ALABAMA DEPARTMENT OF TRANSPORTATION

1409 Coliseum Boulevard, Montgomery, Alabama 36110

Bureau of Materials and Tests

3700 Fairground Road, Montgomery, Alabama 36110
Phone (334)206-2200 FAX (334)264-6263

Kay Ivey
Governor

John R. Cooper
Transportation Director

November 28, 2017

MEMORANDUM

TO: Mr. Matt Ericksen, P.E.
Mobile River Bridge Director

FROM: Ms. Kaye Chancellor Davis, P.E. AKCD
Geotechnical Engineer

RE: Project No. DPI-0030 (005)
I-10 Mobile River Bridge
Mobile County

Attached please find the Subsurface Data Report for the East Area for the above referenced project as produced by Thompson Engineering. Geotechnical Section has reviewed the attached report and agrees with the recommendations contained therein. Should you have any questions, please feel free to contact this office.

AKCD:amb
Attachment

C: Project File
File

REPORT OF GEOTECHNICAL CONSULTING SERVICES

GEOTECHNICAL SUBSURFACE DATA REPORT

I-10 Mobile River Bridge – East Area

Mobile County, Alabama

ALDOT PE Project No.: DPI-0030(005)

Thompson Engineering Project No.: 17-1101-0145

November 16, 2017

knowledge · ideas · impact

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November 28, 2017

Mr. Scott W. George, P.E.
Materials and Test Engineer
Alabama Department of Transportation
Bureau of Materials and Test
3700 Fairgrounds Road
Montgomery, Alabama 36130

Attention: **Kaye Chancellor Davis, P.E.**
ALDOT Geotechnical Engineer

Subject: **Report of Geotechnical Consulting Services**
Subsurface Data Report
I-10 Mobile River Bridge – East Area
ALDOT PE Project No.: DPI-0030(005)
Mobile, Mobile County, Alabama
Thompson Project No. 17-1101-0145

Dear Ms. Davis:

Thompson Engineering is pleased to transmit this geotechnical subsurface data report for the project referenced above. This submittal summarizes the field exploration and laboratory testing results for the referenced design build operate and maintain project. Our services were performed in accordance with the Thompson Fee Proposals dated July 20, 2017.

We appreciate the opportunity to assist the Alabama Department of Transportation with project-related geotechnical matters. Please do not hesitate to contact our office with any questions concerning this submittal.

Respectfully submitted,

THOMPSON ENGINEERING, INC.

Michael Davis, Jr. E.I.
Geotechnical Engineering Associate II

Sam Sternberg III, P.E.
Senior Geotechnical Engineer

2970 Cottage Hill Road, Ste. 190
Mobile, AL 36606
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www.thompsonengineering.com

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1.0 SCOPE OF SERVICES

Thompson Engineering (Thompson) has completed the field exploration and laboratory testing for the East Area in support of the overall Mobile River Bridge (MRB) located in Mobile and Baldwin Counties, Alabama. This scope of work was performed in general accordance with the contracted scope of services between the Alabama Department of Transportation (ALDOT) and Thompson, dated July 20, 2017. Our services were authorized in the ALDOT Work Order #71,002 on Contract ID #2096.

2.0 PROJECT DESCRIPTION

The East Area is located along interstate I-10 in Spanish Fort, Baldwin County, Alabama. This portion of the project includes approximate stations 945+00 to 970+00 along the I-10 Mainline. The scope of services included landside subsurface exploration and associated laboratory testing for the I-10 modifications in support of the design build or design build operate and maintain (DBFOM) delivery method. The overall intent was to provide subsurface information to the prospective teams in an effort to reduce the risk and unknowns associated with the subsurface conditions. **Figure 1** below depicts the project location and immediate surrounding areas.

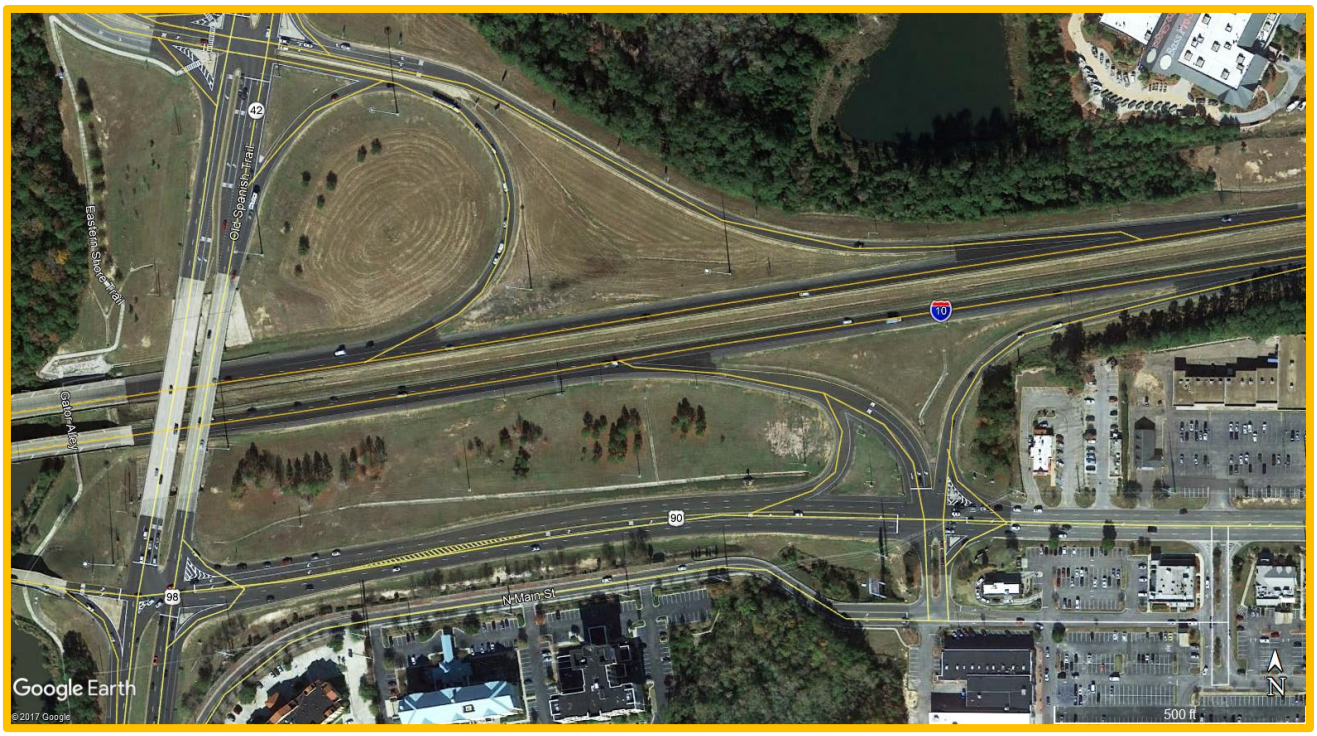


***Figure 1**: Project location and immediate surrounding area.*

3.0 SUBSURFACE EXPLORATION PROGRAM

Thompson geotechnical drilling crews performed soil test borings and sampling operations at the approximate locations shown on the appended Boring Location Plan in **Appendix A**. A CME 550X All-Terrain Vehicle (ATV) drilling rig, equipped with an automatic penetration test hammer, was utilized to advance the borings using hollow stem auger and mud rotary drilling techniques. Drilling and field operations took place between August 29, 2017 and September 10 2017. The hammer energy report for the automatic SPT hammer on the drill rig is attached in **Appendix D** of this report.

Borings were drilled to depths ranging from 20 to 150 feet below the existing ground surface as shown on the attached Record of Test Borings in **Appendix B.** Boring locations were surveyed by

Thompson Survey crews upon completion.

Brief descriptions of the testing protocols are presented below.

3.1 Standard Penetration Test (SPT) Borings

The SPT borings were performed in general accordance with AASHTO T-206 guidelines. Recovered samples were examined and visually classified in the field or in the geotechnical laboratory by a geologist or engineer. Samples were returned to Thompson's geotechnical laboratory for additional testing. The results of the classification and stratification are shown on the appended Record of Test Borings. Weight of Rod (WOR) and Weight of Hammer (WOH) "N" blow counts were noted as a zero (0) on the attached boring logs.

3.2 Undisturbed Soil Sampling

Undisturbed soil specimens were recovered utilizing thin-wall "Shelby" tube sampling equipment at select depths within soft to firm cohesive soil zones. Undisturbed samples were collected in general accordance AASHTO T-207. The recovered soil samples were sealed and transported to Thompson's geotechnical laboratory.

3.3 Cone Penetration Tests

The cone penetration tests were carried out using an integrated electronic piezocone (CPTU). The cone reaction system consisted of a S4 Mini Track Rig. The cone was advanced to termination depths at a rate of 2 cm/s. Tip resistance (qc), sleeve friction (fs), and dynamic pore pressure measurements (u2) were recorded every 5 centimeters (2 inches). Testing was performed in general accordance with the methods and procedures described in ASTM Specification D5778-07. Samples are not recovered with the cone penetration test.

The results of the soundings are shown on the CPT logs, presented in **Appendix B**. The corrected tip resistance (Qt) is the recorded tip resistance (Qc) which has been corrected to account for the pore water pressures acting on unequal tip areas of the cone.

4.0 LABORATORY TESTING

Samples selected for laboratory testing were assigned by Thompson. **Table 1** provides a quantitative summary of the lab tests performed.

Table 1: Laboratory Testing Summary

Test Type	Quantity
Atterberg Limits	61
Full Sieve Analysis	61
Consolidation	1
Unconsolidated Undrained (U.U.) Triaxial Shear Tests	6
Consolidated Undrained (C.U.) Triaxial Shear Tests	2

A laboratory test summary table, BMT-5 sheets, and individual test results are included in **Appendix C**.

5.0 SUBSURFACE FINDINGS

While establishment of generalized subsurface conditions is useful for the geotechnical engineering evaluation process, such generalizations hould be reviewed with caution as they promote extrapolation of recovered data between soil test boring locations. The stratifications shown on the Soil Test Borings represent the conditions only at the actual boring locations. The actual transition between soil types may be more gradual than those depicted.

Where laboratory tests were not available, the approximate AASHTO classifications correlation to the USCS was used based upon **Table 3** of the FHWA Publication FHWA ED-88-053, "Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications."

5.1 Groundwater Conditions

Groundwater measurements were taken immediately after borehole completion. Delayed measurements were obtained whenever possible. Fluctuations in groundwater depth measurements can be attributed to elevations and/or drilling techniques used in the field. Groundwater depth measurements are provided in **Table 2**.

Table 2: Groundwater Depth Measurements

Boring	Completion of Boring (ft.)	Day 1 (ft.)	Day 2 (ft.)	Sept. 15, 2017 (ft.)	Comments/Additional GW Readings
TH-14	Not Obtained	17.3	17.4	18.0	
TH-15	Not Obtained	Not Obtained	Not Obtained	19.7	
TH-15A	Not Obtained	Not Obtained	Not Obtained	Not Obtained	
TH-16	23.0	Not Obtained	Not Obtained	9.4	
TH-16A	Not Obtained	Not Obtained	Not Obtained	Not Obtained	
TH-17	Not Encountered	Not Obtained	Not Obtained	14.1	
TH-18	Not Obtained	Not Obtained	Not Obtained	Not Obtained	
TH-19	Not Encountered	13.3	13.4	13.7	
TH-20	Not Obtained	15.7	Not Obtained	17.2	
TH-21	Not Obtained	10.5	Not Obtained	11.1	
TH-22	14.5	28.0	Not Obtained	Not Obtained	
TH-22A	Not Obtained	Not Obtained	Not Obtained	---	Installed 11/27/2017. 7.4 ft.(Day 3), 7.4 ft.(Day 4), 7.2 ft. (Day 5)
TH-23	Not Obtained	15.0	Not Obtained	9.9	

Fluctuations of the groundwater level on this project may be expected to occur seasonally as a result of rainfall, surface runoff, tidal issues, and immediate area construction activities.

6.0 REPORT LIMITATIONS

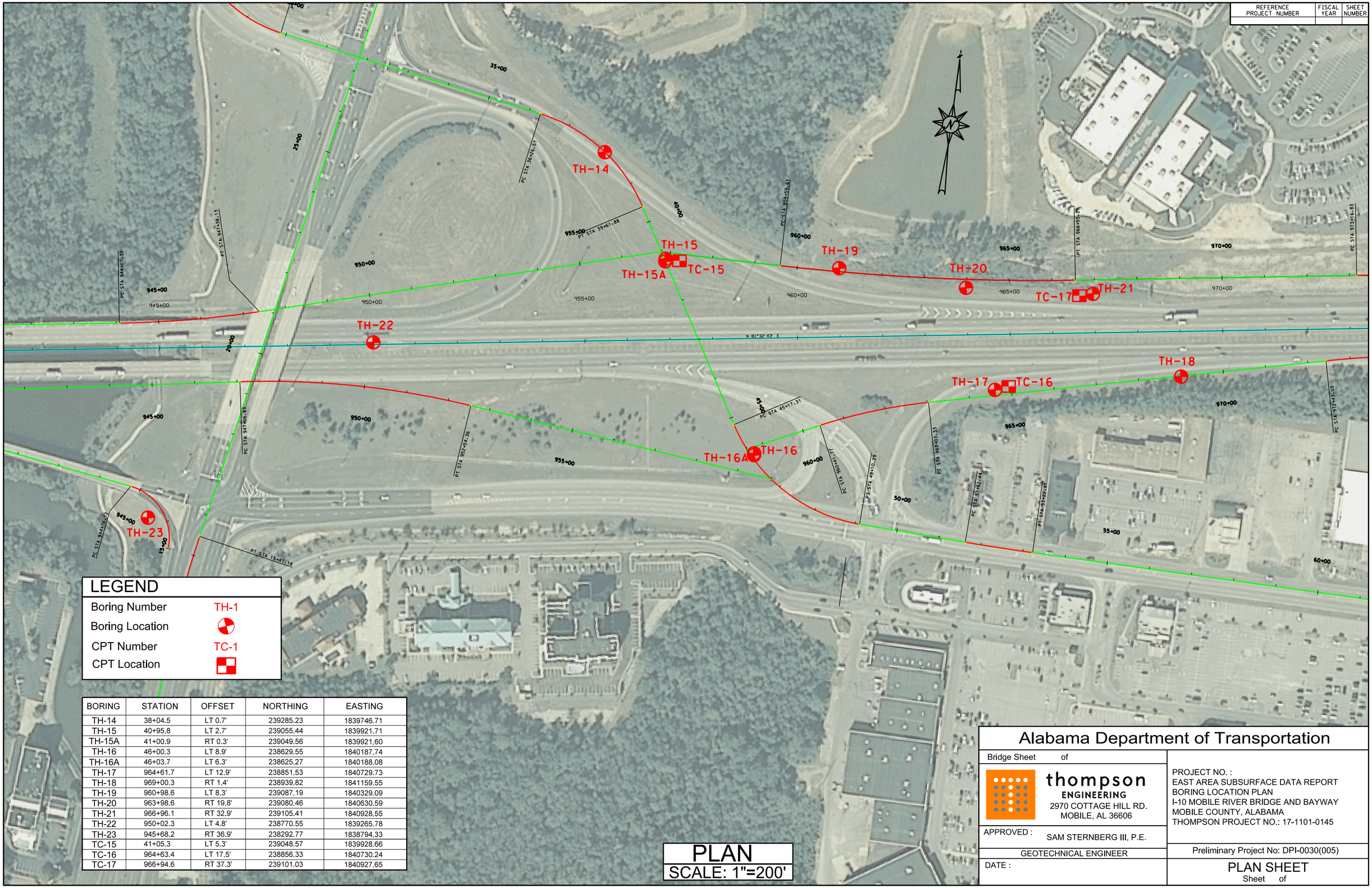
This Geotechnical Subsurface Data Report has been prepared for the exlusive use of ALDOT for the specific project discussed herein. This Geotechnical Subsurface Data Report has been prepared in accordance with generally accepted local geotechnical engineering practices; no other warranty is expressed or implied. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards.

The observations from field sample recovery, laboratory examination of samples and testing, and computed data analysis, which are presented in this data report, should be considered preliminary investigation and are subject to change upon the acquisition of additional data during the final investigation for the final design. Additional subsurface exploration including borings and laboratory testing for the purposes of evaluating cut slopes, embankment slopes, embankment settlements, retaining walls and bridge foundation types and capacities will be required for final design and applicable to the specific final design layout. The Geotechnical Engineer of Record for the project must review the data submitted in this report and develop their own interpretation of the testing results as they apply to design.

APPENDIX A

- **Boring Location Plan**

REFERENCE PROJECT NUMBER	FISCAL YEAR	SHEET NUMBER



LEGEND

Boring Number	TH-1
Boring Location	
CPT Number	TC-1
CPT Location	

BORING	STATION	OFFSET	NORTHING	EASTING
TH-14	38+04.5	LT 0.7'	239285.23	1839746.71
TH-15	40+95.8	LT 2.7'	239055.44	1839921.71
TH-15A	41+00.9	RT 0.3'	239049.56	1839921.60
TH-16	46+00.3	LT 8.9'	238629.55	1840187.74
TH-16A	46+03.7	LT 6.3'	238625.27	1840188.08
TH-17	964+61.7	LT 12.9'	238851.53	1840729.73
TH-18	969+00.3	RT 1.4'	238939.82	1841159.55
TH-19	960+98.6	LT 8.3'	239087.19	1840329.09
TH-20	963+98.6	RT 19.8'	239080.46	1840630.59
TH-21	966+96.1	RT 32.9'	239105.41	1840928.55
TH-22	950+02.3	LT 4.8'	238770.55	1839265.78
TH-23	945+68.2	RT 36.9'	238292.77	1838794.33
TC-15	41+05.3	LT 5.3'	239048.57	1839928.66
TC-16	964+63.4	LT 17.5'	238856.33	1840730.24
TC-17	966+94.6	RT 37.3'	239101.03	1840927.65

PLAN
SCALE: 1"=200'

Alabama Department of Transportation

Bridge Sheet of

thompson ENGINEERING
2970 COTTAGE HILL RD.
MOBILE, AL 36606

APPROVED : SAM STERNBERG III, P.E.

GEOTECHNICAL ENGINEER

DATE :

PROJECT NO. :
EAST AREA SUBSURFACE DATA REPORT
BORING LOCATION PLAN
I-10 MOBILE RIVER BRIDGE AND BAYWAY
MOBILE COUNTY, ALABAMA
THOMPSON PROJECT NO.: 17-1101-0145

Preliminary Project No: DPI-0030(005)

PLAN SHEET
Sheet of

APPENDIX B

- **Records of Test Borings**
- **CPT Soundings**
- **Legend**

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RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-14	**Boring Location:**	38+04.5	**Offset:**	LT 0.7	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C. Tisher
Elev.:	44.9 ft.	**Northing:**	239285.23	**Easting:**	1839746.71	**Date Started:**	9/5/2017
Total Depth:	20.0 ft.	**Soil Depth:**	20.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/5/2017
Bore Hole Diameter (in):	6-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	3 1/4" HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	17.4 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0		Approximately 6 inches of topsoil. Loose, dry, reddish brown, fine grained, with trace organics, SILTY SAND (SM)		0.0	SS-1	1	3	3	6
		Medium dense, moist, reddish brown and brown, fine to medium grained, CLAYEY SAND (SC, A-2-6(0)), LL=22 PL=11 PI=11 NMC=12.0 %#200=27.6		1.5	SS-2	4	6	8	14
				3.0	SS-3	8	19	21	40
5.0	40.0	Dense, moist, reddish brown, fine grained, with trace gravel, SILTY SAND (SM) Medium dense, light reddish brown		4.5	SS-4	4	11	16	27
		Dense, moist, reddish brown, fine grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=18.5 %#200=19.5		6.0	SS-5	12	15	20	35
				8.5					
10.0	35.0	Medium dense			SS-6	18	8	10	18
				13.5					
15.0	30.0	Medium dense, moist, reddish brown, fine grained, CLAYEY SAND (SC, A-2-4(0)), LL=21 PL=11 PI=10 NMC=13.7 %#200=31.8			SS-7	5	6	13	19
▽				18.5					
20.0	25.0	Medium dense			SS-8	5	8	8	16
		Boring Terminated at 20.0 feet.							

SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

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RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-15	**Boring Location:**	40+95.8	**Offset:**	LT 2.7	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.Tisher
Elev.:	29.5 ft.	**Northing:**	239055.44	**Easting:**	1839921.71	**Date Started:**	9/4/2017
Total Depth:	25.0 ft.	**Soil Depth:**	25.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/4/2017
Bore Hole Diameter (in):	6-inch	**AASHTO / ASTM Sampling Methods:**		AASHTO T206 & T207			
Drill Machine:	CME 550X	**Drill Method:**	3 1/4" HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	N.O.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) / PL MC LL / FINES CONTENT (%) 10 20 30 40 50 60 70 80 90
0.0										
		Approximately 4 inches of topsoil.		0.0	SS-1	2	2	3	5	
		Loose, dark brown and reddish brown, fine grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=16.9 %#200=22.9		1.5	SS-2	3	3	7	10	
		Loose, reddish brown and light brown		3.0	T-1					
5.0	25.0	Undisturbed sample obtained from 3.0 to 5.0 feet. Approximately 24 inches of recovery. Reddish brown and gray, SANDY LEAN CLAY (CL) Soft, No Recovery		5.0	SS-3	1	1	2	3	
		Very soft, moist, reddish brown and gray		6.5	SS-4	0	0	2	2	
		Undisturbed sample obtained from 8.0 to 10.0 feet.		8.0	T-2					
10.0	20.0	Approximately 24 inches of recovery. Moist, light brown and gray, SANDY LEAN CLAY (CL, A-6(12)), LL=37 PL=13 PI=24 NMC=20.9 %#200=63.8								
		Stiff, reddish brown		13.5	SS-5	4	5	5	10	
15.0	15.0									
		Dense, moist, reddish brown, fine grained, SILTY SAND (SM, A-4(0)), LL=NP PL=NP PI=NP NMC=17.3 %#200=38.6		18.5	SS-6	3	15	23	38	
20.0	10.0									
		Loose, wet, tan, fine to medium grained		23.5	SS-7	6	3	4	7	
25.0	5.0									
		Boring Terminated at 25.0 feet.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

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RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-15A	**Boring Location:**	41+00.9	**Offset:**	RT 0.3	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	29.1 ft.	**Northing:**	239049.56	**Easting:**	1839921.6	**Date Started:**	9/8/2017
Total Depth:	40.0 ft.	**Soil Depth:**	40 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/8/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	19.7 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0	29.1	Mud rotary drilled to 28.5 feet and began sampling.							
5.0	25.0								
10.0	20.0								
15.0	15.0								
20.0	10.0								
25.0	5.0								
30.0	0.0	Medium dense, moist, brown, fine grained, SILTY SAND (SM)		28.5	SS-1	10	13	12	25

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

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RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-15A	**Boring Location:**	41+00.9	**Offset:**	RT 0.3	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	29.1 ft.	**Northing:**	239049.56	**Easting:**	1839921.6	**Date Started:**	9/8/2017
Total Depth:	40.0 ft.	**Soil Depth:**	40 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/8/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	19.7 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
30.0										
35.0	-5.0	Very dense, moist, brown, fine to medium grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=18.5 %#200=16.1		33.5	SS-2	42	50/5	X	50+	>>
40.0	-10.0	Very dense, fine grained		38.5	SS-3	60	50/2	X	50+	>>
		Boring Terminated at 40.0 feet.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

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RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-16	**Boring Location:**	46+00.3	**Offset:**	LT 8.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C. Tisher
Elev.:	19.3 ft.	**Northing:**	238629.55	**Easting:**	1840187.74	**Date Started:**	9/3/2017
Total Depth:	25.0 ft.	**Soil Depth:**	25.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/3/2017
Bore Hole Diameter (in):	6-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	3 1/4" HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 23.0 ft.	**Delayed:**	N.O.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0			0.0	SS-1	3	4	4	8
		Approximately 4 inches of topsoil. Loose, moist, brown and dark brown, fine grained, with trace clay and trace organics, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=12.6 %#200=30.5	1.5	SS-2	3	4	5	9
5.0	15.0	Loose, moist, pale brown, fine grained, SILTY, CLAYEY SAND (SC-SM, A-4(0)), LL=19 PL=13 PI=6 NMC=14.1 %#200=42.1	3.0	SS-3	4	5	6	11
		Stiff, moist, light brown and brown, SANDY LEAN CLAY (CL, A-6(5)), LL=28 PL=12 PI=16 NMC=14.1 %#200=54.2	4.5	SS-4	5	2	3	5
		Firm, light brown and reddish brown Undisturbed sample obtained from 6.0 to 8.0 feet. Approximately 24 inches of recovery.	6.0	T-1				
10.0	10.0	Moist, pale brown and gray, SANDY LEAN CLAY (CL, A-6(8)), LL=28 PL=12 PI=16 NMC=34.1 %#200=69.2	8.5	SS-5	2	3	4	7
		Firm, pale brown and dark gray						
15.0	5.0	Very soft, wet, pale brown, SANDY LEAN CLAY (CL, A-6(6)), LL=30 PL=14 PI=16 NMC=23.3 %#200=56.9	13.5	SS-6	0	0	0	0
20.0	0.0	Undisturbed sample obtained from 18.5 to 20.5 feet. Approximately 24 inches of recovery. Moist, brown and gray, SANDY LEAN CLAY (CL, A-6(4)), LL=26 PL=13 PI=13 NMC=23.8 %#200=56.1	18.5	T-2				
▼								
25.0	-5.0	Very loose, wet, gray, fine grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=20.0 %#200=23.1	23.5	SS-7	3	1	0	1
		Boring Terminated at 25.0 feet.						

