

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 090702

FEDERAL AID PROJECT NO. FEDERAL AID PROJECT STPF-0004(106)

HWY. 72/PLENTYWOOD RD. INTERS. IMPVTS. (S)

STATE HIGHWAY 72 SECTION 3

IN BENTON COUNTY

The information contained herein was obtained by the Department for design and estimating purposes only. It is being furnished with the express understanding that said information does not constitute a part of the Proposal or Contract and represents only the best knowledge of the Department as to the location, character and depth of the materials encountered. The information is only included and made available so that bidders may have access to subsurface information obtained by the Department and is not intended to be a substitute for personal investigation, interpretation and judgment of the bidder. The bidder should be cognizant of the possibility that conditions affecting the cost and/or quantities of work to be performed may differ from those indicated herein.



MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261, Little Rock, AR 72203-2261

Phone: (501) 569-2185 | Fax: (501) 569-2368

January 27, 2025

TO: Mr. Charles Martin, Engineer of Roadway Design

SUBJECT: Job No. 090702
Hwy. 72/Plentywood Rd. Inters. Impvts. (S)
Route 72 Section 3
Benton County

Attached is the soil survey, pavement soundings, and strength data for the above referenced project. The project consists of adding a left turn lane at the intersection of Plentywood Road and Highway 72. Samples were obtained in the existing travel lanes, shoulders, and ditch line.

The subgrade soils consist primarily of low plasticity cherty clay. The subgrade soils will require stabilization to provide a stable working platform. Due to the size of the project, undercut is the most appropriate technique. Based on DCP testing, approximately 2 feet of undercut is required to remove all soft unstable organic material. Rock was encountered at station 102+00 6, 21 and 32 feet right of centerline at a depth of 4.5, 4.5 and 2.5 feet respectively.

Based on currently available cross sections the construction grade line closely matches that of the existing road. The widening will take place in the existing ditches. The maximum embankment height is approximately three feet. The embankment may be constructed with locally available unspecified material.

The proposed cut and fill slopes are acceptable as shown in the cross sections.

The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located in the vicinity of Avoca.

Paul Tinsley
Materials Engineer

RPT:yz:bjj

Attachment

cc: District 9 Engineer
Maintenance
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
PAUL TINSLEY, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE	- 11/19/2024	SEQUENCE NO.	- 1
JOB NUMBER	- 090702	MATERIAL CODE	- SSRVPS
		SPEC. YEAR	- 2014
		SUPPLIER ID.	- 1
		COUNTY/STATE	- 04
		DISTRICT NO.	- 09

JOB NAME - HWY 72/PLENTYWOOD RD. INTERS IMPVTS (S)

* STATION LIMITS R-VALUE AT 240 psi *

RESILIENT MODULUS	
STA 109	2098

REMARKS -

-
AASHTO TESTS : T190

[illegible]

DCP TEST RESULTS

Project:	090702
Location:	Sta. 109+00 35 LT
DCP NO.:	1

Date: 1/22/2025
Soil Type(s): Cherty Clay

Hammer

☐ 10.1 lbs.

☒ 17.6 lbs.

