

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 012290

FEDERAL AID PROJECT NO. HSIP-2373(3)

HWY. 64 - HWY. 5 (SAFETY IMPVTS.) (SEL. SECS.) (S)

STATE HIGHWAY 36 SECTION 1 & 2

IN FAULKNER & WHITE 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.



ARKANSAS DEPARTMENT OF TRANSPORTATION

ArDOT.gov | IDriveArkansas.com | Scott E. Bennett, P.E., Director

MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

April 24, 2019

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 012290
Hwy. 64 – Hwy. 5 (Safety Impvts.) (S)
Routes 36 Sections 1 & 2
Faulkner and White Counties

Attached is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project is to realign approximately .2 miles of Highway 36. Samples were obtained in the existing travel lanes, and ditch line. The shoulders were not paved within the project limits.

Laboratory results indicate the subgrade soils consist primarily of sandy clay. The soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction.

Based on currently available cross sections the maximum embankment height is approximately five feet. The embankment is proposed to be constructed crossing a ditch into an open field. Prior to construction all soft unstable organic material should be undercut, anticipated to be no more than two feet. The embankment may be constructed with locally available material utilizing a 3:1 slope configuration.

The cut slopes are acceptable as shown

Listed below is the additional information requested for use in developing the plans:

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

- 2. Asphalt Concrete Hot Mix

Table with 3 columns: Type, Asphalt Cement %, Mineral Aggregate %. Rows include Surface Course, Binder Course, and Base Course.

Handwritten signature of Michael C. Benson, Materials Engineer

MCB:pt:bjj

Attachment

cc: State Constr. Eng. – Master File Copy
District 5 Engineer
District 8 Engineer
System Information and Research Div.
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS

MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 04/11/2019
JOB NUMBER - 012290

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 23
DISTRICT NO. - 08

JOB NAME - HWY. 64 - HWY. 5 (SAFETY IMPVTS.) (SEL. SECS.) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 9

RESILIENT MODULUS
STA. 315+00 8784

REMARKS -

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AASHTO TESTS : T190

JOB: 012290

Arkansas State Highway Transportation Department

JOB NAME: HWY. 64 - HWY. 5 (SAFETY IMPVTS.)(SEL. SECS.)(S)

Materials Division

COUNTY NO. 23 DATE TESTED 4/11/2019

Michael Benson, Materials Engineer

STA.#	LOC.	DEPTH	COLOR	#4 #10 #40 #80 #200					L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E					
315+00	14LT	0-5	BROWN	100	96	90	86	82	38	15	A-6(12)	RV16	
306+00	06 RT	0-5	BROWN	100				93	34	14	A-6(13)	S11	23.2
306+00	14 RT	0-5	BROWN	91	85	80	76	69	30	11	A-6(6)	S12	22.6
311+04	14 LT	0-5	BROWN	89	78	65	61	54	33	12	A-6(4)	S13	22.6
315+00	06 LT	0-5	BROWN	88	84	81	80	74	33	15	A-6(9)	S14	22.7
315+00	14 LT	0-5	BROWN	56	53	53	51	48	28	11	A-6(2)	S15	22.2

comments:

Wednesday, April 24, 2019

JOB: 012290
DATE TESTED
4/11/2019

Arkansas State Highway Transportation Department
Materials Division

JOB NAME: HWY. 64 - HWY. 5 (SAFETY IMPVTS.)(SEL. SECS.)(S)
COUNTY NO. 23
Michael Benson, Materials Engineer

PAVEMENT SOUNDINGS

STA.#	LOC.			
306+00	06 RT	ACHM SC	AGG BASE CL-5	
		7.50	8.0	
306+00	14 RT	ACHM SC	AGG BASE CL-5	
		---	---	
311+04	14 LT	ACHM SC	AGG BASE CL-5	
		---	---	
315+00	06 LT	ACHM SC	AGG BASE CRS CL-5	
		6.50	8.0	
315+00	14 LT	ACHM SC	AGG BASE CRS CL-5	
		---	---	

Comments:

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

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

Job No.	012290	Material Code	SSRVPS
Date Sampled:	3-7-19	Station No.:	315+00
Date Tested:	March 20, 2019	Location:	14' LT
Name of Project:	HWY. 64-HWY. 5 (SAFETY IMPVTS.)(SEL. SECS.)(S)		
County:	Code: 23	Name:	FAULKNER
Sampled By:	DICKERSON/BATES	Depth:	0-5
Lab No.:	20190813	AASHTO Class:	A-6 (12)
Sample ID:	RV16	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	3.94
Middle	3.95
Bottom	3.94
Average	3.94
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.02
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.02
Initial Area, Ao (sq. in):	12.14
Initial Volume, AoLo (cu. in):	97.35

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3071.90
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4. Soil Properties:

Optimum Moisture Content (%):	19.3
Maximum Dry Density (pcf):	105.7
95% of MDD (pcf):	100.4
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3071.90
Compaction Moisture content (%):	19.5
Compaction Wet Density (pcf):	120.23
Compaction Dry Density (pcf):	100.61
Moisture Content After Mr Test (%):	19.3

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

#VALUE!

