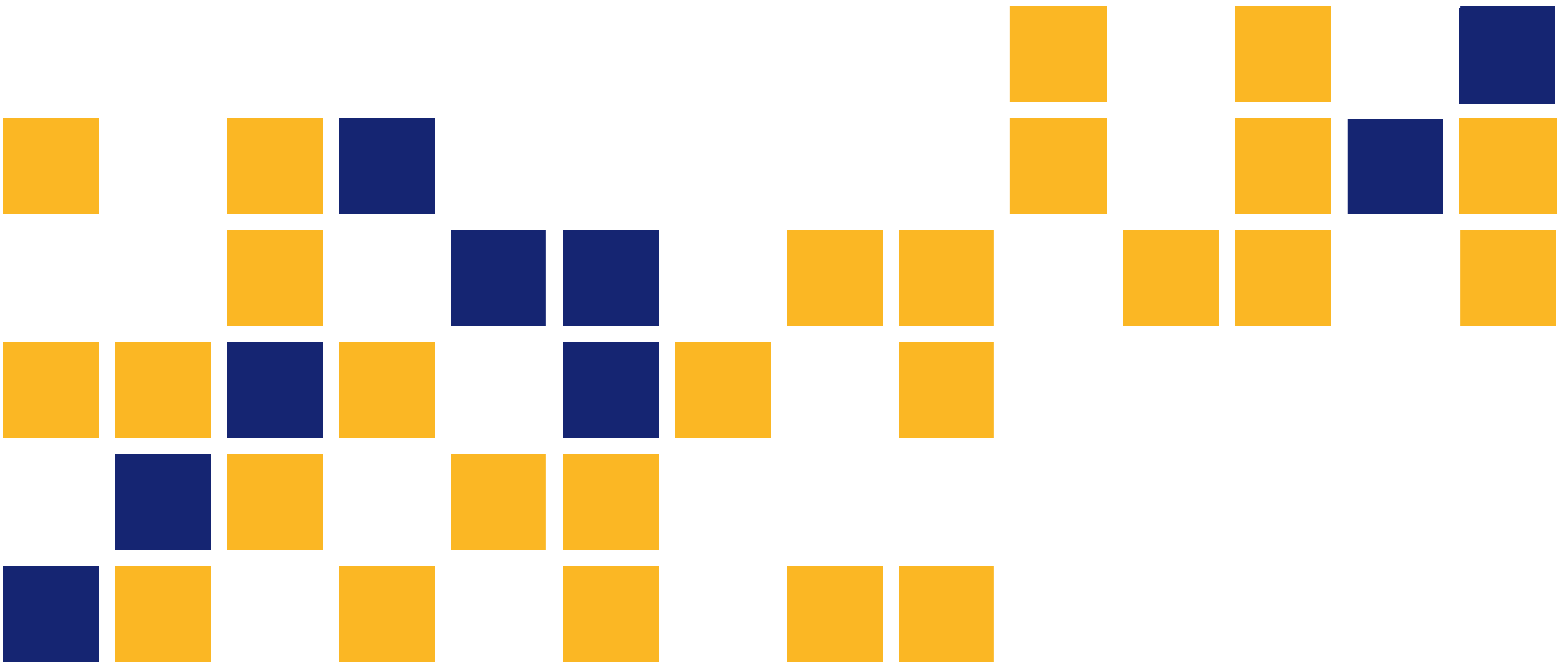
Report No. K-TRAN: KU-17-1 ▪ APPENDICES ▪ November 2017

Lime Kiln Dust for Treated Subgrades

Jamal Kakrasul
Robert L. Parsons, Ph.D., P.E.
Jie Han, Ph.D., P.E.

The University of Kansas



Kansas Department of Transportation

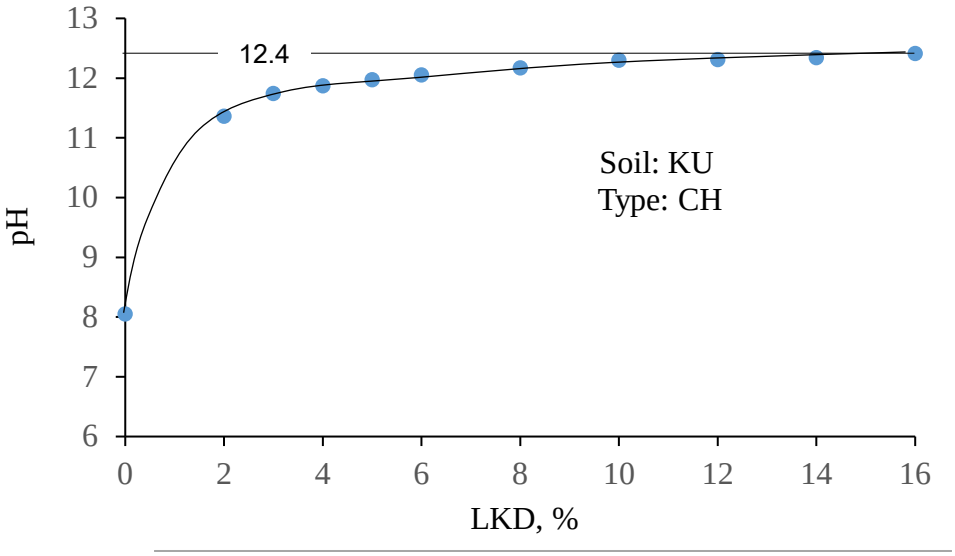
Appendices Table of Contents

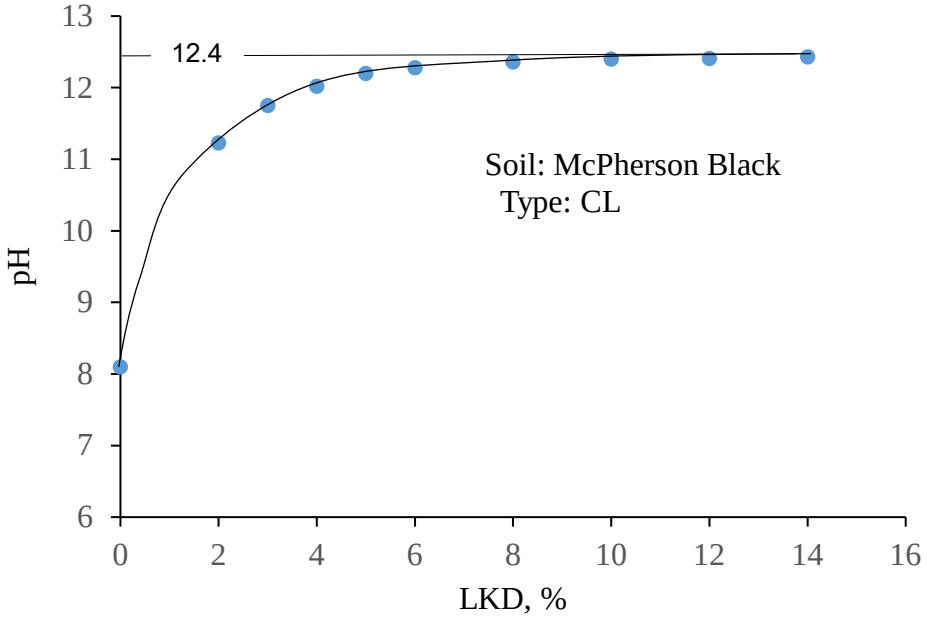
Due to file size, the full report without appendices is available in a separate file located at:

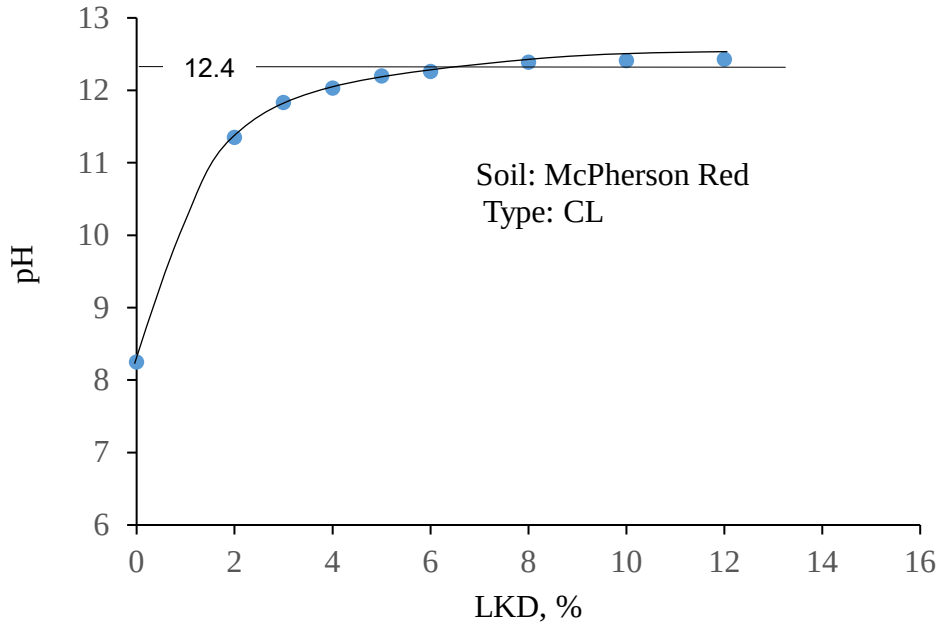
https://kdotapp.ksdot.org/kdotlib/kdotlib2.aspx

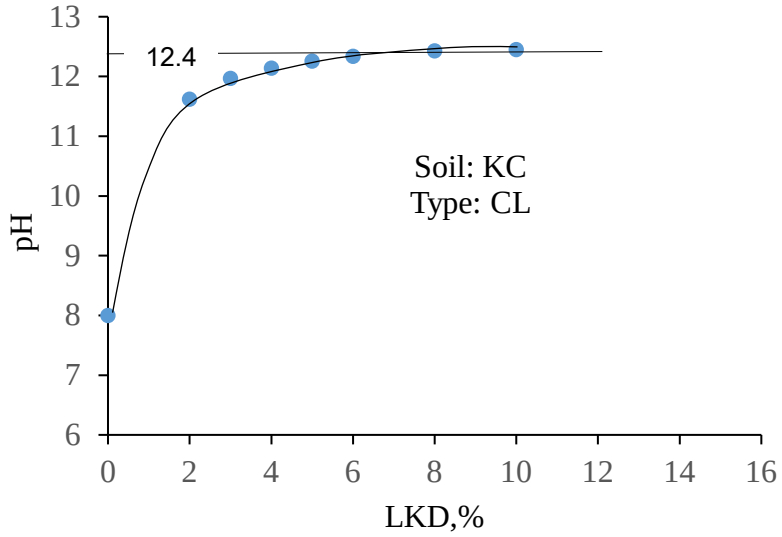
or by contacting the KDOT Library at KDOT#Research.Library@ks.gov.

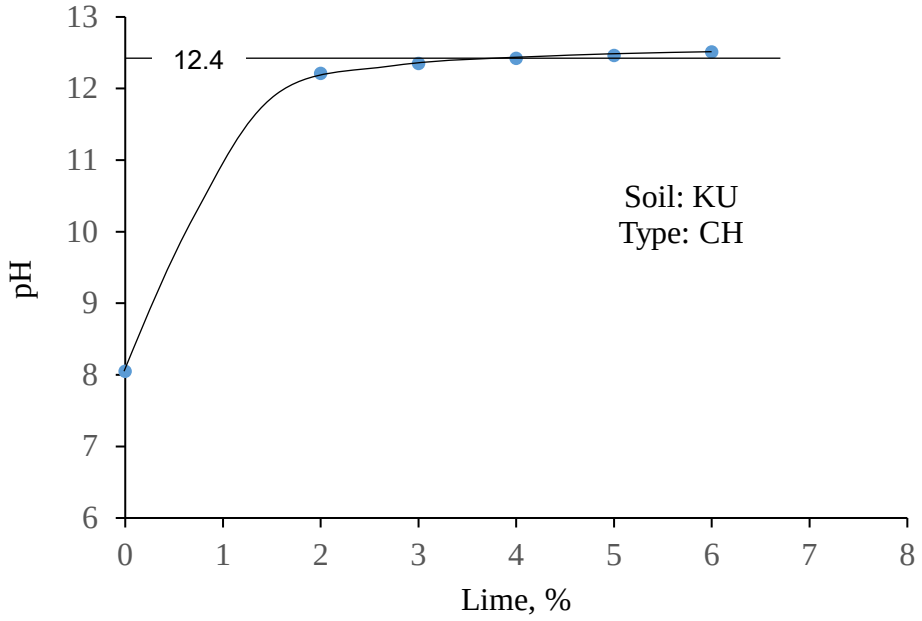
Appendix A: pH Test Results

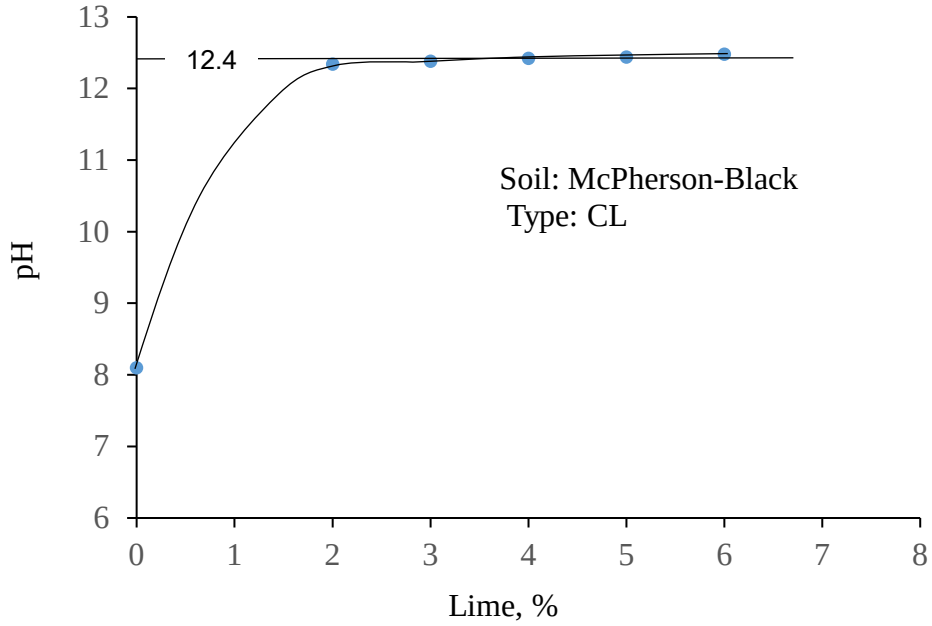


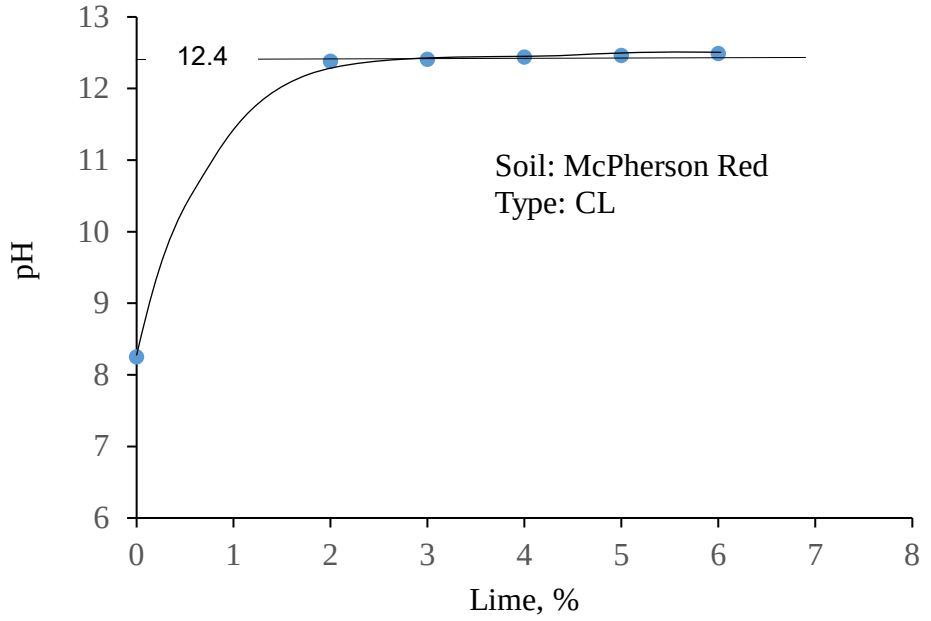


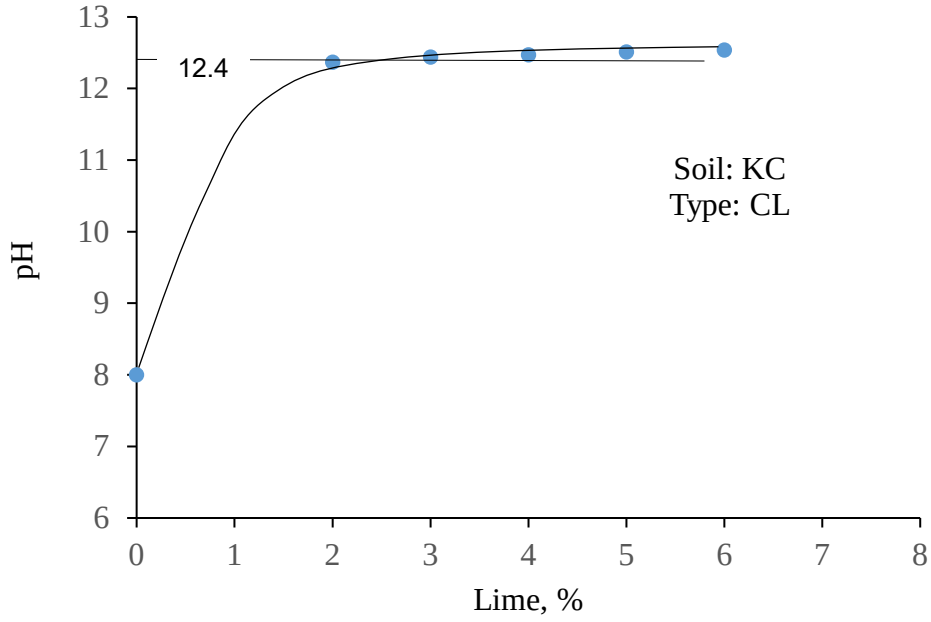

13
12
11
10
9
8
7
6
pH
12.4
Soil: McPherson Red
Type: CL
0
2
4
6
8
10
12
14
16
LKD, %


13
12
11
10
9
8
7
6
pH
12.4
Soil: KC
Type: CL
0
2
4
6
8
10
12
14
16
LKD,%


13
12
11
10
9
8
7
6
pH
12.4
Soil: KU
Type: CH
0
1
2
3
4
5
6
7
8
Lime, %

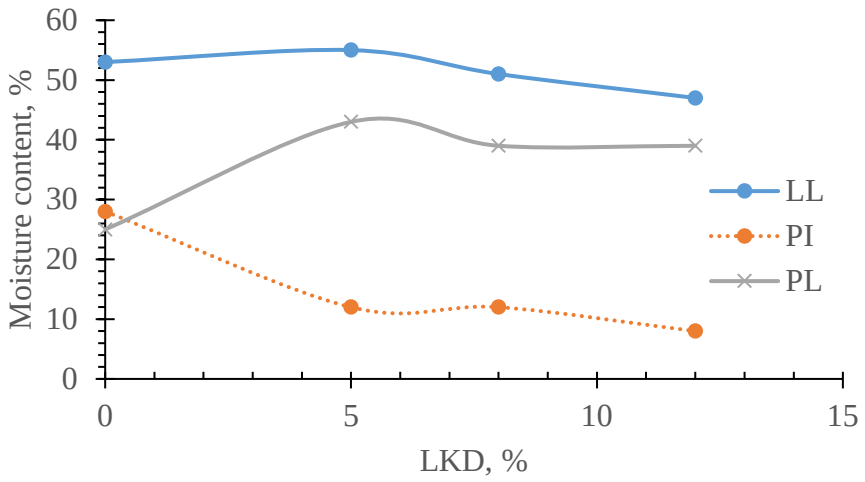

13
12
11
10
9
8
7
6
pH
12.4
Soil: McPherson-Black
Type: CL
0
1
2
3
4
5
6
7
8
Lime, %


13
12
11
10
9
8
7
6
pH
12.4
Soil: McPherson Red
Type: CL
0
1
2
3
4
5
6
7
8
Lime, %

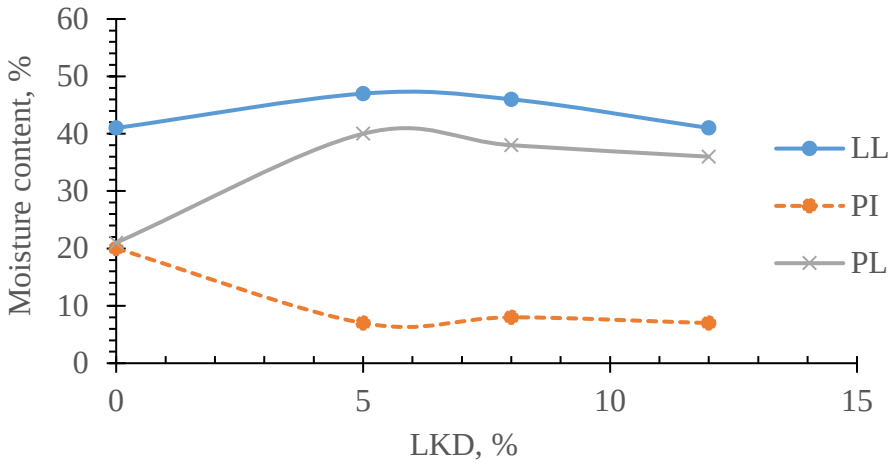

13
12
11
10
9
8
7
6
pH
12.4
Soil: KC
Type: CL
0
1
2
3
4
5
6
7
8
Lime, %

Appendix B: Atterberg Limits Curves

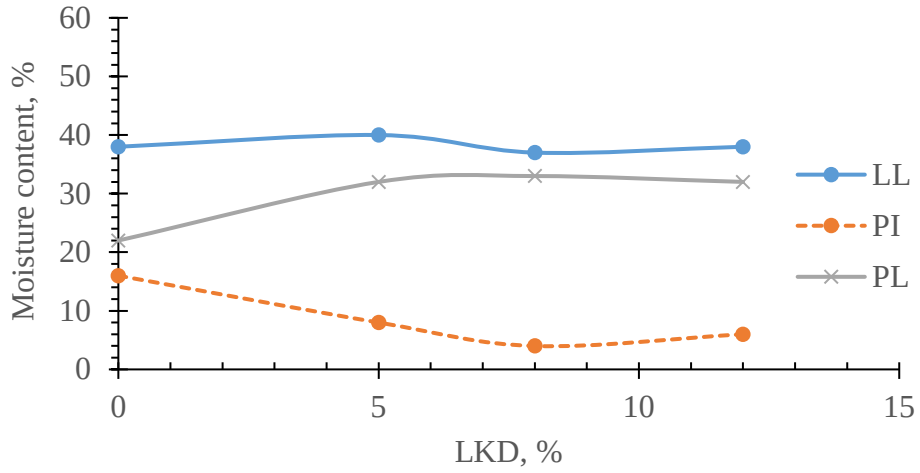
Soil: KU



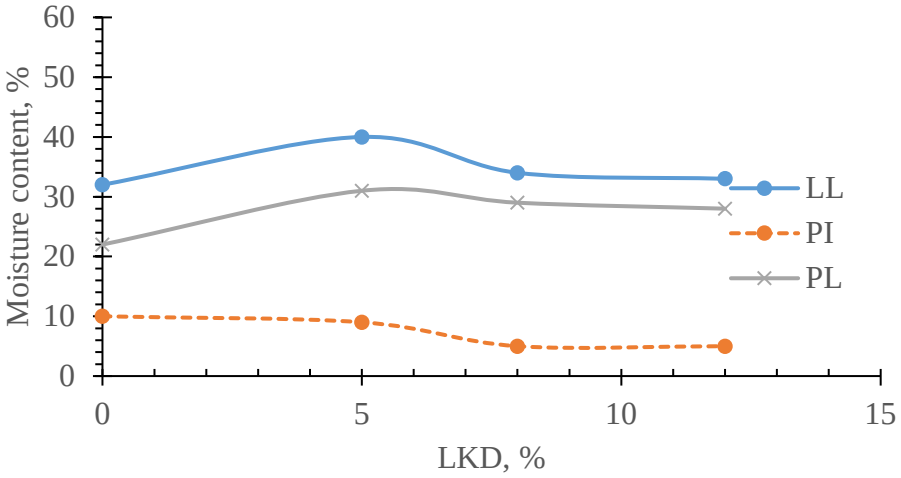
Soil: McPherson Red



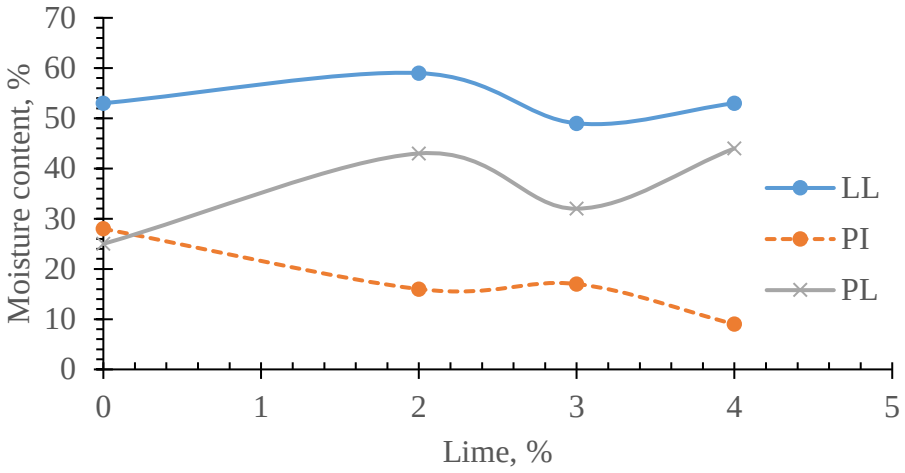
Soil: McPherson Black



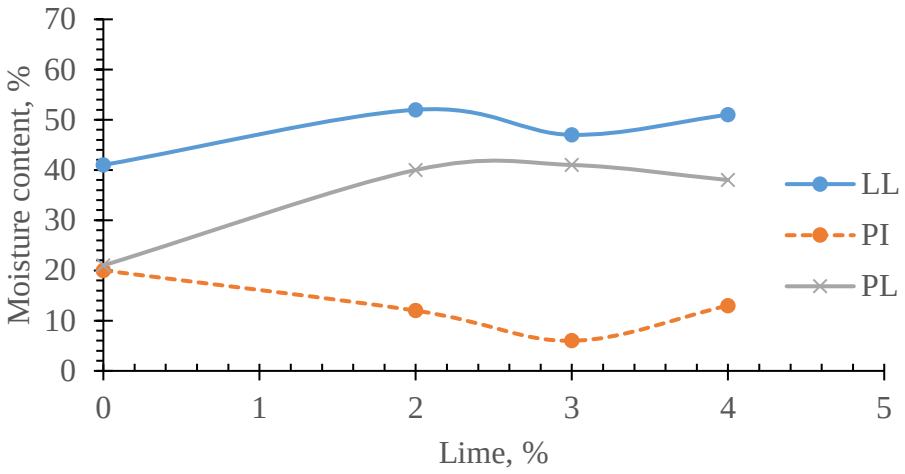
Soil: KC



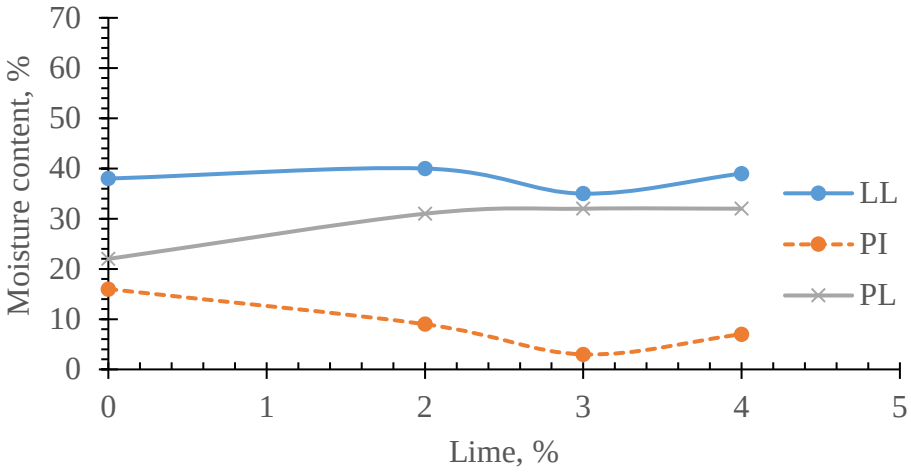
Soil: KU



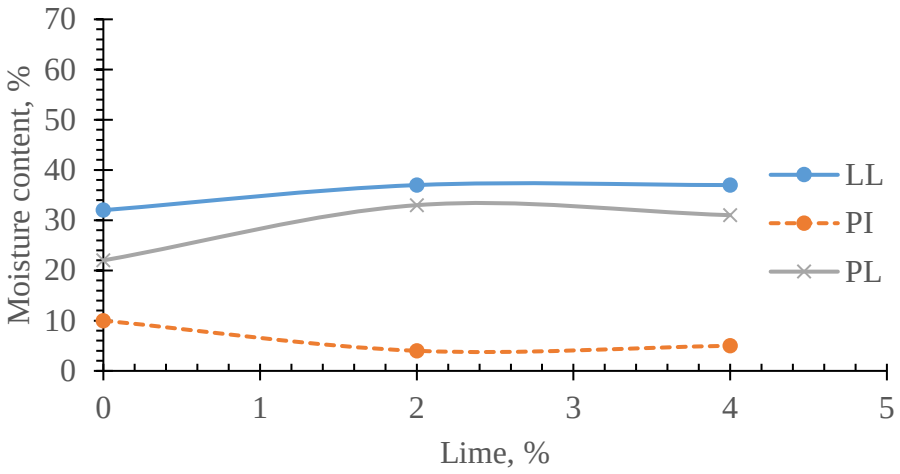
Soil: McPherson Red



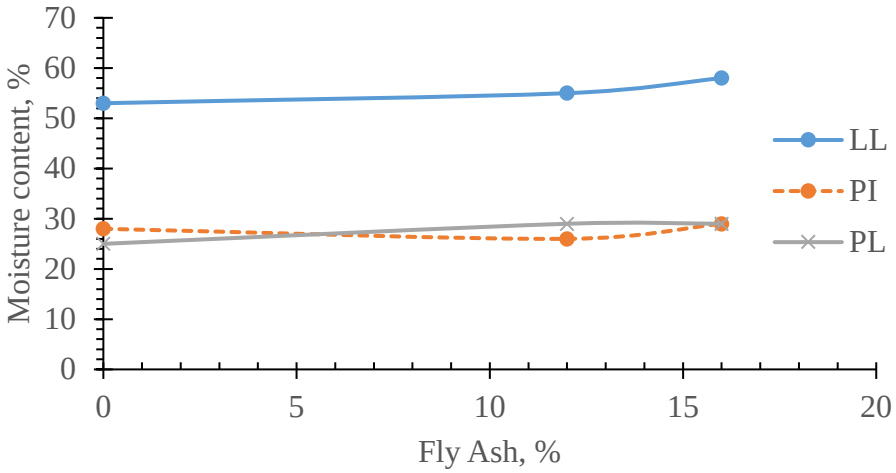
Soil: McPherson Black



Soil: KC



Soil: KU



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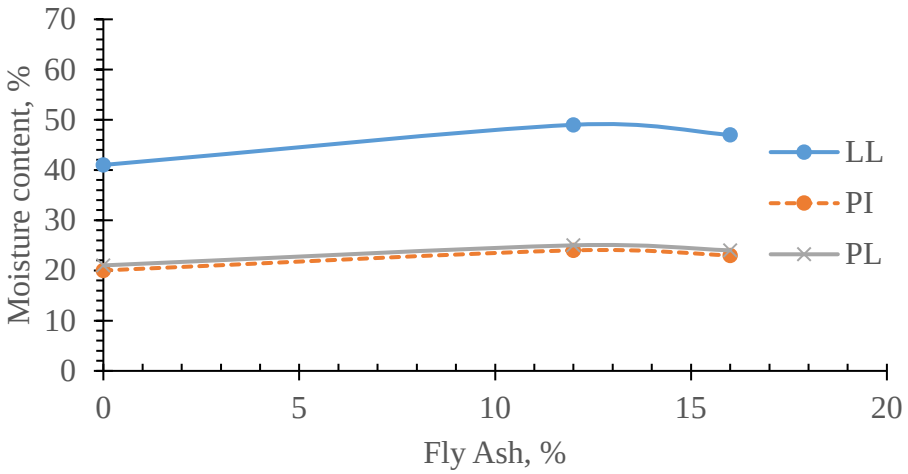

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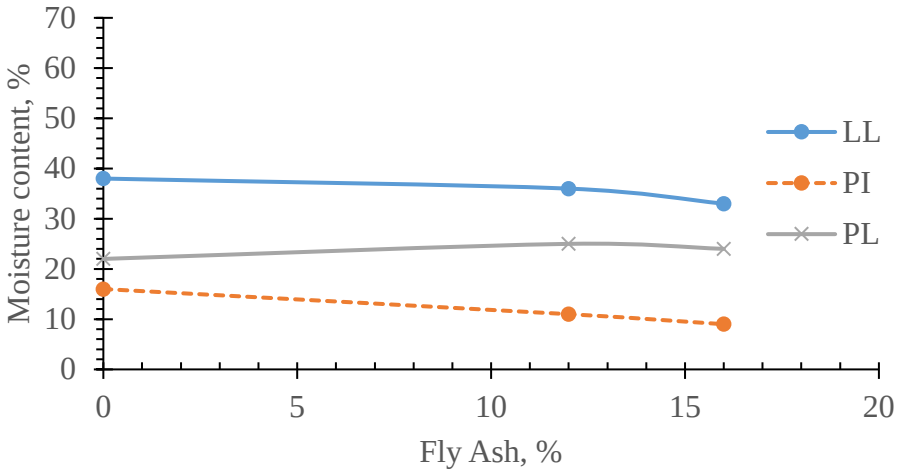
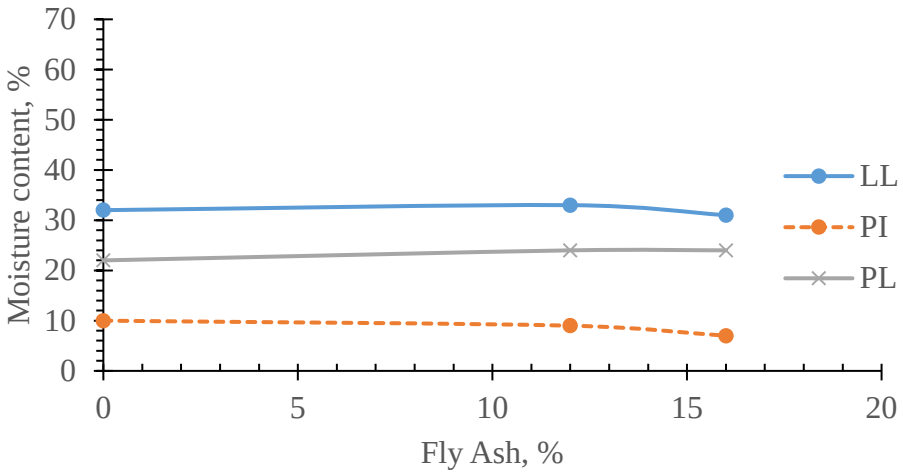
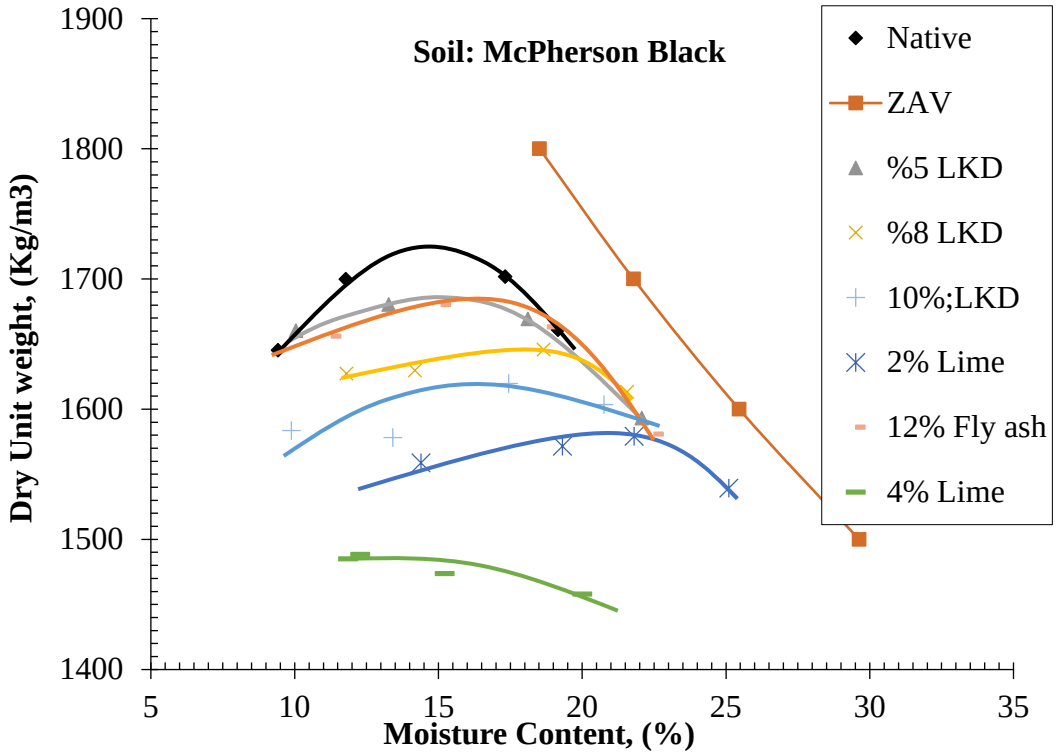
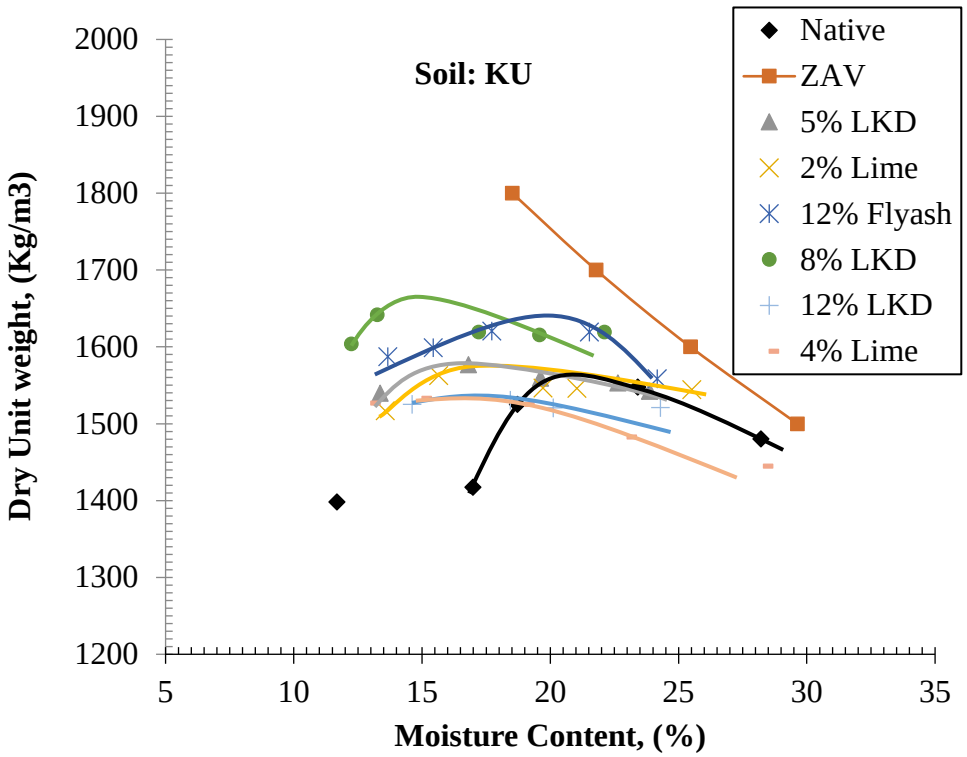


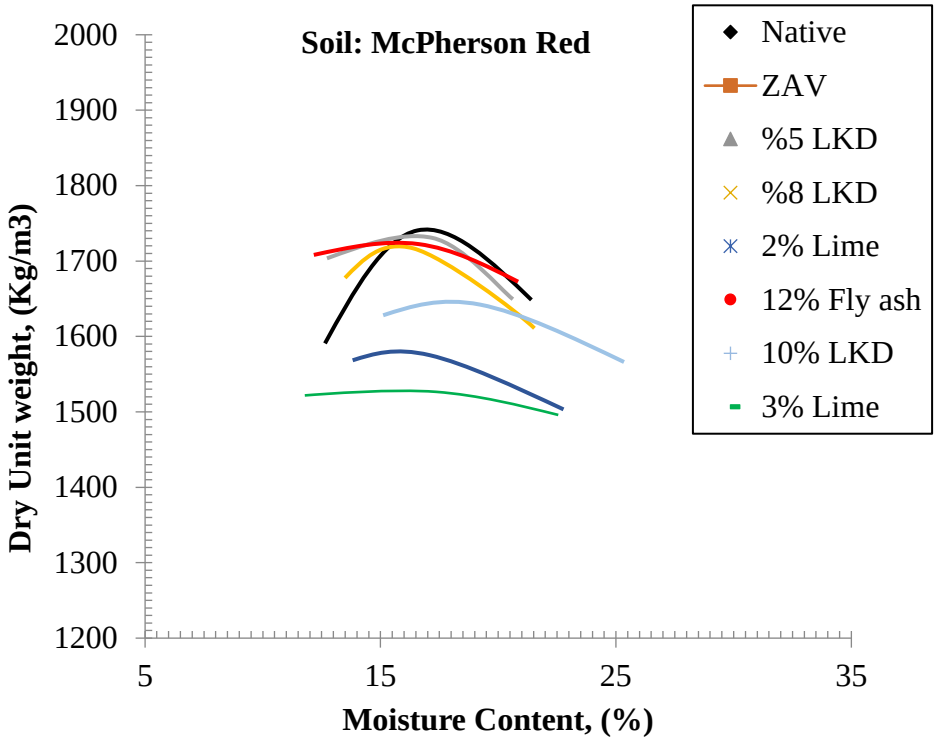
Soil: KC

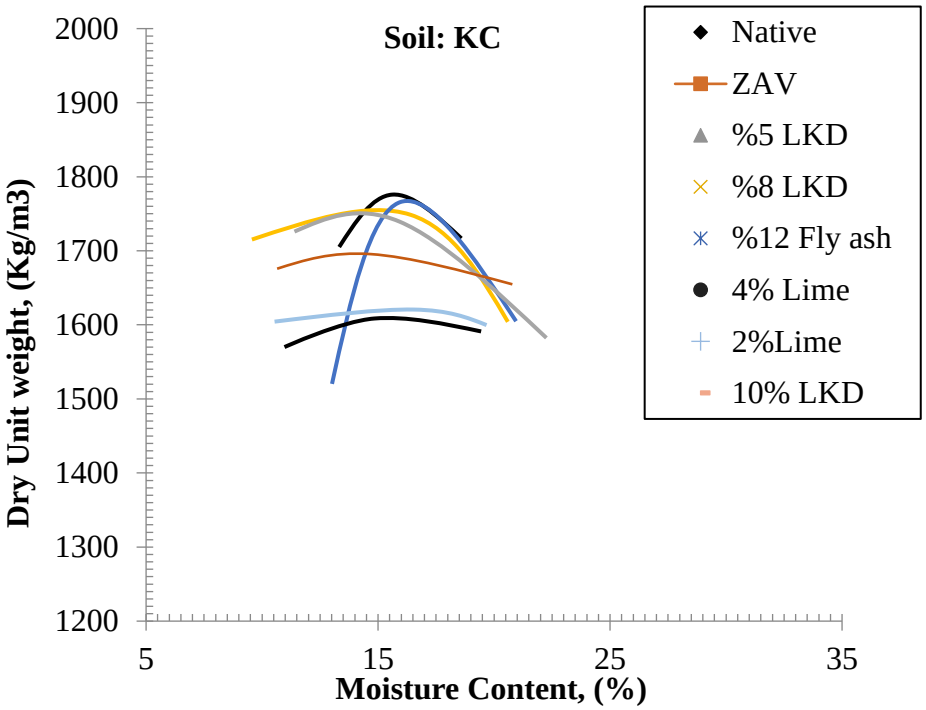


Appendix C: Moisture-Density Relation Curves




Soil: KU
Native
ZAV
5% LKD
2% Lime
12% Flyash
8% LKD
12% LKD
4% Lime
Dry Unit weight, (Kg/m3)
2000
1900
1800
1700
1600
1500
1400
1300
1200
5
10
15
20
25
30
35
Moisture Content, (%)


Soil: McPherson Red
Native
ZAV
%5 LKD
%8 LKD
2% Lime
12% Fly ash
10% LKD
3% Lime
Dry Unit weight, (Kg/m3)
2000
1900
1800
1700
1600
1500
1400
1300
1200
5
15
25
35
Moisture Content, (%)


Soil: KC
Dry Unit weight, (Kg/m3)
2000
1900
1800
1700
1600
1500
1400
1300
1200
5
15
25
35
Moisture Content, (%)
Native
ZAV
%5 LKD
%8 LKD
%12 Fly ash
4% Lime
2%Lime
10% LKD

Appendix D: Resilient Modulus Data

Kansas Department of Transportation

Report of sample of Soils

Laboratory No. 17-0976

Date Reported. July 24, 2017

Date Received. June 16, 2017

Specification No _____ Quantity _____

Source of material Roadway Subgrade

Sample from Multiple Counties

Submitted by Robert Parsons

Identification marks Labeled Sample Bags

Project or POV AD-3700-18 ACT 634

Type of construction LKD KTRAN Study

TEST RESULTS

Please see attached Resilient Modulus tests results.

