Contractor's expense.

The number of Warning Signs, measured as described above, shall be paid for at the Contract unit price bid per Each for the item, "Warning Signs", and the Contract unit price bid per Each/Day for "Temporary Warning Signs" which prices and payments shall be full compensation for providing certification, furnishing, placing, maintaining, and relocating warning signs, and any temporary sign supports, hardware, materials and all labor, equipment, tools, and incidentals necessary to complete the work. Signs stolen or damaged shall be replaced at the Contractor's expense.

Payment for traffic control devices shall be based on the Contractor's daily certification, on a Department's form, that the number of temporary traffic control devices are fully operational (i.e., lights working, signs in good legible condition and in their proper position).

03/04/2010

748502 - RAISED/RECESSED PAVEMENT MARKER

Description:

This work consists of furnishing and installing raised/recessed pavement markers in accordance with the Plans and these specifications.

Materials:

The cast iron housing shall meet the requirements of ASTM A 536-84, Grade 72-45-84.

The reflectors shall meet the requirements of ASTM D 4383-03.

For installation on interstates, freeways, and principal arterials, the pavement marker shall have red reflectorized material on the back side (the side not facing the direction of traffic).

Epoxy shall meet the requirements of AASHTO M237, Type IV.

The followings models have been tested and approved by the Department and shall be used:

1. (Ennis Paint) Stimsonite - Avery Dennison Model 101LPCR Snow Plowable Marker.
2. Ray-O-Lite Model 300 Snow Plowable Marker with Model 2004 Reflector.
3. Or Approved Equal.

Construction Methods:

Pavement shall be saw cut to match the bottom contour of the marker housing using a saw and blade suitable for the pavement material being sawed. The depth of the cut slot must allow the housing to be set in epoxy, with leveling lugs resting on the pavement surface, so that the front edge of marker is at or below the surface of the pavement. Excessive saw cuts must be repaired to the satisfaction of the Engineer. When cutting is complete, the slot shall be cleaned as recommended by the manufacturer of the epoxy material. The epoxy and pavement marker will be installed in the prepared contour slot in the pavement per the manufacturer's recommendations.

After installation, the Striping and Markings Section shall be notified for inspection and approval of acceptance of the raised pavement markers.

Method of Measurement:

The quantity of raised/recessed pavement markers will be measured as the actual number installed and accepted.

Basis of Payment:

The quantity of raised/recessed pavement markers will be paid for at the Contract unit price per each. Price and payment will constitute full compensation for furnishing all materials, installation, saw-cutting, cleaning, disposal of discarded materials, for all labor, tools, equipment, all necessary incidentals associated with the item to complete the work.

03/13/08

- 748506 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 4**
- 748507 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 6**
- 748508 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 8**
- 748509 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 12**
- 748510 - PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, EPOXY RESIN PAINT**
- 748535 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 4**
- 748536 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 6**
- 748537 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 8**
- 748538 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 10**
- 748539 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 12**
- 748540 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 16**
- 748557 - PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, BLACK, 3"**

Description:

This work consists of furnishing and applying white or yellow, epoxy reflectorized pavement markings or black epoxy contrast pavement markings at the locations and in accordance with the patterns indicated on the Plans, or as directed by the Engineer, and in accordance with these specifications.

The white/yellow epoxy marking material shall be hot-applied by spray methods onto bituminous and/or Portland cement concrete pavement surfaces as required by the Plans. Following an application of double drop glass beads of two sizes and upon curing, the resultant epoxy marking shall be an adherent reflectorized stripe of the specified thickness and width that is capable of resisting deformation by traffic. All marking materials shall be certified lead free and free of cadmium, mercury, hexvalent chromium, and other toxic heavy metals.

The black epoxy marking shall be a two-component, hot-spray applied epoxy resin pavement marking material to be used for pavement marking on Portland cement concrete pavement surfaces. Following an aggregate drop, and upon curing, it shall produce an adherent stripe of specified thickness and width capable of resisting wear from traffic. Black contrast pavement markings will be required on all Portland cement concrete pavements.

Materials Requirements:

A. White and Yellow Reflectorized Epoxy

1. Epoxy Composition Requirements:

The epoxy resin composition shall be specifically formulated for use as a pavement marking material and for hot-spray application at elevated temperatures. The type and amounts of epoxy resins and curing agents shall be at the option of the manufacturer, providing the other composition and physical requirements of this specification are met.

The epoxy marking material shall be a two-component (Part A and Part B), 100% solids type system formulated and designed to provide a simple volumetric mixing ratio (e.g. two volumes of Part A to one volume of Part B).

Component A of both white and yellow shall conform to the following requirements:

% BY WEIGHT		
	WHITE:	YELLOW:
Pigments	Titanium Dioxide - 18% Min. (ASTM D476, Type II)	Organic Yellow - 6%-10%
Epoxy Resin	75% Min., 82% Max.	70% Min., 77% Max.

The entire pigment composition shall consist of either titanium dioxide and/or organic yellow pigment. No extender pigments are permitted. The white pigment upon analysis, shall contain a minimum of 16.5% TiO₂ (100% purity).

Epoxy Content-WPE (Component A) - The epoxy content of the epoxy resin will be tested in accordance with ASTM D1652 and calculated as the weight per epoxy equivalent (WPE) for both white and yellow. The epoxy content will be determined on a pigment free basis. The epoxy content (WPE) shall meet a target value provided by the manufacturer and approved by the Department's Material and Research Section (from now on will be addressed as Department). A ± 50 tolerance will be applied to the target value to establish the acceptance range.

Amine Value (Component B) - The amine value of the curing agent shall be tested in accordance with ASTM D2074-66 to determine its total amine value. The total amine value shall meet a target value provided by the manufacturer and approved by the Department. A ± 50 tolerance will be applied to the target value to establish the acceptance range.

Toxicity - Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property.

Viscosity - Formulations of each component shall be such that the viscosity of both components shall coincide (within 10%) at a recommended spray application.

2. Physical Properties of Mixed Composition:

Unless otherwise noted, all samples are to be prepared and tested at an ambient temperature of 73 ± 5 F. (23 ± 3 C).

- a. Color. The white epoxy composition when applied at a minimum wet film thickness of 20 ± 1 mils ($500 \mu\text{m}$) as applicable and allowed to dry, shall plot within the boundaries described by the four corner points listed in Tables 1 and 2 of ASTM D 6628-01 when measured in accordance with the test methods prescribed in Section 7 of ASTM D 6628-01.

The yellow epoxy composition when applied at a minimum wet film thickness of 20 ± 1 mils ($500 \mu\text{m}$) as applicable and allowed to dry, shall plot within the boundaries described by the four corner points listed in Tables 1 and 2 of ASTM D 6628-01 when measured in accordance with the test methods prescribed in Section 7 of ASTM D 6628-01.

- b. Directional Reflectance. The white epoxy composition (without glass spheres) shall have a daylight directional reflectance of not less than 84% relative to a magnesium oxide standard when tested in accordance with Method 6121 of Federal Test Method Standard No. 141.

