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. 2023-16 DATE April 25, 2023

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,11, 2023 and then publicly opened, for furnishing the supplies, materials, and/or services as described below.

Bids will be opened May 11, 2023.
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 Full Depth Reclamation (FDR) using cement and type of materials to use and the process and procedures necessary in reclaiming 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 year of 2023.
5	Bidder should specify approximate start date if awarded bid. Days_____
6	Bidder shall quote each item on the bid sheet per ton and gallons as specified on bid sheet.
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 # 2023-16 must be noted on the outside of bidders envelope.
10	Bidder should list price: **Total cost for all jobs $**_____

EXECUTION OF BID

Date_____

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 not to be shown in the bid price, but is to be added 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 into 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 72401and 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.

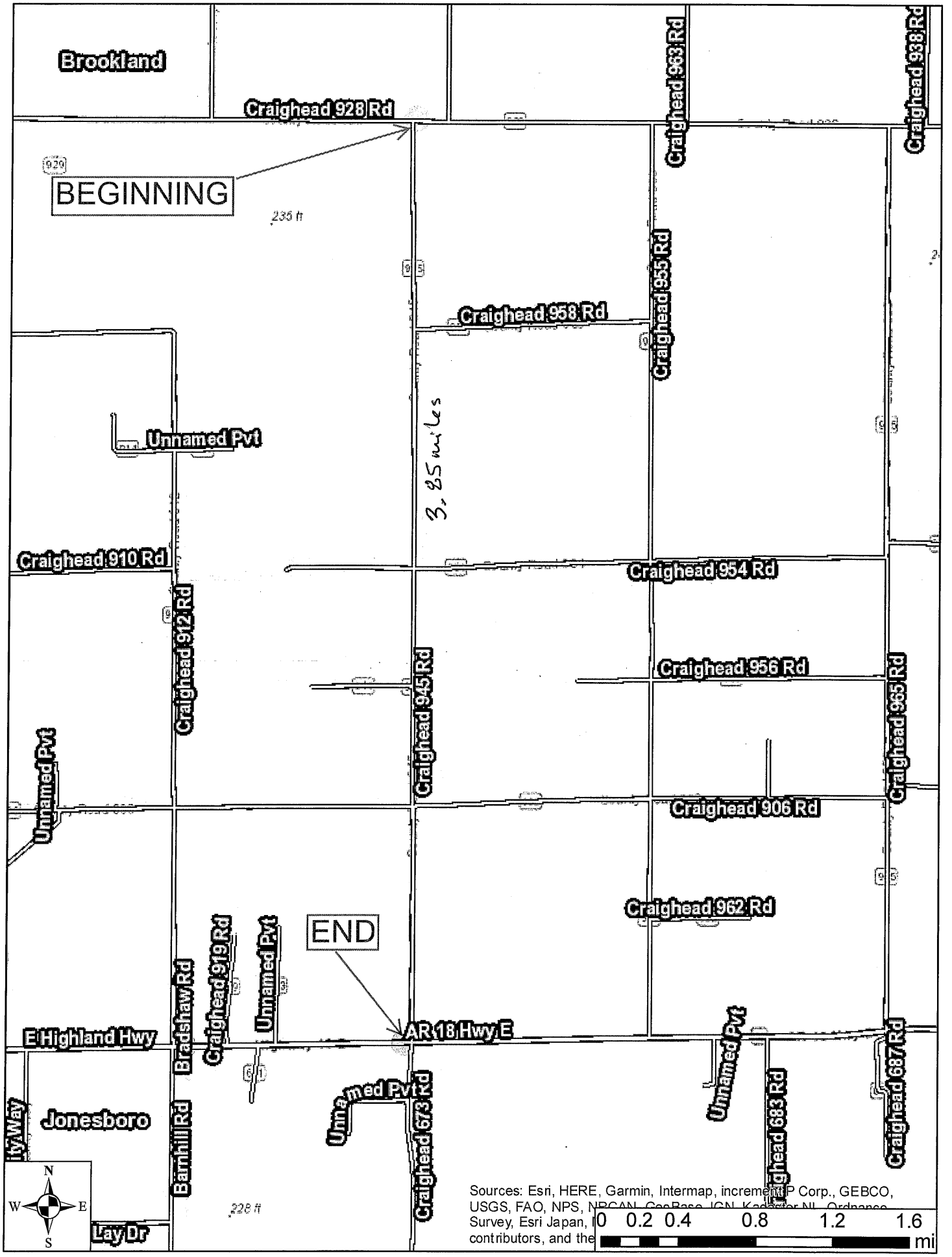
8 Additional information may be obtained from the Purchasing Department.