Luke Metheny
File 18-3

Reported by: _____

Title: Luke Metheny, P.E., Chief Geotechnical Engineer

KANSAS DEPARTMENT OF TRANSPORTATION

INFORMATION SHEET FOR SOIL SAMPLES

Submitted by Robert Parsons Address 700 SW Harrison Date 6-16-17

Engineer in Charge Luke Metheny Sampled by Geotechnical Services/KU

Project No. AD-3700-17 ACT 634 County

Type of Const. LKD KTRAN Study Check whether: Active ☐ Prelim ☐ Research ☒

Sample	Type			Tests Required	KU Remold Specs
KC	Native			Remolded Res Mod	1775 MDD, OMC 15.7%
KC	5% LKD			Remolded Res Mod	1745 MDD, OMC 14.4%
KC	2.5% Lime			Remolded Res Mod	1613 MDD, OMC 15.9%
KU	Native			Remolded Res Mod	1562 MDD, OMC 20.7%
KU	5% LKD			Remolded Res Mod	1672 MDD, OMC 17%
KU	4% Lime			Remolded Res Mod	1538 MDD, OMC 17.3%
McPherson Blk	Native			Remolded Res Mod	1725 MDD, OMC 14.8%
McPherson Blk	5% LKD			Remolded Res Mod	1688 MDD, OMC 15.2%
McPherson Blk	3.5 % Lime			Remolded Res Mod	1489 MDD, OMC 14.5%
McPherson Red	Native			Remolded Res Mod	1740 MDD, OMC 17.2%
McPherson Red	5% LKD			Remolded Res Mod	1727 MDD, OMC 16.7%
McPherson Red	3% Lime			Remolded Res Mod	1524 MDD, OMC 15.2%

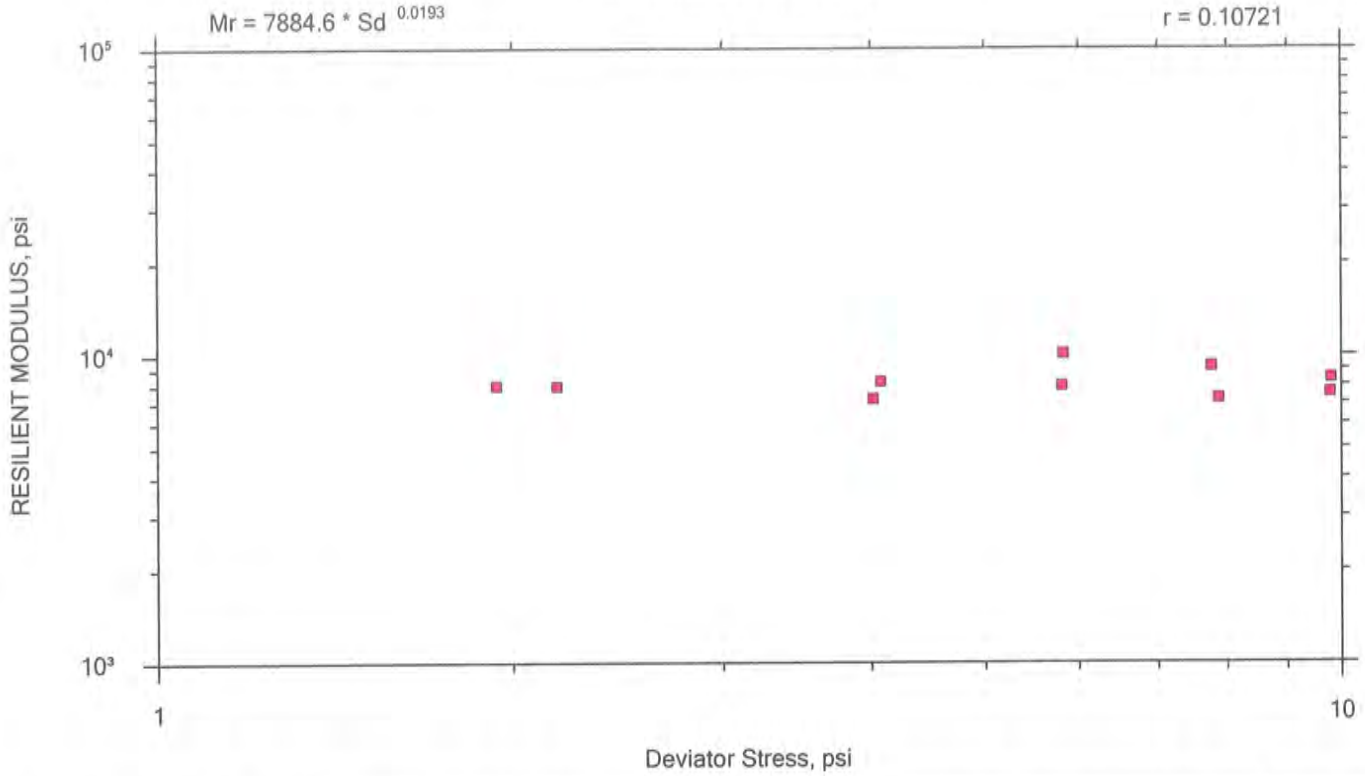
LABORATORY RECORD

Date Received 6-16-17 Laboratory No. 17-0976

Remarks See Luke Metheny for tests

Note—One copy of this form completely filled out must accompany each sample or group of samples submitted to the Materials & Research Lab., 2300 SW Van Buren, Topeka, Kansas.

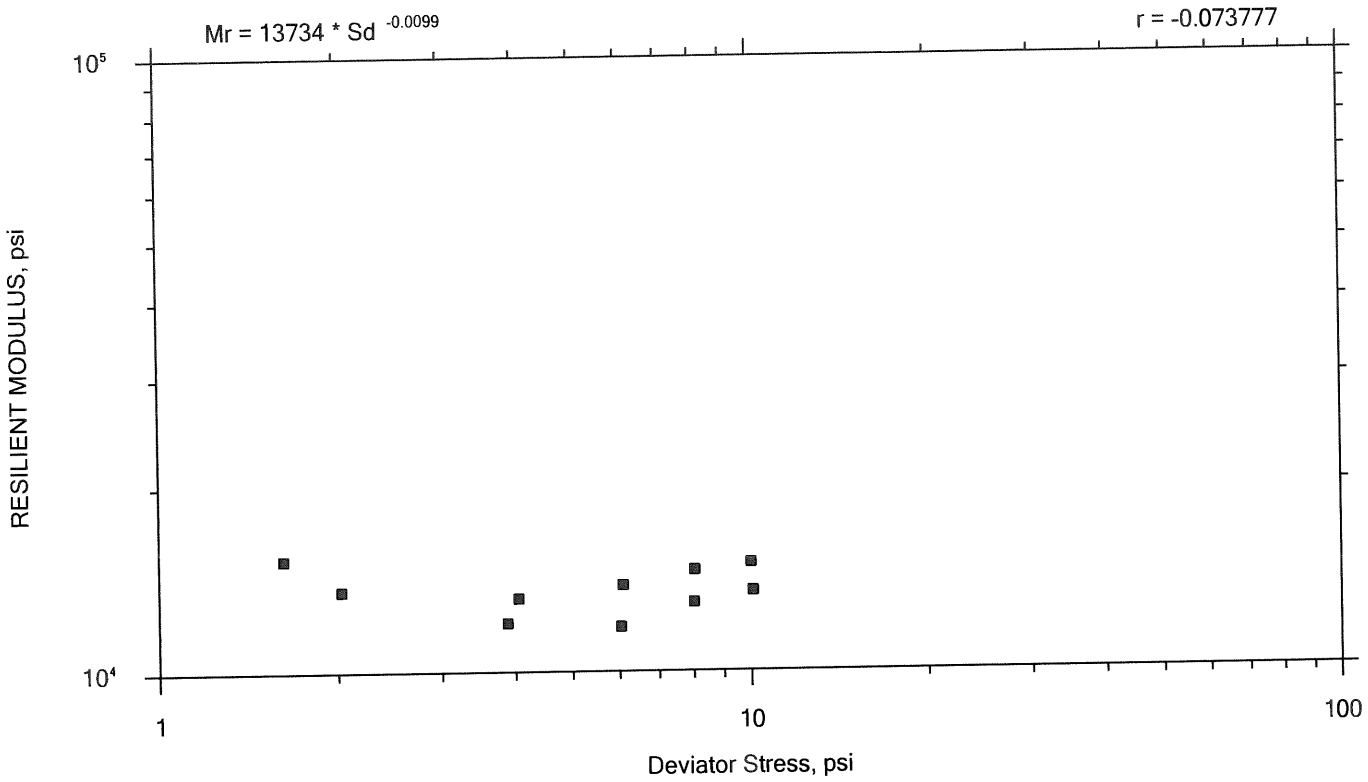
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.478	2	2.177	0.1222	15.61	0.02	0.00	7960.7	946.15
4.524	4	4.074	0.0679	17.65	0.04	0.00	8221.3	195.28
4.499	6	5.822	0.0325	19.32	0.05	0.00	10100	293.78
4.477	8	7.754	0.0862	21.18	0.08	0.00	9173.5	166.04
4.514	10	9.796	0.0933	23.34	0.10	0.00	8401.5	96.344
2.498	2	1.936	0.0639	9.429	0.02	0.00	7996.7	530.03
2.491	4	4.014	0.0640	11.49	0.05	0.00	7216.2	128.8
2.486	6	5.805	0.1028	13.26	0.06	0.00	7956.5	235.06
2.479	8	7.863	0.0788	15.3	0.10	0.00	7219	57.2
2.474	10	9.781	0.1119	17.2	0.12	0.00	7551.2	134.38

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: KC Nat Virgin	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1775 moisture 15.7% minus 45 ml H2O		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\KC Native Virgin.dat		

RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.441	2	2.028	0.1191	15.35	0.01	0.00	13548	657.81
4.469	4	4.048	0.1722	17.46	0.03	0.00	13167	606.67
4.499	6	6.089	0.1469	19.59	0.04	0.00	13809	460.61
4.475	8	8.04	0.1231	21.46	0.05	0.00	14600	188.7
4.449	10	10	0.2033	23.35	0.06	0.00	14995	308.73
2.449	2	1.621	0.0859	8.968	0.01	0.00	15236	2852.2
2.444	4	3.874	0.0750	11.21	0.03	0.00	12008	449.51
2.441	6	6.029	0.1326	13.35	0.05	0.00	11816	382.43
2.441	8	8.015	0.1001	15.34	0.06	0.00	12926	288.19
2.522	10	10.07	0.1718	17.64	0.07	0.00	13481	208.2

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: KC 5% LKD	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1745, moisture 14.4%, and 5% LKD		
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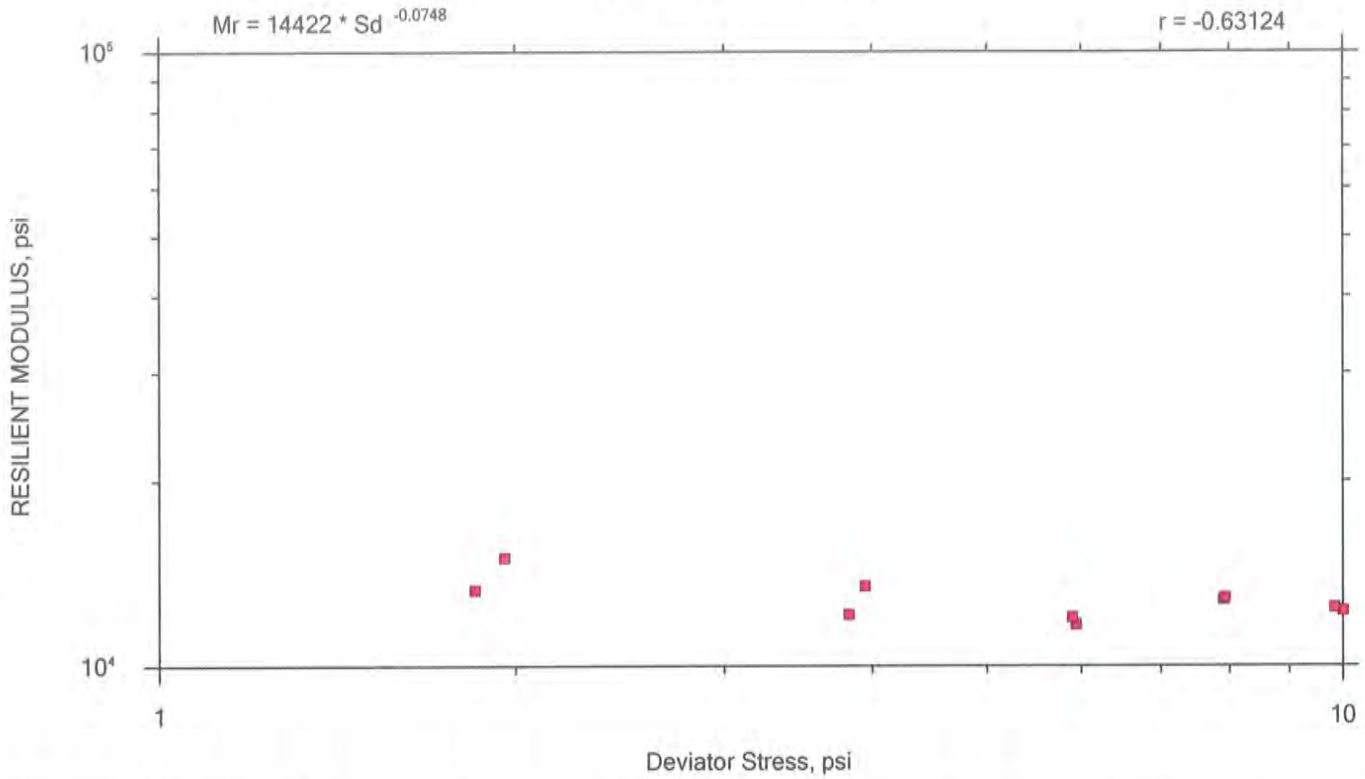
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.485	2	1.957	0.0528	15.41	0.01	0.00	15012	818.53
4.455	4	3.944	0.0258	17.31	0.03	0.00	13483	442.13
4.436	6	5.941	0.0350	19.25	0.05	0.00	11670	173.58
4.476	8	7.905	0.0358	21.33	0.06	0.00	12826	223.74
4.462	10	9.997	0.0569	23.38	0.07	0.00	12282	259.72
2.462	2	1.847	0.0557	9.234	0.01	0.00	13294	1634.6
2.459	4	3.821	0.0619	11.2	0.03	0.00	12123	302.11
2.453	6	5.896	0.0757	13.26	0.04	0.00	11986	201.43
2.444	8	7.931	0.0556	15.26	0.05	0.00	12899	246.4
2.434	10	9.834	0.0822	17.14	0.07	0.00	12428	206.7

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: KC Lime	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1613, moisture 15.9%, and 2.5% lime		
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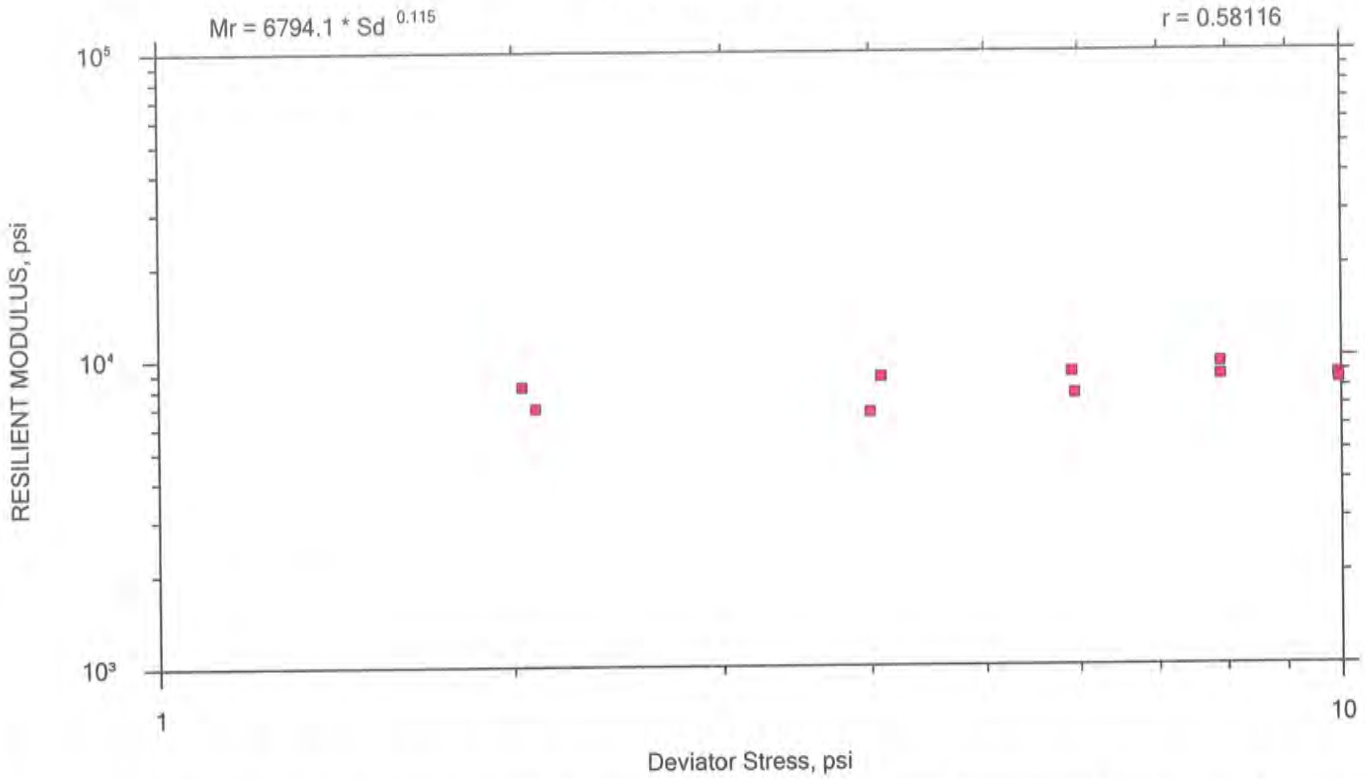
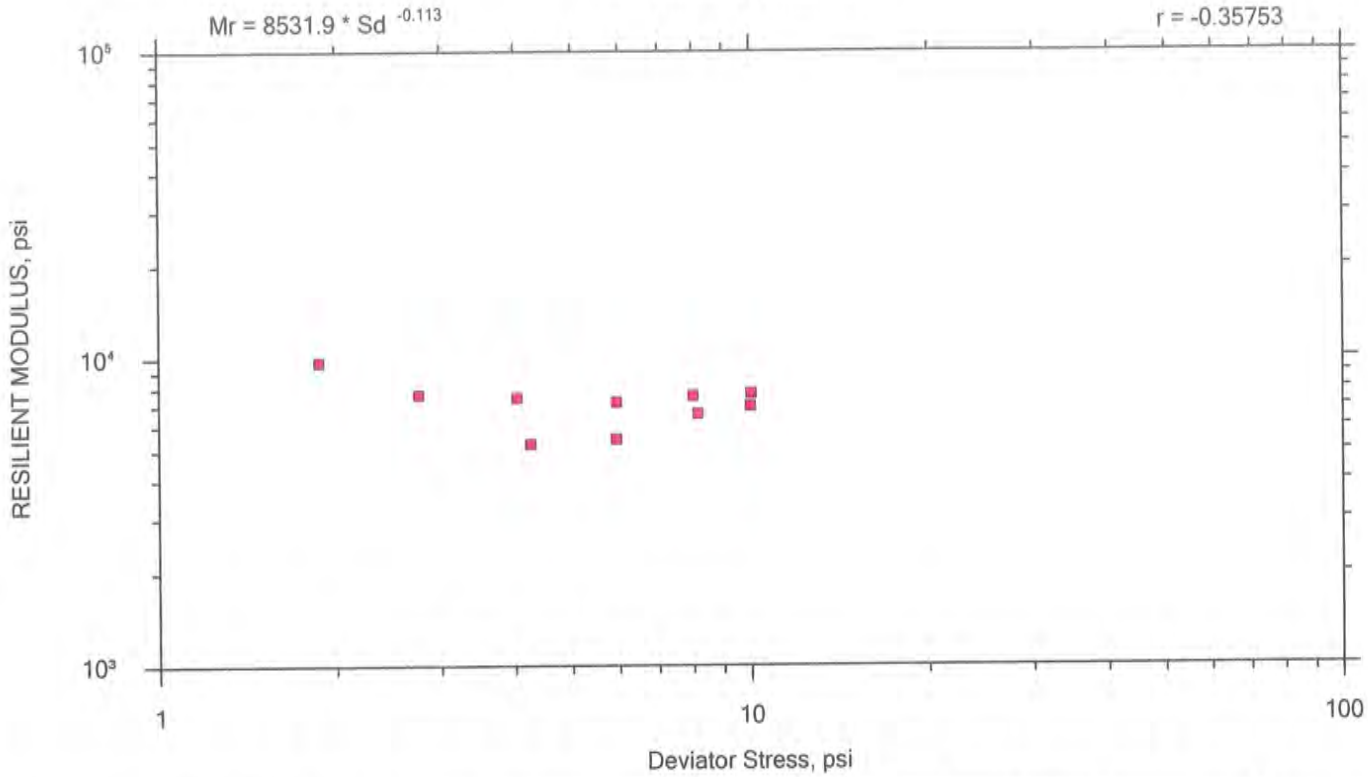
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.532	2	2.031	0.0427	15.63	0.02	0.00	8161.4	404.89
4.478	4	4.08	0.0596	17.52	0.04	0.00	8725.4	88.229
4.452	6	5.91	0.1161	19.27	0.06	0.00	8986.6	258.32
4.517	8	7.89	0.0833	21.44	0.07	0.00	9604	169.04
4.506	10	9.935	0.1037	23.45	0.10	0.00	8758.6	102.98
2.466	2	2.085	0.0685	9.482	0.03	0.00	6927.3	299.23
2.466	4	3.995	0.1107	11.39	0.05	0.00	6693.7	222.25
2.468	6	5.94	0.0172	13.34	0.07	0.00	7646.7	94.733
2.468	8	7.892	0.0815	15.3	0.08	0.00	8724.4	160.12
2.468	10	9.946	0.0670	17.35	0.11	0.00	8458.4	58.069

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: KU Nat Virgin	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1562 moisture 20.7%		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\KU Native Virgin.dat		

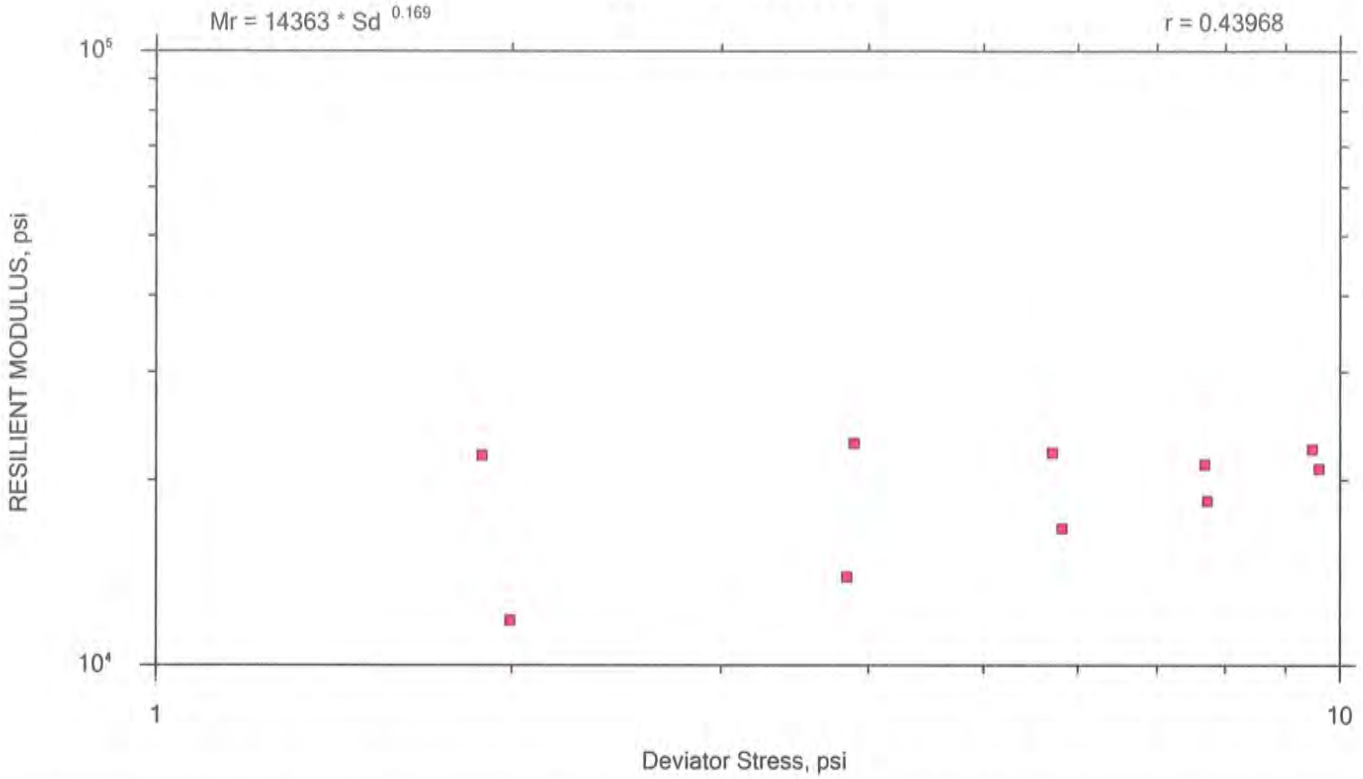
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.495	2	1.869	0.0494	15.35	0.02	0.00	9740.6	1581.1
4.464	4	4.031	0.0940	17.42	0.05	0.00	7449.4	479.15
4.504	6	5.933	0.1187	19.45	0.07	0.00	7198.9	258.91
4.494	8	7.996	0.1441	21.48	0.09	0.00	7539	154.65
4.488	10	10.01	0.1147	23.48	0.12	0.00	7673.5	138.32
2.493	2	2.753	0.4022	10.23	0.03	0.00	7635.6	945.7
2.495	4	4.25	0.3041	11.74	0.07	0.01	5266.2	704.22
2.495	6	5.931	0.2288	13.42	0.10	0.00	5452.3	225.46
2.495	8	8.146	0.0759	15.63	0.11	0.00	6596	42.562
2.495	10	9.978	0.1128	17.46	0.13	0.00	6993.9	99.695

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: KU 5% LKD	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1672, moisture 17%, and 5% LKD		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\KU 5% LKD.dat		

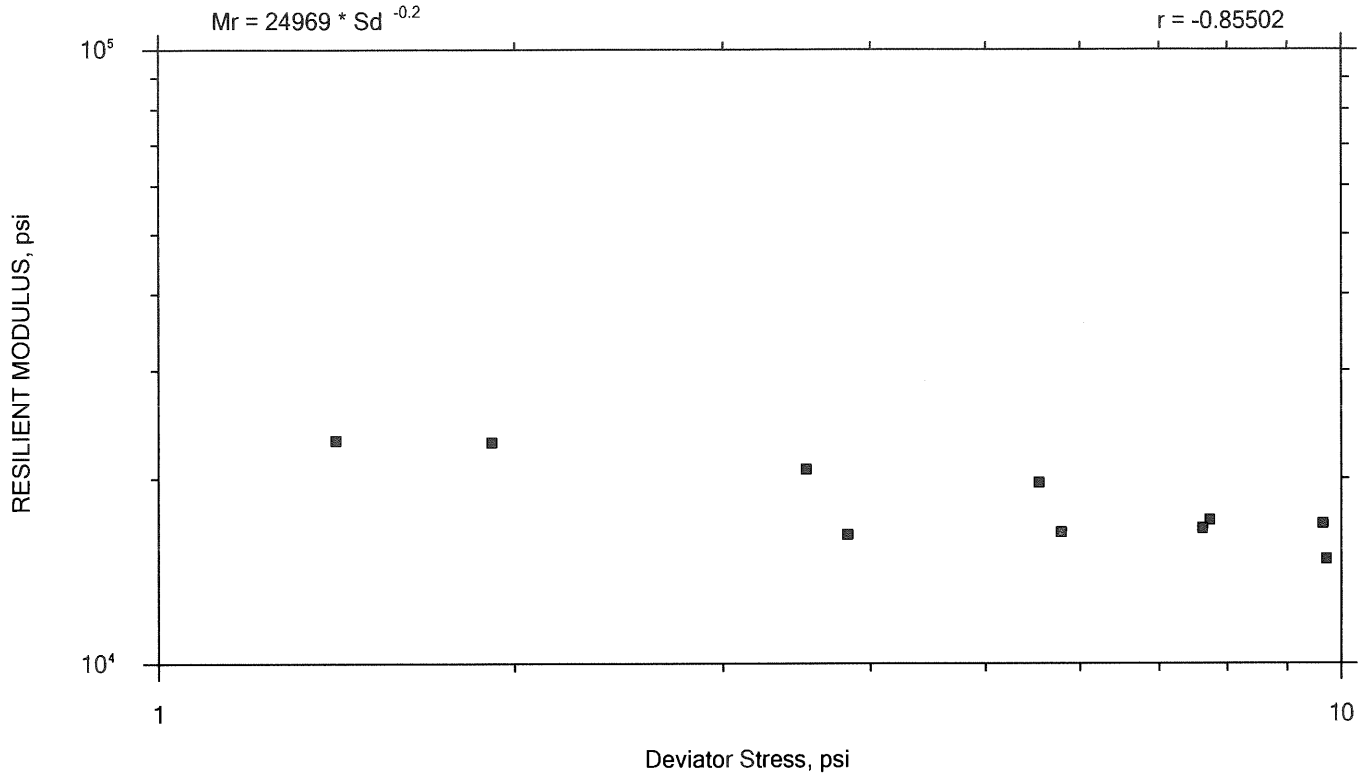
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.442	2	1.886	0.1111	15.21	0.01	0.00	21936	1887.9
4.465	4	3.889	0.0651	17.28	0.02	0.00	22962	1007.6
4.492	6	5.71	0.0336	19.18	0.02	0.00	22183	790.95
4.462	8	7.682	0.1115	21.07	0.03	0.00	21227	294.17
4.494	10	9.469	0.1334	22.95	0.04	0.00	22463	356.42
2.515	2	1.992	0.0724	9.538	0.01	0.00	11840	597.1
2.52	4	3.835	0.0721	11.39	0.02	0.00	13913	681.52
2.49	6	5.816	0.0899	13.29	0.03	0.00	16694	283.8
2.456	8	7.72	0.0760	15.09	0.04	0.00	18509	175.57
2.457	10	9.594	0.1604	16.97	0.04	0.00	20865	85.978

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: KU Lime	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1538, moisture 17.3%, and 4% lime		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\KU Lime.dat		

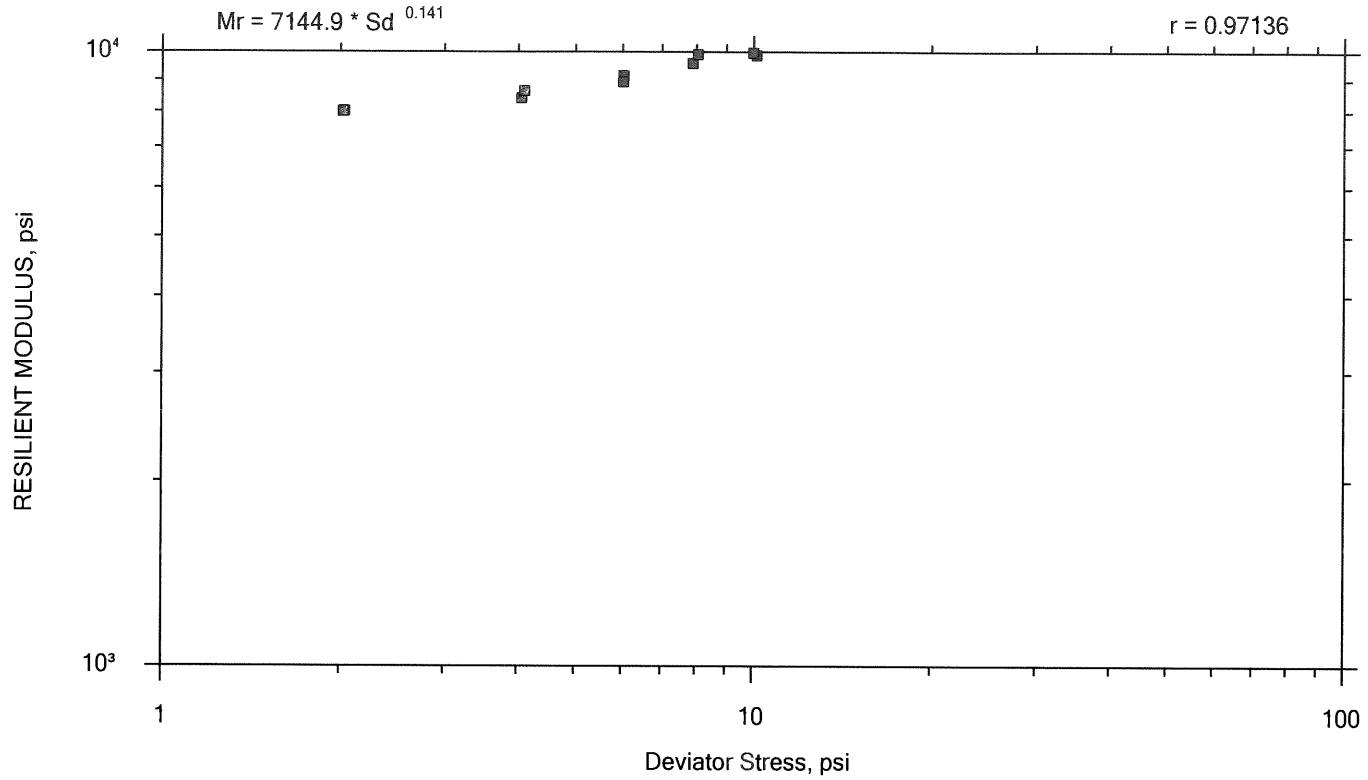
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.486	2	1.912	0.0473	15.37	0.01	0.00	22922	4650.5
4.473	4	3.825	0.0378	17.25	0.02	0.00	16223	663.27
4.488	6	5.786	0.0231	19.25	0.03	0.00	16370	427.35
4.51	8	7.728	0.0112	21.26	0.04	0.00	17129	485.85
4.497	10	9.644	0.1267	23.14	0.05	0.00	16891	353.31
2.451	2	1.413	0.0553	8.766	0.01	0.00	23091	3363.3
2.448	4	3.528	0.0452	10.87	0.01	0.00	20709	1150.8
2.455	6	5.541	0.1169	12.91	0.02	0.00	19701	1137.9
2.521	8	7.621	0.0715	15.18	0.04	0.00	16593	679.61
2.512	10	9.71	0.0769	17.25	0.06	0.00	14798	405.13

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: McP BlkNatVirg	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1725 moisture 14.8%		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\McP Blk Native Virgin.dat		

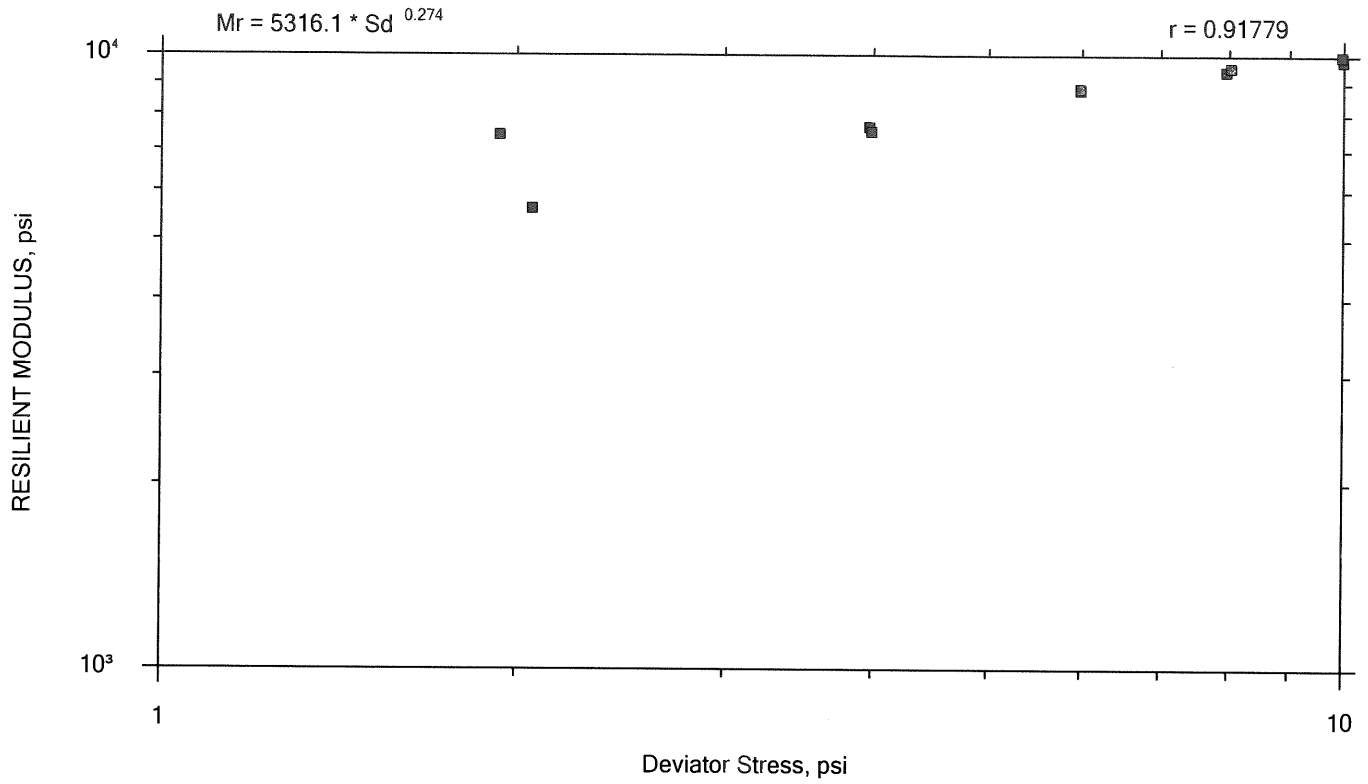
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.493	2	2.03	0.0922	15.51	0.02	0.00	8012	917.13
4.484	4	4.043	0.0647	17.49	0.04	0.00	8404.4	149.15
4.477	6	6.019	0.0822	19.45	0.06	0.00	9141.2	166.04
4.519	8	7.883	0.0346	21.44	0.07	0.00	9581.7	92.67
4.519	10	10.12	0.0700	23.68	0.09	0.00	9873.9	56.433
2.488	2	2.018	0.0634	9.481	0.02	0.00	7995.3	189.61
2.485	4	4.092	0.0790	11.55	0.04	0.00	8646.4	420.87
2.482	6	6.009	0.0402	13.45	0.06	0.00	8937.7	143.93
2.478	8	8.044	0.0224	15.48	0.07	0.00	9913.4	121.65
2.476	10	9.989	0.0478	17.42	0.09	0.00	9972.2	181.83

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: McP Blk 5% LKD	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1688, moisture 15.2%, and 5% LKD		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\McP Blk 5% LKD.dat		

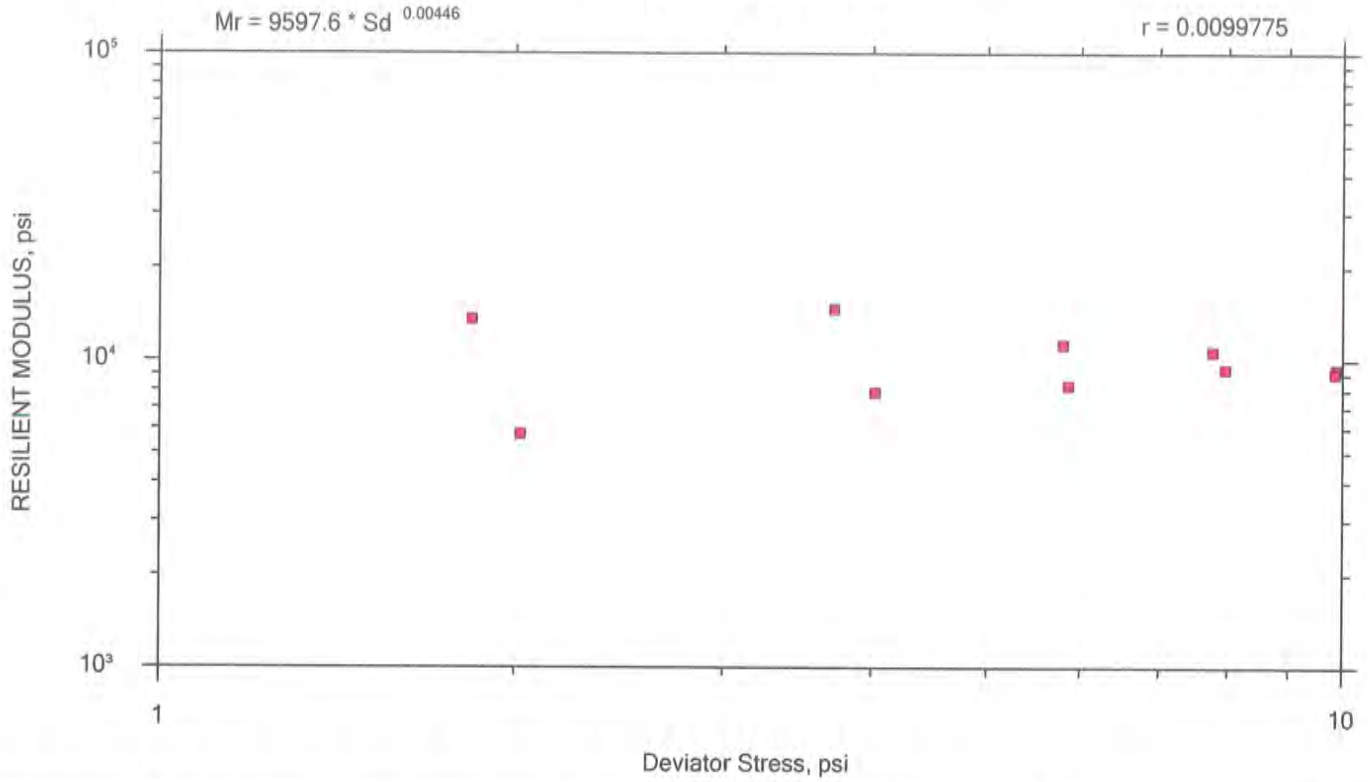
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.497	2	1.933	0.0298	15.43	0.02	0.00	7401.8	178.95
4.49	4	3.968	0.0324	17.44	0.05	0.00	7641.8	116.63
4.483	6	5.98	0.0895	19.43	0.06	0.00	8790.1	234.67
4.477	8	7.947	0.1268	21.38	0.08	0.00	9430.8	207.84
4.473	10	9.982	0.1049	23.4	0.09	0.00	9813.1	150.46
2.504	2	2.06	0.0703	9.572	0.03	0.00	5618.6	139.33
2.491	4	3.985	0.0932	11.46	0.05	0.00	7510.4	134.16
2.485	6	5.974	0.1091	13.43	0.06	0.00	8828.6	103.51
2.481	8	8.02	0.0685	15.46	0.08	0.00	9567.2	118.17
2.476	10	9.96	0.0496	17.39	0.09	0.00	9988.5	169.15

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: McP Blk Lime	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1489, moisture 14.5%, and 3.5% lime		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\McP Blk Lime.dat		

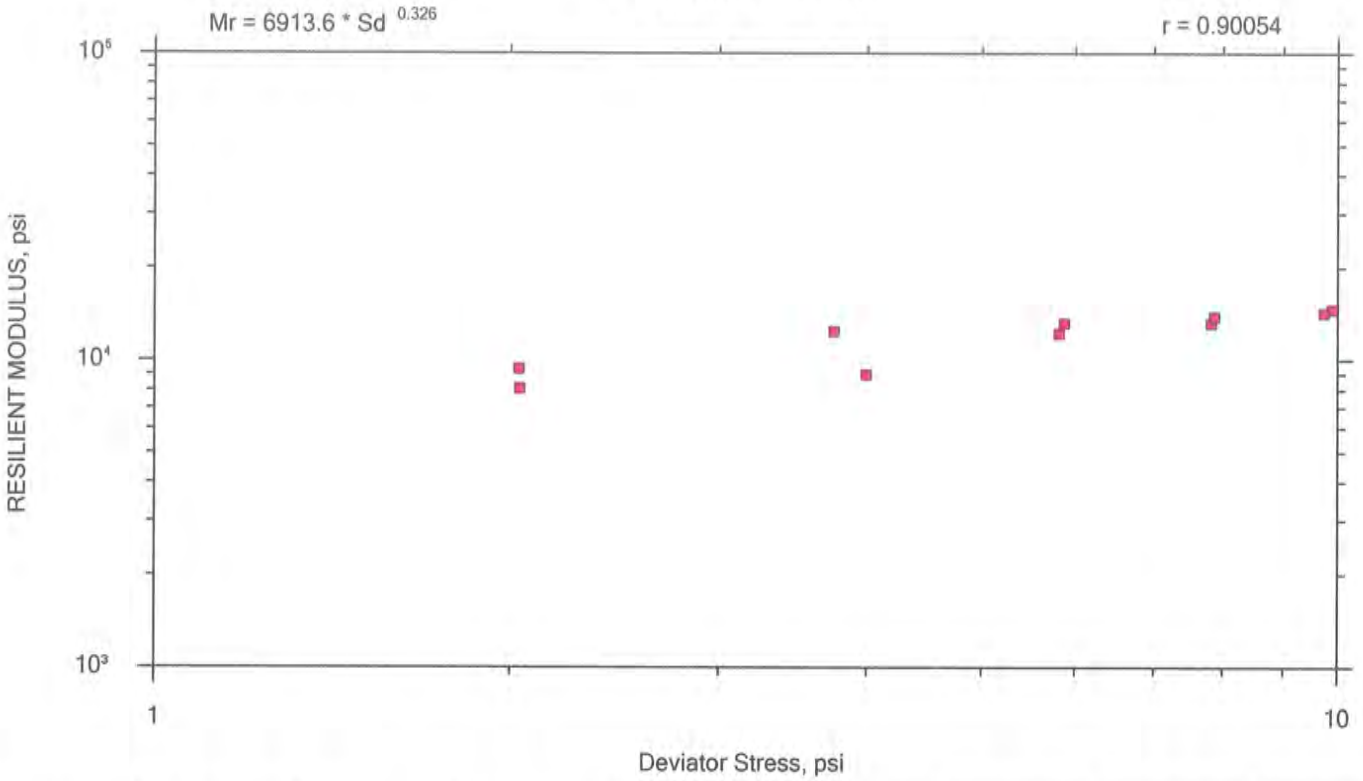
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.465	2	1.838	0.0513	15.23	0.01	0.00	13583	571.77
4.503	4	3.716	0.0942	17.23	0.02	0.00	14653	529.62
4.494	6	5.797	0.0849	19.28	0.05	0.00	11265	350.8
4.487	8	7.761	0.0537	21.22	0.06	0.00	10683	278.51
4.482	10	9.875	0.0561	23.32	0.09	0.00	9364.3	43.823
2.463	2	2.02	0.0484	9.408	0.03	0.00	5744.9	245.75
2.468	4	4.023	0.1541	11.43	0.05	0.00	7865.9	375.7
2.469	6	5.858	0.0377	13.27	0.06	0.00	8284.1	102.96
2.471	8	7.952	0.0393	15.37	0.08	0.00	9368.6	197.87
2.472	10	9.846	0.0812	17.26	0.10	0.00	9063.6	46.166

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: McP RedNatVirg	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1725 moisture 14.8%		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\McP Red Native Virgin.dat		

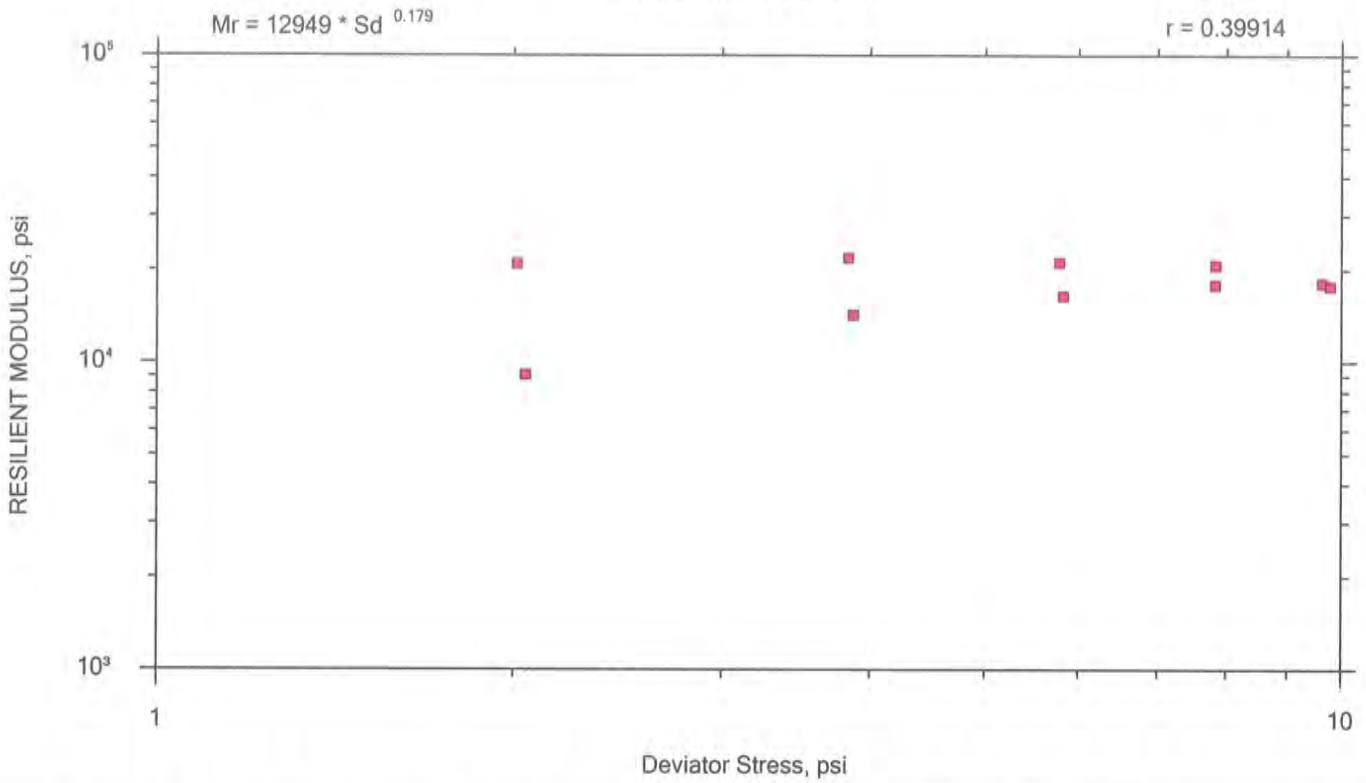
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.478	2	2.033	0.1234	15.47	0.02	0.00	9367.9	980.56
4.469	4	3.993	0.1825	17.4	0.04	0.00	8975.8	499.54
4.461	6	5.814	0.0661	19.2	0.04	0.00	12202	229.11
4.457	8	7.818	0.0612	21.19	0.05	0.00	13183	350.35
4.484	10	9.897	0.0970	23.35	0.06	0.00	14610	123.2
2.443	2	2.036	0.1063	9.366	0.02	0.00	8069.7	465.94
2.444	4	3.751	0.1336	11.08	0.03	0.00	12389	454.15
2.443	6	5.873	0.1677	13.2	0.04	0.00	13197	481.89
2.442	8	7.867	0.1172	15.19	0.05	0.00	13844	113.57
2.512	10	9.734	0.0490	17.27	0.06	0.00	14238	286.19

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: McP Red 5% LKD	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1727, moisture 16.7%, and 5% LKD		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\McP Red 5% LKD.dat		

RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.443	2	2.013	0.0585	15.34	0.01	0.00	20902	3315.8
4.442	4	3.834	0.1038	17.16	0.02	0.00	21886	1809.6
4.465	6	5.78	0.0886	19.17	0.02	0.00	21172	992.02
4.485	8	7.834	0.0719	21.29	0.03	0.00	20717	353.17
4.466	10	9.624	0.1079	23.02	0.05	0.00	18108	144.55
2.471	2	2.046	0.0383	9.46	0.02	0.00	9088.1	704.33
2.465	4	3.871	0.0715	11.27	0.02	0.00	14275	294.24
2.467	6	5.822	0.0539	13.22	0.03	0.00	16448	598.09
2.468	8	7.827	0.0700	15.23	0.04	0.00	17905	294.2
2.468	10	9.78	0.1346	17.18	0.05	0.00	17707	223.26

Project: LKD KTRAN	Location:	Project No.: AD-3700-17
Boring No.:	Tested By: JL	Checked By:
Sample No.: McP Red Lime	Test Date: 6/26/2017	Depth:
Test No.: 17-0976	Sample Type: Remold KU specs	Elevation:
Description:		
Remarks: Remolded with DD 1524, moisture 15.2%, and 3% lime		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2017\17-0976\17-0976\McP Red Lime.dat		

Appendix E: LKD Lab Data from the Baker Wetlands

KANSAS DEPARTMENT OF TRANSPORTATION

INFORMATION SHEET FOR SOIL SAMPLES

Submitted by Luke Metheny Address 700 SW Harrison Date 4-8-15

Engineer in Charge Jim Brennan Sampled by Geotechnical Section

Project No. 10-23 K-8392-04 County Douglas

Type of Const. Subgrade Investigation (Lime Kiln Dust) Check whether: Active ☐ Prelim ☐ Research ☒

Sample Number	Station	Dist. $\mathbb{C}_L$ m.	Depth m	Tests Required	Remarks
ST-1	0+56	10.3 Lt	0.0-2.0	Resmod, Rtn, dry density, % moisture, QU	Resmod is the priority
ST-2	1+06	8.4 Lt	0.0-2.0	Resmod, Rtn, dry density, % moisture, QU	Resmod is the priority
ST-3	1+38	10.0 Lt	0.0-2.0	Resmod, Rtn, dry density, % moisture, QU	Resmod is the priority
ST-4	1+73	9.0 Lt	0.0-2.0	Resmod, Rtn, dry density, % moisture, QU	Resmod is the priority
ST-5	2+27	12.1 Lt	0.0-2.0	Resmod, Rtn, dry density, % moisture, QU	Resmod is the priority
Bag-1	0+56	8.5 Lt	0.0-1.0	Proctor, Rtn, Swell test, Resmod, and Qu remolded to 95% Standard Proctor and Optimum Moisture	
Bag-2	1+04	9.0 Lt	0.0-1.0	Proctor w/ 5% Lime Kiln Dust, Rtn after mixing, Resmod, Swell, Qu on plugs after 3 and 7 days	
Bag-3	1+36	10.0 Lt	0.0-1.0	Proctor w/ 8% Lime Kiln Dust, Rtn after mixing, Resmod, Swell, Qu on plugs after 3 and 7 days	
Bag-4	1+71	9.5 Lt	0.0-1.0	Proctor w/ 12% Lime Kiln Dust, Rtn after mixing, Resmod, Swell, Qu on plugs after 3 and 7 days	
Bag-5	2+24	12.3 Lt	0.0-1.0	Proctor w/ 15% Lime Kiln Dust, Rtn after mixing, Resmod, Swell, Qu on plugs after 3 and 7 days	
Date: 4-8-15				Lab No. 15-0714	

Kansas Department of Transportation

Report of sample of Soil

Laboratory No. 15-0714

Date Reported. May 8, 2015

Date Received. April 8, 2015

Specification No -- Quantity - - -

Source of material

Sample from Subgrade

Submitted by Luke Metheny for Jim Brennan

Identification marks Tags on bags and in Shelby Tubes

Project or POV 10-23 K-8392-04

Type of construction

TEST RESULTS

Please see attached Unconfined Compression, Standard Compaction, Routine, and Resilient Modulus test results.