The yellow epoxy composition (without glass spheres) shall have a daylight directional reflectance of not less than 55% relative to a magnesium oxide standard when tested in accordance with Method 6121 of Federal Test Method Standard No. 141.

- c. Drying Time (Laboratory). The epoxy composition, when mixed in the proper ratio and applied at a 20 ± 1 mils ($500 \mu\text{m}$) minimum wet film thickness, and immediately dressed with large reflective glass spheres (Federal Spec. Type 4) at a rate of 12 lb/gal (1.4 kg/l) of epoxy pavement marking materials, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied at a rate of 12 lb/gal (1.4 kg/L) of epoxy pavement marking material, shall exhibit a no-track condition in 15 minutes or less (ASTM D711). A Bird Applicator or any other doctor blade shall be used to produce a uniform film thickness.

- d. Drying Time (Field). When installed at a minimum wet film thickness of 20 ± 1 mils (500 or $625 \mu\text{m}$) and reflectorized with glass spheres, the maximum drying times shall correspond to these temperatures:

80 F (27 C)	10 minutes
70 F (21 C)	10 minutes

60 F (16 C)	15 minutes
50 F (10 C)	25 minutes
40 F (4 C)	45 minutes
35 F (2 C)	60 minutes

The composition shall dry to no-tracking in approximately 10 minutes, and after thirty (30) minutes shall show no damaging effect from traffic. Dry to no-tracking shall be considered as the condition where no visual deposition of the epoxy marking to the pavement surface is observed when viewed from a distance of 100 feet (30 meters), after a passenger car is passed over the line. Regardless of the temperature at the time of installation, the installation contractor shall be responsible for protection of the markings material until dry to a non-tracking state.

- e. Abrasion Resistance. The wear index of the composition shall not exceed 82 when tested in accordance with ASTM C501 using a CS-17 wheel and under a load of 1000 grams for 1000 cycles.
- f. Tensile Strength. The tensile strength of the epoxy composition shall not be less than 6000 psi (41 MPa) when tested in accordance with ASTM D638 using a Type IV specimen [0.125 ± 0.010 (3.18 ± 0.25 mm) thick]. Tests shall be conducted at an ambient temperature of 75 ± 5 F (24 ± 3 C). The testing machine shall operate at a speed of 0.20 (5.1 mm) per minute.

The total conditioning or drying period, from the time the epoxy composition is first mixed to the time of testing, shall not be less than 24 hours nor more than 96 hours.

Test specimens for tensile strength determination will be prepared as follows:

A 1/8 inch (3 mm) thick sheet of epoxy material is cast from a reservoir-type mold, fabricated from polytetrafluorethylene (PTFE), 1/8 deep x 10 x 10 (3 mm deep x 250 mm x 250 mm).

Prior to casting, the mold is sprayed with a suitable release agent. A sufficient amount of epoxy composition is mixed in the proper proportions (A:B) and poured level with the top of the mold. Care should be taken so as not to decrease or exceed the 1/8 (3 mm) thickness.

After a period of 1 to 4 hours, the material will have set into a semi-rigid sheet that is flexible enough to die-cut yet rigid enough to retain its shape. While the material is in this plastic state, five (5) specimens shall be die-cut and then placed on a flat, smooth, PTFE surface for the completion of the specified conditioning period.

- g. Compressive Strength. The compressive strength of the epoxy composition shall not be less than 12,000 psi (83 MPa) when tested in accordance with ASTM D695 except that a compression tool shall not be necessary. The test specimen shall be a right cylinder [0.50 inch diameter by 1.0 inch length (12 mm diameter by 25 mm length)]. Tests shall be conducted at an ambient temperature of 75 ± 5 F (24 ± 3 C).

The total conditioning or drying period, from the time the epoxy composition is first mixed to the time of testing shall not be less than 24 hours nor more than 96 hours.

Test specimens for compressive strength determinations will be prepared as follows:

Five molds will be prepared from 1/2 (12 mm) I.D., 1/16 (1.5 mm) wall thickness acrylic tubing, cut in 1 1/2 (38 mm) lengths. After spraying the inside of the mold with a suitable release agent,⁽¹⁾ the cylindrical tubes are placed in a vertical position on a PTFE sheet base. A sufficient amount of epoxy composition is thoroughly mixed in the proper proportions (A:B) and poured into the mold to a depth of approximately 1 1/4 (32 mm). After a minimum of 72 hours curing, the specimens are removed from the molds and machined to a length of 1 ± 0.002 (25 mm ± 0.05 mm).

- h. Hardness. The epoxy composition when tested in accordance with ASTM D2240 shall have a Shore D hardness of between 75 and 100. Samples shall be allowed to dry for not less than 24 hours nor more than 96 hours prior to testing.

B. Reflective Glass Spheres/Beads

Reflective glass spheres for drop-on application shall conform to the following requirements:

The glass spheres shall be colorless; clean; transparent; free from milkiness or excessive air bubbles; and essentially clean from-surface scarring or scratching. They shall be spherical in shape and at least 80% of the glass beads shall be true spheres when tested in accordance with ASTM D1155. At least 80% of the Type IV beads shall be true spheres as measured by the visual method.

The refractive index of the spheres shall be a minimum of 1.50 as determined by the liquid immersion method at 77 F (25 C).

The silica content of the glass spheres shall not be less than 60%.

The crushing resistance of the spheres shall be as follows: A 40 lb. (18 kg) dead weight, for 20 to 30 (850 μm to 600 μm) mesh spheres shall be the average resistance when tested in accordance with ASTM D1213.

The glass spheres shall have the following grading when tested in accordance with ASTM D1214.

M247 AASHTO Type 1 Glass Spheres

<u>U.S. Standard Sieve</u>	<u>% Retained</u>	<u>% Passing</u>
#20 (850μm)	0	100
#30 (600μm)	5-25	75-95
#50 (300μm)	40-65	15-35
#100 (150μm)	15-35	0-5
Pan	0-5	

Type 4 Large Spheres

<u>U.S. Standard Sieve</u>	<u>% Retained</u>	<u>% Passing</u>
#10 (2000 μm)	0	100
#12 (1680 μm)	0-5	95-100
#14 (1410 μm)	5-20	80-95
#16 (1190 μm)	40-80	10-40
#18 (1000 μm)	10-40	0-5
#20 (850 μm)	0-5	0-2
Pan	0-2	

The AASHTO M247 Type 1 glass spheres shall be treated with a moisture-proof coating. They shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for marking operations. The moisture-resistance of the glass spheres shall be determined in accordance with AASHTO M247 test method 4.4.1.

Type IV glass spheres shall be treated with an adhesion coating. They shall show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for marking operations. The adhesion coating property of the Type IV beads shall be tested in accordance with the dansyl-chloride test.

C. Black Epoxy Contrast Markings

Epoxy Resin Requirements: The two-component, 100% solids, paint shall be formulated and designed to provide a simple volumetric mixing ratio (e.g. 2 part component A to 1 part component B) specifically for service as a hot-spray applied binder for black aggregate in such a manner as to produce maximum adhesion. The material shall be composed of epoxy resins and pigments only.