9 Point of contact will be Road Supt, John James at 870-450-2352

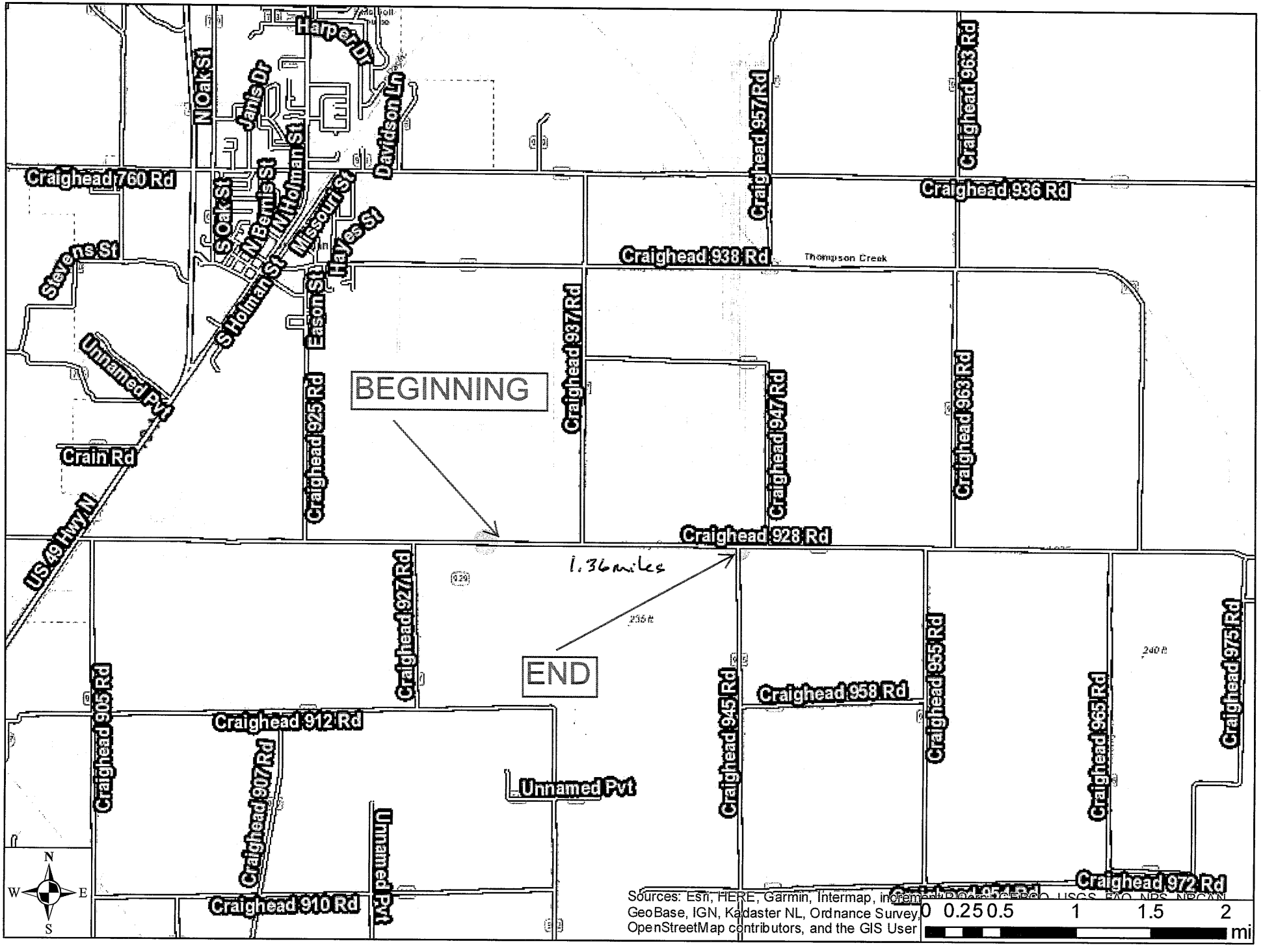
THE COUNTY RESERVES THE RIGHT TO ACCEPT PART OR ALL OF ANY SPECIFIC BID OR BIDS AND TO ACCEPT BID WITH OR WITHOUT TRADE-IN, AND REJECT ANY AND ALL BIDS.

			SPECIFICATIONS									
1			Scope: We are requesting pricing for Full Depth Reclamation (FDR) using cement for county roads. This includes 10" thick									
			and 12" thick stabilized base, cement, prime coat, tack coat, ACHM, traffic control, and mobilization. The work will									
			be done in accordance with the current ARDOT specifications, Craighead County Construction Specifications, and									
			MTA Engineering studies, for full depth reclamation using cement.									
			The full depth reclamation of county roads must be completed by August 15,2023. Liquidated damages									
			after this date are $500 per calendar day. If material availability becomes an issue the County will									
			consider alternative solutions.									
2			Each item of job listed below must be bid individually as listed with a total cost calculated..									
3			These quantities are estimated for bid purposes. Please look at the job, calculate									
			quantities and cost per unit.									
4			Craighead County reserves the right to accept, reject, in whole or in part, to									
			waive informalities in bids received, or accept bids with variations.									
5			Traffic control with one lane traffic at a time shall be responsibility of contractor.									
6			**Cement stabilization shall be 24 feet wide**									
7			**ACHM paving shall be 22 feet wide**									
			Test strip will be required.									
8			**Bid bond shall be submitted with bid and performance and insurance bonds**									
			shall be submitted upon bid award.									
9												
			Job number of County Roads to be reclaimed									
				Estimated	Estimated	Estimated	Estimated	Price	Price	Price		
				Sq Yds	Tons	Prime(Gal)	Tack(Gal)	Per SqYd	Per Ton	Per Gal	Extended Price	
						.15 gl/sq yd	.05 gl/sq yd					
Job	CR 945	1	FDR Stabilized base 12" thick	19,040.00								
A	CR 928		FDR Stabilized base 10" thick	54,080.00								
		2	Cement		2,716							
		3	Prime Coat(CSS-1h) (.15gl/sqyd)			10,968						
		4	ACHM (12.5mm)		11,059.4							
		5	Tack Coat (.05gl/sqyd)				3,351.30					
		6	Traffic Control (Lump Sum)									
			(One lane traffic at a time)									
		7	Mobilization (Lump Sum)									
										Total Cost		

CR 945


Brookland
Craighead 928 Rd
Craighead 963 Rd
Craighead 938 Rd
929
BEGINNING
235 ft
Craighead 955 Rd
Craighead 958 Rd
3.35 miles
Unnamed Pvt
Craighead 910 Rd
Craighead 954 Rd
Craighead 912 Rd
Craighead 945 Rd
Craighead 956 Rd
Craighead 965 Rd
Unnamed Pvt
Craighead 906 Rd
Craighead 962 Rd
END
Craighead 919 Rd
Unnamed Pvt
Bradshaw Rd
E Highland Hwy
AR 18 Hwy E
Unnamed Pvt
Craighead 687 Rd
Unnamed Pvt Rd
Craighead 673 Rd
Craighead 683 Rd
Ivy Way
Jonesboro
Barnhill Rd
N
W
E
S
228 ft
Lay Dr
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, I
contributors, and the
0 0.2 0.4 0.8 1.2 1.6
mi

CR 928


Harper Dr
N Oak St
Janis Dr
Davidson Ln
Craighead 957 Rd
Craighead 963 Rd
Craighead 760 Rd
Craighead 936 Rd
S Oak St
N Bemis St
N Holman St
Missouri St
Hayes St
Stevens St
Craighead 938 Rd
Thompson Creek
S Holman St
Eason St
Craighead 937 Rd
Unnamed Pvt
BEGINNING
Craighead 925 Rd
Craighead 947 Rd
Craighead 963 Rd
Crain Rd
US 49 Hwy N
Craighead 928 Rd
1.36 miles
Craighead 927 Rd
END
Craighead 905 Rd
Craighead 912 Rd
Craighead 945 Rd
Craighead 955 Rd
Craighead 958 Rd
Craighead 965 Rd
Craighead 975 Rd
Craighead 907 Rd
Unnamed Pvt
Unnamed Pvt
Craighead 910 Rd
Craighead 972 Rd
N
W
E
S
Sources: Esri, HERE, Garmin, Intermap, increment P Corp, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, OpenStreetMap contributors, and the GIS User
0 0.25 0.5 1 1.5 2
mi

Craighead County Construction Specifications For Full Depth Reclamation (FDR) Using Cement

1. Description

Full Depth Reclamation (FDR) with Portland cement shall consist of pulverizing the existing flexible pavement and underlying materials (base and/or subgrade materials) to the length, depth and width as specified by Craighead County or as shown on the plans, blending with Portland cement, water, other additives as required by the mix design, to produce a cement stabilized base. This material shall then be shaped, compacted, cured and protected in accordance with the plans and specifications.

