

ARKANSAS DEPARTMENT OF TRANSPORTATION



SUBSURFACE INVESTIGATION

STATE JOB NO. 090581

FEDERAL AID PROJECT NO. CPFCDS-NHPP-0005(50)

BELLEFONTE – MARION CO. LINE (PASSING LANES) (S)

STATE HIGHWAY 62 SECTION 7

IN BOONE 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

March 31, 2025

TO: Mr. Charles Martin, Engineer of Roadway Design

SUBJECT: Job No. 090581
Bellefonte – Marion Co. Line (Passing Lanes) (S)
Route 62 Section 7
Boone County

Attached are the soil survey and pavement soundings (attachment A), Resilient Modulus (Attachment B), and DCP (Attachment C) test data for the above referenced project. Photos of the jobsite are in attachment D. The job is to construct 1.7 miles of passing lanes (widening and new location) for Highway 62. Samples were obtained in the existing travel lanes and ditch line. Slide areas were not observed within the project limits. A Resilient Modulus of 2200 psi is recommended for pavement design.

The subgrade soils consist primarily of moderately to highly plastic cherty clay. The granular nature of the subgrade soils should provide a stable working platform with conventional processing if the weather is favorable during construction. If a stable work platform can not be achieved, it is recommended that the subgrade be treated to a depth of 18 inches using 4% lime (by dry wt.).

Limestone bedding and cobbles were observed in the ditch line and existing cut slopes within the project limits. Rock was encountered during the field investigation; Table 1 below lists the location and depth.

Table 1 Location and Depth of Rock

Station	Location from C.L. (ft.)	Depth (ft.)
135+00	21 Lt.	3.5
151+00	6 Lt.	3.5
167+00	6, 25 Lt.	2.4, 2
197+00	27 Rt.	4

Based on currently available cross sections significant cut and fill will be included in this project. Two large fills are planned. The first between stations 128+00 to 137+00 has an approximate fill height of 25 feet. The second between stations 142+00 to 159+00 results in a fill height of approximately 33 feet. Temporary retaining walls will be utilized for the purpose of maintaining traffic flow. Due to the presence of chert fragments, the onsite soils will generally be suitable for fill material. The embankments may be constructed with locally available materials placed in accordance with Section 210 of the Standard Specifications, Edition 2014. The proposed slope configurations are acceptable as shown.

The maximum cut depth is approximately 20 feet. The proposed 3:1 cut slopes are acceptable as shown. Rock may be encountered during excavation.



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The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located near Harrison.



Paul Tinsley
Materials Engineer

RPT:yz:bjj
Attachment
cc: District 9 Engineer
Maintenance
G. C. File

Attachment A

Soil Survey

Pavement Soundings

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

PAUL TINSLEY, MATERIALS ENGINEER

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

DATE - 01/16/25 SEQUENCE NO. - 3
JOB NUMBER - 090581 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 - 05
SUPPLIER NAME - STATE DISTRICT NO. - 09
NAME OF PROJECT - BELLEFONTE-MARION CO LINE(PASSING LANES) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - BOONE COUNTY DATE SAMPLED - 11/06/24
SAMPLED BY - d.thornton DATE RECEIVED - 11/18/24
SAMPLE FROM - TEST HOLE DATE TESTED - 01/16/25
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20242302	20242303	20242304
SAMPLE ID	S319	S320	S321
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	135+00	135+00	143+00
LOCATION	06 LT	21 LT	06 RT
DEPTH IN FEET	0-5.0	0-3.5z	0-5.0
MAT'L COLOR	BROWN	BROWN	BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	36 12 11.30	36 12 11.10	36 12 11.10
LONGITUDE DEG-MIN-SEC	92 57 1.30	92 57 1.30	92 56 51.60
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	100	100	100
3/8 IN.	95	95	94
NO. 4	85	82	85
NO. 10	83	75	77
NO. 40	75	66	60
NO. 80	73	61	60
NO. 200	71	57	57
LIQUID LIMIT	57	58	52
PLASTICITY INDEX	35	38	38
AASHTO SOIL	A-7-6(24)	A-7-6(18)	A-7-6(17)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	35.0	37.6	25.3
ACHM SC (IN)	7.25W	--	4.75X
ACHM SC (IN)	--	--	5.25
AGGR BASE CRS CL7 (IN)	7.0	--	7.0
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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