The paint shall be well mixed in the manufacturing process and shall be free from defects and imperfections that may adversely affect the serviceability of the finished product. The paint shall not thicken, curdle, gel, settle excessively, or otherwise display any objectionable properties after storage. Individual components shall not require mixing prior to use when stored for a maximum of 6 months.

The overall paint composition shall be left to the discretion of the manufacturer, but shall meet the following requirements:

Composition:	<u>Component</u> Carbon Black (ASTM D476 Type III) Talc Epoxy Resin	<u>Percent By Weight</u> 7±2 percent, by weight 14±2 percent, by weight 79±4 percent, by weight
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D. Black Aggregate

The moisture resistant aggregate shall meet the gradation requirements (AASHTO T27) as follows:

<u>Sieve Size</u>	<u>Percent Retained</u>
#30	18-28%
#40	60-80%
#50	2-14%

The moisture resistant aggregate shall have a ceramic coating. The aggregate shall be angular with no dry dispensement pigment allowed.

<u>Hardness:</u>	The black aggregate hardness shall be 6.5-7 on Moh's Mineral Scale.
<u>Porosity:</u>	The black aggregate porosity shall be less than two (2) percent.
<u>Moisture Content:</u>	The black aggregate moisture content shall be less than a half (.5) percent.

E. Packaging and Shipment

Epoxy pavement marking materials shall be shipped to the job site in strong substantial containers. Individual containers shall be plainly marked with the following information:

- a. Name of Product
- b. Lot Number
- c. Batch Number
- d. Test Number
- e. Date of Manufacture
- f. Date of expiration of acceptance (12 months from date of manufacture)
- g. The statement (as appropriate)
Part A - Contains Pigment & Epoxy Resin
Part B - Contains Catalyst
- h. Quantity
- i. Mixing proportions, Application Temperature and Instructions
- j. Safety Information
- k. Manufacturer's Name and Address

Reflective glass spheres shall be shipped in moisture resistant bags. Each bag shall be marked with the name and address of the manufacturer and the name and net weight of the material.

F. The Department reserves the right to randomly take a one-quart sample of white, yellow and hardener, of the epoxy material or glass spheres without prior notice for testing to ensure the epoxy material meets specifications.

Epoxy Application Equipment:

Application equipment for the placement of epoxy reflectorized pavement markings shall be approved by the Department, prior to the start of work.

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

In general, the application equipment shall be a mobile, truck mounted and self contained pavement marking machine, specifically designed to apply epoxy resin materials and reflective glass spheres in continuous and skip-line patterns. The application equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks, and other special patterns.

The Engineer may approve the use of a portable applicator in lieu of truck mounted accessories, for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized epoxy markings in accordance with these specifications.

The applicator shall be capable of installing up to 20,000 lineal feet (6,100 lineal meters) of epoxy reflectorized pavement markings in an 8-hour day and shall include the following features:

1. The applicator shall provide individual material reservoirs, or space, for the storage of Part A and Part B of the epoxy resin composition; for the storage of water; and for the storage of reflective glass spheres.
2. The applicator shall be equipped with heating equipment of sufficient capacity to maintain the individual epoxy resin components at the manufacturer's recommended temperature for spray application and for heating water to a temperature of approximately 140 F (60 C).
3. The glass spheres shall be gravity dropped upon 20 mils (500 um) of epoxy pavement markings to produce a wet-night-reflective pavement marking. The large spheres (Federal Spec. Type 4) shall be applied at a rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material. This application rate and the following gradation shall conform to FHWA's FP-96: Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (pages 757-761 Type 3 and Type 4 Beads).
4. The applicator shall be equipped with metering devices or pressure gauges, on the proportioning pumps. Metering devices or pressure gauges shall be visible to the Engineer.
5. The applicator shall be equipped with all the necessary spray equipment, mixers, compressors, and other appurtenances to allow for the placement of epoxy reflectorized pavement markings in a simultaneous sequence of operations as described below in Construction Details, D. Applications of Epoxy Reflectorized Pavement Markings of this Special Provisions.

Construction Details.

A. General: All pavement marking and patterns shall be placed as shown on the Plans or as directed by the Engineer.

Before any pavement markings work is begun, a schedule of operations shall be submitted for the approval of the Engineer. This schedule shall be submitted 2 weeks prior to the application of the striping.

At least five (5) days prior to starting striping the Contractor shall provide the Engineer with the epoxy manufacturer's written instructions for use. These instructions shall include but not be limited to: mixing ratios, application temperatures, and recommendations for use of water spray.

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

The Contractor shall be responsible for removing, to the satisfaction of the Engineer, tracking marks, spilled epoxy or epoxy markings applied in unauthorized areas.

The hot water spray shall not be used in conjunction with markings applications on any pavement surface, or on any existing durable type marking, unless specifically recommended by the manufacturer of the epoxy material.

- B. Atmospheric Conditions: Epoxy 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 a minimum of 35 F (2 C) and the ambient temperature shall be a minimum of 35 F (2 C) and rising. The Engineer shall be the sole determiner as to when atmospheric conditions and pavement surface conditions are such to produce satisfactory results.
- C. Surface Preparations: The Contractor shall clean the pavement or existing durable marking to the satisfaction of the Engineer.

Surface cleaning and preparation work shall be performed only in the area of the epoxy markings application.

At the time of application all pavement surfaces and existing durable markings shall be free of oil, dirt, dust, grease and similar foreign materials. The cost of cleaning these contaminants shall be included in the bid price of this item. Also, the item shall include the cost of removal of the curing component in the area of the epoxy markings application, if concrete curing compounds on new portland cement concrete surfaces have been used. Waterblasting will not be permitted for removal.

- D. Application of White/Yellow Epoxy Reflectorized Pavement Markings: White/yellow epoxy reflectorized pavement markings shall be placed at the widths and patterns designated on the Contract Plans.

Markings operations shall not begin until applicable surface preparation work is completed, and approved by the Engineer.

White/yellow epoxy pavement markings shall be applied at a minimum uniform thickness of 20 mils (500 μ m) on all Portland cement concrete and bituminous concrete pavement, including Stone Matrix Asphalt.

Large reflective glass spheres (Federal Spec. Type 4) shall be applied at the rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material, immediately followed by a second drop of AASHTO M-247 Type 1 glass spheres applied at a rate of 12 pounds per gallon (1.4 kg/L) of epoxy pavement marking material. Glass spheres shall uniformly cover the length and width of the pavement marking.

- E. Application of Black Epoxy Contrast Pavement Markings: Black epoxy contrast pavement markings shall be placed at the widths designated on the Contract Plans.

Markings operations shall not begin until applicable surface preparation work is completed, and approved by the Engineer.

Black epoxy contrast pavement markings shall be applied at a minimum uniform thickness of 20 mils (500 µm) on all Portland cement concrete surfaces followed by a single drop of graded black aggregate.

The width of black epoxy line shall be applied for the following situations:

Center Skip Line - On Portland cement concrete pavements a black contrast skip line shall be 10 feet (3 m) in length of the same width as the white epoxy reflectorized skip. It is to lead the white skip and stop at the beginning of the white skip. The black contrast skip is to have a single application of graded black aggregate.

