

**CRAIGHEAD COUNTY  
INVITATION TO BID-Not an Order**

Craighead County Judge's Office  
511 Union St. Suite 119  
Jonesboro, Arkansas 72401

**PURCHASING OFFICE  
BID NO. 2026-17**

Sealed bids, subject to the conditions on the attached hereof, and as may be attached hereto, will be received at this office until 2:00 PM May 6, 2026 and then publicly opened, for furnishing the supplies, materials, and/or services as described below.

Bids will be opened May 6, 2026,  
2:00 P.M. Local Time

FOB Craighead County, Arkansas

BY: Al Haines  
Purchasing Director

Item #	DESCRIPTION
1	The intent of the attached specifications is to describe asphalt chip sealing, scrub sealing, traffic control, and type of materials to use for preserving various County Roads in Craighead County.
2	The successful bidder will furnish Craighead County a signed copy of all delivery receipts for each road or job, and will invoice the County for each job individually.
3	Does bidder meet all specifications? Yes _____ No _____ If no, please attach sheets explaining differences.
4	Successful bidder shall maintain bid price throughout the 2026 asphalt seal season.
5	Bidder should specify approximate start date if awarded bid. Date _____
6	Bidder shall quote price per gallon of asphalt sealer and mineral aggregate laid on roads and each job should be bid separately and should include traffic control and mobilization.
7	Bid must be signed by an authorized representative or bid will be rejected.
8	Bidder should return all pages of this bid package.
9	Bid # 2026-17 must be noted on the outside of bidders envelope.
10	Total cost per job should be shown on Bid Sheet Form <span style="float:right">Total bid for all jobs \$ _____</span>

**EXECUTION OF BID**

We, the undersigned, have read all the requirements set forth in this bid proposal including specifications, conditions, and pertinent information regarding the articles being bid on, and we agree to furnish articles at the prices instructions, stated.

Arkansas use Tax Register No. \_\_\_\_\_  
Bidder \_\_\_\_\_ Address \_\_\_\_\_  
By \_\_\_\_\_ City \_\_\_\_\_  
(Person Authorized to Sign Bids) Title \_\_\_\_\_

**UNSIGNED BIDS WILL BE REJECTED**

**BIDS ARE SUBJECT TO REJECTION UNLESS SUBMITTED ON THIS FORM**

**NOTICE TO BIDDERS, SEE REVERSE SIDE OR ATTACHMENTS FOR INSTRUCTIONS AND CONDITIONS.**

**CRAIGHEAD COUNTY  
JONESBORO, ARKANSAS**

**CONDITIONS OF BIDDING**

**Compliance with the following conditions is necessary for consideration of this bid.**

- 1 Signature-This bid must be signed with the firm name and by an authorized officer, employee or agent.
- 2 Sales Tax-Is to be included in the bid price, but is to be listed separately by the vendor to the invoice billing to the County.  
The County is not exempt from Arkansas State Sales Tax. Contractors are to include all costs in the bid price, including applicable taxes.
- 3 Freight and other delivery charges-to destination at designated County job site in the County must be included in bid. Charges may not be added after the bid is opened.
- 4 Discounts-Show rate, total amount, and latest day any discounts will be allowed after receipt of article and invoice, otherwise County will deduct allowed discount when payment is made.
- 5 Firm Price-All prices quoted will remain firm for at least 30 days from date of bid, unless otherwise specified by the County or bidder
- 6 Identical Bids-In the event of two or more identical low bids, the contract may be awarded arbitrarily or for any reason to any of such bidders, or split in any proportion between the said two or more bidders at discretion of the County.
- 7 Clean up-Complete cleanup and proper disposal of any and all job related items is considered to be a part of any contract let by Craighead County.
- 8 Ambiguity in bid-Any ambiguity in any bid as the result of omission, error, lack of clarity or non-compliance specifications, instructions, and all conditions of bidding shall be construed in the light most favorable to the County
- 9 Construction  
A. When requested, the Contractor is to supply the County with evidence of having and maintaining proper and specifically Workman's Compensation Insurance in accordance with the laws of the State of Arkansas, Public Liability, and Property Damage. All premiums and cost shall be paid by Contractor. In no way will the County be responsible in case of accident.  
B. A Performance Bond equaling the total amount of any bid exceeding \$50,000 must be provided for erection of any public building, public structure, or public improvement(Pursuant to Arkansas Code 18-44-503.)
- 10 The County reserves the right to reject any and all bids, accept in whole or in part, to waive informalities in bids received, to accept bids on materials or equipment with variations from specifications in those cases where efficiency of operation will not be impaired, and unless otherwise specified by bidder, to accept any item in the bid. If unit prices and extensions thereof do not coincide, the County may accept the bid for the lesser amount whether reflected by extension or by the correct multiple of the unit price.

**INSTRUCTIONS TO BIDDERS**

(Please read carefully)

- 1 Submit bid on bid form attached.
- 2 Address all bids to: Purchasing Director, Craighead County Judge's Office, 511 Union St.; Suite 119, Jonesboro, Arkansas 72401 and make certain to indicate identifying bid number on the outside of bid envelope.
- 3 DO NOT include Federal Excise Tax in bid. County will furnish exemption certificate.
- 4 Bids received after stated time will not be considered.
- 5 Be sure and read all conditions and verify amounts before submitting bids. No changes or additions will be allowed after submission.
- 6 Guarantees and warranties should be attached as a part of the bid, as they may be a consideration in awarding contract.
- 7 Delivery or contract completion time is to be shown, as this date may, where time is of the essence, determine the contract award.
- 8 Additional information may be obtained from the Purchasing Department.
- 9 Bid Bond of 5% is required with this bid.
- 10 **Point of contact will be Marvin Day at 243-6453**

COUNTY RESERVES THE RIGHT TO ACCEPT PART OR ALL OF ANY SPECIFIC BID OR BIDS  
AND TO ACCEPT BID WITH OR WITHOUT TRADE-IN, AND REJECT ANY AND ALL BIDS.