Swell Test Results :

Bag-1	Bag-2	Bag-3	Bag-4	Bag-5
1.43%	0.21%	0.81%	2.08%	3.55%

c : Jim Brennan (email & 1 copy)
Luke Metheny (email)
File 18-3

Reported by:

Title Luke Metheny, P.E., Geotchnical Engineer

Kansas Department of Transportation

Report of sample of Shelby Tubes and Bags

Laboratory No. 15-0714
Date Reported: 4/30/2015
Date Received: 4/8/2015

Specification N°. AASHTO T-208 — Quantity: 5 tubes 5 bags
Source of Material 10-23 K8392-04 — County: Douglas
Sampled from 10-23 K8392-04
Submitted by: Luke Metheny
Identification marks: Tags on samples
Project or POV 10-23 K8392-04
Description of site:
Type of Construction Subgrade Investigation (Lime Kiln Dust)

TEST RESULTS

Sample No.	Station	Offset (FT)	Depth (FT)	Description	Unconfined. Compression Qu (psf)	Elastic Modulus E (psf)	Dry Density γ_d (pcf)	Moisture Percent w %
ST-1	0+56	10.3' Lt	0.0-2.0	Firm brown clay with rocks	*		108.7	18.5
ST-2	1+06	8.4' Lt	0.0-2.0	Firm brown clay with rocks	*		119.8	14.6
ST-3	1+38	10' Lt	0.0-2.0	Firm brown clay with rocks	*		116.3	13.9
ST-4	1+73	9' Lt	0.0-2.0	Firm brown clay with rocks	*		110.1	13.2
ST-5	2+27	12.1' Lt	0.0-2.0	Firm brown clay with rocks	5340	310000	107.4	15.6
Bag-1	0+56	8.5' Lt	0.0-1.0	95% Standard Proctor Optimum Moisture	2220	95200	97.4	18.0
Bag-2	1+04	9.0' Lt	0.0-1.0	5% lime remold QU at 3 days	9180	1920000	94.9	19.1
Bag-3	1+36	10.0' Lt	0.0-1.0	8% lime remold QU at 3 days	7450	886000	95.0	16.2
Bag-4	1+71	9.5' Lt	0.0-1.0	12% lime remold QU at 3 days	5520	425000	94.7	12.8
Bag-5	2+24	12.3' Lt	0.0-1.0	15% lime remold QU at 3 days	7130	646000	94.8	12.2
Bag-2	1+04	9.0' Lt	0.0-1.0	5% lime remold QU at 7 days	11900	3200000	96.8	17.5
Bag-3	1+36	10.0' Lt	0.0-1.0	8% lime remold QU at 7 days	12400	2190000	96.0	16.1
Bag-4	1+71	9.5' Lt	0.0-1.0	12% lime remold QU at 7 days	9230	1010000	95.7	12.9
Bag-5	2+24	12.3' Lt	0.0-1.0	15% lime remold QU at 7 days	8990	1280000	94.2	12.2

* Not enough sample for Qu

See attached routine and standard proctor test results

cc: L. Metheny (email)
R. Henthorne (email)
D. thompson (email)
File 18-3

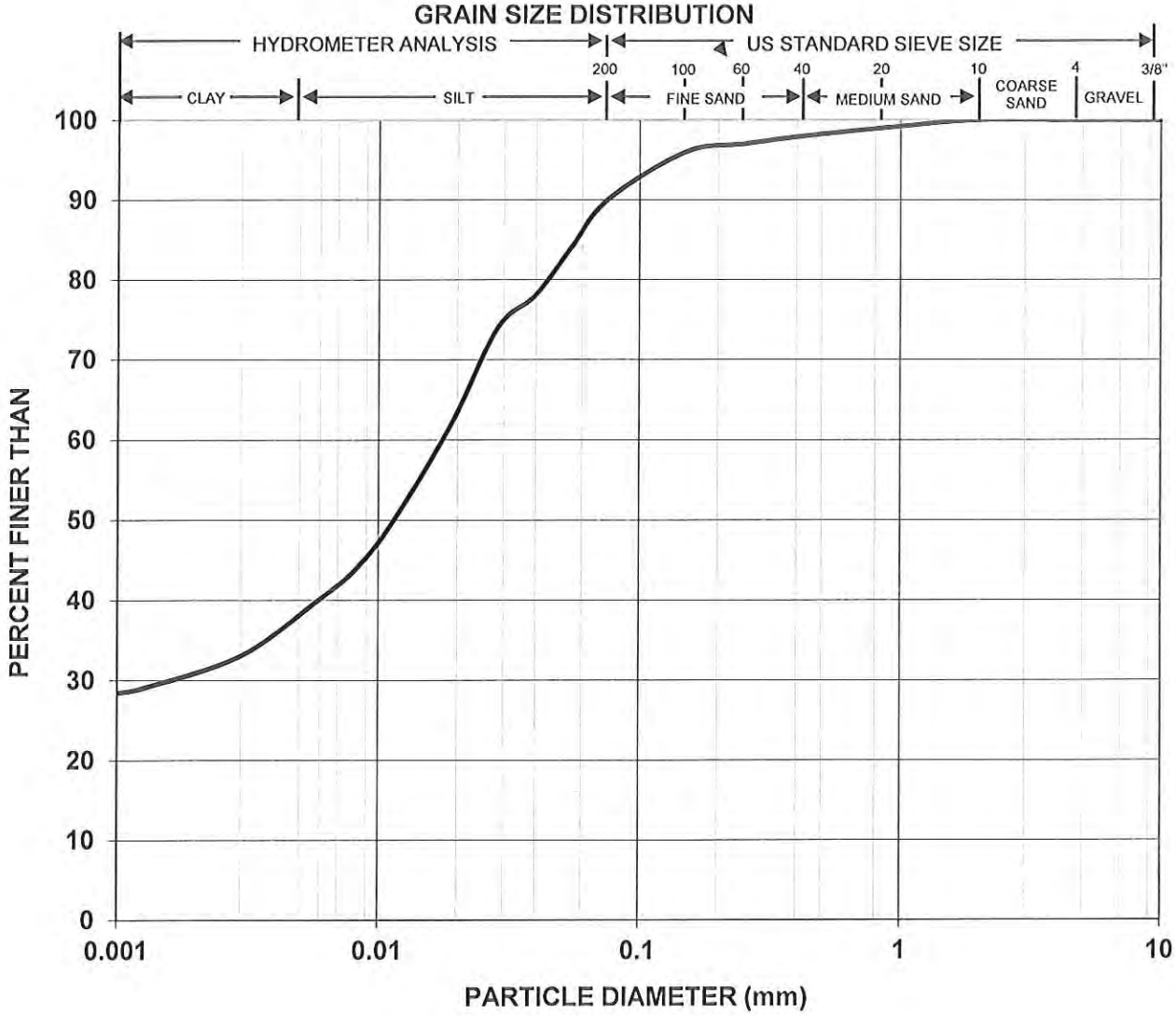
Reported by: Luke Metheny

Title: Luke Metheny, P.E., Geotechnical Engineer

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/23/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-1	0+56	10.3Lt	0.0-2.0	36	19	17	0.0	2.63	C / CL

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

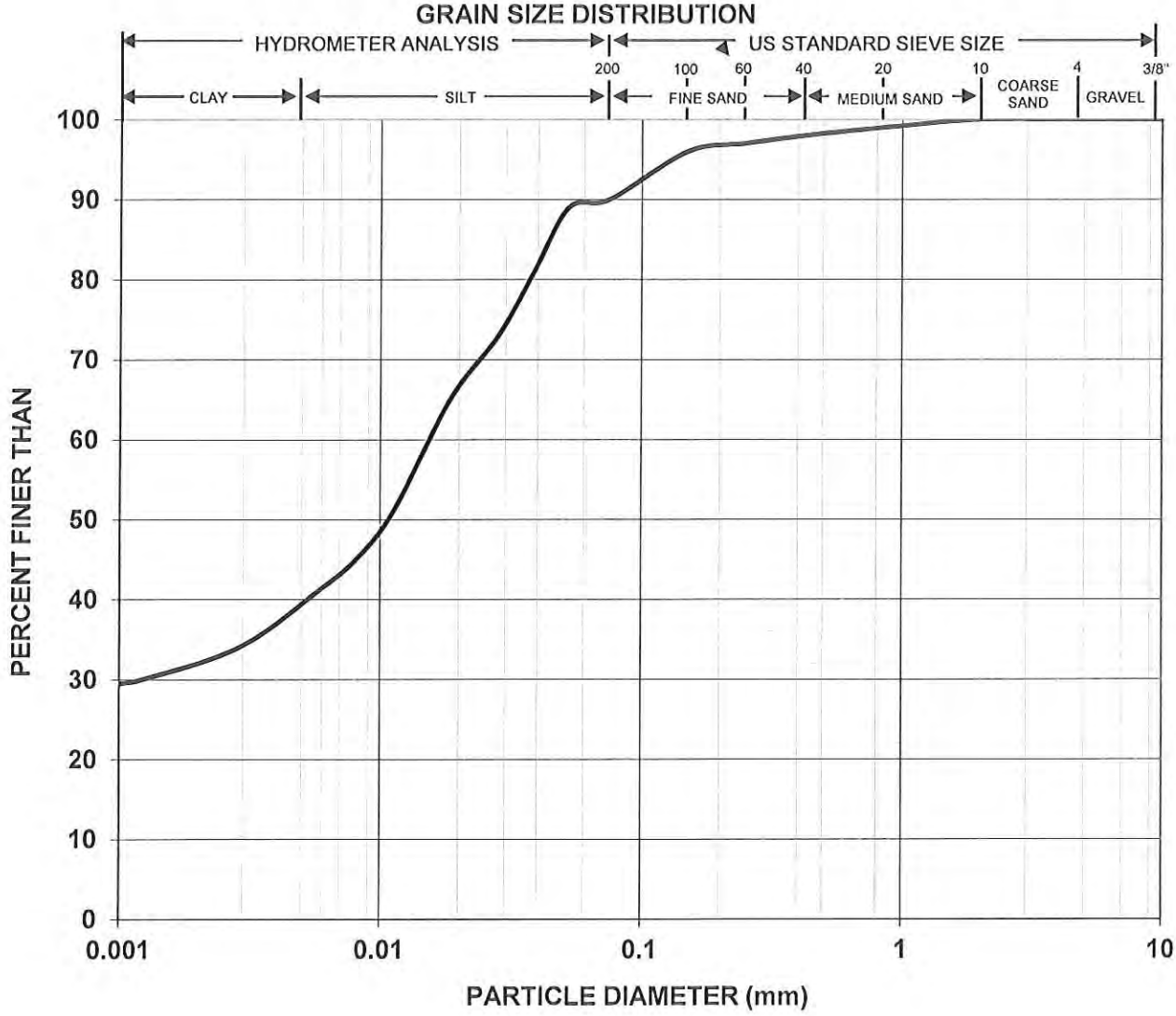
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/24/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-2	1+06	8.4Lt	0.0-2.0	35	17	18	0.0	2.67	C / CL

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

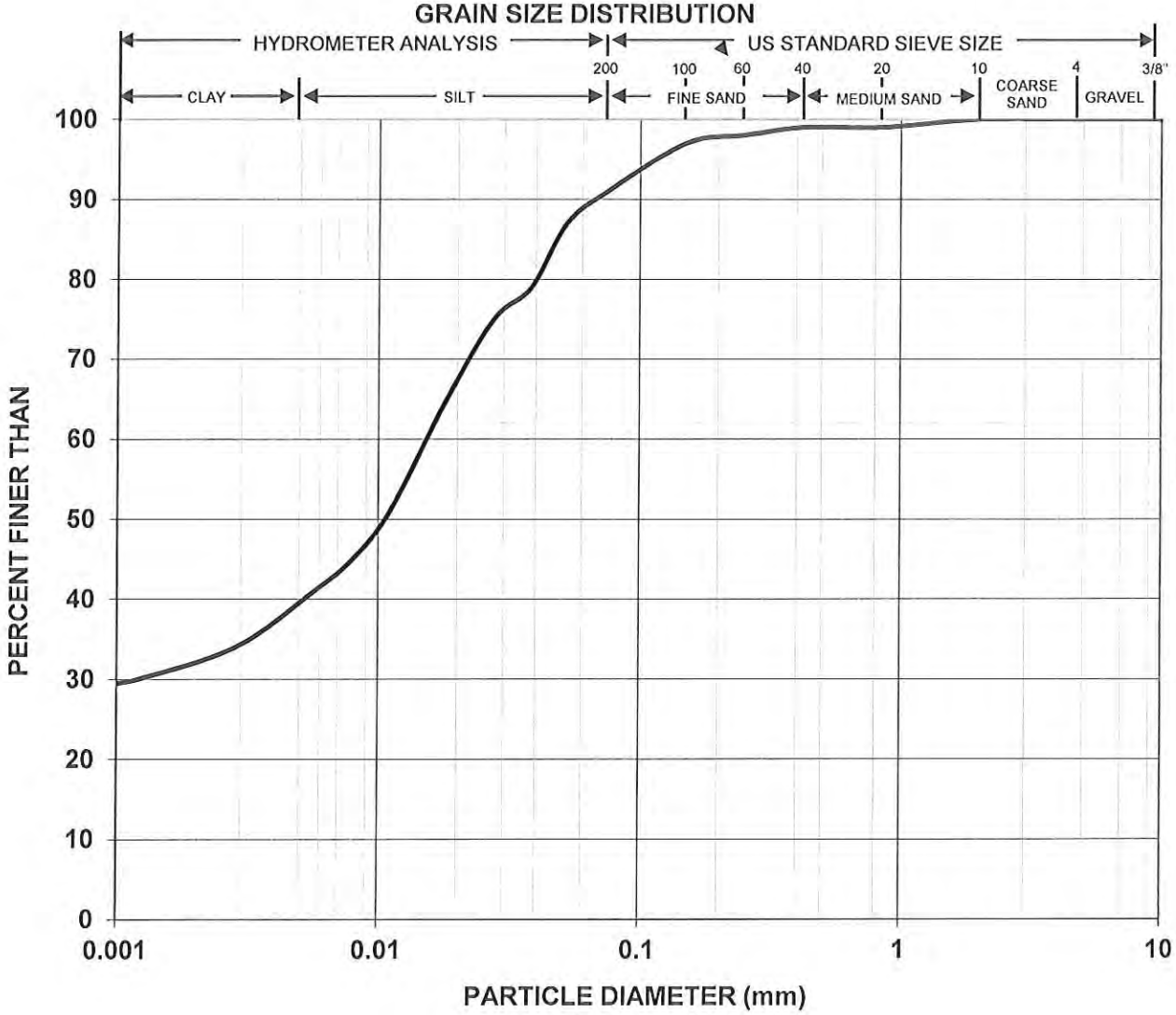
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/24/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-3	1+38	10.0Lt	0.0-2.0	37	20	17	0.0	2.71	C / CL

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

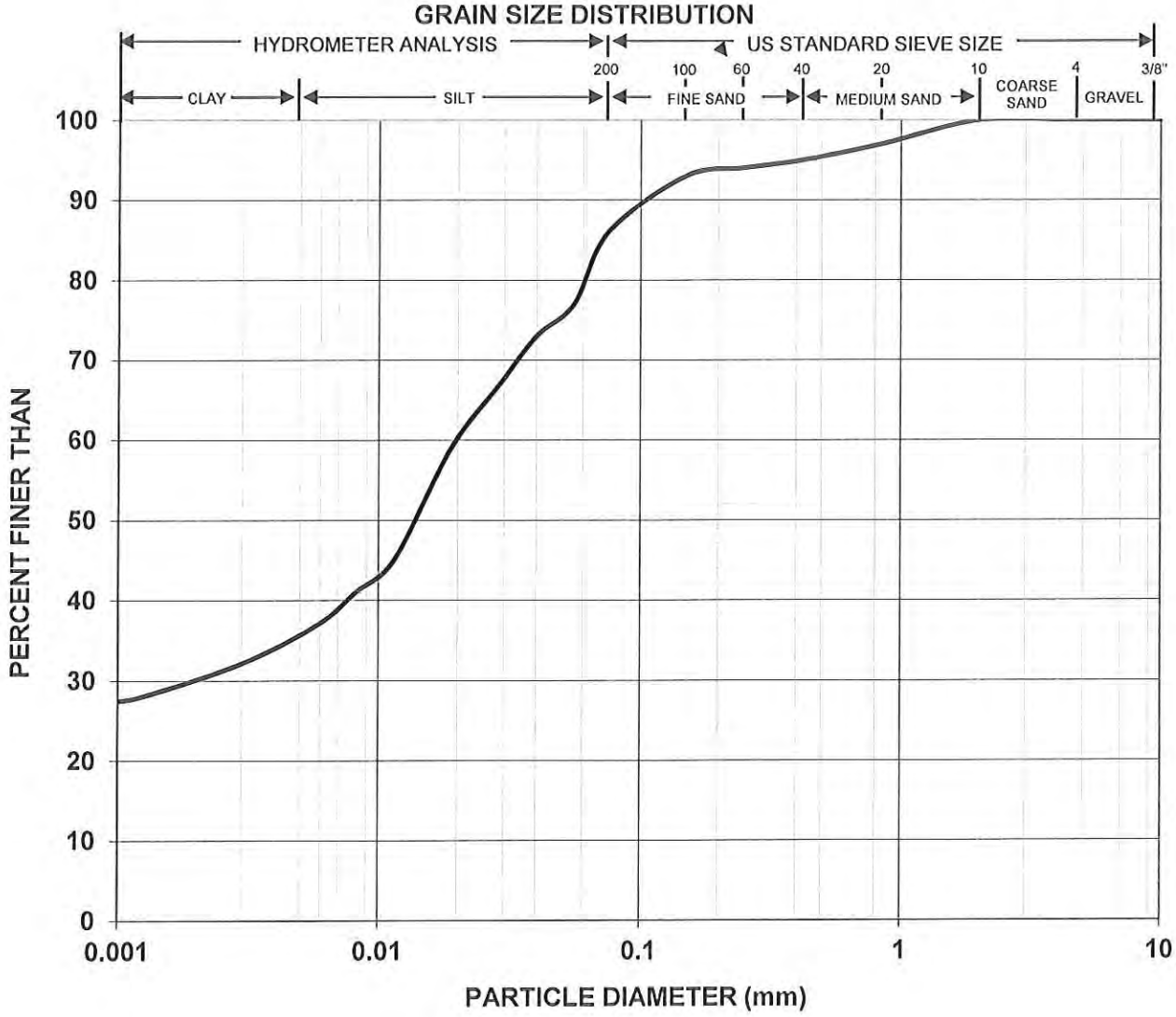
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/24/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-4	1+73	9.0Lt	0.0-2.0	33	18	15	0.0	2.67	C / CL

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

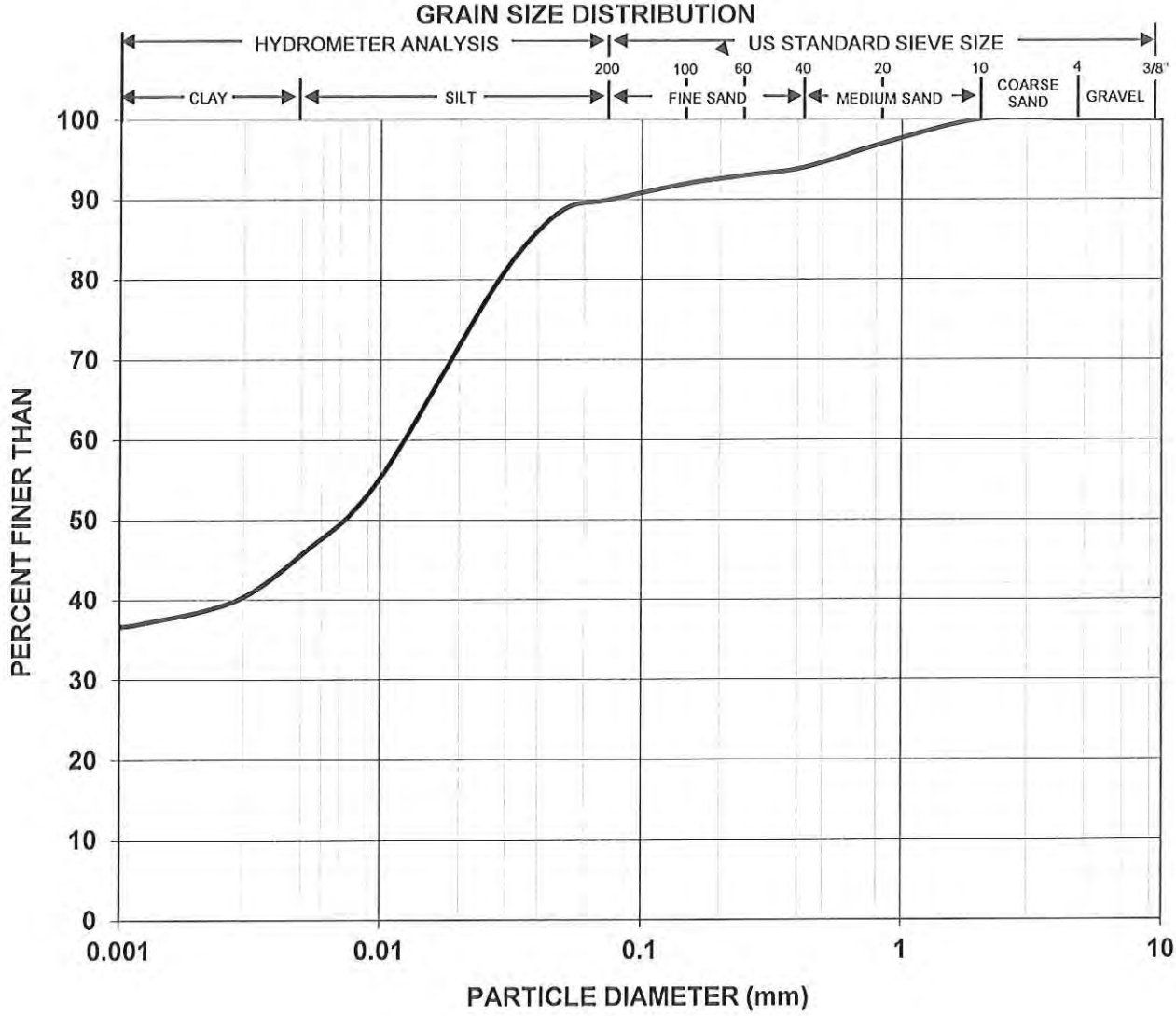
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/30/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-5	2+27	12.1Lt	0.0-2.0	44	23	21	0.0	2.68	C / CL

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

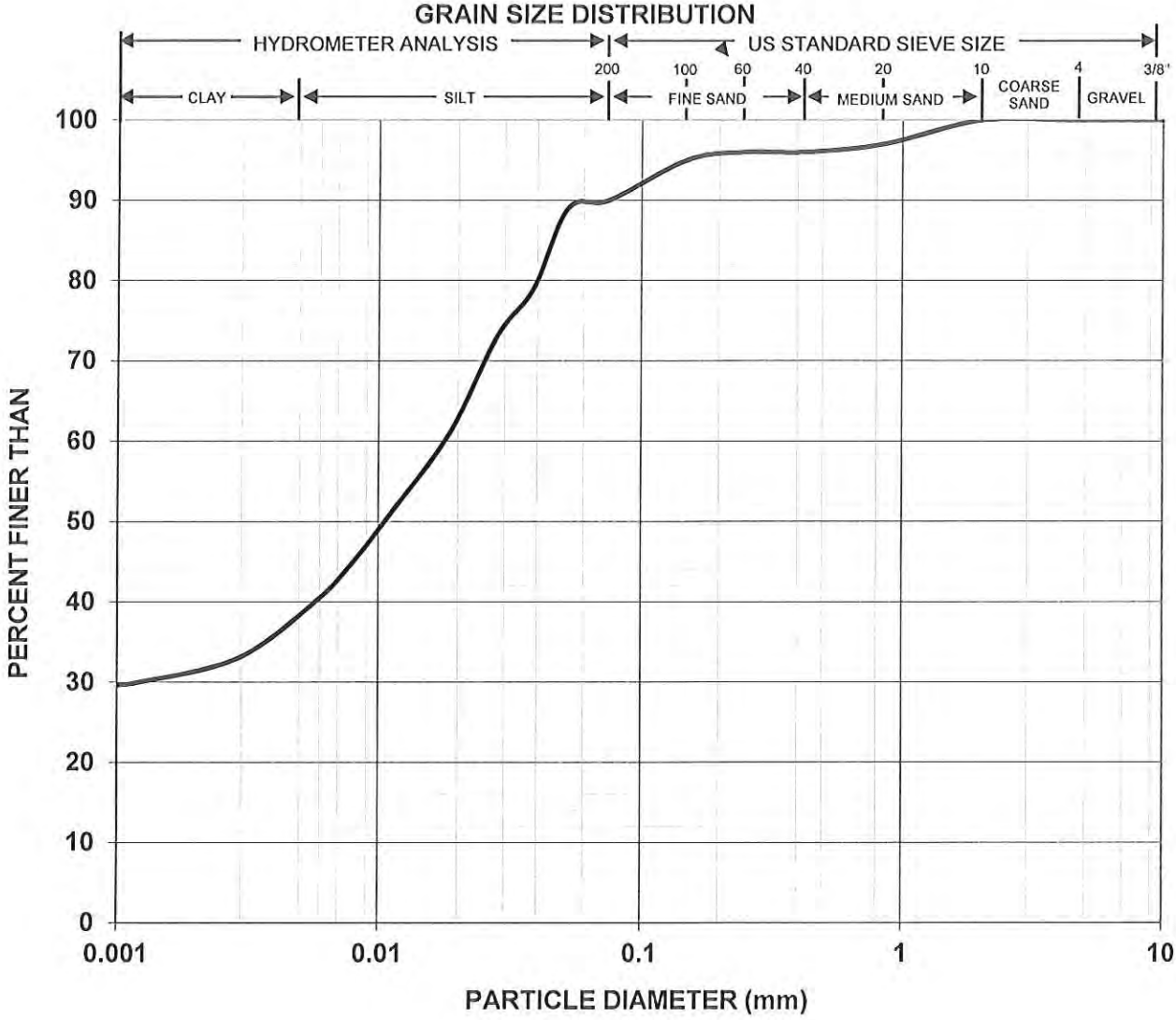
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY:	Luke Metheny	**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/15/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
Bag 1 Raw	0+56	8.5Lt	0.0-1.0	36	19	17	0.0	2.69	C / CL

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

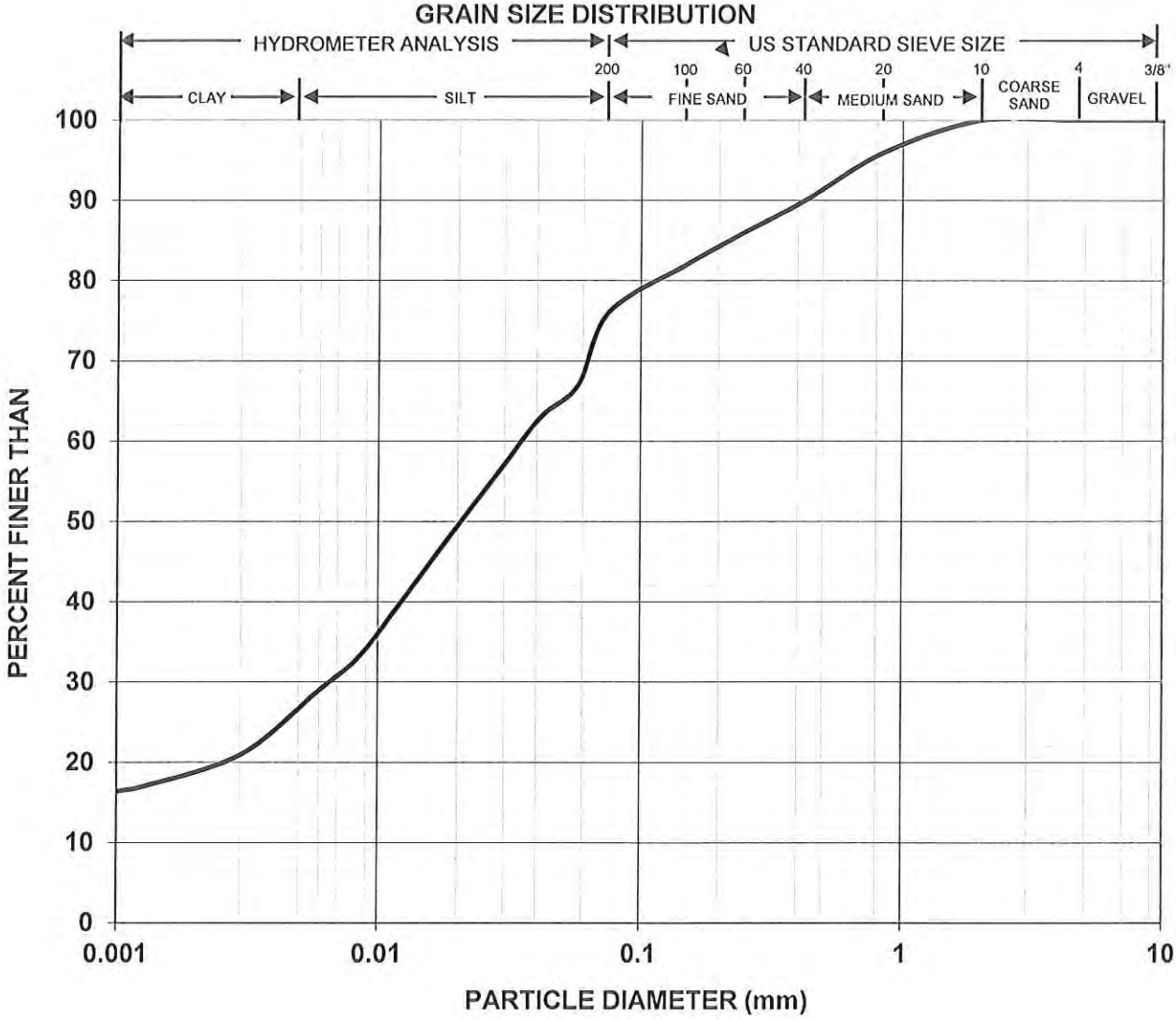
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY:	Luke Metheny	**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/22/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
Bag 2 5%LKD	1+04	9.0Lt	0.0-1.0	34	28	6	0.0	2.69	CL / ML

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

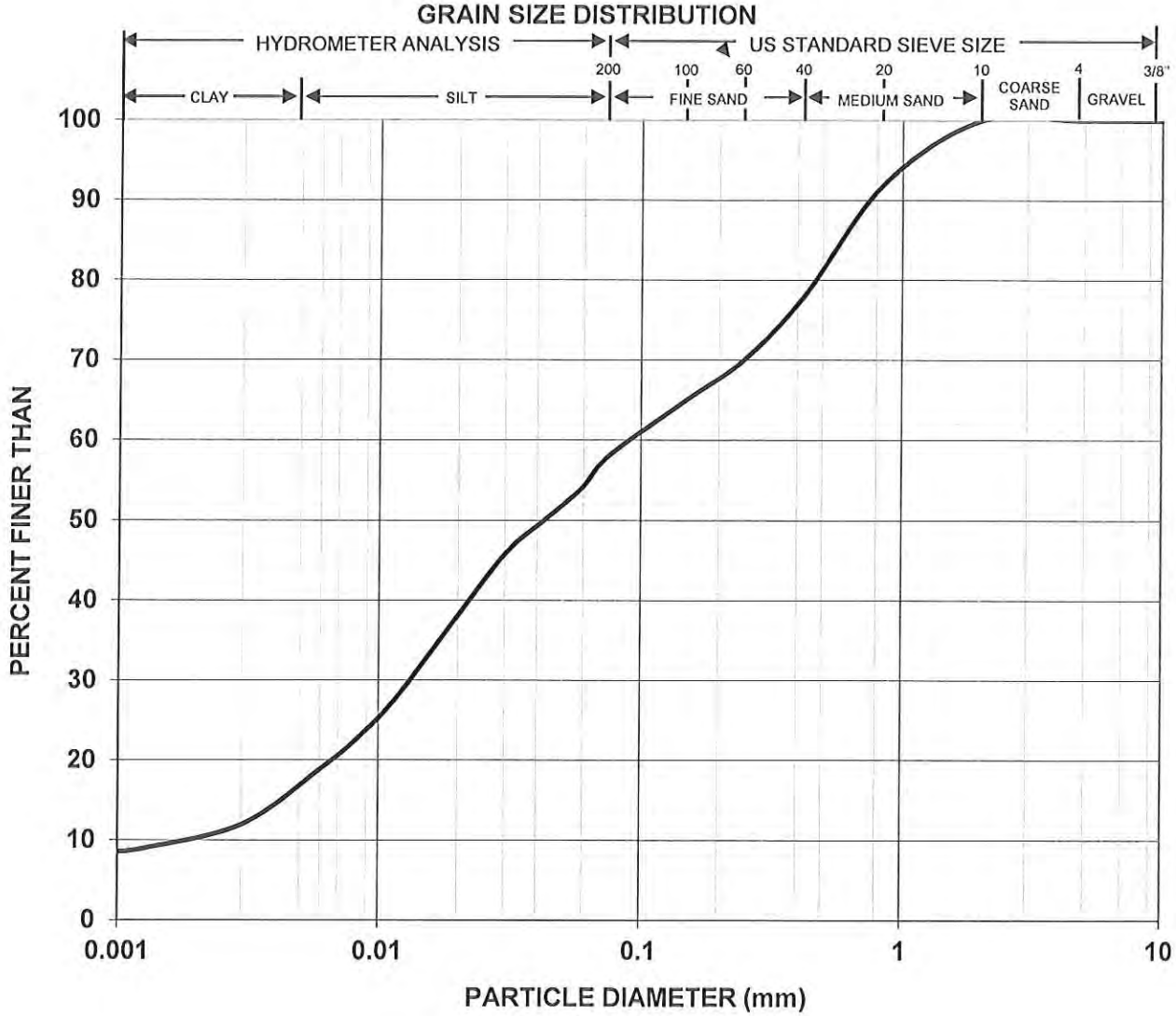
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/22/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
Bag 3 8%LKD	1+36	140.0Lt	0.0-1.0	NP	NP	NP	0.0	2.75	L / ML

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

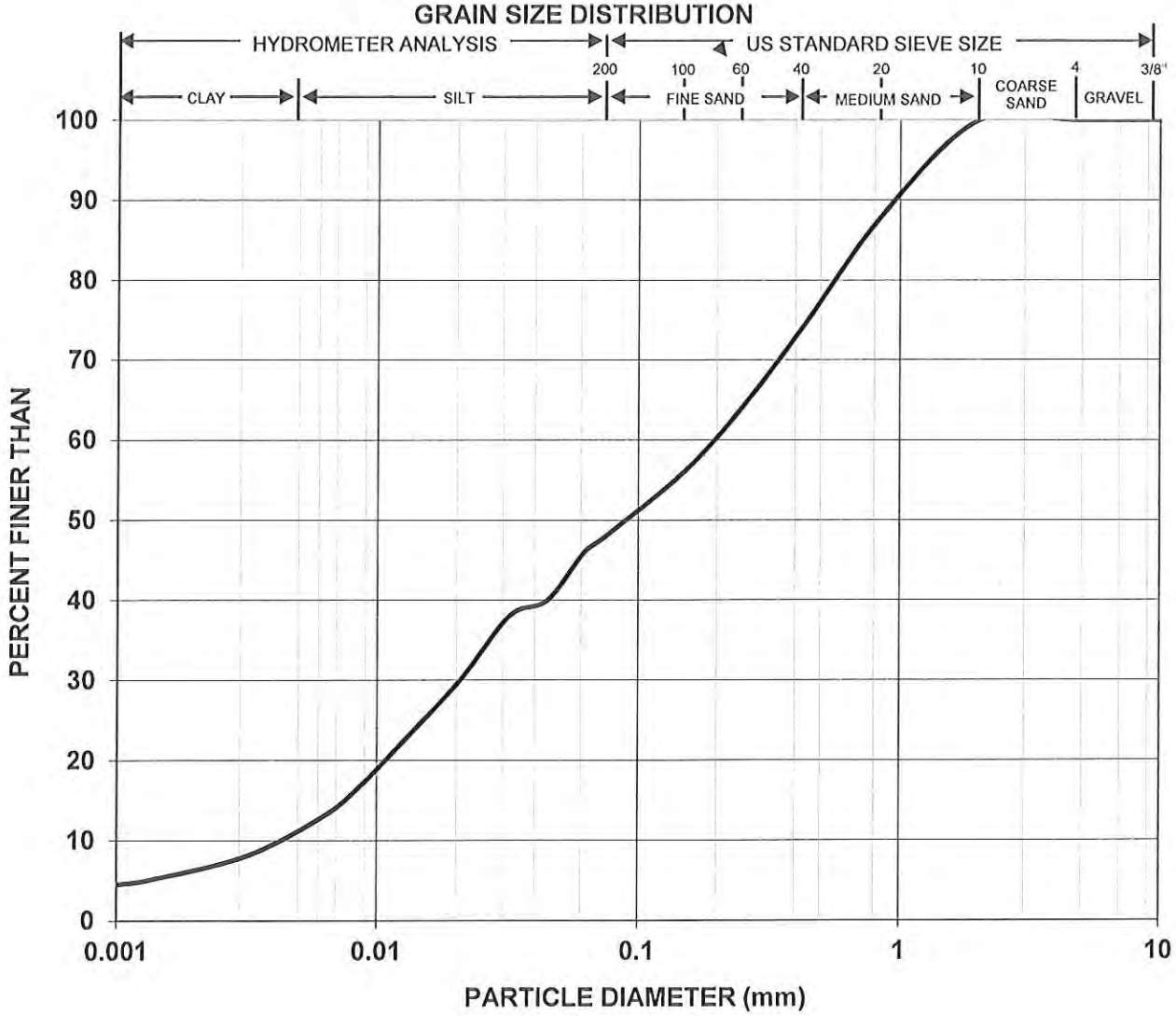
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/30/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
Bag 4 12%LKD	1+71	9.5Lt	0.0-1.0	NP	NP	NP	0.0	2.68	SL / SM

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

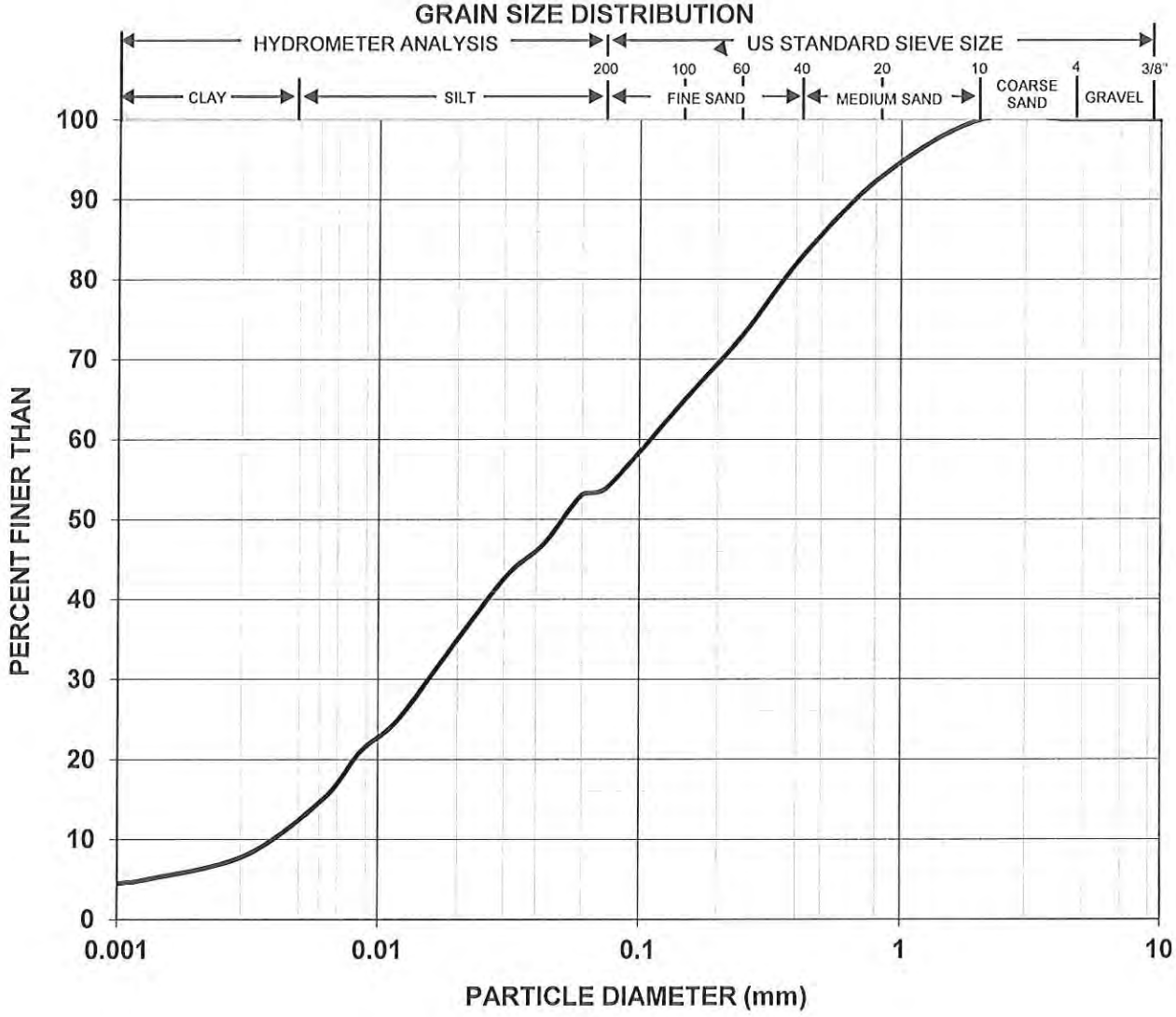
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-0714
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	4/30/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
Bag 5	2+24	12.3Lt	0.0-1.0	NP	NP	NP	0.0	2.72	SL / ML