Edge Lines - All edge lines on Portland cement concrete pavements shall have a base of black contrast markings which is 4 inches (100 mm) wider than the reflective white or yellow marking. The black contrast marking is to be applied first with a single drop of graded black aggregate. Once it has cured sufficiently so as not to track, the reflectorized white or yellow line is to be applied on top of it. The reflective line is to be centered along the black contrast line such that a minimum of 2 inches (50 mm) of black contrast marking is visible on either side of the reflective marking.

F. Defective Epoxy Pavement Markings: Epoxy reflectorized pavement markings, which after application and curing 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 film thickness [(less than 20±1 mils (500 µm) as applicable] and line widths; insufficient glass bead coverage or inadequate glass bead retention.

Repair Method: Prepare the surface of the defective epoxy marking by shot blasting, sand blasting, or water blasting. No other cleaning methods will be allowed. Surface preparation shall be performed to the extent that a substantial amount of the reflective glass spheres are removed and a roughened epoxy marking surface remains.

Immediately after surface preparation remove loose particles and foreign debris by brooming or blasting with compressed air.

Repair shall be made by re-striping over the cleaned surface, in accordance with the requirements of this specification and at a full 20±1 mils (500 µm) minimum line thickness as applicable.

2. Uncured or discolored epoxy (brown patches); insufficient bond to pavement surface (or existing durable marking).

Uncured epoxy shall be defined as applied material that fails to cure (dry) in accordance with the requirements of this specification under MATERIALS, A, 2d. DRYING TIME (FIELD); or applied material that fails to cure (dry) within a reasonable time period under actual field conditions, as defined by the Engineer.

Discoloration (brown patches) shall be defined as localized areas or patches of brown or grayish colored epoxy marking material. These areas often occur in a cyclic pattern and also, often are not visible until several days or weeks after markings are applied.

Repair Method: The defective epoxy marking shall be completely removed and cleaned to the underlying pavement surface to the satisfaction of the Engineer.

The extent of removal shall be the defective area plus any adjacent epoxy pavement marking material extending one foot (300 mm) any direction.

After surface preparation work is complete, repair shall be made by re-applying epoxy over the cleaned pavement surface in accordance with the requirements of this specification.

3. Reflectivity for epoxy resin paint.

After satisfactory completion of all striping work and written notification from the Contractor, the Department shall test the striping to ensure it has the minimum reflectivity. The testing will be completed within 30 calendar days from notification. The Contractor may request that tests be conducted on completed phases or portions of the work. Approval of such a request will be at the discretion of the Engineer. Testing will be done using a Delta LTL 2000 Retrometer (30 meter geometry). Five readings will be taken per line per mile (1.6 km). Projects less than 1 mile (1.6 km) in length will have a minimum of 5 readings per line. These readings will then be averaged for the overall project average.

The required average minimum initial reflectivity reading in millicandellas shall be:

White 450
Yellow 325

Any single reading shall not be less than 350 millicandellas for white and 250 millicandellas for yellow. Without exception, any pavement markings installed that does not meet the above average minimum initial reflectivity numbers shall be removed and replaced, at the installation contractor's expense.

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 epoxy reflectorized pavement markings shall be performed by the Contractor at no additional cost to the State.

Method of Measurement:

The quantity of permanent pavement striping (white, yellow, or black epoxy resin paint) will be measured by the number of linear feet (meters) of pavement striping line and number of square feet (meter) of symbol installed on the pavement and accepted in accordance with the Plans.

Basis of Payment:

The quantity of permanent pavement striping (white, yellow, or black epoxy resin paint) payment will be paid for at the Contract unit price per linear foot (meter) for 4 , 6 , 8 , 10 , 12 , 16 (100 mm, 150 mm, 200 mm, 250 mm, 300 mm, or 400 mm) line and the Contract unit price per square foot (meter) of symbol. The quantity of permanent pavement marking (white, yellow, or black epoxy resin paint) will be paid for at the Contract unit price per linear foot (meter) of line and the Contract unit price per square foot (meter) of symbol. Price and payment shall include cleaning and preparing the pavement surface, and placing all materials, for all labor, tools, equipment and incidentals necessary to complete the work.

NOTE:

For information only:

The following manufacturers are known to us which manufacturer Epoxy Resin Paint for Pavement Striping. The Department does not endorse or require the use of any of the manufacturers listed below. However, a bidder wishes to use another manufacturer's product, it shall be submitted for review and approval prior to submitting a bid proposal. Should the product be deemed unacceptable by the Department, the successful bidder will be required to use only an approved product.

1. POLY CARB, Inc.
33095 Bainbridge Road
Solon, Ohio 44139
Tel. 1-800-CALLMIX

2. IPS - Ennis Paint
P.O. Box 13582
Research Triangle Park, North Carolina 27709
Tel. 1-877-477-7623

3. Epoplex
One Park Avenue
Maple Shade, NJ 08052
Tel. 1-800-822-6920
4. Or an approved equal.

4/22/2010

- 748541 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
4"
- 748542 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
6"
- 748543 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
8"
- 748544 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
12"
- 748545 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
16"
- 748546 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
SYMBOL/LEGEND
- 748553 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
BIKE SYMBOL
- 748554 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
PEDESTRIAN SYMBOL
- 748555 - PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS,
HANDICAP SYMBOL

Description:

This work consists of furnishing and installing preformed retroreflective thermoplastic pavement marking with a preapplied Federal Specification Type IV glass bead coating throughout its entire cross section on bituminous asphalt pavement at the locations and in accordance with the patterns on the Plans, or as directed by the Engineer.

The preformed retroreflective markings shall conform to the size and dimensions as shown in the Federal "Standard Highway Signs" book found at: <http://mutcd.fhwa.dot.gov/SHSe/pavement.pdf> as referred to in the Delaware Manual on Uniform Traffic Control Devices, Part 3, Markings.

Materials:

General: Only materials listed on the Department's Approved Pavement Markings Material List will be used for this item. The preformed retroreflective markings shall be fusible to bituminous asphalt pavement by means of the normal heat of a propane type of torch. Adhesives, primers or sealers are not necessary prior to the preformed retroreflective markings application on bituminous asphalt pavement.

The preformed retroreflective markings shall conform to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The markings shall have resealing characteristics and be capable of fusing to itself and previously applied worn hydrocarbon and/or alkyd thermoplastic pavement markings.

The preformed retroreflective markings shall be capable of application on bituminous asphalt pavement wearing courses during the paving operation in accordance with the manufacturer's instructions. After application the markings shall be immediately ready for traffic. The preformed retroreflective markings shall be suitable for use for one year after the date of receipt when stored in accordance with the manufacturer's recommendations.

The preformed retroreflective thermoplastic markings shall not be brittle and must be sufficiently cohesive and flexible at temperatures exceeding 50°F (10°C) for one person to carry without the danger of fracturing the material prior to application.

Composition: The retroreflective pliant rosin ester thermoplastic pavement markings shall consist of a homogeneous mixture of high quality polymeric thermoplastic binders, pigments, fillers and glass beads. The thermoplastic material must conform to AASHTO M249-79(86) with the exception of the relevant differences due to the material being preformed, and identified herein.

