



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

JENNIFER COHAN
SECRETARY

VIA WEBSITE POSTING

October 2, 2018

Contract No. T201806101.01
Federal Aid Project No. NHS-N059(42)
Pavement and Rehabilitation, North I, 2018
New Castle County

Ladies and Gentlemen:

Enclosed is Addendum No. 2 for the referenced contract consisting of the following:

1. The Bid Proposal Cover, revised, to be substituted for the same page in the Proposal.
2. Four (4) pages, Special Provision 401517-Stone Matrix Asphalt (SMA) Wearing Surface, pages 43, 44, 45 and 46, revised, to be substituted for the same pages in the Proposal.

Please note the revisions listed above and submit your bid based upon this information.

Sincerely,

~signature on file~

Robert A. Kovacs
Competitively Bid Contracts Coordinator
Delaware Department of Transportation

STATE OF DELAWARE



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201806101.01

FEDERAL AID PROJECT NO. NHS-N059(42)

CFDA NO. 20.205

Pavement and Rehabilitation, North I, 2018

New Castle County

ADVERTISEMENT DATE: September 17, 2018

COMPLETION TIME: 180 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
DELAWARE DEPARTMENT OF TRANSPORTATION
AUGUST 2016

Bids will be received in the Bidder's Room at the Delaware Department of Transportation's Administration Building, 800 Bay Road, Dover, Delaware prior to 2:00 P.M. local time **October 9, 2018**

Asphalt Cements. The asphalt cement shall be Superpave PG ~~76-22~~ 64E-22 Performance Grade Asphalt according to AASHTO ~~M320~~ M332, Table 1 and tested according to AASHTO R29.

Stabilizers. Stabilizers have been used to ensure the draindown requirements below are met (<0.3% draindown). Other technologies, in addition to various types of fibers, may be used in this item if test data and field performance demonstrate these specifications are met. If cellulose fiber or mineral fiber stabilizers are chosen by the producer, they shall meet the requirements below and be specifically designed for use in hot-mix asphalt paving mixtures. The producer shall supply the Engineer with certified test results showing the stabilizers are specifically designed for hot-mix asphalt paving mixtures. A representative of the manufacturer of the stabilizers shall be present at initial production to provide technical assistance.

Cellulose Fibers. Cellulose fibers shall conform to the following requirements:

Test Property	Test Method	Specification Limits
Ash Content, % Non-Volatiles Max.	ASTM D128	23
pH	AASHTO MP8	6.5 to 8.5
Moisture Content, % Max by Mass	AASHTO MP8	5.0
Fiber Length, Max inches	AASHTO MP8	0.25

Mineral Fibers. Mineral fibers shall be made from virgin basalt, diabase, slag, or other silicious rock and shall conform to the following requirements:

Test Property	Test Method	Specification Limits
Fiber Length, Max inches	AASHTO MP8	0.25
Fiber Thickness, Max inches	AASHTO MP8	0.0002
Shot Content No. 60 Sieve No. 230 Sieve	ASTM C612	85 – 95 60 - 80

Antistripping Additives. An approved heat stable anti-stripping additive shall be added to the asphalt cement used for SMA if the TSR value dictates the need.

MIX DESIGN:

Aggregates. The washed gradation (AASHTO T11) of the final mixture for the SMA shall conform to the following gradation:

Sieve	% Passing
12.5 <u>19</u> mm (1/2" <u>3/4"</u>)	100
9.5 <u>12.5</u> mm (3/8" <u>1/2"</u>)	70-95 <u>90-100</u>
4.75 <u>9.55</u> mm (#4 <u>3/8"</u>)	30-50 <u>50-80</u>
2.36 <u>4.75</u> mm (#8 <u>#4</u>)	20-30 <u>20-35</u>
1.18 <u>2.36</u> mm (#16 <u>#8</u>)	0-21 <u>16-34</u>
0.60 <u>1.18</u> mm (#30 <u>#16</u>)	0-18 <u>0-21</u>
0.30 <u>0.60</u> mm (#50 <u>#30</u>)	0-15 <u>0-18</u>
0.075 <u>0.30</u> mm (#200 <u>#50</u>)	8.0-12.0 <u>0-15</u>
<u>0.075</u> mm (<u>#200</u>)	<u>8.0 - 11</u>

Mix Design. The SMA shall meet the following mix design parameters at 100 design gyrations ($N_d=100$) in the Superpave Gyrotory Compactor:

Property	Requirement
Air Voids, %	4.0
VMA, % Min.	18.0
Draindown at production temperature (AASHTO T305), % Max at 1 hour	0.30
Target Asphalt Content, % Min	6.0

Anti-Strip Additives. Tensile Strength Ratio (TSR) values, as determined by the AASHTO T283 Test Method, shall be a minimum of 80. If an anti-strip additive is required, the amount of the additive used shall be 0.25 to 1.0 % by weight of the asphalt cement as determined by the TSR testing, recommended by the additive manufacturer, and approved by the Engineer.

Stabilizer Content. The dosage rates of any stabilizing agent shall be determined by the Contractor to meet these specifications.