AASHTO TESTS : T24 T88 T89 T90 T265
:

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

PAUL TINSLEY, MATERIALS ENGINEER

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

DATE - 01/16/25 SEQUENCE NO. - 4
JOB NUMBER - 090581 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 - 05
SUPPLIER NAME - STATE DISTRICT NO. - 09
NAME OF PROJECT - BELLEFONTE-MARION CO LINE(PASSING LANES) (S)
PROJECT ENGINEER - NOT APPLICABLE
PIT/QUARRY - ARKANSAS
LOCATION - BOONE COUNTY DATE SAMPLED - 11/06/24
SAMPLED BY - d.thornton DATE RECEIVED - 11/18/24
SAMPLE FROM - TEST HOLE DATE TESTED - 01/16/25
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20242305	20242306	20242307
SAMPLE ID	S322	S323	S324
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	143+00	151+00	151+00
LOCATION	27 RT	06 LT	22 LT
DEPTH IN FEET	0-5.0	0-3.5z	0-5.0
MAT'L COLOR	BROWN	RD/BR	RD/BR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	36 12 11.00	36 12 9.60	36 12 9.70
LONGITUDE DEG-MIN-SEC	92 56 51.70	92 56 41.90	92 56 41.80
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	100	100	-
3/8 IN.	97	97	100
NO. 4	93	94	82
NO. 10	88	88	64
NO. 40	81	74	44
NO. 80	78	65	32
NO. 200	77	61	20
LIQUID LIMIT	68	46	41
PLASTICITY INDEX	42	27	28
AASHTO SOIL	A-7-6(34)	A-7-6(44)	A-2-7(1)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	27.7	25.8	25.0
ACHM SC (IN)	--	8.0W	--
AGGR BASE CRS CL7 (IN)	--	6.0	--
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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

AASHTO TESTS : T24 T88 T89 T90 T265
:

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

PAUL TINSLEY, MATERIALS ENGINEER

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

DATE - 02/03/25 SEQUENCE NO. - 5
 JOB NUMBER - 090581 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 - 05
 SUPPLIER NAME - STATE DISTRICT NO. - 09
 NAME OF PROJECT - BELLEFONTE-MARION CO LINE(PASSING LANES)(S)
 PROJECT ENGINEER - NOT APPLICABLE
 PIT/QUARRY - ARKANSAS
 LOCATION - BOONE COUNTY DATE SAMPLED - 11/06/24
 SAMPLED BY - d.thornton DATE RECEIVED - 11/18/24
 SAMPLE FROM - TEST HOLE DATE TESTED - 01/16/25
 MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS

LAB NUMBER	20242308	20242309	20242310
SAMPLE ID	S325	S326	S327
TEST STATUS	INFORMATION ONLY	INFORMATION ONLY	INFORMATION ONLY
STATION	159+00	159+00	167+00
LOCATION	06 RT	20 RT	06 LT
DEPTH IN FEET	0-5.0	0-5.0	0-2.4z
MAT'L COLOR	BROWN	GRAY	BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	36 12 7.20	36 12 7.10	36 12 5.40
LONGITUDE DEG-MIN-SEC	92 56 32.70	92 56 32.80	92 56 23.20
% PASSING			
2 IN.	-	-	-
1 1/2 IN.	-	-	-
3/4 IN.	100	100	100
3/8 IN.	90	94	96
NO. 4	77	87	90
NO. 10	68	81	84
NO. 40	61	70	74
NO. 80	57	64	67
NO. 200	54	60	63
LIQUID LIMIT	35	32	44
PLASTICITY INDEX	19	17	29
AASHTO SOIL	A-6(7)	A-6(7)	A-7-6(15)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	20.7	21.9	31.3
ACHM SC (IN)	8.75W	--	8.75W
AGGR BASE CRS CL7 (IN)	7.0	--	6.0
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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

-
-
-
-

AASHTO TESTS : T24 T88 T89 T90 T265

:

Attachment B

Resilient Modulus

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

DATE - 03/04/2025
JOB NUMBER - 090581

SEQUENCE NO. - 1
MATERIAL CODE - SSRVPS
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 05
DISTRICT NO. - 09

JOB NAME - BELLEFONTE-MARION CO LINE (PASSING LANES) (S)