Intermix Glass Beads: The preformed retroreflective material shall contain a minimum of 30% glass spheres which shall conform to AASHTO M247-81 Type 1. Glass spheres shall have a minimum of 80% true spheres overall.

Top Beads: To provide the required retroreflectivity, the preapplied factory top coating of glass beads shall be a combination of both Federal Spec. Type IV and AASHTO M247-81 Type I beads. Federal Spec. Type IV beads shall be evenly disbursed across the entire surface of the product at a minimum rate of 4 lb. (1.8 kg) per 100 ft² (9.3 m²) and the AASHTO at 3 lb.(1.4 kg) per 100 ft² (9.3 m²). In combination, the total glass bead coverage shall be 7-8 lb. (3.2-3.6 kg) per 100 ft² (9.3 m²). The AASHTO M247-81 Type I beads shall have a minimum of 80% true spheres overall and the Federal Spec. Type IV beads shall be 80% true spheres on the 12 and 14 sieves and shall be no less than 75% true spheres on the remaining sieves.

Retroreflectivity: After satisfactory completion of all striping work and written notification from the contractor, the Department shall test the striping to ensure it has the minimum reflectivity. The testing will be completed within 30 calendar days from notification. Testing will be done using a Delta LTL 2000 Retrometer (30 meter geometry). The required minimum initial reflectivity reading in millicandellas shall be:

White 300
Yellow 200
Blue 200

Skid Resistance: The surface of the preformed retroreflective thermoplastic markings shall provide a pre-applied minimum skid resistance value of 45-51 BPN and a post-applied minimum skid resistance value of 45-55 BPN when tested according to ASTM E303-74.

Thickness: The thickness of the supplied material shall have a minimum average thickness of .090" (90 mils) for all Longitudinal lines and a thickness of .125" (125 mils) for all transverse lines and symbols/legends.

Tensile Strength and Elongation: The preformed retroreflective thermoplastic material shall have a minimum tensile strength of 150 lb. per square inch (1054 kg per square mm) of cross section, at .002" (2.28 mil) thickness, when tested according to ASTM D638-76 except that a sample 6" by 1" (150 mm by 25 mm) shall be tested at a temperature between 70°F and 80°F (21°C and 27°C) using a jaw speed of 10" to 12" (250 mm to 300 mm) per minute. The sample shall have a maximum elongation of 20% at break when tested by this method.

Flexibility: The preformed retroreflective thermoplastic marking material shall have flexibility at 50°F such that when a 1" by 6" (25 mm by 150 mm) sample is bent through an arc of 90 degrees at a uniform rate in 10 seconds (9 degrees per second) over a 1" (25 mm) mandrel, no cracking occurs in the test sample. The sample must be conditioned prior to testing at 50°F±2 degrees (10°C) for a minimum of four hours. At least two specimens tested must meet the flexibility requirements at 50°F (10°C) for a passing result.

Environmental Resistance: The applied markings shall be resistance to deterioration due to exposure to sunlight, water, oil, diesel fuels, gasoline, pavement oil content, salt and adverse weather conditions.

Effective Performance Life: When properly applied, in accordance with manufacturer's instructions, the preformed retroreflective pavement markings shall be neat and durable. The markings shall remain skid resistant and show no lifting, shrinkage, tearing, roll back or other signs of poor adhesion for a period of one winter season.

Oil/grease Resistant Test: The preformed retroreflective thermoplastic material shall not dissolve or smear after rubbing a small amount of motor oil on a small piece of the thermoplastic material for two minutes.

Bond Strength: The material shall exhibit a bond strength to Portland Cement Concrete (PCC) equal or exceed 180 psi when tested at room temperature (73.4±3°F) (23°C) in accordance to ASTM Standard Test Method for Bond Strength of thermoplastic marking Material D4796-88. Place a coarse brick in a 400°F (204°C) oven for 5 minutes. Prepare a 4 square inch test specimen. Place the test specimen on the brick and further heat in the 400°F (204°C) oven for 15 minutes. The test specimen is then allowed to cool to room temperature and prepared for testing.

Low Temperature Cracking (Stress) Resistance for Extended Period: The material shall be tested according to AASHTO T250 Section 7 with Section 7.2.3 modified for and extended cold temperature 15 degrees $\pm 3^{\circ}\text{F}$ ($-9.4\pm 2^{\circ}\text{C}$) exposure period 72 hours. Any cracking shall constitute failure of the material for PCC road surfaces.

Impact Resistance (Gardner Falling Weight): A 2" by 7.5" (50 by 190 mm) specimen shall be applied on a course concrete brick. Using a Gardner Impact Tester, a 2 lb (.91 kg) weight is dropped from a height of 80" (2032 mm). The specimen when tested at room temperature $73.4\pm 3^{\circ}\text{F}$ (23°C) should show no sign of cracking. (Test procedure is in accordance with ASTM D5420-93).

Packaging: The flexible preformed retroreflective thermoplastic marking materials, for use as transverse or longitudinal markings as well as legends, arrows and symbols shall be available in flat form material or in rolls. Flat material shall be supplied in maximum of 4' (1.2 m) lengths up to 2' (.6 m) in width. The material shall be packed in suitable cartons clearly labeled for ease of identifying the contents.

Construction Methods:

The markings shall be applied in strict accordance with the manufacturer's recommendations on clean and dry surfaces. Marking configurations shall be in accordance with the "Delaware Manual on Uniform Traffic Control Devices, Part 3, Markings."

The preformed retroreflective thermoplastic material shall be fusible to the pavement by means of a propane torch recommended by the manufacturer. Preheating the surface to remove any latent moisture will be done just prior to the placement and installation of the Symbol/ Legend.

No markings shall be placed when the ambient temperature is below 40°F (4°C). The material shall be kept in a location above 55°F (13°C) until just before application.

The supplier shall provide technical services as may be required.

Method of Measurement:

The quantity of pavement striping (748541-748545) will be measured by the number of linear feet (linear meters) of 4", 6", 8", 12", or 16" pavement striping line placed and accepted. The quantity of symbol/ legend (748546) will be measured by the number of square feet (meters) of symbol/legend placed and accepted. The quantity of bike symbol, pedestrian symbol, and handicap symbol (748551-748553) will be measured as each placed and accepted. The dimensions for the symbol/legends are listed under Section 748.10 in the Delaware Standard Specifications.

Bike Rider with Helmet shall be 3' X 5'.

Pedestrian shall be 4' X 8'.

Handicap Symbol shall be 40" X 40".

Basis of Payment:

The quantity of pavement striping payment will be paid for at the Contract unit price per linear foot (linear meter) for 4", 6", 8", 12" and 16" (100 mm, 150 mm, 200 mm, 300 mm, and 400 mm) line. The quantity of symbol/legend will be paid for at the Contract unit price per square foot (meter). The quantity of bike symbol, pedestrian symbol, and handicap symbol will be paid for at the Contract unit price per each. Price and payment shall include cleaning and preparing the pavement surface, and placing all materials, for all labor, tools, equipment and incidentals necessary to complete the work.