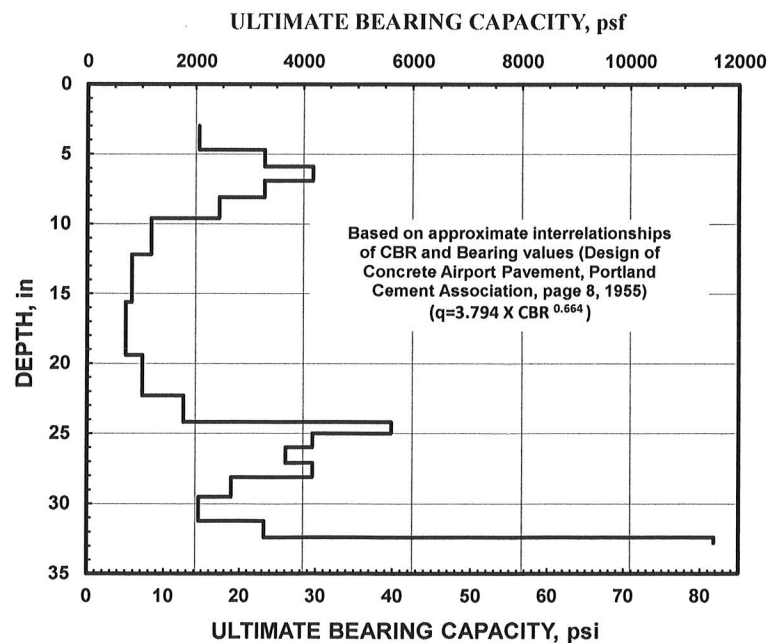
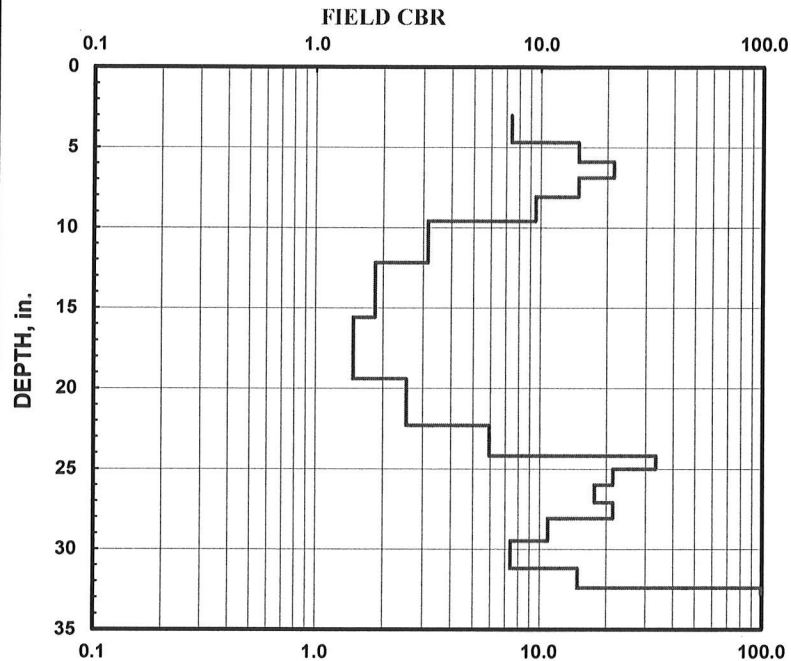
☐ Both hammers used

Soil Type

☐ CH

☐ CL

☒ All other soils

[illegible]

[illegible]