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

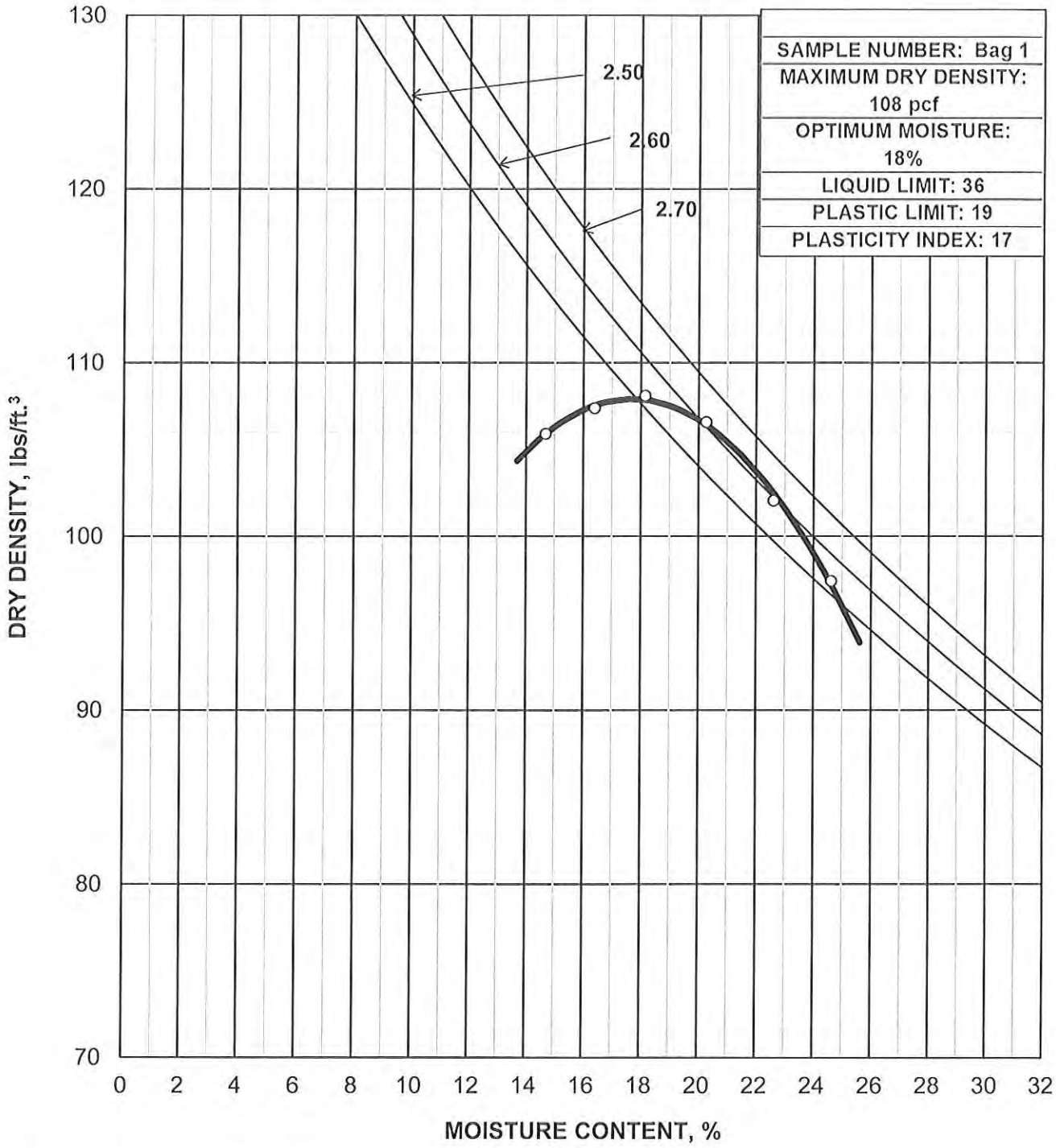
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION

REPORT OF SOIL COMPACTION TESTS

SUBMITTED BY	Luke Metheny	**ADDRESS**	ESOB	**LAB. NO**	015-0714
PROJECT	10-23 K-8392-04	**COUNTY**	Douglas	**DATE**	4-14-15



TEST METHOD AASHTO-T99

REMARKS

Raw Soil

BY

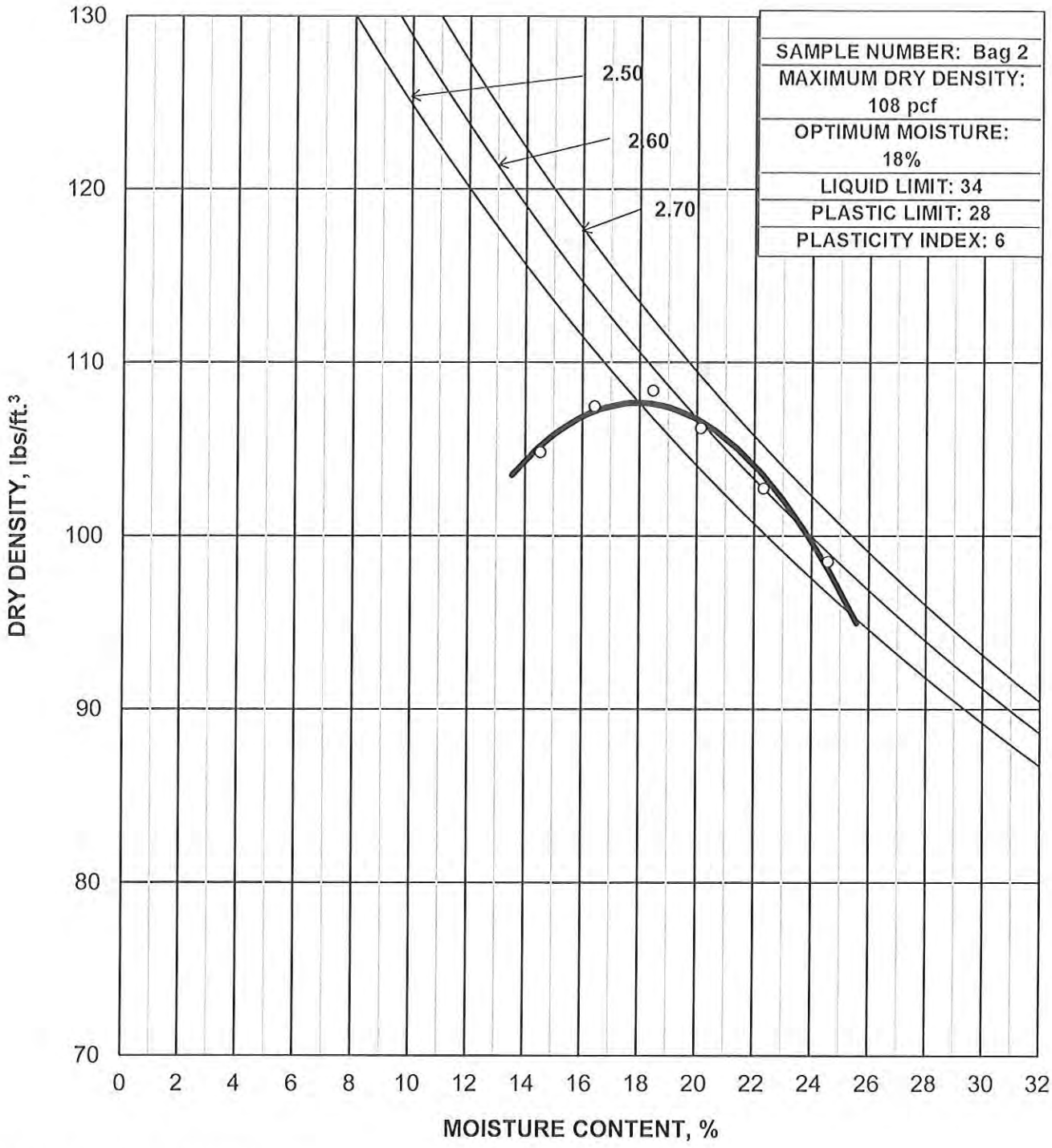
Luke Metheny, P.E., Geotechnical Engineer

D.O.T. Form No. 638

KANSAS DEPARTMENT OF TRANSPORTATION

REPORT OF SOIL COMPACTION TESTS

SUBMITTED BY	Luke Metheny	**ADDRESS**	ESOB	**LAB. NO**	015-0714
PROJECT	10-23 K-8392-04	**COUNTY**	Douglas	**DATE**	4-15-15



TEST METHOD AASHTO-T99

REMARKS

Mixed with 5% Lime Kiln Dust

BY

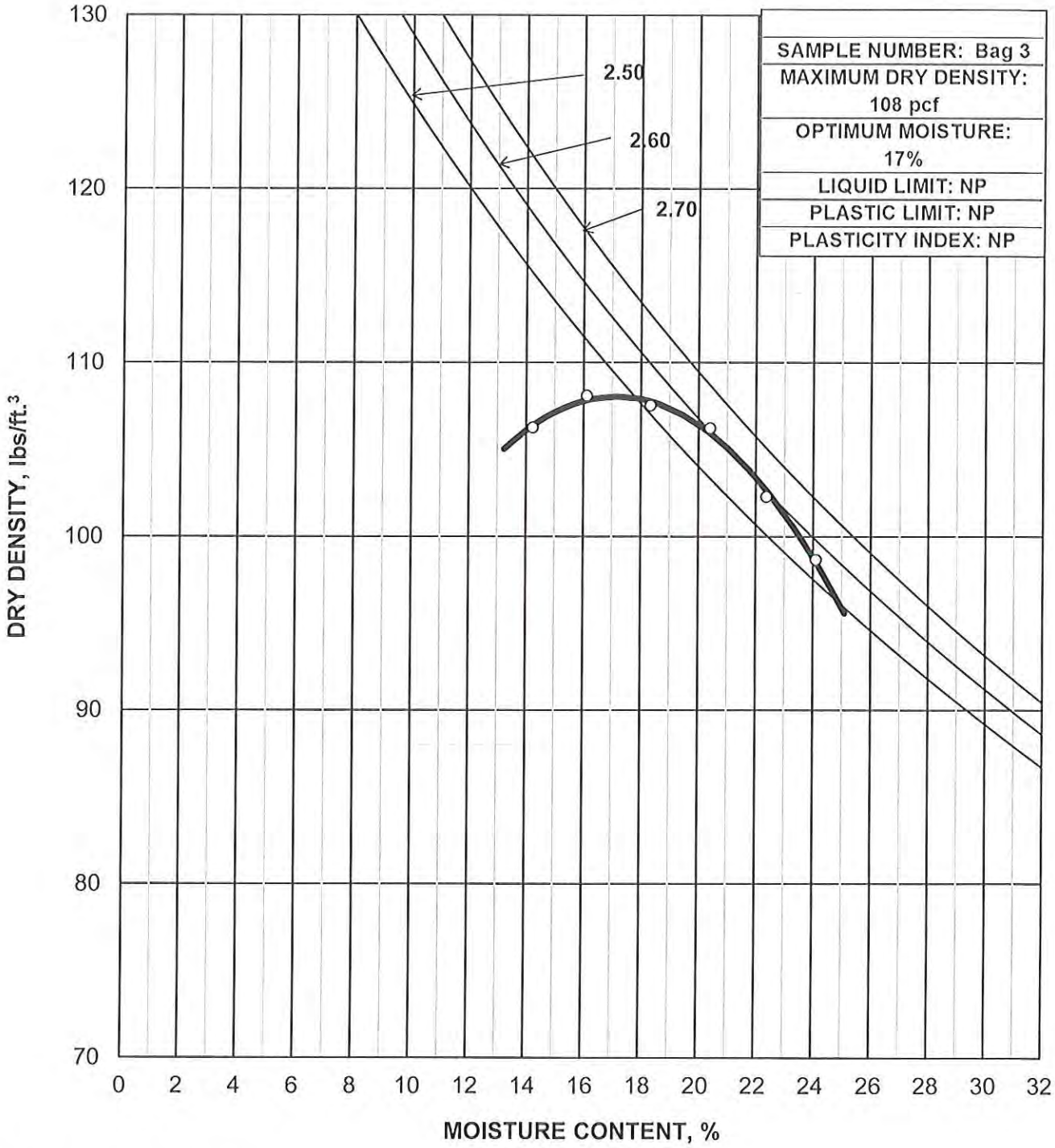
Luke Metheny, P.E., Geotechnical Engineer

D.O.T. Form No. 638

KANSAS DEPARTMENT OF TRANSPORTATION

REPORT OF SOIL COMPACTION TESTS

SUBMITTED BY	Luke Metheny	**ADDRESS**	ESOB	**LAB. NO**	015-0714
PROJECT	10-23 K-8392-04	**COUNTY**	Douglas	**DATE**	4-15-15



TEST METHOD AASHTO-T99

REMARKS

Mixed with 8% Lime Kiln Dust

BY

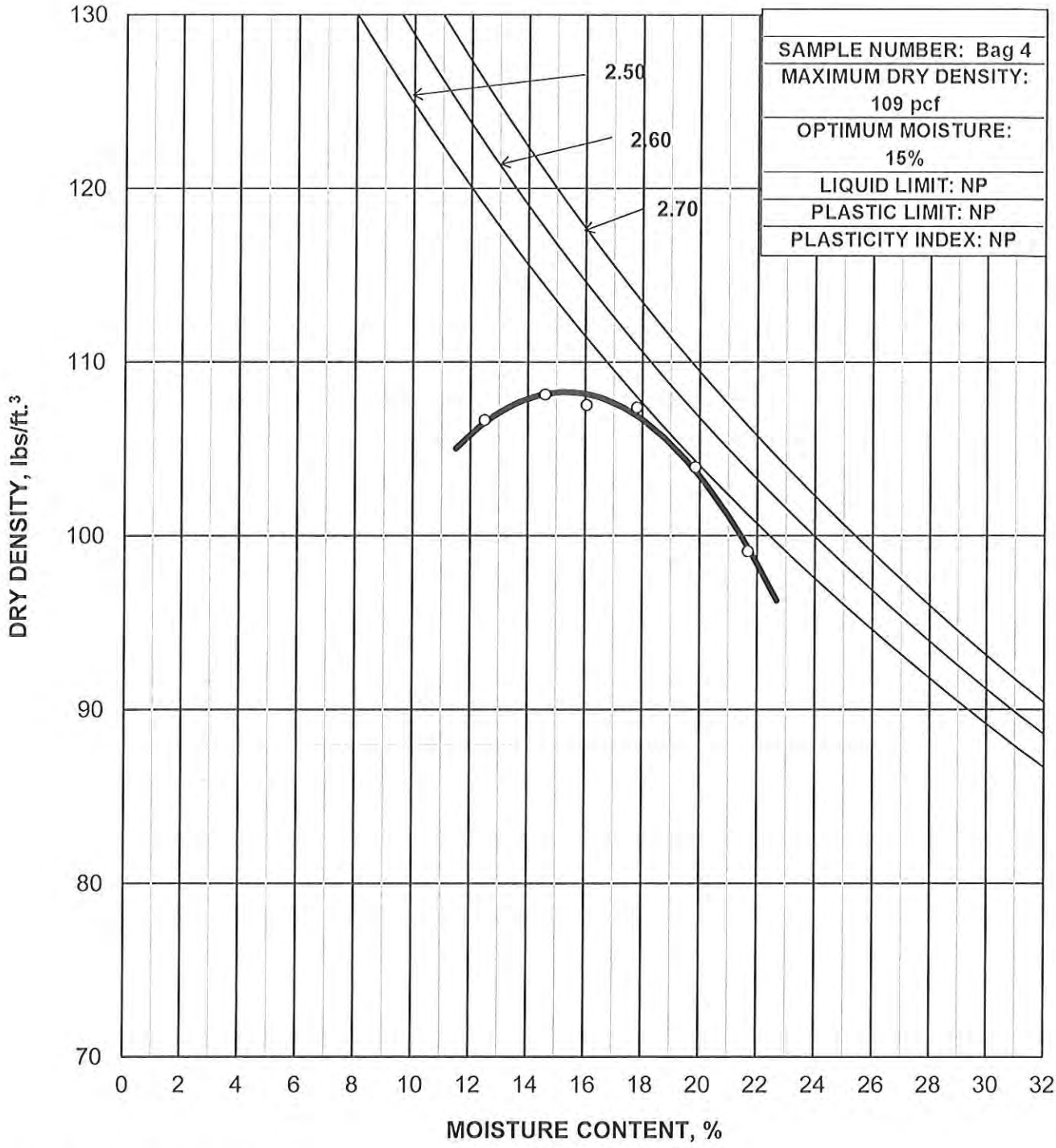
Luke Metheny, P.E., Geotechnical Engineer

D.O.T. Form No. 638

KANSAS DEPARTMENT OF TRANSPORTATION

REPORT OF SOIL COMPACTION TESTS

SUBMITTED BY	Luke Metheny	**ADDRESS**	ESOB	**LAB. NO**	015-0714
PROJECT	10-23 K-8392-04	**COUNTY**	Douglas	**DATE**	4-16-15



TEST METHOD AASHTO-T99

REMARKS

Mixed with 12% Lime Kiln Dust

BY

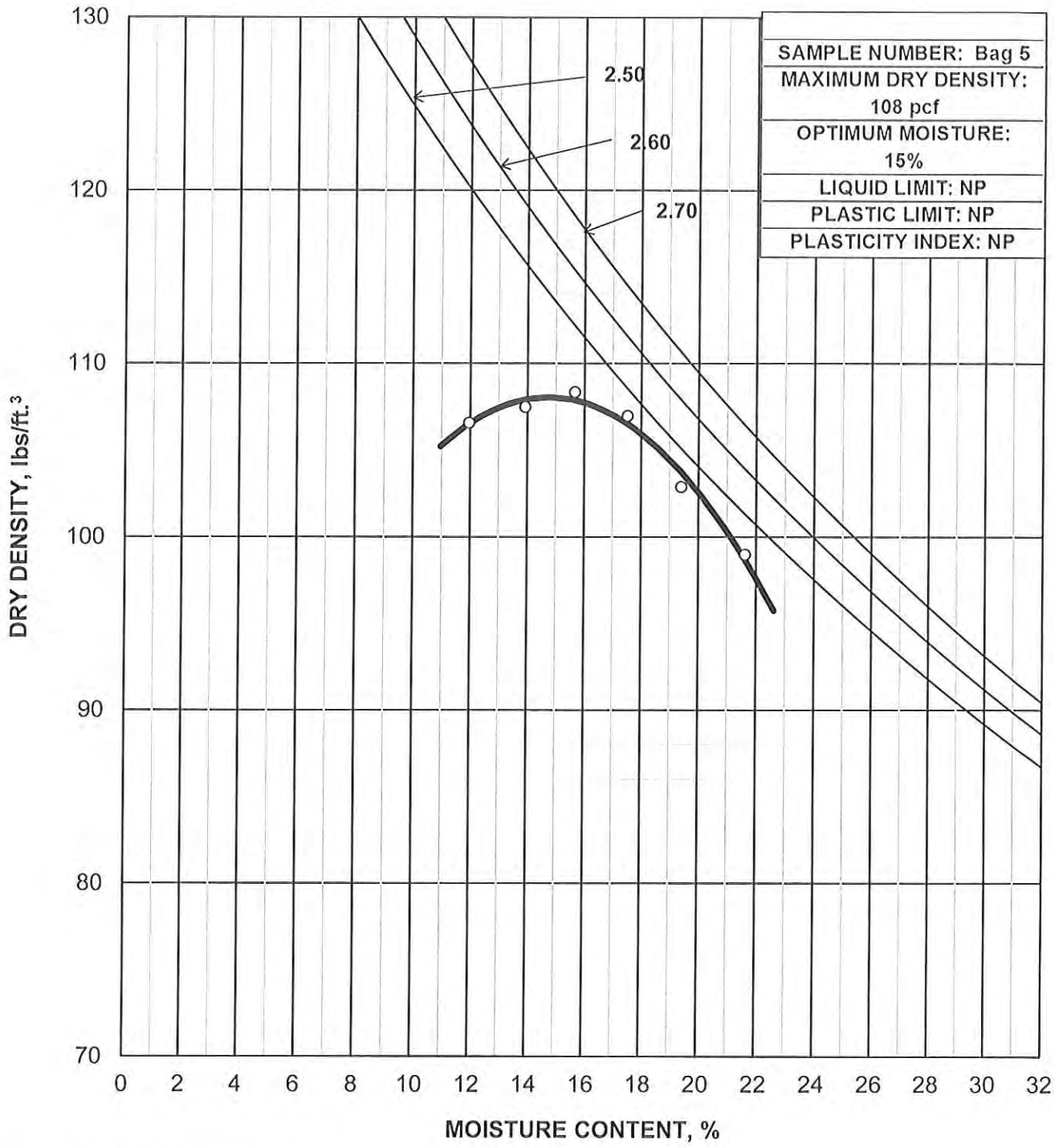
Luke Metheny, P.E., Geotechnical Engineer

D.O.T. Form No. 638

KANSAS DEPARTMENT OF TRANSPORTATION

REPORT OF SOIL COMPACTION TESTS

SUBMITTED BY	Luke Metheny	**ADDRESS**	ESOB	**LAB. NO**	015-0714
PROJECT	10-23 K-8392-04	**COUNTY**	Douglas	**DATE**	4-16-15



TEST METHOD AASHTO-T99

REMARKS

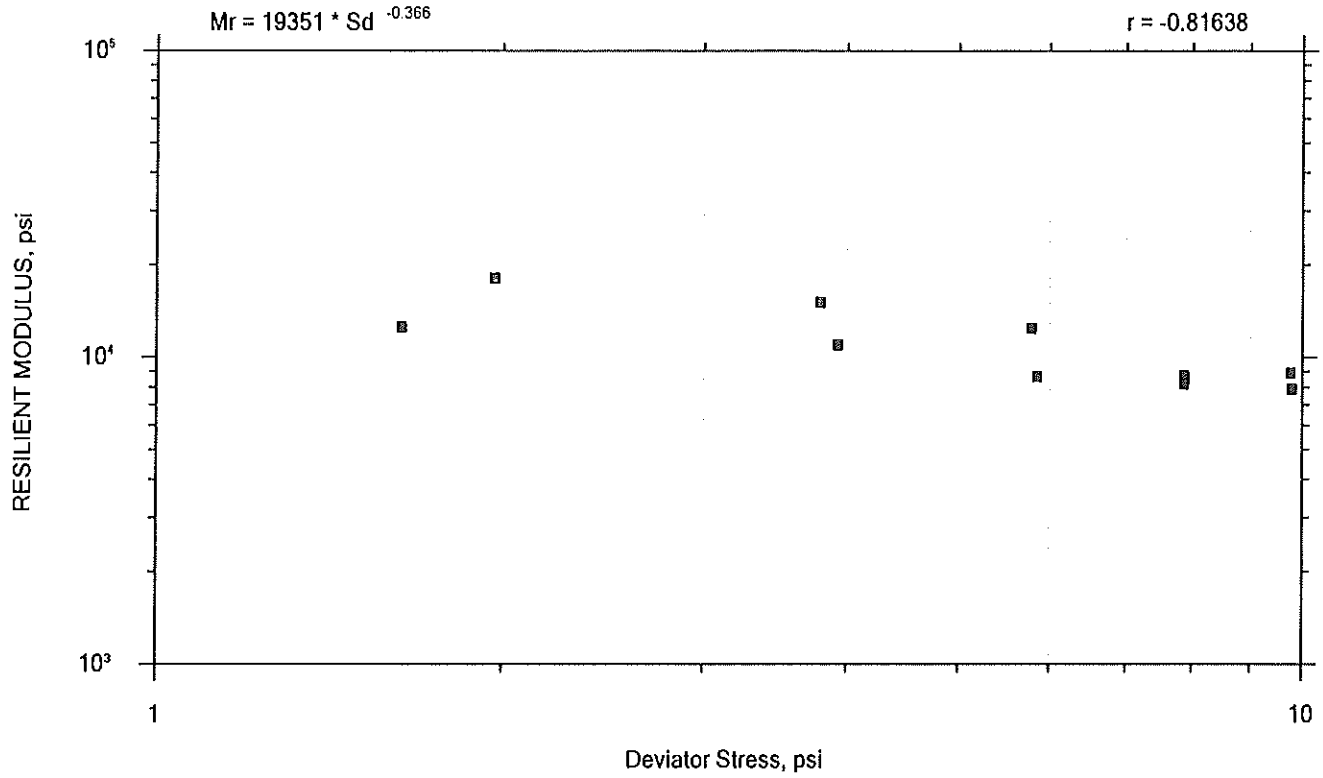
Mixed with 15% Lime Kiln Dust

BY

Luke Metheny, P.E., Geotechnical Engineer

D.O.T. Form No. 638

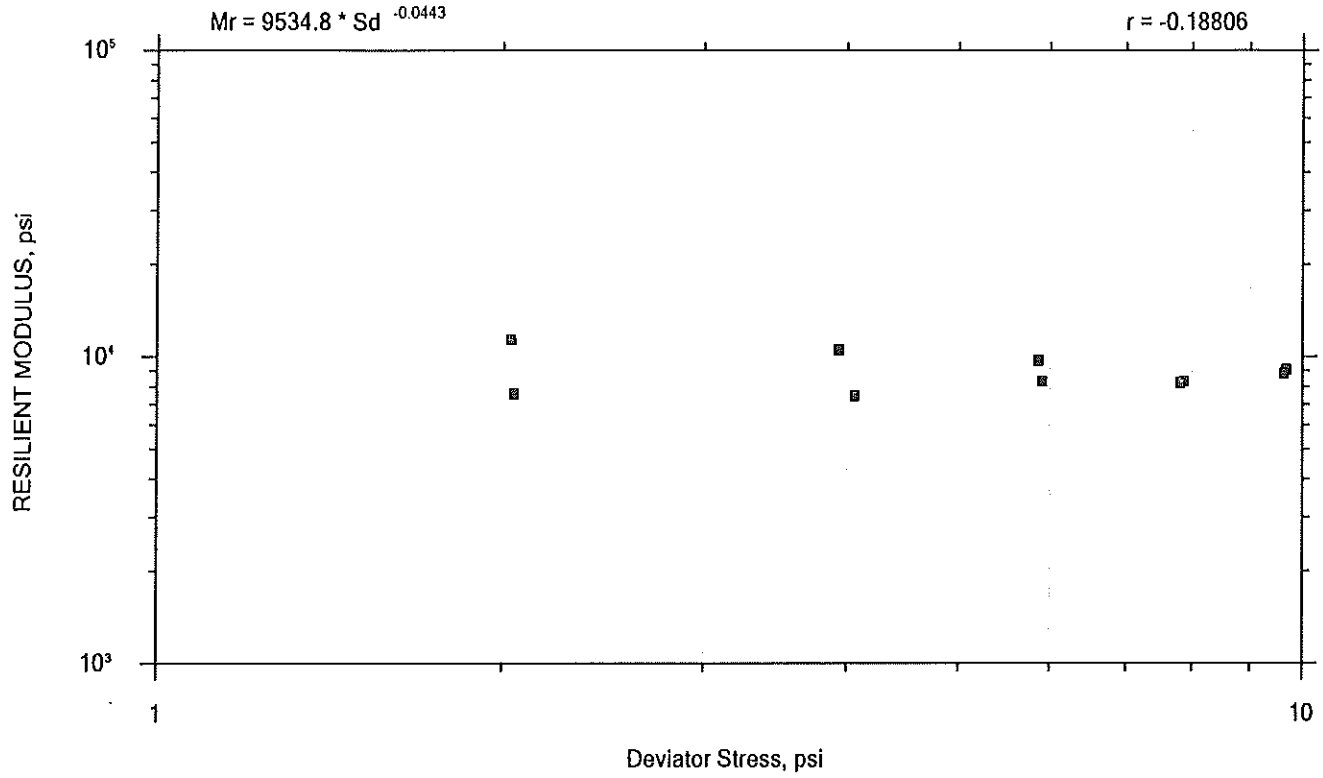
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.558	2	1.968	0.1251	15.64	0.01	0.00	18113	2056.2
4.547	4	3.795	0.0594	17.44	0.02	0.00	15083	465.83
4.538	6	5.785	0.0647	19.4	0.04	0.00	12427	322.16
4.53	8	7.875	0.0476	21.46	0.08	0.00	8717.6	133.48
4.524	10	9.766	0.1143	23.34	0.10	0.00	8897	208.7
2.57	2	1.636	0.1186	9.347	0.01	0.00	12544	1493.7
2.567	4	3.929	0.0883	11.63	0.03	0.00	10967	316.46
2.553	6	5.855	0.1219	13.51	0.06	0.00	8677.1	399.07
2.536	8	7.873	0.1434	15.48	0.09	0.00	8188.3	200.4
2.533	10	9.79	0.0991	17.39	0.11	0.00	7893.2	206.57

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: ST-1	Test Date: 4/10/2015	Depth: 0.0-2.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: Light brown clay fill, firm		
Remarks:		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2015\15-0714\15-0714 RES MOD\15-0714 ST-1.dat		

RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.628	2	2.034	0.0842	15.92	0.02	0.00	11363	2480.9
4.592	4	3.938	0.0705	17.71	0.03	0.00	10519	337.2
4.641	6	5.867	0.0630	19.79	0.05	0.00	9724.5	423.69
4.617	8	7.873	0.0875	21.72	0.08	0.00	8321.1	122.91
4.595	10	9.682	0.0583	23.47	0.10	0.00	9075.5	85.812
2.601	2	2.046	0.0855	9.848	0.02	0.00	7580.6	544.59
2.591	4	4.065	0.0667	11.84	0.05	0.00	7466.2	200.17
2.584	6	5.91	0.0679	13.66	0.06	0.00	8329.1	357.6
2.653	8	7.807	0.1030	15.77	0.08	0.00	8230.3	151.37
2.641	10	9.628	0.0886	17.55	0.10	0.00	8824.6	174.83

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: ST-3	Test Date: 4/14/2015	Depth: 0.0-2.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: Light brown clay fill, firm		
Remarks:		
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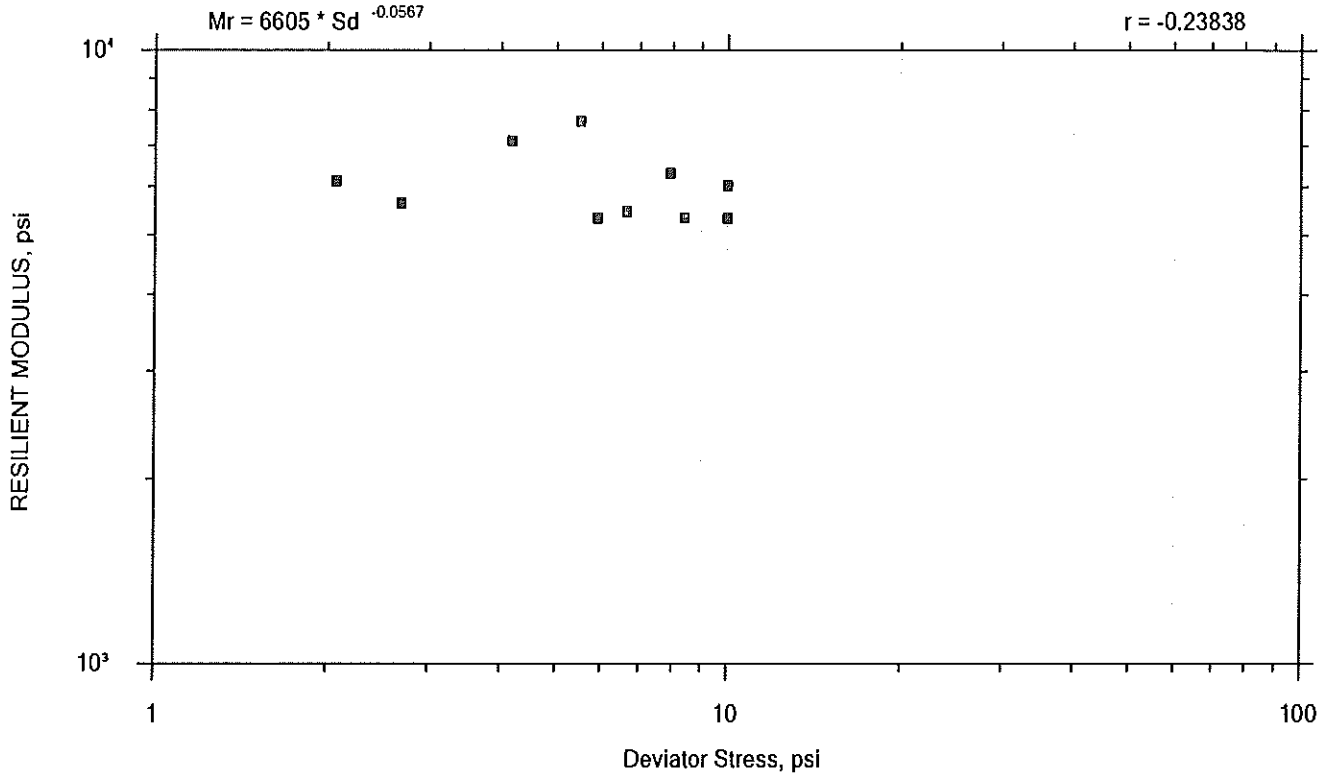
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.437	2	2.073	0.1030	15.38	0.03	0.00	6122	350.75
4.412	4	4.177	0.2253	17.41	0.05	0.01	7120.4	963.24
4.445	6	5.902	0.1815	19.24	0.10	0.00	5329	183.69
4.436	8	7.921	0.2234	21.23	0.11	0.01	6308	577.43
4.417	10	10	0.1617	23.26	0.15	0.00	6019.5	106.02
2.452	2	2.686	0.4223	10.04	0.04	0.00	5636.7	989.97
2.438	4	5.507	0.2366	12.82	0.07	0.00	7668.2	506.63
2.419	6	6.642	0.5949	13.9	0.11	0.00	5460.1	426.52
2.412	8	8.397	0.3144	15.63	0.14	0.01	5337.2	265.56
2.405	10	9.992	0.1806	17.21	0.17	0.01	5329.1	313.64

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: ST-4	Test Date: 4/16/2015	Depth: 0.0-2.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: Light brown clay fill, firm		
Remarks:		
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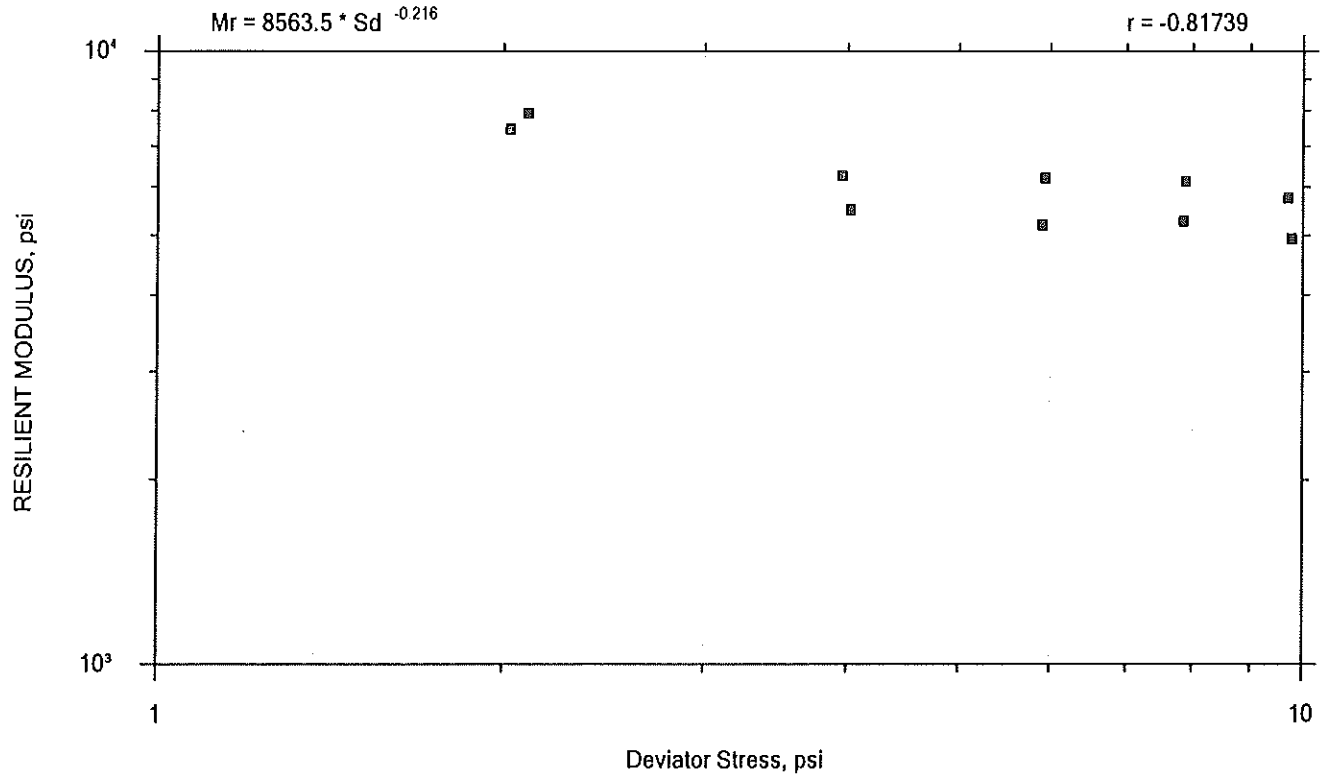
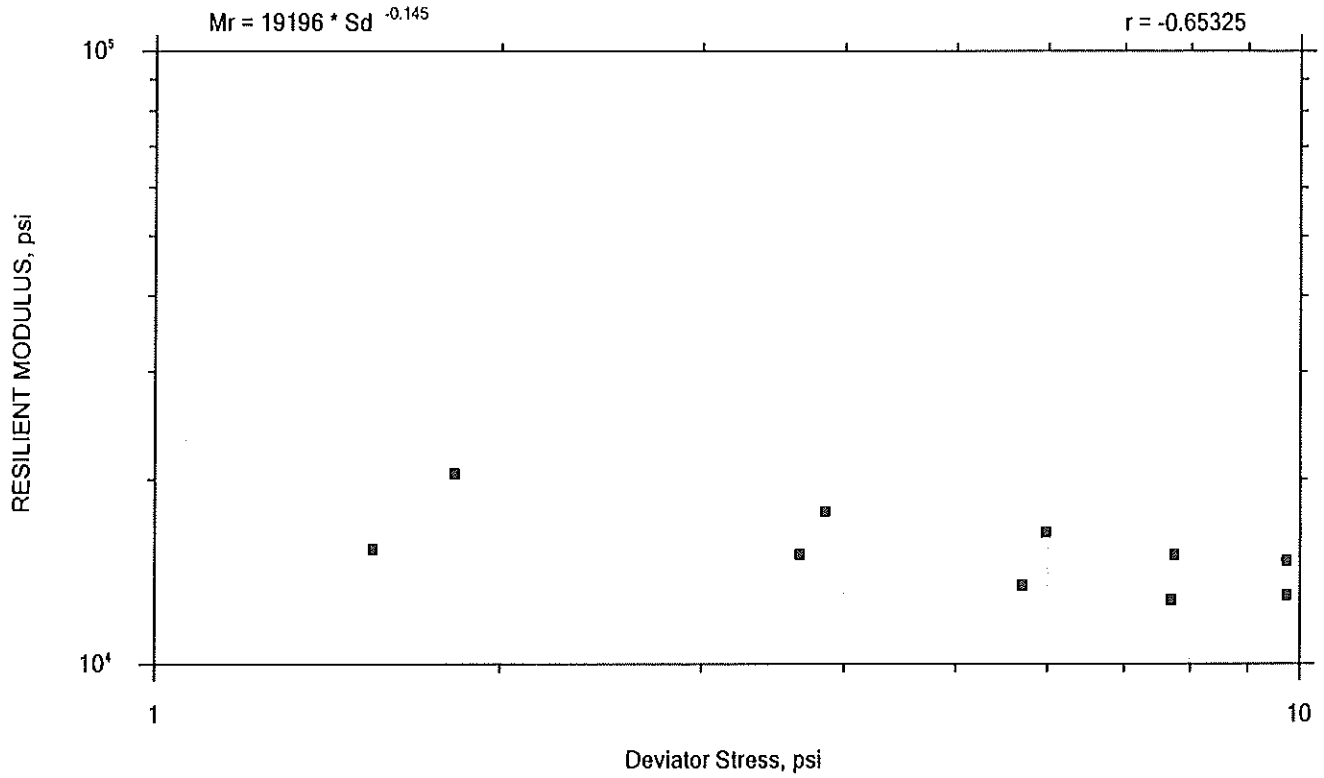
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.607	2	2.101	0.0745	15.92	0.02	0.00	7916.3	431.27
4.587	4	3.955	0.0986	17.72	0.06	0.00	6261.4	372.12
4.628	6	5.941	0.1231	19.83	0.09	0.00	6207.5	182.91
4.597	8	7.891	0.0474	21.68	0.12	0.00	6128.6	49.47
4.641	10	9.705	0.1076	23.63	0.15	0.00	5760.3	157.31
2.59	2	2.027	0.0436	9.796	0.02	0.00	7457.8	453.93
2.577	4	4.028	0.0782	11.76	0.07	0.00	5512.5	262.99
2.65	6	5.912	0.0873	13.86	0.10	0.00	5200.5	107.53
2.63	8	7.854	0.0817	15.74	0.13	0.00	5279.7	59.697
2.613	10	9.777	0.1274	17.62	0.18	0.00	4944.7	85.35

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: Bag 1	Test Date: 4/15/2015	Depth: 0.0-1.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: REMOLD		
Remarks:		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2015\15-0714\15-0714 RES MOD\15-0714 BAG 1.dat		

RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.586	2	1.826	0.0472	15.58	0.01	0.00	20437	1119.1
4.624	4	3.849	0.1117	17.72	0.02	0.00	17735	522.64
4.592	6	5.978	0.0393	19.75	0.03	0.00	16400	347.23
4.643	8	7.744	0.1297	21.67	0.05	0.00	15054	86.555
4.603	10	9.733	0.0812	23.54	0.06	0.00	14743	155.95
2.586	2	1.551	0.0879	9.31	0.01	0.00	15387	514.45
2.567	4	3.657	0.0576	11.36	0.02	0.00	15095	211.63
2.642	6	5.707	0.0403	13.63	0.04	0.00	13440	388.81
2.621	8	7.693	0.0500	15.56	0.05	0.00	12710	148.65
2.598	10	9.734	0.0825	17.53	0.07	0.00	12952	243.63

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: Bag 2	Test Date: 4/15/2015	Depth: 0.0-1.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: REMOLD		
Remarks:		
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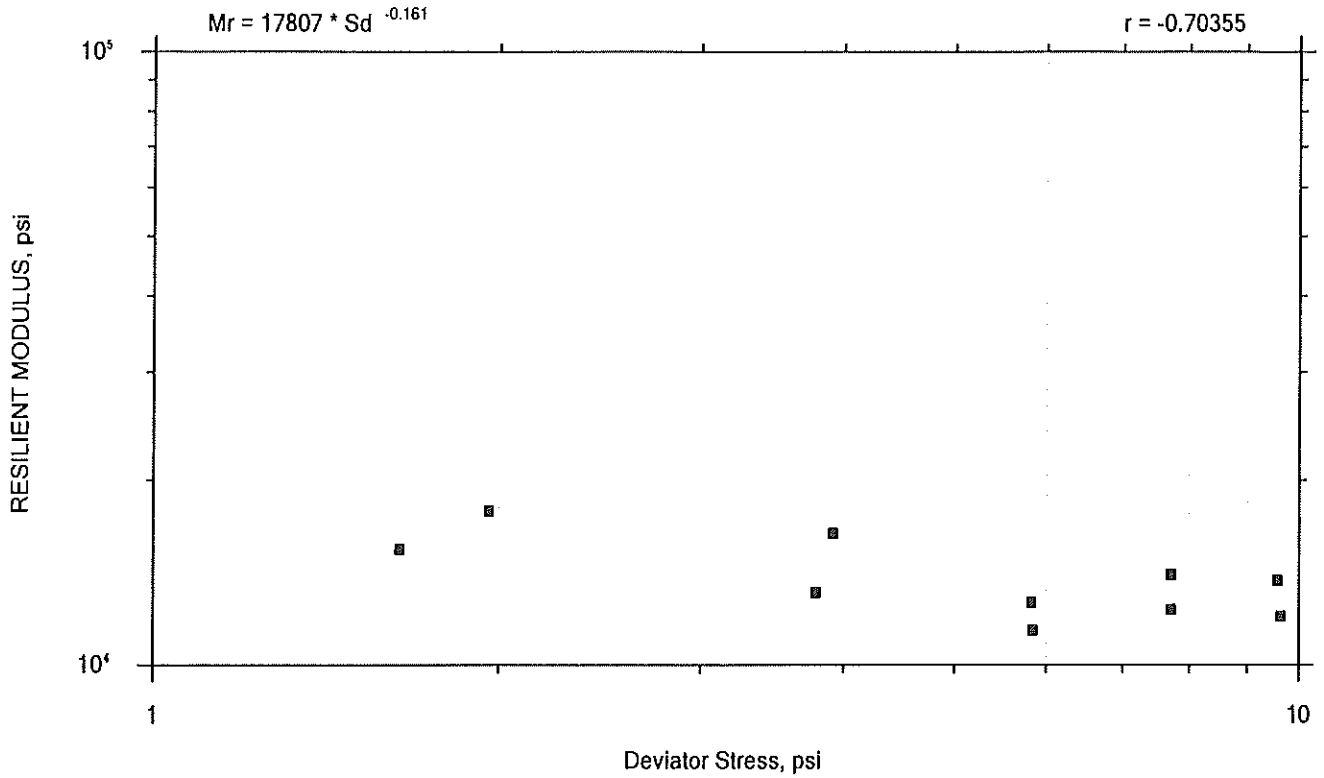
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.508	2	1.959	0.0552	15.48	0.01	0.00	17805	2042.6
4.54	4	3.916	0.0412	17.53	0.02	0.00	16386	1039.9
4.511	6	5.828	0.0329	19.36	0.04	0.00	12657	152.8
4.553	8	7.711	0.1282	21.37	0.05	0.00	14035	171.59
4.528	10	9.573	0.0738	23.16	0.06	0.00	13734	81.565
2.501	2	1.639	0.0721	9.144	0.01	0.00	15417	712.98
2.494	4	3.783	0.0628	11.26	0.03	0.00	13114	566.06
2.56	6	5.842	0.1163	13.52	0.05	0.00	11403	334.2
2.543	8	7.71	0.0693	15.34	0.06	0.00	12313	136.11
2.526	10	9.639	0.0751	17.22	0.07	0.00	11999	164.13