2. Treatment Thickness

The existing flexible pavement, base and/or subgrade material shall be pulverized to a total depth specified in the contract within ± 0.5 inches. The pulverized section shall then be re-graded, with excess material removed and hauled away as necessary, so as to allow for the net placement of 10 or 12 inches of new pavement material as specified.

3. Construction Limitations

All full depth reclamation operations including pulverizing, mixing, compacting, finishing, and curing shall be completed during daylight hours. The length of roadbed pulverized at any time shall not exceed the length that can be completely pulverized, mixed, and compacted in the same working day without approval from county officials. No FDR construction activities are allowed when the ambient air temperature is below 40 ^{0}F or when it is raining at the job site.

4. Cement

Cement shall meet the requirements for Type I or II Portland cement or for Portland Limestone Cement (PLC). The cement type used should be consistent with the type used in the mix design unless approval is given from county officials.

5. Water

Water shall be added to achieve the desired moisture content. Water added shall be free from deleterious concentrations of oils, acids, alkalis, salts, sugars, vegetation, as well as other organic, chemical or deleterious substances. The water shall not cause an adverse effect on either the cementitious stabilizing agent or the reclaimed mixture. If the water is of questionable quality, it shall be tested in accordance with ASTM C1602 or according to local standards and procedures.

6. Equipment

The FDR equipment shall be capable of pulverizing the existing asphalt and underlying materials. The equipment used for blending/mixing the pulverized materials with stabilizing agent, water, additives and corrective aggregate, if used, shall be capable of producing a homogeneous and uniformly blended reclaimed mixture. The equipment used for placement of the FDR stabilized base shall be capable of placement to the lines, grades, and guidelines provided by County officials. The equipment shall consist of the following major components:

6.1 Spreaders/Distributors

Spreaders or distributors used to apply dry powder stabilizing agents and/or additives shall be non- pressurized mechanical vane-feed, cyclone or screw type capable of providing a consistent, accurate and uniform distribution of material while minimizing dust during construction.

6.2 Additive Slurry Storage and Supply Equipment

If used, slurry shall be produced using onsite portable batching equipment or inline processed and fed directly to the reclaiming equipment. Additive slurry storage and supply equipment shall have agitators or similar

equipment to keep the slurry in suspension when held in the slurry batch or storage tanks. Slurry shall be kept in suspension during transport using agitator equipment. The meter system controlling application of slurry shall apply the additive within a tolerance of ± 10% of the specified rate.

6.3 Mixing/Reclaiming Equipment

Only self-propelled, high powered rotary mixers/reclaimers capable of mixing in-place to a depth of 12 inches shall be used. The cutting drum shall be approximately 4 feet in width and fitted with cutting teeth capable of trimming earth, aggregate and asphalt materials and be so designed that they may be accurately adjusted vertically and held in-place. The machine shall not weigh less than 25,000 lbs. and shall have the strength and rigidity so that it shall not develop a center deflection of more than 1/8 in. Disc harrows, bucket teeth and other equipment that does not meet the above requirements shall not be used for FDR.

The mixer/reclaimer shall be fitted with an integrated water injection system capable of introducing water into the cutting drum during the mixing process. The metering device shall be capable of automatically adjusting the flow of water to compensate for any variation in the amount of reclaimed material introduced into the mixing chamber. Water shall be calculated on a volumetric basis tied to a foot per minute gauge using a calibrated meter that is capable of accurately measuring the amount of water to within a tolerance of ± 10% of the rate required. Automatic digital readings shall be displayed for both the flow rate and total amount of reclaimed material and water in appropriate units of weight and time.

6.4 Motor Grader

A motor grader for pre-shaping, aerating, spreading and final shaping of the material shall be provided. The motor grader shall have a cross slope indicator.

6.5 Rollers

Compacting of the reclaimed mixture shall be completed using self-propelled rollers, complete with properly operating scrapers and water spray systems. The number, weight and types of rollers shall be as necessary to obtain the required compaction throughout the entire FDR thickness. A pneumatic roller of adequate size, a vibratory padfoot roller with an 84-inch wide drum equipped with knockdown blade, and a single or double drum vibratory steel roller may be used in any combination to achieve density.

6.6 Water Truck

Water truck(s) for supplying water to the reclaimer or roadway for addition of moisture and for curing during the FDR operation shall be provided. Water truck(s) shall be capable of providing a controlled and consistent spray without eroding or otherwise damaging the compacted FDR stabilized base surface.

7. Materials

RAP and underlying material shall consist of the existing asphalt material, existing base course material and/or subgrade material. The underlying materials shall be free of roots, sod, topsoil, weeds, wood or any material deleterious to its reaction with the cementitious stabilizing agent. The gradation of the processed (pulverized) material should meet the general requirements of Table 1 or within mix design tolerance.

Table 1 – GRADATION OF PROCESSED (PULVERIZED) MATERIALS

Sieve Size	Minimum Percent Passing
3 in. (75 mm)	100
2 in. (50 mm)	95
No. 4 (4.75 mm)	55
No. 200 (0.075 mm)	5

Rubberized crack filler, pavement markers, loop wires, thermoplastic markers, paving fabric and other similar materials shall be removed as observed from the roadway during the reclaiming process. Residual materials that cannot be completely removed from the reclaimed material may be incorporated into the FDR mixture if the Contractor can demonstrate that those added materials will not adversely affect performance. Any such materials retained in the mixture shall be appropriately sized and blended so as to not adversely affect the appearance or strength of the FDR stabilized base.

8. Construction

Throughout the pulverization, mixing, placement and compaction of the reclaimed materials, adjustments may be made to the cementitious stabilizing agent, water, and additives so as to produce a reclaimed mixture with optimal performance that meets specification requirements. All adjustments shall be recorded and submitted to County Officials.