DCP TEST RESULTS

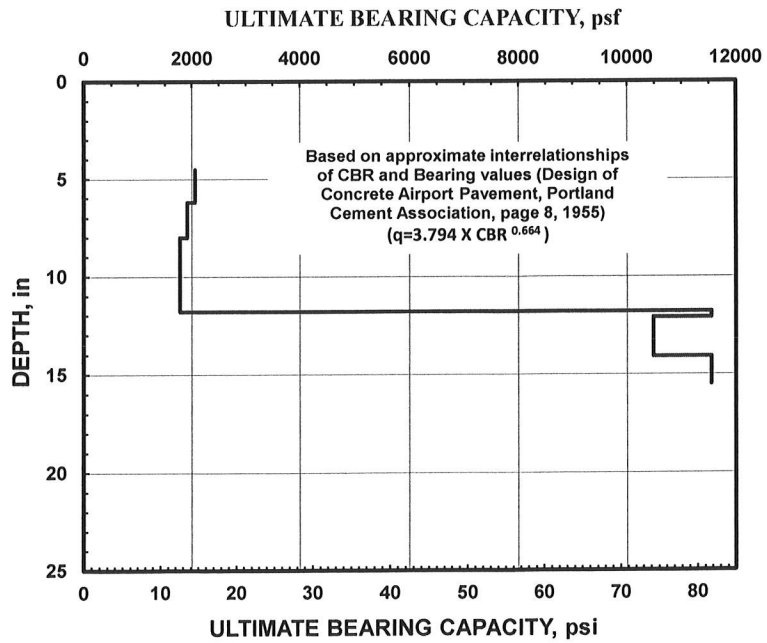
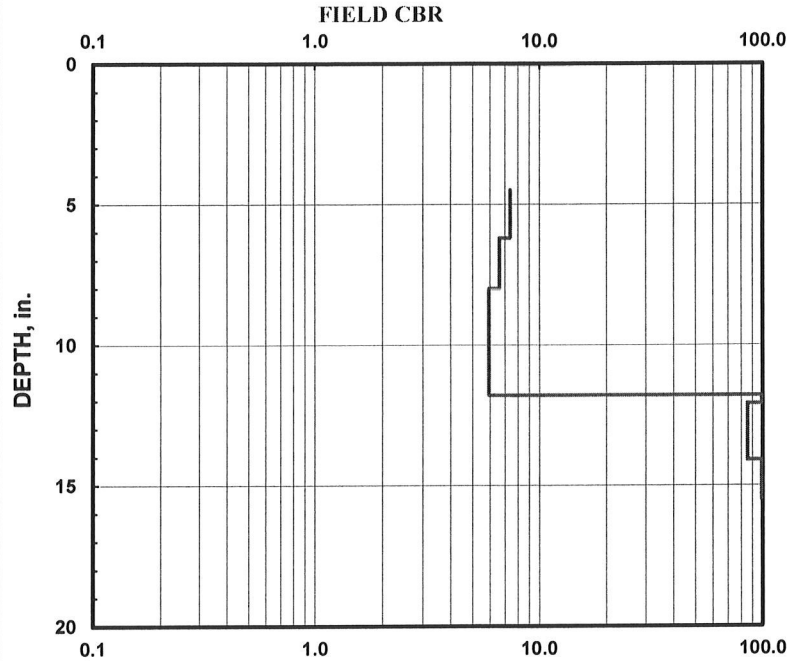
Project: 090702
Location: Sta. 102+00 35 RT
DCP NO.: 2

Date: 1/22/2025
Soil Type(s): Cherty Clay

Hammer
☐ 10.1 lbs.
☒ 17.6 lbs.
☐ Both hammers used

Soil Type
☐ CH
☐ CL
☒ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0		1
2	114	1
2	157	1
2	203	1
2	251	1
2	300	1
2	307	1
2	320	1
2	333	1
2	345	1
2	358	1
2	368	1
2	376	1
2	381	1
2	389	1
2	394	1



**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES**

Job No.	090702	Material Code	RV
Date Sampled:	5/23/2024	Station No.:	109+00
Date Tested:	October 11, 2024	Location:	32LT
Name of Project:	HWY 72/PLENTYWOOD RD INTEERS INPVTs		
County:	Code: 1	Name:	ARKANSAS
Sampled By:	JLB	Depth:	0-5.0
Lab No.:	20240976	AASHTO Class:	A-6(9)
Sample ID:	RV105	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

1. Testing Information:

Preconditioning - Permanent Strain > 5% (Y=Yes or N= No)	N
Testing - Permanent Strain > 5% (Y=Yes or N=No)	N
Number of Load Sequences Completed (0-15)	15

2. Specimen Information:

Specimen Diameter (in):	
Top	3.97
Middle	4.00
Bottom	3.98
Average	3.98
Membrane Thickness (in):	0.00
Height of Specimen, Cap and Base (in):	7.98
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	7.98
Initial Area, Ao (sq. in):	12.47
Initial Volume, AoLo (cu. in):	99.48

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3248.40
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4. Soil Properties:

Optimum Moisture Content (%):	16.3
Maximum Dry Density (pcf):	107.7
95% of MDD (pcf):	102.3
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3248.40
Compaction Moisture content (%):	19.5
Compaction Wet Density (pcf):	124.42
Compaction Dry Density (pcf):	104.13
Moisture Content After Mr Test (%):	19.4