Warranty:

The Contractor shall warrant to the Department that the installed retroreflective preformed thermoplastic pavement markings are free of defects, as hereafter defined, for a period of one winter season beginning at the initial acceptance of the marking installation by the Department. The initial acceptance of the marking installation will occur upon the satisfactory correction of all deficiencies noted in the marking installation during the Final Inspection of the project. The markings shall be warranted against failure due

to blistering, excessive cracking, bleeding, staining, discoloration, oil content of the pavement materials, smearing and spreading under heat, deterioration due to contact with grease deposits, oil, diesel fuel, or gasoline drippings, chipping, spalling, poor adhesion to the pavement materials, vehicular damage, and wear from normal maintenance activities including snow plowing.

The Contractor shall repair all defective areas identified by the Department after initial installation or during the Warranty Period. All repairs shall begin immediately following the notice to the Contractor by the Department unless weather limitations prevent the corrective work. Should the contractor not commence work within the period stated in the notice, weather permitting, and pending severity, the Department reserves the right to remedy the condition and charge the contractor for the work. Any corrective work shall be as recommended by the manufacturer of the marking material and approved by the Department. The Department shall be given notification before the Contractor begins corrective work to allow for inspection of the operation. All costs associated with the repair work shall be the responsibility of the contractor. These costs shall include, but are not limited to, removal, material, maintenance of traffic, etc.

2/28/09

- 763605 - MAINTENANCE OF TRAFFIC, TWO LANE, TWO WAY WITH SHOULDER CLOSURE**
- 763606 - MAINTENANCE OF TRAFFIC, TWO LANE, TWO WAY WITH LANE CLOSURE**
- 763607 - MAINTENANCE OF TRAFFIC, MULTILANE, DIVIDED HIGHWAY WITH SHOULDER CLOSURE**
- 763608 - MAINTENANCE OF TRAFFIC, MULTILANE, DIVIDED HIGHWAY WITH LANE CLOSURE**
- 763609 - MAINTENANCE OF TRAFFIC, MULTILANE LIMITED CONTROL FOR INTERSTATES AND HIGHWAYS WITH SHOULDER CLOSURE**
- 763610 - MAINTENANCE OF TRAFFIC, MULTILANE LIMITED CONTROL FOR INTERSTATES AND HIGHWAYS WITH ONE LANE CLOSURE**
- 763611 - MAINTENANCE OF TRAFFIC, MULTILANE LIMITED CONTROL FOR INTERSTATES AND HIGHWAYS WITH MULTIPLE LANE CLOSURES**

Description:

This work shall include maintaining vehicular and pedestrian traffic while work is being done or a travel area is affected by work as indicated in the job order. All work and traffic control devices shall be in accordance with 2007 Delaware Manual on Uniform Traffic Control Devices (MUTCD), Part 6, herein after referred to as the Traffic Control Manual (latest edition with all revisions made up to the advertisement date of this project and from hereon shall be addressed as the Traffic Control Manual), notes and details on the Plans.

Prior to the beginning of any work in a particular location, the Contractor shall first place traffic control devices so as to effectively close that area to the passage of unauthorized vehicles, and protect the work and personnel until the area is ready for public use.

The safety measures outlined herein and in the traffic Manual shall be considered as elementary only, and not necessarily sufficient in every instance to guarantee the protection of the traveling public. The final responsibility for the installation of adequate safety precautions, and for the protection of the traveling public, and its own personnel shall rest with the Contractor.

The Contractor shall be responsible for all traffic control devices if specified in the job order. The Department reserves the right to set up and maintain traffic if indicated in the job order or as specified by the Engineer.

Schedule and Construction Control:

A maintenance of traffic plan and construction schedule shall be required for all operations affecting the flow of traffic on all roadways where work is to be performed. The maintenance of traffic plan shall be submitted to the engineer seven days in advance of the proposed work for approval. The plan must show all methods and devices the Contractor proposes for the maintenance of traffic.

The Contractor shall take the precautions to safeguard the traveling public on the all roadways applicable to this contract. When the Contractor's vehicles are moving on the roadways, the vehicles hazard lights shall be in operation unless the vehicle can sustain a speed in excess of 35 M.P.H. All Contractor's vehicles and his suppliers that are parked adjacent to the moving lanes shall be equipped and activated with a rotating amber colored beacon.

During weekend and holidays, all lanes and shoulders of the Interstate and ramps shall be open. Weekends for all Expressway Systems shall be defined as the period from 3:00 p.m. Friday to 6:00 a.m. Monday. Lane and shoulder closings shall not be permitted during the following holiday periods:

- December 24 through December 27 (Christmas)
- December 31 through January 3 (New Year's)
- Good Friday through the Monday following Good Friday
- Friday prior to Memorial Day through the Tuesday following Memorial Day
- July 3 through July 5 (Independence Day)
- Friday prior to Labor Day through the Tuesday following Labor Day

Wednesday prior to Thanksgiving through the Monday following Thanksgiving

Lane Closings on the roadways shall be limited between the hours of 9:00 a.m. and 3:00 p.m. Monday through Friday and 9:00 p.m. through 5:00 a.m. Sunday through Thursday.

Materials:

The contractor shall supply all traffic control devices as necessary to protect the work area as provided for in the Traffic Control Manual.

Construction Methods:

The method of installation shall be as prescribed in the Traffic Control Manual. The minimum installation requirements for maintenance of traffic are described in Cases 1 and 13 of the Traffic Control Manual and shall be incidental to other pay items in this contract. The Maintenance of Traffic shall be distinguished based on the following roadway types and closures:

1. Two Lane, Two Way with Shoulder Closure
2. Two Lane, Two Way with Lane Closure
3. Multilane, Divided Highway with Shoulder Closure
4. Multilane, Divided Highway with Lane Closure
5. Multilane Limited Control for Interstates and Highways with Shoulder Closure
6. Multilane Limited Control for Interstates and Highways with One Lane Closure
7. Multilane Limited Control for Interstates and Highways with Multiple Lane Closures

For Two Lane, Two Way roadways with Shoulder Closures, Case numbers 2 from the Traffic Control Manual shall be used for the maintenance of traffic operations under this contract.

For Two Lane, Two Way roadways with Lane Closures, Case numbers 7, 13, and 14 from the Traffic Control Manual shall be used for the maintenance of traffic operations under this contract.

For Multilane, Divided Highways with Shoulder Closures, Case numbers 3, 4, and 5 from the Traffic Control Manual shall be used for the maintenance of traffic operations under this contract.

For Multilane, Divided Highways with Lane Closures, Case numbers 7, 8, and 9 from the Traffic Control Manual shall be used for the maintenance of traffic operations under this contract.

For Multilane Limited Control for Interstates and Highways with Shoulder Closures, Case numbers 4 and 5 from the Traffic Control Manual be used for the maintenance of traffic operations under this contract.

For Multilane Limited Control for Interstates and Highways with One Lane Closure, Case numbers 7, 8, 13, and 14 from the Traffic Control Manual shall be used for the maintenance of traffic operations under this contract.

For Multilane Limited Control for Interstates and Highways with Multiple Lane Closures, Case numbers 9, 13, and 14 from the Traffic Control Manual shall be used for the maintenance of traffic operations under this contract.