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE

SS - Split Spoon
T - Shelby Tube
DCP - Dynamic Cone Penetrometer
AC - Auger Cuttings
GB - Grab Bag
NQ - Rock Core

DRILLING METHOD

HSA - Hollow Stem Augers
SSA - Solid Stem Augers
HA - Hand Auger
MR - Mud Rotary Wash
RC - Rock Coring

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-16A	**Boring Location:**	46+03.7	**Offset:**	LT 6.3	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	19.1 ft.	**Northing:**	238625.27	**Easting:**	1840188.08	**Date Started:**	9/8/2017
Total Depth:	30.0 ft.	**Soil Depth:**	30.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/8/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	9.4 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
0.0										
	15.0	Mud rotary drilled to 23.5 feet and began sampling.								
5.0										
	10.0									
10.0 ▽										
	5.0									
15.0										
	0.0									
20.0										
	-5.0	Soft, moist, brown, SANDY SILTY CLAY (CL-ML, A-4(0)), LL=19 PL=14 PI=5 NMC=18.4 %#200=62.8		23.5	SS-1	1	1	1	2	● ⊗ ▲
25.0										
	-10.0	Very dense, moist, brown, fine to medium grained, POORLY GRADED SAND with SILT (SP-SM, A-3(0)),		28.5	SS-2	50/2	X	X	50+	▲ ○ >>●
30.0										

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-16A	**Boring Location:**	46+03.7	**Offset:**	LT 6.3	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	19.1 ft.	**Northing:**	238625.27	**Easting:**	1840188.08	**Date Started:**	9/8/2017
Total Depth:	30.0 ft.	**Soil Depth:**	30.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/8/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	9.4 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	● SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
		LL=NP PL=NP PI=NP NMC=23.1 %#200=8.2 Boring Terminated at 30.0 feet.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-17	**Boring Location:**	964+61.7	**Offset:**	LT 12.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C. Tisher
Elev.:	41.7 ft.	**Northing:**	238851.53	**Easting:**	1840729.73	**Date Started:**	9/3/2017
Total Depth:	20.0 ft.	**Soil Depth:**	20.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/3/2017
Bore Hole Diameter (in):	6-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	3 1/4" HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.E.	**Delayed:**	14.1 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0									
	40.0	Approximately 7 inches of topsoil. Soft, moist, light brown and light gray, SANDY LEAN CLAY (CL, A-4(2)), LL=20 PL=11 PI=9 NMC=14.7 %#200=57.7		0.0	SS-1	1	1	2	3
				1.5	SS-2	2	3	3	6
		Loose, moist, brown, fine grained, CLAYEY SAND (SC)		3.0	SS-3	3	2	4	6
5.0		Loose, moist, reddish brown, fine to medium grained, CLAYEY SAND (SC, A-2-6(0)), LL=23 PL=12 PI=11 NMC=14.6 %#200=30.3		4.5	SS-4	4	5	4	9
	35.0	Stiff, moist, brown and light gray, SANDY LEAN CLAY (CL, A-6(9)), LL=35 PL=15 PI=20 NMC=21.5 %#200=61.6		6.0	SS-5	6	8	10	18
		Medium dense, moist, pale brown, fine grained, CLAYEY SAND (SC)		8.5	SS-6	4	12	11	23
10.0		Medium dense, moist, light brown, fine grained, CLAYEY SAND (SC, A-2-4(0)), LL=20 PL=12 PI=8 NMC=24.9 %#200=15.1							
	30.0								
▽ 15.0		Loose, moist, light brown, fine grained, POORLY GRADED SAND with SILT (SP-SM)		13.5	SS-7	3	2	3	5
	25.0								
				18.5					
20.0		Medium dense, wet, light brown, fine grained, with trace gravel, POORLY GRADED SAND with SILT (SP-SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=22.5 %#200=11.1			SS-8	3	5	8	13
		Boring Terminated at 20.0 feet.							

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-18	**Boring Location:**	969+00.3	**Offset:**	RT 1.4	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C. Tisher
Elev.:	54.2 ft.	**Northing:**	238939.82	**Easting:**	1841159.55	**Date Started:**	8/29/2017
Total Depth:	20.0 ft.	**Soil Depth:**	20.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	8/29/2017
Bore Hole Diameter (in):	6-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	3 1/4" HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	N.O.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0		Approximately 7 inches of topsoil.		0.0					
		Very loose, dry, reddish brown and brown, fine grained, CLAYEY SAND (SC, A-6(5)), LL=34 PL=12 PI=22 NMC=11.8 %#200=44.7		1.5	SS-1	1	2	2	4
		Medium dense, moist, reddish brown, fine to medium grained, CLAYEY SAND (SC, A-2-6(0)), LL=27 PL=12 PI=15 NMC=17.4 %#200=18.7		3.0	SS-2	2	4	7	11
	50.0			4.5	SS-3	4	7	8	15
5.0		Top of spoon: Medium dense, moist, reddish brown, fine to medium grained, with trace gravel, CLAYEY SAND (SC, A-2-6(1)), LL=32 PL=14 PI=18 NMC=17.7 %#200=32.2		6.0	SS-4	5	5	8	13
		Bottom of spoon: Stiff, moist, reddish brown, SANDY LEAN CLAY (CL)			SS-5	3	6	8	14
		Stiff		8.5					
	45.0	Stiff, moist, pale gray and reddish brown, SANDY LEAN CLAY (CL, A-6(8)), LL=37 PL=17 PI=20 NMC=19.4 %#200=55.8			SS-6	8	28	29	57
10.0		Hard							
	40.0	Very stiff, light gray and reddish brown		13.5	SS-7	15	12	16	28
15.0									
	35.0	Hard, moist, reddish brown, SANDY LEAN CLAY (CL, A-6(7)), LL=35 PL=15 PI=20 NMC=17.8 %#200=51.9		18.5	SS-8	6	20	28	48
20.0		Boring Terminated at 20.0 feet.							

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-19	**Boring Location:**	960+98.6	**Offset:**	LT 8.3	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.Tisher
Elev.:	36.3 ft.	**Northing:**	239087.19	**Easting:**	1840329.09	**Date Started:**	9/5/2017
Total Depth:	20.0 ft.	**Soil Depth:**	20.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/5/2017
Bore Hole Diameter (in):	6-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	3 1/4" HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.E.	**Delayed:**	13.4 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0	35.0	Approximately 4 inches of topsoil. Very loose, brown, fine grained, with trace organics, SILTY SAND (SM)		0.0	SS-1	2	2	2	4
		Very loose, moist, black, fine to medium grained, with trace gravel, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=23.8 %#200=33.1		1.5	SS-2	1	1	1	2
		Medium dense, moist, brown and reddish brown, fine to medium grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=12.0 %#200=24.6		3.0	SS-3	3	5	6	11
5.0				4.5	SS-4	3	3	2	5
	30.0	Loose, wet, dark brown and reddish brown							
		Medium dense, moist, light reddish brown, fine to medium grained, CLAYEY SAND (SC, A-6(2)), LL=32 PL=12 PI=20 NMC=14.5 %#200=35.9		6.0	SS-5	4	5	14	19
				8.5	SS-6	9	12	12	24
10.0		Medium dense, reddish brown, fine grained, POORLY GRADED SAND with SILT (SP-SM)							
	25.0								
▽									
		Loose		13.5	SS-7	4	6	4	10
15.0									
	20.0								
				18.5	SS-8	9	8	10	18
20.0		Medium dense, wet, reddish brown, fine to medium grained, POORLY GRADED SAND with SILT (SP-SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=22.6 %#200=11.8							
		Boring Terminated at 20.0 feet.							

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-20	**Boring Location:**	963+98.6	**Offset:**	RT 19.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	45.8 ft.	**Northing:**	239080.46	**Easting:**	1840630.59	**Date Started:**	9/7/2017
Total Depth:	35.0 ft.	**Soil Depth:**	35.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/7/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	15.7 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0	45.0	Loose, dry, red, fine to medium grained, SILTY SAND (SM, A-4(0)), LL=NP PL=NP PI=NP NMC=10.1 %#200=40.7		0.0	SS-1	3	3	2	5
		Loose, brown		1.5	SS-2	6	5	5	10
		Stiff, moist, brown, LEAN CLAY with SAND (CL, A-6(13)), LL=34 PL=13 PI=21 NMC=16.6 %#200=73.2		3.0	SS-3	3	4	8	12
5.0	40.0	Loose, moist, brown and gray, fine grained, POORLY GRADED SAND (SP)		4.5	SS-4	5	4	4	8
		Stiff, moist, brown and gray, SANDY LEAN CLAY (CL, A-6(9)), LL=31 PL=12 PI=19 NMC=14.7 %#200=64.2		6.0	SS-5	4	3	8	11
				8.5	SS-6	3	3	3	6
10.0	35.0	Loose, moist, brown, fine grained, CLAYEY SAND (SC, A-2-6(2)), LL=35 PL=13 PI=22 NMC=16.2 %#200=34.0							
		Dense		13.5	SS-7	4	6	26	32
15.0 ▽	30.0								
		Very dense, moist, brown, fine to medium grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=13.9 %#200=19.3		18.5	SS-8	28	36	41	77
20.0	25.0								
		Dense		23.5	SS-9	11	18	16	34
25.0	20.0								
		Loose, wet, brown, fine grained, CLAYEY SAND (SC)		28.5	SS-10	1	2	3	5
30.0									

SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE

SS - Split Spoon
T - Shelby Tube
DCP - Dynamic Cone Penetrometer
AC - Auger Cuttings
GB - Grab Bag
NQ - Rock Core

DRILLING METHOD

HSA - Hollow Stem Augers
SSA - Solid Stem Augers
HA - Hand Auger
MR - Mud Rotary Wash
RC - Rock Coring

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-20	**Boring Location:**	963+98.6	**Offset:**	RT 19.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	45.8 ft.	**Northing:**	239080.46	**Easting:**	1840630.59	**Date Started:**	9/7/2017
Total Depth:	35.0 ft.	**Soil Depth:**	35.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/7/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	15.7 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
30.0	15.0									
35.0		Firm, moist, gray, with few sand, FAT CLAY (CH, A-7-6(56)), LL=80 PL=23 PI=57 NMC=32.3 %#200=87.6		33.5	SS-11	2	3	4	7	
		Boring Terminated at 35.0 feet.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-21	**Boring Location:**	966+96.1	**Offset:**	RT 32.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	53.3 ft.	**Northing:**	239105.41	**Easting:**	1840928.55	**Date Started:**	9/7/2017
Total Depth:	30.0 ft.	**Soil Depth:**	30.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/7/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	10.5 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0		Approximately 2 inches of topsoil. Loose, dry, red, fine grained, SILTY SAND (SM)	0.0	SS-1	4	3	3	6
	50.0	Stiff, moist, gray, SANDY LEAN CLAY (CL, A-6(12)), LL=37 PL=13 PI=24 NMC=22.8 %#200=64.0	1.5	SS-2	3	3	6	9
		Firm, wet, brown	3.0	SS-3	3	3	3	6
5.0		Stiff	4.5	SS-4	3	4	6	10
	45.0	Very dense, moist, brown, fine grained, CLAYEY SAND (SC, A-7-6(6)), LL=48 PL=20 PI=28 NMC=13.6 %#200=40.6	6.0	SS-5	3	24	37	61
		Very dense, moist, brown and gray, fine grained, POORLY GRADED SAND (SP)	8.5	SS-6	19	30	43	73
10.0 ▽	40.0	Loose, moist, brown, fine grained, CLAYEY SAND (SC)	13.5	SS-7	3	3	2	5
15.0								
	35.0	Loose, moist, brown, fine to medium grained, with trace gravel, CLAYEY SAND (SC, A-6(1)), LL=27 PL=16 PI=11 NMC=18.3 %#200=41.0	18.5	SS-8	3	3	4	7
20.0								
	30.0	Dense, moist, brown, fine grained, POORLY GRADED SAND with SILT (SP-SM)	23.5	SS-9	7	11	32	43
25.0								
	25.0	Very dense, moist, brown, fine grained, POORLY GRADED SAND with SILT (SP-SM, A-2-4(0)), LL=NP	28.5	SS-10	11	23	30	53
30.0								

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-21	**Boring Location:**	966+96.1	**Offset:**	RT 32.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia
Elev.:	53.3 ft.	**Northing:**	239105.41	**Easting:**	1840928.55	**Date Started:**	9/7/2017
Total Depth:	30.0 ft.	**Soil Depth:**	30.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/7/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	10.5 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	● SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
		PL=NP PI=NP NMC=18.6 %#200=11.2 Boring Terminated at 30.0 feet.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-22	**Boring Location:**	950+02.3	**Offset:**	LT 4.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	B.Ellis
Elev.:	22.7 ft.	**Northing:**	238770.55	**Easting:**	1839265.78	**Date Started:**	9/8/2017
Total Depth:	150.0 ft.	**Soil Depth:**	150.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/10/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 14.5 ft.	**Delayed:**	28.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
0.0	22.7	Approximately 6 inches of topsoil. Loose, dry, dark brown and dark reddish brown, fine grained, with trace organics, SILTY SAND (SM), FILL		0.0	SS-1	3	3	5	8	
	20.0	Medium dense, dark red and light brown, FILL		1.5	SS-2	4	7	10	17	
		Medium dense, moist, light brown and light reddish brown, fine grained, POORLY GRADED SAND (SP, A-3(0)), FILL, LL=NP PL=NP PI=NP NMC=21.9 %#200=4.0		3.0	SS-3	5	9	12	21	
5.0		Medium dense, light brown, FILL		4.5	SS-4	4	6	11	17	
	15.0	Medium dense, moist, light brown, fine grained, POORLY GRADED SAND (SP, A-3(0)), FILL, LL=NP PL=NP PI=NP NMC=28.2 %#200=3.4		6.0	SS-5	6	9	14	23	
10.0		Medium dense, light brown and brown, FILL		8.5	SS-6	5	12	14	26	
	10.0									
15.0 ▼		Firm, wet, yellowish brown, SANDY SILT (ML)		13.5	SS-7	5	3	2	5	
	5.0									
20.0		Firm, wet, light gray, SANDY SILT (ML, A-4(0)), LL=NP PL=NP PI=NP NMC=20.8 %#200=51.5		18.5	SS-8	4	3	2	5	
	0.0									
25.0		Stiff		23.5	SS-9	3	4	5	9	
▽	-5.0									
30.0		Firm, gray		28.5	SS-10	3	2	3	5	

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-22	**Boring Location:**	950+02.3	**Offset:**	LT 4.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	B.Ellis
Elev.:	22.7 ft.	**Northing:**	238770.55	**Easting:**	1839265.78	**Date Started:**	9/8/2017
Total Depth:	150.0 ft.	**Soil Depth:**	150.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/10/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 14.5 ft.	**Delayed:**	28.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
30.0								
	-10.0	Soft, light gray	33.5	SS-11	3	2	2	4
35.0								
	-15.0	Top of spoon: Firm	38.5	SS-12	1	3	3	6
40.0		Bottom of spoon: Loose, moist, light gray, fine grained, CLAYEY SAND (SC)						
	-20.0	Loose	43.5	SS-13	3	3	5	8
45.0								
	-25.0	Undisturbed sample obtained from 48.5 to 50.5 feet. Approximately 24 inches of recovery. Moist, light gray, fine grained, CLAYEY SAND (SC, A-4(1)), LL=29 PL=21 PI=8 NMC=26.5 %#200=48.7	48.5	T-1				
50.0								
	-30.0	Loose, wet, gray, fine grained, CLAYEY SAND (SC, A-4(0)), LL=27 PL=18 PI=9 NMC=27.0 %#200=39.7	53.5	SS-14	1	2	4	6
55.0								
	-35.0	Loose, moist	58.5	SS-15	2	3	3	6
60.0								

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-22	**Boring Location:**	950+02.3	**Offset:**	LT 4.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	B.Ellis
Elev.:	22.7 ft.	**Northing:**	238770.55	**Easting:**	1839265.78	**Date Started:**	9/8/2017
Total Depth:	150.0 ft.	**Soil Depth:**	150.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/10/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 14.5 ft.	**Delayed:**	28.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) / PL MC LL / FINES CONTENT (%)
60.0										10 20 30 40 50 60 70 80 90
	-40.0	Loose, bluish gray		63.5	SS-16	0	1	4	5	
65.0	-45.0	Undisturbed sample obtained from 68.5 to 70.5 feet. Approximately 24 inches of recovery. Moist, light gray, fine grained, SILTY, CLAYEY SAND (SC-SM, A-4(1)), LL=25 PL=18 PI=7 NMC=20.6 %#200=46.8		68.5	T-2					
70.0	-50.0	Medium dense, bluish gray		73.5	SS-17	4	7	6	13	
75.0	-55.0	Dense, wet, bluish gray, fine grained, SILTY SAND (SM)		78.5	SS-18	8	16	21	37	
80.0	-60.0	Stiff, moist, bluish gray, SANDY SILT (ML, A-4(0)), LL=NP PL=NP PI=NP NMC=23.9 %#200=54.6		83.5	SS-19	4	6	4	10	
85.0	-65.0	Dense, wet, bluish gray, fine grained, SILTY SAND (SM)		88.5	SS-20	15	15	25	40	
90.0										

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-22	**Boring Location:**	950+02.3	**Offset:**	LT 4.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	B.Ellis
Elev.:	22.7 ft.	**Northing:**	238770.55	**Easting:**	1839265.78	**Date Started:**	9/8/2017
Total Depth:	150.0 ft.	**Soil Depth:**	150.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/10/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 14.5 ft.	**Delayed:**	28.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) / PL MC LL / FINES CONTENT (%) 10 20 30 40 50 60 70 80 90
90.0										
	-70.0									
95.0		Very stiff, moist, bluish gray, SANDY LEAN CLAY (CL)		93.5	SS-21	6	9	9	18	
	-75.0									
100.0		Very stiff, moist, bluish gray, SANDY LEAN CLAY (CL, A-4(4)), LL=29 PL=19 PI=10 NMC=23.9 %#200=60.3		98.5	SS-22	6	8	9	17	
	-80.0									
105.0		Very dense, No Recovery. Lost split spoon shoe which may have affected the "N" value.		103.5	SS-23	20	29	43	72	
	-85.0									
110.0		Medium dense, moist, bluish gray, fine grained, SILTY SAND (SM, A-4(0)), LL=NP PL=NP PI=NP NMC=23.0 %#200=42.4		108.5	SS-24	6	10	10	20	
	-90.0									
115.0		Medium dense, wet, gray and bluish gray		113.5	SS-25	7	13	16	29	
	-95.0									
120.0		Medium dense, wet, gray and bluish gray, fine grained, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP		118.5	SS-26	8	9	10	19	

LEGEND

SAMPLER TYPE

- SS - Split Spoon
- T - Shelby Tube
- DCP - Dynamic Cone Penetrometer
- AC - Auger Cuttings
- GB - Grab Bag
- NQ - Rock Core

DRILLING METHOD

- HSA - Hollow Stem Augers
- SSA - Solid Stem Augers
- HA - Hand Auger
- MR - Mud Rotary Wash
- RC - Rock Coring

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-22	**Boring Location:**	950+02.3	**Offset:**	LT 4.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	B.Ellis
Elev.:	22.7 ft.	**Northing:**	238770.55	**Easting:**	1839265.78	**Date Started:**	9/8/2017
Total Depth:	150.0 ft.	**Soil Depth:**	150.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/10/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 14.5 ft.	**Delayed:**	28.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
120.0									
	-100.0	PI=NP NMC=26.2 %#200=27.3							
125.0		Loose, gray, with trace organics		123.5	SS-27	6	5	5	10
	-105.0								
130.0		Stiff, moist, dark gray, with trace organics, SANDY LEAN CLAY (CL)		128.5	SS-28	5	5	6	11
	-110.0								
135.0		Undisturbed sample obtained from 133.5 to 135.5 feet. Approximately 14 inches of recovery. Moist, dark gray, SANDY LEAN CLAY (CL, A-4(2)), LL=28 PL=20 PI=8 NMC=23.4 %#200=52.9		133.5	T-3				
	-115.0								
140.0		Very stiff, bluish gray		138.5	SS-29	11	14	16	30
	-120.0								
145.0		Hard		143.5	SS-30	11	17	22	39
	-125.0								
150.0		Very dense, wet, bluish gray, fine grained, SILTY SAND (SM)		148.5	SS-31	20	30	34	64

● SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-22	**Boring Location:**	950+02.3	**Offset:**	LT 4.8	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	B.Ellis
Elev.:	22.7 ft.	**Northing:**	238770.55	**Easting:**	1839265.78	**Date Started:**	9/8/2017
Total Depth:	150.0 ft.	**Soil Depth:**	150.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/10/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**	AASHTO T206 & T207				
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** 14.5 ft.	**Delayed:**	28.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	● SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) ▲ 10 20 30 40 50 60 70 80 90
		Boring Terminated at 150.0 feet. Note: Additional boring offset and drilled to a depth of 15 feet for installation of a temporary piezometer.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-23	**Boring Location:**	945+68.2	**Offset:**	RT 36.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia/B.Ellis
Elev.:	28.7 ft.	**Northing:**	238292.77	**Easting:**	1838794.33	**Date Started:**	9/8/2017
Total Depth:	100.0 ft.	**Soil Depth:**	100.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/9/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**		AASHTO T206 & T207			
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	15.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)
0.0		Approximately 6 inches of topsoil. Loose, dry, red, fine grained, SILTY SAND (SM)		0.0	SS-1	3	5	4	9
		Medium dense, moist, brown		1.5	SS-2	4	7	9	16
	25.0	Medium dense, moist, brown, fine grained, with trace gravel, SILTY SAND (SM, A-2-4(0)), LL=NP PL=NP PI=NP NMC=15.8 %#200=20.5		3.0	SS-3	9	12	11	23
5.0		Medium dense		4.5	SS-4	4	9	11	20
		Stiff, moist, brown, SANDY LEAN CLAY (CL, A-6(15)), LL=40 PL=15 PI=25 NMC=17.6 %#200=69.7		6.0	SS-5	2	4	7	11
	20.0	Stiff		8.5	SS-6	3	4	6	10
10.0									
	15.0			13.5	SS-7	5	7	10	17
15.0 ▽		Very stiff, moist, brown, with trace gravel, SANDY LEAN CLAY (CL, A-6(4)), LL=29 PL=14 PI=15 NMC=16.1 %#200=51.3							
	10.0	Very stiff		18.5	SS-8	4	6	10	16
20.0									
	5.0			23.5	SS-9	4	11	10	21
25.0		Very stiff, moist, brown, SANDY LEAN CLAY (CL, A-6(4)), LL=28 PL=13 PI=15 NMC=16.6 %#200=52.1							
	0.0			28.5	SS-10	12	14	20	34
30.0		Dense, moist, brown, medium grained, POORLY GRADED SAND (SP)							

SPT N VALUE (blows / foot)

PL MC LL

▲ FINES CONTENT (%) ▲

10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-23	**Boring Location:**	945+68.2	**Offset:**	RT 36.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia/B.Ellis
Elev.:	28.7 ft.	**Northing:**	238292.77	**Easting:**	1838794.33	**Date Started:**	9/8/2017
Total Depth:	100.0 ft.	**Soil Depth:**	100.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/9/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**		AASHTO T206 & T207			
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	15.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) / PL MC LL / FINES CONTENT (%)
30.0										
35.0	-5.0	Medium dense, moist, brown, medium grained, with trace gravel, POORLY GRADED SAND (SP, A-1-b(0)), LL=NP PL=NP PI=NP NMC=15.0 %#200=2.9		33.5	SS-11	4	9	11	20	
40.0	-10.0	Medium dense		38.5	SS-12	10	6	6	12	
45.0	-15.0	Soft, wet, reddish brown, SANDY LEAN CLAY (CL)		43.5	SS-13	1	2	2	4	
50.0	-20.0	Firm, wet, reddish brown and gray, SANDY LEAN CLAY (CL, A-6(12)), LL=40 PL=18 PI=22 NMC=27.1 %#200=66.1		48.5	SS-14	2	3	4	7	
55.0	-25.0	Loose, moist, gray, fine grained, with trace organics, SILTY CLAYEY SAND (SC-SM)		53.5	SS-15	3	3	3	6	
60.0	-30.0	Undisturbed sample obtained from 58.0 to 60.0 feet. Approximately 24 inches of recovery. Moist, gray, fine grained, SILTY, CLAYEY SAND		58.0	T-1					

LEGEND

SAMPLER TYPE

- SS - Split Spoon
- T - Shelby Tube
- DCP - Dynamic Cone Penetrometer
- AC - Auger Cuttings
- GB - Grab Bag
- NQ - Rock Core

DRILLING METHOD

- HSA - Hollow Stem Augers
- SSA - Solid Stem Augers
- HA - Hand Auger
- MR - Mud Rotary Wash
- RC - Rock Coring

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-23	**Boring Location:**	945+68.2	**Offset:**	RT 36.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia/B.Ellis
Elev.:	28.7 ft.	**Northing:**	238292.77	**Easting:**	1838794.33	**Date Started:**	9/8/2017
Total Depth:	100.0 ft.	**Soil Depth:**	100.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/9/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**		AASHTO T206 & T207			
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	15.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) / PL MC LL / FINES CONTENT (%)
60.0										● SPT N VALUE (blows / foot) PL MC LL ▲ FINES CONTENT (%) 10 20 30 40 50 60 70 80 90
		(SC-SM, A-4(0)), LL=25 PL=21 PI=4 NMC=24.4 %#200=40.4								
	-35.0	Medium dense, dark gray		63.5	SS-16	5	5	7	12	
65.0										
	-40.0	Undisturbed sample obtained from 68.5 to 70.5 feet. Approximately 24 inches of recovery. Moist, gray, fine grained, SILTY, CLAYEY SAND (SC-SM, A-4(0)), LL=28 PL=21 PI=7 NMC=24.8 %#200=41.1		68.5	T-2					
70.0										
	-45.0	Medium dense, moist, gray, fine grained, SILTY, CLAYEY SAND (SC-SM, A-4(1)), LL=27 PL=21 PI=6 NMC=23.4 %#200=49.9		73.5	SS-17	4	4	7	11	
75.0										
	-50.0	Loose, moist, gray, fine grained, SILTY SAND (SM)		78.5	SS-18	4	4	6	10	
80.0										
	-55.0	Medium dense		83.5	SS-19	5	5	6	11	
85.0										
	-60.0	Very stiff, moist, gray, with few sand, LEAN CLAY (CL, A-6(13)), LL=34 PL=18 PI=16 NMC=24.5		88.5	SS-20	5	8	9	17	
90.0										

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

RECORD OF TEST BORING

Site Description:	I-10 Mobile River Bridge and Bayway					**County:**	Mobile
Boring No.:	TH-23	**Boring Location:**	945+68.2	**Offset:**	RT 36.9	**Alignment:**	East Area
ALDOT PE No.:	DPI-0030(005)	**TE Project No.:**	15-1101-0228			**Eng./Geo.:**	C.LaFroscia/B.Ellis
Elev.:	28.7 ft.	**Northing:**	238292.77	**Easting:**	1838794.33	**Date Started:**	9/8/2017
Total Depth:	100.0 ft.	**Soil Depth:**	100.0 ft.	**Core Depth:**	0.0 ft.	**Date Completed:**	9/9/2017
Bore Hole Diameter (in):	4-inch	**AASHTO / ASTM Sampling Methods:**		AASHTO T206 & T207			
Drill Machine:	CME 550X	**Drill Method:**	MR	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	Thompson Eng	**Groundwater:**	**TOB** N.O.	**Delayed:**	15.0 ft.