**SPECIFICATIONS**

- 1 Scope: As part of the ongoing asphalt preservation on various county roads, We are requesting bids for sealing various county roads according to the attached specifications.  
The work will be done in accordance with the current ARDOT specifications for sealing asphalt roads.
- 2 Each job listed below must be bid separately.
- 3 See attached specifications indicating road numbers, locations, and job numbers for sealing, traffic control, and fog sealing various roads in Craighead County.
- 4 Craighead County stipulates that the successful bidder will do other sealing jobs at the bid price should other monies become available to Craighead County.
- 5 Craighead County reserves the right to accept, reject, in whole or in part, to waive informalities in bids received, or accept bids with variations.

6	Traffic control shall be responsibility of contractor. Any damages to property, vehicles, persons, or any other incidents or accidents shall be the liability of the contractor.
7	Mobilization costs should be listed as a separate item.
8	All applications of product of sealing, traffic control, and related jobs in this bid package shall be according to attached specifications.
9	Signage shall be placed at all road intersections according to the Manual on Uniform Traffic Control Devices.
10	Job must be completed according to ARDOT Specification.
11	Liquidated damages will be \$500 per day after September 30,2026.
12	Bidder should include Arkansas Sales and Use Tax in bid price, but list tax separate on invoice submitted to County for payment.
13	Bid bond of 5% shall be submitted with bid and performance and insurance bonds shall be submitted upon bid award.

**Bid Sheet Form**

**Bid 2026-17 Job number of County Roads to be chip sealed and scrub sealed  
Asphalt Preservation on various Craighead County Roads**

	County Road	Estimated Sq Yards	Est miles	Item	Quantity	Unit Price	Extension
Job 1	346	8,166.9	0.63	Mineral Aggregate (Class 4)(25 lbs/sy)	102.1 tons		
				CMS-1PC (.3gal/sy)	2450.1 gallons		
				Fog Seal Type 2 (.1gal/sy)	816.7 gallons		
Job 2	CR 865	26,278.0	2.04	Mineral Aggregate (Class 4)(25 lbs/sy)	328.5 tons		
				CMS-1PC (.3gal/sy)	7,883.4 gallons		
				Fog Seal Type 2 (.1gal/sy)	2,627.8 gallons		
Job 3	CR 730	25,398.0	2.06	Mineral Aggregate (Class 4)(25 lbs/sy)	317.5 tons		
				CMS-1PC (.3gal/sy)	7619.4 gallons		
				Fog Seal Type 2 (.1gal/sy)	2539.8 gallons		
Job 4	CR 368	4,710.0	0.37	Mineral Aggregate (Class 4)(25 lbs/sy)	58.9 tons		
				CMS-1PC (.3gal/sy)	1413 gallons		
				Fog Seal Type 2 (.1gal/sy)	471 gallons		
Job 5	CR 319	14,233.3	1.16	Mineral Aggregate (Class 4)(25 lbs/sy)	177.9 tons		
				CMS-1PC (.3gal/sy)	4269.9 gallons		
				Fog Seal Type 2 (.1gal/sy)	1423.3 gallons		
Job 6	CR 755	12,973.3	1.05	Mineral Aggregate (Class 4)(25 lbs/sy)	162.2 tons		
				CMS-1PC (.3gal/sy)	3892.0 gallons		
				Fog Seal Type 2 (.1gal/sy)	1297.3 gallons		
				Traffic Control/Temporary Signage (Follow MUTCD Regulations)	1 Each		
				Mobilization Cost(not to exceed 5%)	1 Each		
				Bid according to Specifications and Attachments:		<b>Total Bid</b>	\$ _____
				Surfacing Quantities			
				Traffic Control Devices			

## GOVERNING SPECIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION,  
EDITION OF 2014, AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.




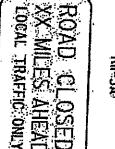
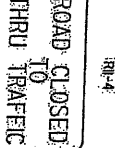

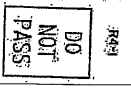
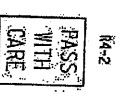

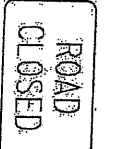
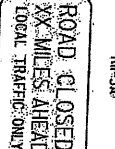
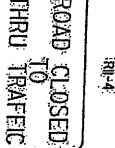

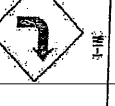

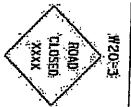



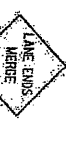
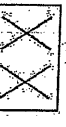
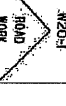
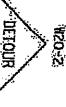
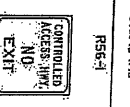
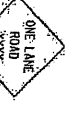



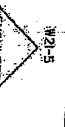
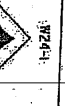
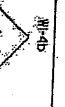
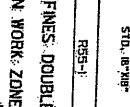
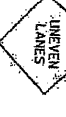

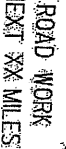





NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
100-3	CONTRACTORS LICENSE
100-4	DEPARTMENT NAME CHANGE
102-2	ISSUANCE OF PROPOSALS
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
306-1	QUALITY CONTROL AND ACCEPTANCE
400-2	ASPHALT SURFACE TREATMENT
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-3	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES (MASH)
723-1	GENERAL REQUIREMENTS FOR SIGNS
729-1	CHANNEL POST SIGN SUPPORT
JOB SA1864	BIDDING REQUIREMENTS AND CONDITIONS
JOB SA1864	FOG SEAL
JOB SA1864	MANDATORY ELECTRONIC CONTRACT
JOB SA1864	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB SA1864	REJUVENATING MASS GRAVE TREATMENT