* STATION LIMITS R-VALUE AT 240 psi *

RESILIENT MODULUS
STA 111+00 2205

REMARKS -
-

AASHTO TESTS : T190

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

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

Job No.	090581	Material Code	RV
Date Sampled:	02/03/2025	Station No.:	111+00
Date Tested:	February 27, 2025	Location:	27RT
Name of Project:	BELLEFONTE-MARION CO LINE (PASSING		
County:	Code: 5	Name: BOONE	
Sampled By:	EB	Depth:	0-5.0
Lab No.:	20242318	AASHTO Class:	A-4(1)
Sample ID:	RV335	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	4.13
Middle	3.94
Bottom	3.95
Average	4.01
Membrane Thickness (in):	0.00
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):	12.61
Initial Volume, AoLo (cu. in):	101.10

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3194.30
------------------------------	---------

4. Soil Properties:

Optimum Moisture Content (%):	15.0
Maximum Dry Density (pcf):	107.3
95% of MDD (pcf):	101.9
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3194.30
Compaction Moisture content (%):	17.9
Compaction Wet Density (pcf):	120.38
Compaction Dry Density (pcf):	102.12
Moisture Content After Mr Test (%):	17.8

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

#VALUE!

7. Resilient Modulus, Mr:

1747(S_c)^{-0.02519}(S₃)^{0.52878}

8. Comments

9. Tested By:

EB

Date: February 27, 2025

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

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

Job No. 090581
 Date Sampled: 02/03/2025
 Date Tested: February 27, 2025
 Name of Project: BELLEFONTE-MARION CO LINE (PASSING
 County: Code: 5 Name: BOONE
 Sampled By: EB
 Lab No.: 20242318
 Sample ID: RV335
 LATITUDE:

Material Code RV
 Station No.: 111+00
 Location: 27RT
 Depth: 0-5.0
 AASHTO Class: A-4(1)
 Material Type (1 or 2): 2
 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. LVD T 1 and 2	Resilient Strain ϵ_r	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	26.2	23.5	2.7	2.1	1.9	0.2	0.00245	0.00030	6,106
Sequence 2	6.0	4.0	49.5	46.8	2.7	3.9	3.7	0.2	0.00538	0.00067	5,537
Sequence 3	6.0	6.0	72.9	69.1	3.8	5.8	5.5	0.3	0.00911	0.00114	4,826
Sequence 4	6.0	8.0	96.5	90.2	6.3	7.7	7.2	0.5	0.01418	0.00177	4,049
Sequence 5	6.0	10.0	120.9	112.1	8.8	9.6	8.9	0.7	0.01917	0.00239	3,719
Sequence 6	4.0	2.0	24.6	21.9	2.7	2.0	1.7	0.2	0.00445	0.00055	3,130
Sequence 7	4.0	4.0	45.3	42.6	2.7	3.6	3.4	0.2	0.01001	0.00125	2,709
Sequence 8	4.0	6.0	68.8	65.9	2.9	5.5	5.2	0.2	0.01494	0.00186	2,806
Sequence 9	4.0	8.0	95.4	90.1	5.4	7.6	7.1	0.4	0.01828	0.00228	3,136
Sequence 10	4.0	10.0	120.4	112.5	7.9	9.5	8.9	0.6	0.02170	0.00271	3,298
Sequence 11	2.0	2.0	23.3	20.6	2.8	1.9	1.6	0.2	0.00546	0.00068	2,398
Sequence 12	2.0	4.0	43.5	40.7	2.8	3.4	3.2	0.2	0.01175	0.00146	2,205
Sequence 13	2.0	6.0	66.8	64.1	2.8	5.3	5.1	0.2	0.01721	0.00215	2,368
Sequence 14	2.0	8.0	93.5	89.0	4.5	7.4	7.1	0.4	0.01967	0.00245	2,878
Sequence 15	2.0	10.0	119.2	112.2	7.0	9.5	8.9	0.6	0.02311	0.00288	3,090