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft.)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	N Value (Field)	SPT N VALUE (blows / foot) / PL MC LL / FINES CONTENT (%) 10 20 30 40 50 60 70 80 90
90.0		%#200=86.2								
	-65.0									
95.0		Undisturbed sample obtained from 93.5 to 95.5 feet. Approximately 24 inches of recovery. Top of tube: Moist, gray fine grained, CLAYEY SAND (SC)		93.5	T-3					
		Bottom of tube: Moist, gray, fine grained, SILTY SAND (SM)								
	-70.0			98.5						
100.0		Medium dense, wet			SS-21	4	5	7	12	●
		Boring Terminated at 100.0 feet.								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	AC - Auger Cuttings	HSA - Hollow Stem Augers	MR - Mud Rotary Wash
T - Shelby Tube	GB - Grab Bag	SSA - Solid Stem Augers	RC - Rock Coring
DCP - Dynamic Cone Penetrometer	NQ - Rock Core	HA - Hand Auger	

thompson ENGINEERING

Mobile River Bridge CPT Investigation
Mobile, Alabama

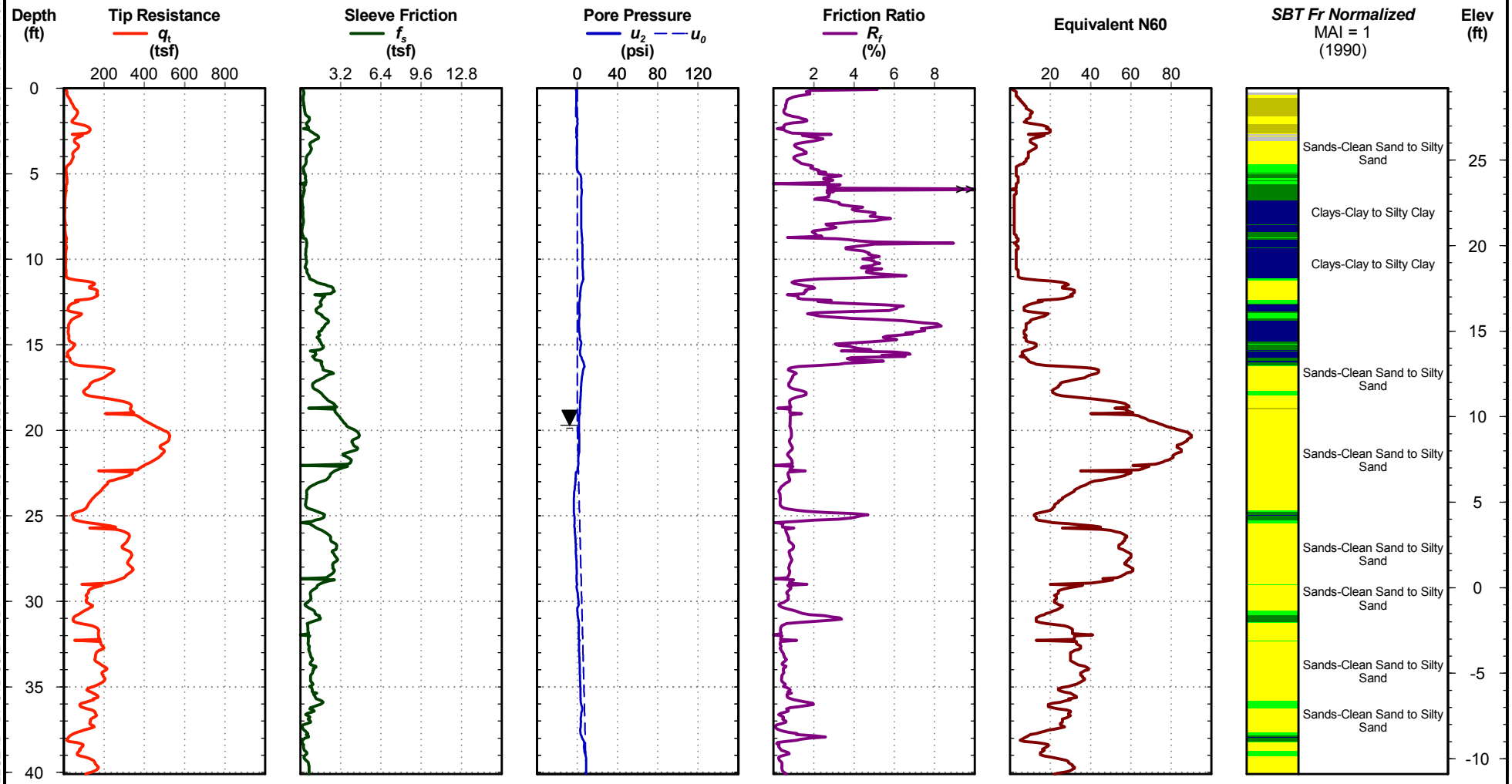
Cone Penetration Test

TC-15

Project #: 15-1101-0228
Date: Nov. 1, 2017

Northing: 239048.6
Easting: 1839928.7

Elevation: 29.2
Filename: TC-15.cpt



*Water level measured from adjacent boring TH-15

1 - Sensitive, Fine Grained Soils
2 - Organic Soils, Peats
3 - Clays-Clay to Silty Clay
4 - Silt Mixtures-Clay Silt to Silty Clay
5 - Sand Mixtures-Silty Sand to Sandy Silt
6 - Sands-Clean Sand to Silty Sand
7 - Gravelly Sand to Sand
8 - Very Stiff Clay to Clayey Sand
9 - Very Stiff Fine Grained Soils

TC-15

thompson ENGINEERING

Mobile River Bridge CPT Investigation
Mobile, Alabama

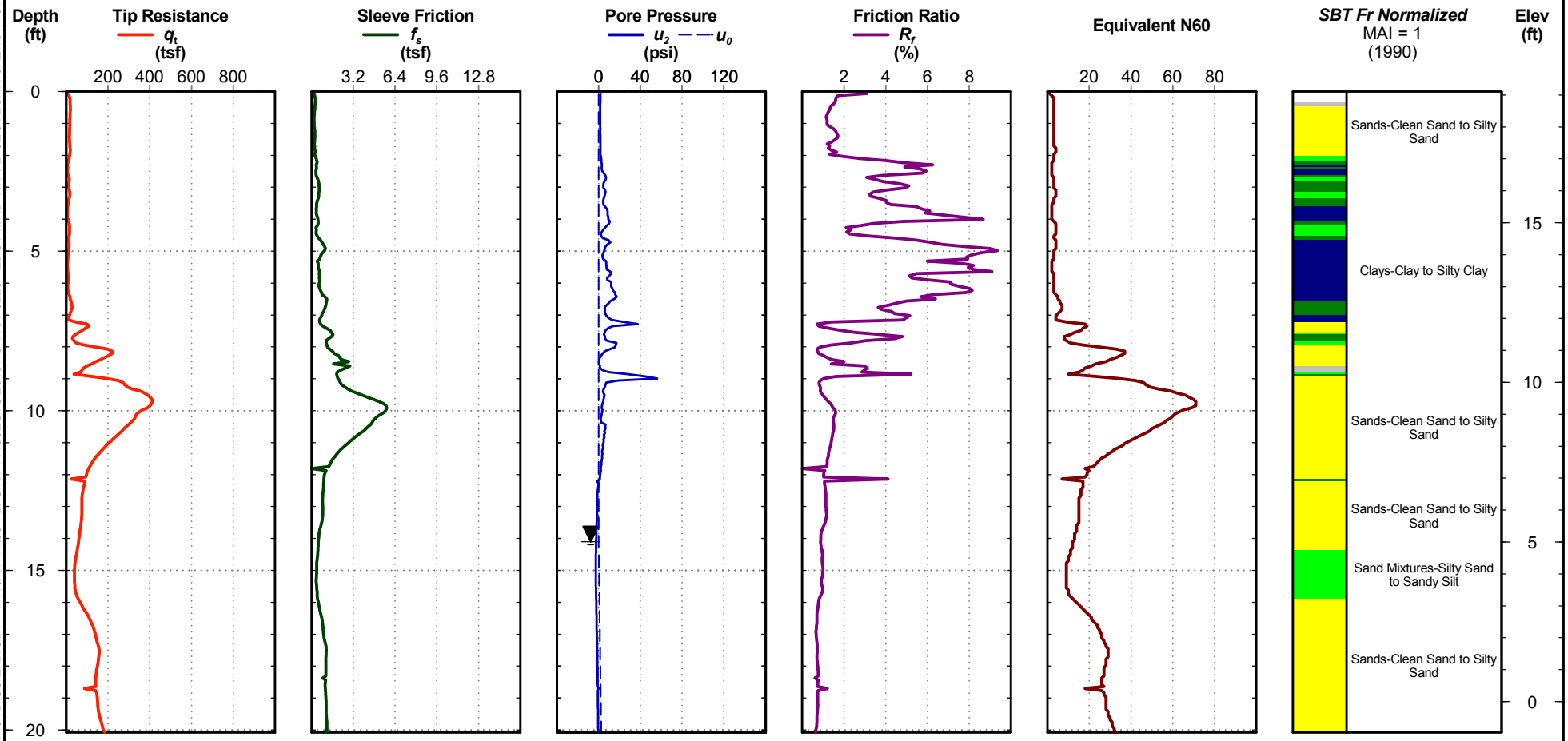
Cone Penetration Test

TC-16

Project #: 15-1101-0228
Date: Nov. 1, 2017

Northing: 238856.3
Easting: 1840730.2

Elevation: 19.11
Filename: TC-16.cpt



*Water level measured from adjacent boring TH-17

1 - Sensitive, Fine Grained Soils
2 - Organic Soils, Peats
3 - Clays-Clay to Silty Clay
4 - Silt Mixtures-Clay Silt to Silty Clay
5 - Sand Mixtures-Silty Sand to Sandy Silt
6 - Sands-Clean Sand to Silty Sand
7 - Gravelly Sand to Sand
8 - Very Stiff Clay to Clayey Sand
9 - Very Stiff Fine Grained Soils

TC-16

thompson ENGINEERING

Mobile River Bridge CPT Investigation
Mobile, Alabama

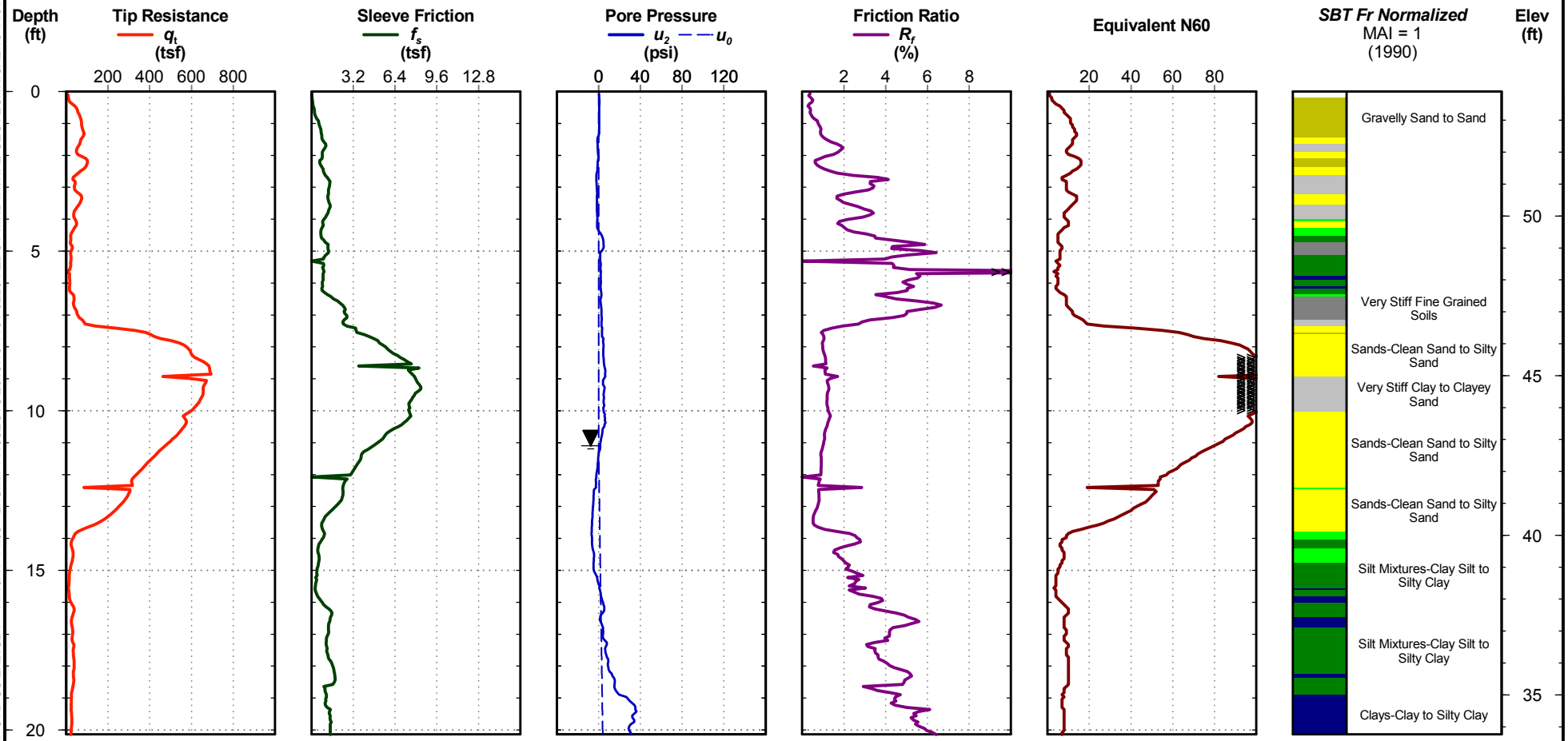
Cone Penetration Test

TC-17

Project #: 15-1101-0228
Date: Nov. 1, 2017

Northing: 239101.0
Easting: 1840927.7

Elevation: 53.9
Filename: TC-17.cpt



*Water level measured from adjacent boring TH-21

1 - Sensitive, Fine Grained Soils
2 - Organic Soils, Peats
3 - Clays-Clay to Silty Clay
4 - Silt Mixtures-Clay Silt to Silty Clay
5 - Sand Mixtures-Silty Sand to Sandy Silt
6 - Sands-Clean Sand to Silty Sand
7 - Gravelly Sand to Sand
8 - Very Stiff Clay to Clayey Sand
9 - Very Stiff Fine Grained Soils

TC-17

KEY TO SYMBOLS

Thompson Engineering, Inc

PROJECT NAME I-10 Mobile River Bridge and Bayway **CLIENT** ALDOT

ALDOT PROJECT NO: DPI-0030(005) **TE PROJECT NO:** 15-1101-0228 **PROJECT LOCATION** Baldwin, Baldwin

LITHOLOGIC SYMBOLS


ASPHALT: Asphalt


AUGER


CH: USCS High Plasticity Clay


CL: USCS Low Plasticity Clay


CL-ML: USCS Low Plasticity Silty Clay


CONCRETE: Concrete


GM: USCS Silty Gravel


GP: USCS Poorly-graded Gravel


GP-GM: USCS Poorly-graded Gravel with Silt


GW: USCS Well-graded Gravel


MH: USCS Elastic Silt


ML: USCS Silt


SC: USCS Clayey Sand


SC-SM: USCS Clayey Sand


SM: USCS Silty Sand


SP: USCS Poorly-graded Sand

SAMPLER TYPE

SS - Split Spoon

T - Shelby Tube

DCP - Dynamic Cone Penetrometer

AC - Auger Cuttings

GB - Grab Bag

NQ - Rock Core

GROUNDWATER LEGEND

▽ Delayed Groundwater Level

▼ Groundwater Level at TOB (Time of Boring). Water levels at the time of boring may have not been obtained due to mud rotary drilling techniques.

N.E. - Not Encountered

N.O. - Not Obtained

ABBREVIATIONS

LL	- LIQUID LIMIT (%)	%#200	- PERCENT PASSING NO. 200 SIEVE
PL	- PLASTIC LIMIT (%)	PP	- POCKET PENETROMETER (TSF)
PI	- PLASTIC INDEX (%)	TV	- TORVANE
NMC	- MOISTURE CONTENT (%)	UC	- UNCONFINED COMPRESSION
DD	- DRY DENSITY (PCF)		
NP	- NON PLASTIC		

APPENDIX C

- **Laboratory Summary**
- **BMT-5's**
- **Consolidated Undrained (C.U.) Triaxial Shear Tests**
- **Unconsolidated Undrained (U.U.) Triaxial Shear Test Results**
- **One Dimensional Consolidation Tests**

Station & Offset	Boring No.	Sample ID	Depth (ft)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Gravel	% Sand	% Pass 200		D50 (mm)	USCS	AASHTO
										% Silt	% Clay			
38+04.5 LT 0.7	TH-14	SS-2	1.5	12.0	22	11	11	0.0	72.4	27.6		0.1886	SC	A-2-6(0)
38+04.5 LT 0.7	TH-14	SS-5	6.0	18.5	NP	NP	NP	0.0	80.5	19.5		0.1842	SM	A-2-4(0)
38+04.5 LT 0.7	TH-14	SS-7	13.5	13.7	21	11	10	0.0	68.2	31.8		0.1563	SC	A-2-4(0)
40+95.8 LT 2.7	TH-15	SS-1	0.0	16.9	NP	NP	NP	0.1	76.9	22.9		0.1707	SM	A-2-4(0)
40+95.8 LT 2.7	TH-15	T-2	8.0	20.9	37	13	24	0.1	36.1	63.8			CL	A-6(12)
40+95.8 LT 2.7	TH-15	SS-6	18.5	17.3	NP	NP	NP	0.0	61.4	38.6		0.1313	SM	A-4(0)
41+00.9 RT 0.3	TH-15A	SS-2	33.5	18.5	NP	NP	NP	2.2	81.7	16.1		0.2603	SM	A-2-4(0)
46+00.3 LT 8.9	TH-16	SS-1	0.0	12.6	NP	NP	NP	1.1	68.4	30.5		0.1666	SM	A-2-4(0)
46+00.3 LT 8.9	TH-16	SS-2	1.5	14.1	19	13	6	0.2	57.6	42.1		0.1026	SC-SM	A-4(0)
46+00.3 LT 8.9	TH-16	SS-3	3.0	14.1	28	12	16	0.0	45.8	54.2			CL	A-6(5)
46+00.3 LT 8.9	TH-16	T-1	6.0	34.1	28	12	16	0.0	30.8	69.2			CL	A-6(8)
46+00.3 LT 8.9	TH-16	SS-6	13.5	23.3	30	14	16	0.0	43.1	56.9			CL	A-6(6)
46+00.3 LT 8.9	TH-16	T-2	18.5	23.8	26	13	13	0.0	43.9	56.1			CL	A-6(4)
46+00.3 LT 8.9	TH-16	SS-7	23.5	20.0	NP	NP	NP	0.0	76.9	23.1		0.1865	SM	A-2-4(0)
46+03.7 LT 6.3	TH-16A	SS-1	23.5	18.4	19	14	5	0.0	37.2	62.8			CL-ML	A-4(0)
46+03.7 LT 6.3	TH-16A	SS-2	28.5	23.1	NP	NP	NP	0.8	91.0	8.2		0.2603	SP-SM	A-3(0)
964+61.7 LT 12.9	TH-17	SS-1	0.0	14.7	20	11	9	0.0	42.3	57.7			CL	A-4(2)
964+61.7 LT 12.9	TH-17	SS-3	3.0	14.6	23	12	11	0.1	69.6	30.3		0.1918	SC	A-2-6(0)
964+61.7 LT 12.9	TH-17	SS-4	4.5	21.5	35	15	20	0.0	38.4	61.6			CL	A-6(9)
964+61.7 LT 12.9	TH-17	SS-6	8.5	24.9	20	12	8	0.8	84.2	15.1		0.1917	SC	A-2-4(0)
964+61.7 LT 12.9	TH-17	SS-8	18.5	22.5	NP	NP	NP	1.8	87.0	11.1		0.2229	SP-SM	A-2-4(0)
969+00.3 RT 1.4	TH-18	SS-1	0.0	11.8	34	12	22	0.2	55.1	44.7		0.0988	SC	A-6(5)
969+00.3 RT 1.4	TH-18	SS-2	1.5	17.4	27	12	15	0.0	81.3	18.7		0.2804	SC	A-2-6(0)
969+00.3 RT 1.4	TH-18	SS-3	3.0	17.7	32	14	18	2.4	65.4	32.2		0.2073	SC	A-2-6(1)
969+00.3 RT 1.4	TH-18	SS-5	6.0	19.4	37	17	20	0.0	44.2	55.8			CL	A-6(8)
969+00.3 RT 1.4	TH-18	SS-8	18.5	17.8	35	15	20	0.7	47.4	51.9			CL	A-6(7)
960+98.6 LT 8.3	TH-19	SS-2	1.5	23.8	NP	NP	NP	1.9	65.0	33.1		0.1570	SM	A-2-4(0)
960+98.6 LT 8.3	TH-19	SS-3	3.0	12.0	NP	NP	NP	0.7	74.7	24.6		0.1769	SM	A-2-4(0)
960+98.6 LT 8.3	TH-19	SS-5	6.0	14.5	32	12	20	0.0	64.1	35.9		0.1523	SC	A-6(2)
960+98.6 LT 8.3	TH-19	SS-8	18.5	22.6	NP	NP	NP	0.0	88.2	11.8		0.2640	SP-SM	A-2-4(0)

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Soil Classification Summary

ALDOT
ALDOT Project No.: 15-1101-0228
Project Name: I-10 Mobile River Bridge and Bayway
Mobile, Alabama

Station & Offset	Boring No.	Sample ID	Depth (ft)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Gravel	% Sand	% Pass 200		D50 (mm)	USCS	AASHTO
										% Silt	% Clay			
963+98.6 RT 19.8	TH-20	SS-1	0.0	10.1	NP	NP	NP	0.1	59.2	40.7		0.1578	SM	A-4(0)
963+98.6 RT 19.8	TH-20	SS-3	3.0	16.6	34	13	21	0.3	26.4	73.2			CL	A-6(13)
963+98.6 RT 19.8	TH-20	SS-5	6.0	14.7	31	12	19	0.3	35.5	64.2			CL	A-6(9)
963+98.6 RT 19.8	TH-20	SS-6	8.5	16.2	35	13	22	0.0	66.0	34.0		0.1578	SC	A-2-6(2)
963+98.6 RT 19.8	TH-20	SS-8	18.5	13.9	NP	NP	NP	0.0	80.7	19.3		0.2561	SM	A-2-4(0)
963+98.6 RT 19.8	TH-20	SS-11	33.5	32.3	80	23	57	0.0	12.4	87.6			CH	A-7-6(56)
966+96.1 RT 32.9	TH-21	SS-2	1.5	22.8	37	13	24	0.7	35.3	64.0			CL	A-6(12)
966+96.1 RT 32.9	TH-21	SS-5	6.0	13.6	48	20	28	0.5	58.9	40.6		0.1606	SC	A-7-6(6)
966+96.1 RT 32.9	TH-21	SS-8	18.5	18.3	27	16	11	2.2	56.8	41.0		0.1276	SC	A-6(1)
966+96.1 RT 32.9	TH-21	SS-10	28.5	18.6	NP	NP	NP	0.0	88.8	11.2		0.2302	SP-SM	A-2-4(0)
950+02.3 LT 4.8	TH-22	SS-3	3.0	21.9	NP	NP	NP	0.0	96.0	4.0		0.2515	SP	A-3(0)
950+02.3 LT 4.8	TH-22	SS-5	6.0	28.2	NP	NP	NP	0.0	96.6	3.4		0.2560	SP	A-3(0)
950+02.3 LT 4.8	TH-22	SS-8	18.5	20.8	NP	NP	NP	0.0	48.5	51.5			ML	A-4(0)
950+02.3 LT 4.8	TH-22	T-1	48.5	26.5	29	21	8	0.0	51.3	48.7		0.0763	SC	A-4(1)
950+02.3 LT 4.8	TH-22	SS-14	53.5	27.0	27	18	9	0.0	60.3	39.7		0.0888	SC	A-4(0)
950+02.3 LT 4.8	TH-22	T-2	68.5	20.6	25	18	7	0.0	53.2	46.8		0.0801	SC-SM	A-4(1)
950+02.3 LT 4.8	TH-22	SS-19	83.5	23.9	NP	NP	NP	0.0	45.4	54.6			ML	A-4(0)
950+02.3 LT 4.8	TH-22	SS-22	98.5	23.9	29	19	10	0.0	39.7	60.3			CL	A-4(4)
950+02.3 LT 4.8	TH-22	SS-24	108.5	23.0	NP	NP	NP	0.0	57.6	42.4		0.0863	SM	A-4(0)
950+02.3 LT 4.8	TH-22	SS-26	118.5	26.2	NP	NP	NP	0.0	72.7	27.3		0.1270	SM	A-2-4(0)
950+02.3 LT 4.8	TH-22	T-3	133.5	23.4	28	20	8	0.4	46.8	52.9			CL	A-4(2)
945+68.2 RT 36.9	TH-23	SS-3	3.0	15.8	NP	NP	NP	1.7	77.8	20.5		0.2193	SM	A-2-4(0)
945+68.2 RT 36.9	TH-23	SS-5	6.0	17.6	40	15	25	0.7	29.7	69.7			CL	A-6(15)
945+68.2 RT 36.9	TH-23	SS-7	13.5	16.1	29	14	15	1.2	47.5	51.3			CL	A-6(4)
945+68.2 RT 36.9	TH-23	SS-9	23.5	16.6	28	13	15	0.5	47.4	52.1			CL	A-6(4)
945+68.2 RT 36.9	TH-23	SS-11	33.5	15.0	NP	NP	NP	1.7	95.4	2.9		0.8630	SP	A-1-b(0)
945+68.2 RT 36.9	TH-23	SS-14	48.5	27.1	40	18	22	0.0	33.9	66.1			CL	A-6(12)
945+68.2 RT 36.9	TH-23	T-1	58.0	24.4	25	21	4	0.0	59.6	40.4		0.0880	SC-SM	A-4(0)
945+68.2 RT 36.9	TH-23	T-2	68.5	24.8	28	21	7	0.0	58.9	41.1		0.0898	SC-SM	A-4(0)
945+68.2 RT 36.9	TH-23	SS-17	73.5	23.4	27	21	6	0.0	50.1	49.9		0.0752	SC-SM	A-4(1)

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Soil Classification Summary

ALDOT
ALDOT Project No.: 15-1101-0228
Project Name: I-10 Mobile River Bridge and Bayway
Mobile, Alabama

Station & Offset	Boring No.	Sample ID	Depth (ft)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Gravel	% Sand	% Pass 200		D50 (mm)	USCS	AASHTO
										% Silt	% Clay			
945+68.2 RT 36.9	TH-23	SS-20	88.5	24.5	34	18	16	0.7	13.1	86.2			CL	A-6(13)

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ENGINEERING

Soil Classification Summary

ALDOT
ALDOT Project No.: 15-1101-0228
Project Name: I-10 Mobile River Bridge and Bayway
Mobile, Alabama

BMT-5

Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-14	TH-14	TH-14	TH-15	TH-15	TH-15
Station	38+04.5	38+04.5	38+04.5	40+95.8	40+95.8	40+95.8
Offset	LT 0.7	LT 0.7	LT 0.7	LT 2.7	LT 2.7	LT 2.7
Sample ID	SS-2	SS-5	SS-7	SS-1	T-2	SS-6
Depth (ft)	1.5	6.0	13.5	0.0	8.0	18.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
#4 SIEVE (4.75mm)	100.0	100.0	100.0	99.9	99.9	100.0
#10 SIEVE (2.00mm)	99.9	99.6	99.4	98.1	99.3	99.4
#20 SIEVE (0.85mm)	97.7	98.8	98.7	96.8	98.8	97.6
#40" SIEVE (425um)	83.9	94.6	93.7	93.2	96.9	90.7
#60 SIEVE (250um)	64.0	74.6	74.5	80.2	91.2	73.6
#100 SIEVE (150um)	38.6	33.5	47.8	39.7	81.0	52.8
#140 SIEVE (106um)	31.4	24.8	38.7	29.0	73.1	45.5
#200 SIEVE (75um)	27.6	19.5	31.8	22.9	63.8	38.6
Clay						
Silt						
Total Sand	72.4	80.5	68.2	76.9	36.1	61.4
Total Gravel	0.0	0.0	0.0	0.1	0.1	0.0
ATTERBERG LIMITS						
Liquid Limit	22	NP	21	NP	37	NP
Plastic Limit	11	NP	11	NP	13	NP
Plasticity Index	11	NP	10	NP	24	NP
USCS	SC	SM	SC	SM	CL	SM
AASHTO	A-2-6(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)	A-6(12)	A-4(0)