Plant Control:

Mineral Filler Supply. Mineral filler dust shall be added to the mixture in a consistent manner to ensure the job mix formula requirements are met. The mineral filler supply system shall be submitted to the Engineer for review and the approval of the submitted system will be at the discretion of the Engineer.

Stabilizer Supply System. When stabilizing additives are required in the mixture, a separate system for feeding shall be used to proportion the required amount into the mixture so that uniform distribution is obtained. The feeding system shall be interlocked into the production plant to ensure correct proportioning.

When a batch plant is used, the stabilizer shall be added through a separate inlet directly into the weigh hopper above the pugmill. The addition of the stabilizer shall be timed to occur during the hot aggregate charging of the hopper. Adequate dry mixing time is required to ensure proper blending of the aggregate and the stabilizer. Dry mixing time shall be increased 5 to 15 seconds. Wet mixing time shall be increased at least 5 seconds for the stabilizer to ensure adequate blending with asphalt cement.

When a drum plant is used, the stabilizer shall be added into the drum mixer to ensure complete blending of the stabilizer into the mix. For this purpose, when adding loose fiber, a separate fiber feeding system shall be utilized that can accurately and uniformly introduce fiber into the drum at such a rate as not to limit the normal production of mix through the drum. An in-line no-flow detector shall be installed in the output side of the fiber blower to ensure that a flow of fiber is entering the drum. It shall be connected to an approved alarm system which will indicate when fiber is not entering the drum. Also, an easily visible portion of the fiber feed tube shall be clear to allow the Engineer to ensure that fiber is flowing into the drum. At no time shall there be any evidence of fiber in the baghouse or returned/wasted baghouse fines.

All stabilizer addition systems shall be approved by the Engineer prior to start-up of the contract.

Construction Methods:

Demonstration:

Before proceeding with the actual production paving work, the Contractor shall demonstrate that an acceptable mix can be produced, placed, and compacted to these Specifications. A minimum of 100 tons of acceptable SMA material shall be produced, placed, and compacted utilizing all paving equipment that will be used on the mainline paving, over a suitable and representative hot-mix base, approved by the Engineer, outside the project limits.

Weather Restrictions:

Placement of SMA will be permitted only when the ambient and surface temperatures are at least 50 F and rising.

Hauling Units:

Hauling units shall be as specified in Section 401.03 and the following:

The time between plant mixing and shipment shall not exceed one half hour, i.e. the SMA shall not be stored in the silo for more than one half hour. The haul trucks shall deliver the SMA to a material transfer device capable of continuously re-mixing and/or re-blending the material internally to ensure that the SMA is free from physical and thermal segregation. The material transfer device shall be self-propelled and capable to move freely between delivery trucks and the asphalt paver, equipped with a hopper insert, without requiring additional equipment.

~~The Engineer will evaluate the performance of the paving operation by measuring the temperature of the mat surface immediately behind the screed of the paver during placement to develop a temperature profile. Surface temperature profile measurements shall be taken transversely across the mat, at any time during the project, to determine if the equipment is working properly. Each temperature profile will consist of three surface temperature measurements; the location of the temperature measurements will be at the approximate center and one foot to three feet from the edge of each side of the mat parallel to the paver screed. The difference between the maximum and minimum temperature within each temperature profile shall not be more than 25°F. If the difference between any two temperatures taken in a single profile exceeds 25°F, the paving operation shall be halted and adjustments made to ensure that the hot mix placed is within the temperature profile requirements. Once adjustments are made, the Engineer will take measurements for an additional temperature profile to verify that corrective actions taken resulted in the mix placed meeting temperature differential requirements.~~

Mix Placement Temperature:

~~The temperature of the mixture at the time of placement shall not be less than 290 F. The mix shall be placed at a minimum atmospheric and pavement surface temperatures of 50 F. Spread (lay down) Temperature for this mix id specified as 290 F to 325 F.~~

Compaction:

~~The pavement shall be compacted to 94% of maximum theoretical density or 6% air voids. Item 401699 will be used by the Engineer to calculate payment for this item; Table 5 is modified as referenced below for this item:~~

Degree of Compaction (%)	Pay Adjustment Factor (%)
>97	-100*
96	-10
95	0
94	+5
93	0
92	-10
91	-15
90	-25
89	-30
88	-100*
*or remove and replace at Engineer's discretion.	

Contract No. T201806101.01

Opening to Traffic:

Traffic shall not be allowed on the finished roadway until the roadway temperature cools to at least 140°F.

Method of Measurement and Basis of Payment:

This work will be measured and paid for at the Contract unit price bid per ton for Stone Matrix Asphalt complete, in place, and accepted, which price and payment will be full compensation for furnishing, hauling, preparing and placing all materials; for labor, equipment, tools; and incidentals necessary to complete this item.

Materials produced and striping used for the demonstration will not be paid for but will be considered incidental to the item Stone Matrix Asphalt.

Basis of Payment will also include applicable pay adjustments per 401699, except plant production is tested in 250 ton sub-lots.

10/1/2018