7. Resilient Modulus, Mr:

15296(Sc)^{-0.29421}(S3)^{0.14733}

8. Comments

9. Tested By:

GW

Date: March 20, 2019

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

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

Job No. 012290 **Material Code** SSRVPS
Date Sampled: 3-7-19 **Station No.:** 315+00
Date Tested: March 20, 2019 **Location:** 14' LT
Name of Project: HWY. 64-HWY. 5 (SAFETY IMPVTS.)(SEL. SECS.)(S)
County: Code: 23 **Name:** FAULKNER
Sampled By: DICKERSON/BATES **Depth:** 0-5
Lab No.: 20190813 **AASHTO Class:** A-6 (12)
Sample ID: RV16 **Material Type (1 or 2):** 2
LATITUDE: **LONGITUDE:**

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
	S ₃ psi	S _{cyclic} psi	P _{max} lbs	P _{cyclic} lbs	P _{contact} lbs	S _{max} psi	S _{cyclic} psi	S _{contact} psi	H _{avg} in	ε _r in/in	M _r psi
Sequence 1	6.0	2.0	25.3	22.5	2.8	2.1	1.9	0.2	0.0092	0.00011	16,171
Sequence 2	6.0	4.0	47.4	44.7	2.8	3.9	3.7	0.2	0.00202	0.00025	14,641
Sequence 3	6.0	6.0	69.8	66.3	3.5	5.7	5.5	0.3	0.00338	0.00042	12,960
Sequence 4	6.0	8.0	92.0	86.1	5.9	7.6	7.1	0.5	0.00517	0.00065	10,991
Sequence 5	6.0	10.0	113.7	105.4	8.3	9.4	8.7	0.7	0.00712	0.00089	9,781
Sequence 6	4.0	2.0	25.2	22.4	2.7	2.1	1.8	0.2	0.00099	0.00012	14,931
Sequence 7	4.0	4.0	47.1	44.4	2.8	3.9	3.7	0.2	0.00219	0.00027	13,388
Sequence 8	4.0	6.0	68.2	65.5	2.8	5.6	5.4	0.2	0.00364	0.00045	11,889
Sequence 9	4.0	8.0	90.2	85.2	5.1	7.4	7.0	0.4	0.00540	0.00067	10,415
Sequence 10	4.0	10.0	111.8	104.3	7.5	9.2	8.6	0.6	0.00736	0.00092	9,367
Sequence 11	2.0	2.0	25.2	22.5	2.7	2.1	1.9	0.2	0.00112	0.00014	13,261
Sequence 12	2.0	4.0	46.9	44.2	2.7	3.9	3.6	0.2	0.00241	0.00030	12,118
Sequence 13	2.0	6.0	67.6	64.8	2.8	5.6	5.3	0.2	0.00395	0.00049	10,830
Sequence 14	2.0	8.0	88.8	84.6	4.2	7.3	7.0	0.3	0.00577	0.00072	9,698
Sequence 15	2.0	10.0	110.0	103.4	6.6	9.1	8.5	0.5	0.00778	0.00097	8,784

TESTED BY _____ DATE _____
 REVIEWED BY _____ DATE _____
 GW _____ March 20, 2019

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

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

Job No.	012290	Material Code	SSRVPS
Date Sampled:	3-7-19	Station No.:	315+00
Date Tested:	March 20, 2019	Location:	14' LT
Name of Project:	HWY. 64-HWY. 5 (SAFETY IMPVTS.)(SEL. SECS.)(S)		
County:	Code: 23	Name:	FAULKNER
Sampled By:	DICKERSON/BATES	Depth:	0-5
Lab No.:	20190813	AASHTO Class:	A-6 (12)
Sample ID:	RV16	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