Throughout the pulverization, mixing, placement and compaction of the reclaimed materials, adjustments may be made to the cementitious stabilizing agent, water, and additives so as to produce a reclaimed mixture with optimal performance that meets specification requirements. All adjustments shall be recorded and submitted to County Officials.

8.1 Roadway Preparation

Before the stabilization process begins, the area to be stabilized shall be pre-pulverized, graded, and/or shaped to the lines and grades as specified by the county officials. During this process any unsuitable soil or material shall be removed and replaced with materials meeting project plan and specification requirements. The subgrade shall be firm and able to support, without yielding or subsequent settlement, the construction equipment and compaction of the FDR stabilized base. Soft or yielding subgrade shall be made stable before construction proceeds. Any manholes, valve covers, or other buried structures/utilities shall be protected from damage prior to processing. FDR shall be constructed in a series of parallel lanes such that longitudinal and transverse joints are minimized.

8.2 Control Strip

During the first day of production the first load of cementitious stabilizing agent shall be used by the Contractor to construct a control strip to verify that the construction process meets specification requirements. The control strip shall be of adequate size for the Contractor to:

- 8.2.1 Demonstrate that the equipment, materials, and processes proposed can produce a reclaimed material layer that conforms to specification requirements.
- 8.2.2 Determine the optimal rates for cementitious stabilizing agent, water, and any additives recommended for the reclaimed material.
- 8.2.3 Determine the sequence and manner of rolling necessary to obtain specified density requirements.

FDR operations may continue through the first day unless the Contractor's equipment and process fails to meet the requirements for successful completion of FDR operations. FDR operations shall not continue beyond the first day unless a control strip has been approved by County Officials. If necessary, the contractor will cease production after the first load of cement stabilizing agent until new procedures are developed. Once new procedures are developed, a new test section shall be required. If the new procedures are still deemed unsatisfactory, then production must

cease, and a new corrective action plan submitted to County officials prior to beginning work.

In lieu of a control strip, the County Officials may allow the Contractor to provide proof, based on previous experience with the same equipment, personnel, and materials that the work will conform to specification requirements.

8.3 Pulverization

The pre-determined full depth of asphalt material and underlying materials (base and/or subgrade) shall be pulverized to a homogenous mixture and specified gradation using a mixer/reclaimer meeting the requirements of Section 6.3. The mixture shall be brought to the desired moisture content during this process by means of surface application or through the mixer/reclaimer's integrated fluid injection system.

Longitudinal joints between successive cuts shall overlap a minimum of 6 inches (150 mm) and transverse joints shall overlap a minimum of 2 feet (0.60 m).

8.4 Cementitious Application and Mixing

Removal and disposal of excess material, if required, shall be performed on the pulverized asphalt, base and subgrade material prior to cementitious treatment. Following pulverization and any trimming, if necessary, the cementitious material shall be spread on or applied to the pulverized material in accordance with the mix design using an approved spreader/distributor or slurry equipment. The actual final dry unit weight of pulverized material shall be determined during construction. The cementitious stabilizing agent shall be applied to within a tolerance of ± 5% of the rate required. The compressive strength at 7 days for the FDR stabilized base should be within acceptable range of the mix design.

Dust control measures shall be employed to minimize fugitive dust. With a dry stabilizing agent, the distance between the spreader and the reclaiming operation shall be reduced appropriately during windy days. Slurry may be spread on the pulverized reclaimed material in front of the reclaiming operation or may be added directly to the reclaimer's mixing chamber through the reclaimer's integrated fluid injection system. If the stabilizing agent is supplied in slurry form in front of the reclaiming operation, the reclaimed material shall be scarified prior to spreading of slurry to prevent excessive runoff or ponding. Slurry shall be produced at the jobsite. The Contractor shall provide the Owner Agency with batch or inline production logs daily. In no case shall dry stabilizing agent or slurry be allowed to remain exposed at the end of the workday. No traffic, other than the reclaiming equipment, shall be allowed to pass over the spread stabilizing agent until the reclaiming operation is complete.

The first contact of cementitious stabilizing agent with water prior to application on the reclaimed material shall not exceed 60 minutes. The time from cement placement to start of mixing shall not exceed 30 minutes. If using dry stabilizing agent, water application shall only be added through the mixer/reclaimer's integrated fluid injection system during mixing. Mixing shall be performed while introducing water into the pulverized material through the metering device on the mixer. After completion of the first pass, the road shall be shaped with a motor grader and compacted with a steel wheel roller to provide improved depth control. A second pass of the reclaimer shall be completed with the required amount of stabilizing agent added. If necessary, water shall be added to the pulverized material during mixing to bring the moisture content to within minus 1 to plus 2 percent of the optimum moisture content determined in accordance with ASTM D558 to ensure chemical reaction of the cementitious stabilizing agent and processed

materials. Mixing shall continue until the entire mixture, RAP, base and/or subgrade material is pulverized, and gradation requirements are met. The final check for gradation shall not be made until the conclusion of mixing operations. The entire operation of cementitious stabilizing agent spreading, water application and mixing shall result in a uniform pulverized base, stabilizing agent, and water mixture for the full design depth and width.

Longitudinal joints between successive passes shall overlap a minimum of 6 inches and transverse joints shall overlap a minimum of 2 feet.

To ensure a uniformly treated section, any material/soil around manholes, utility risers, valves and adjacent to curbs/gutters or in corners, shall have that material/soil pulled out to the depth of treatment and placed where it is accessible for mixing. After mixing, that material shall be replaced and compacted.

8.5 Compaction

The Contractor shall sequence operations such that compaction shall begin no more than 20 minutes after mixing or immediately upon achieving gradation and moisture requirements. All compaction operations shall be completed within 2 hours from start of mixing operations. No section shall be left undisturbed for more than 30 minutes during compaction operations. At the start of compaction, the moisture content shall be within -1% to +2% of the specified optimum moisture content determined in accordance with ASTM D558. The mixed material shall be uniformly compacted in one layer to a minimum of 98% of the maximum dry density determined in accordance with ASTM D558, based on a moving average of five consecutive tests, or at the discretion of County Officials, with no test below 96%. Field density of compacted material may be determined by nuclear method in the direct transmission mode (AASHTO T 310, ASTM D6938) or sand cone method (AASHTO T 191, ASTM D1556).

