



## **Addendum No. 1**

### **ITB No. 16-01: 2011 SPLOST MAINTENANCE CONTRACT #5B 193,000 SY of High Density Mineral Bond**

**January 22, 2016**

**ITB #16-01** is hereby amended as follows:

1. Below are questions received and corresponding answers:

A. Question: In special Provisions 1.5 Weather it states apply surface treatment @ 45 deg F. and rising. I think that is for interstate shoulders, I am not sure that product would dry in time to open road. Can this be moved back to the original 55 degree?

Answer: The spec has been revised to apply the product at a minimum temperature of 55 degrees F and rising. See attached revised Special Provision pages SP.2 thru SP.8.

B. Question: In special provisions Construction equipment 3.1 B be changed back to original spec.

Answer: The paver will need to be calibrated in the presence of the Engineer. This portion of the spec remains as originally published. However, a test strip will need to be conducted and the gallons of product applied along with the application rate confirmed and approved by the Engineer or Inspector.

2. All other conditions remain in full force and effect.

3. If a proposal has been submitted and anything in this Addendum causes the bidder to change the item offered or to increase or decrease the proposal price, the new price and/or changes will be inserted below:

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4. All bidders under this Invitation to Bid are kindly requested to acknowledge receipt of this Addendum on Page 16, Part II of the Bid Form.

*Tina Malone*

Tina Malone, CPPB CPPO  
Procurement Officer  
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**SECTION 32 01 13.68**  
**HIGH DENSITY MINERAL BOND**

**PART 1 GENERAL**

**1.1 DESCRIPTION**

- A. This section covers the materials, equipment, construction, and application procedures for placing High Density Mineral Bond for extending the life of existing bituminous paved surfaces. The High Density Mineral Bond shall be a mixture of fine aggregates blended with non-ionic, thixotropic asphalt emulsion utilizing inorganic emulsifiers, and other additives. All ingredients shall be properly proportioned, mixed, and spread on the paved surface in accordance with the Specification and as directed by the Engineer.

**1.2 REFERENCES**

- A. AASHTO Standards:  
R 9 Acceptance Sampling Plans for Highway Construction.
- B. ANSI Standards:  
B74.8 Ball Mill Test for Friability of Abrasive Grain.
- C. ASTM Standards:  
C 114 Analysis of Hydraulic Cement.  
C 117 Materials Finer Than 0.075 mm (No. 22) Sieve in Mineral Aggregates by Washing.  
C 128 Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.  
C 136 Sieve Analysis of Fine and Coarse Aggregates.  
C 170 Compressive Strength of Dimension Stone.  
C 604 True Specific Gravity of Refractory Materials by Gas Comparison Pycnometer.  
C 1326 Knoop Indentation Hardness of Advanced Ceramics.  
D 217 Cone Penetration of Lubricating Grease.  
D 721 Oil Content of Petroleum Waxes.  
D 1644 Nonvolatile Content (Solids by weight).  
D 2170 Kinematic Viscosity of Asphalts (Bitumens).  
D 2172 Quantitative Extraction of Bitumen From Bituminous Paving Mixtures.  
D 2196 Rheological Properties of Non-Newtonian materials by Rotational (Brookfield type) Viscometer.  
D 2216 Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.  
D 2486 Determining Wear Resistance in Cycles.  
D 2697 Volume Nonvolatile Matter in Clear or Pigmented Coatings.  
D 2939 Emulsified Bitumens Used as Protective Coatings.  
D 2960 Determining Volatile Organic Compound Content of Paints and Related Coatings.  
E 70 pH of Aqueous Solutions with the Glass Electrode.

**1.3 SUBMITTALS**

- A. Results of wear resistance test current within one (1) calendar year (article 2.3).  
B. Traffic control and notification plan.  
C. Mix Design: 2 WEEKS prior to use, submit proportions of aggregate, filler, water, polymer, and emulsion in the mix.  
D. Equipment: List of construction equipment to be used,  
E. Certification from emulsion manufacturer that states the emulsion meets the requirements described in article 2.1 of this section.  
F. Warranty.