TESTED BY _____
 REVIEWED BY _____

EB
 DATE February 27, 2025

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

MATERIALS DIVISION

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

Job No. 090581
 Date Sampled: 02/03/2025
 Date Tested: February 27, 2025
 Name of Project: BELLEFONTNE-MARION CO LINE (PASSING
 County: EB
 Sampled By: 20242318
 Lab No.: RV335
 Sample ID: Name: BOONE
 Code: 5
 Material Code RV
 Station No.: 111+00
 Location: 27RT
 Depth: 0-5.0
 ASHTO Class: A-4(1)
 Material Type (1 or 2): 2
 LONGITUDE:

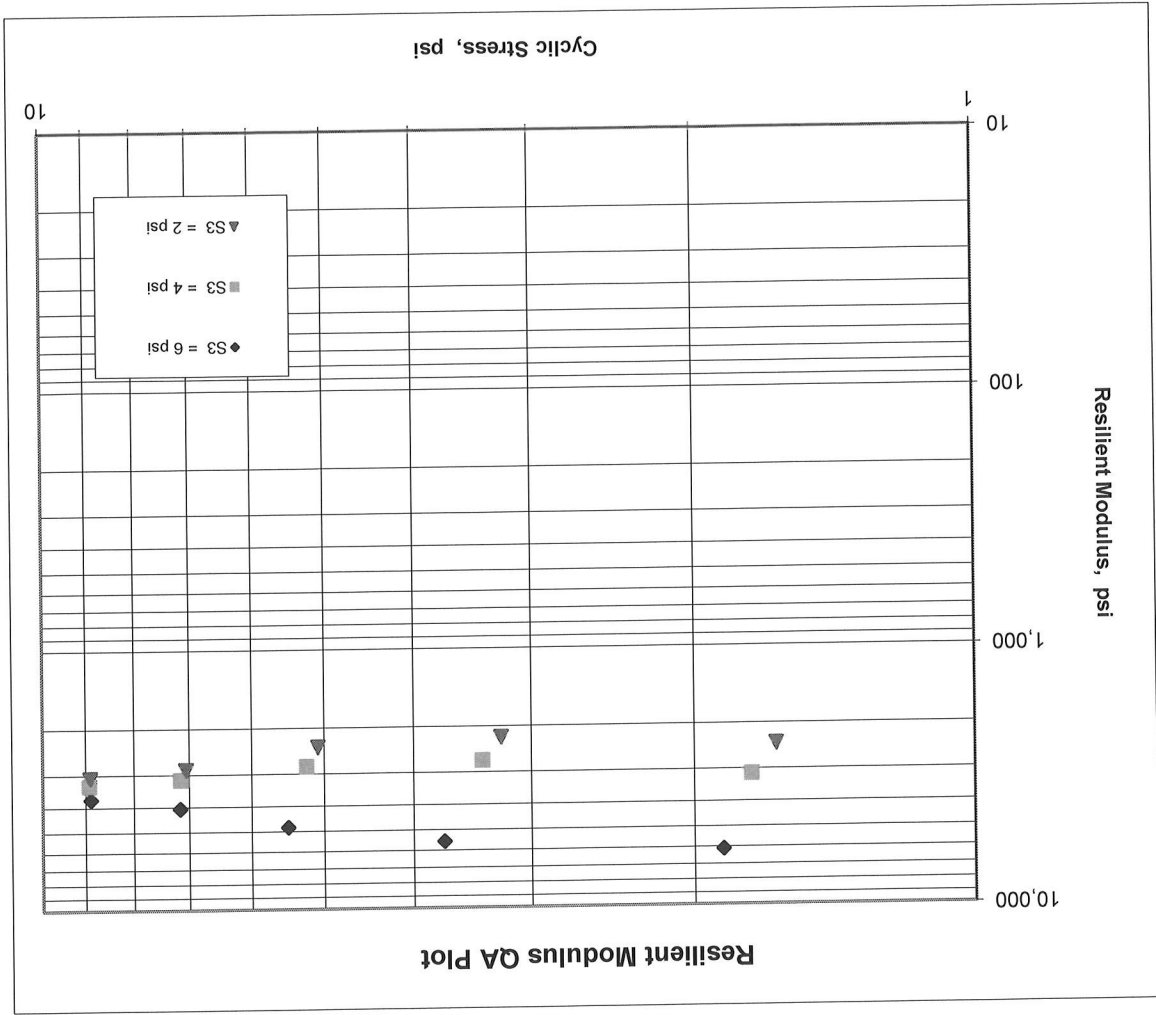
$$M_R = K_1 (S_c)^{K_2} (S_3)^{K_3}$$

$$K_1 = 1,747$$

$$K_2 = -0.02519$$

$$K_3 = 0.52878$$

$$R^2 = 0.66$$



Attachment C

DCP Data



Input By: BJJ
Checked By: YZ

Date: 3/20/2025
Date: 3/25/2025

Job No.: 090581
Location: Sta. 118+00 55' Rt.
Crew: Jordan, Johnson, Thornton

DCP No.: 4
Test Date 3/19/2025

Initial Reading (in.) @ 0.0
End-of-Drive Reading (in.) @ 36.8
Reset Reading (in.) to 26.0
Added Rod (in.) NA

No. Blows	Raw Reading from DCP (in.)	Cumulated Penetration (in.)	Cumulated Penetration (mm)	Penetration between Readings (mm)	Penetration per Blow (mm/blow)
2	1.6	1.6	41	41	20.3
3	2.2	2.2	56	15	5.1
3	3.1	3.1	79	23	7.6
5	5.1	5.1	130	51	10.2
5	8.1	8.1	206	76	15.2
5	8.1	8.1	206	0	0.0
5	9.0	9.0	229	23	4.6
5	11.6	11.6	295	66	13.2
5	12.9	12.9	328	33	6.6
5	13.6	13.6	345	18	3.6
5	14.1	14.1	358	13	2.5
5	14.8	14.8	376	18	3.6
5	15.5	15.5	394	18	3.6
5	17.9	17.9	455	61	12.2
5	19.4	19.4	493	38	7.6
5	20.1	20.1	511	18	3.6
5	20.8	20.8	528	18	3.6