6. Quick Shear Test (Y=Yes, N=No, N/A=Not Applicable): #VALUE!

7. Resilient Modulus, Mr: $2445(S_c)^{-0.13134}(S_3)^{0.22284}$

8. Comments

9. Tested By:

JLB

Date: October 11, 2024

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES

Job No.
Date Sampled:
Date Tested:
Name of Project:
County:
Sampled By:
Lab No.:
Sample ID:
LATITUDE:

090702
5/23/2024
October 11, 2024
HWY 72/PLENTYWOOD RD INTEERS INPVTs
Code: 1
JLB
20240976
RV105
Name: ARKANSAS

Material Code
Station No.:
Location:
Depth:
AASHTO Class:
Material Type (1 or 2):
LONGITUDE:

RV
109+00
32LT
0-5.0
A-6(9)
2

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied Max. Axial Load	Actual Applied Cyclic Load	Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic Stress	Actual Applied Contact Stress	Average Recov Def. LVDT 1 and 2	Resilient Strain	Resilient Modulus
DESIGNATION	S ₃	S _{cyclic}	P _{max}	P _{cyclic}	P _{contact}	S _{max}	S _{cyclic}	S _{contact}	H _{avg}	ε _r	M _r
UNIT	psi	psi	lbs	lbs	lbs	psi	psi	psi	in	in/in	psi
Sequence 1	6.0	2.0	25.7	23.0	2.6	2.1	1.8	0.2	0.00363	0.00045	4,061
Sequence 2	6.0	4.0	48.3	45.7	2.6	3.9	3.7	0.2	0.00859	0.00108	3,407
Sequence 3	6.0	6.0	69.9	66.3	3.6	5.6	5.3	0.3	0.01560	0.00195	2,719
Sequence 4	6.0	8.0	94.2	88.1	6.1	7.6	7.1	0.5	0.02135	0.00268	2,642
Sequence 5	6.0	10.0	119.4	110.9	8.6	9.6	8.9	0.7	0.02536	0.00318	2,798
Sequence 6	4.0	2.0	25.0	22.3	2.7	2.0	1.8	0.2	0.00464	0.00058	3,076
Sequence 7	4.0	4.0	45.6	42.9	2.7	3.7	3.4	0.2	0.01155	0.00145	2,380
Sequence 8	4.0	6.0	68.1	65.5	2.7	5.5	5.3	0.2	0.01854	0.00232	2,261
Sequence 9	4.0	8.0	95.2	90.0	5.2	7.6	7.2	0.4	0.02308	0.00289	2,497
Sequence 10	4.0	10.0	120.1	112.5	7.6	9.6	9.0	0.6	0.02630	0.00330	2,738
Sequence 11	2.0	2.0	24.7	22.1	2.6	2.0	1.8	0.2	0.00509	0.00064	2,777
Sequence 12	2.0	4.0	44.8	42.2	2.6	3.6	3.4	0.2	0.01248	0.00156	2,166
Sequence 13	2.0	6.0	67.3	64.7	2.6	5.4	5.2	0.2	0.01974	0.00247	2,098
Sequence 14	2.0	8.0	94.1	89.8	4.3	7.5	7.2	0.3	0.02452	0.00307	2,344
Sequence 15	2.0	10.0	118.2	111.6	6.6	9.5	9.0	0.5	0.02738	0.00343	2,609

TESTED BY
REVIEWED BY

JLB

DATE
DATE

October 11, 2024

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION

AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED / THINWALL TUBE SAMPLES

Job No.	090702	Material Code	RV
Date Sampled:	5/23/2024	Station No.:	109+00
Date Tested:	October 11, 2024	Location:	32LT
Name of Project:	HWY 72/PLENTYWOOD RD INTEERS INPVTs		
County:	Code: 1	Name:	ARKANSAS
Sampled By:	JLB	Depth:	0-5.0
Lab No.:	20240976	AASHTO Class:	A-6(9)
Sample ID:	RV105	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