Method of Measurement:

The quantity for Maintenance of Traffic shall be measured per Each for each case described in the Traffic Control Manual. The Maintenance of Traffic shall be distinguished based on the following roadway types and closures:

1. Two Lane, Two Way with Shoulder Closure
2. Two Lane, Two Way with Lane Closure
3. Multilane, Divided Highway with Shoulder Closure
4. Multilane, Divided Highway with Lane Closure
5. Multilane Limited Control for Interstates and Highways with Shoulder Closure
6. Multilane Limited Control for Interstates and Highways with One Lane Closure

7. Multilane Limited Control for Interstates and Highways with Multiple Lane Closures

Basis of Payment:

The quantity for Maintenance of Traffic will be paid for at the Contract unit price per Each. Price payment will constitute full compensation for set up, removal, furnishing and placing all material, labor, equipment, tools, appurtenances, drums, resetting of drums if required, signs, arrow panels and all incidentals necessary to complete the work. Each maintenance of traffic item for the seven types of installations will be paid per one set up-take down cycle and shall cover all maintenance of traffic required by the Traffic Control Manual. Each job order will indicate the number of allowable set up-take down cycles.

The Basis of Payment is applicable to the following types of installations:

1. Two Lane, Two Way with Shoulder Closure
2. Two Lane, Two Way with Lane Closure
3. Multilane, Divided Highway with Shoulder Closure
4. Multilane, Divided Highway with Lane Closure
5. Multilane Limited Control for Interstates and Highways with Shoulder Closure
6. Multilane Limited Control for Interstates and Highways with One Lane Closure
7. Multilane Limited Control for Interstates and Highways with Multiple Lane Closures

Each of the above items shall include payment for the following:

1. Providing, transporting, locating, setting up, and maintaining of all necessary traffic control devices as prescribed above.
2. Removal and transporting of all devices back to the storage yard upon completion of the job task.

8/5/08

763632 – REMOVAL OF RAISED PAVEMENT MARKER

Description:

This work consists of removing and disposing of raised pavement markers at locations noted on the Plans and filling in the void with patching material.

Materials:

A cementitious, rapid setting, semi-leveling mortar mix with a gel state consistency shall be used for filling in the voids.

The rapid setting mortar mix shall have a 4-6 minute working time and reach a minimum compressive strength of 3,000 psi within 60 minutes.

The material shall be approved by the Engineer prior to placement.

Construction Methods:

The Contractor shall remove raised pavement markers minimizing damage to the existing pavement. The Contractor may use a back hoe or hand tool to remove the raised pavement marker. The method of removal of the raised pavement marker shall be approved by the Engineer.

Immediately after removing the raised pavement marker, the Contractor shall remove all loose debris from the void, dry the void, and fill the void with the approved patching material. The patching material shall be mixed and placed according to the manufacturer's recommendations.

Method of Measurement:

The quantity of removal of raised pavement markers will be measured as the actual number of each pavement marker removed.

Basis of Payment:

The quantity of removal of pavement markers will be paid for at the Contract unit price of each. Price and payment will constitute full compensation for all labor, equipment, tools, patching materials, disposal of the pavement markers, and incidentals required to complete the work.

11/14/08



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
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CAROLANN WICKS, P.E.
SECRETARY

UTILITY STATEMENT

STATE CONTRACT No. T201106803
Project I.D. No. 10-98765
Microsurfacing, Central and South, FY2011

CENTRAL DISTRICT

No utility relocation involvement is anticipated, should any conflicts be encountered during construction requiring adjustment and/or relocation, the necessary relocation work shall be accomplished by the respective agencies, as directed by the District Engineer.

Any adjustments and/ or relocations of municipally owned sewer or water facilities shall be done by the State's contractor in accordance with the respective agencies' standard specifications as directed by the District Engineer.

General Notes

1. The Contractor's attention is directed to Section 105.09 Utilities, Delaware Standard Specifications, August 2001. The Contractor shall contact Miss Utility (1-800-282-8555) two working days prior to any excavation. The Contractor is responsible for the support and protection of all utilities when excavating. The Contractor is responsible for ensuring proper clearances, including safety clearances, from overhead utilities for construction equipment. The Contractor is advised to check the site for access purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. It is understood and agreed that the Contractor has considered in his bid all permanent and temporary utility appurtenances in their present and relocated positions as shown on the plans or described in the Utility Statement or are readily discernible and that no additional compensation will be allowed for any delays, inconvenience, or damage due to any interference from the utility facilities and appurtenances or the operation of moving them, except that the Contractor may be granted an equitable extension of time.

14
M...
A...
General Notes & Conditions

3. Coordination and cooperation among the Utility Companies and the State's Contractor are of prime importance. Therefore, the Contractor is directed to contact the following Utility Company representatives with any questions regarding this work prior to submitting bids and work schedules. Proposed work schedules should reflect the Utility Companies' proposed relocations. The Utility Companies do not work on weekends or legal holidays.

DIVISION OF TRANSPORTATION SOLUTIONS

12-2-10
DATE


UTILITY ENGINEER

**STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
PO BOX 778
DOVER, DELAWARE 19903**

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201106803

F.A.P. No. N/A for R/W

MICROSURFACING, CENTRAL AND SOUTH, FY 2011

KENT COUNTY

Certificate of Right-of-Way Status – Stipulated

As required by 23CFR Part 635, all necessary right of way has been acquired in accordance with current State/Federal rules and regulations covering the acquisition of real property.

This is to certify that this project is awaiting Written Town Agreements (WTA). When all WTA's have been acquired a 100% certificate of right-of-way will be issued.

It is further certified that there were no individuals or families displaced by this project. Therefore the provisions of 49 CFR Part 24 is not applicable to the project.

There will be no relocation of personal property or displacement of any owner or tenant occupants on this project. There are no improvements to be removed or demolished as part of this project.

REAL ESTATE SECTION

Carol V. O'Donoghue
Assistant Chief, Real Estate

December 13, 2010



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

CAROLANN WICKS, P.E.
SECRETARY

October 15, 2010

ENVIRONMENTAL REQUIREMENTS

for

State Contract No. T201106803/31-068-03

Federal Aid No.: None

Contract Title: Microsurfacing Central and South, FY 2011

In accordance with the procedural provisions for implementing the National Environmental Policy Act of 1969, as amended, the referenced project has been processed through the Department's Environmental Review Procedures and has been classified as a Level D/ Class II Action.

Due to the nature of the proposed construction activities, permits are not required for this project. However, the following construction requirements and special provisions have been developed to minimize and mitigate impact to the surrounding environs. These requirements by DelDOT not specified within the contract, but listed below, are the responsibility of the contractor and is subject to risk of shut down at the contractor's expense if not followed.

GENERAL REQUIREMENTS:

1. All construction debris, excavated material, brush, rocks, and refuse incidental to such work shall be placed either on shore above the influence of flood waters or on some suitable dumping ground.
2. That effort shall be made to keep construction debris from entering adjacent waterways or wetlands. Any debris that enters those areas shall be removed immediately.
3. The disposal of trees, brush, and other debris in any stream corridor, wetland, surface water, or drainage area is prohibited.