3	22.5	22.5	571	43	14.4
3	24.0	24.0	610	38	12.7
3	25.6	25.6	650	41	13.5
3	26.7	26.7	678	28	9.3
3	31.3	31.3	795	117	38.9
3	34.9	34.9	886	91	30.5
3	36.8	36.8	935	48	16.1
3	33.2	44.0	1118	183	61.0
3	34.4	45.2	1148	30	10.2
3	35.2	46.0	1168	20	6.8
3	36.1	46.9	1191	23	7.6
3	36.9	47.7	1212	20	6.8



Input By: BJJ
Checked By: YZ

Date: 3/20/2025
Date: 3/25/2025

Job No.: 090581
Location: Sta. 143+00 50' Lt.
Crew: Jordan, Johnson, Thornton

DCP No.: 3
Test Date 3/19/2025

Initial Reading (in.) @ 0.0
End-of-Drive Reading (in.) @ 35.9
Reset Reading (in.) to 24.3
Added Rod (in.) NA

No. Blows	Raw Reading from DCP (in.)	Cumulated Penetration (in.)	Cumulated Penetration (mm)	Penetration between Readings (mm)	Penetration per Blow (mm/blow)
2	3.3	3.3	84	84	41.9
3	5.6	5.6	142	58	19.5
3	8.1	8.1	206	63	21.2
5	11.5	11.5	292	86	17.3
5	16.0	16.0	406	114	22.9
5	16.6	16.6	422	15	3.0
5	17.5	17.5	444	23	4.6
5	18.3	18.3	465	20	4.1
5	18.9	18.9	480	15	3.0
5	19.4	19.4	493	13	2.5
5	19.9	19.9	505	13	2.5
5	20.5	20.5	521	15	3.0
5	21.3	21.3	541	20	4.1
5	21.9	21.9	556	15	3.0
5	22.7	22.7	577	20	4.1
5	23.3	23.3	592	15	3.0
5	24.3	24.3	617	25	5.1
3	25.0	25.0	635	18	5.9
3	25.6	25.6	650	15	5.1
3	26.3	26.3	668	18	5.9
3	26.7	26.7	678	10	3.4
3	27.4	27.4	696	18	5.9
3	28.1	28.1	714	18	5.9
3	28.5	28.5	724	10	3.4
3	29.5	29.5	749	25	8.5
3	30.1	30.1	765	15	5.1
3	30.7	30.7	780	15	5.1
3	31.3	31.3	795	15	5.1
3	31.7	31.7	805	10	3.4
3	35.9	35.9	912	107	35.6
3	24.8	36.4	925	13	4.2
3	25.1	36.7	932	8	2.5
3	25.3	36.9	937	5	1.7
3	25.6	37.2	945	8	2.5