BMT-5

Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-15A	TH-16	TH-16	TH-16	TH-16	TH-16
Station	41+00.9	46+00.3	46+00.3	46+00.3	46+00.3	46+00.3
Offset	RT 0.3	LT 8.9	LT 8.9	LT 8.9	LT 8.9	LT 8.9
Sample ID	SS-2	SS-1	SS-2	SS-3	T-1	SS-6
Depth (ft)	33.5	0.0	1.5	3.0	6.0	13.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
#4 SIEVE (4.75mm)	97.8	98.9	99.8	100.0	100.0	100.0
#10 SIEVE (2.00mm)	91.7	96.7	98.7	99.3	99.9	99.8
#20 SIEVE (0.85mm)	81.5	94.2	97.2	98.8	99.7	99.0
#40" SIEVE (425um)	65.3	85.7	91.8	96.3	98.2	93.7
#60 SIEVE (250um)	48.7	66.6	77.6	85.5	91.1	83.2
#100 SIEVE (150um)	30.2	45.7	59.8	73.0	83.9	71.0
#140 SIEVE (106um)	21.8	37.1	50.8	63.6	77.7	64.1
#200 SIEVE (75um)	16.1	30.5	42.1	54.2	69.2	56.9
Clay						
Silt						
Total Sand	81.7	68.4	57.6	45.8	30.8	43.1
Total Gravel	2.2	1.1	0.2	0.0	0.0	0.0
ATTERBERG LIMITS						
Liquid Limit	NP	NP	19	28	28	30
Plastic Limit	NP	NP	13	12	12	14
Plasticity Index	NP	NP	6	16	16	16
USCS	SM	SM	SC-SM	CL	CL	CL
AASHTO	A-2-4(0)	A-2-4(0)	A-4(0)	A-6(5)	A-6(8)	A-6(6)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-16	TH-16	TH-16A	TH-16A	TH-17	TH-17
Station	46+00.3	46+00.3	46+03.7	46+03.7	964+61.7	964+61.7
Offset	LT 8.9	LT 8.9	LT 6.3	LT 6.3	LT 12.9	LT 12.9
Sample ID	T-2	SS-7	SS-1	SS-2	SS-1	SS-3
Depth (ft)	18.5	23.5	23.5	28.5	0.0	3.0
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
#4 SIEVE (4.75mm)	100.0	100.0	100.0	99.2	100.0	99.9
#10 SIEVE (2.00mm)	99.8	100.0	100.0	96.3	99.8	99.0
#20 SIEVE (0.85mm)	99.0	98.9	99.7	93.1	98.3	96.8
#40" SIEVE (425um)	94.2	92.7	95.8	81.9	92.8	86.1
#60 SIEVE (250um)	83.6	66.9	86.2	47.4	80.7	60.9
#100 SIEVE (150um)	71.2	37.4	77.0	19.2	69.3	39.9
#140 SIEVE (106um)	64.0	28.6	71.2	12.5	63.5	33.9
#200 SIEVE (75um)	56.1	23.1	62.8	8.2	57.7	30.3
Clay						
Silt						
Total Sand	43.9	76.9	37.2	91.0	42.3	69.6
Total Gravel	0.0	0.0	0.0	0.8	0.0	0.1
ATTERBERG LIMITS						
Liquid Limit	26	NP	19	NP	20	23
Plastic Limit	13	NP	14	NP	11	12
Plasticity Index	13	NP	5	NP	9	11
USCS	CL	SM	CL-ML	SP-SM	CL	SC
AASHTO	A-6(4)	A-2-4(0)	A-4(0)	A-3(0)	A-4(2)	A-2-6(0)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-17	TH-17	TH-17	TH-18	TH-18	TH-18
Station	964+61.7	964+61.7	964+61.7	969+00.3	969+00.3	969+00.3
Offset	LT 12.9	LT 12.9	LT 12.9	RT 1.4	RT 1.4	RT 1.4
Sample ID	SS-4	SS-6	SS-8	SS-1	SS-2	SS-3
Depth (ft)	4.5	8.5	18.5	0.0	1.5	3.0
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	99.0
#4 SIEVE (4.75mm)	100.0	99.2	98.2	99.8	100.0	97.6
#10 SIEVE (2.00mm)	99.6	99.1	97.3	98.6	98.7	95.0
#20 SIEVE (0.85mm)	97.7	98.7	96.5	95.7	94.2	89.9
#40" SIEVE (425um)	89.9	95.1	92.7	87.3	77.7	76.3
#60 SIEVE (250um)	75.8	75.8	59.4	72.4	42.4	55.2
#100 SIEVE (150um)	66.2	26.2	17.5	58.1	24.0	40.9
#140 SIEVE (106um)	63.4	18.0	12.9	51.4	20.6	36.1
#200 SIEVE (75um)	61.6	15.1	11.1	44.7	18.7	32.2
Clay						
Silt						
Total Sand	38.4	84.2	87.0	55.1	81.3	65.4
Total Gravel	0.0	0.8	1.8	0.2	0.0	2.4
ATTERBERG LIMITS						
Liquid Limit	35	20	NP	34	27	32
Plastic Limit	15	12	NP	12	12	14
Plasticity Index	20	8	NP	22	15	18
USCS	CL	SC	SP-SM	SC	SC	SC
AASHTO	A-6(9)	A-2-4(0)	A-2-4(0)	A-6(5)	A-2-6(0)	A-2-6(1)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-18	TH-18	TH-19	TH-19	TH-19	TH-19
Station	969+00.3	969+00.3	960+98.6	960+98.6	960+98.6	960+98.6
Offset	RT 1.4	RT 1.4	LT 8.3	LT 8.3	LT 8.3	LT 8.3
Sample ID	SS-5	SS-8	SS-2	SS-3	SS-5	SS-8
Depth (ft)	6.0	18.5	1.5	3.0	6.0	18.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	98.8	100.0	100.0	100.0
#4 SIEVE (4.75mm)	100.0	99.3	98.1	99.3	100.0	100.0
#10 SIEVE (2.00mm)	99.8	98.5	96.6	97.4	99.8	99.2
#20 SIEVE (0.85mm)	99.1	97.1	93.8	94.0	97.4	97.4
#40" SIEVE (425um)	95.8	92.0	85.1	83.5	87.0	85.0
#60 SIEVE (250um)	88.8	83.5	68.6	65.4	68.1	46.0
#100 SIEVE (150um)	74.3	71.4	48.2	42.7	49.4	18.1
#140 SIEVE (106um)	65.0	61.8	39.6	32.3	42.1	13.9
#200 SIEVE (75um)	55.8	51.9	33.1	24.6	35.9	11.8
Clay						
Silt						
Total Sand	44.2	47.4	65.0	74.7	64.1	88.2
Total Gravel	0.0	0.7	1.9	0.7	0.0	0.0
ATTERBERG LIMITS						
Liquid Limit	37	35	NP	NP	32	NP
Plastic Limit	17	15	NP	NP	12	NP
Plasticity Index	20	20	NP	NP	20	NP
USCS	CL	CL	SM	SM	SC	SP-SM
AASHTO	A-6(8)	A-6(7)	A-2-4(0)	A-2-4(0)	A-6(2)	A-2-4(0)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-20	TH-20	TH-20	TH-20	TH-20	TH-20
Station	963+98.6	963+98.6	963+98.6	963+98.6	963+98.6	963+98.6
Offset	RT 19.8	RT 19.8	RT 19.8	RT 19.8	RT 19.8	RT 19.8
Sample ID	SS-1	SS-3	SS-5	SS-6	SS-8	SS-11
Depth (ft)	0.0	3.0	6.0	8.5	18.5	33.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
#4 SIEVE (4.75mm)	99.9	99.7	99.7	100.0	100.0	100.0
#10 SIEVE (2.00mm)	99.5	99.6	99.3	99.1	99.2	99.8
#20 SIEVE (0.85mm)	97.1	99.4	98.6	97.6	95.4	99.5
#40" SIEVE (425um)	87.2	98.5	96.2	90.2	79.4	97.8
#60 SIEVE (250um)	69.4	95.7	91.1	72.6	48.6	93.5
#100 SIEVE (150um)	47.9	90.3	80.6	47.5	28.0	89.9
#140 SIEVE (106um)	43.4	84.4	73.7	39.8	22.8	88.6
#200 SIEVE (75um)	40.7	73.2	64.2	34.0	19.3	87.6
Clay						
Silt						
Total Sand	59.2	26.4	35.5	66.0	80.7	12.4
Total Gravel	0.1	0.3	0.3	0.0	0.0	0.0
ATTERBERG LIMITS						
Liquid Limit	NP	34	31	35	NP	80
Plastic Limit	NP	13	12	13	NP	23
Plasticity Index	NP	21	19	22	NP	57
USCS	SM	CL	CL	SC	SM	CH
AASHTO	A-4(0)	A-6(13)	A-6(9)	A-2-6(2)	A-2-4(0)	A-7-6(56)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-21	TH-21	TH-21	TH-21	TH-22	TH-22
Station	966+96.1	966+96.1	966+96.1	966+96.1	950+02.3	950+02.3
Offset	RT 32.9	RT 32.9	RT 32.9	RT 32.9	LT 4.8	LT 4.8
Sample ID	SS-2	SS-5	SS-8	SS-10	SS-3	SS-5
Depth (ft)	1.5	6.0	18.5	28.5	3.0	6.0
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	99.8	100.0	98.4	100.0	100.0	100.0
#4 SIEVE (4.75mm)	99.3	99.5	97.8	100.0	100.0	100.0
#10 SIEVE (2.00mm)	99.2	98.6	96.9	99.6	99.9	99.9
#20 SIEVE (0.85mm)	98.5	96.3	94.4	99.4	99.3	99.6
#40" SIEVE (425um)	98.5	87.5	83.5	95.2	95.3	94.7
#60 SIEVE (250um)	95.9	63.8	66.5	56.6	49.5	47.9
#100 SIEVE (150um)	90.9	47.9	52.9	15.7	7.6	15.4
#140 SIEVE (106um)	80.5	43.6	46.7	12.6	5.0	5.8
#200 SIEVE (75um)	64.0	40.6	41.0	11.2	4.0	3.4
Clay						
Silt						
Total Sand	35.3	58.9	56.8	88.8	96.0	96.6
Total Gravel	0.7	0.5	2.2	0.0	0.0	0.0
ATTERBERG LIMITS						
Liquid Limit	37	48	27	NP	NP	NP
Plastic Limit	13	20	16	NP	NP	NP
Plasticity Index	24	28	11	NP	NP	NP
USCS	CL	SC	SC	SP-SM	SP	SP
AASHTO	A-6(12)	A-7-6(6)	A-6(1)	A-2-4(0)	A-3(0)	A-3(0)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
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ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-22	TH-22	TH-22	TH-22	TH-22	TH-22
Station	950+02.3	950+02.3	950+02.3	950+02.3	950+02.3	950+02.3
Offset	LT 4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8
Sample ID	SS-8	T-1	SS-14	T-2	SS-19	SS-22
Depth (ft)	18.5	48.5	53.5	68.5	83.5	98.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
#4 SIEVE (4.75mm)	100.0	100.0	100.0	100.0	100.0	100.0
#10 SIEVE (2.00mm)	99.9	100.0	100.0	100.0	100.0	99.6
#20 SIEVE (0.85mm)	99.8	99.7	100.0	99.9	100.0	98.5
#40" SIEVE (425um)	99.8	99.7	99.7	99.6	98.0	97.3
#60 SIEVE (250um)	98.3	99.0	98.0	98.4	93.3	95.0
#100 SIEVE (150um)	83.3	93.3	85.7	86.5	87.8	87.5
#140 SIEVE (106um)	65.3	74.6	60.8	63.8	73.2	77.1
#200 SIEVE (75um)	51.5	48.7	39.7	46.8	54.6	60.3
Clay						
Silt						
Total Sand	48.5	51.3	60.3	53.2	45.4	39.7
Total Gravel	0.0	0.0	0.0	0.0	0.0	0.0
ATTERBERG LIMITS						
Liquid Limit	NP	29	27	25	NP	29
Plastic Limit	NP	21	18	18	NP	19
Plasticity Index	NP	8	9	7	NP	10
USCS	ML	SC	SC	SC-SM	ML	CL
AASHTO	A-4(0)	A-4(1)	A-4(0)	A-4(1)	A-4(0)	A-4(4)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
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ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-22	TH-22	TH-22	TH-23	TH-23	TH-23
Station	950+02.3	950+02.3	950+02.3	945+68.2	945+68.2	945+68.2
Offset	LT 4.8	LT 4.8	LT 4.8	RT 36.9	RT 36.9	RT 36.9
Sample ID	SS-24	SS-26	T-3	SS-3	SS-5	SS-7
Depth (ft)	108.5	118.5	133.5	3.0	6.0	13.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	98.7	100.0	100.0
#4 SIEVE (4.75mm)	100.0	100.0	99.6	98.3	99.3	98.8
#10 SIEVE (2.00mm)	100.0	100.0	99.6	97.6	97.6	97.5
#20 SIEVE (0.85mm)	99.9	100.0	99.5	96.8	94.5	97.3
#40" SIEVE (425um)	99.0	98.8	99.3	89.3	89.2	95.6
#60 SIEVE (250um)	95.0	94.3	98.7	56.2	83.0	91.6
#100 SIEVE (150um)	80.6	65.3	88.0	32.0	78.3	84.7
#140 SIEVE (106um)	61.1	33.4	67.8	24.9	74.6	69.7
#200 SIEVE (75um)	42.4	27.3	52.9	20.5	69.7	51.3
Clay						
Silt						
Total Sand	57.6	72.7	46.8	77.8	29.7	47.5
Total Gravel	0.0	0.0	0.4	1.7	0.7	1.2
ATTERBERG LIMITS						
Liquid Limit	NP	NP	28	NP	40	29
Plastic Limit	NP	NP	20	NP	15	14
Plasticity Index	NP	NP	8	NP	25	15
USCS	SM	SM	CL	SM	CL	CL
AASHTO	A-4(0)	A-2-4(0)	A-4(2)	A-2-4(0)	A-6(15)	A-6(4)

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Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
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ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-23	TH-23	TH-23	TH-23	TH-23	TH-23
Station	945+68.2	945+68.2	945+68.2	945+68.2	945+68.2	945+68.2
Offset	RT 36.9	RT 36.9	RT 36.9	RT 36.9	RT 36.9	RT 36.9
Sample ID	SS-9	SS-11	SS-14	T-1	T-2	SS-17
Depth (ft)	23.5	33.5	48.5	58.0	68.5	73.5
TOTAL PASSING (%)						
3" SIEVE (75mm)	100.0	100.0	100.0	100.0	100.0	100.0
2 1/2" SIEVE (63mm)	100.0	100.0	100.0	100.0	100.0	100.0
2" SIEVE (50mm)	100.0	100.0	100.0	100.0	100.0	100.0
1 1/2" SIEVE (37.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
1" SIEVE (25mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/4" SIEVE (19mm)	100.0	100.0	100.0	100.0	100.0	100.0
1/2" SIEVE (12.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
3/8" SIEVE (9.5mm)	100.0	100.0	100.0	100.0	100.0	100.0
#4 SIEVE (4.75mm)	99.5	98.3	100.0	100.0	100.0	100.0
#10 SIEVE (2.00mm)	97.8	88.8	99.8	100.0	100.0	99.8
#20 SIEVE (0.85mm)	95.0	49.3	99.8	99.9	99.5	99.5
#40" SIEVE (425um)	89.4	6.1	99.8	99.7	98.7	99.0
#60 SIEVE (250um)	80.1	4.4	99.4	98.3	96.8	97.5
#100 SIEVE (150um)	67.4	3.4	95.6	86.1	83.9	86.5
#140 SIEVE (106um)	59.9	3.1	84.2	61.1	58.2	65.4
#200 SIEVE (75um)	52.1	2.9	66.1	40.4	41.1	49.9
Clay						
Silt						
Total Sand	47.4	95.4	33.9	59.6	58.9	50.1
Total Gravel	0.5	1.7	0.0	0.0	0.0	0.0
ATTERBERG LIMITS						
Liquid Limit	28	NP	40	25	28	27
Plastic Limit	13	NP	18	21	21	21
Plasticity Index	15	NP	22	4	7	6
USCS	CL	SP	CL	SC-SM	SC-SM	SC-SM
AASHTO	A-6(4)	A-1-b(0)	A-6(12)	A-4(0)	A-4(0)	A-4(1)

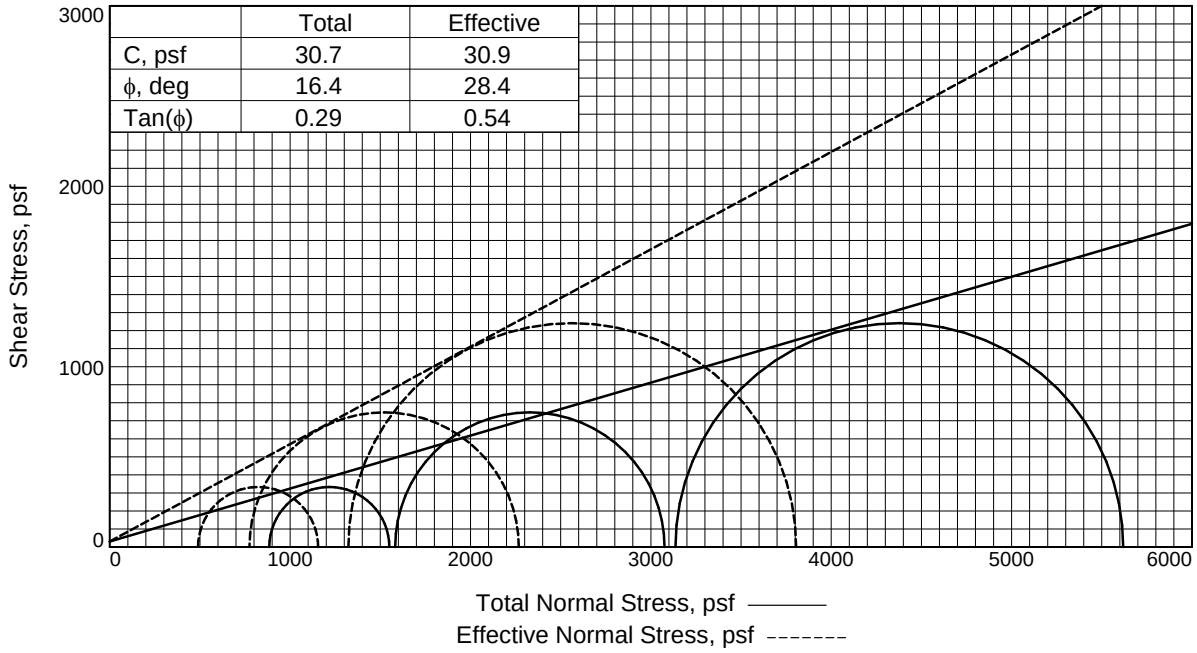
BMT-5

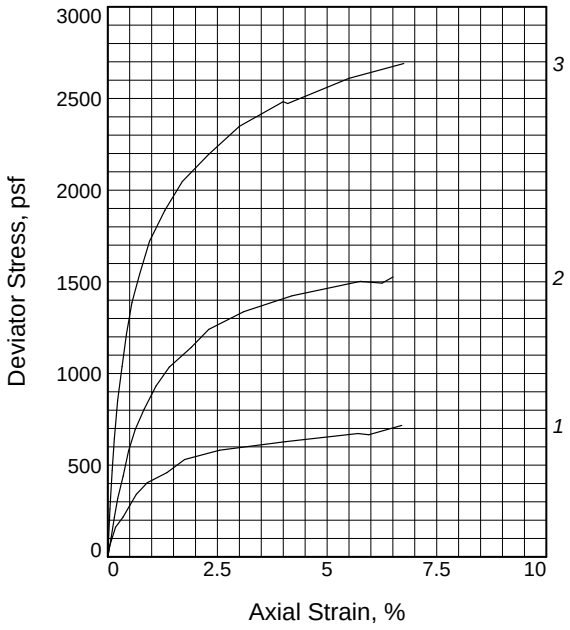
Client: ALDOT
Project: I-10 Mobile River Bridge and Bayway
ALDOT Project No.:15-1101-0228

Project No.: 15-1101-0228
Region: Southwest Region
Date: 01/15/2018

ALABAMA DEPARTMENT OF TRANSPORTATION
SOILS AND BASE COARSE ANALYSIS

Boring No.	TH-23
Station	945+68.2
Offset	RT 36.9
Sample ID	SS-20
Depth (ft)	88.5
TOTAL PASSING (%)	
3" SIEVE (75mm)	100.0
2 1/2" SIEVE (63mm)	100.0
2" SIEVE (50mm)	100.0
1 1/2" SIEVE (37.5mm)	100.0
1" SIEVE (25mm)	100.0
3/4" SIEVE (19mm)	100.0
1/2" SIEVE (12.5mm)	100.0
3/8" SIEVE (9.5mm)	100.0
#4 SIEVE (4.75mm)	99.3
#10 SIEVE (2.00mm)	99.1
#20 SIEVE (0.85mm)	99.1
#40" SIEVE (425um)	98.7
#60 SIEVE (250um)	98.3
#100 SIEVE (150um)	97.6
#140 SIEVE (106um)	93.6
#200 SIEVE (75um)	86.2
Clay	
Silt	
Total Sand	13.1
Total Gravel	0.7
ATTERBERG LIMITS	
Liquid Limit	34
Plastic Limit	18
Plasticity Index	16
USCS	CL
AASHTO	A-6(13)





Specimen No.		1	2	3
Initial	Water Content, %	21.8	21.3	22.1
	Dry Density, pcf	104.5	109.2	105.3
	Saturation, %	102.4	114.0	105.8
	Void Ratio	0.5528	0.4870	0.5421
	Diameter, in.	1.398	1.403	1.395
	Height, in.	2.790	2.790	2.770
At Test	Water Content, %	21.0	19.8	21.9
	Dry Density, pcf	104.5	109.2	105.3
	Saturation, %	98.8	105.7	105.0
	Void Ratio	0.5528	0.4870	0.5421
	Diameter, in.	1.398	1.403	1.395
	Height, in.	2.790	2.790	2.770
Strain at peak, %		6.0	6.3	4.0
Back Pressure, psf		1788.5	1745.3	1798.6
Cell Pressure, psf		2672.6	3327.8	4934.9
Fail. Stress, psf		665.8	1493.1	2482.8
Excess Pore Pr., psf		394.8	808.1	1813.7
Ult. Stress, psf		665.8	1493.1	2482.8
Excess Pore Pr., psf		394.8	808.1	1813.7
$\bar{\sigma}_1$ Failure, psf		1155.1	2267.5	3805.4
$\bar{\sigma}_3$ Failure, psf		489.3	774.4	1322.6

Type of Test:
CU with Pore Pressures

Sample Type: Shelby Tube

Description: SANDY LEAN CLAY (CL A-6(8))

Specific Gravity= 2.60

Remarks: Symmetrical Bulge
Samples were a little soft

Figure _____

Client: ALDOT

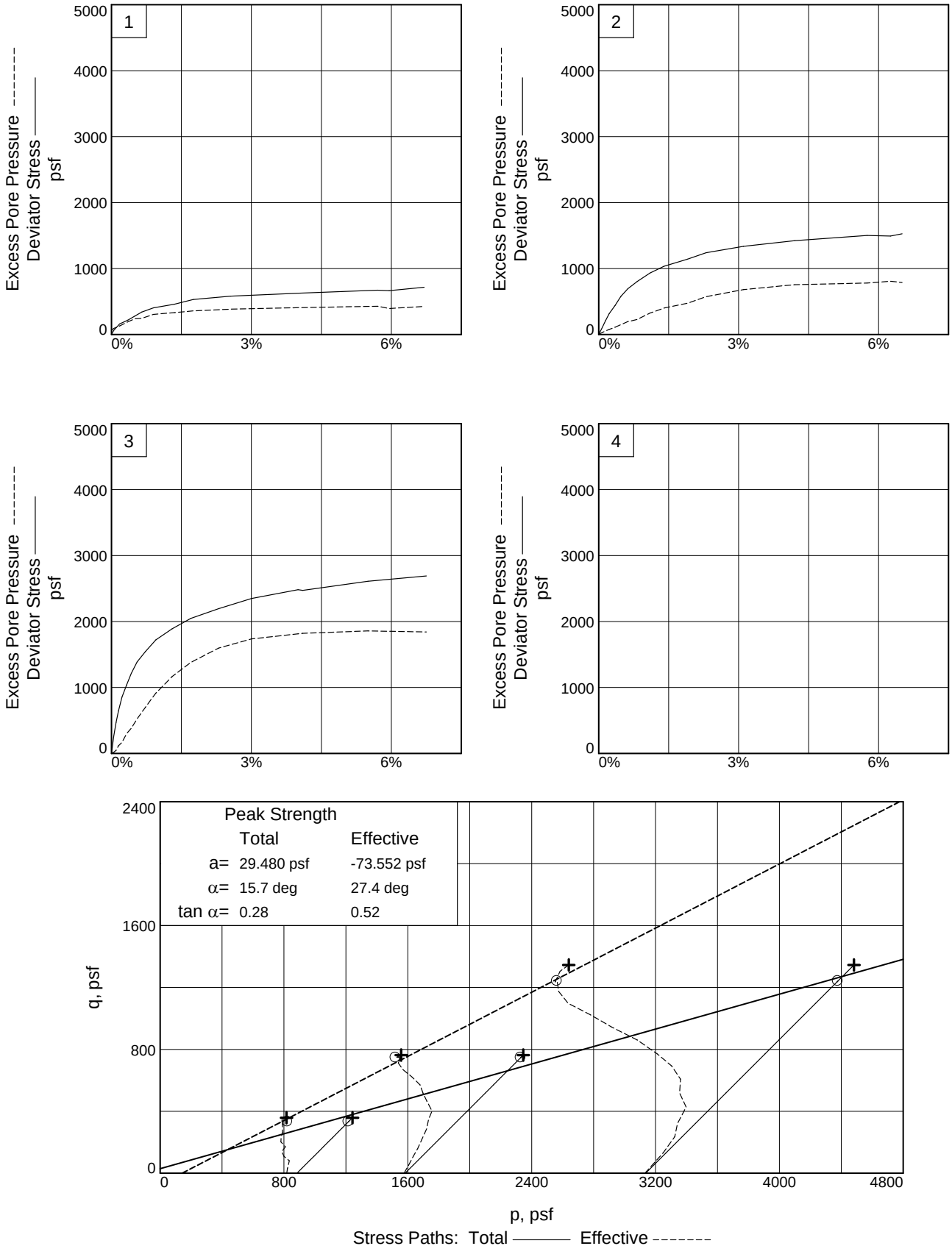
Project: Mobile River Bridge

Source of Sample: Lab #8047 **Depth:** 6.0'-8.0'

Sample Number: TH-16 T-1

Proj. No.: 1511010228 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Thompson Engineering
Mobile, Alabama