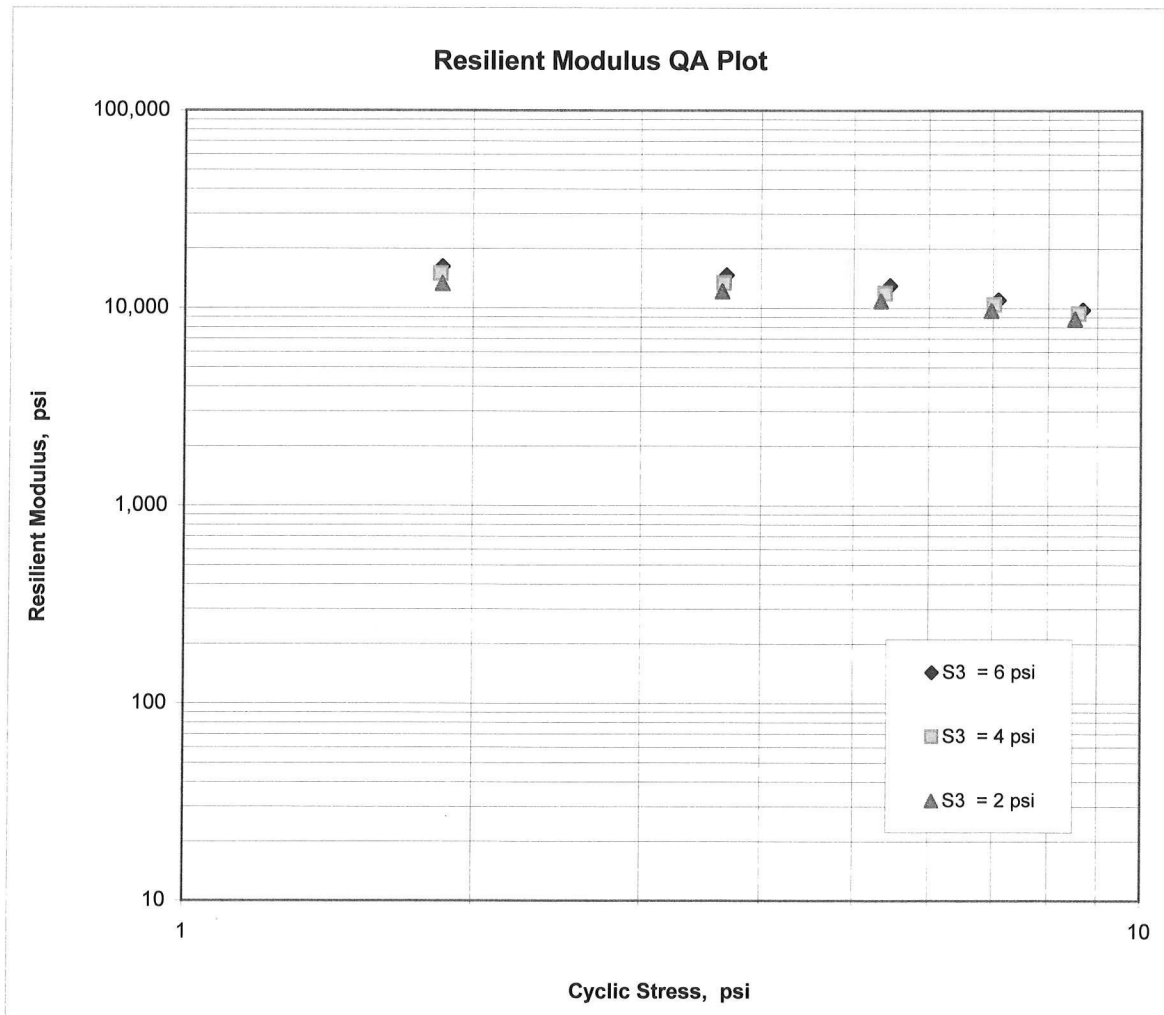
$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$$K_1 = 15,296$$