## 1.4 QUALITY ASSURANCE

- A. CONTRACTOR has successfully completed at least five (5) projects of similar size and nature, using the same mix design as described in this section. Upon request, provide a list of five (5) projects which have demonstrated a five (5) year minimum proven performance on a bituminous surface. Acceptable performance after five (5) year period is no less than 70 percent residual coverage in the treated surface area.
- B. Foreman of the crew has completed at least three (3) projects of similar size and nature.
- C. Do not change the source of the emulsified asphalt or aggregate without supporting changes in the mix design.
- D. Reject asphalt emulsion that does not meet requirements of this section.
- E. Remove product found defective after installation and install acceptable product at no additional cost to OWNER.
- F. If requested, submit a quality control and inspections and testing report describing source and field quality control activities performed by CONTRACTOR and Suppliers.

## 1.5 WEATHER

- A. Temperature:
  - 1. Apply surface treatment material when air and roadbed temperatures in the shade are 55 deg F. and rising.
  - 2. Do not apply surface treatment material if pavement or air temperature is below 55 deg F. and falling or if the finished product will freeze before 48 hours.
- B. Moisture and Wind: Do not apply surface treatment material during rain, 24 hours prior to forecast rain, or unsuitable windy weather.

## 1.6 NOTICE

- A. Follow Laws and Regulations concerning when and to whom notices are to be given. Give written notices at least two (2) days prior to applying surface treatment material.
- B. Indicate application time and when the surface can be used. Include a map providing detailed directions signifying the specific area to be closed.
- C. Provide a minimum of two contacts that represent CONTRACTOR with phone numbers which can be reached at any time during the project.
- D. Warn of potential vehicle tow away and other construction issues affecting neighborhood.
- E. Should work not occur on specified day, send a new notice before the end of the day.

## 1.7 ACCEPTANCE

### A. General:

- 1. Acceptance is by Lot.
- 2. If non-complying material has been installed and no price for the material is specified, apply price adjustment against cost of work requiring complying material as part of its installation, Section 01 29 00.
- 3. Opening flexible paving surface treatment to vehicular traffic does not constitute acceptance.
- 4. Observation of CONTRACTOR's field quality control testing does not constitute acceptance. Such testing; however, may be used by ENGINEER for acceptance if requirements of Section 01 35 10 are met.
- 5. Dispute resolution, Section 01 35 10.

### B. Surface Treatment Material:

- 1. Asphalt Binder: Acceptance is not specified in this Section. Refer to Section 32 12 03 and the material requirements in article 2.1 for acceptance.

2. Aggregate Source: Verify suitability of aggregate source.
3. Mixture, Ready to Install: Lot size is one (1) day production with 10,000 gallons sub-lots. Collect samples randomly and test for density, ASTM D2939.

**C. Placement**

1. Lot size is 1 land mile. Sub-lot size is 0.1 lane mile.
2. Mat Appearance:
  - a. No runoff onto concrete curbs and shoulders.
  - b. No streaking.
  - c. No light spots.
  - d. No de-bonding due to road contaminants.

**D. Price Adjustment:** Mat appearance defects may be accepted if a 2.5 percent pay reduction is applied against the lot for each condition not met. Maximum pay reduction for the lot is five (5) percent. ENGINEER may waive pay adjustment if CONTRACTOR corrects deficiencies at no additional cost to OWNER.

**1.8 WARRANTY**

A. The surface treatment material must carry a warranty from both the CONTRACTOR and the manufacturer for a period of five (5) years when applied to pavement in appropriate condition. Acceptable performance after a five year period is defined as 70% or greater of residual HDMB coverage of the inter-aggregate bituminous surface area. Mechanical disturbances by heavy equipment use or snow and ice removal equipment, etc. are excluded from warranty. The warranty shall include coverage for peeling and premature wear. The Constructor shall notify in writing if the pavement surface is not considered suitable for HDMB to request a waiver of the warranty.