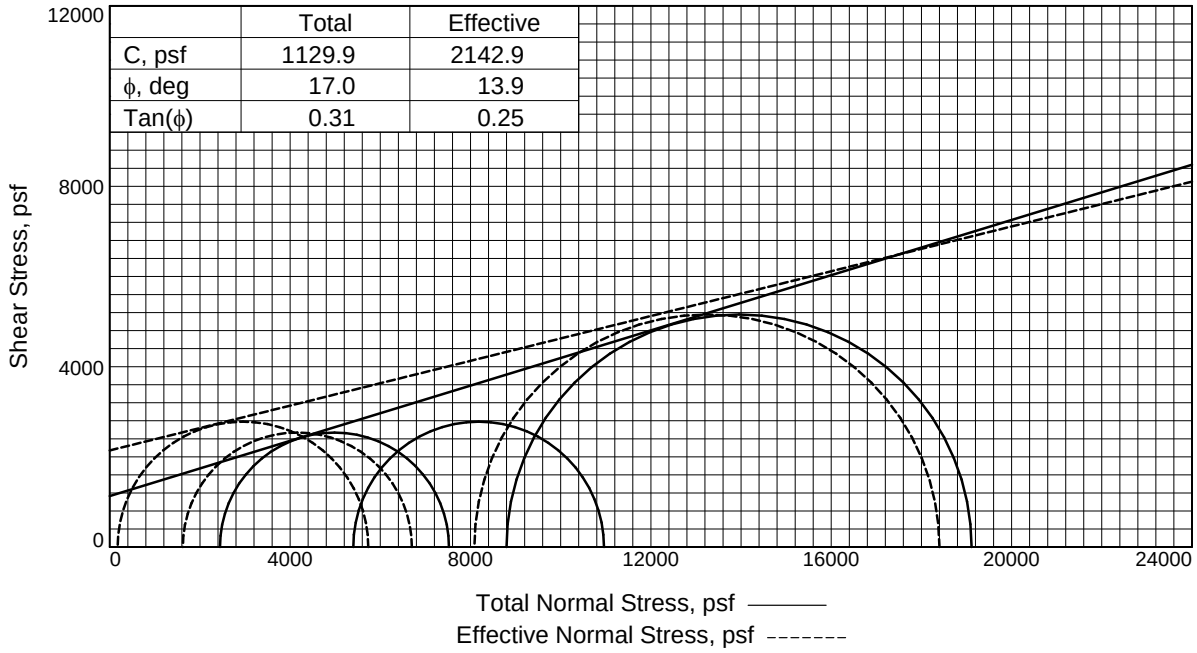
Client: ALDOT

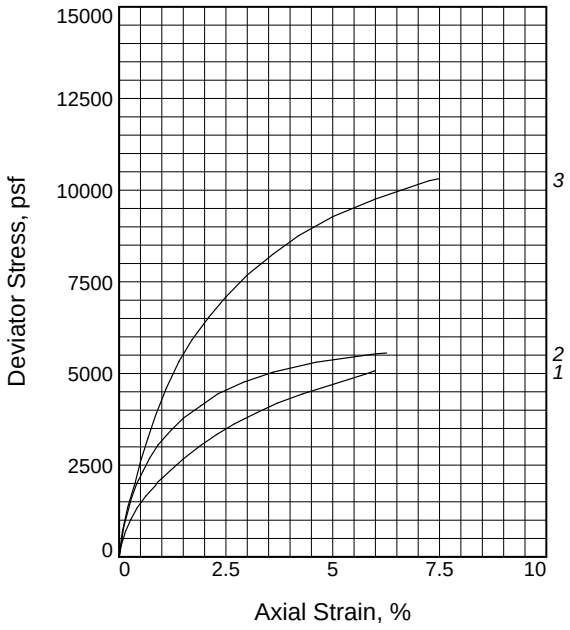
Project: Mobile River Bridge

Source of Sample: Lab #8047 **Depth:** 6.0'-8.0' **Sample Number:** TH-16 T-1

Project No.: 1511010228 **Figure** _____

Thompson Engineering





Specimen No.		1	2	3
Initial	Water Content, %	18.1	28.7	28.7
	Dry Density, pcf	116.9	92.9	95.5
	Saturation, %	114.6	96.9	103.3
	Void Ratio	0.4206	0.7880	0.7393
	Diameter, in.	1.421	1.422	1.400
	Height, in.	2.770	2.800	2.810
At Test	Water Content, %	17.2	26.7	26.7
	Dry Density, pcf	116.9	92.9	95.5
	Saturation, %	108.5	90.1	96.0
	Void Ratio	0.4206	0.7880	0.7393
	Diameter, in.	1.421	1.422	1.400
	Height, in.	2.770	2.800	2.810
Strain at peak, %		6.0	6.3	7.5
Back Pressure, psf		1669.0	1800.0	1733.8
Cell Pressure, psf		4112.6	7200.0	10532.2
Fail. Stress, psf		5079.0	5560.4	10314.1
Excess Pore Pr., psf		824.2	5226.4	713.2
Ult. Stress, psf		5079.0	5560.4	10314.1
Excess Pore Pr., psf		824.2	5226.4	713.2
$\bar{\sigma}_1$ Failure, psf		6698.5	5733.9	18399.3
$\bar{\sigma}_3$ Failure, psf		1619.5	173.6	8085.2

Type of Test:
CU with Pore Pressures

Sample Type: Shelby Tube

Description: SANDY LEAN CLAY (CL A-6(4))

Specific Gravity= 2.66

Remarks: Symmetrical Bulge

Figure _____

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8047 **Depth:** 18.5'-20.0'

Sample Number: TH-16 T-2

Proj. No.: 1511010228 **Date Sampled:**

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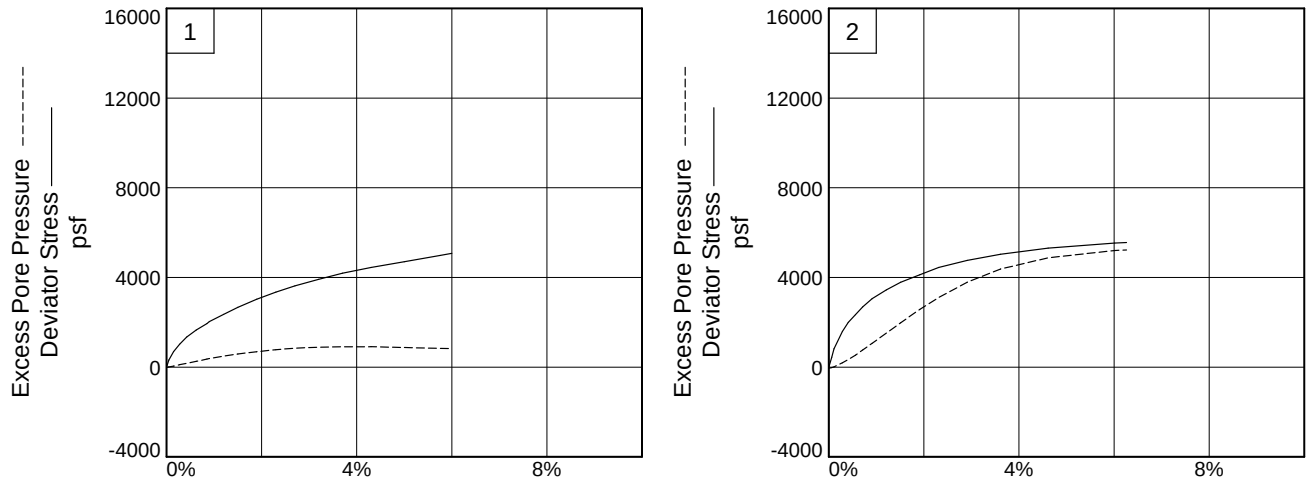
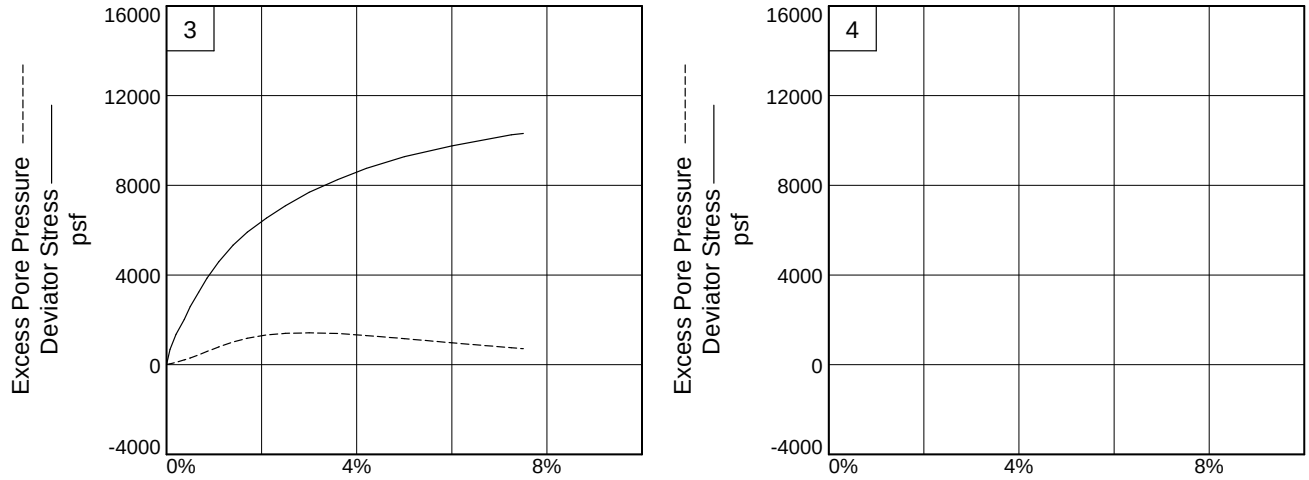
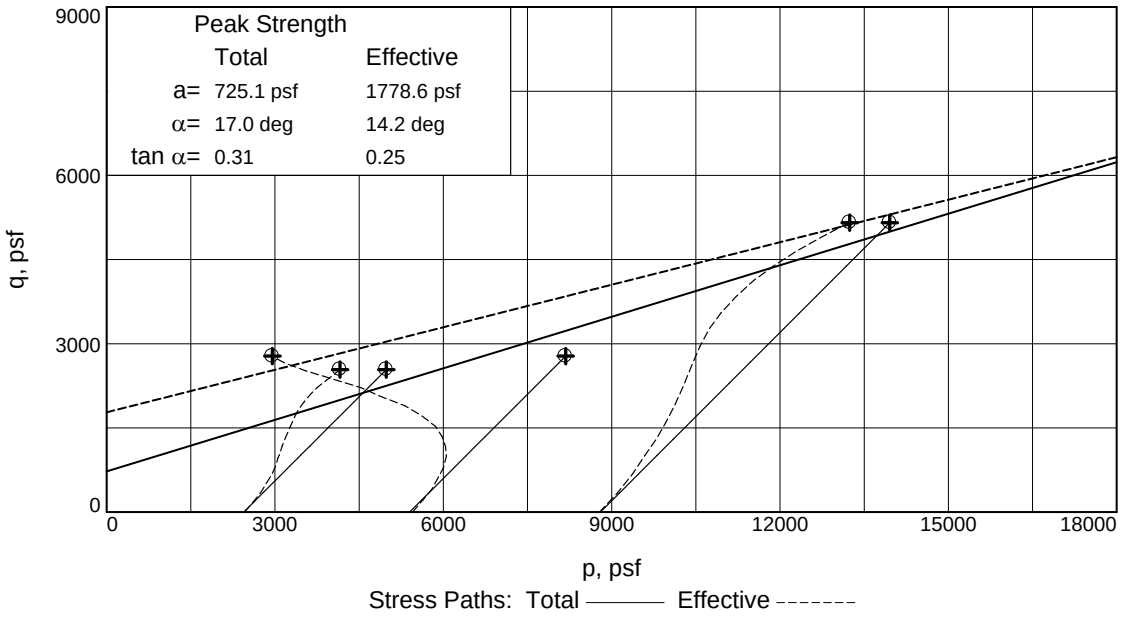
Mobile, Alabama

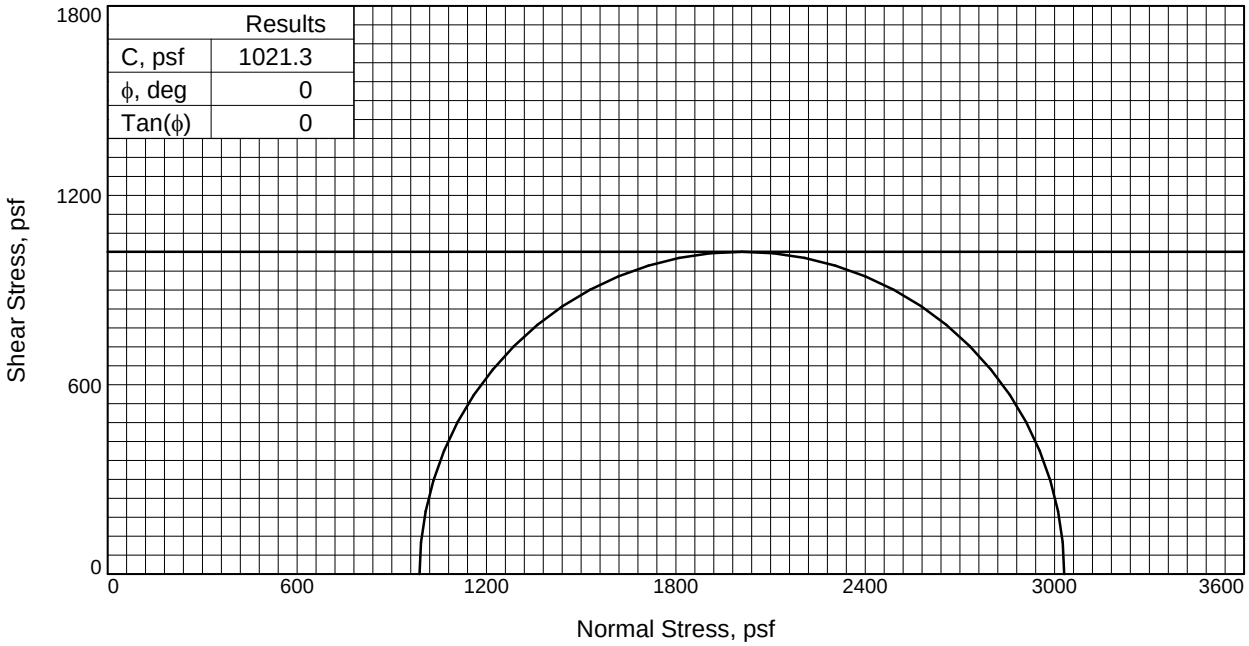


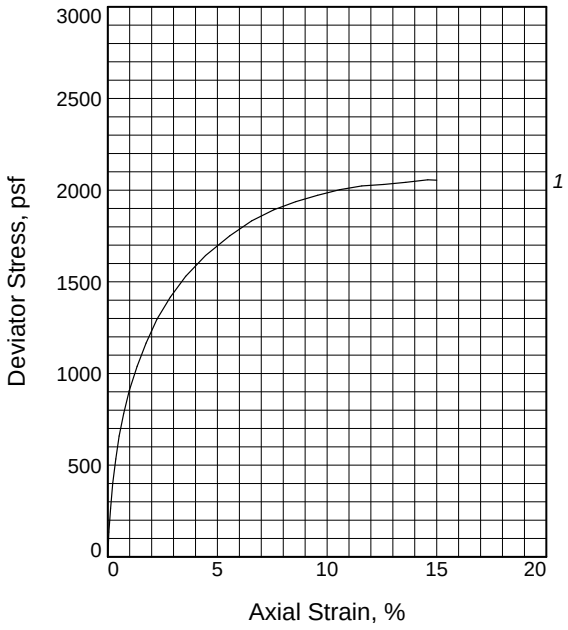




Client: ALDOT
Project: Mobile River Bridge
Source of Sample: Lab #8047 **Depth:** 18.5'-20.0' **Sample Number:** TH-16 T-2
Project No.: 1511010228 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	22.2
	Dry Density, pcf	104.9
	Saturation, %	101.4
	Void Ratio	0.5830
	Diameter, in.	2.846
	Height, in.	5.505
At Test	Water Content, %	23.3
	Dry Density, pcf	104.9
	Saturation, %	106.4
	Void Ratio	0.5830
	Diameter, in.	2.846
	Height, in.	5.505
Strain at peak, %		13.6
Back Pressure, psf		0.0
Cell Pressure, psf		987.8
Fail. Stress, psf		2042.5
Strain, %		13.6
Ult. Stress, psf		2042.5
Strain, %		13.6
σ_1 Failure, psf		3030.4
σ_3 Failure, psf		987.8

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: SANDY LEAN CLAY(CL A-6(12))

Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 8.0'-10.0'

Sample Number: TH-15 T-2

Proj. No.: 1511010228 **Date Sampled:**

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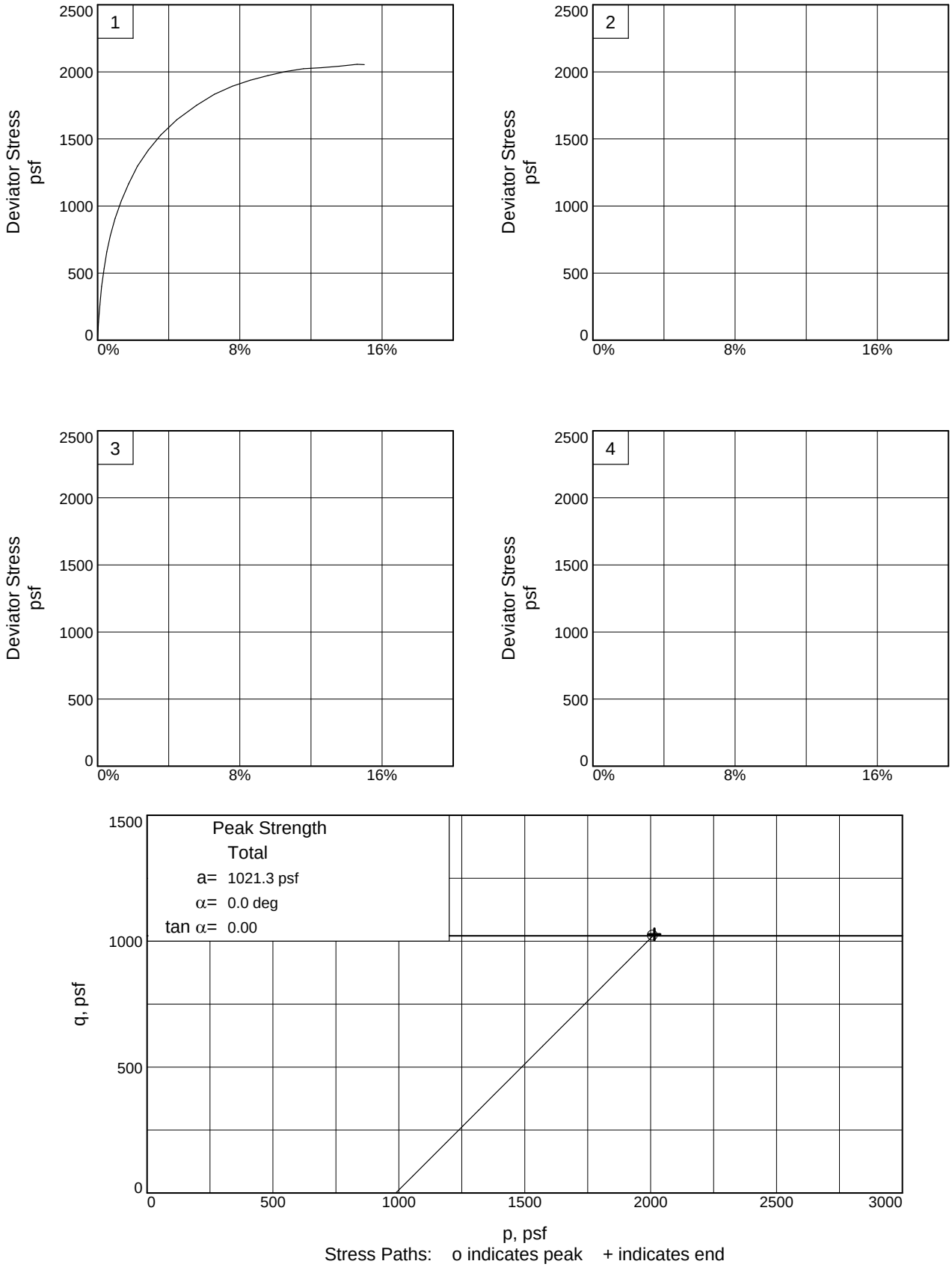


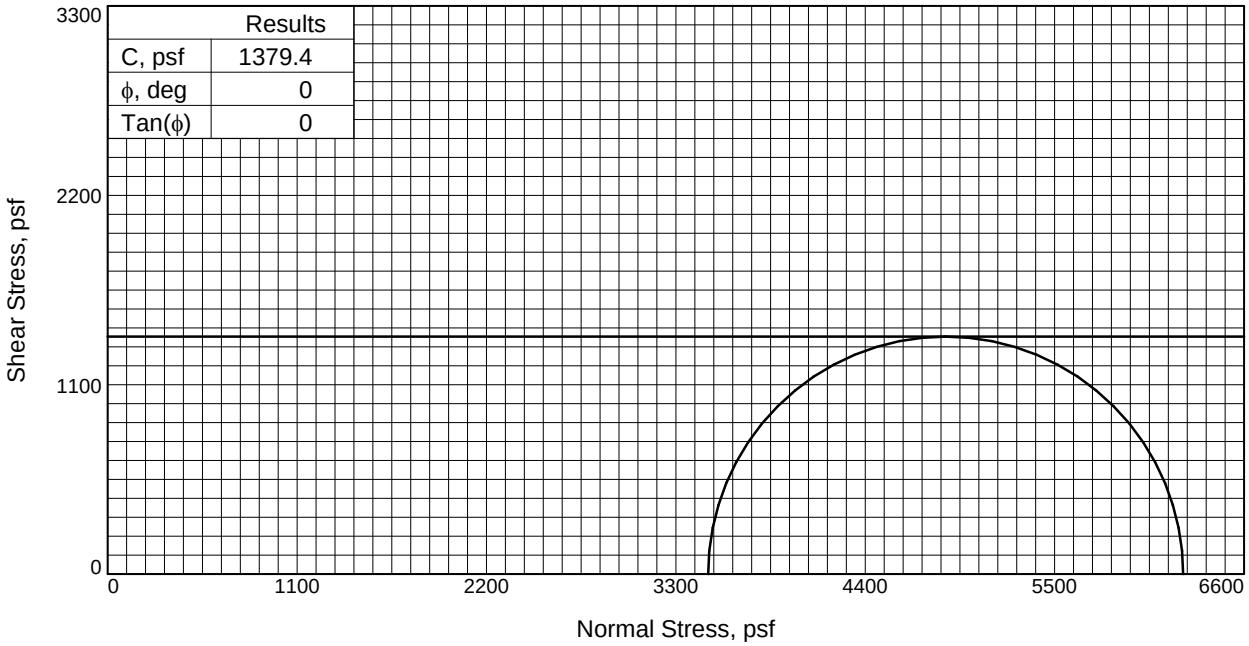
Client: ALDOT

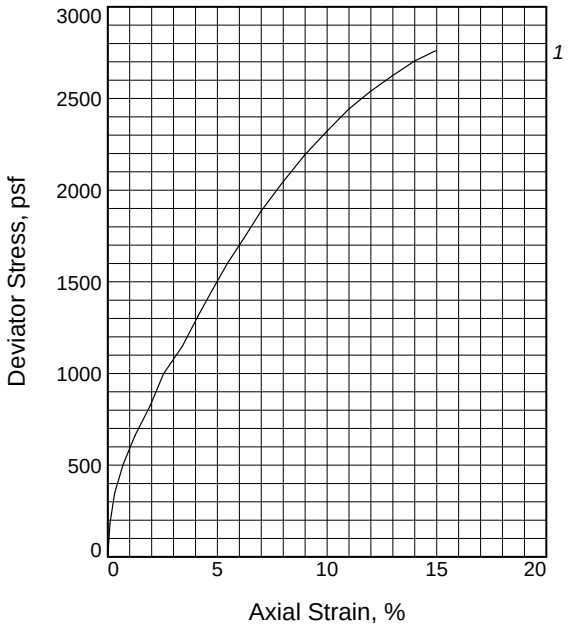
Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 8.0'-10.0' **Sample Number:** TH-15 T-2

Project No.: 1511010228 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	25.9
	Dry Density, pcf	100.1
	Saturation, %	104.5
	Void Ratio	0.6591
	Diameter, in.	2.807
	Height, in.	5.699
At Test	Water Content, %	25.9
	Dry Density, pcf	100.1
	Saturation, %	104.5
	Void Ratio	0.6591
	Diameter, in.	2.807
	Height, in.	5.699
Strain at peak, %		15.0
Back Pressure, psf		0.0
Cell Pressure, psf		3487.7
Fail. Stress, psf		2758.7
Strain, %		15.0
Ult. Stress, psf		2758.7
Strain, %		15.0
σ_1 Failure, psf		6246.4
σ_3 Failure, psf		3487.7

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: CLAYEY SAND(SC A-4(1))

Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 48.5'-50.5'

Sample Number: TH-22 T-1

Proj. No.: 1511010228 **Date Sampled:**

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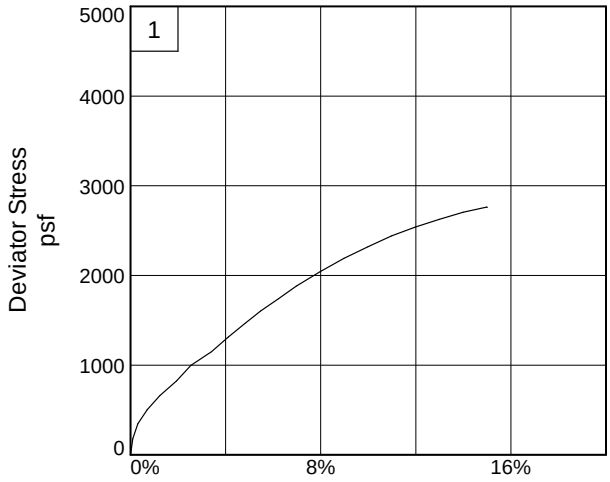