 R1-1 STANDARD, 30"x30" EXPRESS, 36"x36" SPECIAL, 48"x48" R1-1	 R1-2 STD. 36"x36" EXP. 48"x48" F.V. 60"x60" R1-2	 R2-4 STD. 24"x36" EXP. 36"x36" F.V. 48"x36" R2-4	 R1-3A 60"x30" R1-3A	 R1-4 60"x30" R1-4	 R2-5a STD. 36"x36" F.V. 48"x36" R2-5a	 R4-1 STD. 24"x36" EXP. 36"x36" F.V. 48"x36" R4-1	 R4-2 STD. 24"x36" EXP. 36"x36" F.V. 48"x36" R4-2	<p>General Notes:</p> <ol style="list-style-type: none"> <li>1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO STANDARD SPECIFICATIONS, LATEST EDITION, AND TO THE FEDERAL HIGHWAY ADMINISTRATION.</li> <li>2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL REMAIN IN PLACE UNTIL THE END OF THE WORK. OPERATORS AND SIGNMAINTENANCE PERSONNEL SHALL BE RESPONSIBLE FOR THE PROPER POSITIONING, CLEANING AND LIGHTING OF ALL DEVICES. DEVICES SHALL BE REMOVED, STORED, OR REPAIRED AS NECESSARY. CONSTRUCTION SHALL BE CANCELED, REVERSED, OR REPAIRED AS NECESSARY.</li> <li>3. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE NUMBER 100'S OR 150'S SHOULD BE MOUNTED ON TWO POSTS OR ABOVE. THE NUMBER OF POSTS SHALL BE 2 FOR STANDARD CHANGED POST OR 4 FOR ROAD CLOSED SIGNS. ALL SIGNS SHALL BE PAINTED WITH REFLECTIVE MATERIAL AND SHALL BE IN ACCORDANCE WITH THE STANDARD DRAWING T-2. SIGNS SHALL BE MOUNTED IN ACCORDANCE WITH THE STANDARD DRAWING T-2.</li> <li>4. SIGNS SHALL BE MOUNTED ON A SINGLE POST, ALTHOUGH THOSE NUMBER 100'S OR 150'S SHOULD BE MOUNTED ON TWO POSTS OR ABOVE. THE NUMBER OF POSTS SHALL BE 2 FOR STANDARD CHANGED POST OR 4 FOR ROAD CLOSED SIGNS. ALL SIGNS SHALL BE PAINTED WITH REFLECTIVE MATERIAL AND SHALL BE IN ACCORDANCE WITH THE STANDARD DRAWING T-2.</li> <li>5. SIGN POSTS SHALL BE 2 IN DIAMETER CHANGED POST OR 4 IN DIAMETER FOR ROAD CLOSED SIGNS. ALL SIGNS SHALL BE PAINTED WITH REFLECTIVE MATERIAL AND SHALL BE IN ACCORDANCE WITH THE STANDARD DRAWING T-2.</li> <li>6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE MAXIMUM CLEARANCE FROM THE PREVIOUS SIGN. SIGNS SHALL BE MOUNTED AT A MINIMUM OF 2 FEET FROM THE PREVIOUS SIGN.</li> <li>7. ALL POSTS AND SIGNPOSTS MOUNTED SIGNS SHOULD BE MOUNTED AT A MINIMUM DISTANCE OF 7 FEET FROM THE BOTTOM OF THE SIGN TO THE TOP OF THE SIGN. A MINIMUM DISTANCE OF 7 FEET SHALL BE USED WHEN MOUNTING SIGNS TO THE ROADWAY SURFACE. INTERMEDIATE VERTICAL CURVES SHALL BE MOUNTED ON PORTABLE SUPPORTS. SIGNS SHALL BE 5' RETROREFLECTIVE DEVICES. SIGNS SHALL BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT TERM SHORT DURATION AND SHALL BE LONG TERM STATIONARY SIGNS FOR LONG TERM DURATION. SIGNS SHALL BE MOUNTED ON PORTABLE SUPPORTS OR AS APPROVED BY THE SIGNMAINTENANCE PERSONNEL. SIGNS SHALL BE MOUNTED ON PORTABLE SUPPORTS OR AS APPROVED BY THE SIGNMAINTENANCE PERSONNEL.</li> </ol>
 W1-3 STD. 30"x30" EXP. 36"x36" SPECIAL, 48"x48" W1-3	 W1-4 48"x30" W1-4	 W1-5A 60"x30" W1-5A	 W1-6 60"x30" W1-6	 W3-4 STD. 36"x36" F.V. 48"x36" W3-4	 W1-1 STD. 36"x36" F.V. 48"x36" W1-1	 W1-2 STD. 36"x36" F.V. 48"x36" W1-2	 W20-3 STD. 36"x36" F.V. 48"x36" W20-3	
 W20-4 STD. 36"x36" SPECIAL, 48"x48" W20-4	 W16-3 STD. 48"x30" W16-3	 W16-7 60"x30" W16-7	 W16-8 60"x30" W16-8	 W3-1 STD. 36"x36" F.V. 48"x36" W3-1	 W20-1 STD. 36"x36" F.V. 48"x36" W20-1	 W20-2 STD. 36"x36" F.V. 48"x36" W20-2	 R56-1 STD. 36"x36" F.V. 48"x36" R56-1	
 W20-4 STD. 36"x36" SPECIAL, 48"x48" W20-4	 W20-5 STD. 36"x36" SPECIAL, 48"x48" W20-5	 W20-7a STD. 36"x36" F.V. 48"x36" W20-7a	 W9-2 STD. 36"x36" F.V. 48"x36" W9-2	 W3-1 STD. 24"x24" W3-1	 W20-1 STD. 36"x36" F.V. 48"x36" W20-1	 W20-2 STD. 36"x36" F.V. 48"x36" W20-2	 R56-1 STD. 36"x36" F.V. 48"x36" R56-1	
 W18-11 STD. 36"x36" F.V. 48"x48" W18-11	 W18-9 STD. 36"x36" F.V. 48"x36" W18-9	 60"x30" W18-9	 48"x24" W18-9	 W2-5 STD. 36"x36" SPECIAL, 48"x36" W2-5	 W4-9 STD. 36"x36" SPECIAL, 60"x36" W4-9	 W4-10 48"x36" W4-10	 R56-1 STD. 36"x36" F.V. 48"x36" R56-1	