8.6 Finishing and Surface Tolerance

As compaction nears completion, the surface of the FDR stabilized base shall be shaped to the specified lines, grades and cross sections. Compaction shall then be continued until uniform and adequate density is achieved. During the finishing process the surface shall be kept moist by means of water spray devices that shall not erode the surface. Compaction and finishing shall be performed in such a manner so as to produce a surface free of compaction planes, cracks, ridges or loose material. The surface tolerance shall not vary more than 1/2 inch from a 10-foot straight edge placed on the surface. The Contractor shall correct humps exceeding this tolerance by trimming, milling or abrasive grinding. Feathering shall not be permitted for repair of low areas. Depressions exceeding the specified depth tolerance shall have a tack coat applied and filled with an asphalt mixture just prior to placement of the final surfacing. All finishing operations shall be completed within 4 hours from start of mixing. However, trimming (cuts only) can be completed within 24 hours of mixing.

8.7 Curing

After completion of final finishing, the cementitious stabilized surface shall be cured by application of a bituminous or other approved sealing membrane, or by being kept continuously moist for a period of 3 to 5 days with a water spray that shall not erode the surface of the FDR stabilized base. If curing material is used, it shall be applied as soon as possible, but no later than 24 hours after completing finishing operations. The surface shall be kept continuously moist prior to application of the curing membrane.

For bituminous curing membranes the FDR stabilized base shall be free of all loose, extraneous materials and shall be applied in the form of a fog seal composed of either CSS-1h or SS-1h emulsified asphalt, or another emulsion approved by the Owner Agency, diluted up to 60 percent by volume with water. The fog seal shall be applied at a rate of 0.10 to 0.20 gal/yd^2, (0.4 to 0.8 L/m^2). When a sand blotter is required, it shall be applied to the surface at 2 to 3 lbs/yd^2. Sand shall be free from clay or organic material. Application rates of fog seal and sand blotter shall be determined by the Contractor and shall be such that a stable and safe roadway surface can be maintained until the surface course is placed. A bituminous curing compound resistant to tracking may be used in place of a sand blotter if proven to be effective.

for stiffness after each additional rolling pass. It is anticipated that the roller will have to make 1 to 4 passes to achieve the required reduction in stiffness.

After cessation of microcracking the section the stabilized surface, if previously moist cured, shall be moist cured for an additional 2 to 4 days with a water spray that shall not erode the surface of the FDR stabilized base. As an alternative, the stabilized surface shall be moist cured for an additional 4 hours and then a bituminous or other approved sealing membrane applied in accordance with Section 7.9.

If the stabilized surface was previously cured prior to microcracking with a bituminous or other approved sealing membrane, then the stabilized surface shall be moist cured by being kept continuously moist for a period of 2 hours and then a bituminous or other approved sealing membrane reapplied in accordance with Section 7.9.

9. Traffic

FDR stabilization shall be constructed in one-lane widths with active traffic control during construction. Full roadway width construction will not be allowed without approval by County officials. Completed portions of FDR stabilized base can be opened immediately to low speed local car traffic and to construction equipment, provided the curing material is not impaired. Finished portions of the FDR stabilized base traveled on by construction equipment used in constructing an adjoining section shall be protected in such a manner so as to prevent equipment from marring or damaging the completed work. If damage occurs, it may be necessary to keep heavy truck traffic off the stabilized base until the final surfacing is placed, and/or the stabilized base has passed proof roll testing. Proof rolling shall represent the type of traffic expected on the pavement. If deformation does not occur, moving truck traffic can be allowed at speeds less than 30 mph until the final surfacing is placed. If deformation does occur, truck traffic shall be kept off the stabilized base until it is firm enough to support the loads.

10. Maintenance

After opening to traffic and prior to placing the surface course, the surface of the FDR stabilized base shall be maintained in a condition suitable for the safe movement of traffic. The Contractor shall protect and maintain the surface from nuisance water, other deleterious substances, and/or any other damage. Any damage to the completed FDR stabilized base shall be repaired by the Contractor prior to placement of the final surfacing. If it is necessary to replace any processed material, the replacement shall be for full depth, with vertical cuts, using an approved material. Skin patches shall not be permitted. No direct payment shall be made, and costs shall be included elsewhere for protection and maintenance of the stabilized base.

11. Surfacing

Final surfacing (hot or warm mix asphalt, seal coat, or concrete) can be placed any time after curing, as long as the FDR stabilized base is sufficiently stable (proof roll) to support the required construction equipment without marring or permanent distortion of the surface.

12. Quality Assurance Testing

The Contractor shall perform process and quality control (QC) sampling and testing, and exercise management control to ensure that FDR base conforms to the project plans and specifications. The Contractor shall provide a qualified technician to perform process and quality control sampling and testing during construction of the FDR. The proficiency of testing laboratories and sampling and testing personnel shall be reviewed and approved by County Officials prior to providing services to the project. County Officials shall have unrestricted access to all information resulting from mix design and quality control activities. All quality control testing results shall be submitted to the County Officials.

Sampling and testing shall be performed as outlined in these specifications and within the guidelines shown in the following table:

A

Quality Control Measures by Contractor

Type of Testing	Method	Frequency	Sample location & Size	Target
Cement (portland or blended hydraulic	Supplier Generated certificate	Before use of every load	N/A	N/A
Cement; Dry Spread Rate	Volumetric Distribution	Every 1/2 mile	From Pavement; one 3ftX3ft square canvas patch test	± 5% of mix design application rate
Cement; slurry application rate	Volumetric Dist % solids by drying or hydrometer	Once for every delivery load	App rate: 1 delivery load over area applied; %solids from batch tank, 1 qt	± 5% of mix design application rate
Control Strip	Nuclear gauge per ASTM D2950 or other approved method	As needed during test strip and first day	As necessary	Rolling pattern to meet density requirements
FDR Gradation	Air dried or wet gradation	Once during test strip & first day or a route change or change in materials occurs	Sample in accordance with ASTM D979 from mat. Approx 22 lbs sample size	Within Mix design tolerence
Moisture Content of Reclaimed Mixture	AASHTO T 329 AASHTO T 265, ASTM D2216 or ASTM D4643	In control strip and as required	Sample in accordance with ASTM D979 from mat. Approx 22 lbs sample size	Adjust to -1 to +2% of optimum moisture content; ASTM D588
Depth of Pulverization/ stabilized material	Depth Probe	Every 1000 ft.	Across mat width	± 1/2 inch or Minimum plan specified
FDR Compaction	Nuclear gauge (ASTM D6938) Direct Transmission	Initial control strip as required and every 1,000 ft. thereafter	Random sampling as per ASTM D3665	≥ 96% of ASTM D588,
Mat Width	Tape Measure	Every 1000 ft.	Across mat width	± 3 inches

13. Measurement and Payment

Quantities of the FDR stabilized base shall be measured by the square yard completed and accepted by the Owner Agency to the depths specified or shown on the plans. Cementitious stabilizing agent and additive weight shall be based upon certified delivery weight tickets, less any unused portion. Water used in this operation shall not be paid for directly and shall be considered subsidiary to the bid item.