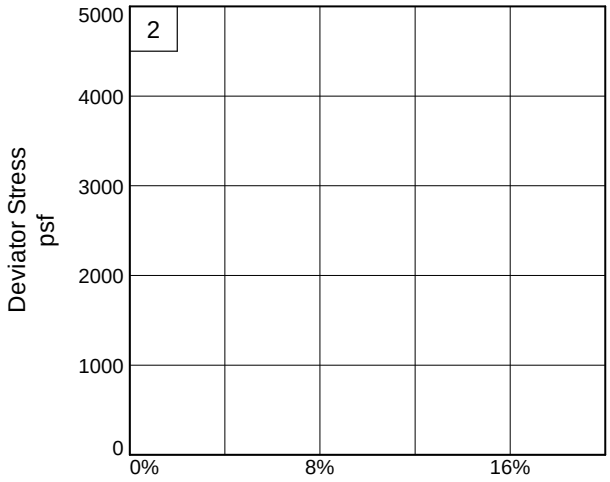

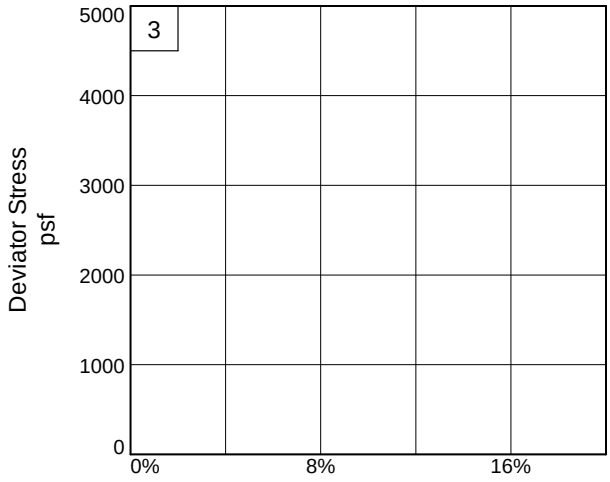

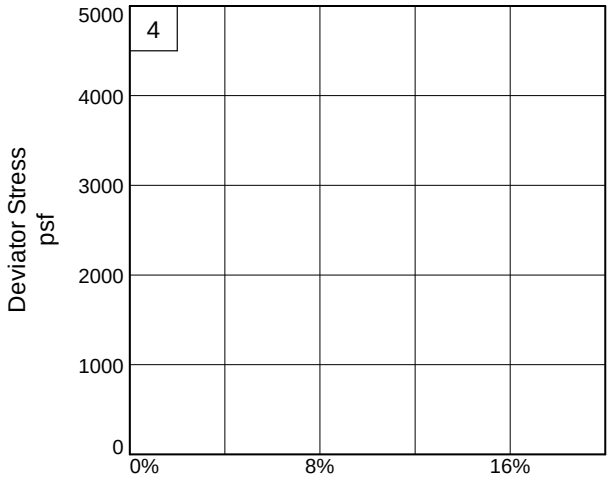

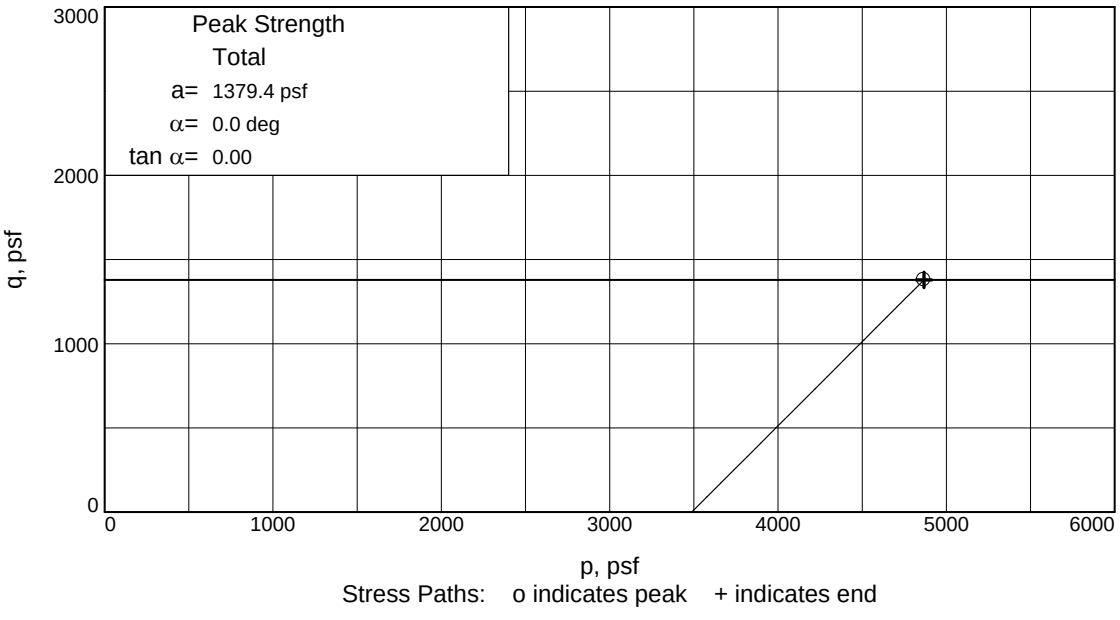

Stress Paths: o indicates peak + indicates end

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 48.5'-50.5' **Sample Number:** TH-22 T-1

Project No.: 1511010228 **Figure** _____

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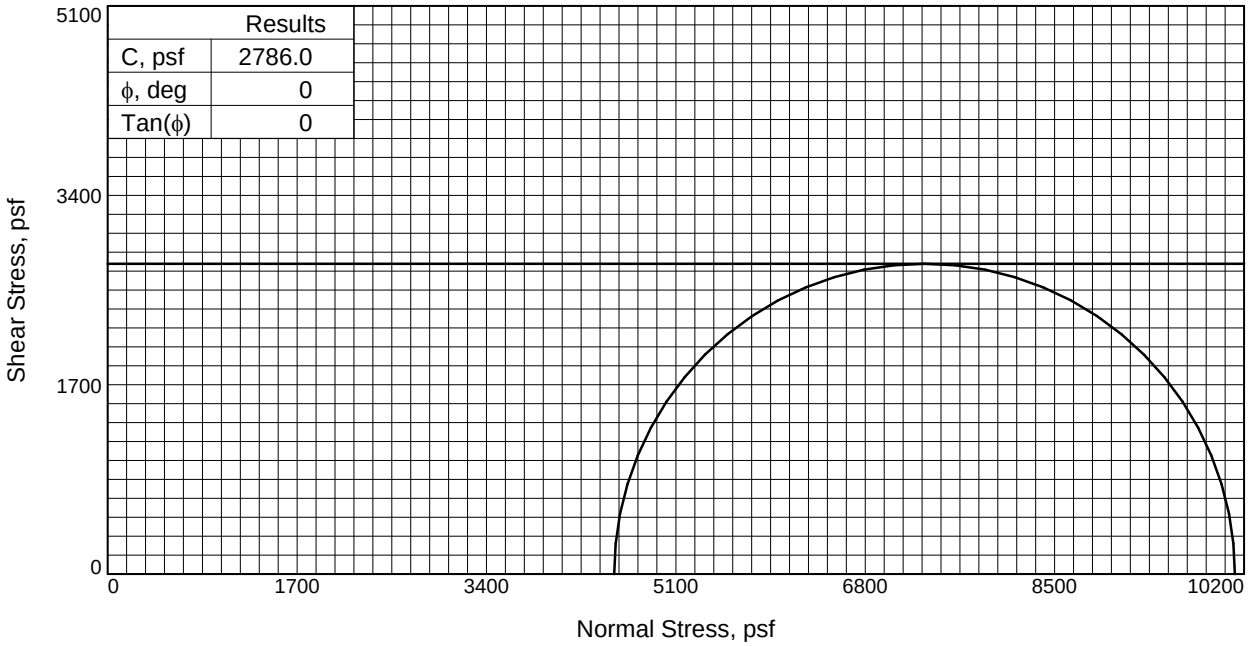

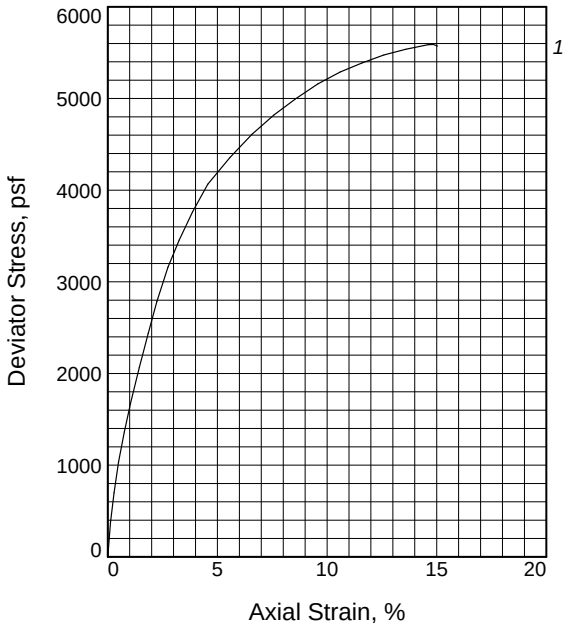

Specimen No.		1
Initial	Water Content, %	22.2
	Dry Density, pcf	103.6
	Saturation, %	97.9
	Void Ratio	0.6036
	Diameter, in.	2.868
	Height, in.	5.714
At Test	Water Content, %	22.7
	Dry Density, pcf	103.6
	Saturation, %	99.9
	Void Ratio	0.6036
	Diameter, in.	2.868
	Height, in.	5.714
Strain at peak, %		15.0
Back Pressure, psf		0.0
Cell Pressure, psf		4546.1
Fail. Stress, psf		5572.0
Strain, %		15.0
Ult. Stress, psf		5572.0
Strain, %		15.0
σ_1 Failure, psf		10118.0
σ_3 Failure, psf		4546.1

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: SILTY, CLAYEY SAND(SC-SM A-4(1))

Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 68.5'-70.5'

Sample Number: TH-22 T-2

Proj. No.: 1511010228 **Date Sampled:**

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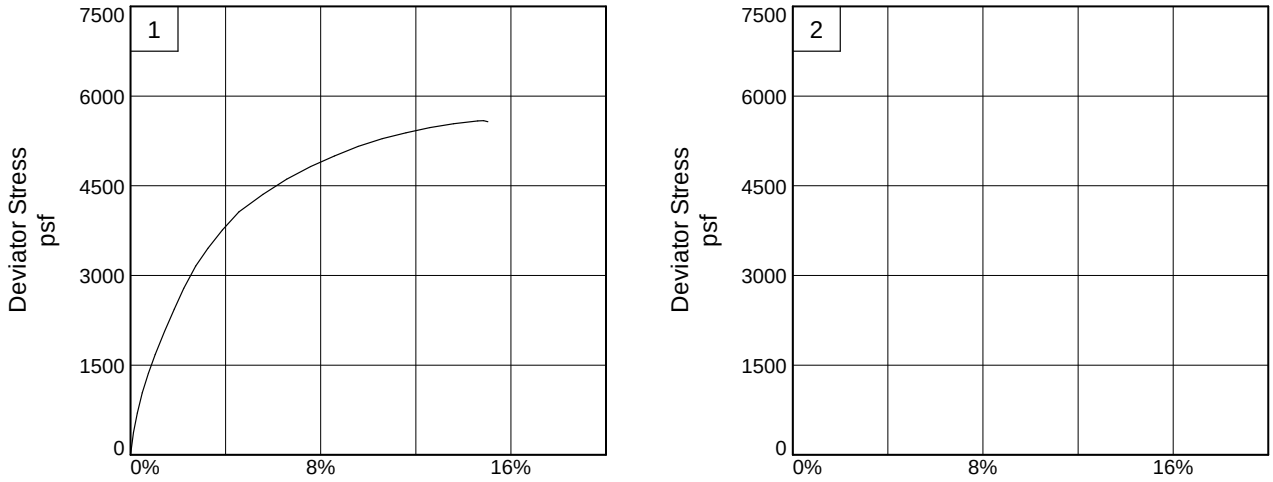
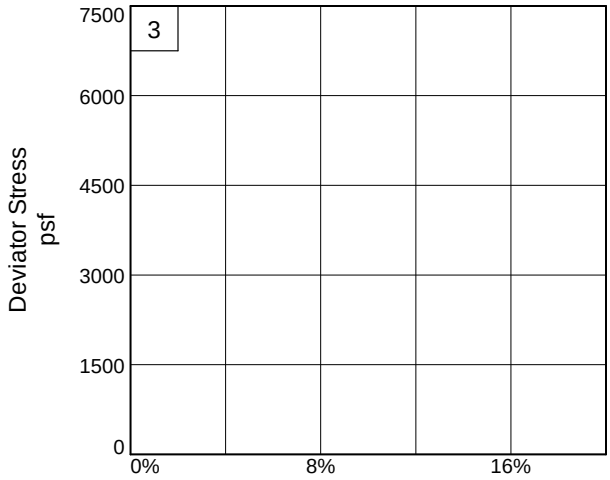
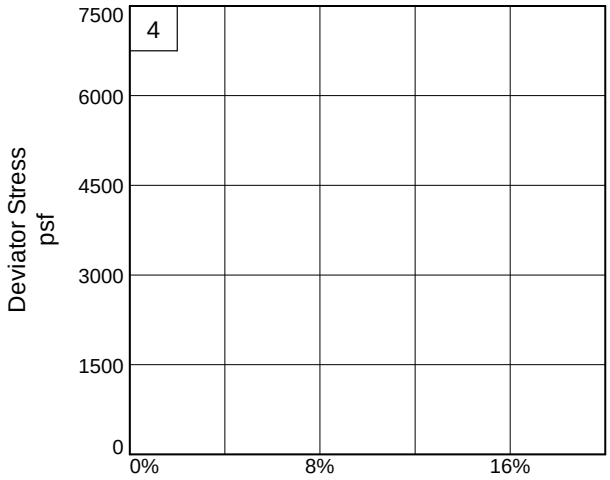
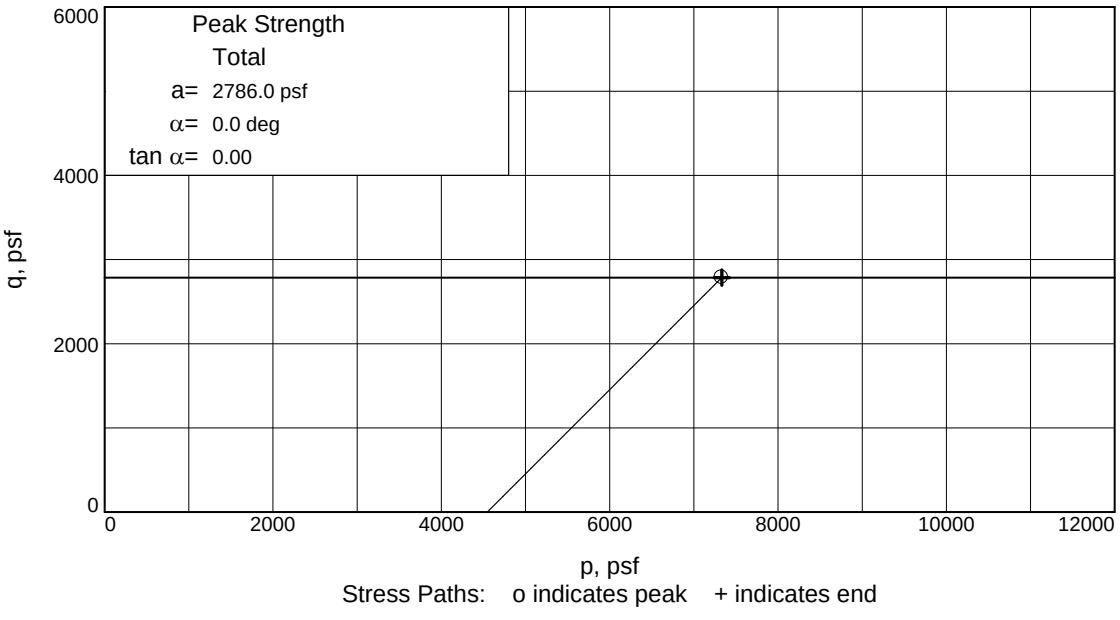
Thompson Engineering
Mobile, Alabama



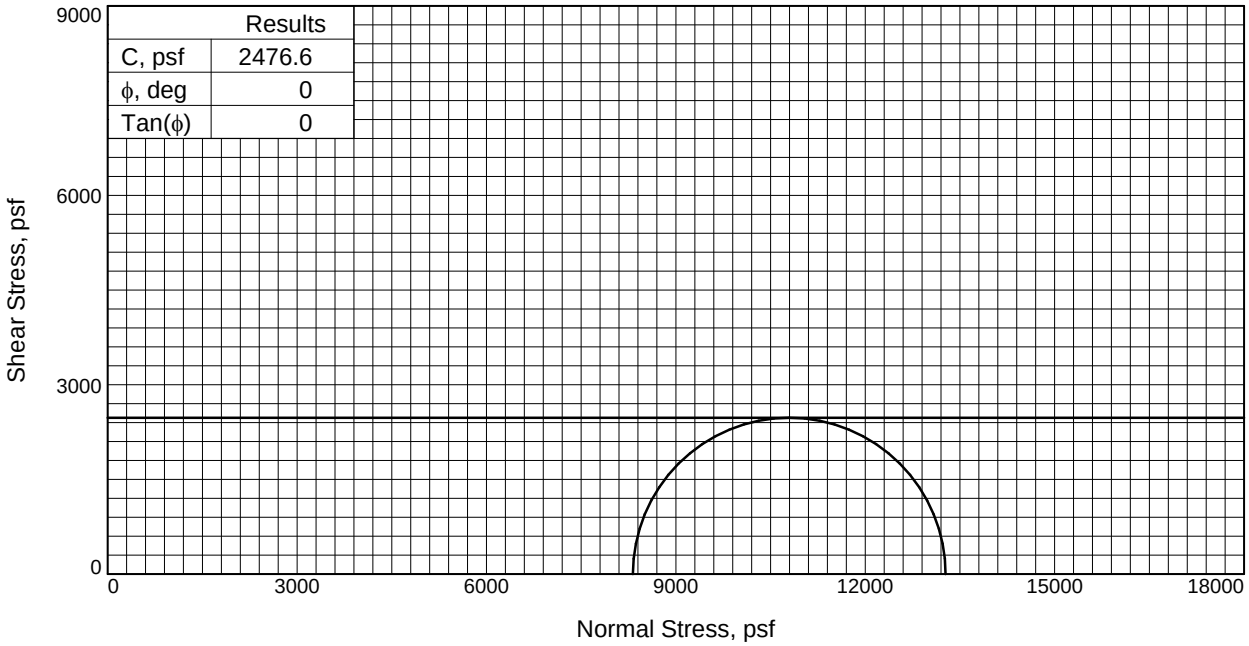


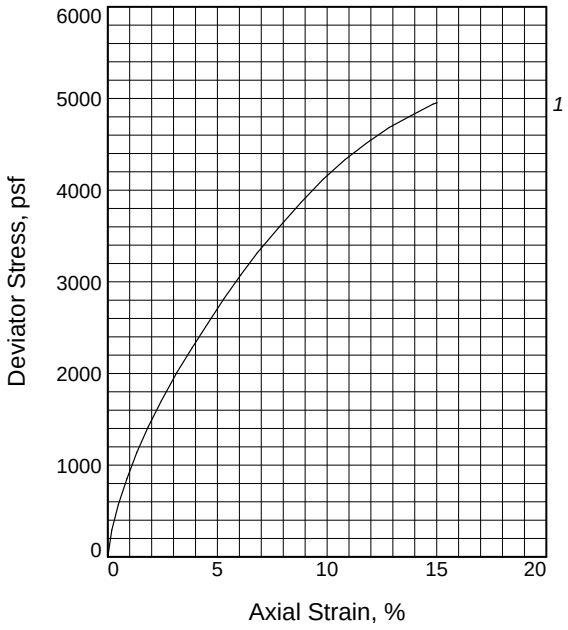




Client: ALDOT
Project: Mobile River Bridge
Source of Sample: Lab #8085 **Depth:** 68.5'-70.5' **Sample Number:** TH-22 T-2
Project No.: 1511010228 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	23.1
	Dry Density, pcf	104.4
	Saturation, %	103.8
	Void Ratio	0.5911
	Diameter, in.	2.833
	Height, in.	5.694
At Test	Water Content, %	24.0
	Dry Density, pcf	104.4
	Saturation, %	107.9
	Void Ratio	0.5911
	Diameter, in.	2.833
	Height, in.	5.694
Strain at peak, %		15.0
Back Pressure, psf		0.0
Cell Pressure, psf		8318.9
Fail. Stress, psf		4953.2
Strain, %		15.0
Ult. Stress, psf		4953.2
Strain, %		15.0
σ_1 Failure, psf		13272.1
σ_3 Failure, psf		8318.9

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: SANDY LEAN CLAY(CL A-4(2))

Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 133.5'-135.0'

Sample Number: TH-22 T-3

Proj. No.: 1511010228 **Date Sampled:**

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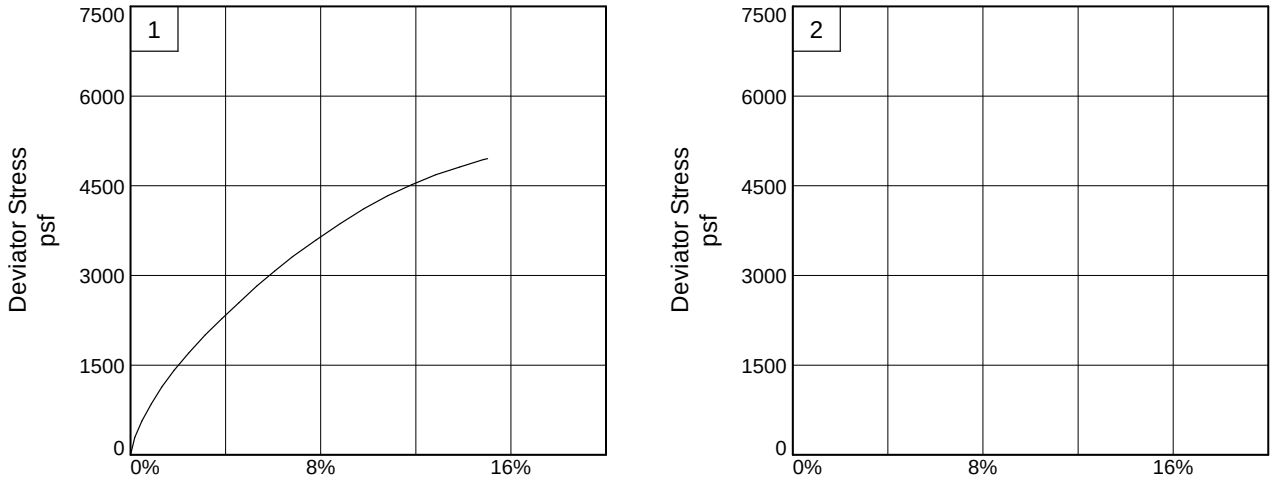
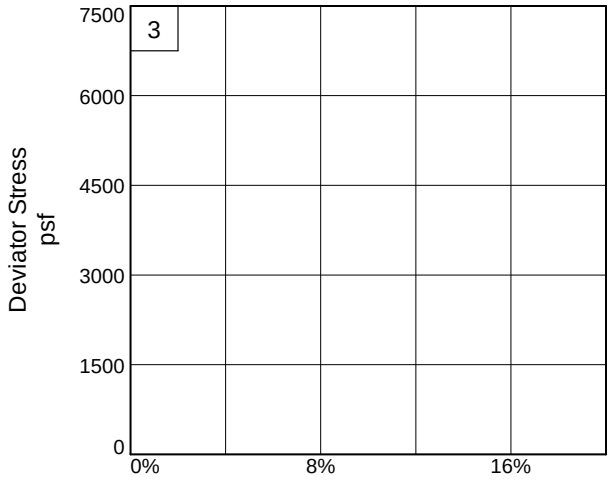
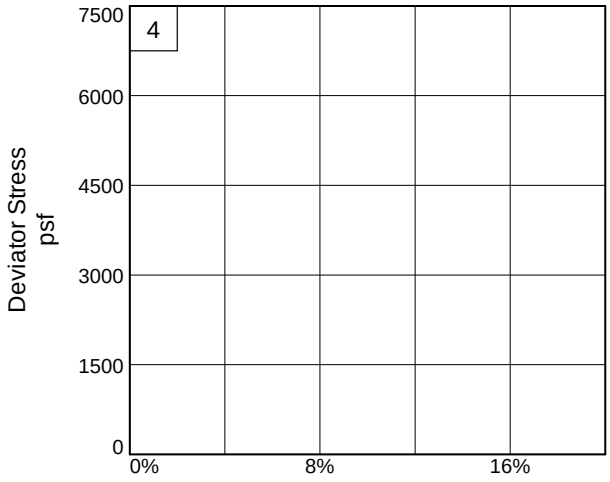
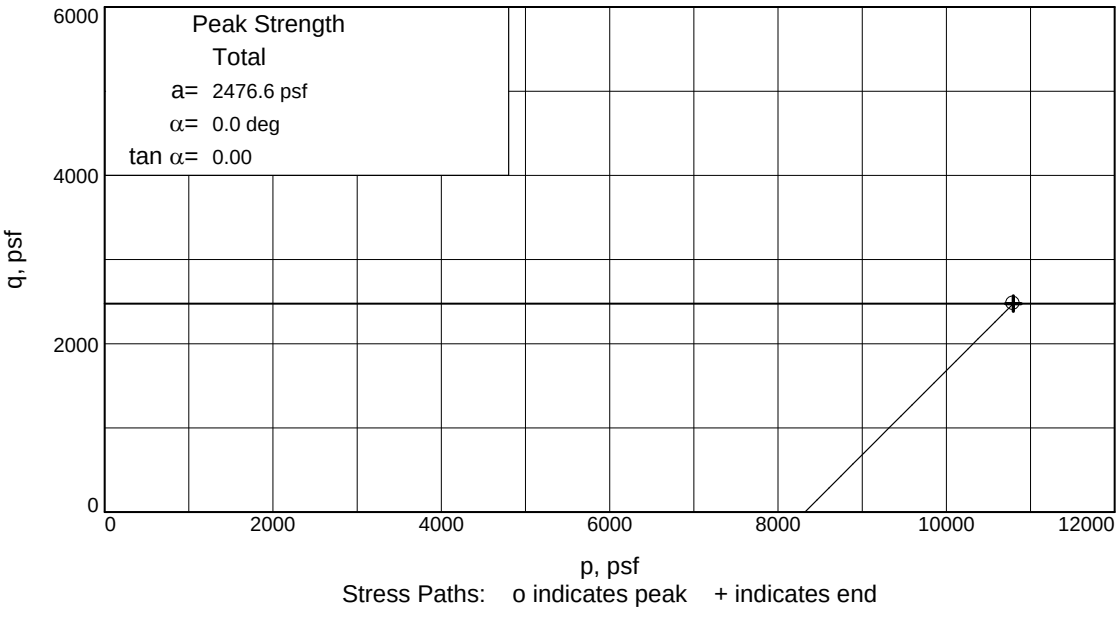
Thompson Engineering
Mobile, Alabama