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: Bag 3	Test Date: 4/16/2015	Depth: 0.0-1.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: REMOLD		
Remarks:		
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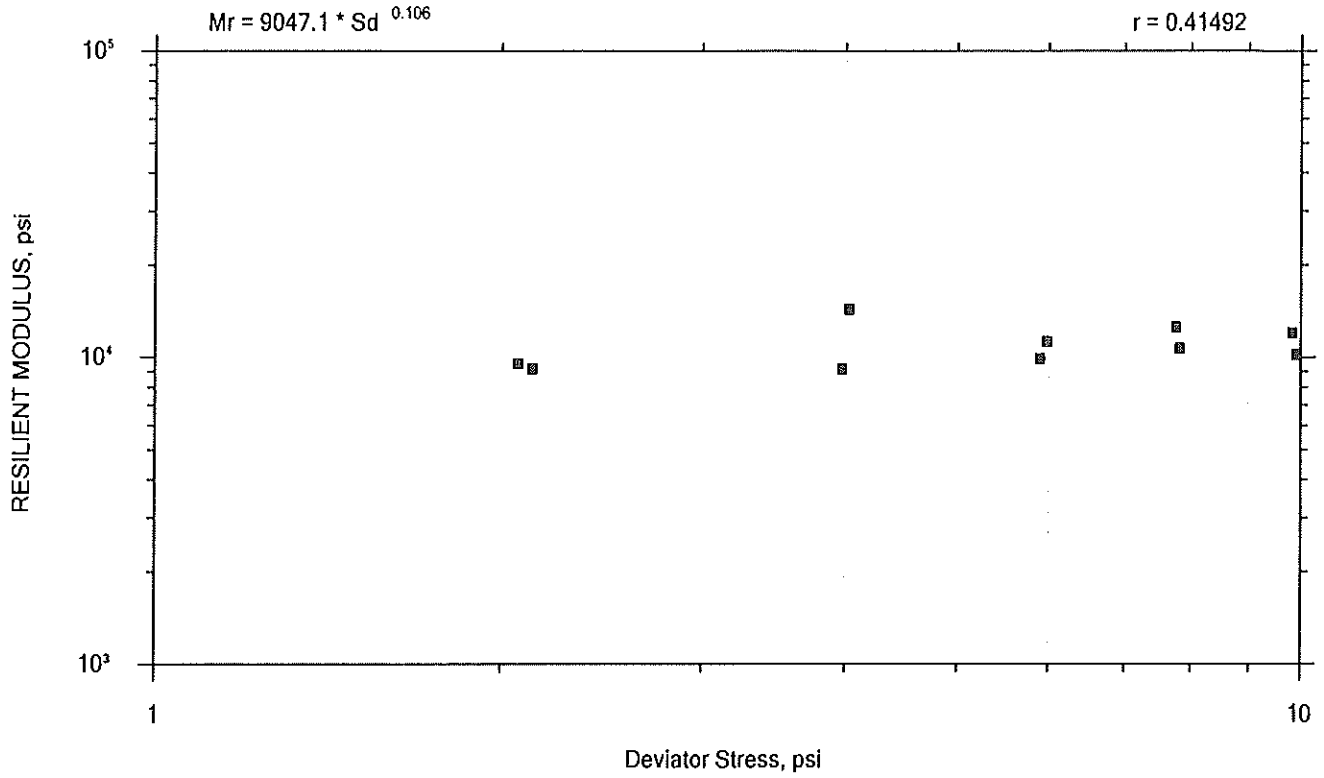
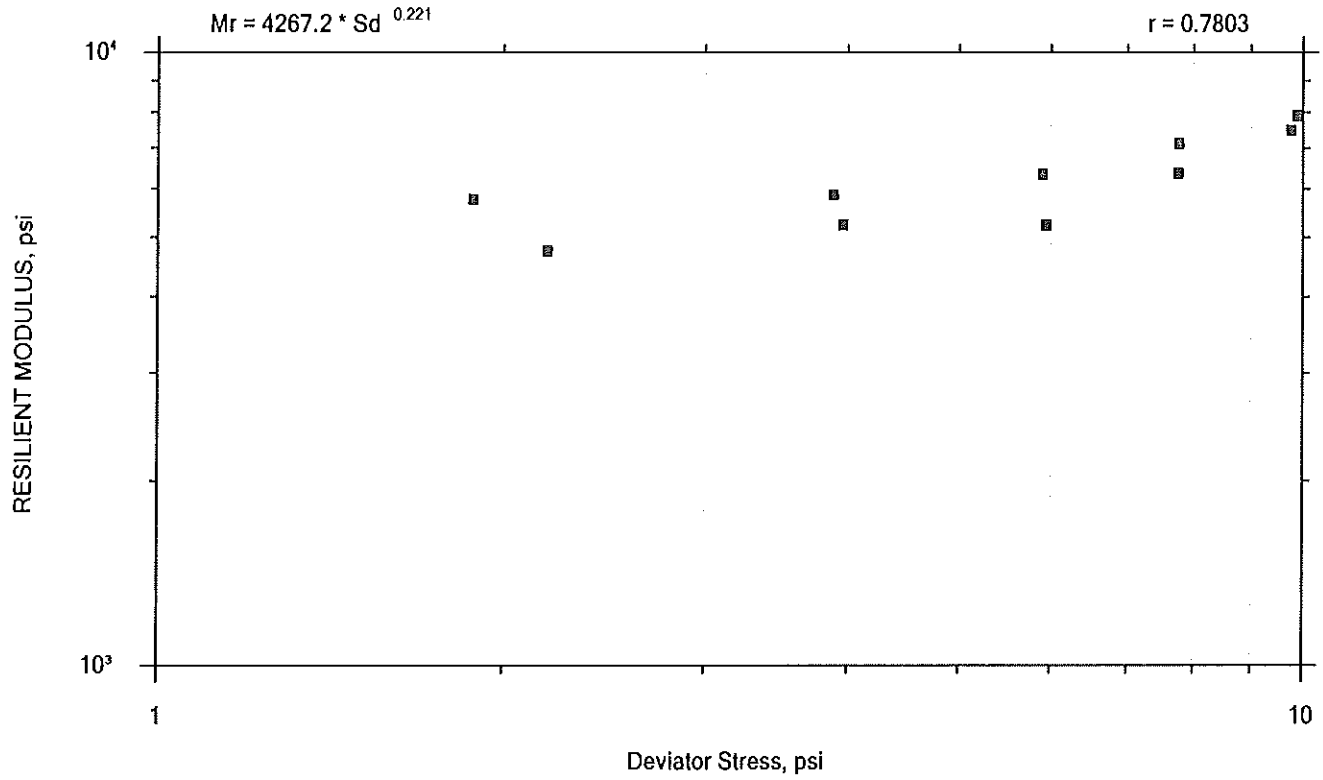
RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.48	2	2.069	0.0912	15.51	0.02	0.00	9541.8	562.73
4.527	4	4.032	0.0684	17.61	0.03	0.00	14329	761.3
4.497	6	5.988	0.0871	19.48	0.05	0.00	11247	217.04
4.475	8	7.765	0.0761	21.19	0.06	0.00	12533	254.75
4.522	10	9.832	0.0894	23.4	0.07	0.00	12026	184.28
2.465	2	2.13	0.0510	9.526	0.02	0.00	9189.5	667.98
2.544	4	3.975	0.0702	11.61	0.04	0.00	9170.2	104.34
2.526	6	5.904	0.0573	13.48	0.05	0.00	9889.9	179.49
2.507	8	7.825	0.0507	15.34	0.07	0.00	10717	163.73
2.487	10	9.915	0.1000	17.38	0.09	0.00	10232	155.2

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: Bag 4	Test Date: 4/23/2015	Depth: 0.0-1.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: REMOLD		
Remarks:		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2015\15-0714\15-0714 RES MOD\15-0714 BAG 4.dat		

RM SUMMARY REPORT



Confining Stress S3 (psi)	Nom. Max. Deviator Stress (psi)	Mean Deviator Stress (psi)	Std. Dev. Deviator Stress (psi)	Mean Bulk Stress (psi)	Mean Resilient Strain (%)	Std. Dev. Resilient Strain (%)	Mean Resilient Modulus (psi)	Std. Dev. Resilient Modulus (psi)
4.592	2	1.883	0.0642	15.66	0.03	0.00	5763.3	311.3
4.581	4	3.964	0.2559	17.71	0.07	0.00	5240.9	385.94
4.57	6	5.942	0.3271	19.65	0.10	0.01	5238.7	90.317
4.565	8	7.759	0.1273	21.46	0.11	0.00	6367.6	248.82
4.593	10	9.759	0.0897	23.54	0.12	0.00	7473	117.18
2.598	2	2.184	0.2872	9.98	0.04	0.00	4743.3	687.96
2.592	4	3.888	0.1841	11.66	0.06	0.00	5867.4	259.32
2.587	6	5.903	0.1236	13.66	0.08	0.00	6334.4	72.607
2.581	8	7.767	0.2158	15.51	0.10	0.00	7113.4	219.22
2.576	10	9.884	0.1751	17.61	0.11	0.00	7898.6	158.78

Project:	Location:	Project No.: K-8392-04
Boring No.:	Tested By: SS	Checked By:
Sample No.: Bag 5	Test Date: 4/23/2015	Depth: 0.0-1.0
Test No.: 15-0714	Sample Type: Shelby Tube	Elevation:
Description: REMOLD		
Remarks:		
File: \\Dt00ma00\kdotdata\MAT LAB\Groups\Shared\GEOTECH\SOILS\LAB\Completed Tests\2015\15-0714\15-0714 RES MOD\15-0714 BAG 5.dat		

Kansas Department of Transportation

Report of sample of Shelby Tube

Laboratory No. 15-1220
Date Reported: 5/18/2015
Date Received: 5/15/2015

Specification N°.	AASHTO T-208	Quantity:	2
Source of Material	10-23 K-8392-04	County:	Douglas
Sampled from	10-23 K-8392-04		
Submitted by:	Luke Metheny		
Identification marks:	Tags on samples		
Project or POV	10-23 K-8392-04		
Description of site:			
Type of Construction	Subgrade		

TEST RESULTS

Sample No.	Station	Offset (FT)	Depth (FT)	Description	Unconfined. Compression Qu (psf)	Elastic Modulus E (psf)	Dry Density γ_d (pcf)	Moisture Percent w %
ST1	2+00	43.6' Rt	0.0-2.0	Dry hard brn limy clay w/rocks	6540	299000	106.9	15.8
ST2	2+00	43.6' Lt	0.0-2.0	Dry hard brn limy clay w/rocks	4330	672000	95.5	22.0

cc: J. Brennan (email)
L. Metheny (email)
File 18-3

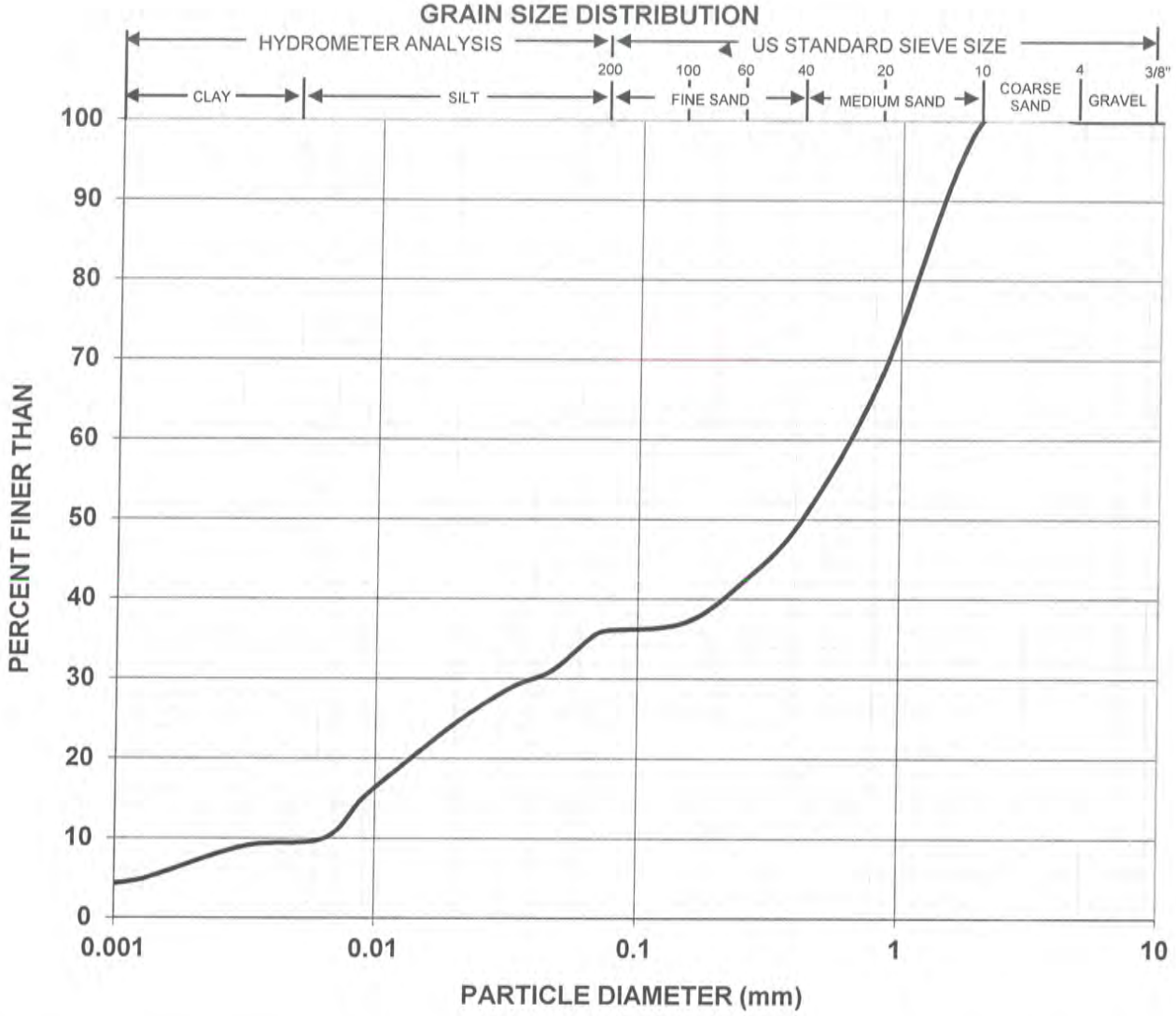
Reported by: Luke Metheny

Title: Luke Metheny, P.E., Geotechnical Engineer

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-1220
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	5/20/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-1	2+00	43.6Rt	0.0-2.0	NP	NP	NP	0.0	2.67	SL / SM

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

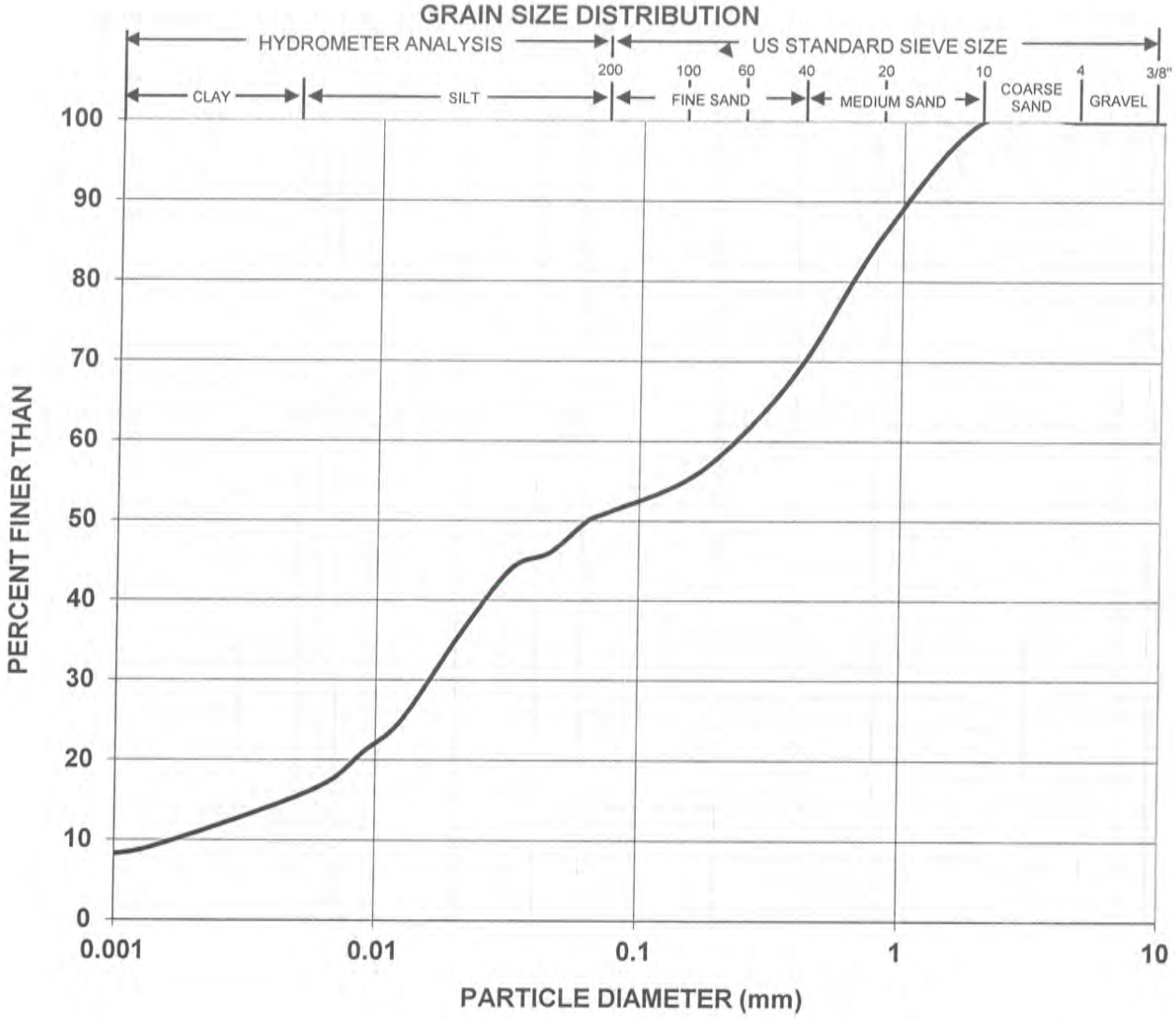
Rev. 3-99

D.O.T. NO. 635

KANSAS DEPARTMENT OF TRANSPORTATION
REPORT OF SOIL TESTS

SUBMITTED BY: Luke Metheny		**ADDRESS:**	ESOB	**LAB NO.**	015-1220
PROJECT:	10-23 K-8392-04	**COUNTY:**	Douglas	**DATE:**	5/20/15

GRAIN SIZE DISTRIBUTION



PHYSICAL PROPERTIES

SAMPLE NUMBER	STATION	CL DIST.	DEPTH (ft)	L.L.	P.L.	P.I.	% RET. ON 10 SEIVE	SPEC. GRAV. (PASS NO. 10)	CLASS KS/UNIF.
ST-2	2+00	43.6Lt	0.0-2.0	NP	NP	NP	0.0	2.61	SL / ML

Test Method: AASHTO T-88 (Iowa Air Dispersion)

REMARKS

By _____
Luke Metheny, P.E., Geotechnical Engineer

Rev. 3-99

D.O.T. NO. 635

Kansas Department of Transportation

Report of sample of Bagged Soil

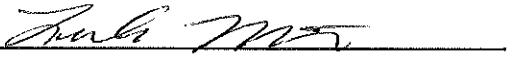
Laboratory No. 15-1221
Date Reported: 6/11/2015
Date Received: 5/15/2015

Specification N°.	AASHTO T-208	Quantity:	10
Source of Material	10-23 K-8392-04	County:	Douglas
Sampled from	10-23 K-8392-04		
Submitted by:	Luke Metheny		
Identification marks:	Tags on samples		
Project or POV	10-23 K-8392-04		
Description of site:			
Type of Construction	Subgrade Modification		

TEST RESULTS

Sample No.	Station	Offset (FT)	Depth (FT)	Description	Unconfined. Compression Qu (psf)	Elastic Modulus E (psf)	Dry Density γ_d (pcf)	Moisture Percent w %
3 Day	2+50	43.6' Lt		5% LKD 26% Water	14400	1370000	94.0	25.1
3 Day	2+50	43.6' Lt		12% LKD 30% Water	20200	1610000	91.6	26.4
3 Day	2+50	43.6' Lt		12% LKD 35% Water	15300	1440000	87.5	30.5
3 Day	2+50	43.6' Lt		15% LKD 30% Water	23000	2110000	91.2	25.7
3 Day	2+50	43.6' Lt		15% LKD 35% Water	18700	2230000	86.6	30.1
7 Day	2+50	43.6' Lt		5% LKD 26% Water	14900	1010000	74.2	59.2
7 Day	2+50	43.6' Lt		12% LKD 30% Water	20100	1620000	90.4	27.3
7 Day	2+50	43.6' Lt		12% LKD 35% Water	16000	1390000	86.4	31.3
7 Day	2+50	43.6' Lt		15% LKD 30% Water	27600	2370000	90.8	26.7
7 Day	2+50	43.6' Lt		15% LKD 35% Water	22200	2300000	87.6	30.1

cc: J. Brennan (email & 1 copy)
L. Metheny (email)
File 18-3

Reported by: 

Title: Luke Metheny, P.E., Geotechnical Engineer

Kansas Department of Transportation

Report of sample of Shelby Tube

Laboratory No. 15-1236
Date Reported: 5/21/2015
Date Received: 5/18/2015

Specification N°.	AASHTO T-208	Quantity:	2
Source of Material	10-23 K-8392-04	County:	Douglas
Sampled from	10-23 K-8392-04		
Submitted by:	Luke Metheny		
Identification marks:	Tags on samples		
Project or POV	10-23 K-8392-04		
Description of site:			
Type of Construction	Subgrade		

TEST RESULTS

Sample No.	Station	Offset (FT)	Depth (FT)	Description	Unconfined. Compression Qu (psf)	Elastic Modulus E (psf)	Dry Density γ_d (pcf)	Moisture Percent w %
ST3	2+00	42.6' Rt		Dry hard brn limy clay w/rocks	5940	500000	107.6	15.3
ST4	2+00	42.6' Lt		Dry hard brn limy clay w/rocks	6460	657000	97.4	21.6

cc: J. Brennan (email)
L. Metheny (email)
File 18-3

Reported by: Luke Metheny

Title: Luke Metheny, P.E., Geotechnical Engineer

Kansas Department of Transportation

Report of sample of Shelby Tube

Laboratory No. 15-1270
Date Reported: 5/22/2015
Date Received: 5/20/2015

Specification N°.	AASHTO T-208	Quantity:	2
Source of Material	10-23 K-8392-04	County:	Douglas
Sampled from	10-23 K-8392-04		
Submitted by:	Luke Metheny		
Identification marks:	Tags on samples		
Project or POV	10-23 K-8392-04		
Description of site:	K-10 By-pass		
Type of Construction	Subgrade modification		

TEST RESULTS

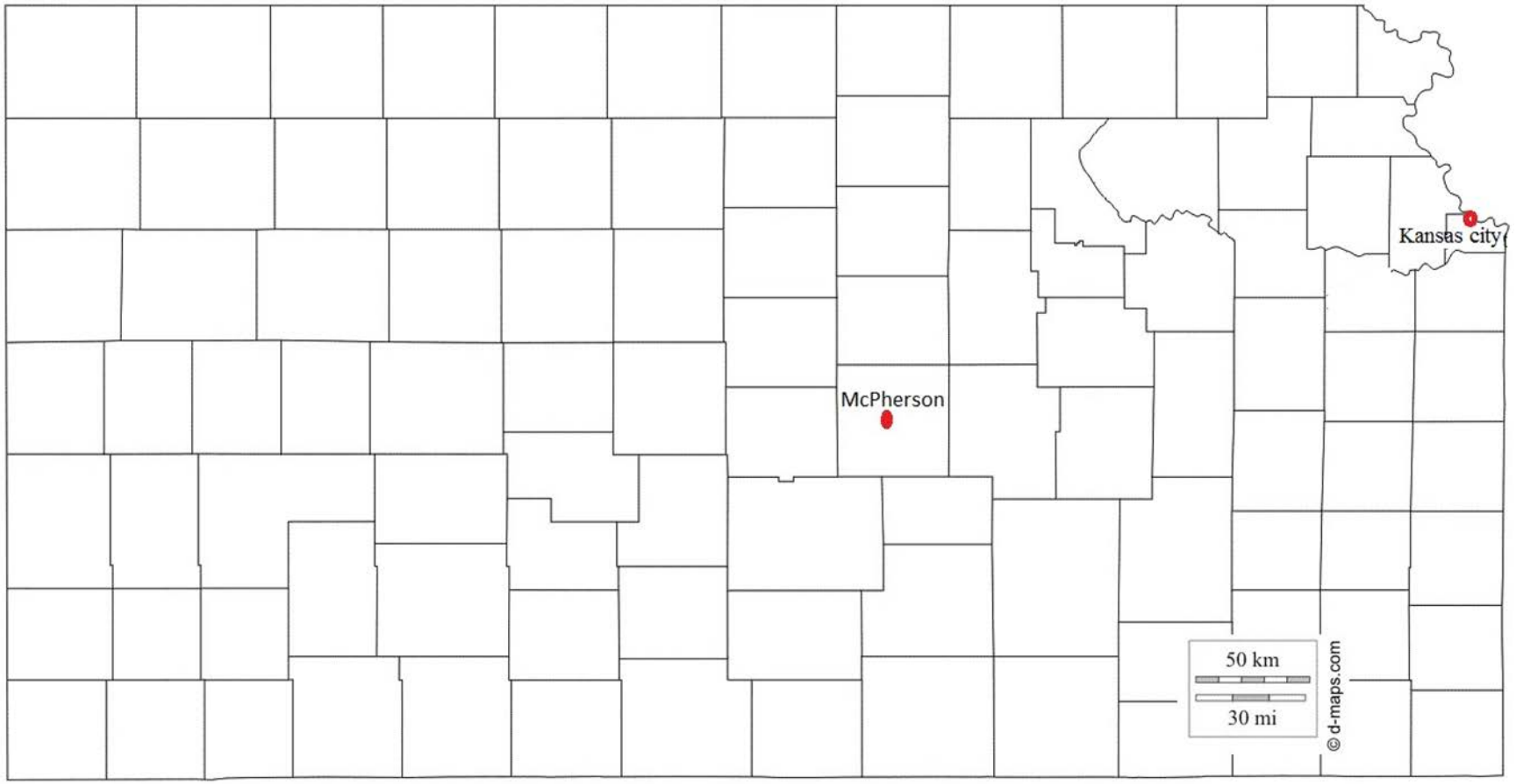
Sample No.	Station	Offset (FT)	Depth (FT)	Description	Unconfined. Compression Qu (psf)	Elastic Modulus E (psf)	Dry Density γ_d (pcf)	Moisture Percent w %
ST-5	2+00	43.6' Rt	0.0-2.0	Limy, dry, hard dk brn clay w/rocks	5250	675000	104.4	14.9
ST-6	2+00	43.6' Lt	0.0-2.0	Limy, dry, hard dk brn clay w/rocks	7600	1280000	100.5	20.9

cc: J. Brennan (email)
L. Metheny (email)
File 18-3

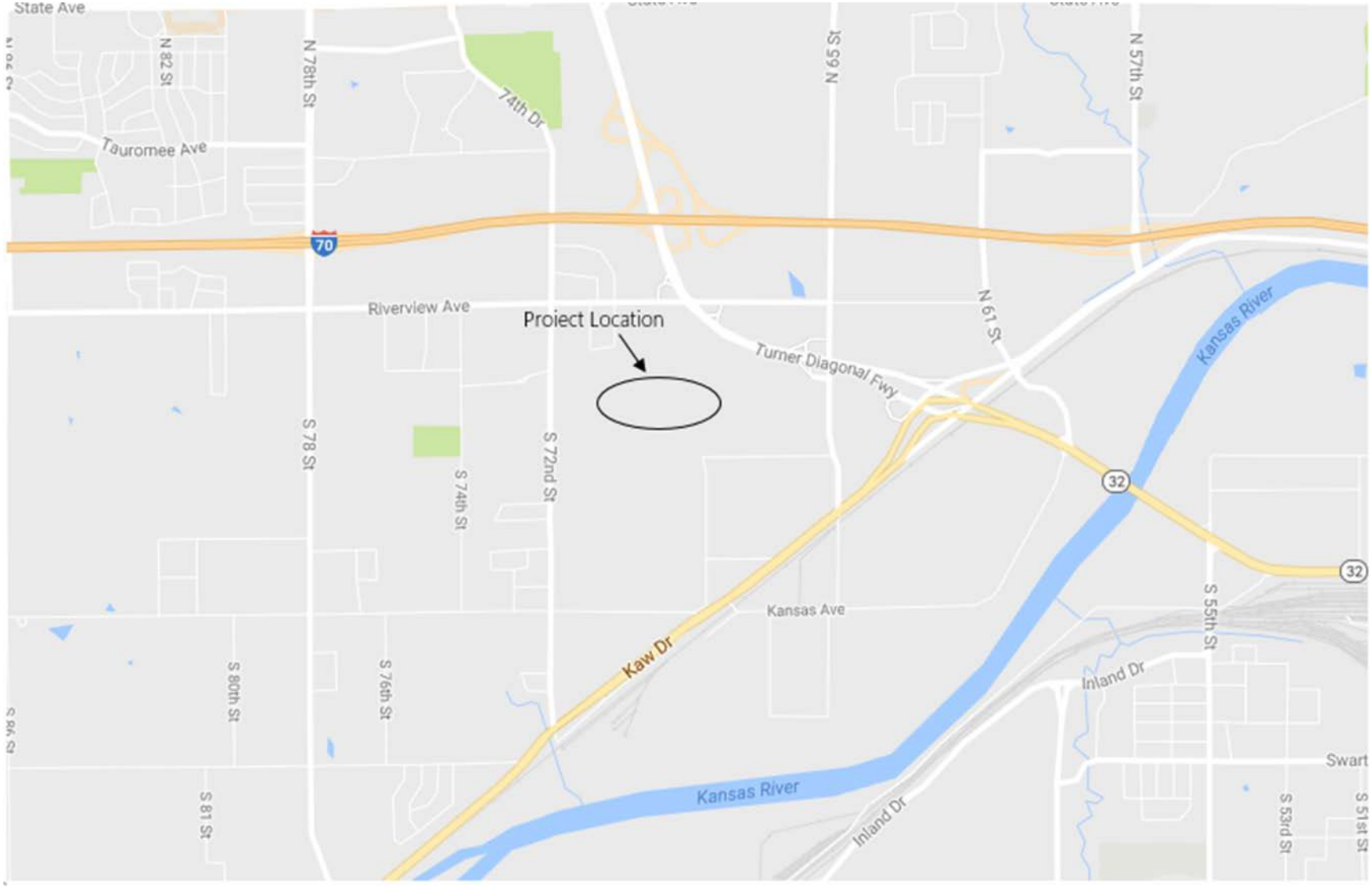
Reported by: Luke Me

Title: Luke Metheny, P.E., Geotechnical Engineer

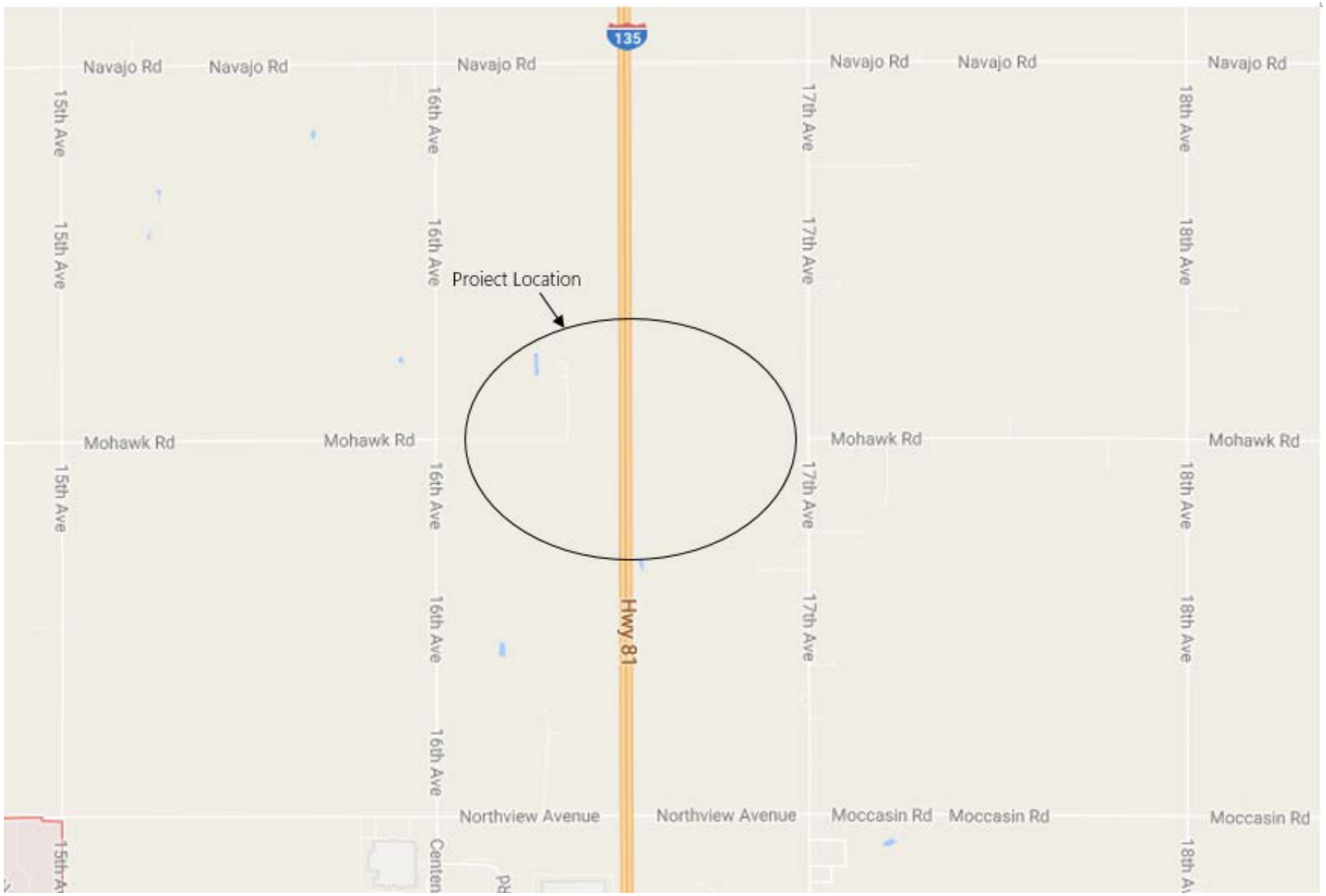
Appendix F: Locations of Projects and Selected Photographs of Operations



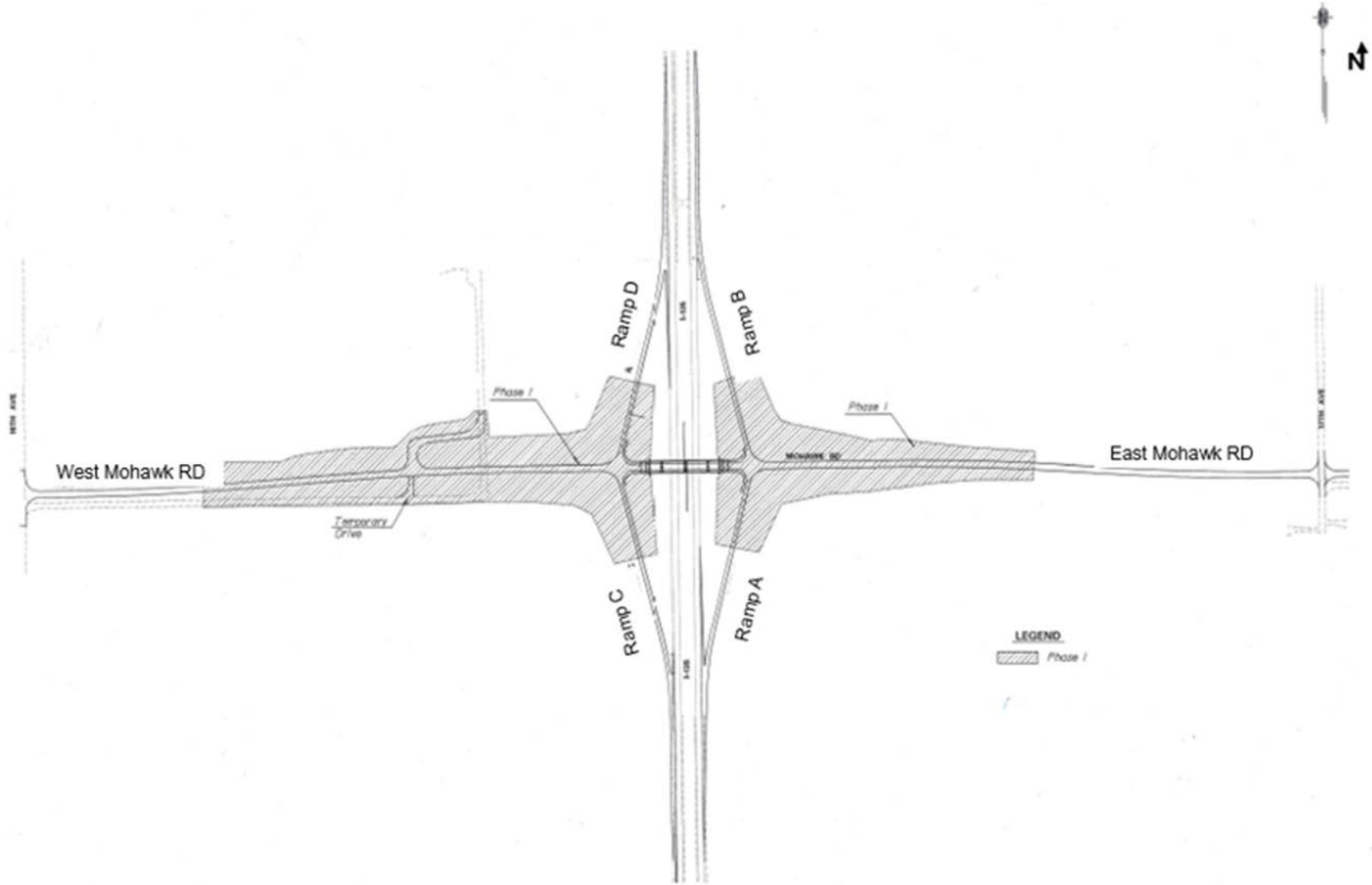
Approximate locations of the projects and the layout of the testing site



A foundation Pad of a commercial store in Kansas City, Kansas



I-35 Mohawk Road Interchange project, McPherson, Kansas



Layout of the I-35 Mohawk RD Testing Sites

Selected photographs of LKD-Treated Subgrade construction operations:


WR 240i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Appendix G: DCP-Index and Estimated CBR Values

Dynamic Cone Penetration (DCP)-Index Results

Location	Station	Pavement conditions	DCP-Index (mm/blows)		
			1-2 hours*	2 days*	14 days*
McPherson West-Mohawk RD	27+00	LKD treated	26.89	19.50	
		In-situ	38.44	28.58	
	28+27	LKD treated		17.92	
		In-situ		28.67	
	29+00	LKD treated	35.63	11.31	12.15
		In-situ	43.44	30.25	34.67
	30+00	LKD treated		14.69	
		In-situ		19.75	
	31+00	LKD treated	31.44	14.69	9.55
		In-situ	21.58	17.75	15.33
	32+00	LKD treated		12.90	
		In-situ		23.92	
	33+00	LKD treated	37.50	23.60	16.92
		In-situ	71.56	30.44	18.93
	34+00	LKD treated		22.00	
		In-situ		31.50	
	35+00	LKD treated		11.46	11.07
		In-situ		16.56	21.67
	36+00	LKD treated		11.36	
		In-situ		24.75	
	38+00	LKD treated		12.86	
		In-situ		23.60	
Average		LKD treated	32.86	15.66	12.42
		In-situ	43.76	25.07	22.65

*After compaction

Location	Station	Pavement conditions	DCP-Index (mm/blows)	
			1-2 hours*	1 day*
McPherson East-Mohawk RD	53+33	LKD treated	32.75	15.00
		In-situ	55.83	30.92
	54+25	LKD treated	29.00	
		In-situ	61.33	
	55+25	LKD treated	31.75	17.81
		In-situ	57.17	34.89
	55+25N	LKD treated	40.83	11.74
		In-situ	48.00	40.33
	56+25	LKD treated	30.08	20.43
		In-situ	38.67	30.89
	57+00	LKD treated	50.67	21.57
		In-situ	47.89	25.92
	57+75	LKD treated	37.92	23.11
		In-situ	55.17	31.89
	63+00	LKD treated		13.54
		In-situe		27.11
	65+00S	LKD treated		19.44
		In-situe		55.11
	65+00N	LKD treated		16.43
		In-situe		46.56
	66+50	LKD treated		22.17
		In-situe		47.33
	67+04	LKD treated		19.38
		In-situe		51.00
Average		LKD treated	36.14	18.24
		In-situ	52.01	38.36

*After compaction

Location	Station	Pavement conditions	DCP-Index (mm/blows)		
			1-2 hours*	1 day*	3 days*
McPherson Ramp C	13+02	LKD treated	24.03	11.53	7.00
		In-situ	25.25	28.33	8.93
	14+95	LKD treated	30.56		13.00
		In-situ	43.33		29.00
	16+87	LKD treated		13.08	12.51
		In-situ		24.50	23.25
	18+95	LKD treated	26.11	11.93	11.36
		In-situ	38.22	34.11	27.25
	Average	LKD treated	26.90	12.18	10.97
		In-situ	35.60	28.98	22.11
McPherson Ramp D	35+26	LKD treated	20.37	11.33	15.33
		In-situ	20.78	23.47	28.33
	35+26s	LKD treated	25.87		
		In-situ	31.89		
	37+22	LKD treated	22.07	17.27	14.08
		In-situ	44.67	27.67	28.17
	37+22S	LKD treated	18.55		
		In-situ	36.33		
	41+06	LKD treated	40.00	17.85	12.54
		In-situ	47.57	41.67	20.00
	41+06-2	LKD treated	33.44		
		In-situ	48.00		
	49+98	LKD treated	24.56		15.61
		In-situ	22.22		28.42
	49+98-2	LKD treated	15.00		
		In-situ	10.37		
	Average	LKD treated	24.98	15.48	14.39
		In-situ	32.73	30.93	26.23

*After compaction

Location	Station	Pavement conditions	DCP-Index (mm/blows)		
			1-2 hours*	2 days*	14 days*
McPherson Ramp B	31+25	LKD treated			18.13
		In-situ			20.83
	32+00	LKD treated	23.33		16.19
		In-situ	19.06		20.78
	34+00	LKD treated		15.06	
		In-situ		23.08	
	35+23	LKD treated		9.44	
		In-situ		32.11	
	39+23	LKD treated	14.31	8.46	5.08
		In-situ	24.33	14.76	17.00
	Average	LKD treated	18.82	10.99	13.13
		In-situ	21.69	23.32	19.54
McPherson Ramp B	13+89	LKD treated	22.90	11.38	
		In-situ	58	20.83	
	15+33	LKD treated		14.03	
		In-situ		15.71	
	18+40	LKD treated	25.44	11.21	8.09
		In-situ	30.67	27.42	26.57
	19+03-1	LKD treated			24.20
		In-situ			16.06
	Average	LKD treated	24.17	12.20	16.15
		In-situ	44.33	21.32	21.31

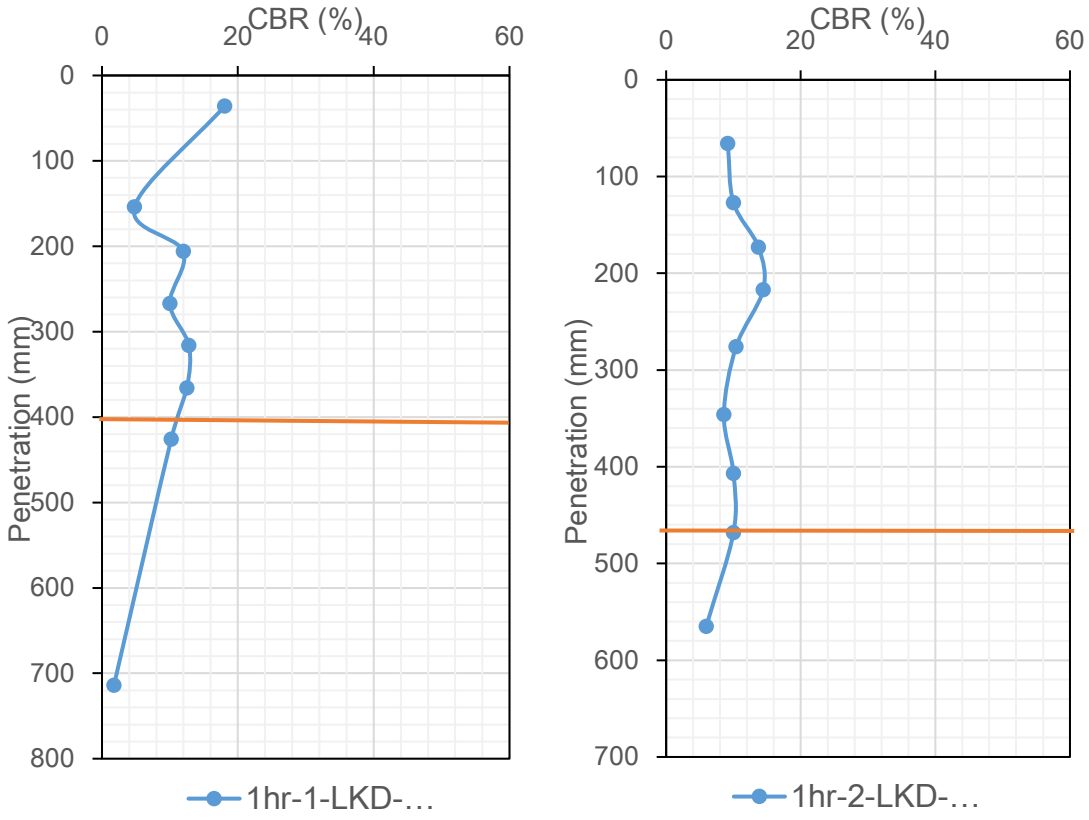
*After compaction

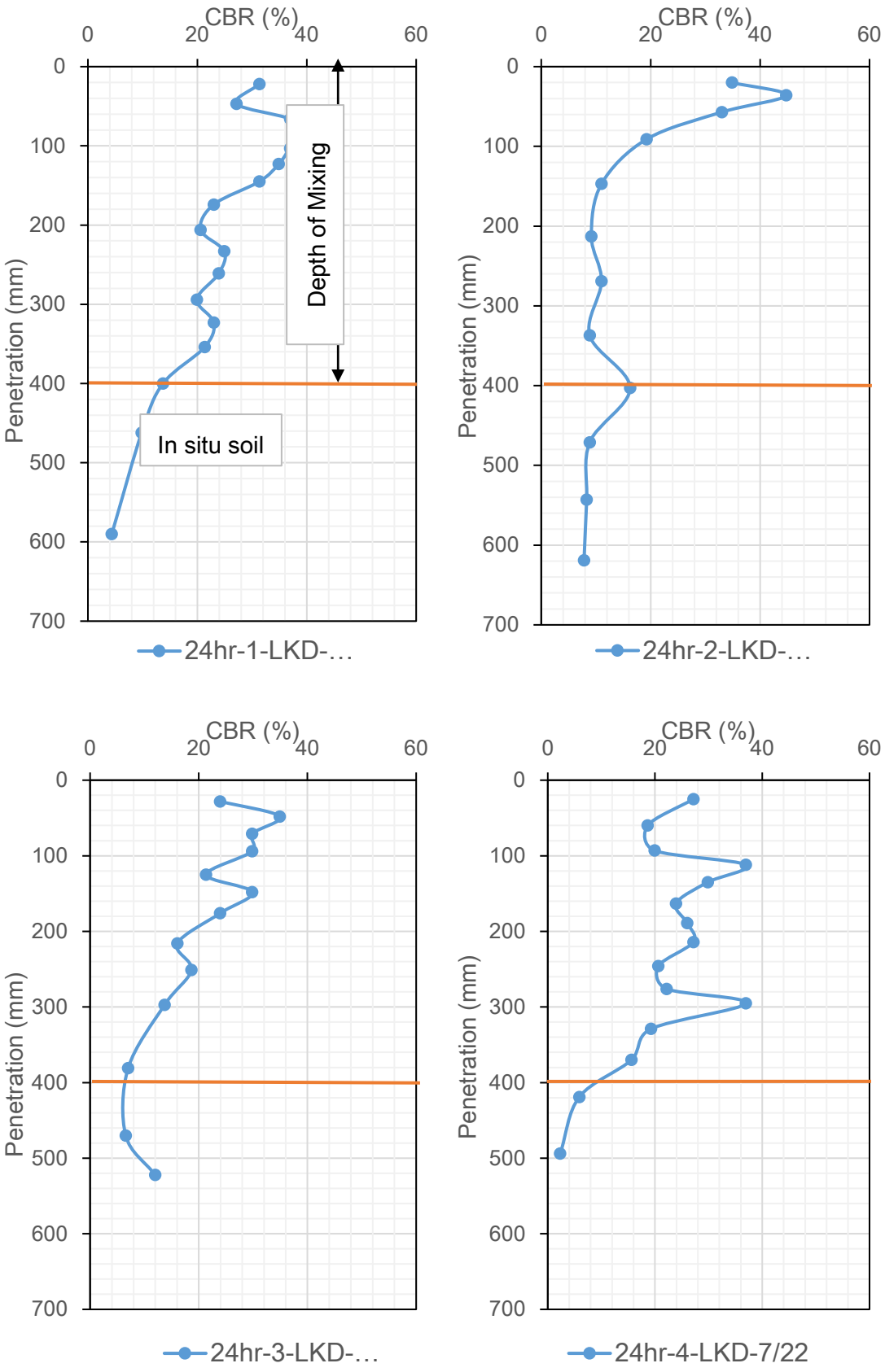
Location	Station	Pavement conditions	DCP-Index (mm/blows)	
			1-2 hours*	1 day*
McPherson upper part of Ramp A	29+25	LKD treated	20.89	15.42
		In-situ	28.22	28.89
	31+25	LKD treated	20.28	14.35
		In-situ	40.67	28.89
	32+00	LKD treated	16.79	13.37
		In-situ	27.22	23.67
Average		LKD treated	19.32	14.38
		In-situ	32.04	27.15