**PART 2 PRODUCTS**

**2.1 EMULSIFIED ASPHALT**

A. Non-ionic thixotropic mineral colloid at 77 Deg F meeting requirements of Section 32 12 03 and the following.

<b>Table 1 – Supplemental Properties</b>			
<b>Criterion</b>	<b>ASTM</b>	<b>Min</b>	<b>Max</b>
Brookfield Viscosity, cPs	D2196	8,000	15,000
Acidity, pH	E70	6.5	7.5
Weight, lbs/gal	D2939	8.7	9.1
Solids, percent	D2939	47	53

**2.2 AGGREGATE**

A. Slate:

<b>Table 2 – Slate</b>			
<b>Physical Properties</b>			
<b>Criterion</b>	<b>ASTM</b>	<b>Min</b>	<b>Max</b>
Specific gravity	C 128		2.7
Compression, psi	C 170	11,000	
Loss on ignition at 1000 deg C, percent	C 114		5
Shipping moisture content, percent	D 2216		1

<b>Gradation</b>			
<b>Sieve</b>	<b>ASTM</b>	<b>Target</b>	<b>Tolerance</b>
No. 20	C 136	99	+1 and -2
No. 50	C 136	74	+/-2
No. 100	C 136	55	+/-2
No. 200	C 117	38	+/-2
NOTES (a) Gradation analyzed according to ASTM C 136 on a dry weight and percent passing basis.			

B. Refined Corundum:

<b>Table 2 – Corundum</b>			
<b>Physical Properties</b>			
<b>Criterion</b>	<b>Standard</b>	<b>Min</b>	<b>Max</b>
Specific gravity	ASTM C 1326		3.92
Knoop 100 Hardness	ASTM D 721		2,050
Ball Mill Fiability (14 grit)	ANSI B74.8		50
Color	ASTM C 604	Brown	
Shape	ASTM D 2216	Blocky with sharp edges	
<b>Gradation</b>			
<b>Sieve</b>	<b>ASTM</b>	<b>Target</b>	<b>Tolerance</b>
No. 35	C 136	99	+1 and -2
No. 45	C 136	85	+/-2
No. 50	C 136	35	+/-2
No. 60	C 136	7	+/-2
NOTES (a) Gradation analyzed according to ASTM C 136 on a dry weight and percent passing basis.			

## 2.3 MIX DESIGN

A. Use the following table as a guide.

<b>Table 4 – Selection Guide</b>			
<b>Asphalt Emulsion</b>			
<b>Criterion</b>	<b>ASTM</b>	<b>Min</b>	<b>Max</b>
Asphalt Content by weight, percent	D 2172	17	
Residual asphalt by weight, percent	D 2939		30
Cone penetration viscosity, cST/sec	D 217	350	450
Weight per gallon, lbs	D 2939	11.2	
Solids volume by percent	D 2697	55	65
Solids weight by percent	D 1644	60	
VOC, g/l	D 3960		10

Aggregate			
Sieve	ASTM	Min	Max
Bentonite and attapulgite clay, percent	--		1.8
Refined corundum / slate content, percent	--	34.5	
Sand or other round aggregate, percent	--		6
Maximum VOC: g/l	--		10
Wear resistance @ 12,000 cycle (70 mils wet), percent	D 2486		6.5
Pinholes on glass	--	No grazing on film	
Resistance to re-emulsification	--	Very good	

## PART 3 EXECUTION

### 3.1 CONSTRUCTION EQUIPMENT

- A. Paver: Continuous flow mixing unit.
1. Capable of applying at least 15,000 square yards of material per day.
  2. Equipped with full sweep helical mixer to assure proper suspension of fine aggregates.
  3. Equipped with a digital operator control station that is capable of adjusting material spread rate in accordance with pre-set calibrations. It shall be equipped with speed sensing equipment capable of maintaining a constant delivery rate of gallons per square yard at variable speeds.
  4. Equipped with two separate filters. The primary filter should be at least 200 square inches with a filter face of 3/8 inch. The secondary filter needs to be at least 1500 square inches with a filter face of 1/8 inch.
  5. Has a retractable spray bar with spacing of 16 inches between each discharge orifice. The bar should be positioned minimum of 20 inches from the surface, no more than 23 inches from the surface.
- B. Paver Calibration: Each paver shall be calibrated to the correct application rate in the presence of the engineer prior to the start of the project and at least once during each day of production. No machine will be allowed to work on the project until the calibration has been completed and/or accepted. Additional calibrations may be required during production as directed by the Engineer.