CANNOT BE
BID PROPOSAL FORMS
USED FOR
CONTRACT T201106803.01
BIDDING

CONTRACT ID: T201106803.01 PROJECT(S): T201106803

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS

SECTION 0001 Category 0001

0010	403510 POLYMER-MODIFIED EMULSION MICRO-SURFACING	697010.000 SY				
0020	403511 POLYMER-MODIFIED EMULSION MICRO-SURFACING	500.000 TON				
0030	403512 POLYMER-MODIFIED EMULSION MICRO-SURFACING, ROLLED	392137.000 SY				
0040	743051 FLAGGER, KENT COUNTY, STATE	3119.000 HOUR	41.81000		130405.39	
0050	743052 FLAGGER, SUSSEX COUNTY, STATE	1082.000 HOUR	41.53000		44935.46	
0060	743063 FLAGGER, KENT COUNTY, STATE, OVERTIME	497.000 HOUR	60.62000		30128.14	
0070	743064 FLAGGER, SUSSEX COUNTY, STATE, OVERTIME	193.000 HOUR	60.22000		11622.46	
0080	743501 WARNING LIGHTS , TYPE B	175.000 EADY				
0090	748015 PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND ALKYD-THERMOPLAST IC	2750.500 SE				

CANNOT BE USED FOR BIDDING

CONTRACT ID: T201106803.01 PROJECT(S): T201106803

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0100	748016 PERMANENT PAVEMENT STRIPING, ALKYD-THERMOPLASTIC, 8"	7600.000 LF				
0110	748019 TEMPORARY MARKINGS, PAINT, 4"	2271221.000 LF				
0120	748026 TEMPORARY MARKINGS, PAINT SYMBOL/LEGEND	2862.500 SF				
0130	748502 RAISED/RECESSED PAVEMENT MARKER	1272.000 EACH				
0140	748506 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, 4"	1123013.000 LF				
0150	748553 PREFORMED RETROREFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS, BIKE SYMBOL	4.000 EACH				
0160	763000 INITIAL EXPENSE	LUMP	LUMP			
0170	763606 MAINTENANCE OF TRAFFIC, TWO LANE, TWO WAY WITH LANE CLOSURE	31.000 EACH				
0180	763632 REMOVAL OF RAISED PAVEMENT MARKER	1272.000 EACH				
	SECTION 0001 TOTAL					
	TOTAL BID					

CANNOT BE USED FOR BIDDING

SUBMISSIONS REQUIRED AT THE TIME OF BID

1. Copy(ies) of the American Traffic Safety Services Association (ATSSA) Certification(s) when listed in the applicable plan notes
2. Standard Specification Section 110.08 Site Reviewer requires that the name and DNREC certification number of each Site Reviewer if required shall be submitted to the Department at the time of bid. The level of certification and number required are listed in the applicable plan notes.
3. Proposed Trainee Plans as required. Number of required programs is listed in the Training Special Provisions within Contract General Notices. The program(s) must be submitted with 10 Calendar Days of notification of apparent low bidder status. Contract Award will not take place until acceptable On-the-Job (OJT) program plans are received by the Civil Rights Group of the Department.

Note: Items 1. and 2. above require copies of the current certifications for those individuals proposed for use on this Contract

Failure of the apparent low bidder to present copies of the required certifications and/or an acceptable OJT Trainee Programs within ten (10) calendar days after the bid opening shall create a rebuttable presumption that the bid is not responsive.

CANNOT BE
USED FOR
BIDDING

CERTIFICATION

Contract No. T201106803.01

The undersigned bidder, _____ whose address is _____
_____ and telephone number is _____
_____ hereby certifies the following:

I/We have carefully examined the location of the proposed work, the proposed plans and specifications, and will be bound, upon award of this contract by the Department of Transportation, to execute in accordance with such award, a contract with necessary surety bond, of which contract this proposal and said plans and specifications shall be a part, to provide all necessary machinery, tools, labor and other means of construction, and to do all the work and to furnish all the materials necessary to perform and complete the said contract within the time and as required in accordance with the requirements of the Department of Transportation, and at the unit prices for the various items as listed on the preceding pages.

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any such increase or decrease in the quantity for any item will not be regarded as a sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided in the contract.

Accompanying this proposal is a surety bond or a security of the bidder assigned to the Department of Transportation, for at least ten (10) percentum of total amount of the proposal, which deposit is to be forfeited as liquidated damages in case this proposal is accepted, and the undersigned shall fail to execute a contract with necessary bond, when required, for the performance of said contract with the Department of Transportation, under the conditions of this proposal, within twenty (20) days after date of official notice of the award of the contract as provided in the requirement and specifications hereto attached; otherwise said deposit is to be returned to the undersigned.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

By submission of this proposal, each bidder and each person signing on behalf of any bidder, certifies as to its own organization, under penalty of perjury, that to the best of each signer's knowledge and belief:

1. The prices in this proposal have been arrived at independently without collusion, consultation, communication, or Agreement with any other bidder or with any competitor for the purpose of restricting competition.
2. Unless required by law, the prices which have been quoted in this proposal have not been knowingly disclosed and will not knowingly be disclosed by the bidder, directly or indirectly, to any other bidder or competitor prior to the opening of proposals.
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

I/We acknowledge receipt and incorporation of addenda to this proposal as follows:

No.	Date								
-----	------	-----	------	-----	------	-----	------	-----	------

(FAILURE TO ACKNOWLEDGE RECEIPT OF ALL ADDENDA WILL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE.)

Sealed and dated this _____ day of _____ in the year of our Lord two thousand and _____
_____ (20__).

Name of Bidder (Organization)

Corporate
Seal

By:

Authorized Signature

Attest _____

Title

SWORN TO AND SUBSCRIBED BEFORE ME this ____ day of _____, 20__.

Notary
Seal

Notary

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____
of _____ in the County of _____ and State of _____
as **Principal**, and _____ of _____ in the
County of _____ and State of _____ as **Surety**, legally authorized to do business in the State
of Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____
Dollars (\$ _____), or _____ percent not to exceed _____
Dollars (\$ _____) of amount of bid on
Contract No. T201106803.01 , to be paid to the **State** for the use and benefit of its Department of
Transportation ("**DelDOT**") for which payment well and truly to be made, we do bind ourselves, our and
each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole
firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden
Principal who has submitted to the **DelDOT** a certain proposal to enter into this contract for the
furnishing of certain materiel and/or services within the **State**, shall be awarded this Contract, and if said
Principal shall well and truly enter into and execute this Contract as may be required by the terms of this
Contract and approved by the **DelDOT**, this Contract to be entered into within twenty days after the date
of official notice of the award thereof in accordance with the terms of said proposal, then this obligation
shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____ day of _____ in the year of our Lord two thousand and
(20 _____)

SEALED, AND DELIVERED IN THE
presence of

Name of Bidder (Organization)

Corporate
Seal

By: _____

Authorized Signature

Attest _____

Title

Name of **Surety**

Witness: _____

By: _____

Title