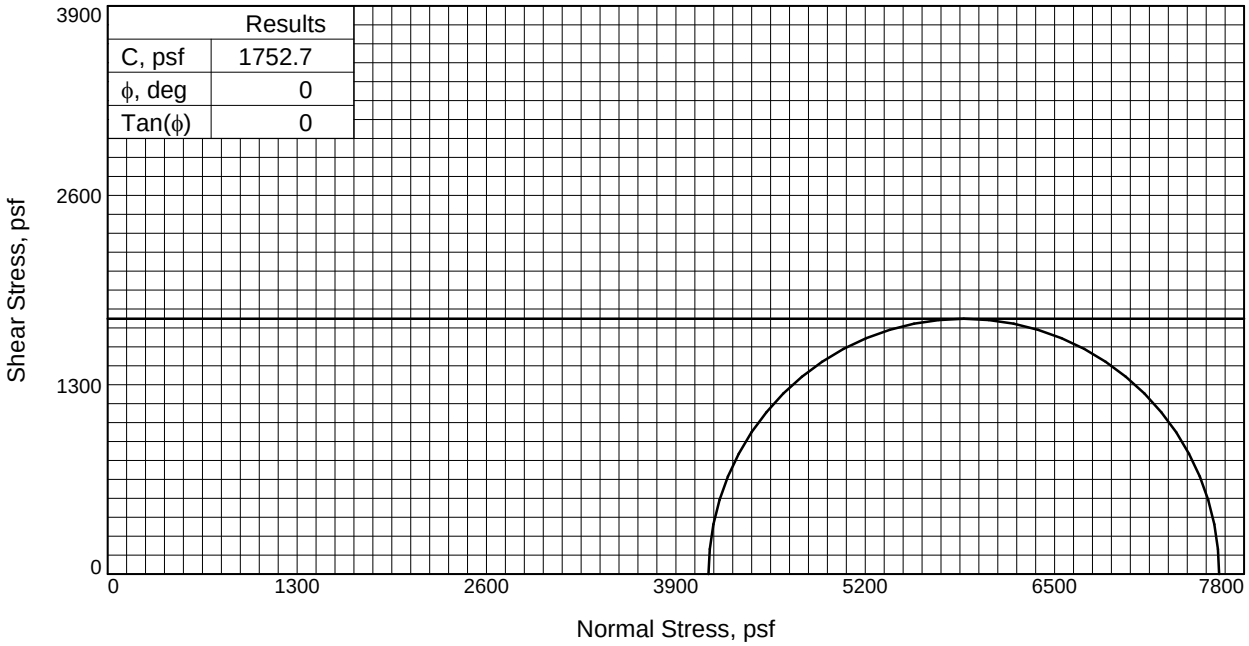
Client: ALDOT

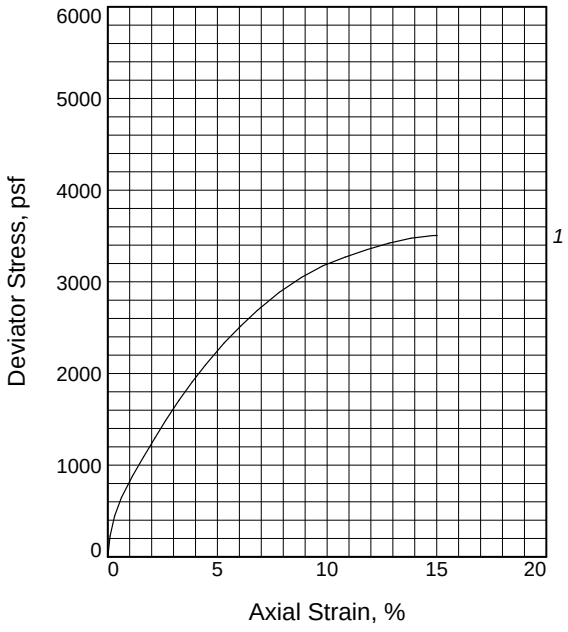
Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 133.5'-135.0' **Sample Number:** TH-22 T-3

Project No.: 1511010228 **Figure** _____

Thompson Engineering





Specimen No.		1
Initial	Water Content, %	23.5
	Dry Density, pcf	103.6
	Saturation, %	103.5
	Void Ratio	0.6034
	Diameter, in.	2.835
	Height, in.	5.675
At Test	Water Content, %	24.3
	Dry Density, pcf	103.6
	Saturation, %	107.2
	Void Ratio	0.6034
	Diameter, in.	2.835
	Height, in.	5.675
Strain at peak, %		15.0
Back Pressure, psf		0.0
Cell Pressure, psf		4124.2
Fail. Stress, psf		3505.3
Strain, %		15.0
Ult. Stress, psf		3505.3
Strain, %		15.0
σ_1 Failure, psf		7629.5
σ_3 Failure, psf		4124.2

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: SILTY, CLAYEY SAND(SC-SM A-4(0))

Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: ALDOT

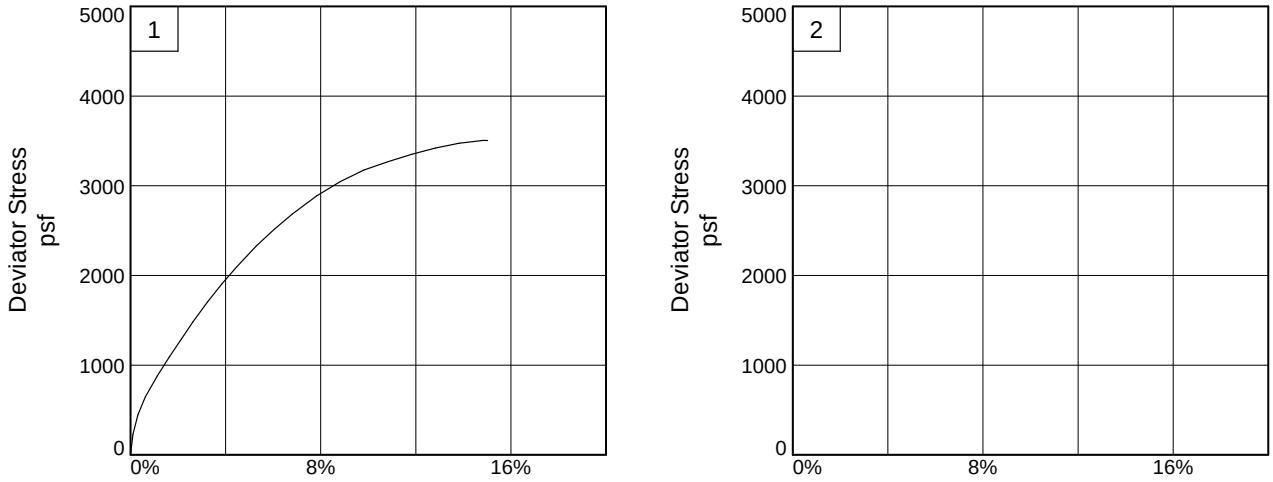
Project: Mobile River Bridge

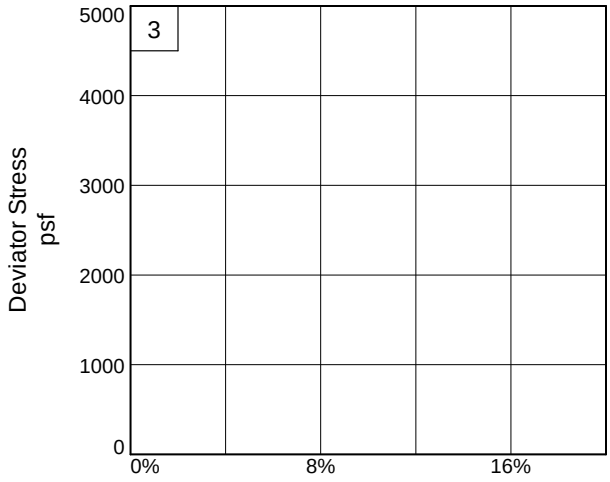
Source of Sample: Lab #8085 **Depth:** 58.0'-60.0'

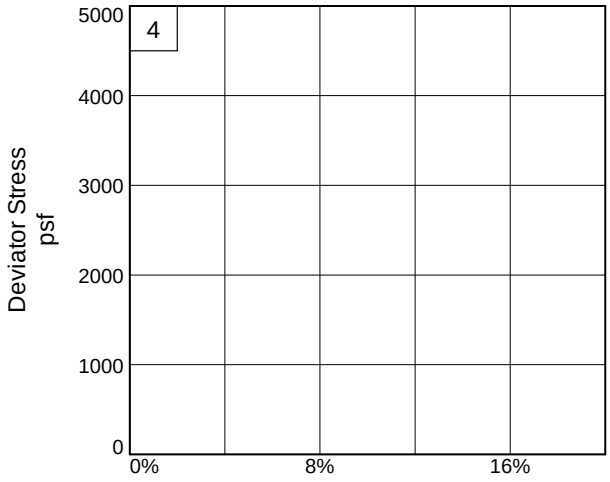
Sample Number: TH-23 T-1

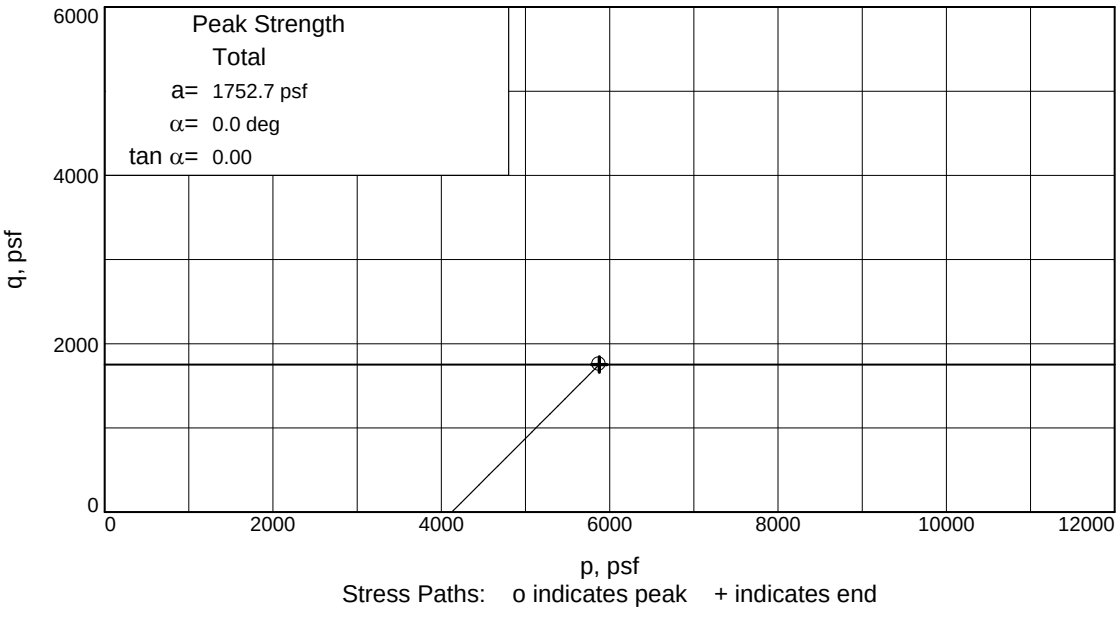
Proj. No.: 1511010228 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Thompson Engineering
Mobile, Alabama









Stress Paths: o indicates peak + indicates end

Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 58.0'-60.0' **Sample Number:** TH-23 T-1

Project No.: 1511010228 **Figure** _____

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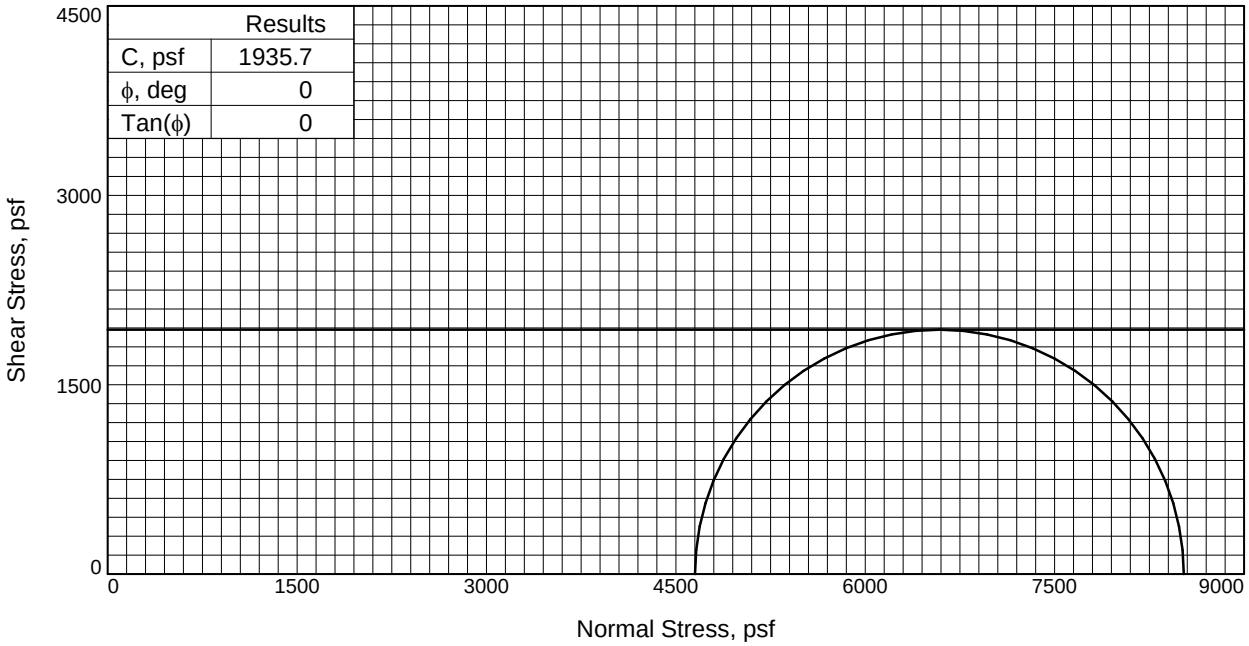
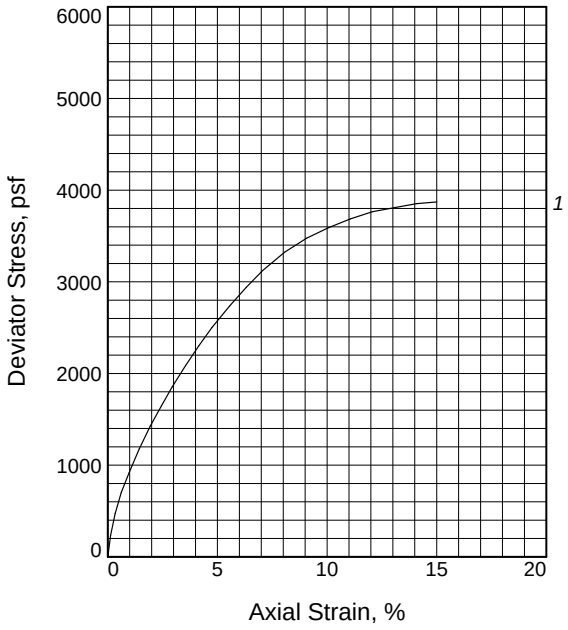




Specimen No.		1
Initial	Water Content, %	22.9
	Dry Density, pcf	104.1
	Saturation, %	102.3
	Void Ratio	0.5948
	Diameter, in.	2.826
	Height, in.	5.659
At Test	Water Content, %	23.4
	Dry Density, pcf	104.1
	Saturation, %	104.8
	Void Ratio	0.5948
	Diameter, in.	2.826
	Height, in.	5.659
Strain at peak, %		15.0
Back Pressure, psf		0.0
Cell Pressure, psf		4651.2
Fail. Stress, psf		3871.4
Strain, %		15.0
Ult. Stress, psf		3871.4
Strain, %		15.0
σ_1 Failure, psf		8522.6
σ_3 Failure, psf		4651.2

Type of Test:
Unconsolidated Undrained

Sample Type: 3-in. Shelby Tube

Description: SILTY, CLAYEY SAND(SC-SM A-4(0))

Specific Gravity= 2.66

Remarks: Compression Failure Mode: Symmetrical Bulge

Figure _____

Client: ALDOT

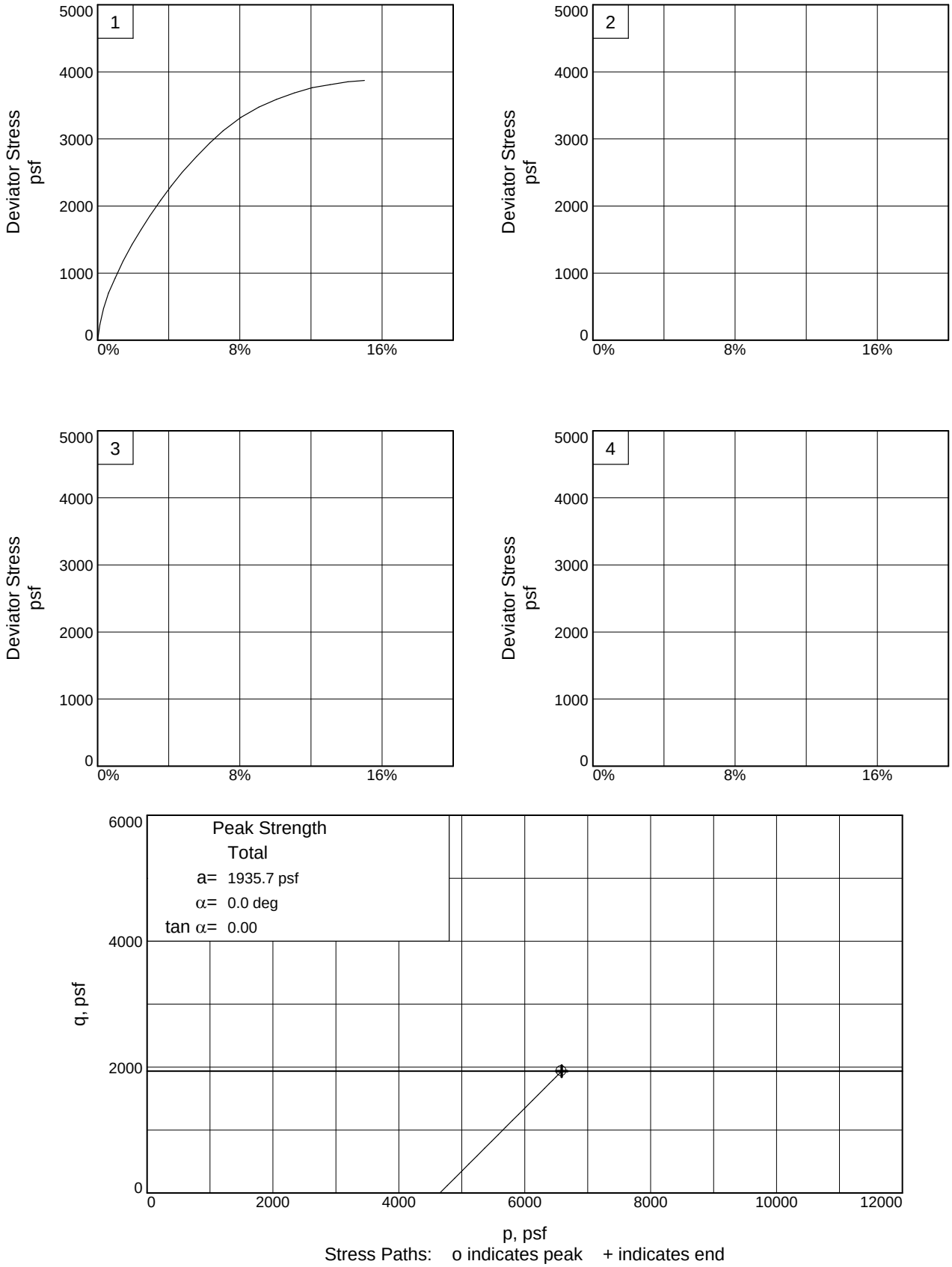
Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 68.5'-70.5'

Sample Number: TH-23 T-2

Proj. No.: 1511010228 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Thompson Engineering
Mobile, Alabama



Client: ALDOT

Project: Mobile River Bridge

Source of Sample: Lab #8085 **Depth:** 68.5'-70.5' **Sample Number:** TH-23 T-2

Project No.: 1511010228 **Figure** _____

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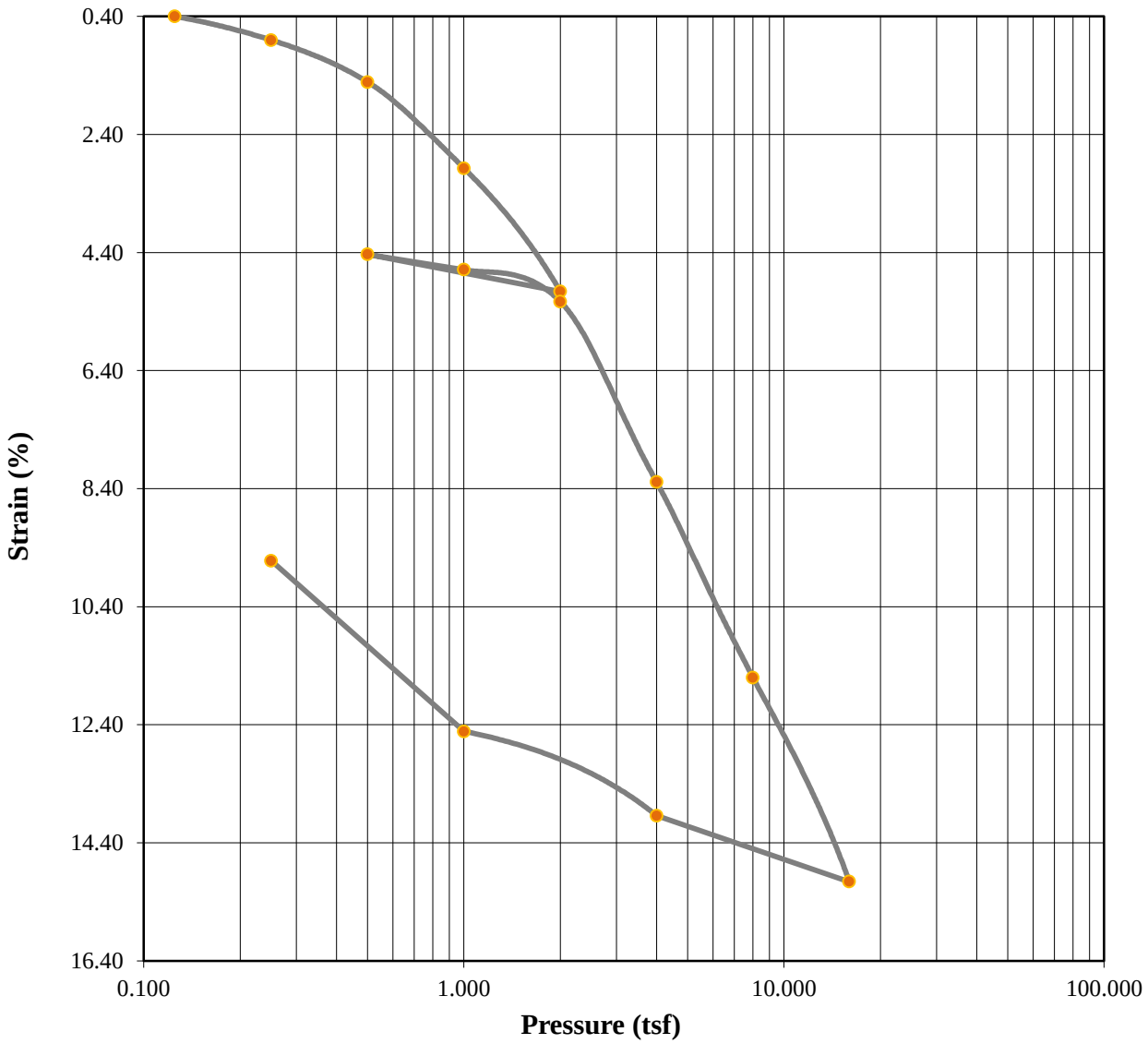
Consolidation Test
Test Results



	Before	After				
Moisture (%):	20.54	16.25	**Liquid Limits:**	37	**Test Date:**	11/6/17
Dry Density (pcf):	105.68	116.51	**Plastic Limits:**	13		
Saturation (%):	95.06	100.85	**Plasticity Index (%):**	0		
Void Ratio:	0.5749	0.4234	**Specific Gravity:**	2.669	Measured	

Sample Description:	SANDY LEAN CLAY (CL A-6(12))			
Project Number:	8085	**Depth:**	8.0-10.0 ft.	**Remarks:**
Sample Number:	T-2	**Boring Number:**	TH-15	
Project:	Mobile River Bridge			
Client:	ALDOT			
Location:	Soils Lab			

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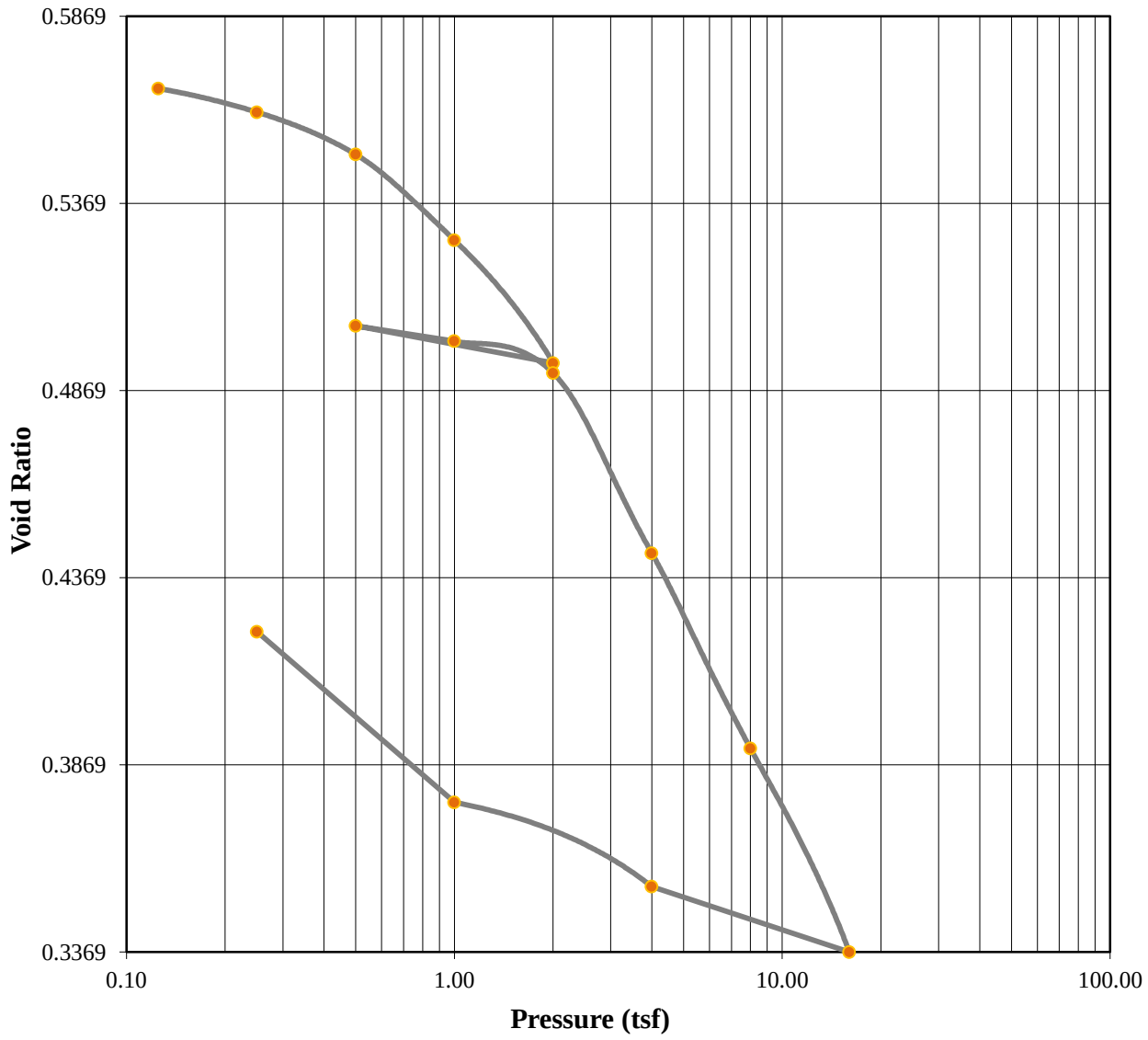
Consolidation Test
Test Results



	Before	After				
Moisture (%):	20.54	16.25	**Liquid Limits:**	37	**Test Date:**	11/6/17
Dry Density (pcf):	105.68	116.51	**Plastic Limits:**	13		
Saturation (%):	95.06	100.85	**Plasticity Index (%):**	0		
Void Ratio:	0.5749	0.4234	**Specific Gravity:**	2.669	Measured	

Soil Description:	SANDY LEAN CLAY (CL A-6(12))			
Project Number:	8085	**Depth:**	8.0-10.0 ft.	**Remarks:**
Sample Number:	T-2	**Boring Number:**	TH-15	
Project:	Mobile River Bridge			
Client:	ALDOT			
Location:	Soils Lab			