Payment for FDR shall be made at the contract unit price per square yard. The price shall be full compensation for all labor, materials, tools, equipment, and incidentals; for doing all the work involved in full depth reclaiming, complete in-place; for pulverizing, mixing, blending, placing, compacting and curing of the FDR stabilized base; for protection and maintenance of the FDR stabilized base; for performing all QA testing including mix design, if required to be adjusted by the Contractor, and for obtaining measurements and recording results of all tests as shown on the plans and specifications.

Pay Item	Pay Unit
Cement	Ton
Full Depth Reclamation (12 inch)	Square Yard
Full Depth Reclamation (10 inch)	Square Yard

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

April 14th, 2023

The Honorable Marvin Day
Craighead County Judge
Jonesboro, AR 72401

RE: Craighead County Roads FDR Project Mix Design Testing, Craighead County, Arkansas

Mr. Day,

At your request, MTA performed FDR mix design testing for the above mentioned project. MTA gathered the samples used for testing in the field with the help of the road department. Three (3) areas from each road (CR 928 and CR 945) were chosen and sampled using an excavator and a small milling machine. The samples were mixed and collected to a depth of approximately 1-ft. The samples were then taken to the lab and individual gradations were performed. The results of these gradations are contained in Appendix A of this report.

Due to the consistency of the gradations for CR 945, further tests were performed on CR 945 Sample 1. Because of the inconsistency of the gradations for CR 928 further tests were run on a mixed sample from all three locations.

After collecting the material in the field MTA then performed modified proctor tests (AASHTO T180D) on samples corresponding to the individual roads, to determine the materials optimum moisture content. The results of the proctor tests are contained in Appendix B of this report.

To determine the recommended cement content for the FDR mix design MTA performed tests on the samples in general accordance with AASHTO T134. The compressive strength data obtained from this testing is contained in Appendix C of this report.

Based on observations and data obtained during testing, MTA recommends that the material for County Road 945 be stabilized at a rate of 7% cement, by weight of dry soil.

Based on observations and data obtained during testing, MTA recommends that the material for County Road 928 be stabilized at a rate of 8.5% cement, by weight of dry soil. Due to the amount of fines contained in the samples obtained from the field, MTA further recommends that the depth of FDR be lessened to a depth of 10-in for County Road 928, to decrease the amount of subgrade mixed into the FDR section.

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA appreciates the opportunity to work with you on this project and we look forward to working with you in the future. If you have any questions regarding this report, please let us know.

Sincerely,

Gray Spahn, P.E.
MTA Engineers

Appendix A: Gradations

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA Job#: _____ **Date:** 3/8/23 **Lab #904300**

Job Name: Craighead County FDR Project

AHTD Job#: _____ **City:** _____

Lot: _____

Sublot: _____

Class of Material

Base Course: _____

Surface Course: _____

Select Material: _____

Other: 9281

Wet Weight: 6032.3 grams

Dry Weight: 5678.3 grams

Wt. After Wash: 4573 grams

Sieve Analysis

Sieve Size	Wt. Retained (gram)	% Retained	% Passing	Spec. Range
1 1/2"	0.0	0%	100%	100%
1"	479.3	8%	92%	95% - 100%
3/4"	723.0	13%	87%	-
1/2"	1293.2	23%	77%	25% - 60%
3/8"	1696.7	30%	70%	-
#4	2698.0	48%	52%	0 - 10%
#8	3311.0	58%	42%	0 - 5%
#16	3736.9	66%	34%	-
#30	4076.4	72%	28%	-
#50	4302.4	76%	24%	-
#100	4470.9	79%	21%	-
#200	4544.4	80.0%	20.0%	-

AASHTO T-2 T-11 T-27 T-248

FM: 4.41

Decant: 19.5%

%Moisture: 6.2

Other: _____

Sampled From: County Road 928 Sample 1

Total Today: _____ TON

Previous Total: _____

Total to Date: _____ TON

Remarks: _____

Pass: _____

Fail: _____

Quality Control: X

Acceptance: _____

Sampled By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Reviewed By: Gray Spahn CTTP# 3218
Lab Manager

Tested By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Signed: Gray Spahn

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA Job#: _____ **Date:** 3/8/23 **Lab #904300**

Job Name: Craighead County FDR Class of Material

AHTD Job#: _____ **City:** Jonesboro Base Course: _____

Lot: _____ Surface Course: _____

Sublot: _____ Select Material: _____

Other: 9281

Wet Weight: 5964.8 grams

Dry Weight: 5441.2 grams

Wt. After Wash: 3387.7 grams

Sieve Analysis

Sieve Size	Wt. Retained (gram)	% Retained	% Passing	Spec. Range
1 1/2"	0.0	0%	100%	100%
1"	239.0	4%	96%	95% - 100%
3/4"	524.5	10%	90%	-
1/2"	1002.6	18%	82%	25% - 60%
3/8"	1389.7	26%	74%	-
#4	2109.7	39%	61%	0 - 10%
#8	2545.3	47%	53%	0 - 5%
#16	2806.0	52%	48%	-
#30	2984.2	55%	45%	-
#50	3170.0	58%	42%	-
#100	3310.7	61%	39%	-
#200	3368.5	61.9%	38.1%	-

AASHTO T-2 T-11 T-27 T-248

FM: 3.46

Decant: 37.7%

%Moisture: 9.6

Other: _____

Sampled From: County Road 928 Sample 1

Total Today: _____ TON Pass: _____

Previous Total: _____ Fail: _____

Total to Date: _____ TON Quality Control: X

Remarks: _____ Acceptance: _____

Sampled By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Reviewed By: Gray Spahn CTTP# 3218
Lab Manager