DCP TEST RESULTS

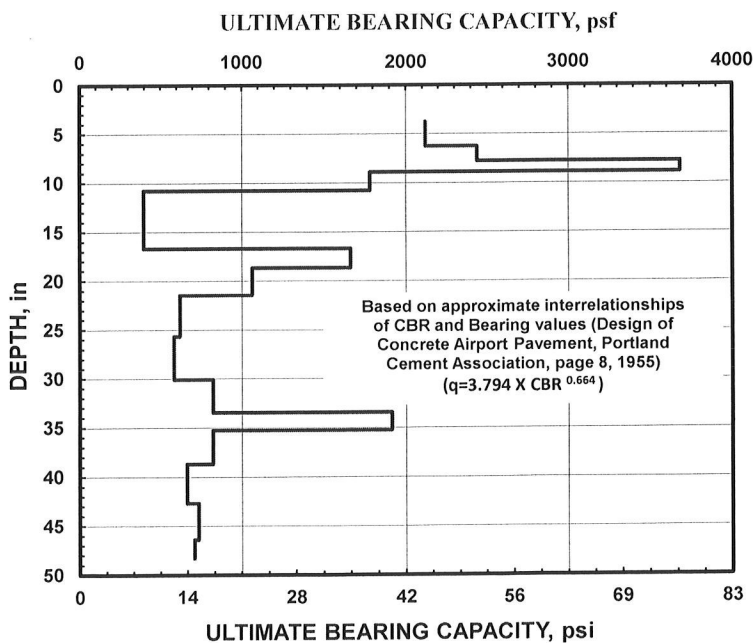
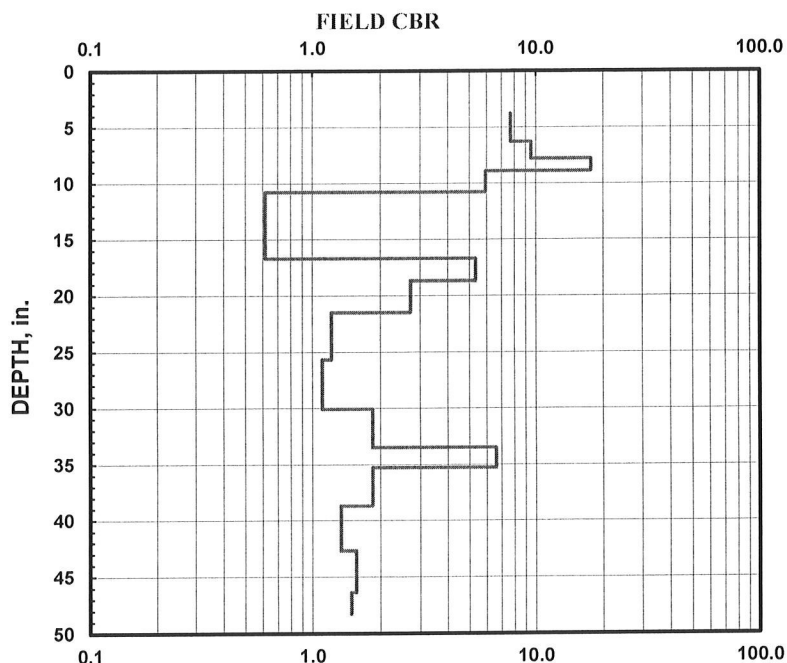
Project: 090581
Location: Sta. 179+00 56' Rt.
DCP NO.: 1

Date: 3/20/2025
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
3	97	1
3	160	1
2	198	1
2	226	1
2	274	1
2	424	1
2	475	1
2	546	1
2	653	1
2	765	1
2	851	1
2	897	1
2	983	1
2	1085	1
2	1179	1
1	1227	1



Attachment D

Photographs

Existing cut slope near Station 138+00 north side of road.



Existing embankment slope near Station 118+00 looking east.



Exposed Soil near Station 116+00



New alignment location looking east near Station 180+00.



Existing cut slope looking west from Station 180+00



Rock outcrop near Station 178+00 in the ditch line