ADVANCE DISTANCES:

500 FT 1/4 MILE  
 1000 FT 1/2 MILE  
 1500 FT 3/4 MILE  
 2000 FT 1 MILE

FINES: DOUBLE IN WORK ZONES  
 36000\*

\* USE 6" LETTERS  
 \*\* USE 4" LETTERS

\* NOTES: SUPPORTS FOR SIGNS, SIGNALS, AND TRAFFIC CONTROL DEVICES SHALL BE SET UP AT LEAST 100 FEET IN ADVANCE OF THE WORK ZONE. SIGNS SHALL BE MOUNTED AT A MINIMUM OF 2 FEET FROM THE PREVIOUS SIGN. SIGNS SHALL BE MOUNTED ON PORTABLE SUPPORTS OR AS APPROVED BY THE SIGNMAINTENANCE PERSONNEL. SIGNS SHALL BE MOUNTED ON PORTABLE SUPPORTS OR AS APPROVED BY THE SIGNMAINTENANCE PERSONNEL.



**ARKANSAS DEPARTMENT OF TRANSPORTATION  
 SPECIAL PROVISION**

JOB NO.

FOG SEAL

**Description:** This work shall consist of the uniform application of an asphalt emulsion to an existing paved surface by means of a bituminous distributor meeting the requirements of Section 403 of Standard Specifications for Highway Construction, 2014 Edition, and/or as directed by the Engineer.

**Materials:** The Fog Seal emulsified asphalt shall meet the properties in the table below. Type 1 is a commodity slow setting, low residue emulsion. Type 2 an emulsion designed for quick traffic return. Type 3 is a polymer modified emulsion for general use. Type 4 is a polymer modified emulsion designed for the rejuvenation of oxidized Hot Mix Asphalt.

TEST ON EMULSION	TEST METHOD	Type 1		Type 2		Type 3		Type 4	
		(MIN)	(MAX)	(MIN)	(MAX)	(MIN)	(MAX)	(MIN)	(MAX)
Viscosity, Saybolt-Furol, @ 77°F, SFS	AASHTO T 59	-	100	-	100	-	100	10	100
Particle Charge	AASHTO T 59	(+) or (-)		(+) or (-)		(+) or (-)		(+) or (-)	
Sieve Test, %	AASHTO T 59	-	-	0.3	-	0.3	-	-	0.3
Storage, 24 hour, %	AASHTO T 59	-	-	-	-	-	-	-	1
Oil Distillate, %	AASHTO T 59	-	-	-	-	-	-	-	0.5
Residue properties from Distillation <sup>1</sup>									
Residue, %	AASHTO T 59	30	-	30	-	30	-	30	-
MSCR @ 64°C, J <sub>nr</sub> @ 3.2/kPa	AASHTO T 350	-	-	-	2.0	-	-	-	-
Penetration, 77°F, 100g, 5 sec	AASHTO T 49	90	250	-	-	40	90	-	-
Elastic Recovery, 25°C, %		-	-	-	-	40	-	-	-
Penetration, 4°C, 200g, 60 sec		-	-	-	-	-	-	30	-
Residue properties from Low Temp Evaporation	AASHTO R 78 Procedure B								
MSCR @ 52°C, J <sub>nr</sub> @ 3.2/kPa	AASHTO TP70	-	-	-	-	-	-	-	2.0
<b>Polymer Properties</b> <sup>(2)</sup>									
Tests on Modifier Mass Change, %	ASTM D471 (modified)	-	-	-	-	-	-	-	50%
<b>Test on Rejuvenating Agent</b>									
Flash Point, COC, °F	AASHTO T 48	-	-	-	-	-	-	380	-
Viscosity, 140 °F, CST	AASHTO T 201	-	-	-	-	-	-	50	175
Saturate, % by wt	ASTM D2007	-	-	-	-	-	-	-	30
Asphaltenes	ASTM D2007	-	-	-	-	-	-	-	1.0
<b>Test on Rejuvenating Residue</b>									
Weight change, %w	ASTM D2872	-	-	-	-	-	-	-	6.5
Viscosity Ratio (RTFO/Orig.)	ASTM D2170	-	-	-	-	-	-	-	3

See next page for footnotes.

ARKANSAS DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISION

JOB NO.