Tested By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Signed: Gray Spahn

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA Job#: _____ **Date:** 3/8/23 **Lab #904300**

Job Name: Craighead County FDR Project

AHTD Job#: _____ **City:** Jonesboro

Lot: _____

Sublot: _____

Class of Material

Base Course: _____

Surface Course: _____

Select Material: _____

Other: 9283

Wet Weight: 5781.1 grams

Dry Weight: 5091.2 grams

Wt. After Wash: 2695.6 grams

Sieve Analysis

Sieve Size	Wt. Retained (gram)	% Retained	% Passing	Spec. Range
1 1/2"	0.0	0%	100%	100%
1"	57.4	1%	99%	95% - 100%
3/4"	234.5	5%	95%	-
1/2"	501.4	10%	90%	25% - 60%
3/8"	740.8	15%	85%	-
#4	1345.5	26%	74%	0 - 10%
#8	1824.9	36%	64%	0 - 5%
#16	2147.2	42%	58%	-
#30	2360.4	46%	54%	-
#50	2515.6	49%	51%	-
#100	2611.6	51%	49%	-
#200	2664.2	52.3%	47.7%	-

AASHTO T-2 T-11 T-27 T-248

FM: 2.71

Decant: 47.1%

%Moisture: 13.6

Other: _____

Sampled From: County Road 928 Sample 3

Total Today: _____ TON

Previous Total: _____

Total to Date: _____ TON

Remarks: _____

Pass: _____

Fail: _____

Quality Control: X

Acceptance: _____

Sampled By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Reviewed By: Gray Spahn CTTP# 3218
Lab Manager

Tested By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Signed: Gray Spahn

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA Job#: _____ **Date:** 3/8/23 **Lab #904300**

Job Name: Craighead County FDR project

AHTD Job#: _____ **City:** Jonesboro

Lot: _____

Sublot: _____

Class of Material

Base Course: _____

Surface Course: _____

Select Material: _____

Other: 9451

Wet Weight: 7850.1 grams

Dry Weight: 7293.5 grams

Wt. After Wash: 4586.1 grams

Sieve Analysis

Sieve Size	Wt. Retained (gram)	% Retained	% Passing	Spec. Range
1 1/2"	0.0	0%	100%	100%
1"	257.4	4%	96%	95% - 100%
3/4"	551.6	8%	92%	-
1/2"	1060.0	15%	85%	25% - 60%
3/8"	1413.7	19%	81%	-
#4	2250.9	31%	69%	0 - 10%
#8	2899.2	40%	60%	0 - 5%
#16	3391.4	46%	54%	-
#30	3779.5	52%	48%	-
#50	4114.6	56%	44%	-
#100	4390.1	60%	40%	-
#200	4509.9	61.8%	38.2%	-

AASHTO T-2 T-11 T-27 T-248

FM: 3.12

Decant: 37.1%

%Moisture: 7.6

Other: _____

Sampled From: County Road 945 Sample 1

Total Today: _____ TON

Previous Total: _____

Total to Date: _____ TON

Remarks: _____

Pass: _____

Fail: _____

Quality Control: X

Acceptance: _____

Sampled By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Reviewed By: Gray Spahn CTTP# 3218
Lab Manager

Tested By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Signed: Gray Spahn

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA Job#: _____ **Date:** 3/8/23

Job Name: Craighead County FDR Project

AHTD Job#: _____ **City:** _____

Lot: _____

Sublot: _____

Lab #904300

Class of Material

Base Course: _____

Surface Course: _____

Select Material: _____

Other: 9452

Wet Weight: 5841.8 grams

Dry Weight: 5345.7 grams

Wt. After Wash: 3231.9 grams

Sieve Analysis

Sieve Size	Wt. Retained (gram)	% Retained	% Passing	Spec. Range
1 1/2"	0.0	0%	100%	100%
1"	370.0	7%	93%	95% - 100%
3/4"	766.2	14%	86%	-
1/2"	1398.5	26%	74%	25% - 60%
3/8"	1675.4	31%	69%	-
#4	1992.7	37%	63%	0 - 10%
#8	2608.4	49%	51%	0 - 5%
#16	2837.3	53%	47%	-
#30	2974.4	56%	44%	-
#50	3083.1	58%	42%	-
#100	3184.3	60%	40%	-
#200	3227.9	60.4%	39.6%	-

AASHTO T-2 T-11 T-27 T-248

FM: 3.58

Decant: 39.5%

%Moisture: 9.3

Other: _____

Sampled From: County Road 945 Sample 2

Total Today: _____ TON

Previous Total: _____

Total to Date: _____ TON

Remarks: _____

Pass: _____

Fail: _____

Quality Control: X

Acceptance: _____

Sampled By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Reviewed By: Gray Spahn CTTP# 3218

Lab Manager

Tested By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Signed: Gray Spahn

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

MTA Job#: _____ **Date:** 3/8/23

Job Name: Craighead County FDR Project

AHTD Job#: _____ **City:** Jonesboro

Lot: _____

Sublot: _____

Lab #904300

Class of Material

Base Course: _____

Surface Course: _____

Select Material: _____

Other: 9453

Wet Weight: 5270 grams

Dry Weight: 4809.9 grams

Wt. After Wash: 2853.7 grams

Sieve Analysis

Sieve Size	Wt. Retained (gram)	% Retained	% Passing	Spec. Range
1 1/2"	0.0	0%	100%	100%
1"	20.9	0%	100%	95% - 100%
3/4"	220.3	5%	95%	-
1/2"	547.1	11%	89%	25% - 60%
3/8"	853.3	18%	82%	-
#4	1468.3	31%	69%	0 - 10%
#8	1871.1	39%	61%	0 - 5%
#16	2057.2	43%	57%	-
#30	2304.6	48%	52%	-
#50	2633.7	55%	45%	-
#100	2808.4	58%	42%	-
#200	2851.7	59.3%	40.7%	-

AASHTO T-2 T-11 T-27 T-248

FM: 2.96

Decant: 40.7%

%Moisture: 9.6

Other: _____

Sampled From: County Road 945 Sample 3

Total Today: _____ TON

Previous Total: _____

Total to Date: _____ TON

Remarks: _____

Pass: _____

Fail: _____

Quality Control: X

Acceptance: _____

Sampled By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Reviewed By: Gray Spahn CTTP# 3218
Lab Manager

Tested By: Gray Spahn CTTP#3218 (Lab Manager)