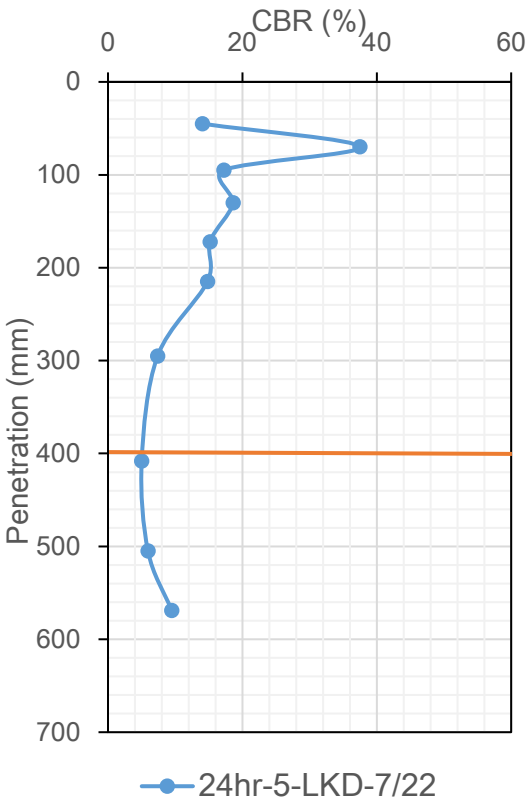
*After compaction

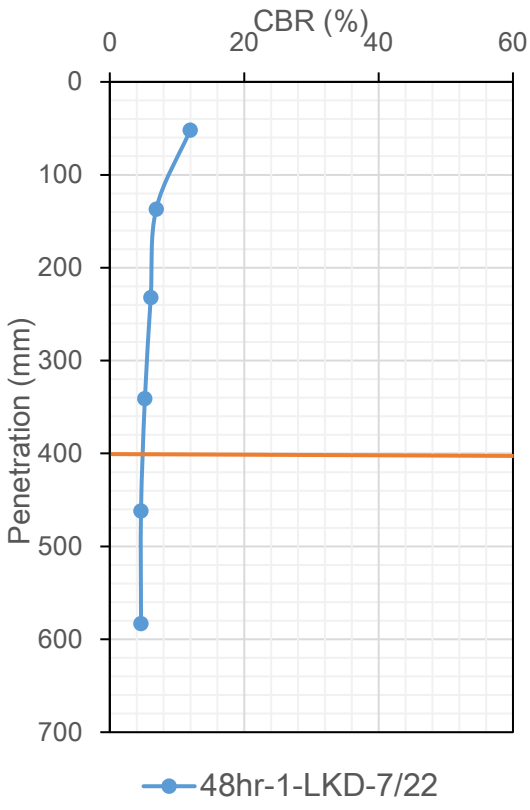
Bearing Capacity Ratio (CBR) versus Depth

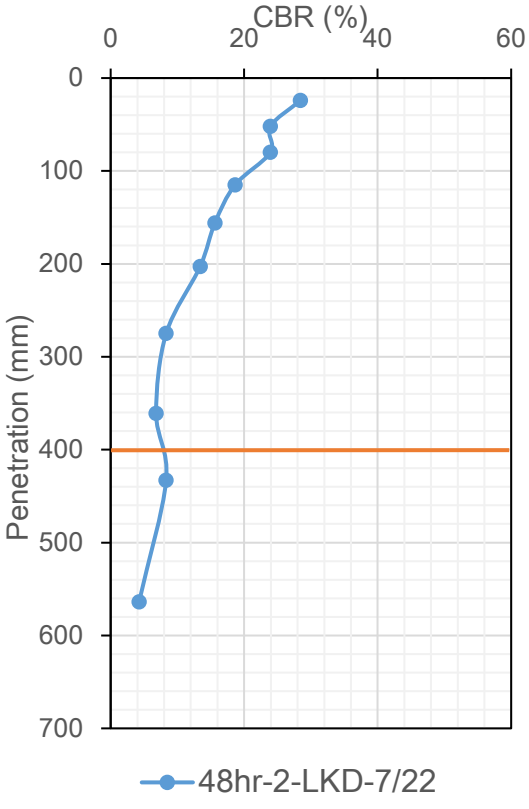
A. A foundation pad in Kansas City

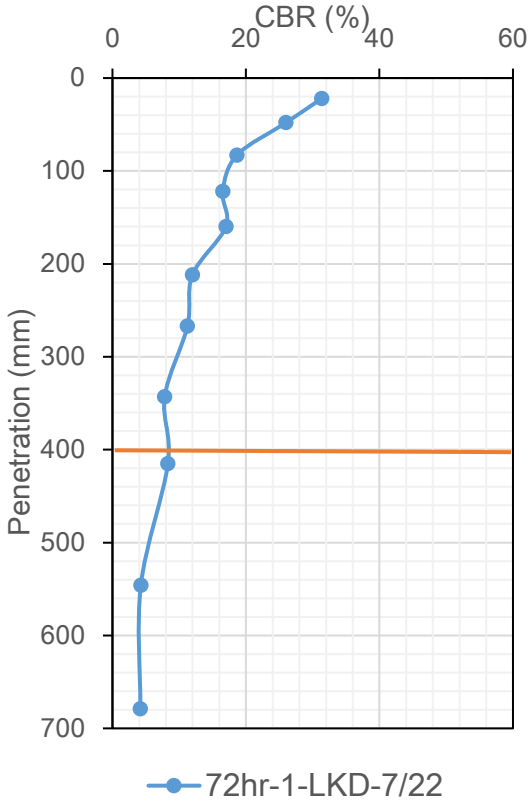



CBR (%)
0
20
40
60
Penetration (mm)
0
100
200
300
400
500
600
700
Depth of Mixing
In situ soil
24hr-1-LKD-…
24hr-2-LKD-…
24hr-3-LKD-…
24hr-4-LKD-7/22

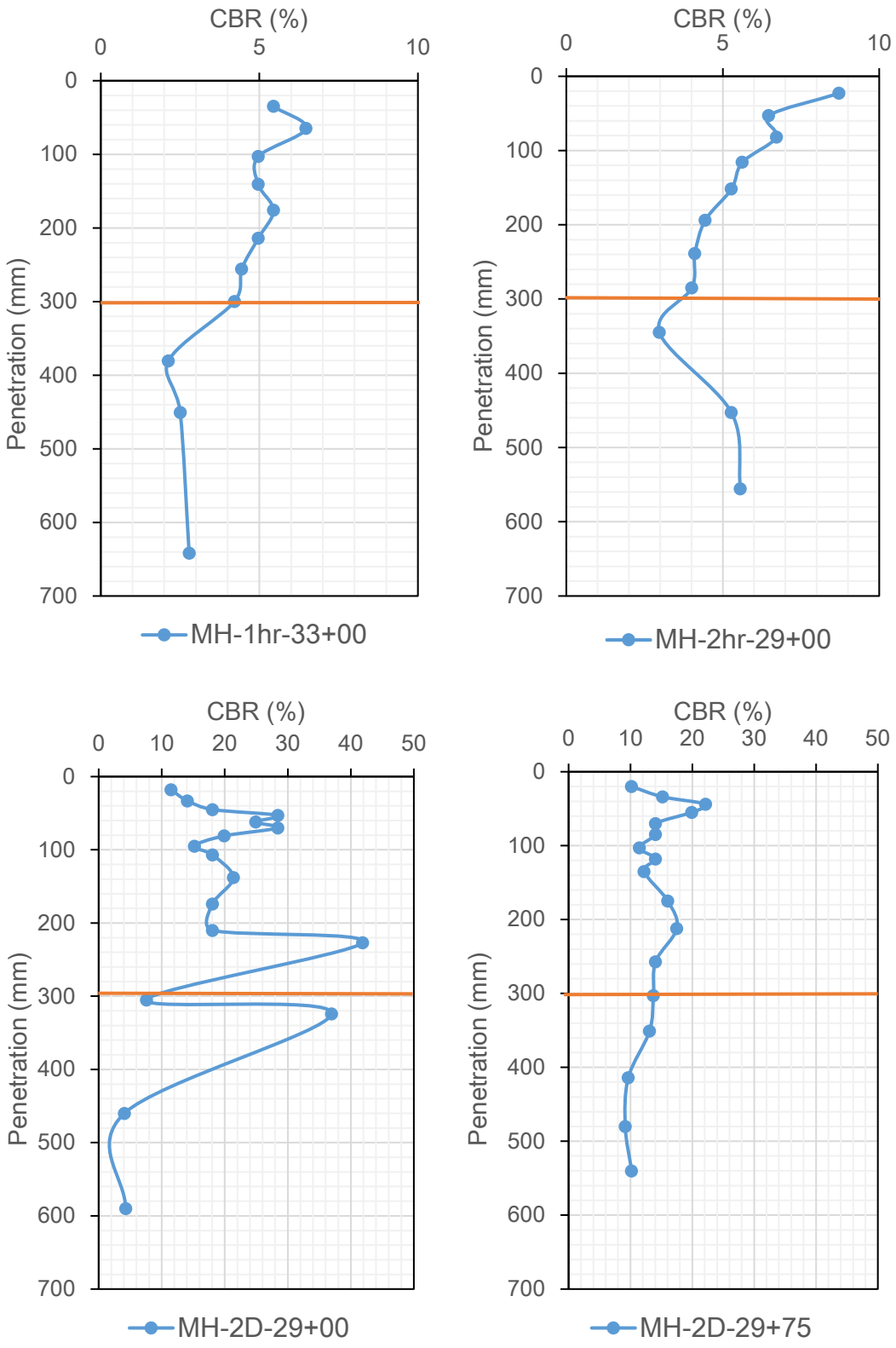

CBR (%)
0
20
40
60
0
100
200
300
400
500
600
700
Penetration (mm)
24hr-5-LKD-7/22

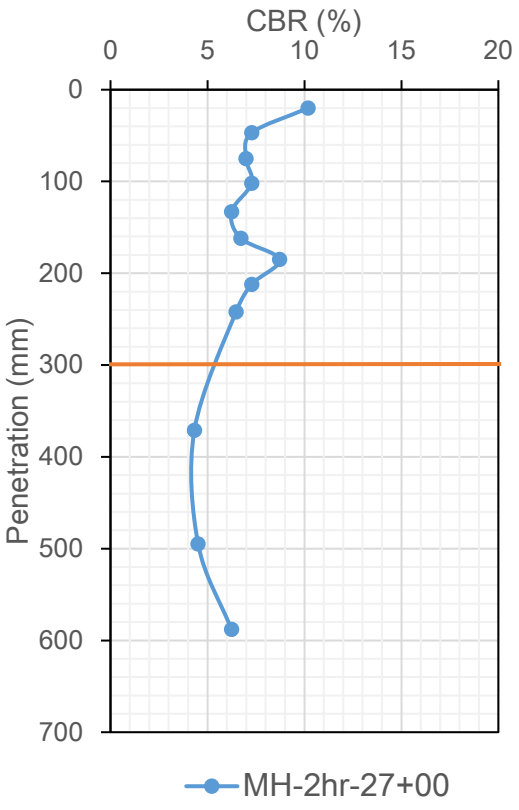

CBR (%)
0
20
40
60
0
100
200
300
400
500
600
700
Penetration (mm)
48hr-1-LKD-7/22

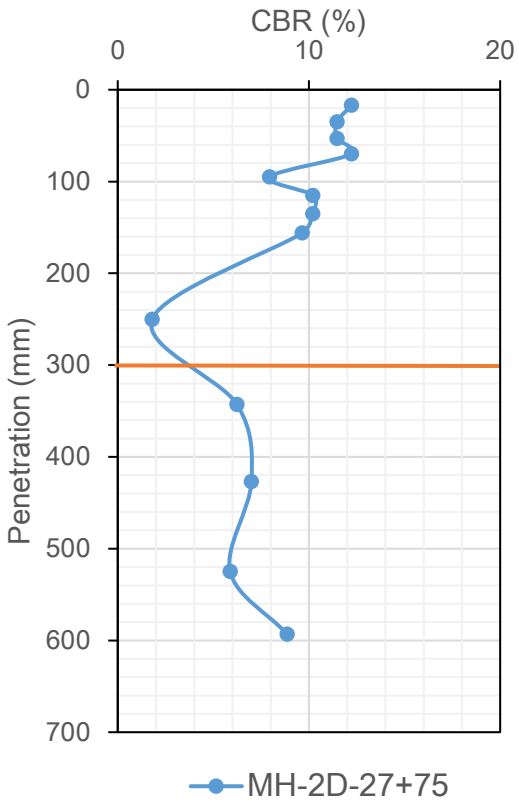

CBR (%)
0
20
40
60
0
100
200
300
400
500
600
700
Penetration (mm)
48hr-2-LKD-7/22

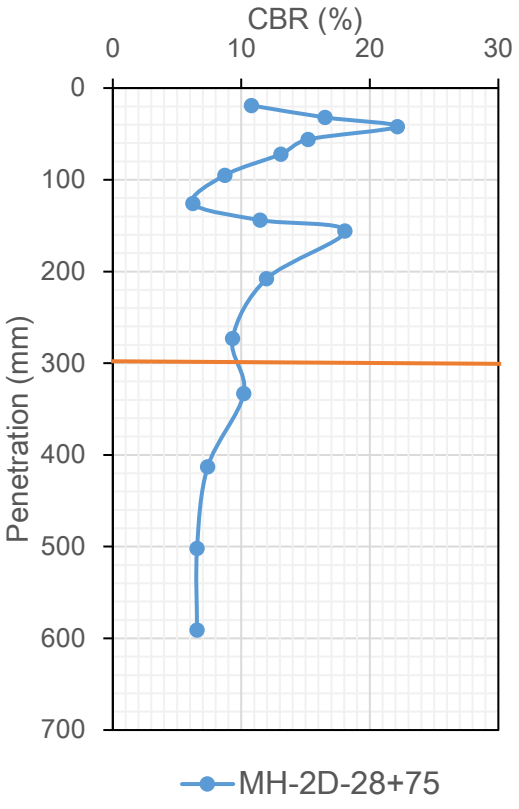

CBR (%)
0
20
40
60
0
100
200
300
400
500
600
700
Penetration (mm)
72hr-1-LKD-7/22

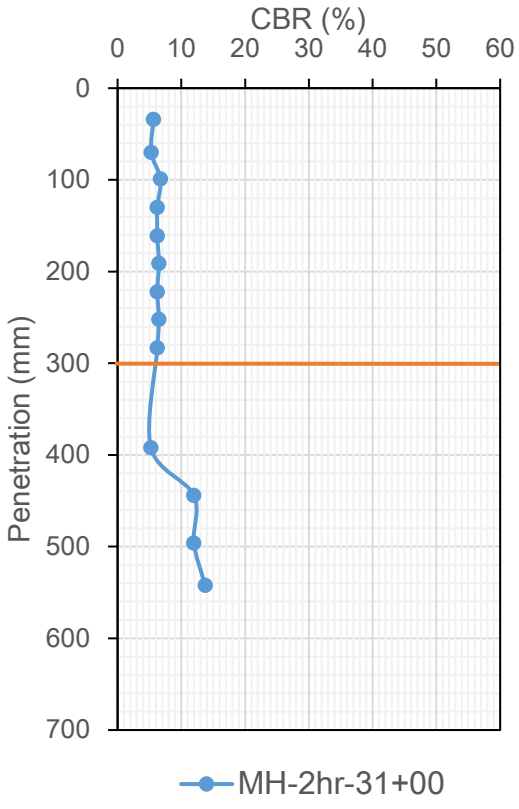
B. West Mohawk RD, McPherson

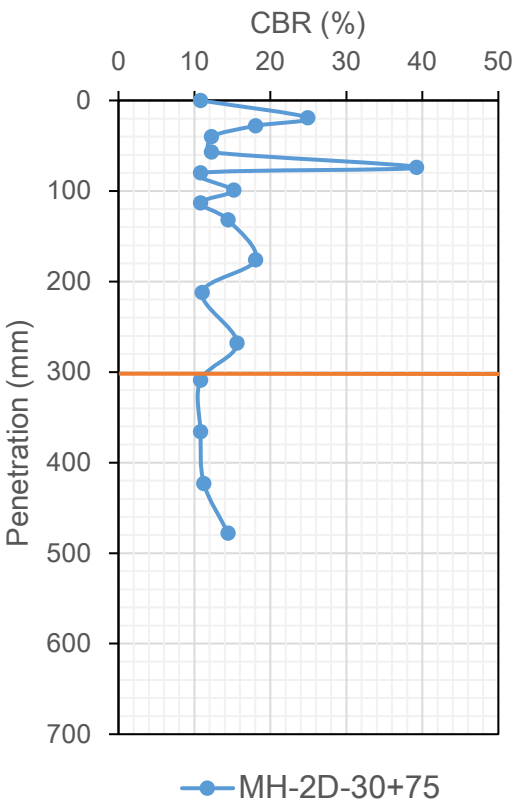


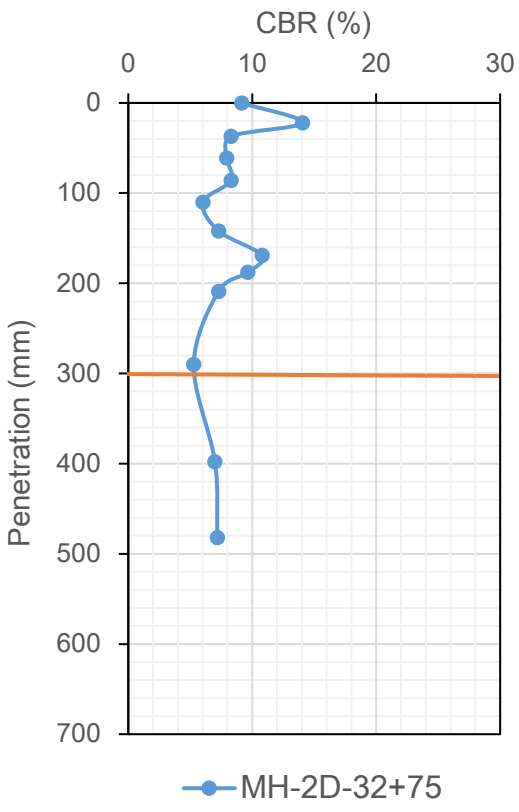

CBR (%)
0
5
10
15
20
0
100
200
300
400
500
600
700
Penetration (mm)
MH-2hr-27+00

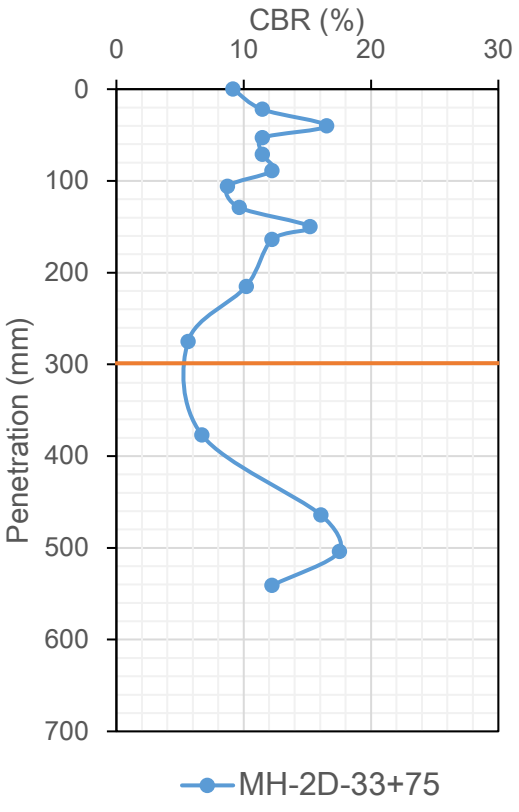

CBR (%)
0
10
20
0
100
200
300
400
500
600
700
Penetration (mm)
MH-2D-27+75

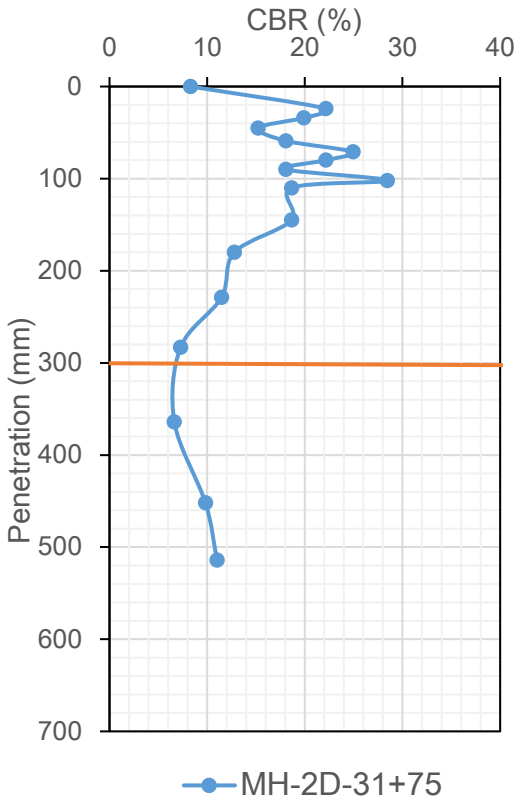

CBR (%)
0
10
20
30
0
100
200
300
400
500
600
700
Penetration (mm)
MH-2D-28+75

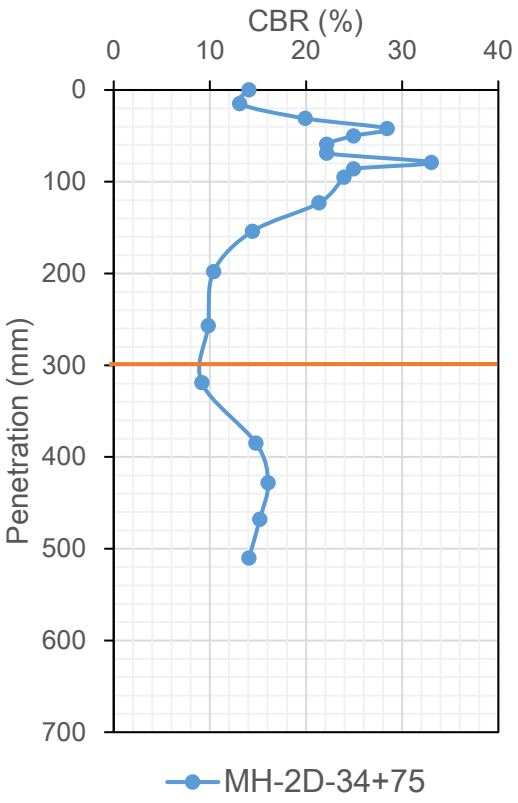

CBR (%)
0
10
20
30
40
50
60
0
100
200
300
400
500
600
700
Penetration (mm)
MH-2hr-31+00

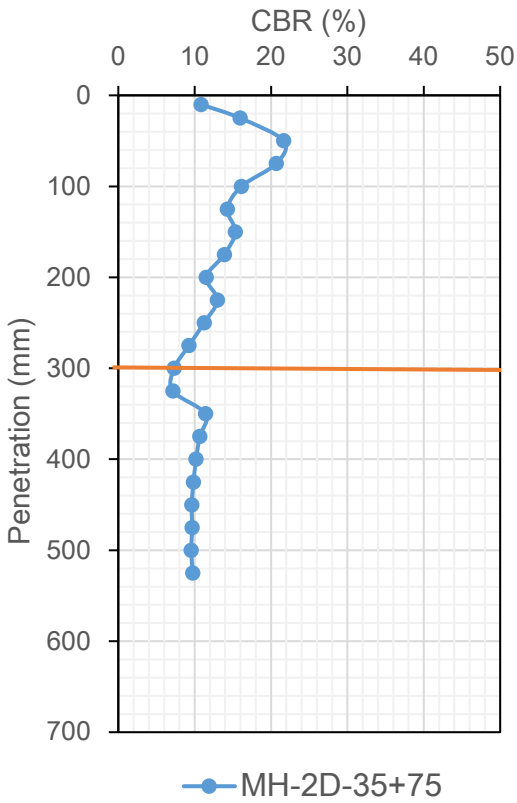

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-30+75

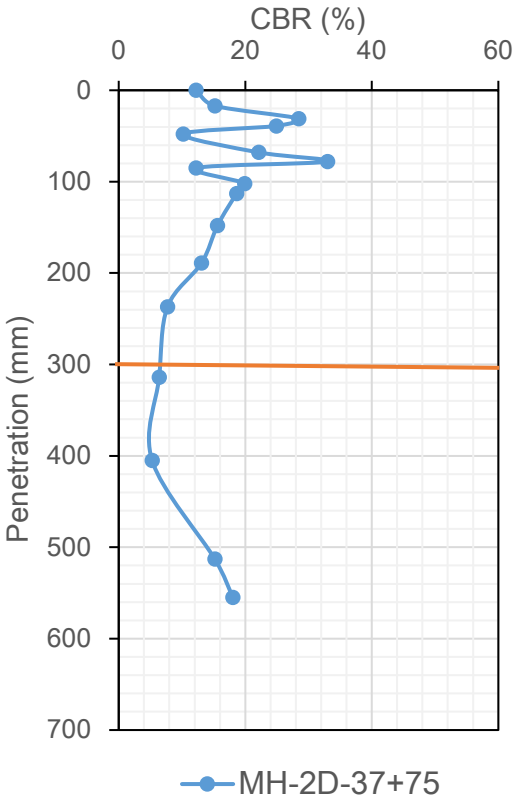

CBR (%)
0
10
20
30
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-32+75

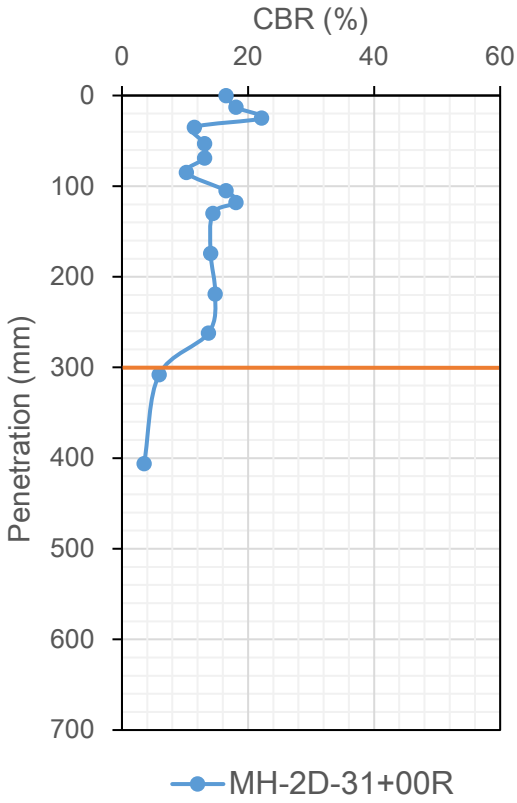

CBR (%)
0
10
20
30
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-33+75

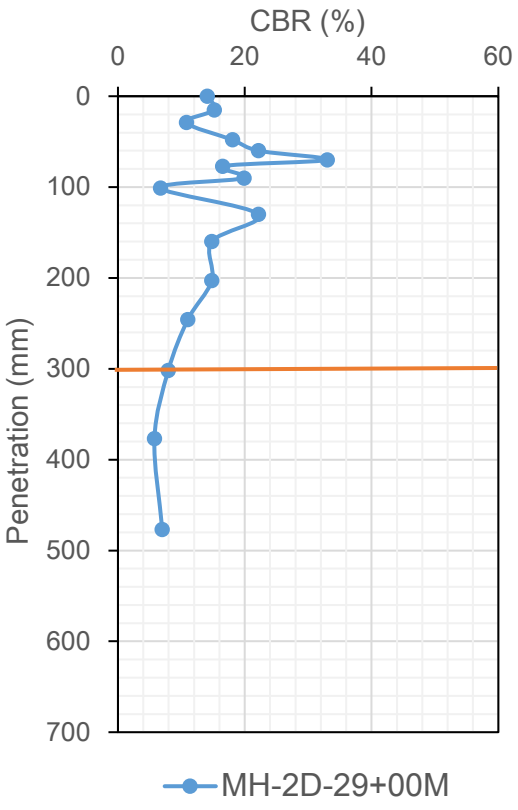

CBR (%)
0
10
20
30
40
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-31+75

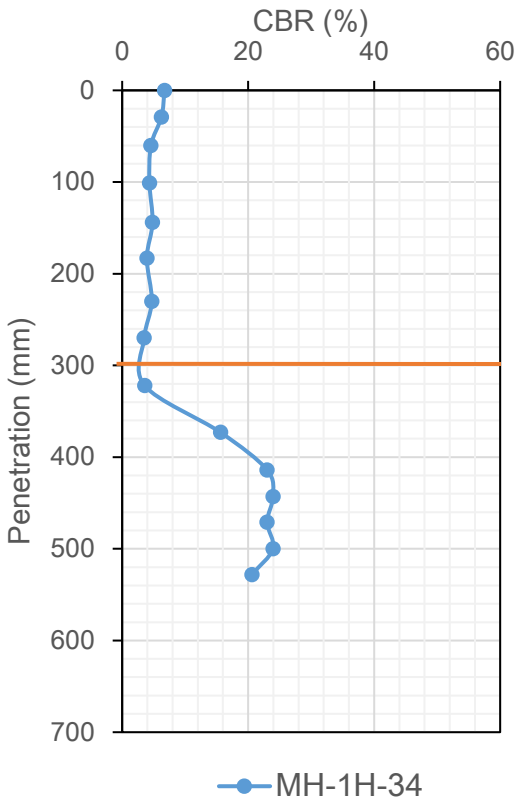

CBR (%)
0
10
20
30
40
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-34+75

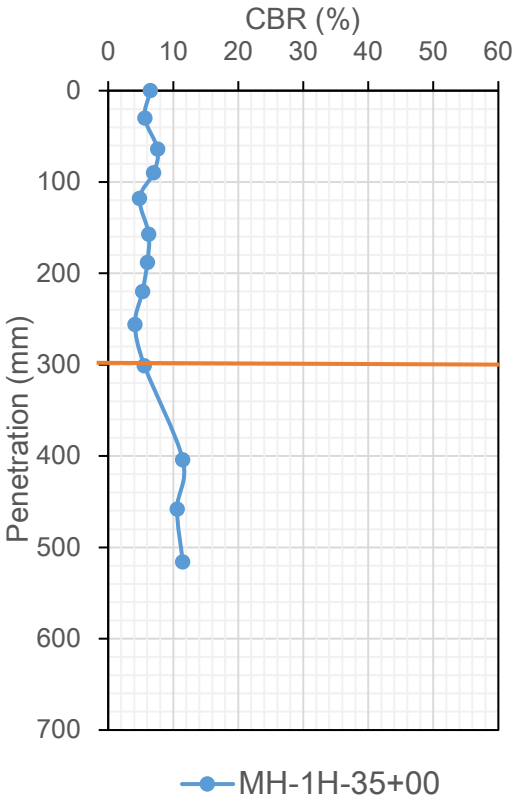

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-35+75

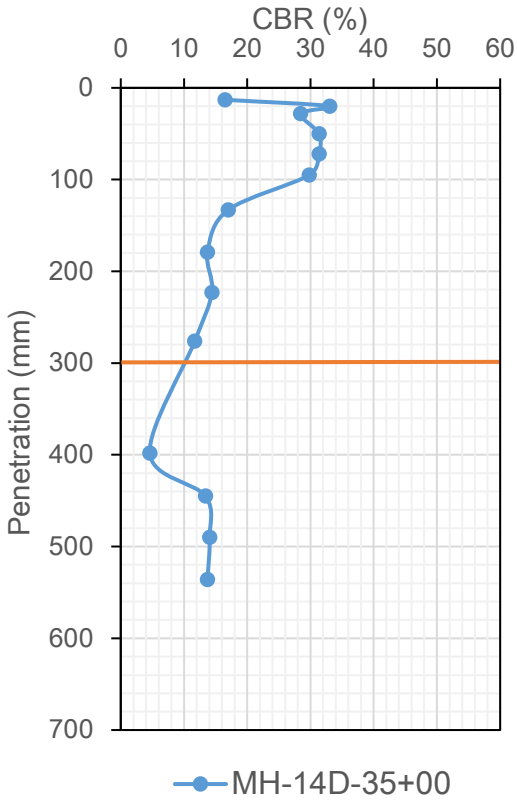

CBR (%)
0
20
40
60
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-37+75

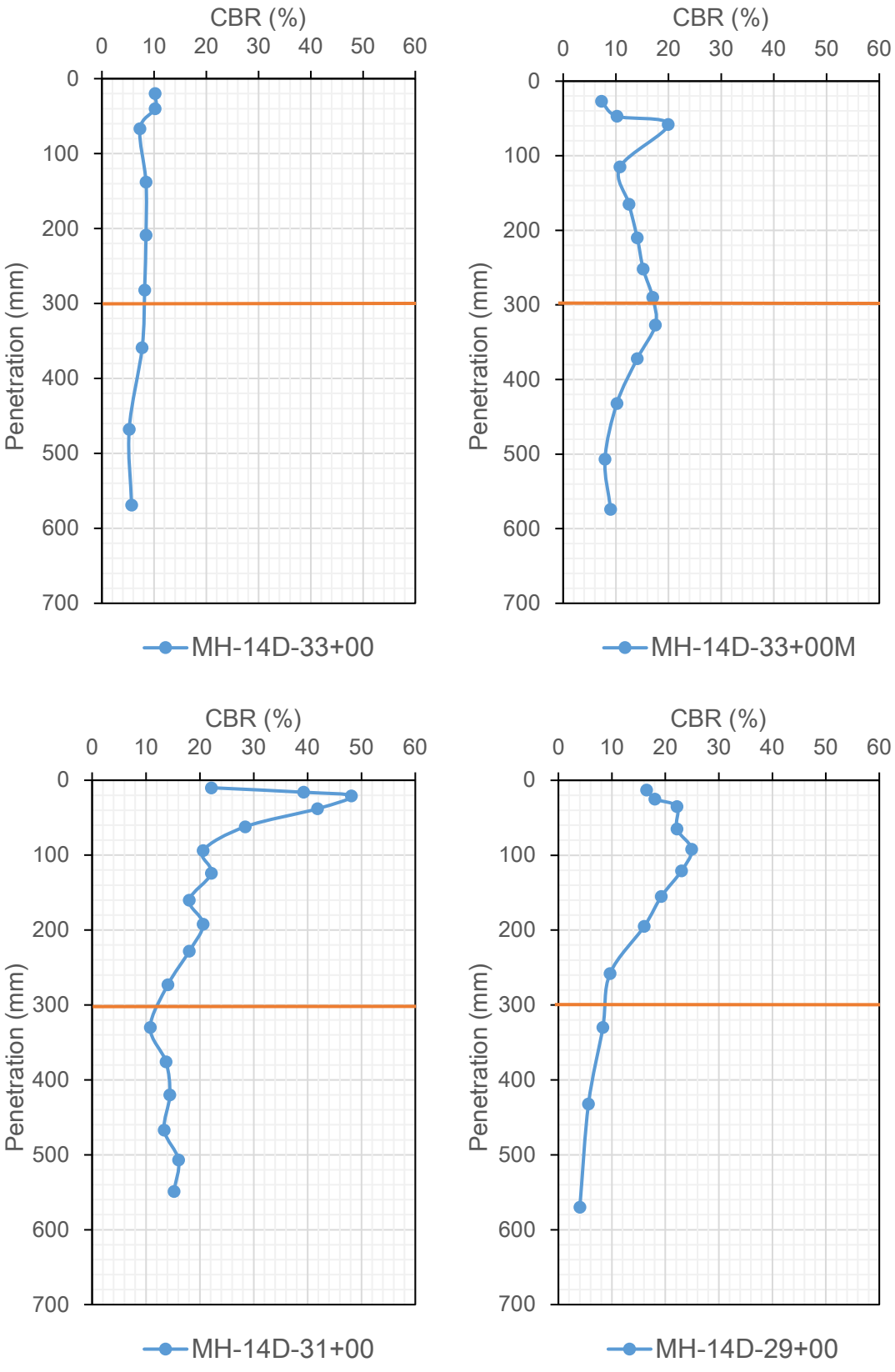

CBR (%)
0
20
40
60
Penetration (mm)
0
100
200
300
400
500
600
700
MH-2D-31+00R


CBR (%)
0
20
40
60
0
100
200
300
400
500
600
700
Penetration (mm)
MH-2D-29+00M

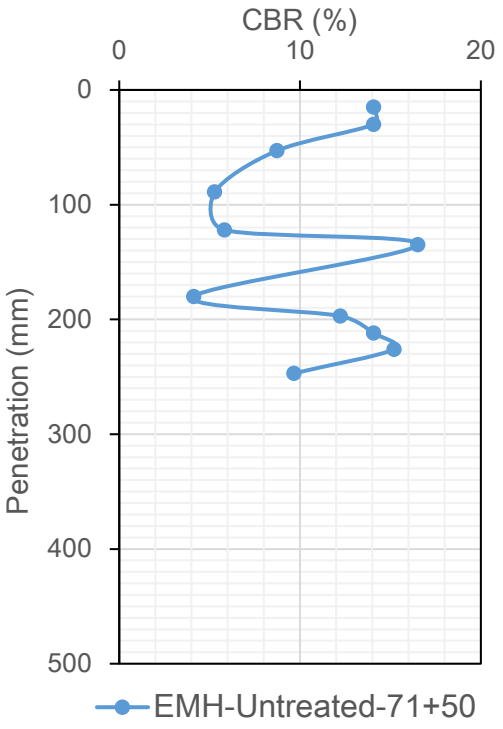

CBR (%)
0
20
40
60
0
100
200
300
400
500
600
700
Penetration (mm)
MH-1H-34

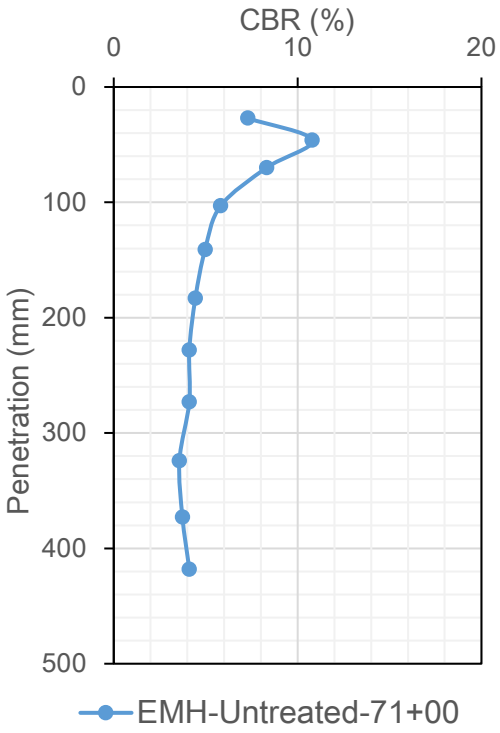

CBR (%)
0
10
20
30
40
50
60
0
100
200
300
400
500
600
700
Penetration (mm)
MH-1H-35+00

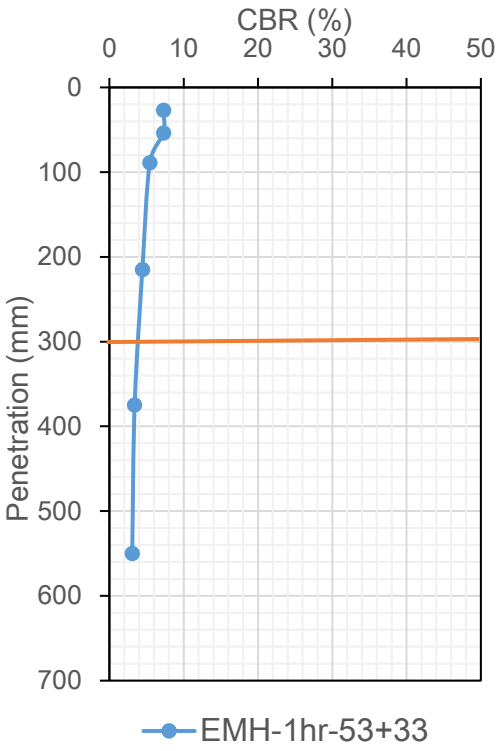

CBR (%)
0
10
20
30
40
50
60
0
100
200
300
400
500
600
700
Penetration (mm)
MH-14D-35+00

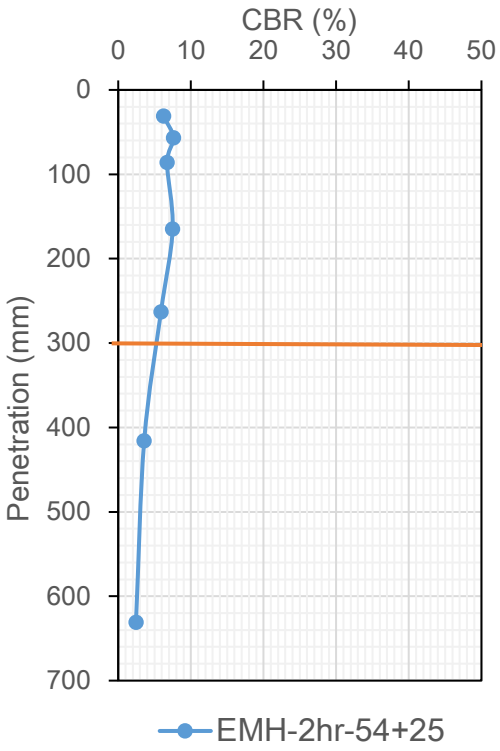

CBR (%)
0 10 20 30 40 50 60
Penetration (mm)
0 100 200 300 400 500 600 700
MH-14D-33+00
CBR (%)
0 10 20 30 40 50 60
Penetration (mm)
0 100 200 300 400 500 600 700
MH-14D-33+00M
CBR (%)
0 10 20 30 40 50 60
Penetration (mm)
0 100 200 300 400 500 600 700
MH-14D-31+00
CBR (%)
0 10 20 30 40 50 60
Penetration (mm)
0 100 200 300 400 500 600 700
MH-14D-29+00