FOG SEAL

Footnotes

1. Exception to AASHTO T 59: Bring the temperature on the lower thermometer slowly to 350°F plus or minus 10°F. Maintain this temperature for 20 minutes. Complete the total distillation in 60 plus or minus 5 minutes.
2. For modifications for Polymer Properties testing, refer to Appendix A Test Modifications.
3. Modify ASTM D471 as follows:
  - a. Place 0.8g of modifier into an 18-mm silicone rubber DSR mold
  - b. If necessary, dry at ambient lab conditions for 72 hr.
  - c. Remove the modifier from the mold and place the sample into a forced draft oven on release paper for 48 hr at 40°C.
  - d. After 48 hr, cool and weigh the sample to the nearest 0.0001 g. Record the weight.
  - e. Pour 30 g of rejuvenating agent in a 90-ml metal container.
  - f. Place modifier sample in the container and add another 30 g of rejuvenating agent. Ensure the modifier sample is completely covered; add more rejuvenating agent if necessary.
  - g. Cover the container with a metal lid and place it into a 40°C oven for 48 hr.
  - h. Remove the sample from the container. Use a paper towel to blot the surface of the sample to remove excess rejuvenator. Allow sample to cool to room temperature and weigh to the nearest 0.0001 g.
  - i. Calculate the mass change, expressed in Equation 1. Mass change will be positive.

$$\text{Mass Change (\%)} = \frac{M_2 - M_1}{M_1} \times 100$$

Where:

M<sub>1</sub> = Mass of modifier sample before being conditioned in the rejuvenating agent (g); and

M<sub>2</sub> = Mass of modifier sample after conditioning in the rejuvenating agent (g).

**Equipment**

**Asphalt Distributor:** The mechanical pressure distributor shall meet the requirements of Subsection 403.06. The spray nozzles shall be rated and of the size recommended for a uniform application rate.

**Rotary Broom:** The Rotary Broom shall be capable of removing dust, debris, and loose mineral aggregate from the surface as needed and based on the specifications herein.

**Equipment Calibration:** The asphalt distributor shall be calibrated by applying asphalt emulsion for a continuous section of minimum 500 ft. The amount of material distributed shall be within 5% of the intended application rate and shall be verified by use of a strapping stick as supplied by the equipment manufacturer. Neither a visual gauge indicating volume nor the computer readout shall be used as a calibration method. The application rate is measured in gal/square yard.

**Test Strip:** Prior to the beginning of the project, the contractor may be required to perform a test strip in a suitable area such as a parking lot or staging area to assure the materials, contractor personnel, and equipment are suitable to produce a satisfactory Fog Seal. The location for the test strip shall be approved by the Engineer. The test strip may be conducted as part of the calibration procedure or may be conducted as part of the project.

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JOB NO.

FOG SEAL

**Surface Preparation**

**General:** Immediately prior to applying the Fog Seal, the pavement surface shall be cleared of all loose material, silt spots, vegetation, and other objectionable material. If water is used, cracks shall be allowed to dry thoroughly before applying the asphalt emulsion. Manholes, valve boxes, drop inlets, and other service entrances shall be protected from the rejuvenating Fog Seal by a suitable method. Thermoplastic and other striping should be removed or protected prior to application of the asphalt emulsion. The Engineer shall approve the surface preparation prior to application of the Fog Seal.

**Material Storage and Handling**

**Asphalt Emulsion:** It is expected that the contractor follows the manufacturer guidelines for storage and handling of the specified Fog Seal emulsion.

**Aggregate:** Aggregate intended for use on the project shall be maintained in such manner as to protect it from contamination by debris and excess moisture. Large or oversized particles shall be removed from the aggregate by screening or other acceptable method prior to use on the project.

**Seasonal Limitations:** The Fog Seal shall be placed between April 1 - September 30 for travel lanes and April 1 - October 30 for shoulders.

**Construction Requirements:** The pavement surface shall be swept and cleaned in accordance with Subsection 402.03(b). Fog Seal shall not be applied when the air or pavement temperature is below 50°F, nor shall it be applied to a surface exhibiting moisture, nor when general weather conditions, in the opinion of the Engineer, are not suitable. Road surface must be dry. Do not apply during foggy weather or when rain is likely to occur the same or following day. In order to allow enough time for the Fog Seal to completely cure, Fog Seal shall not be applied after 3:00 pm in order to allow for complete curing before opening the lane to traffic, unless otherwise approved by the Engineer prior to application (based on weather and traffic conditions). The distributor shall be so adjusted and operated as to distribute evenly the material being applied at a rate between 0.05-0.15 gallons/square yard as indicated on the plans. The application rate shall vary according to the demands of the pavement and shall be determined by the Engineer.

**Traffic Control:** Traffic control shall be maintained until the product has sufficiently cured to withstand traffic without damage. The Fog Seal shall be completely broken before traffic is permitted to drive on it.

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**FOG SEAL**

**Aggregate:** Aggregate is used only as a blotting agent in areas of excess emulsion application or as a means to protect a freshly placed seal in high traffic areas or to facilitate early return to traffic. The aggregate shall be any suitable manufactured or natural sand with top-sized material of less than 0.25 inch. Furnish and uniformly distribute clean, fine sand on the surface to blot excess when an excessive quantity of asphalt is applied. If sand is required, the application rate should be 1.0-2.0 lbs/square yard. Deposits of asphalt material upon the road surface in excess of the quantity specified, caused by stopping or starting the distributor, overflow, leakage, or otherwise, shall be removed at no cost to the Department.

**Method of Measurement:** Fog Seal shall be measured by the gallon.

**Basis of Payment:** Work completed and measured as provided above will be paid for at the contract unit price bid per gallon for Fog Seal. The bid price shall be full compensation for surface preparation, furnishing, preparing, hauling, application of the Fog Seal, and removing of Aggregate used for blotting; and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Fog Seal (Type ____)	Gallon

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**REJUVENATING MASS CRACK TREATMENT**

**Description:**

This item shall consist of the application of a polymer modified asphalt rejuvenating mass crack treatment, as specified, according to these specifications, and in reasonably close conformity with the plans or as directed.