$$K_2 = -0.29421$$

$$K_5 = 0.14733$$

$$R^2 = 0.93$$



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

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 04/15/19 SEQUENCE NO. - 1
JOB NUMBER - 012290 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 - 23
SUPPLIER NAME - STATE DISTRICT NO. - 08
NAME OF PROJECT - HWY. 64 - HWY. 5 (SAFETY IMPVTS.) (SEL. SECS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - FAULKNER, COUNTY DATE SAMPLED - 03/07/19
SAMPLED BY - D.DICKERSON/BATES DATE RECEIVED - 03/12/19
SAMPLE FROM - TEST HOLE DATE TESTED - 04/11/19
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	-	20190557	-	20190558	-	20190559
SAMPLE ID	-	S11	-	S12	-	S13
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-	INFORMATION ONLY
STATION	-	306+00	-	306+00	-	311+04
LOCATION	-	06 RT	-	14 RT	-	14 LT
DEPTH IN FEET	-	0-5	-	0-5	-	0-5
MAT'L COLOR	-	BROWN	-	BROWN	-	BROWN
MAT'L TYPE	-		-		-	
LATITUDE DEG-MIN-SEC	-	35 8 2.30	-	35 08 2.30	-	35 8 6.00
LONGITUDE DEG-MIN-SEC	-	92 15 34.20	-	92 15 34.10	-	92 15 29.80
% PASSING	2 IN.	-	-	-	-	-
	1 1/2 IN.	-	-	-	-	-
	3/4 IN.	-	-	100	-	-
	3/8 IN.	-	-	96	-	100
	NO. 4	- 100	-	91	-	89
	NO. 10	-	-	85	-	78
	NO. 40	-	-	80	-	65
	NO. 80	-	-	76	-	61
	NO. 200	- 93	-	69	-	54
LIQUID LIMIT	-	34	-	30	-	33
PLASTICITY INDEX	-	14	-	11	-	12
AASHTO SOIL	-	A-6(13)	-	A-6(6)	-	A-6(4)
UNIFIED SOIL	-		-		-	
% MOISTURE CONTENT	-	23.2	-	22.6	-	22.6
ACHM SC	(IN)	- 7.50	-	---	-	---
AGG BASE CL-5	(IN)	- 8.0	-	---	-	---
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REMARKS -
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AASHTO TESTS : T24 T88 T89 T90 T265
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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE - 04/15/19 SEQUENCE NO. - 2
JOB NUMBER - 012290 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 - 23
SUPPLIER NAME - STATE DISTRICT NO. - 08
NAME OF PROJECT - HWY. 64 - HWY. 5 (SAFETY IMPVTS.) (SEL. SECS.) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - FAULKNER, COUNTY DATE SAMPLED - 03/07/19
SAMPLED BY - D.DICKERSON/BATES DATE RECEIVED - 03/12/19
SAMPLE FROM - TEST HOLE DATE TESTED - 04/11/19
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	-	20190560	-	20190561	-
SAMPLE ID	-	S14	-	S15	-
TEST STATUS	-	INFORMATION ONLY	-	INFORMATION ONLY	-
STATION	-	315+00	-	315+00	-
LOCATION	-	06 LT	-	14 LT	-
DEPTH IN FEET	-	0-5	-	0-5	-
MAT'L COLOR	-	BROWN	-	BROWN	-
MAT'L TYPE	-		-		-
LATITUDE DEG-MIN-SEC	-	35 8 7.20	-	35 08 7.30	-
LONGITUDE DEG-MIN-SEC	-	92 15 25.40	-	92 15 25.40	-
% PASSING	2	IN.	-		-
	1 1/2	IN.	-	100	-
	3/4	IN.	-	85	-
	3/8	IN.	-	68	-
	NO. 4		-	56	-
	NO. 10		-	53	-
	NO. 40		-	53	-
	NO. 80		-	51	-
	NO. 200		-	48	-
LIQUID LIMIT	-	33	-	28	-
PLASTICITY INDEX	-	15	-	11	-
AASHTO SOIL	-	A-6(9)	-	A-6(2)	-
UNIFIED SOIL	-		-		-
% MOISTURE CONTENT	-	22.7	-	22.2	-
ACHM SC	(IN)	6.50	-	---	-
AGG BASE CRS CL-5	(IN)	8.0	-	---	-
			-		-
			-		-
			-		-
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REMARKS -
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ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
 MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

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

DATE	- 04/11/19	SEQUENCE NO.	- 1
JOB NUMBER	- 012290	MATERIAL CODE	- RV
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 23
SUPPLIER NAME	- STATE	DISTRICT NO.	- 08
NAME OF PROJECT	- HWY. 64 - HWY. 5 (SAFETY IMPVTS.) (SEL. SECS.) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS	DATE SAMPLED	- 03/07/19
LOCATION	- FAULKNER, COUNTY	DATE RECEIVED	- 03/20/19
SAMPLED BY	- DICKERSON;BATES	DATE TESTED	- 04/11/19
SAMPLE FROM	- TEST HOLE		
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS		

LAB NUMBER	-	20190813	-	-
SAMPLE ID	-	RV16	-	-
TEST STATUS	-	INFORMATION ONLY	-	-
STATION	-	315+00	-	-
LOCATION	-	14LT	-	-
DEPTH IN FEET	-	0-5	-	-
MAT'L COLOR	-	BROWN	-	-
MAT'L TYPE	-		-	-
LATITUDE DEG-MIN-SEC	-	35 8 7.30	-	-
LONGITUDE DEG-MIN-SEC	-	92 15 25.40	-	-
% PASSING	2	IN.	-	-
	1 1/2	IN.	-	-
	3/4	IN.	-	-
	3/8	IN.	-	-
	NO. 4	-	100	-
	NO. 10	-	96	-
	NO. 40	-	90	-
	NO. 80	-	86	-
	NO. 200	-	82	-
LIQUID LIMIT	-	38	-	-
PLASTICITY INDEX	-	15	-	-
AASHTO SOIL	-	A-6 (12)	-	-
UNIFIED SOIL	-		-	-
% MOISTURE CONTENT	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
	-		-	-
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REMARKS -
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AASHTO TESTS : T24 T88 T89 T90 T265
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