Signed: Gray Spahn

Signed: Gray Spahn

Appendix B: Proctors

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

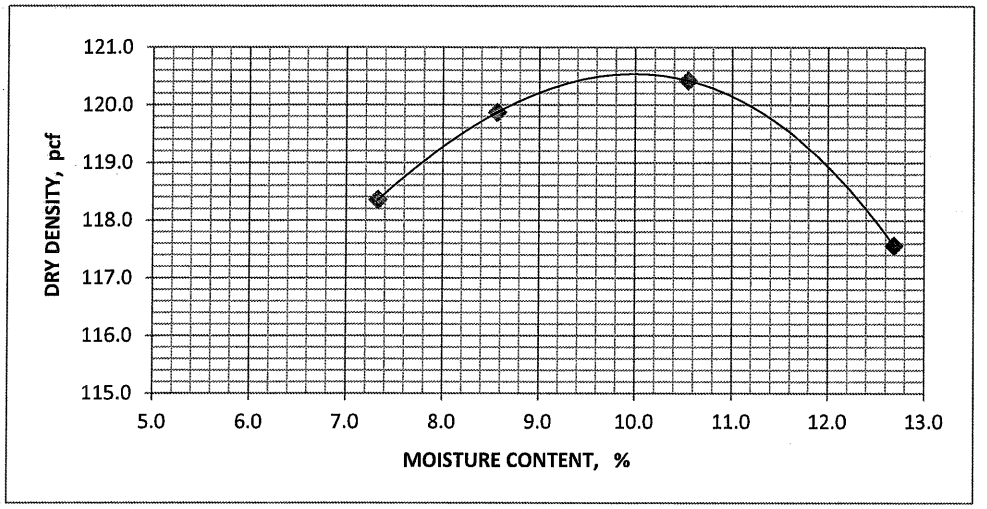
Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

REPORT OF LABORATORY COMPACTION TEST

LAB: Jonesboro 904300
METHOD USED: **AASHTO T180D** MANUAL RAMMER
PREPARATION METHOD: **DRY**
PROJECT: **Craighead County Roads**
AHTD #:
CONTRACTOR:
DATE SAMPLED:
LOCATION: CR928
DESCRIPTION:
MAT'L SOURCE: (mixed)

MAXIMUM DRY DENSITY: **120.6 PCF**
OPTIMUM MOISTURE CONTENT: **10.0%**



SIEVE ANALYSIS (% passing)
ASTM C-136

2"	#DIV/0!
3/4"	#DIV/0!
3/8"	#DIV/0!
#4	#DIV/0!
#10	#DIV/0!
#40	#DIV/0!
#200	#DIV/0!

ASTM C-136

DENSITY	MOISTURE
118.4	7.3
119.9	8.6
120.4	10.5
117.6	12.7

PLASTICITY INDEX
ASTM D-4318

LIQUID LIMIT	40
PLASTIC LIMIT	19
PLASTICITY	21

OVERSIZE CORRECTION DATA:
N/A

TESTED BY: Gray Spahn
CTTP #: 3218
Date:

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

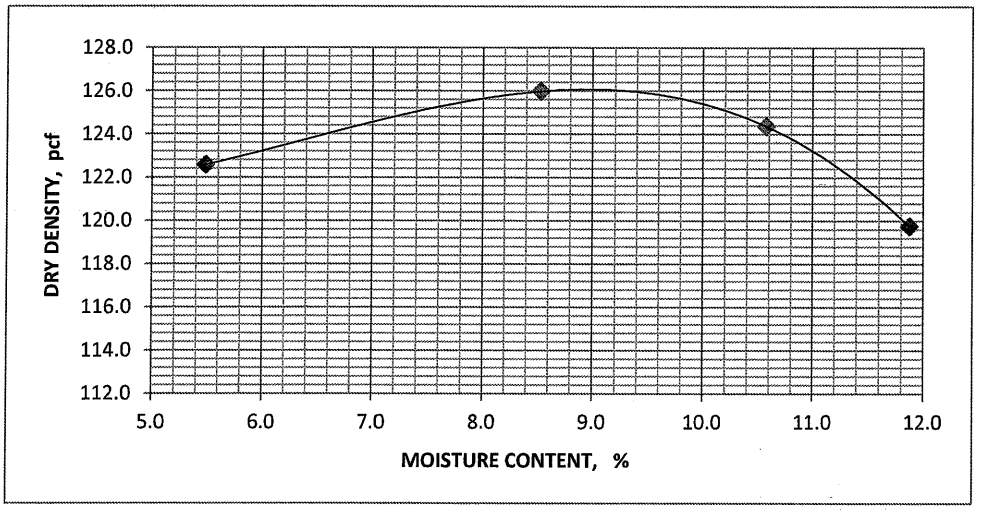
Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

REPORT OF LABORATORY COMPACTION TEST

LAB: Jonesboro 904300
METHOD USED: **AASHTO T180D** MANUAL RAMMER
PREPARATION METHOD: **DRY**
PROJECT: **Craighead County Roads**
AHTD #:
CONTRACTOR:
DATE SAMPLED:
LOCATION: CR945
DESCRIPTION:
MAT'L SOURCE: Sample 1

MAXIMUM DRY DENSITY: **126.1 PCF**
OPTIMUM MOISTURE CONTENT: **9.0%**



SIEVE ANALYSIS (% passing)
ASTM C-136

2"	#DIV/0!
3/4"	#DIV/0!
3/8"	#DIV/0!
#4	#DIV/0!
#10	#DIV/0!
#40	#DIV/0!
#200	#DIV/0!

ASTM C-136

DENSITY	MOISTURE
126.0	8.5
124.4	10.6
119.8	11.9
122.6	5.5

PLASTICITY INDEX
ASTM D-4318

LIQUID LIMIT	27
PLASTIC LIMIT	17
PLASTICITY	10

OVERSIZE CORRECTION DATA:
N/A

TESTED BY: Gray Spahn
CTTP #: 3218
Date:

MTA ENGINEERS

Appendix C: Compressive Strength Data

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Hoover, AL

CR 928 Cement Stablilization Data

Cement Percentage	Compressive Strength
5%	149
5%	160
7%	196
7%	235
10%	265
10%	277

CR 945 Cement Stablilization Data

Cement Percentage	Compressive Strength
3%	75
3%	95
5%	173
5%	154
5%	177
7%	293
7%	326
10%	359