The treatment consists of furnishing properly distributed rejuvenating asphalt emulsion scrubbed into the cracks and voids followed by a uniform application of aggregate for building a riding surface, improving the surface friction of a roadway, sealing cracks in the roadway, reducing the rate of oxidation of a surface mixture, or as an interlayer to delay or reduce the occurrence of reflective cracking.

**Materials:**

- (a) **Asphalt Emulsion.** The asphalt emulsion for rejuvenating mass crack treatment shall meet the requirements of the following table and shall be composed of a polymer modifier, a petroleum based rejuvenating agent, and asphalt. The emulsion supplier shall receive quarterly certificates of analysis (COA) for both the polymer and rejuvenating agency manufacturers. The COAs shall be provided to the Department upon request.

Property	Test Procedure (AASHTO)	Specification	
		(min)	(max)
<b>Emulsion Properties</b>			
Viscosity, Saybolt-Furol, @ 77°F, SFS	T59	50	350
Storage, 24 hour, %	T59	-	1
Oil Distillate, %	T59	-	0.5
Sieve Test, %	T59	-	0.1
Residue by Distillation <sup>(1)</sup> @ 350°F, %	T59	60	-
<b>Residue Properties From Distillation</b>			
Penetration @ 4°C, 200g weight, 60 sec	T49	30	-
<b>Residue Properties From Low Temp Evaporation</b>			
R78, Procedure B			
MSCR @ 52°C, J <sub>nr</sub> @ 3.2/kPa	ASTM D7405	-	4.0
<b>Polymer Properties<sup>(2)</sup></b>			
Tests on Modifier Mass Change, %	ASTM D471 (modified)		50%
<b>Test on Rejuvenating Agent</b>			
Flash Point, COC, °F	ASTM D92	380	-
Viscosity, 140°F, cSt	ASTM D2170	50	175
Saturate, % by wt	ASTM D2007	-	30
Asphaltenes	ASTM D2007	-	1.0
<b>Test on Residue from RTFO</b>			
Weight change, %	ASTM D2872	-	6.5
Viscosity Ratio	ASTM D2170	-	3

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1. Exception to AASHTO T59: Bring the temperature on the lower thermometer slowly to 350°F plus or minus 10°F. Maintain this temperature for 20 minutes. Complete the total distillation in 60 plus or minus 5 minutes.
2. Modify ASTM D471 as follows:
  - a. Place 0.8g of modifier into an 18-mm silicone rubber DSR mold.
  - b. If necessary, dry at ambient lab conditions for 72 hr.
  - c. Remove the modifier from the mold and place the sample into a forced draft oven on release paper for 48 hr at 40°C.
  - d. After 48 hr, cool and weigh the sample to the nearest 0.0001 g. Record the weight.
  - e. Pour 30 g of rejuvenating agent in a 90-ml metal container.
  - f. Place modifier sample in the container and add another 30 g of rejuvenating agent. Ensure the modifier sample is completely covered; add more rejuvenating agent if necessary.
  - g. Cover the container with a metal lid and place it into a 40°C oven for 48 hr.
  - h. Remove the sample from the container. Use a paper towel to blot the surface of the sample to remove excess rejuvenator. Allow sample to cool to room temperature and weigh to the nearest 0.0001 g.
  - i. Calculate the mass change, expressed in Equation 1. Mass change will be positive.
    - i.  $Mass\ Change\ (\%) = \frac{M_2 - M_1}{M_1} \times 100$
    - ii. Where:
    - iii.  $M_1$  = Mass of modifier sample before being conditioned in the rejuvenating agent (g); and
    - iv.  $M_2$  = Mass of modifier sample after conditioning in the rejuvenating agent (g).

**(b) Rejuvenating Agent.** The manufacturer of the rejuvenating agent, through the emulsion supplier and the contractor, shall submit to the Department test results certifying that the material meets the specification shown in the table above. The Department shall not accept test results dated more than 120 calendar days from the date of the project start. At any time during the project, the Department may obtain, and have tested at Department expense, samples of the rejuvenating agent being used in manufacturing of emulsion delivered to the project.

**(c) Latex Polymer.** The manufacturer of the latex polymer, through the emulsion supplier and the contractor, shall submit to the Department test results certifying that the material meets the specification shown in the table above. The Department shall not accept test results dated more than 120 calendar days from the date of the project start. At any time during the project, the Department may obtain, and have tested at Department expense, samples of the latex polymer being used in manufacturing of emulsion delivered to the project.

**(d) Aggregate.** Unless otherwise noted, the aggregate material shall be crushed stone listed in and meeting the requirements of Subsection 403.01 and having a gradation of Class 4 Mineral Aggregate as indicated in Subsection 403.02. When a Rejuvenating Mass Crack Treatment is to be used as an interlayer a Class 1 Mineral Aggregate as indicated in Subsection 403.02 may be used. It shall be stated in the plans if the Class 1 Mineral aggregate is required.

**Equipment:**

**(a) Pressure Distributor.** An approved mechanical pressure distributor shall meet the requirements of Section 403.

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**(b) Broom Sled.** A broom sled as described herein shall be used to force the emulsion into cracks and voids after application of the emulsion from a pressurized distributor and before the application of aggregate.

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The broom sled frame shall be constructed of metal and equipped with means to be attached to and pulled by the distributor truck.

The broom sled must be equipped with a means of raising and lowering the broom sled when desired. It shall be towable in the elevated position. The height of the broom sled assembly shall be adjustable related to the amount of emulsion carried by the broom heads themselves such that, regardless of application rate, the broom sled carries an excess of emulsion in front of the broom heads across the width of the area to be treated while containing the emulsion inside of the broom sled frame and not outside of the intended width of the treatment.