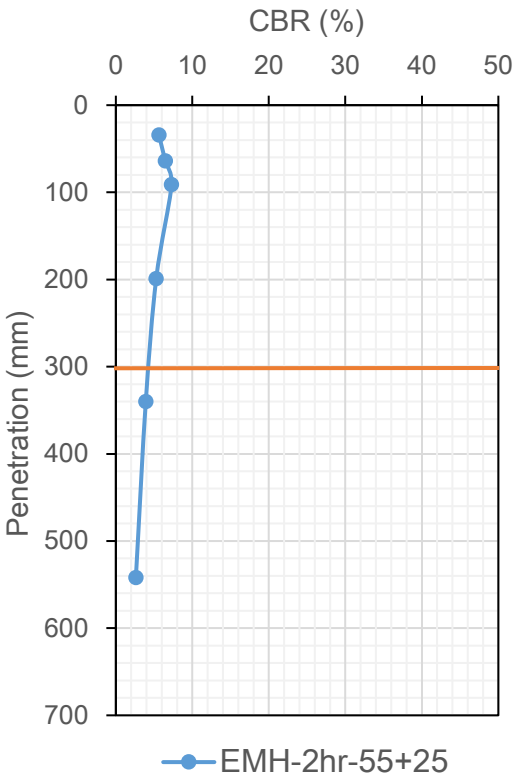
C. East Mohawk RD, McPherson

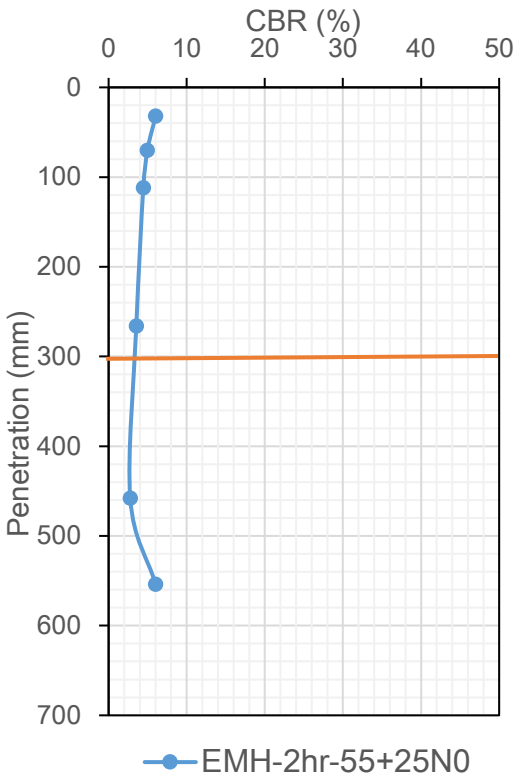


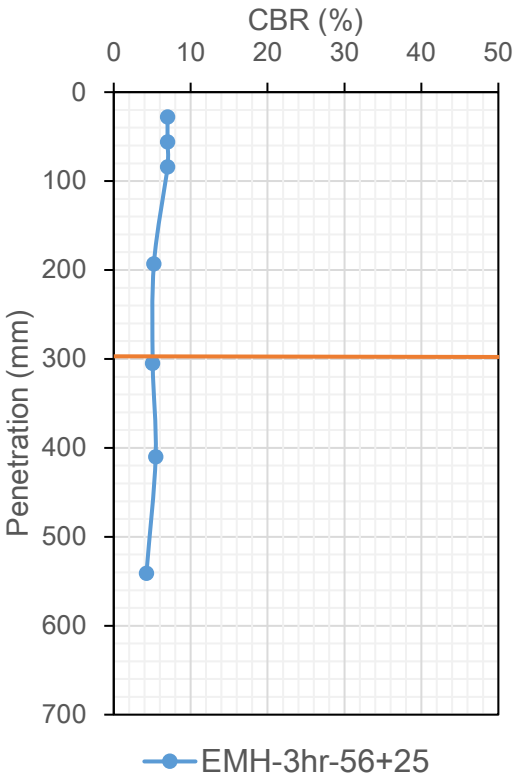


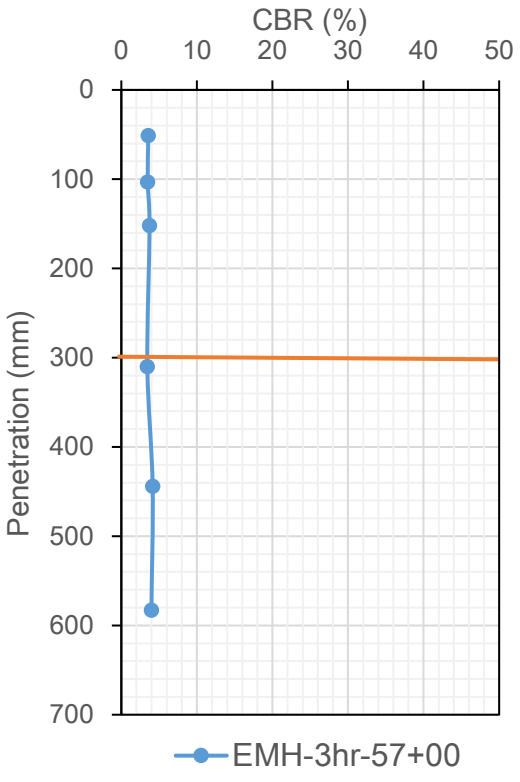


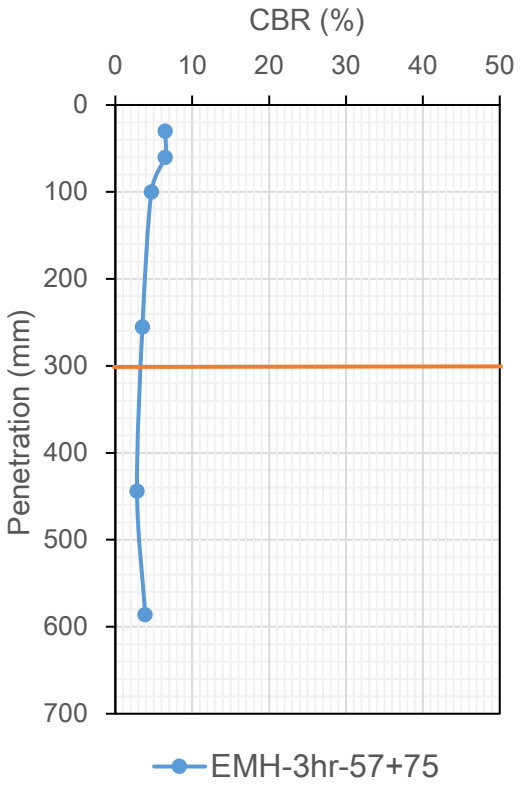


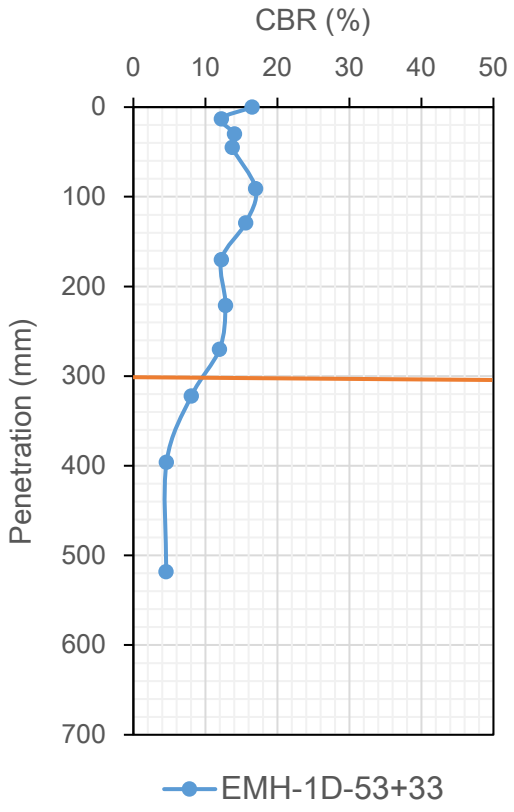

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-2hr-55+25

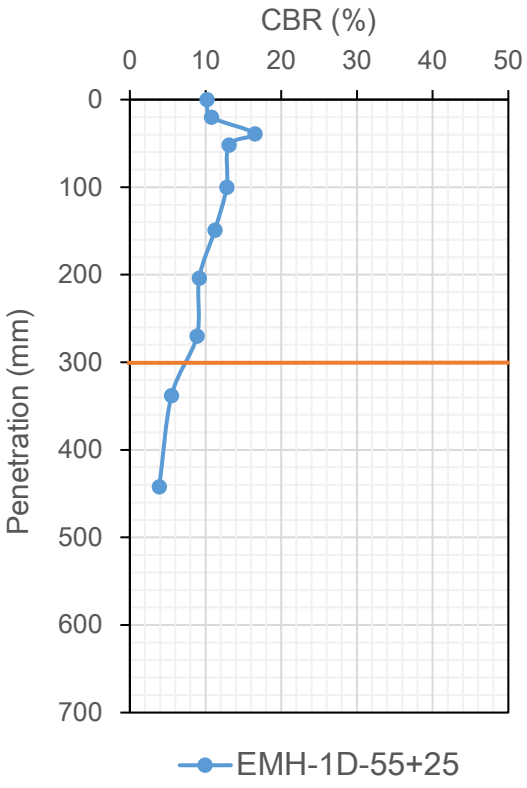

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-2hr-55+25N0

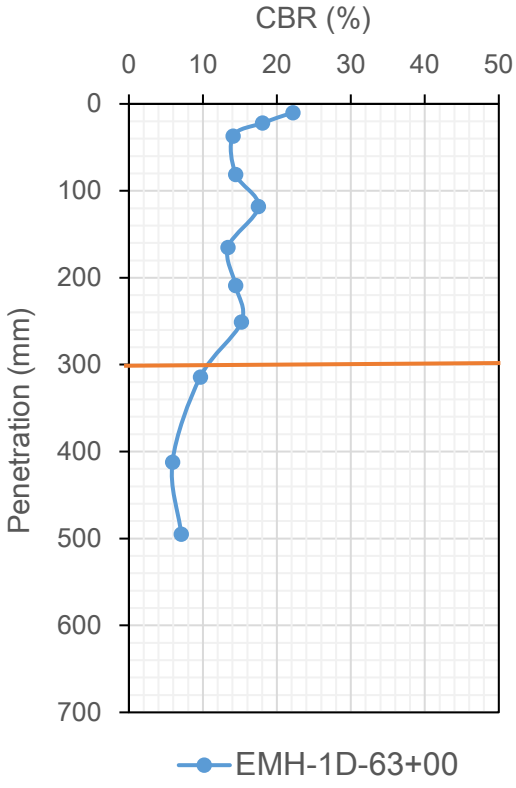

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-3hr-56+25

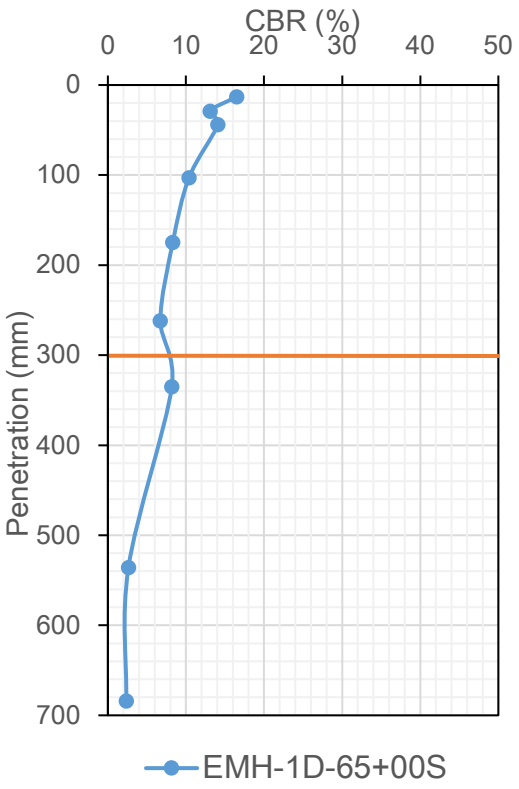

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-3hr-57+00

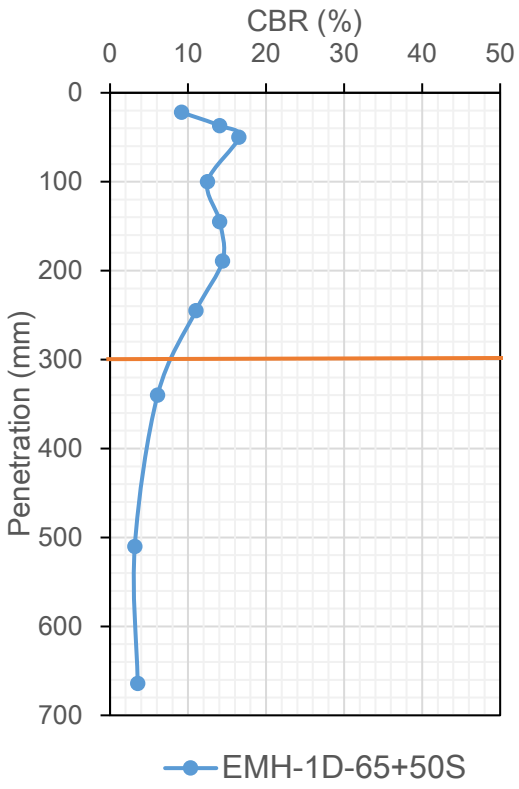

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-3hr-57+75

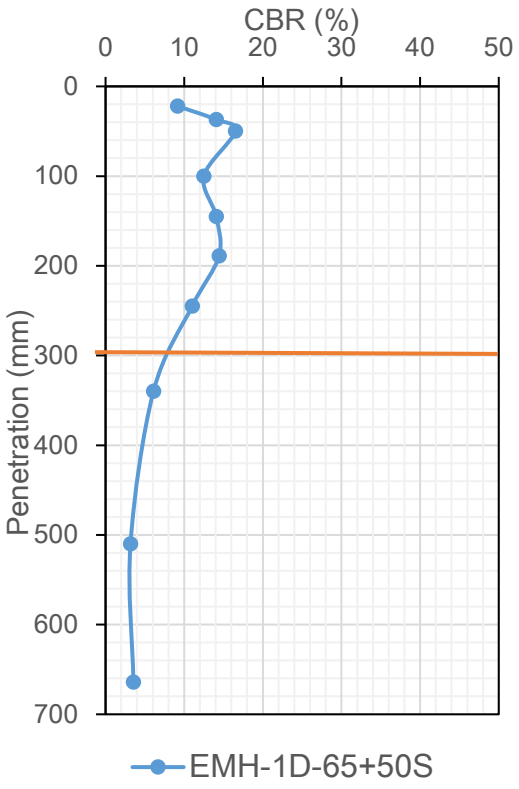

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-53+33

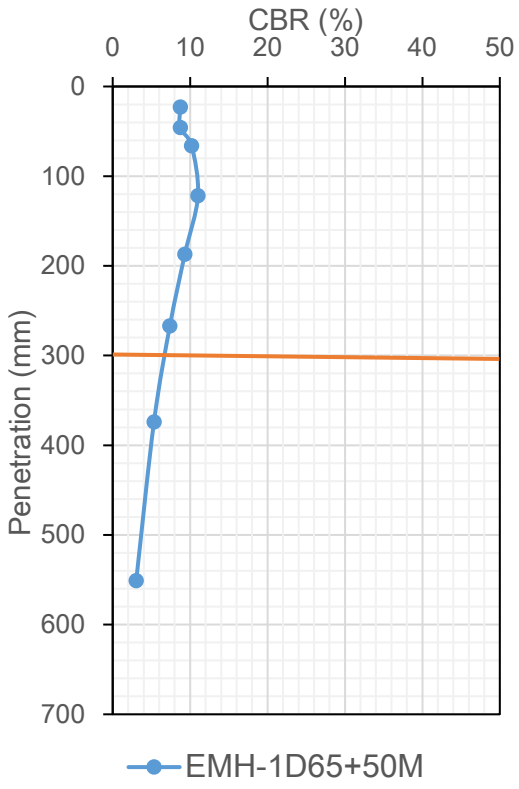

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-55+25

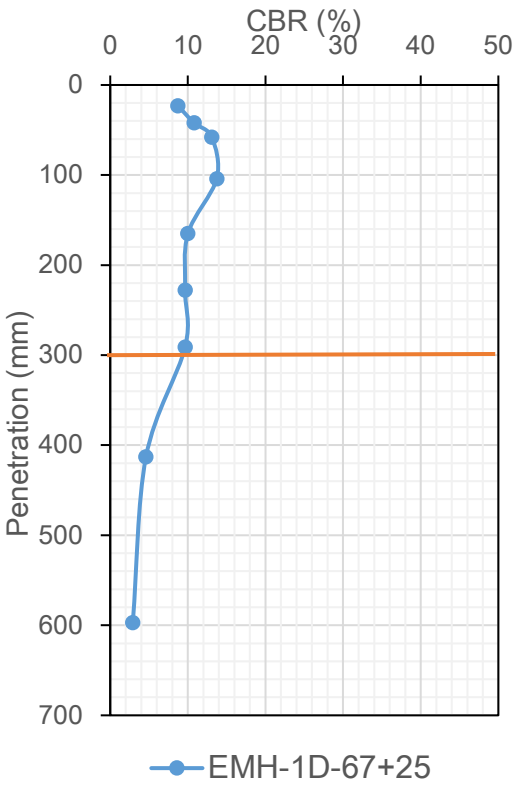

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-63+00

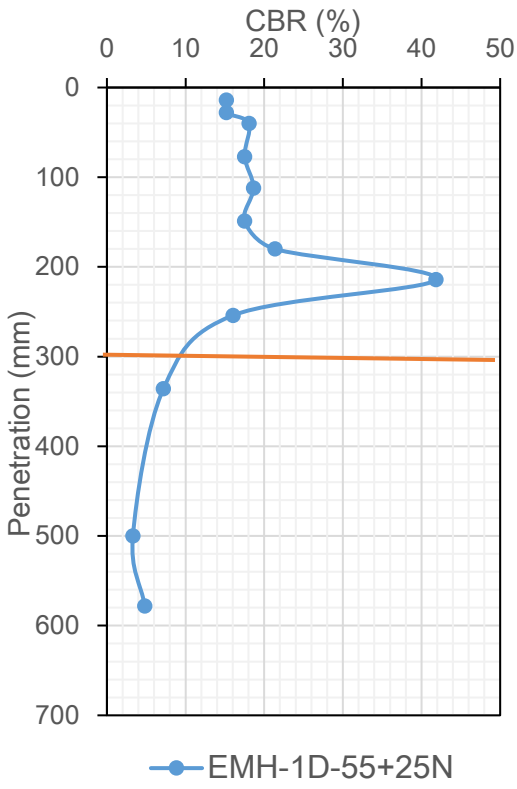

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-1D-65+00S

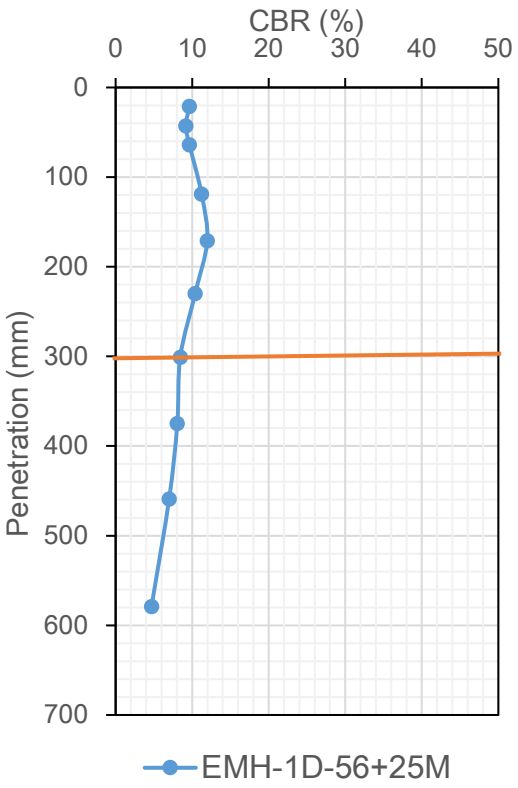

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-1D-65+50S

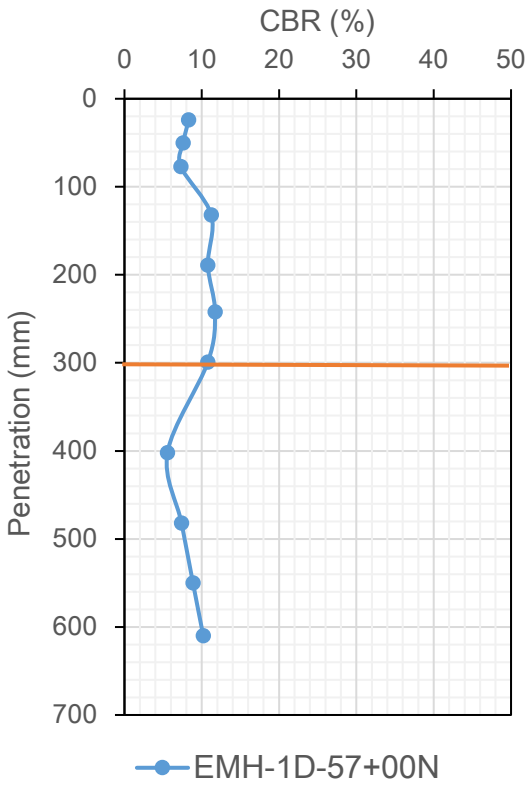

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-1D-65+50S

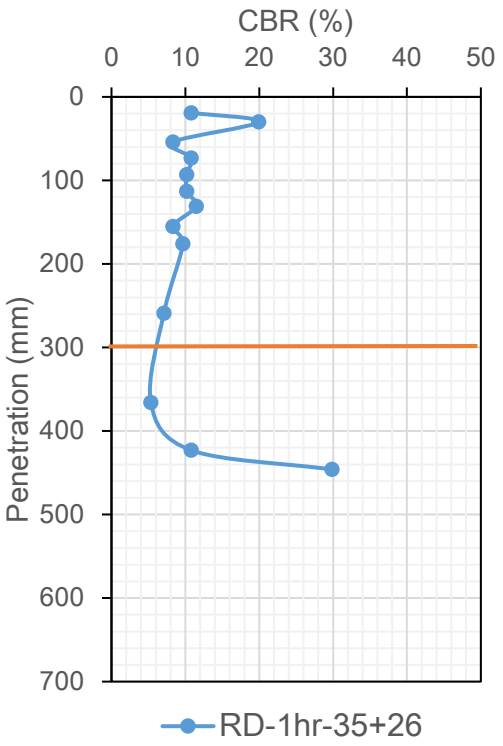

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
EMH-1D65+50M

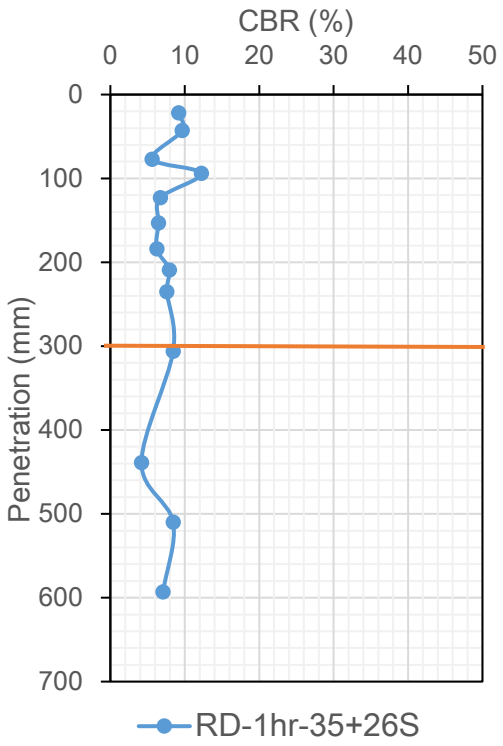

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-67+25

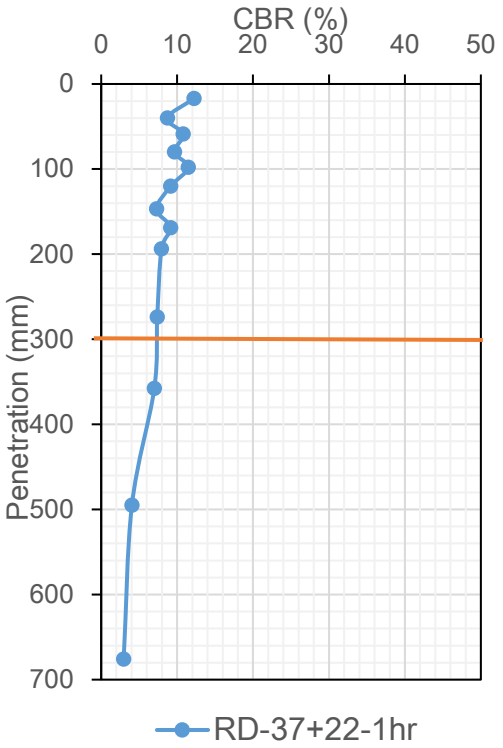

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-55+25N

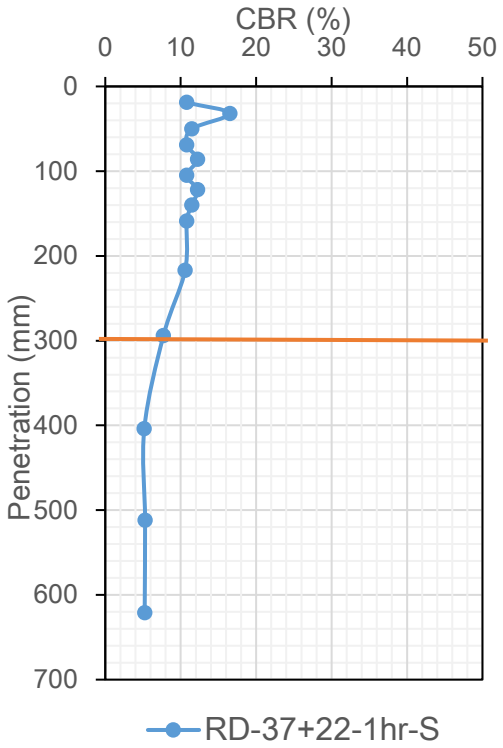

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-56+25M

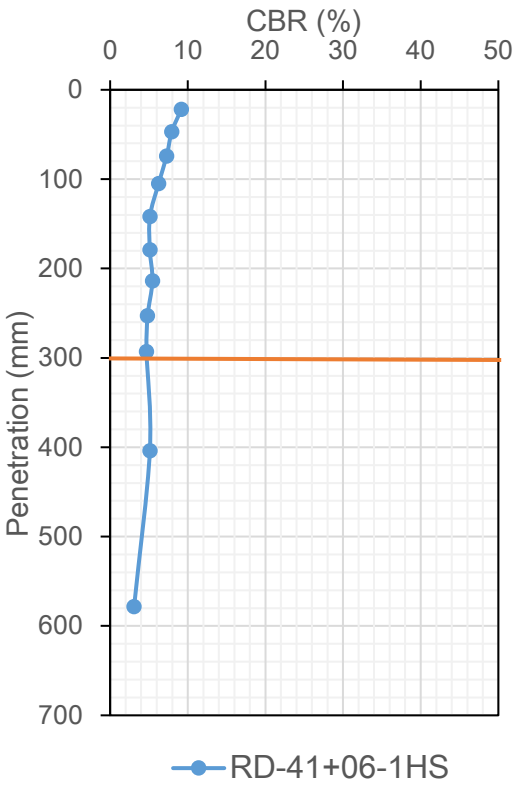

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
EMH-1D-57+00N

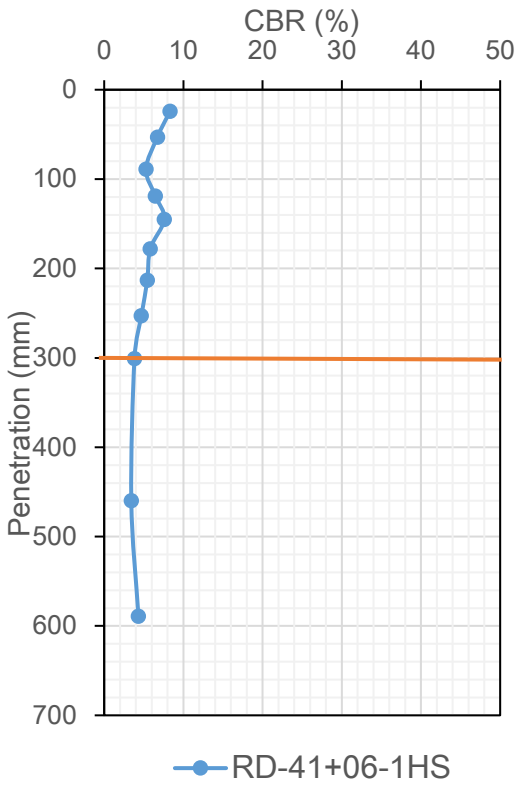

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-1hr-35+26

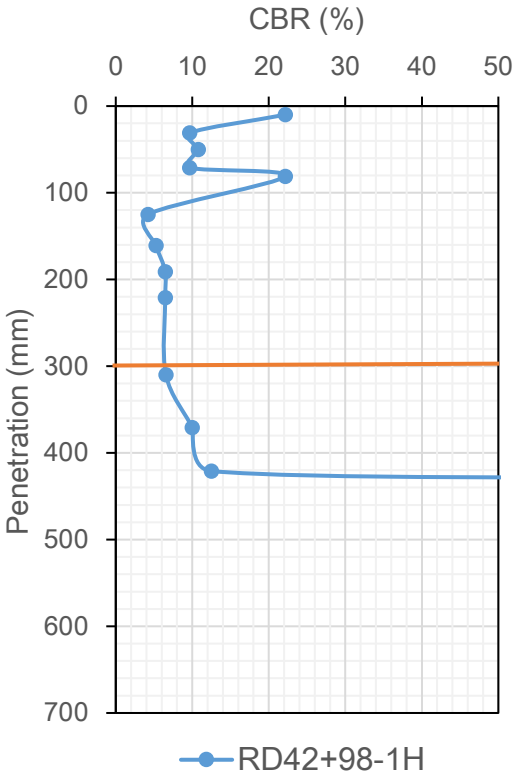

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-1hr-35+26S

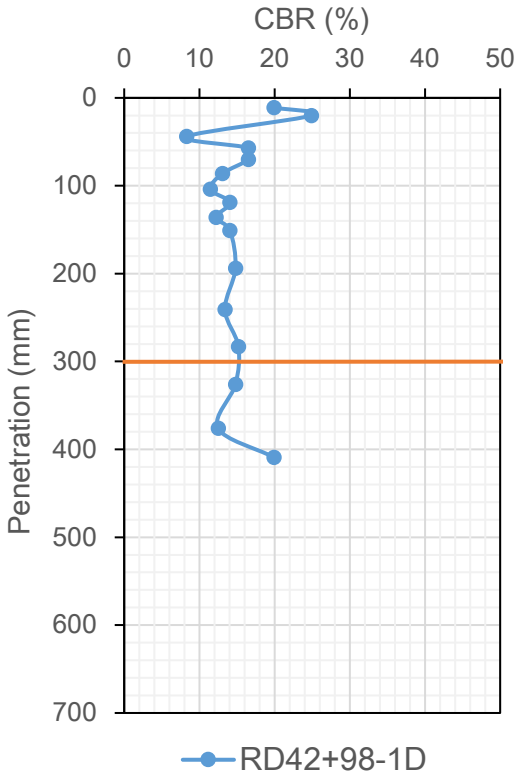

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-37+22-1hr

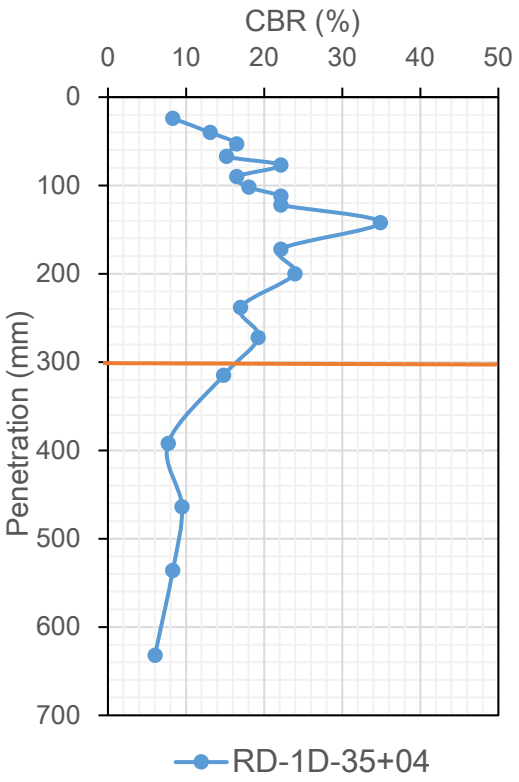

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-37+22-1hr-S

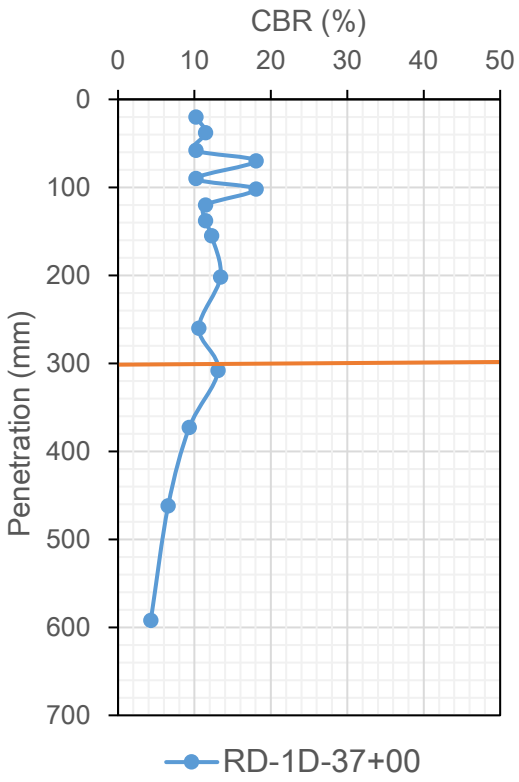

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-41+06-1HS

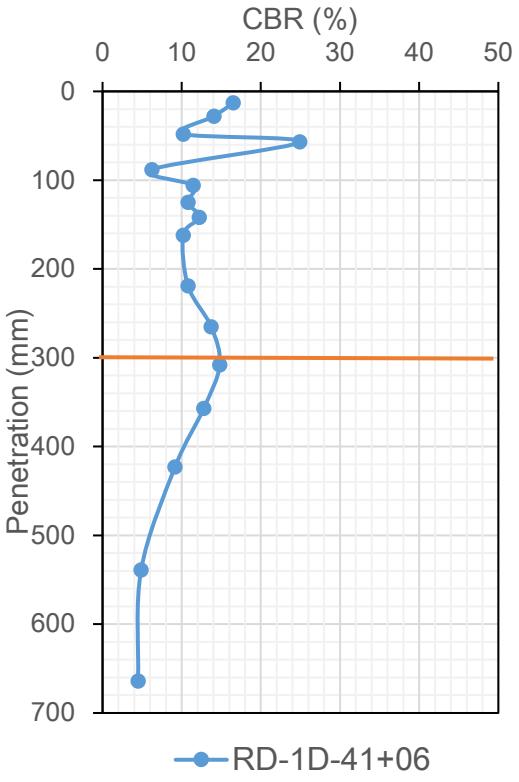

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-41+06-1HS

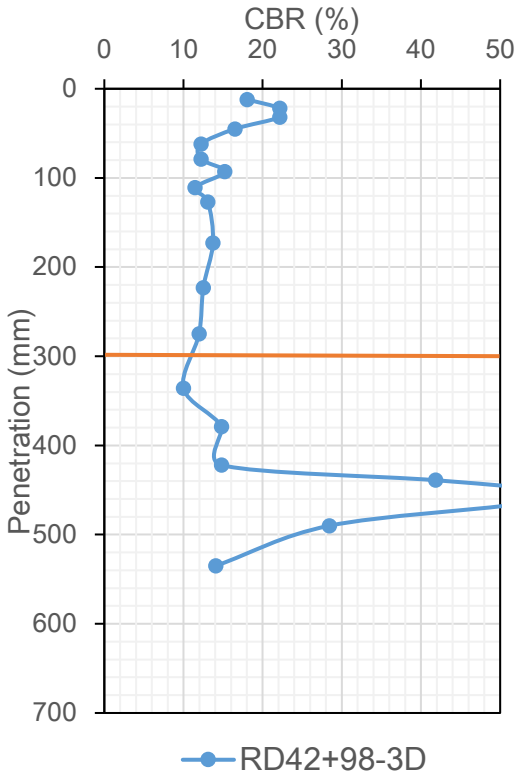

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD42+98-1H

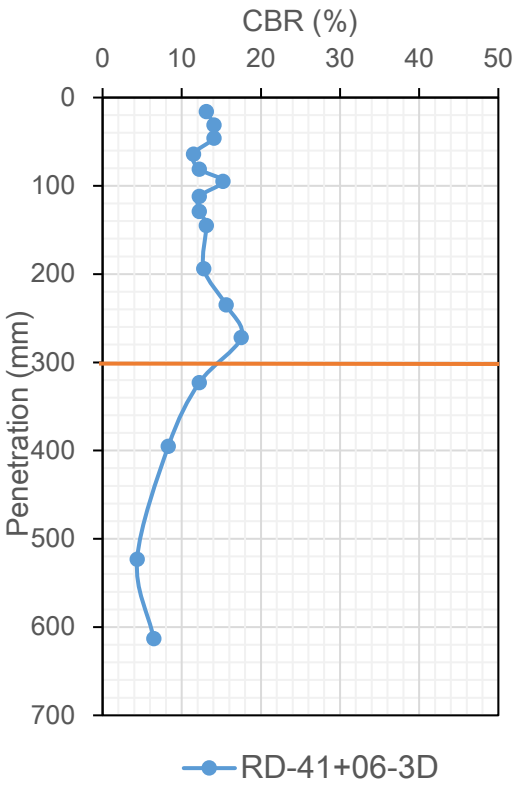

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD42+98-1D

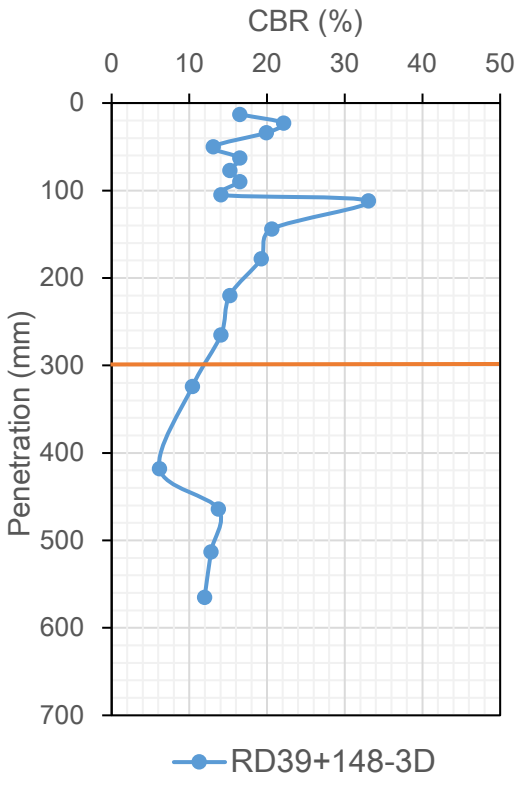

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-1D-35+04

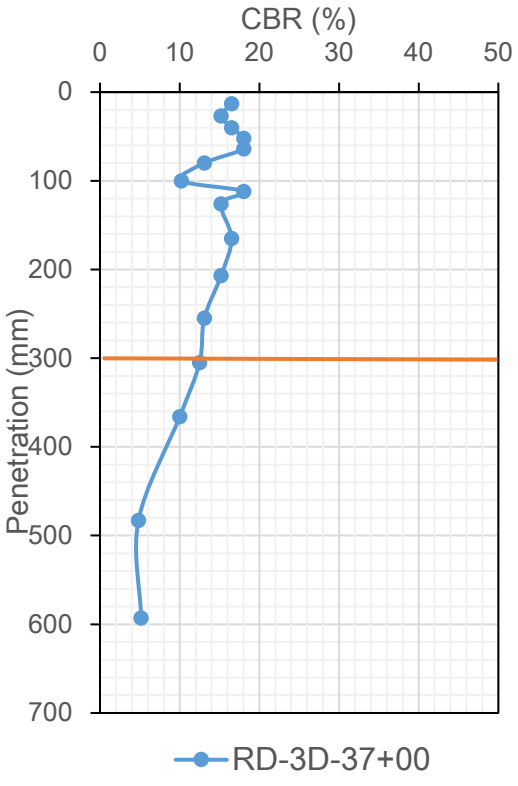

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-1D-37+00

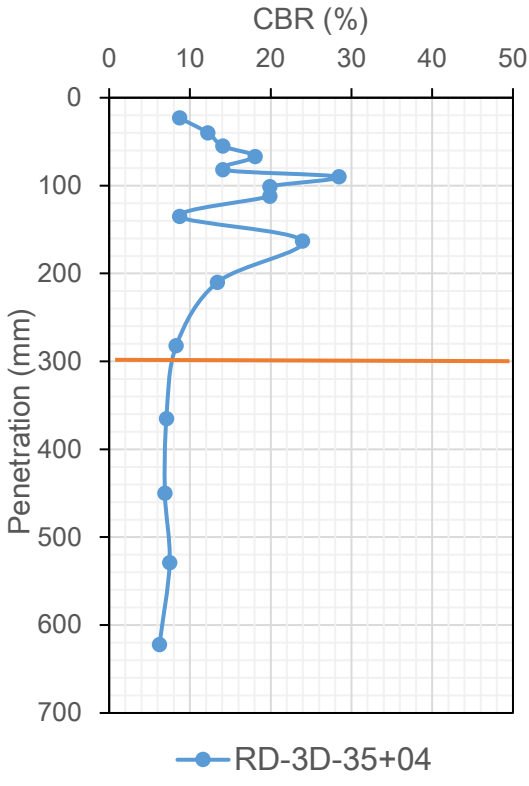

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-1D-41+06

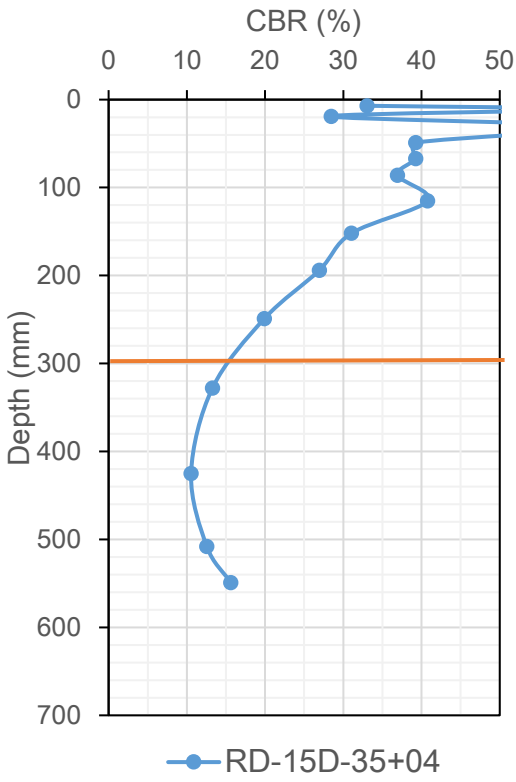

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD42+98-3D


CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-41+06-3D

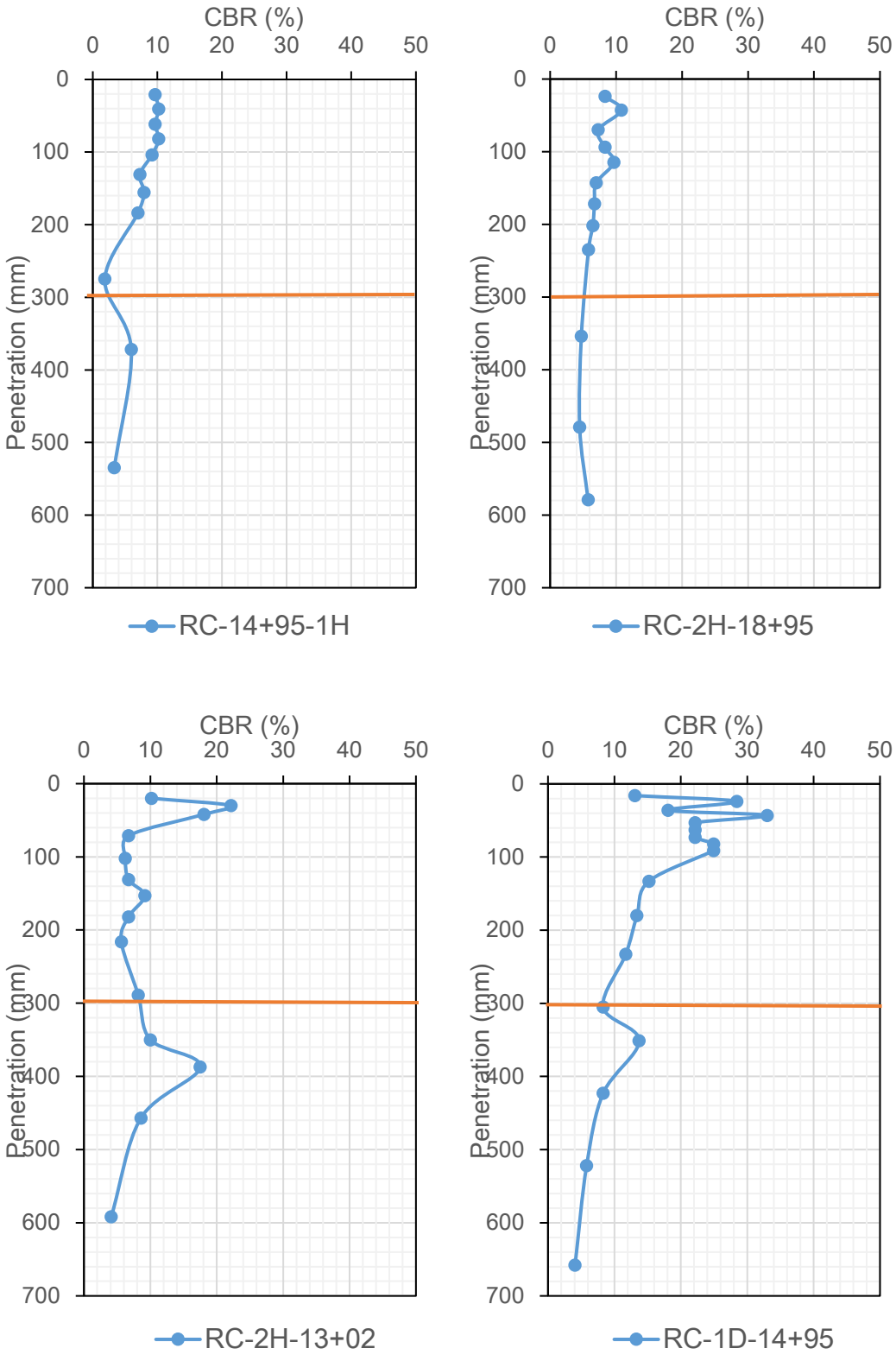

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD39+148-3D

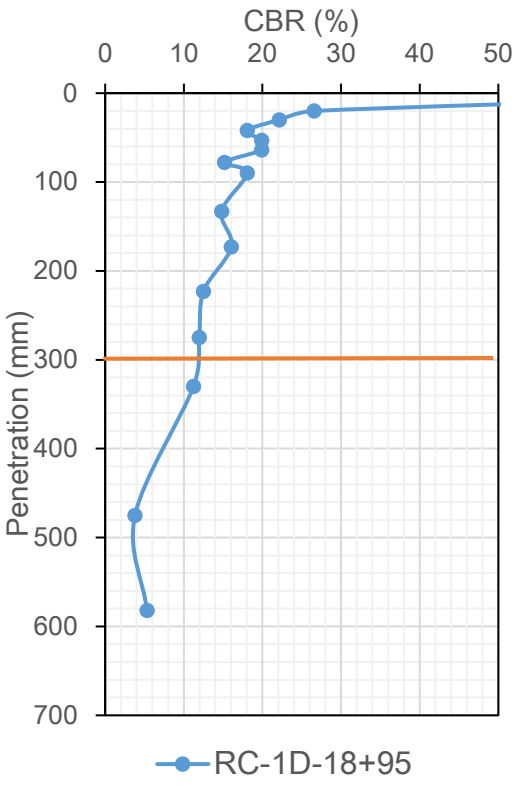

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-3D-37+00

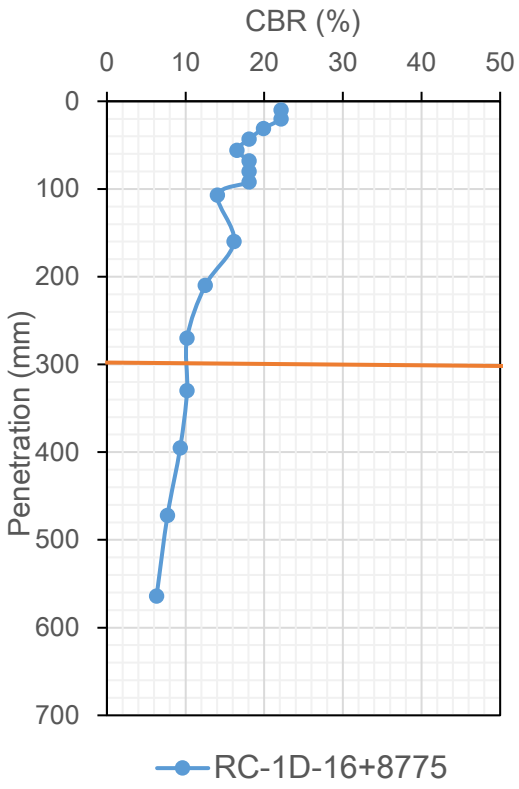

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RD-3D-35+04

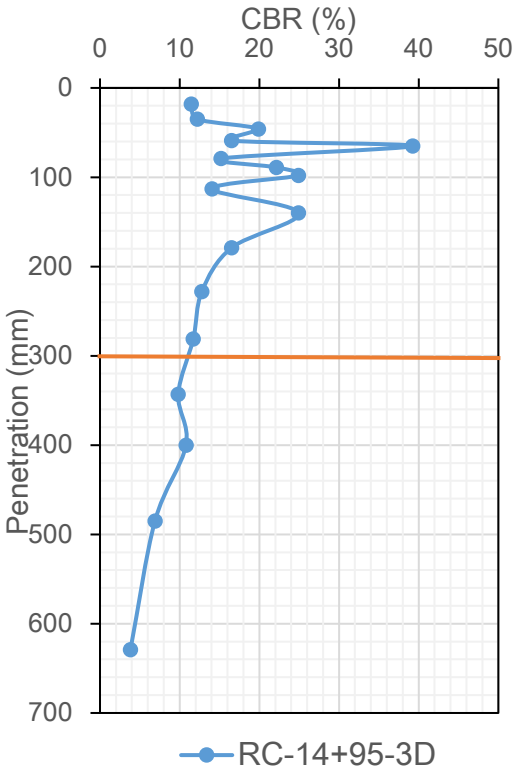

CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Depth (mm)
RD-15D-35+04

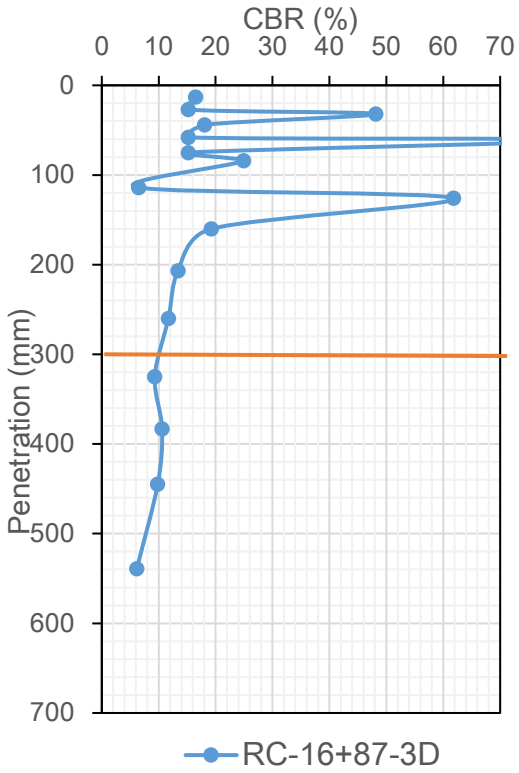
E. Ramp C, McPherson

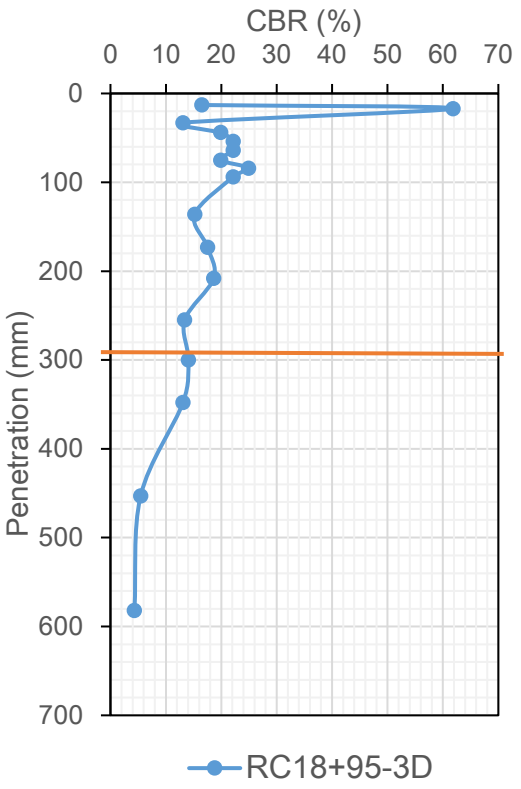


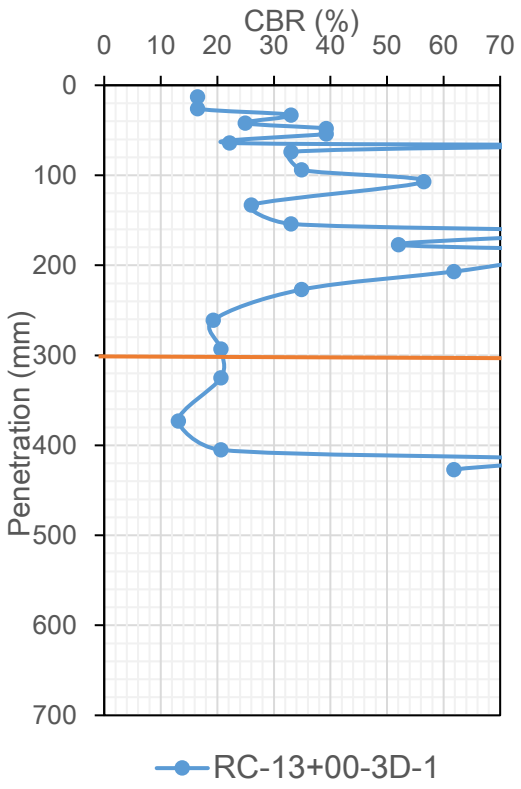

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RC-1D-18+95

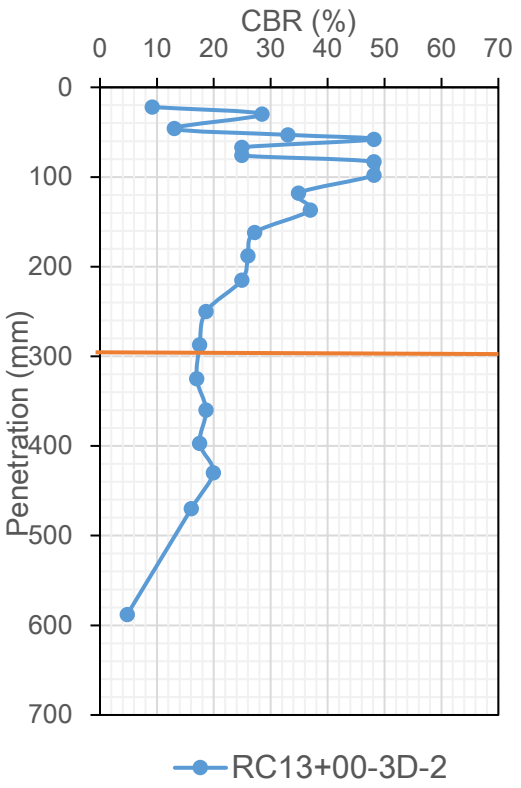

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RC-1D-16+8775

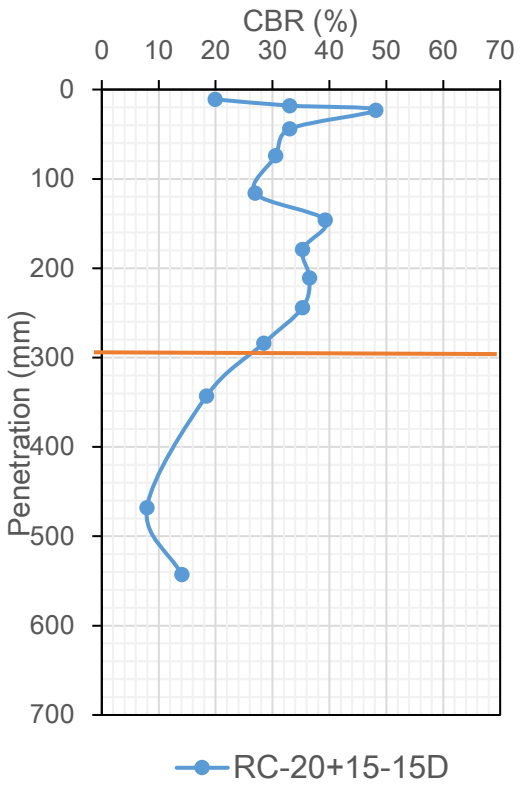

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
RC-14+95-3D

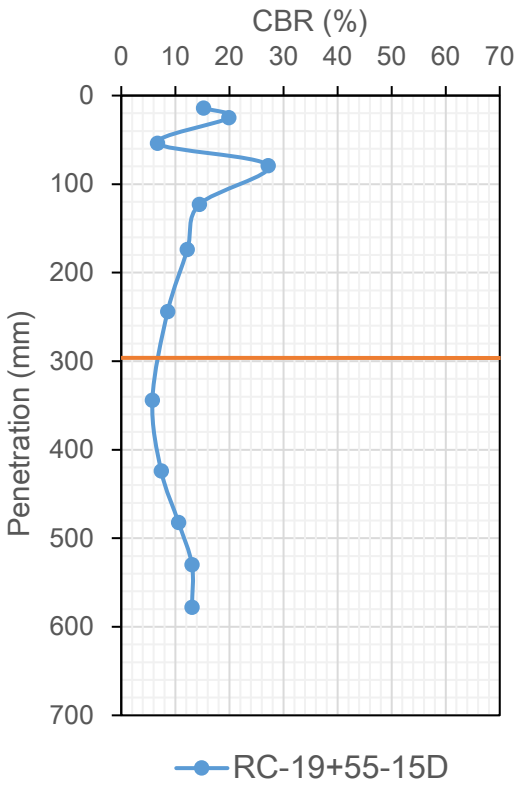

CBR (%)
0
10
20
30
40
50
60
70
Penetration (mm)
0
100
200
300
400
500
600
700
RC-16+87-3D


CBR (%)
0 10 20 30 40 50 60 70
Penetration (mm)
0 100 200 300 400 500 600 700
RC18+95-3D

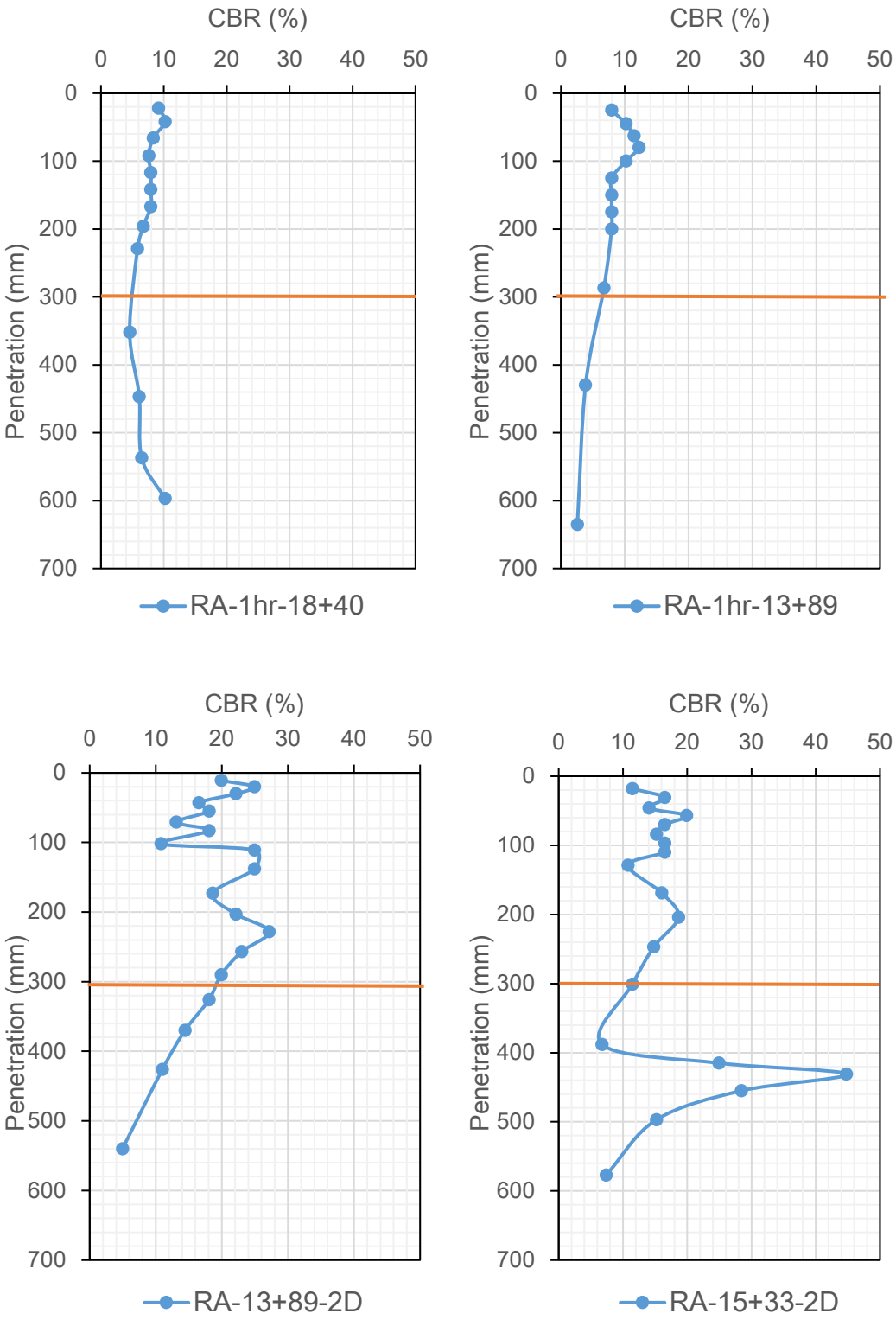

CBR (%)
0 10 20 30 40 50 60 70
Penetration (mm)
0 100 200 300 400 500 600 700
RC-13+00-3D-1

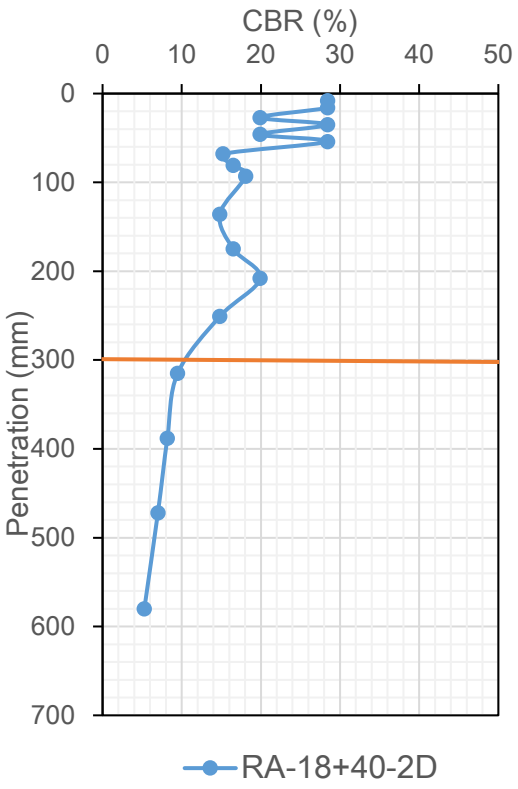

CBR (%)
0 10 20 30 40 50 60 70
Penetration (mm)
0 100 200 300 400 500 600 700
RC13+00-3D-2

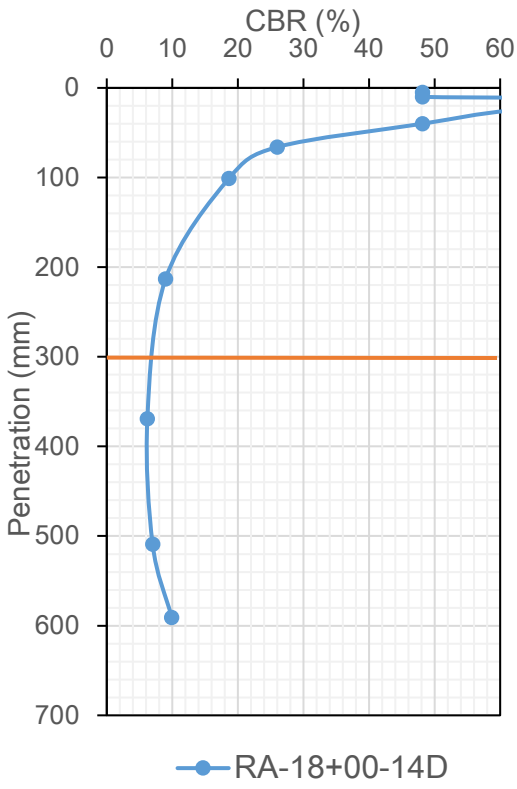

CBR (%)
0 10 20 30 40 50 60 70
Penetration (mm)
0 100 200 300 400 500 600 700
RC-20+15-15D

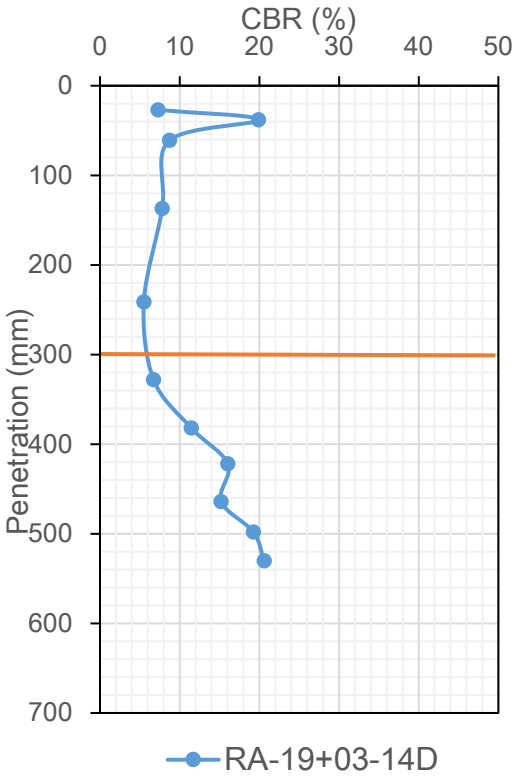

CBR (%)
0
10
20
30
40
50
60
70
0
100
200
300
400
500
600
700
Penetration (mm)
RC-19+55-15D

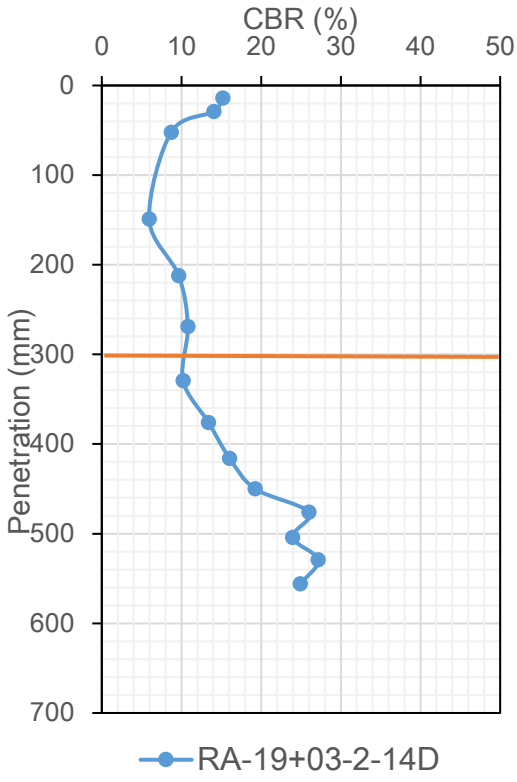
F. Ramp A, McPherson

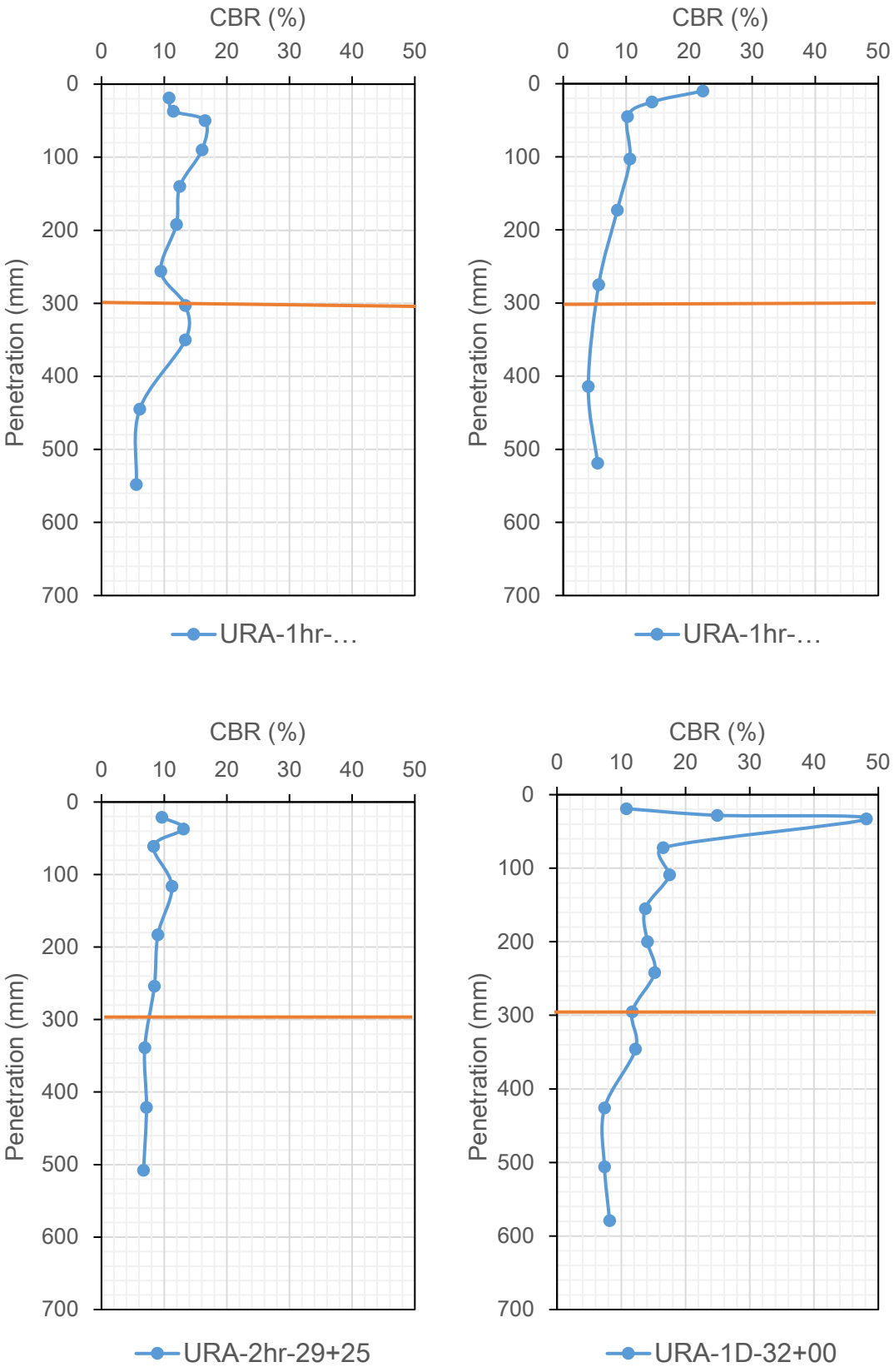


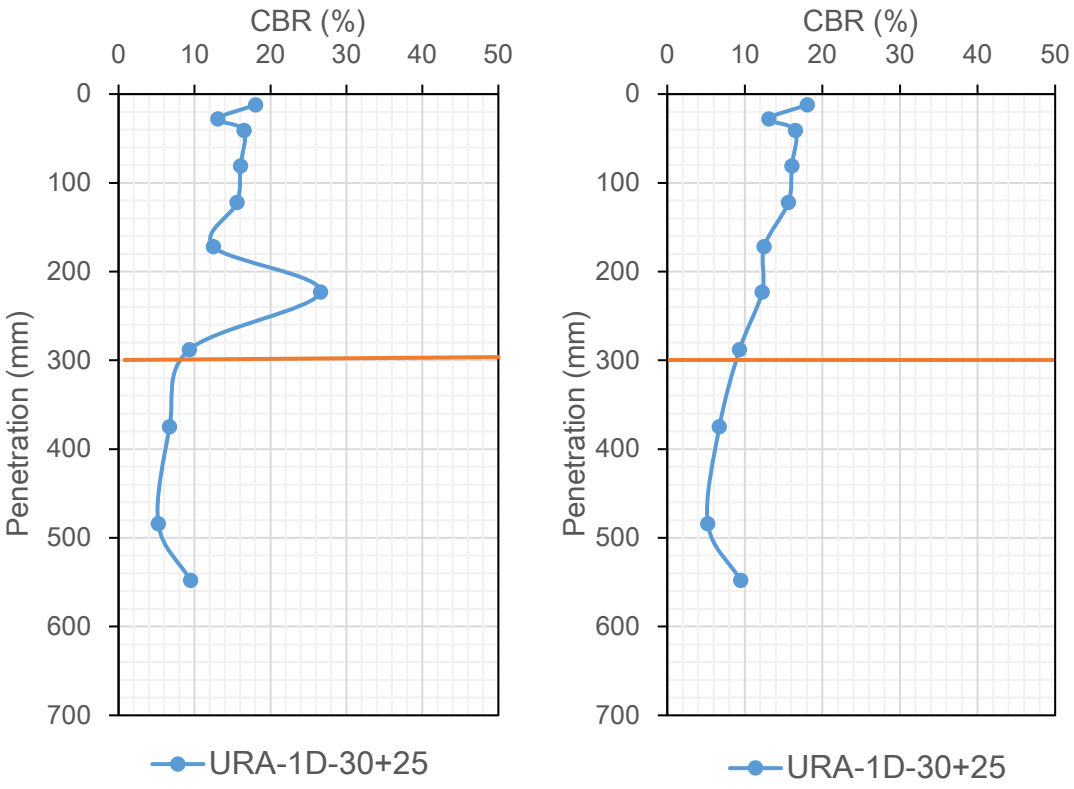

CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RA-18+40-2D


CBR (%)
0 10 20 30 40 50 60
0 100 200 300 400 500 600 700
Penetration (mm)
RA-18+00-14D

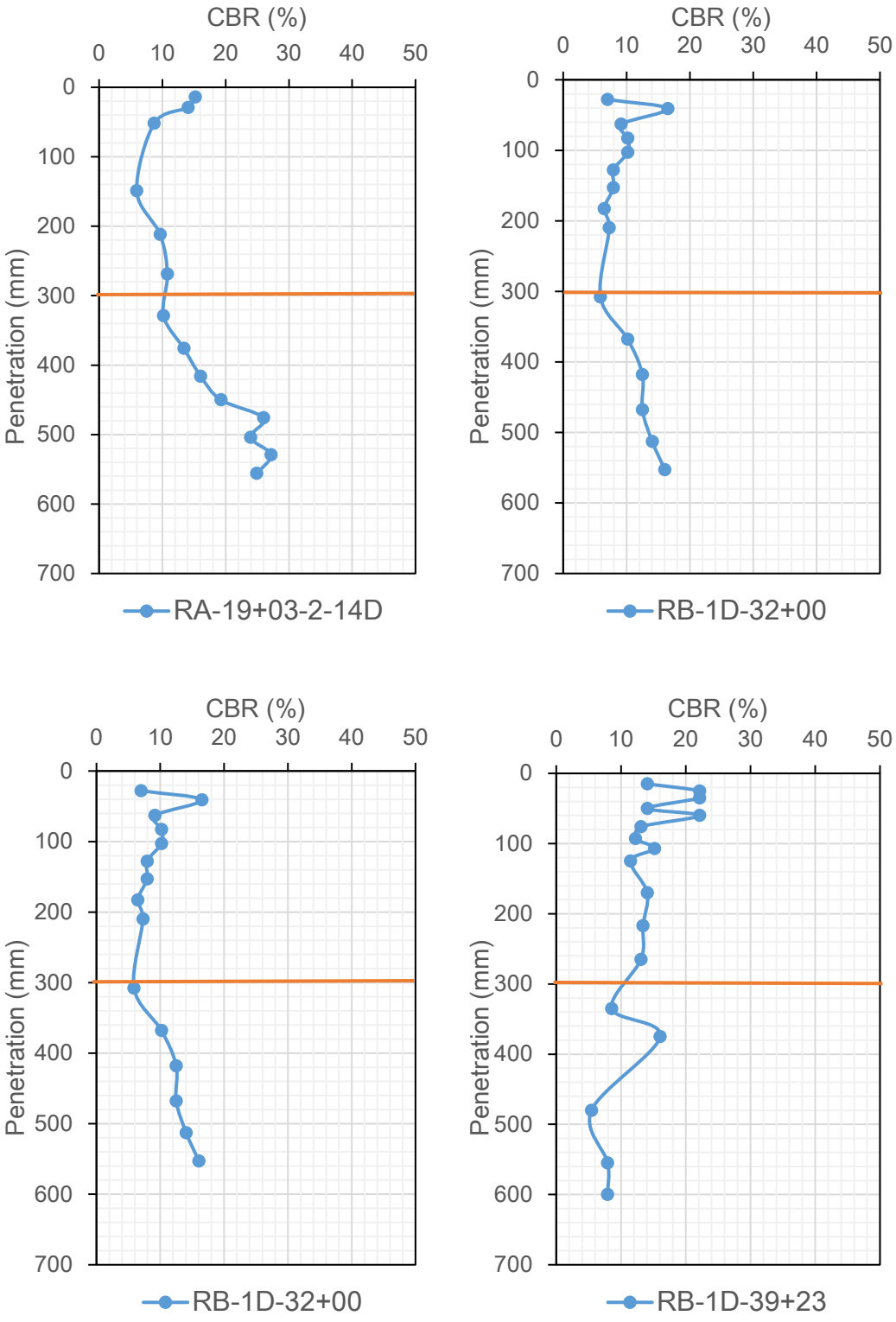

CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RA-19+03-14D

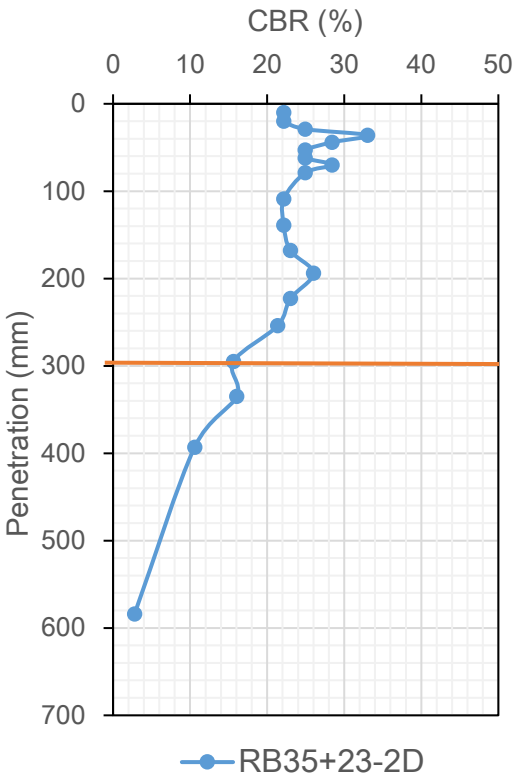

CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RA-19+03-2-14D

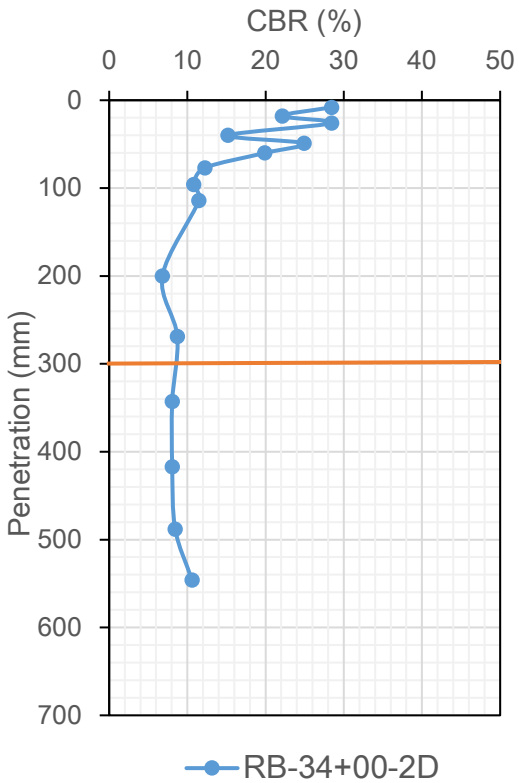

CBR (%)
0 10 20 30 40 50
Penetration (mm)
0 100 200 300 400 500 600 700
URA-1hr-…
CBR (%)
0 10 20 30 40 50
Penetration (mm)
0 100 200 300 400 500 600 700
URA-1hr-…
CBR (%)
0 10 20 30 40 50
Penetration (mm)
0 100 200 300 400 500 600 700
URA-2hr-29+25
CBR (%)
0 10 20 30 40 50
Penetration (mm)
0 100 200 300 400 500 600 700
URA-1D-32+00

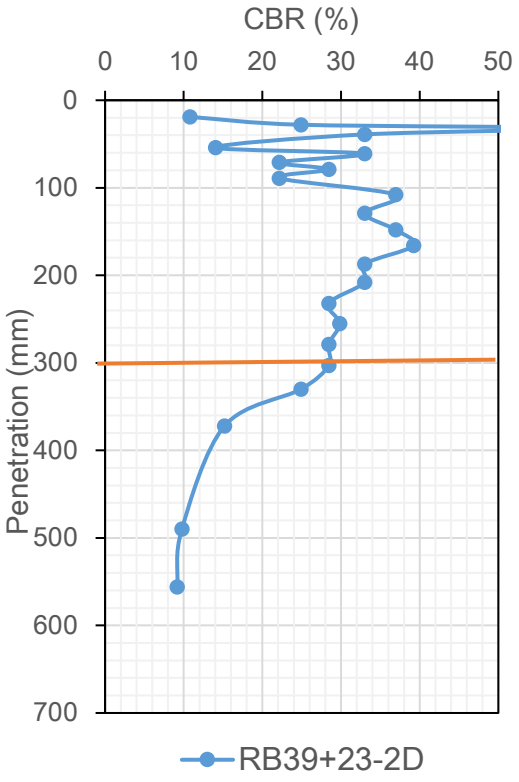

CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
URA-1D-30+25
CBR (%)
0
10
20
30
40
50
Penetration (mm)
0
100
200
300
400
500
600
700
URA-1D-30+25

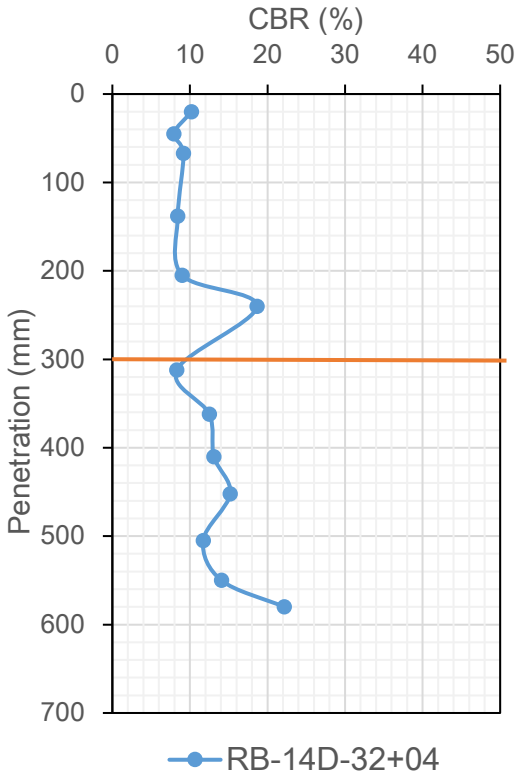
G. Ramp B, McPherson

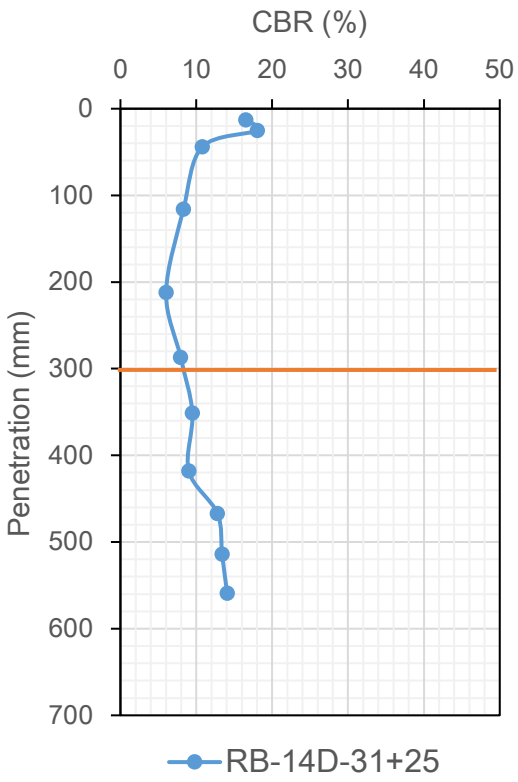



CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RB35+23-2D


CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RB-34+00-2D


CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RB39+23-2D


CBR (%)
0 10 20 30 40 50
0 100 200 300 400 500 600 700
Penetration (mm)
RB-14D-32+04


CBR (%)
0
10
20
30
40
50
0
100
200
300
400
500
600
700
Penetration (mm)
RB-14D-31+25

Appendix H: Light Weight Deflectometer Field Test Measurements

Light Weight Deflectometer (LWD) Data - ASTM-E2583 – 07

Project : I-35 and Mohawk RD Subgrade					Date: 09/20/2016	
Location :West Mohawk RD						
Pavement conditions: 1-3 hrs., A.C.*			Records	Location	Stations	Comment
Deflection	Average (S)	mm	0.39		33+00	
Modulus	Average	MPa	56.96			
Deflection	Average (S)	mm	0.76	outer	33+00	
Modulus	Average	MPa	27.24			
Deflection	Average (S)	mm	0.56		34+00	
Modulus	Average	MPa	40.18			
Deflection	Average (S)	mm	0.44	outer	35+00	
Modulus	Average	MPa	50.90			
Deflection	Average (S)	mm	0.29	inner	35+00	
Modulus	Average	MPa	77.85			
Deflection	Average (S)	mm	0.56		32+00	
Modulus	Average	MPa	40.54			
Deflection	Average (S)	mm	0.64	outer-R	31+00	
Modulus	Average	MPa	34.90			
Deflection	Average (S)	mm	0.70	Outer-L	31+00	
Modulus	Average	MPa	32.14			
Deflection	Average (S)	mm	0.48	inner	30+00	
Modulus	Average	MPa	46.58			
Deflection	Average (S)	mm	0.46	Outer-R	29+00	
Modulus	Average	MPa	48.81			
Deflection	Average (S)	mm	0.71	inner	28+0	
Modulus	Average	MPa	31.91			
Deflection	Average (S)	mm	0.60	outer	28+00	
Modulus	Average	MPa	37.19			
Deflection	Average (S)	mm	0.59		27+00	
Modulus	Average	MPa	37.94			

*After compaction

Project : I-35 and Mohawk RD Subgrade					Date:09/22/2016	
Location :West Mohawk RD					Personnel:	
Pavement conditions: 2 Days LKD					Water Table Depth:	
Pavement conditions: 2 days, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.36	inner	39+74	