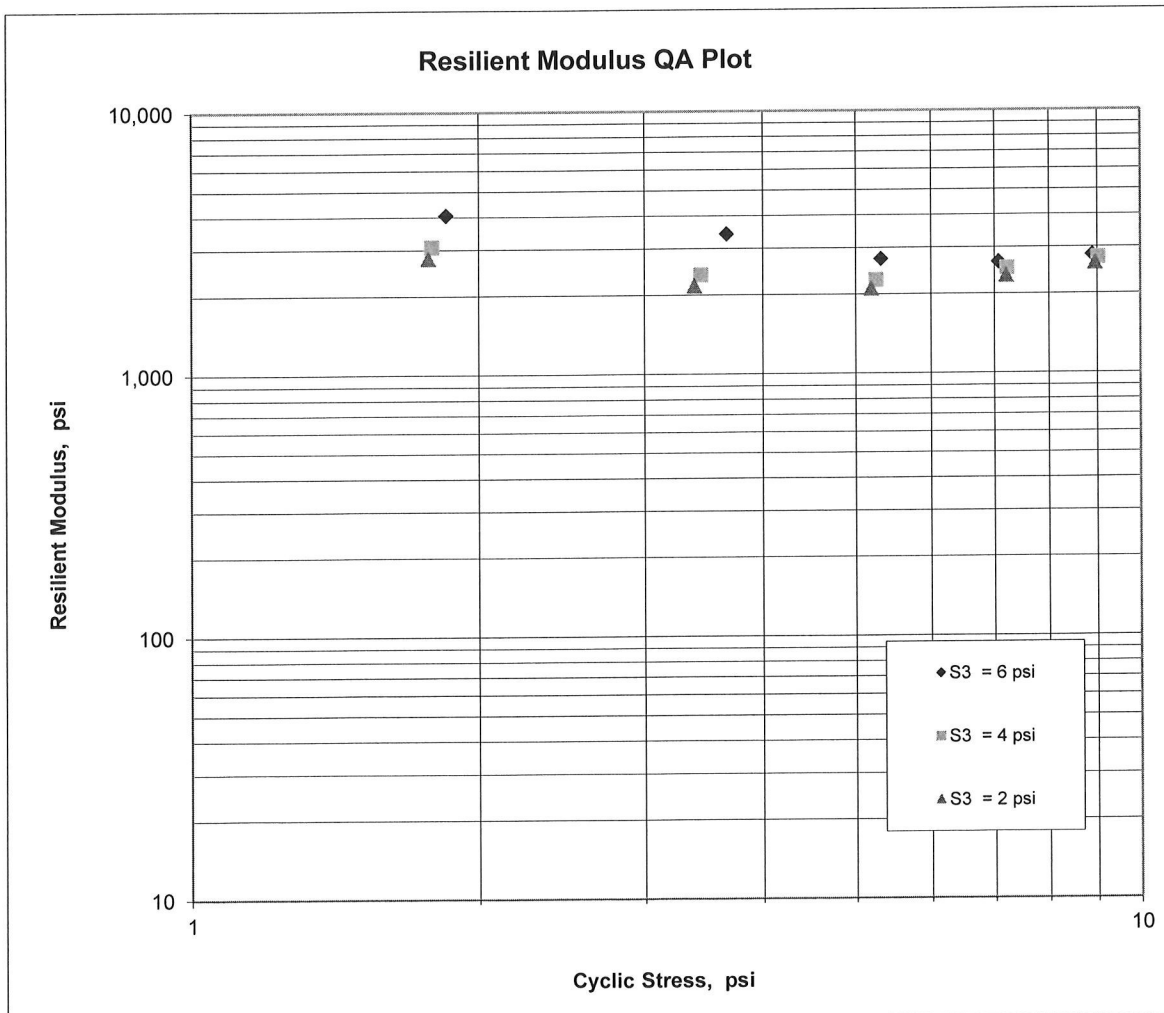
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_5}$$