The main body of the broom sled shall have an overall frame size similar to the one shown in the drawing below. The nearest and furthest members, paralleling the back of the distributor truck, and diagonal members shall be equipped with street brooms. The leading member and the trailing member shall have broom heads angled at approximately 10 to 15 degrees off the centerline of the supporting member. The diagonal members shall have broom heads attached in line with the centerline of the supporting member. Each individual street broom attached to the broom sled assembly shall have a density of bristles to sufficiently push the emulsion evenly within the desired area of application. The stiffness of the bristles shall not bend excessively during application and spreading of the emulsion.

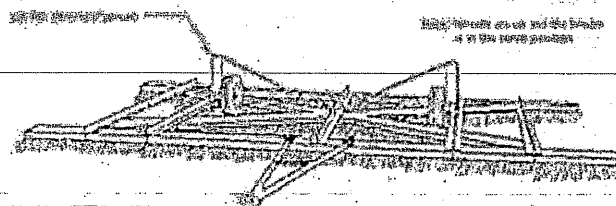
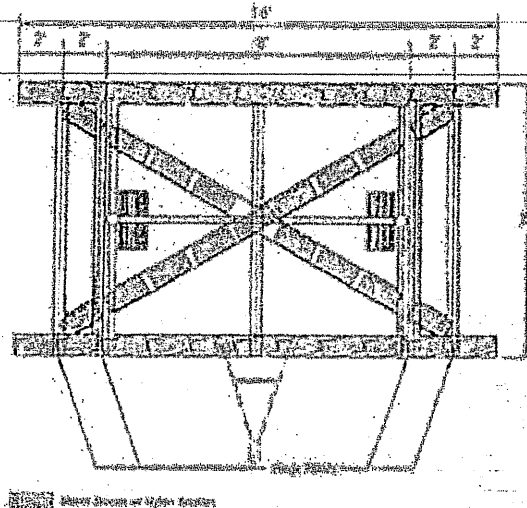
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The broom sled shall be equipped with hinged wing assemblies attached to the main body not to exceed 4.5 feet per side, with diagonals and equipped with the identical street brooms as described herein.

The purpose of the maximum rigid frame width and the hinged wing extensions is not only for maximum width of 16 feet but to maintain the scrubbing process evenly as contours and cross-sections change across the existing road surface. A means or method of controlling the broom sled, causing it to track evenly behind the distributor in curves and on cross slopes, is required.

All broom sled designs shall be submitted to the Department for approval. Demonstration that the broom sled design is capable of filling the cracks with emulsion shall be performed prior to the Engineer approving the broom sled design. Demonstration of the broom sled may be performed on the test strip. An example broom sled design diagram is included in this document.

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Scrub Broom

(c) **Aggregate Spreader.** The mechanical aggregate spreader shall meet the requirements of Subsection 403.07.

(d) **Rollers.** Rollers shall meet the requirements of Subsection 403.08.

(e) **Rotary Broom.** The Rotary Broom shall be capable of removing debris and loose mineral aggregate from the surface as needed and based on the specifications herein.

**Test Strip:**

Prior to the beginning of the project, the contractor shall be required to perform a test strip with a minimum length of 100 feet to assure the materials, contractor personnel and equipment are suitable to produce a satisfactory Rejuvenating Mass Crack Treatment. The test strip may be conducted as part of the calibration procedure. The test strip may be in a suitable area such as a parking lot or staging area. The contractor may also elect to use the project site for the test strip. If the test strip is placed within the project limits the contractor shall correct any deficiencies before opening to traffic as directed by the Engineer at no additional cost to the Department. The location for the test strip shall be approved by the Engineer prior to placement of the test strip.

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**Construction Requirements:**

**(a) General.** The methods employed in performing the work, and all equipment, tools, and machinery used in handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started and whenever found unsatisfactory shall be changed or improved as required. Equipment, tools, and machinery used must be maintained in a satisfactory condition, and must conform to the requirements provided in Section 403.

The surfaces of all structures shall be protected by some satisfactory method to prevent their being disfigured by the application of asphalt material. Objectionable asphalt discoloration, caused by the Contractor's operations, shall be removed from all roadway and bridge structures at no cost to the Department.

Asphalt material shall not be applied on a surface having excess moisture or when weather conditions are unsuitable. The Contractor shall monitor local weather conditions to avoid placing material on the road ahead of adverse weather that could subsequently damage the material. In the event materials are damaged by adverse weather, they shall be replaced or repaired at no additional cost to the Department.

Special precautions shall be taken to ensure that the equipment is operated in a manner that distributes the asphalt and aggregate evenly and uniformly. Deposits of asphalt and aggregate material upon the road surface in excess of the quantity specified, caused by stopping or starting the distributing machine, overflow, leakage, or other mechanical or human errors, shall be removed.

Prior to performing the actual work, all equipment shall be adjusted and calibrated according to Section 403 and applicable manufacturer's requirements.

The surface section shall be constructed in half widths for each application.

**(b) Preparation of Existing Surface.** Potholes and surface depressions will be repaired by the Department prior to the Rejuvenating Mass Crack Treatment work unless shown otherwise on the plans. Immediately prior to application of the asphalt material, clean and de-grass existing pavements over the full width to be treated and all raised pavement markers shall be removed.

Manholes, valve boxes, drop inlets and other service entrances shall be protected from the asphalt emulsion by a suitable method.

**(c) Sweeping and Cleaning.** Before the asphalt material is applied, the surface shall be thoroughly cleaned and swept with a rotary power broom to remove all dust, dirt, mud, and loose or foreign material. A blower may be used to assist in the cleaning operation. The sweeping and cleaning operations shall be carried only far enough in advance of the application of the asphalt material to ensure that the surface is maintained in the proper condition at the time of application. Clean areas not reached by the power broom or blower by hand brooming or blowing.