Modulus	Average	MPa	62.90			
Deflection	Average (S)	mm	0.37	outer	37+75	
Modulus	Average	MPa	61.60			
Deflection	Average (S)	mm	0.51	Inner-wet	37+75	
Modulus	Average	MPa	44.00			
Deflection	Average (S)	mm	0.46	outer	35+75	
Modulus	Average	MPa	48.50			
Deflection	Average (S)	mm	0.38	Outer-L	29+00	
Modulus	Average	MPa	59.10			
Deflection	Average (S)	mm	0.38	inner	34+00	
Modulus	Average	MPa	58.50			
Deflection	Average (S)	mm	0.42	Inner	35+00	
Modulus	Average	MPa	53.60			
Deflection	Average (S)	mm	0.53	outer-L	31+00	
Modulus	Average	MPa	42.10			
Deflection	Average (S)	mm	0.46	inner	30+00	
Modulus	Average	MPa	48.90			
Deflection	Average (S)	mm	0.47	outer-R	29+00	
Modulus	Average	Mpa	48.10			
Deflection	Average (S)	mm	0.34	inner	28+00	
Modulus	Average	MPa	65.80			
Deflection	Average (S)	mm	0.34		27+00	
Modulus	Average	MPa	66.20			

Deflection	Average (S)	mm	0.60	outer-R	33+00	
Modulus	Average	MPa				
Deflection	Average (S)	mm	0.43	inner	32+00	
Modulus	Average	MPa	52.00			
Deflection	Average (S)	mm	0.39	inner	33+00	
Modulus	Average	MPa	57.80			
Deflection	Average (S)	mm	0.41	inner	35+75	
Modulus	Average	MPa	54.70			

Project : I-35 and Mohawk RD Subgrade					Date:10/03/2016	
Location :West Mohawk RD						
Pavement conditions: 14 days, A.C.			Records	Location	Station	Comment
	Average (S)	mm	0.53		35+00	
Modulus	Average	MPa	42.60			
Deflection	Average (S)	mm	0.66		33+00	
Modulus	Average	MPa	34.10			
Deflection	Average (S)	mm	0.60	inner	31+00	
Modulus	Average	MPa	37.60			
Deflection	Average (S)	mm	0.61	outer	31+00	
Modulus	Average	MPa	36.60			
Deflection	Average (S)	mm	0.46	inner	29+00	
Modulus	Average	MPa	49.30			

Project : I-35 and Mohawk RD Subgrade					Date:10/27/2016	
Location :East Mohawk RD						
Pavement conditions: 1-3 hours, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.53		53+33	
Modulus	Average	MPa	42.37			
Deflection	Average (S)	mm	0.73	South	54+25	
Modulus	Average	MPa	30.61			
Deflection	Average (S)	mm	0.84	North	54+25	
Modulus	Average	MPa	26.69			
Deflection	Average (S)	mm	1.99	Untreated	54+25	
Modulus	Average	MPa	11.32			
Deflection	Average (S)	mm	0.45	2 hrs	54+75	
Modulus	Average	MPa	50.11			
Deflection	Average (S)	mm	0.44	south	55+25	
Modulus	Average	MPa	50.90			
Deflection	Average (S)	mm	0.59	Middle	55+25	
Modulus	Average	MPa	38.27			
Deflection	Average (S)	mm	0.76	north	55+25	
Modulus	Average	MPa	29.60			
Deflection	Average (S)	mm	0.69	3 hrs.	56+25	
Modulus	Average	MPa	32.25			
Deflection	Average (S)	mm	0.78	next to	56+25	
Modulus	Average	MPa	28.88			
Deflection	Average (S)	mm	0.96	next to	56+25	
Modulus	Average	MPa	23.36			
Deflection	Average (S)	mm	0.73	South	57+00	
Modulus	Average	MPa	30.99			
Deflection	Average (S)	mm	0.79	North	57+00	
Modulus	Average	MPa	28.40			
Deflection	Average (S)	mm	1.23	untreated	72+00	
Modulus	Average	MPa	18.20			
Deflection	Average (S)	mm	0.59		71+50	
Modulus	Average	MPa	38.40			
Deflection	Average (S)	mm	1.02	untreated		
Modulus	Average	MPa	22.10			

Deflection	Average (S)	mm	0.41	Middle	64+75	
Modulus	Average	MPa	55.15			
Deflection	Average (S)	mm	0.40	middle	65+50	
Modulus	Average	MPa	55.83			
Deflection	Average (S)	mm	0.46	north	65+50	
Modulus	Average	MPa	48.91			
Deflection	Average (S)	mm	0.58	middle	66+50	
Modulus	Average	MPa	39.06			
Deflection	Average (S)	mm	0.71		67+25	
Modulus	Average	MPa	31.50			
Deflection	Average (S)	mm	0.38		68+00	
Modulus	Average	MPa	58.90			

Project : I-35 and Mohawk RD Subgrade					Date:10/28/2016	
Location :East Mohawk RD						
Pavement conditions: 1 day, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.41	Middle	53+33	
Modulus	Average	MPa	54.33			
Deflection	Average (S)	mm	0.48	South	54+25	
Modulus	Average	MPa	46.68			
Deflection	Average (S)	mm	0.52	North	54+25	
Modulus	Average	MPa	42.45			
Deflection	Average (S)	mm	0.59	middle		
Modulus	Average	MPa	38.20		55+25	
Deflection	Average (S)	mm	0.32	repeat	55+25	
Modulus	Average	MPa	69.44			
Deflection	Average (S)	mm	0.40	North	55+25	
Modulus	Average	MPa	56.82			
Deflection	Average (S)	mm	0.40	Middle	56+25	
Modulus	Average	MPa	56.39			
Deflection	Average (S)	mm	0.51	south	57+00	
Modulus	Average	MPa	44.20			
Deflection	Average (S)	mm	0.32	middle	57+00	
Modulus	Average	MPa	70.10			
Deflection	Average (S)	mm	0.47	Middle	58+00	
Modulus	Average	MPa	48.08			
Deflection	Average (S)	mm	1.74	untreated	58+00	
Modulus	Average	MPa	12.90			
Deflection	Average (S)	mm	0.43	middle	63+00	
Modulus	Average	MPa	51.96			
Deflection	Average (S)	mm	0.45	South	64+25	
Modulus	Average	MPa	49.67			
Deflection	Average (S)	mm	0.47	north	64+25	
Modulus	Average	MPa	47.37			

Project : I-35 and Mohawk RD Subgrade					Date:09/20/2016	
Location : Ramp B						
Pavement conditions: hrs., A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.41	Inner	34+00	
Modulus	Average	MPa	54.48			
Deflection	Average (S)	mm	0.61	outer	36+4964	
Modulus	Average	MPa	37.00			
Deflection	Average (S)	mm	0.68	outer-Repeat	36+4964	
Modulus	Average	MPa	33.09			
Deflection	Average (S)	mm	0.34	Inner	36+4964	
Modulus	Average	MPa	65.41			
Deflection	Average (S)	mm	0.95		39+8973	
Modulus	Average	MPa	23.63			
Deflection	Average (S)	mm	0.41	Inner	32+23	
Modulus	Average	MPa	54.70			
Deflection	Average (S)	mm	0.45		33+00	
Modulus	Average	MPa	50.50			
Deflection	Average (S)	mm	0.57		34+03	
Modulus	Average	MPa	39.70			
Deflection	Average (S)	mm	1.10	1	39+2376	
Modulus	Average	MPa	20.50			
Deflection	Average (S)	mm	0.88	2	39+2376	
Modulus	Average	MPa	26.50			

Project : I-35 and Mohawk RD Subgrade					Date:09/22/2016	
Location : Ramp B						
Pavement conditions: 2 days, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.34		31+00	
Modulus	Average	MPa	66.40			
Deflection	Average (S)	mm	0.27	outer	39+00	Shelby
Modulus	Average	MPa	83.00			
Deflection	Average (S)	mm	0.34		38+57	
Modulus	Average	MPa	66.00			
Deflection	Average (S)	mm	0.34		32+00	
Modulus	Average	MPa	65.41			
Deflection	Average (S)	mm	0.39	outer	35+00	
Modulus	Average	MPa	58.30			
Deflection	Average (S)	mm	0.30	inner	35+00	
Modulus	Average	MPa	74.50			
Deflection	Average (S)	mm	0.32		36+49	
Modulus	Average	MPa	69.40			
Deflection	Average (S)	mm	0.57		34+03	
Modulus	Average	MPa	39.70			
Deflection	Average (S)	mm	0.43		39+1664	Shelby
Modulus	Average	MPa	52.50			
Deflection	Average (S)	mm	0.43		31+25	
Modulus	Average	MPa	51.80			

Project : I-35 and Mohawk RD Subgrade					Date:10/03/2016	
Location : Ramp B						
Pavement conditions: 14 days, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.43		31+25	
Modulus	Average	MPa	51.84			
Deflection	Average (S)	mm	0.44		32+23	
Modulus	Average	MPa	51.50			

Project : I-35 and Mohawk RD Subgrade					Date:09/20/2016	
Location : Ramp A						
Pavement conditions: 1 hr., A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	1.032		16+24	
Modulus	Average	MPa	21.8			
Deflection	Average (S)	mm	0.714		15+3337	
Modulus	Average	MPa	31.47			
Deflection	Average (S)	mm	0.595		13+8973	
Modulus	Average	MPa	37.8			
Deflection	Average (S)	mm	0.847	outer	15+3337	
Modulus	Average	MPa	26.56			

Project : I-35 and Mohawk RD Subgrade					Date:09/22/2016	
Location : Ramp A						
Pavement conditions: 2 days, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.36		16+24	
Modulus	Average	MPa	63.00			
Deflection	Average (S)	mm	0.38		15+3337	
Modulus	Average	MPa	58.80			
Deflection	Average (S)	mm	0.43		13+8973	
Modulus	Average	MPa	51.50			
Deflection	Average (S)	mm	0.31	inner	17+00	
Modulus	Average	MPa	71.40			
Deflection	Average (S)	mm	0.36		17+00	repeat
Modulus	Average	MPa	62.00			
Deflection	Average (S)	mm	0.37	inner	18+4040	
Modulus	Average	MPa	61.10			

Project : I-35 and Mohawk RD Subgrade					Date:10/03/2016	
Location : Ramp A						
Pavement conditions: 14 days, A.C.			Records	Location	Station	Comment
Deflection	Average (S)	mm	0.51	inner	18+4040	
Modulus	Average	MPa	44.00			
Deflection	Average (S)	mm	0.46		19+03	
Modulus	Average	MPa	49.00			

Appendix I: Selected Photographs of Shelby Tube Soil Samples

K-TRAN

KANSAS TRANSPORTATION RESEARCH AND NEW-DEVELOPMENT PROGRAM

AD ASTRA PER ASPERA

Kansas

Department of Transportation