$$K_1 = \underline{2,445}$$

$$K_2 = \underline{-0.13134}$$

$$K_5 = \underline{0.22284}$$

$$R^2 = \underline{0.55}$$



ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 06/17/24	SEQUENCE NO.	- 1
JOB NUMBER	- 090702	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 04
SUPPLIER NAME	- STATE	DISTRICT NO.	- 09
NAME OF PROJECT	- HWY 72/PLENTYWOOD RD. INTERS IMPVTS (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 05/23/24
LOCATION	- BENTON COUNTY	DATE RECEIVED	- 05/23/24
SAMPLED BY	- d.thornton	DATE TESTED	- 06/17/24
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20240970	- 20240971	- 20240972
SAMPLE ID	- S99	- S100	- S101
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 102+00	- 102+00	- 102+00
LOCATION	- 06 RT	- 21 RT	- 32 RT
DEPTH IN FEET	- 0-4.5z	- 0-4.5z	- 0-2.5z
MAT'L COLOR	- RD/BR	- RD/BR	- RD/BR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 36 25 10.70	- 36 25 10.70	- 36 25 10.70
LONGITUDE DEG-MIN-SEC	- 94 09 33.40	- 94 09 33.30	- 94 09 33.30
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. - 100	- 100	- 100
	NO. 4 - 94	- 99	- 98
	NO. 10 - 92	- 98	- 95
	NO. 40 - 89	- 96	- 91
	NO. 80 - 85	- 88	- 89
	NO. 200 - 82	- 82	- 86
LIQUID LIMIT	- 24	- 25	- 28
PLASTICITY INDEX	- 7	- 6	- 7
AASHTO SOIL	- A-4 (4)	- A-4 (3)	- A-4 (5)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 19.1	- 21.7	- 23.3
ACHM SC (IN)	- 7.0W	- --	- --
AGGR BASE CRS CL7 (IN)	- 8.0	- --	- --
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS X=STRIPPED Z=AUGER REFUSAL

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- CC:GEOTECH, SOILS

AASHTO TESTS : T24 T88 T89 T90 T265

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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

PAUL TINSLEY, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 09/25/24	SEQUENCE NO.	- 2
JOB NUMBER	- 090702	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 04
SUPPLIER NAME	- STATE	DISTRICT NO.	- 09
NAME OF PROJECT	- HWY 72/PLENTYWOOD RD. INTERS IMPVTS (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 05/23/24
LOCATION	- BENTON COUNTY	DATE RECEIVED	- 05/23/24
SAMPLED BY	- d.thornton	DATE TESTED	- 06/17/24
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20240973	- 20240974	- 20240975
SAMPLE ID	- S102	- S103	- S104
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 109+00	- 109+00	- 109+00
LOCATION	- 06 LT	- 18 lt	- 32 LT
DEPTH IN FEET	- 0-5.0	- 0-5.0	- 0-5.0
MAT'L COLOR	- RD/BR	- RD/BR	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 36 25 17.60	- 36 25 17.60	- 36 25 17.60
LONGITUDE DEG-MIN-SEC	- 94 09 33.40	- 94 09 33.50	- 94 09 33.60
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. - 100	- 100	- 100
	NO. 4 - 98	- 99	- 96
	NO. 10 - 94	- 97	- 93
	NO. 40 - 89	- 92	- 90
	NO. 80 - 84	- 85	- 88
	NO. 200 - 78	- 82	- 84
LIQUID LIMIT	- 22	- 30	- 35
PLASTICITY INDEX	- 4	- 12	- 18
AASHTO SOIL	- A-4 (1)	- A-6 (8)	- A-6 (14)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 19.3	- 21.8	- 22.0
ACHM SC (IN)	- 7.75W	- --	- --
AGGR BASE CRS CL7 (IN)	- 8.0	- --	- --
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS X-STRIPPED Z= AUGER REFUSAL

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- CC:GEOTECH,SOILS

AASHTO TESTS : T24 T88 T89 T90 T265
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*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

AASHTO TESTS : T24 T88 T89 T90 T265
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