**(d) Application of Asphalt Material.** After the surface to be treated has been prepared as specified above, the asphalt material for the surface treatment shall be sprayed uniformly over the surface by means of an approved mechanical pressure distributor,

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meeting the requirements of Section 403, shown on the plans and at the designated rate of application as shown on the plans.

The optimum application rate of asphalt material is dependent on the mineral aggregate gradation as well as the condition of the pavement in which the Rejuvenating Mass Crack Treatment is to be applied. The application rate of the asphalt material may be adjusted by the Engineer based on field conditions at the time of construction.

The asphalt material shall be applied at the temperature between 140 - 180°F. The Contractor shall ensure uniformity of distribution at junctions of distributor loads by use of building paper or other approved methods.

After asphalt material is applied and broomed to force material into cracks and voids, no equipment or traffic will be permitted on the surface until the aggregate is applied and rolled.

**(e) Application of Mineral Aggregate.** The mineral aggregate shall not contain excessive free moisture and shall be spread immediately following the application of the asphalt material. Operations shall not proceed or continue when the asphalt material is allowed to chill, set up, dry, or otherwise impair retention of the mineral aggregate. The mineral aggregate shall be spread with a mechanical spreader meeting the requirements of Section 403. The mineral aggregate shall be distributed over the asphalt material and at the rate of application shown in the plans. The use of an approved chip box to distribute the mineral aggregate will be permitted on detour construction and other areas approved by the Engineer where the use of a mechanical spreader is impractical. Spreading shall be accomplished in such manner that the tires of the trucks or aggregate spreader at no time contact the uncovered and freshly applied asphalt material. Portions of the surface not covered by mechanical spreaders shall be hand spotted so that the entire surface will be uniformly covered. Light hand brooming may be necessary to distribute excess aggregate.

**(f) Rolling and Brooming.** A minimum of two pneumatic rollers, along with one rotary power broom shall be used with each aggregate spreader being used. A steel wheel roller will be allowed as a finish roller with approval by the Engineer.

Rolling shall begin immediately behind the spreader. Each surface treatment shall be completely rolled a minimum of three times.

After the final set of asphalt has occurred and no more than 48 hours after application, the surface shall be lightly broomed to remove excess aggregate. Generally, the brooming shall be confined to the cooler hours of the day and shall be conducted so as not to displace embedded material.

**(g) Second and Successive Applications.** If the work involves two or more applications of asphalt material and mineral aggregate, the rates of application for this material will be those specified on the plans or as designated by the Engineer. The method of construction will be the same as for an asphalt surface treatment meeting the requirements of Section 402. If a second seal is to be constructed, the emulsion shall conform to Subsection 403.03(d) or Subsection 403.03(e). Each application shall be placed only after the preceding application has been satisfactorily completed and cured. Further, the asphalt

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material shall be firmly set and the aggregate firmly embedded so as not to be displaced by brooming. Before application, the surface shall be thoroughly swept with a rotary power broom so that no dust or loose aggregate is left that might cause a plane of cleavage.

**Traffic Control:**

During the application of the asphalt material and aggregate, and during the rolling operation, traffic will not be allowed on the new surface. When traffic must use the lane adjacent to the lane under construction, the Contractor shall regulate the flow of vehicles past the surfacing operation at a speed not to exceed 25 miles per hour (40 km/h). The Engineer may require the use of a pilot vehicle.

Until the asphalt has set and the cover aggregate is firmly embedded, traffic shall not exceed 25 miles per hour (40 km/h). The vehicle speeds shall be controlled by the use of one or a combination of barricades, flaggers, signs, or pilot vehicles that will minimize the loss of cover aggregate. The method used for speed control shall be approved by the Engineer and will be subject to change or modification should the selected method of control prove unsatisfactory.

The Contractor shall route the aggregate haul trucks to and from the work area so that they will not have to turn on the freshly placed surface treatment.

**Temperature and Seasonal Limitations:**

Asphalt material shall not be applied when the ambient and surface temperature including shaded areas is below 60°F (15°C). In addition, asphalt surface treatments shall not be applied outside the following seasonal limitations:

Traveled Lanes	April 15 to September 30
Shoulders	April 1 to October 31

No deviation from the above limitations will be allowed except by written permission from the Engineer.

**Method of Measurement:**

(a) Mineral aggregate in surface treatments will be measured either by the cubic yard (cubic meter) or by the ton (metric ton).

(b) Rejuvenating Mass Crack will be measured by the gallon (liter).

**Basis of Payment:**

Work completed and accepted and measured as provided above will be paid for as follows:

(a) Mineral aggregate will be paid for at the contract unit price bid per ton (metric ton) or per cubic yard (cubic meter) for Mineral Aggregate in Asphalt Surface Treatment.

In cases where the combined specific gravity of the material used for Mineral Aggregate in Rejuvenating Mass Crack Treatment exceeds 2.80 and the method of measurement is by the ton (metric ton), the quantity of material will be adjusted for payment by multiplying the quantity of the material used by the specific gravity of 2.80 and dividing by the higher specific gravity.

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~~(b) Asphalt material will be paid for at the contract unit price bid per gallon (liter) for Rejuvenating Emulsified Asphalt (CMS-1PC).~~

The above contract unit price shall be full compensation for surface preparation including the removal of the raised pavement; furnishing, loading, heating, hauling, placing, and applying materials; for cleaning, sweeping, brooming, rolling; and for all labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

**Pay Item**

**Pay Unit**

Mineral Aggregate in Asphalt Surface  
Treatment (Class \_\_\_)

Cubic Yard (Cubic Meter)  
or Ton (Metric Ton)

Rejuvenating Emulsified Asphalt (CMS-1PC)

Gallon (Liter)