### 3.2 PREPARATION

- A. General:
1. Severely raveled or porous pavements may require tack coat.
  2. Asphalt concrete inlay may be required in rut deformations.
- B. Surface Repair: Patch any holes, raveled areas, and low areas with asphalt concrete.
- C. Crack Repair: Section 32 01 17:
1. Remove plant materials from cracks, edges, and joints.
  2. Blow cracks clean with compressed air.
  3. Seal cracks with hot pour crack sealant. Remove excess sealant.
  4. Allow crack seal to dry before applying surface treatment material.
- D. Traffic control: Grind off existing pavement markings and lane striping. Use reflective tabs to mark striping location before applying surface treatment material.
- E. Cleaning:
1. Remove loose material, mud spots, sand dust, oil, vegetation and other objectionable material.
  2. Do not flush water over cracks or apply pressurized water to cracked pavement.

3. Clean the surface immediately prior to installation.
- F. Tack Coat:
1. Apply tack coat to high absorbent, polished, oxidized, or raveled asphalt surfaces or to concrete or brick surfaces.
  2. Tack coat should consist of one part emulsified asphalt, three parts water and should be SS or CSS grade.

### 3.3 PROTECTION

- A. Implement the traffic control plan requirements. Provide safe passage for pedestrians and vehicles. Do not proceed without flaggers.
- B. Protect trees, plants, and other ground cover from damage.
- C. Prune trees to allow equipment passage underneath, Section 32 01 93. Repair tree damage at no additional cost to OWNER.
- D. Install Invert Covers, Section 01 71 13.
- E. Mask off end of streets and intersections to provide straight lines:
  1. Make straight lines along lip of gutters and shoulders. Keep same thickness in these areas. No runoff on these areas will be permitted.
  2. Vary edge lines no more than ½ inch per 100 feet.
- F. Protect curb, gutter, and sidewalk from spatter, mar, or overcoat.
- G. Protect surface treatment material from traffic until it has cured.

### 3.4 APPLICATION

- A. Application Rate: Two separate applications coats are required. The first application must be thoroughly dry and free of any damp areas before the second application begins. Machine settings must match the following application rates. **A third application will be required at all intersections or roundabouts, which will include the functional area of the intersection up to the radius returns of the intersecting streets.**

Layer	Application Rate (gallons per square yard)
1	0.20 minimum
2	0.16 minimum
3	0.16 minimum

- B. Spreading:
  1. Keep constant delivery rate of material per square yard of surface, even if the forward speed of the machine varies.
  2. Do not reduce application rate along edges or around manhole covers.
  3. Apply both applications right to the edge of the pavement. Do not back away from curbs, manhole covers, and edges on either application.

### 3.5 AFTER APPLICATION

- A. Leave no streaks caused by plugged nozzle or improper spray bar height.
- B. Leave no holes, bare spots, or cracks.
- C. Expose and clean manholes, valve boxes, inlets and other service entrances and Street Fixtures.
- D. Do not permit traffic on product until surface has cured (minimum eight (8) hours).
- E. Do not apply permanent lane marking or paint until placement has aged at least 10 days and layout has been verified with ENGINEER.

### **3.6 FIELD QUALITY CONTROL**

- A. Testing: If density tests (ASTM D2939) show non-compliance, remove the product and halt operations until new material arrives and is shown to be in compliance. Measure the total amounts of material installed, and verify it meets the application rate.
- B. If application rate is determined to be out of tolerance thru determination of gallons used per total area (square yards), for either isolated areas or total area, Contractor to correct deficiencies at no additional cost to the Owner and acceptable to the Engineer.
- C. Protect surface treatment material from traffic until it has cured.

### **3.7 REPAIR**

- A. Remove spatter and mar from curb and gutter, sidewalk, guard rails and guide posts at no additional cost to the OWNER.
- B. Remove surface treatment material from Street Fixtures.
- C. Make lines straight. Provide good appearance.
- D. Leave no streaks, holes, bare spots, or cracks through which liquids or foreign matter could penetrate to the underlying pavement.
- E. Repair collateral damage caused by construction.

### **3.8 METHOD OF MEASUREMENT**

Measurement will be made of the number of square yards {square meters} of accepted high density mineral bond, complete in place.

The length shall be the actual length measured along the surface of the treatment. The width shall be the designated width of completed surface.

### **3.9 BASIS OF PAYMENT**

- A. Unit Price Coverage.  
The unit price of the high density mineral bond shall be full compensation for all materials, equipment, tools, labor, and warranty required for furnishing and placing the completed surface.