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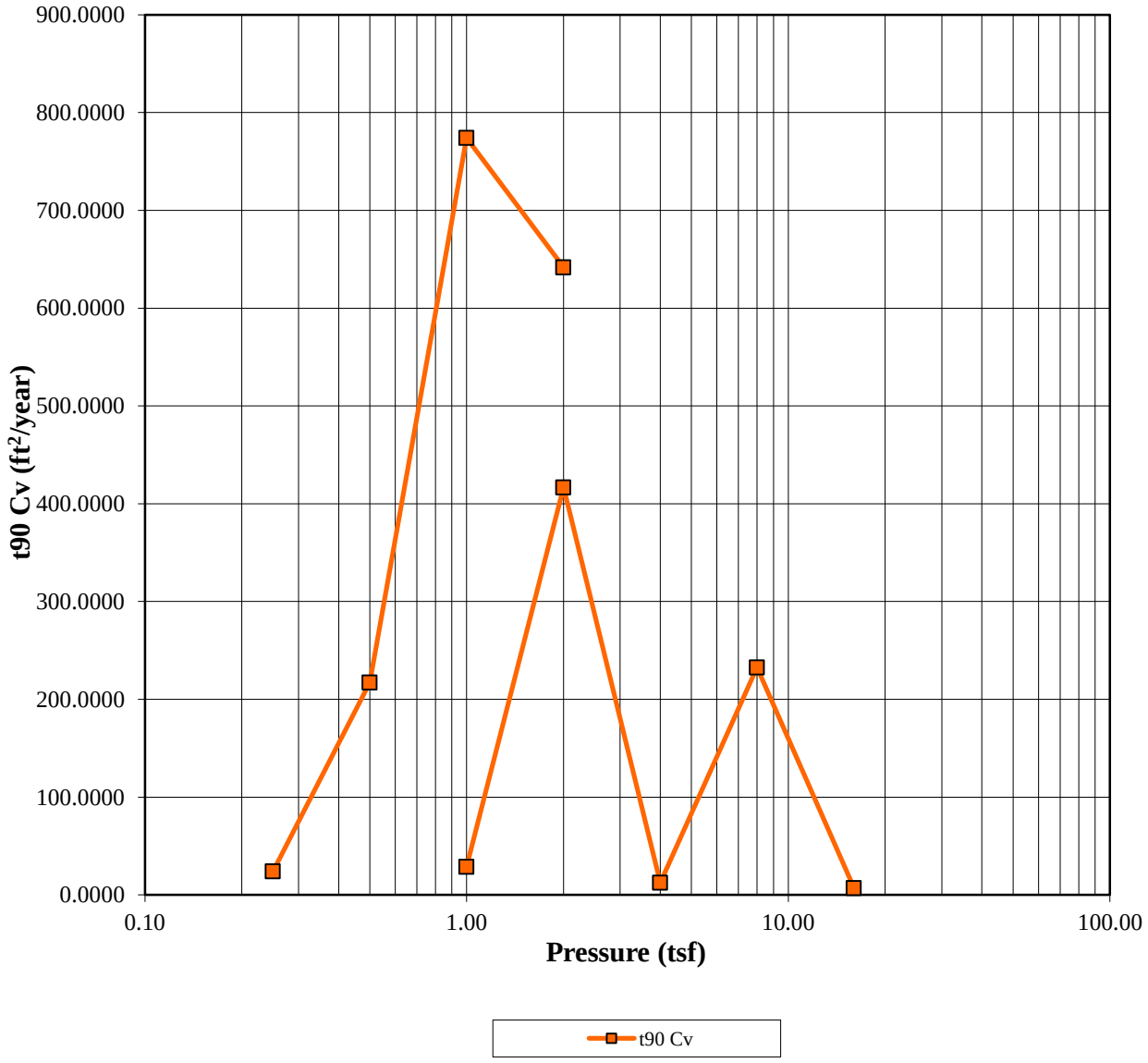
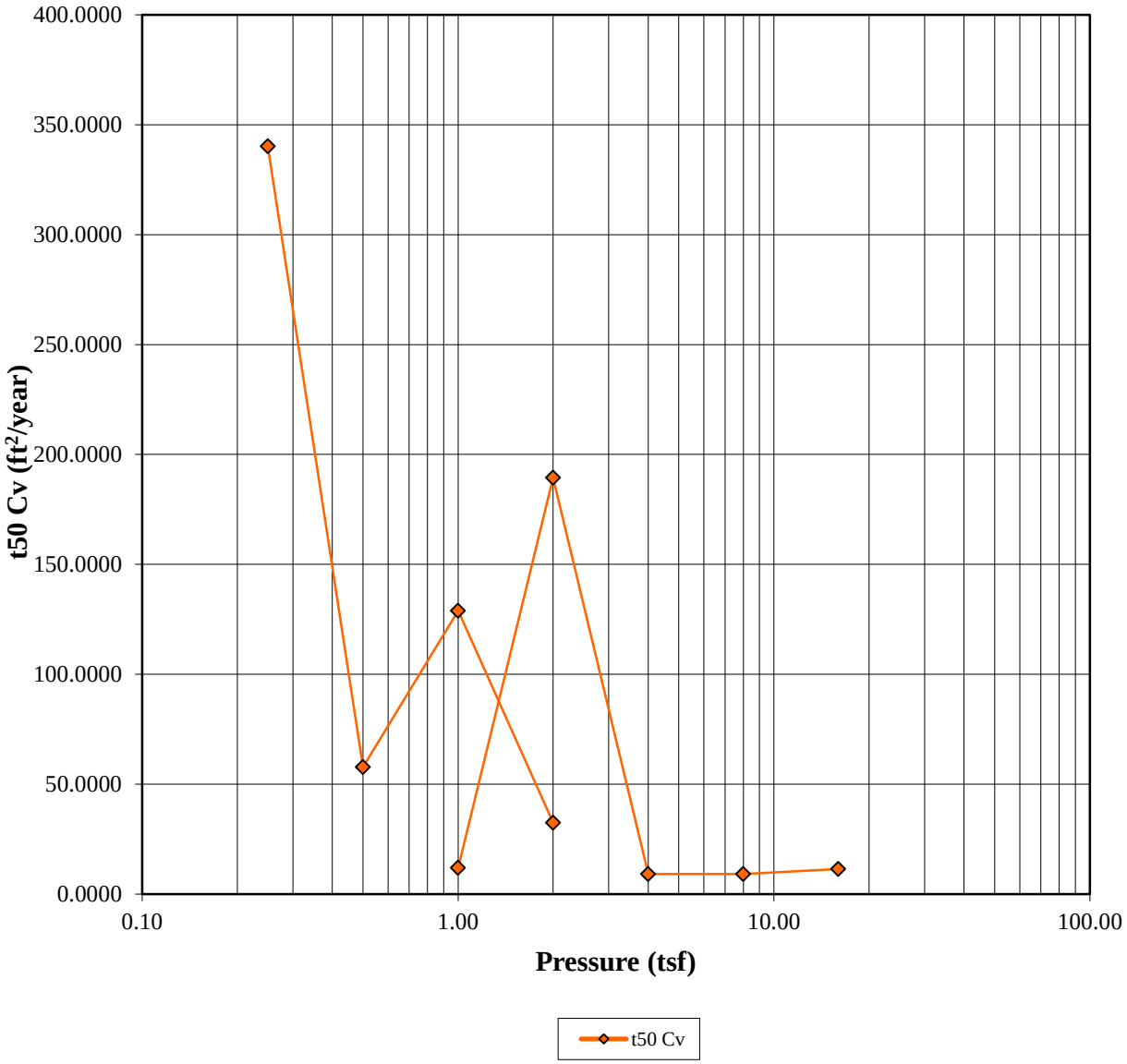
Consolidation Test
Test Results



	Before	After				
Moisture (%):	20.54	16.25	**Liquid Limits:**	37	**Test Date:**	11/6/17
Dry Density (pcf):	105.68	116.51	**Plastic Limits:**	13		
Saturation (%):	95.06	100.85	**Plasticity Index (%):**	0		
Void Ratio:	0.5749	0.4234	**Specific Gravity:**	2.669	Measured	

Soil Description:	SANDY LEAN CLAY (CL A-6(12))			
Project Number:	8085	**Depth:**	8.0-10.0 ft.	**Remarks:**
Sample Number:	T-2	**Boring Number:**	TH-15	
Project:	Mobile River Bridge			
Client:	ALDOT			
Location:	Soils Lab			

Consolidation Test
Test Results



	Before	After				
Moisture (%):	20.54	16.25	**Liquid Limits:**	37	**Test Date:**	11/6/17
Dry Density (pcf):	105.68	116.51	**Plastic Limits:**	13		
Saturation (%):	95.06	100.85	**Plasticity Index (%):**	0		
Void Ratio:	0.5749	0.4234	**Specific Gravity:**	2.669	Measured	

Soil Description:	SANDY LEAN CLAY (CL A-6(12))			
Project Number:	8085	**Depth:**	8.0-10.0 ft.	**Remarks:**
Sample Number:	T-2	**Boring Number:**	TH-15	
Project:	Mobile River Bridge			
Client:	ALDOT			
Location:	Soils Lab			

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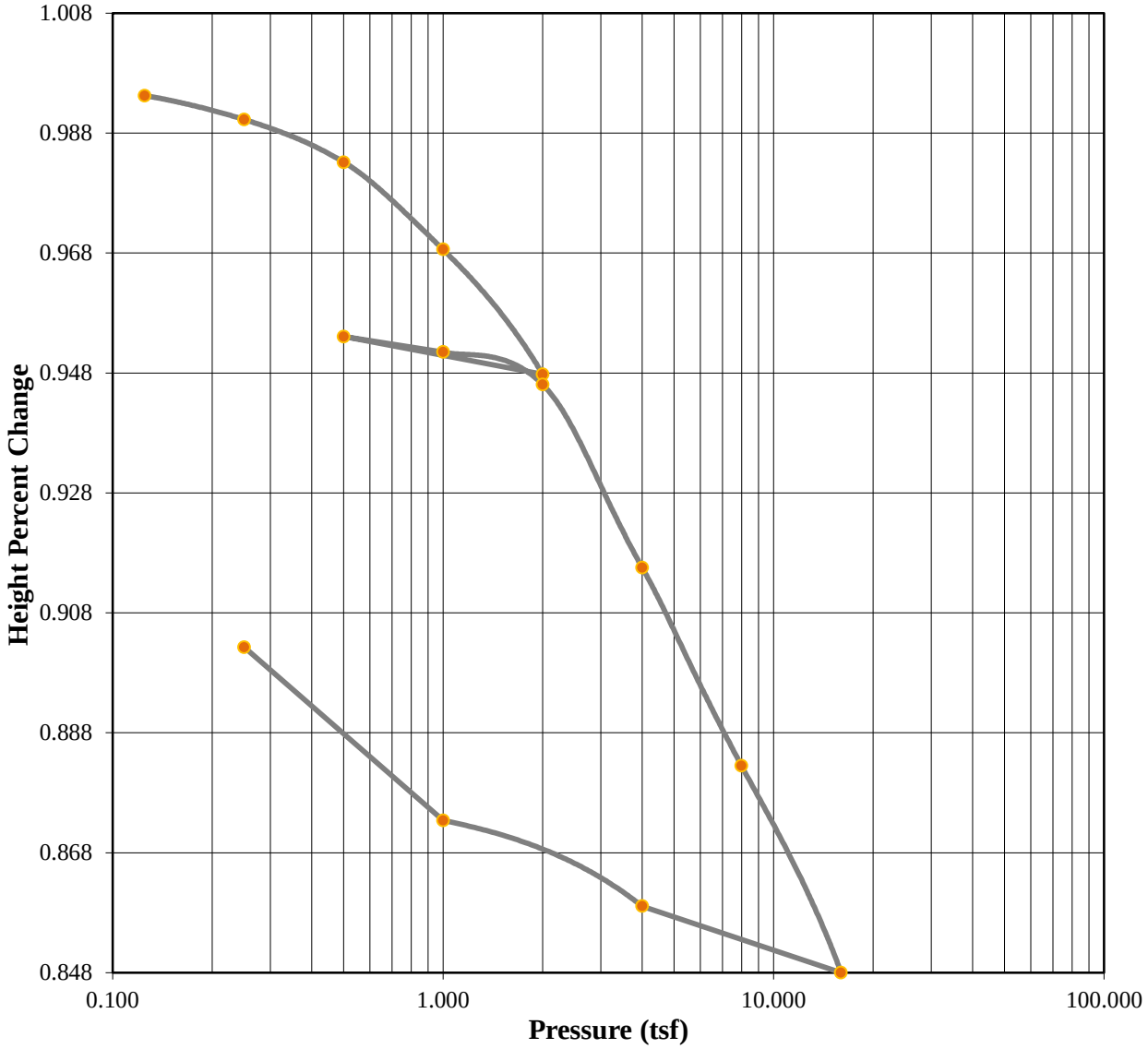
Consolidation Test
Test Results



	Before	After				
Moisture (%):	20.54	16.25	**Liquid Limits:**	37	**Test Date:**	11/6/17
Dry Density (pcf):	105.68	116.51	**Plastic Limits:**	13		
Saturation (%):	95.06	100.85	**Plasticity Index (%):**	0		
Void Ratio:	0.5749	0.4234	**Specific Gravity:**	2.669	Measured	

Soil Description:	SANDY LEAN CLAY (CL A-6(12))			
Project Number:	8085	**Depth:**	8.0-10.0 ft.	**Remarks:**
Sample Number:	T-2	**Boring Number:**	TH-15	
Project:	Mobile River Bridge			
Client:	ALDOT			
Location:	Soils Lab			

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Consolidation Test Results
Summary

Project: Mobile River Bridge
Location: Soils Lab
Job Number: 17-1101-0145

Project Number: 8085

Sample Number: T-2
Boring Number: TH-15
Depth: 8.0-10.0 ft.
Sample Type: Undisturbed

Sample Description: SANDY LEAN CLAY (CL A-6(12))
Remarks:

Test Number:
Test Date: 11/6/17

Index	Load Sequence (tsf)	Cummulative Change in Height (in)	Specimen Height (in)	Height of Void (in)	Vertical Strain (%)	Void Ratio	t90 Fitting Time (min)	t50 Fitting Time (min)	t90 Cv (ft2/year)	t50 Cv (ft2/year)
0	0.000	0.0000	0.9980	0.3639	0.00	0.5739	0.000	0.000	0.000	0.000
1	0.125	0.0040	0.9940	0.3599	0.40	0.5676	0.000	0.000	0.000	0.000
2	0.250	0.0080	0.9900	0.3559	0.80	0.5613	31.159	0.518	24.340	340.152
3	0.500	0.0151	0.9829	0.3488	1.51	0.5500	3.442	2.998	217.187	57.918
4	1.000	0.0297	0.9683	0.3342	2.97	0.5271	0.937	1.307	774.144	128.942
5	2.000	0.0505	0.9475	0.3134	5.06	0.4943	1.083	4.955	641.761	32.570
6	0.500	0.0442	0.9538	0.3197	4.43	0.5042	0.000	0.000	0.000	0.000
7	1.000	0.0468	0.9512	0.3171	4.69	0.5001	24.262	* 13.4787	28.859	12.068
8	2.000	0.0522	0.9458	0.3117	5.23	0.4916	1.661	0.849	416.759	189.441
9	4.000	0.0827	0.9153	0.2812	8.29	0.4435	51.879	16.352	12.496	9.210
10	8.000	0.1158	0.8822	0.2481	11.60	0.3913	2.589	15.252	232.590	9.174
11	16.000	0.1503	0.8477	0.2136	15.06	0.3369	79.032	11.238	7.036	11.495
12	4.000	0.1392	0.8588	0.2247	13.94	0.3544	0.000	0.000	0.000	0.000
13	1.000	0.1249	0.8731	0.2390	12.51	0.3769	0.000	0.000	0.000	0.000
14	0.250	0.0960	0.9020	0.2679	9.62	0.4225	0.000	0.000	0.000	0.000

Predicted value indicated with *

Tested By: B. Hak

Checked By: C. Dugger

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Consolidation Test
Consolidation Specimen Information

Project: Mobile River Bridge **Project Number:** 8085
Location: Soils Lab
Job Number: 17-1101-0145 **Test Date:** 11/6/17

Sample Number: T-2 **Sample Description:**
Boring Number: TH-15 SANDY LEAN CLAY (CL A-6(12))
Depth: 8.0-10.0 ft. **Remarks:**
Sample Type: Undisturbed

Test Number:
Liquid Limit: 37.0000 **Initial Void Ratio:** 0.5749 **Initial Height (in):** 0.9980
Plastic Limit: 13.0000 **Plasticity Index (%):** 0.0000 **Initial Diameter (in):** 2.5030
Specific Gravity: 2.6690 Measured **Weight of Ring (g):** 110.7200

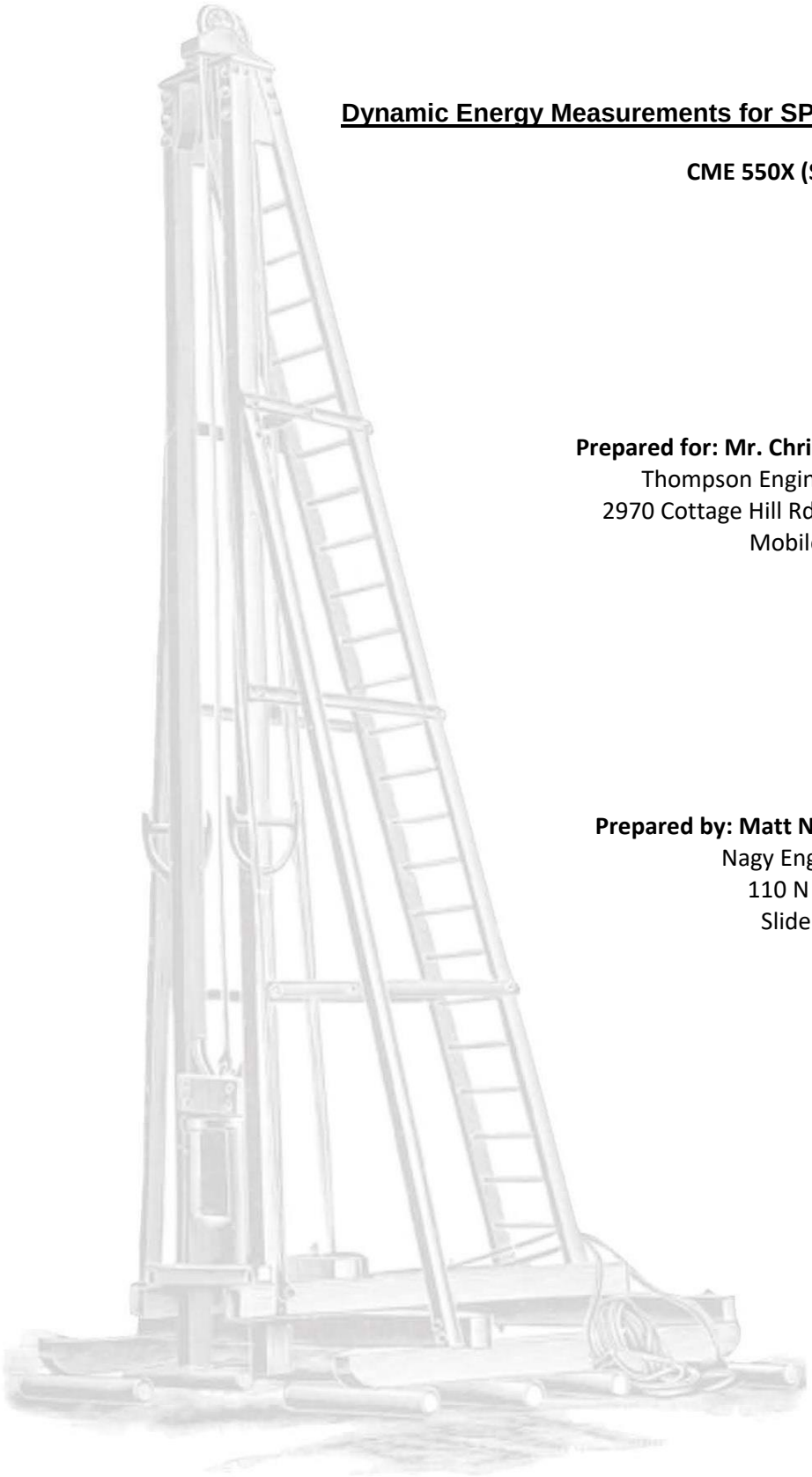
Parameters	Initial Specimen	Final Specimen
Moist Weight + Container (g)	150.71	286.86
Dry Soil + Container (g)	130.51	264.86
Weight of Container (g)	32.18	129.49
Moisture Content (%)	20.54	16.25
Void Ratio	0.5749	0.4234
Saturation (%)	95.06	100.85
Dry Density (pcf)	105.68	116.51

Tested By: B. Hak **Checked By:** C. Dugger

APPENDIX D

- **Drill Rig Hammer Energy Report**

Nagy Engineers, Inc.



Dynamic Energy Measurements for SPT Hammer

CME 550X (S/N 355273)

Prepared for: Mr. Chris Dugger of
Thompson Engineering, Inc.
2970 Cottage Hill Rd., Suite 190
Mobile, AL 36606

Prepared by: Matt Nagy, P.E. of
Nagy Engineers, Inc.
110 N Queens Dr.
Slidell, LA 70458

September 13, 2017

Mr. Chris Dugger
Thompson Engineering, Inc.
2970 Cottage Hill Road, Suite 190
Mobile, AL 36606

Re: SPT Hammer Calibration using Dynamic Energy Measurements
Thompson Engineering Drill Rig – CME 550X (S/N 355273)
Nagy Engineers Job No. 171044-1

Dear Mr. Dugger:

This report summarizes the results from SPT Energy Measurement Testing performed in Mobile, Alabama near the intersection of Interstate 10 and Old Spanish Trail on September 11, 2017. The testing was conducted to calibrate a CME 550X automatic SPT hammer. The hammer reportedly had a 140 lb drop weight and a 2.5 ft drop height. Appendix A gives a summary of the field dynamic test data and results while Appendix B contains the equipment calibration sheets. An overall summary of the test results is presented in Table 1.

OBJECTIVES

The objective of the testing was to perform SPT Energy Measurements according to ASTM D4633-10. These objectives were met using our Pile Driving Analyzer®, Model PAX – SPT Software, which acquired the SPT hammer's transfer energies using an instrumented NWJ rod section and two piezoresistive accelerometers.

TESTING AND EQUIPMENT

Drilling and SPT Hammer Equipment

SPT energy measurements were collected for a CME 550X automatic SPT hammer. The serial number on the rig was s/n 355273. Energy records were collected at various increments between the depths of 13.5 ft and 35.0 ft. The drilling method was mud rotary. Appendix A contains a photo of the CME 550X rig that was tested.

Instrumentation

A Model PAX Pile Driving Analyzer® (PDA) data acquisition system was used to collect and process the dynamic measurements of force and velocity. The PAX is a digital system having a low pass filter cutoff frequency of 5 kHz. The sampling frequency was therefore set to 10 times the low pass filter, or 50 kHz. A

two foot long section of NWJ rod subsection was instrumented with one full bridge foil resistance strain gage and two piezoresistive accelerometers mounted at the midpoint location of the instrumented subsection. Strain and acceleration signals were conditioned, digitized, stored and processed using the PDA. Selected output from the PDA for each recorded impact included the maximum calculated rod top force (FMX), maximum rod top velocity (VMX), maximum average compressive stress (CSX), maximum energy transfer (EMX), energy transfer ratio (ETR) and the hammer operating rate (BPM).

MEASUREMENTS AND CALCULATIONS

FV Method (EMX)

Energy transfer to the PDA gage location, EMX, was computed by the PDA using force, F(t), and velocity, v(t), records as follows:

$$EMX = \int_a^b F(t) \cdot v(t) dt$$

The time "a" corresponds to the start of the record when the energy transfer begins, and "b" is the time at which energy transferred to the rod reaches a maximum value. The FV Method is currently recognized in ASTM D4633-10, and is the theoretically correct result; therefore, no other energy calculation methods are reported.

RESULTS

Upon return to the office, the records collected by the PDA were checked for consistency and accuracy. For example, records from very weak startup or final impacts were not included in the results. Appendix A contains a representative plot of force and normalized velocity versus time and PDIPLOT results for all hammer blows at each dynamically monitored sampling depth. The PDA results include the EMX (transferred energy by the EMX method, as recommended by ASTM D4633-10), ETR (energy transfer ratio), BPM (hammer operating rate), FMX (maximum rod top force), CSX (maximum compressive stress), and VMX (maximum rod top velocity). The plots show each calculated PDA result versus sampling spoon penetration while the tables show statistical summaries for each 6 inch increment. At the end of each table, on the next page, is a statistical evaluation of the results which only include the blows that correspond to the N-Value for that sample.

Table 1 summarizes the average transfer energy values calculated by the EMX method. The records averaged consist only of the hammer blows at each dynamically monitored sampling depth that correspond to the N-Values (i.e. the blows in the initial 6 inches of split spoon driving were not considered

as part of the average). The “energy transfer ratio” (ETR) is defined as the ratio of maximum transferred energy EMX divided by the theoretical hammer potential energy of 350 ft-lbs. The average hammer operating rate is reported in blows per minute (BPM).

CONCLUSIONS

RIG: CME 550X (s/n: 355273) - 140 lbs Hammer – 2.5 ft Drop Height

The average maximum energy transfer (EMX) to the NWJ SPT rod using the 140 lbs drop weight was 314 ft-lbs which is 90% of the 350 ft-lbs potential energy of the hammer. The standard deviation of the transfer efficiency was 3% over the eight samples that were collected. The average hammer operation rate during the time of testing was 51.5 blows/min.

We have appreciated this opportunity to be of assistance to you on this project, please contact our office if you have any questions regarding this report, or if we may be of further service.

Very truly yours,
Nagy Engineers, Inc.

Matthew Nagy, P.E. AL # 33853

Firm COA Number: 4718

Enclosed: Appendices A and B

TABLE 1: Summary of SPT Energy Measurements

CME 550X Automatic SPT Hammer (S/N 355273)

Rod Length Below Gages *LE*	Depth Below Top of Ground	Reported SPT Blow Counts	Maximum Transfer Force *FMX*	Maximum Compressive Stress *CSX*	Average Hammer Blow Rate *BPM*	Average Energy Transfer *EMX*	Average Transfer Efficiency *ETR*
ft	ft	blows/6"	kips	ksi	blows/min	ft-lbs	%
19.0	13.5 to 15.0	3,7,11	42	29.5	43.7	290	83%
24.0	18.5 to 20.0	2,3,8	43	30.6	54.4	310	89%
27.0	21.0 to 22.5	13,23,21	43	30.3	56.6	313	89%
29.0	23.5 to 25.0	8,8,5	43	30.0	50.5	314	90%
32.0	26.0 to 27.5	7,5,5	44	30.7	55.5	327	93%
34.0	28.5 to 30.0	5,9,15	43	30.0	50.4	327	93%
37.0	31.0 to 32.5	6,4,8	43	30.0	50.4	314	90%
39.0	33.5 to 35.0	9,12,12	43	30.5	50.5	318	91%
		Overall Average			**51.5**	**314**	**90%**
		Standard Deviation			**4.1**	**12**	**3%**

Notes

LE - Length from the bottom of the spoon to the PDA gage location.
FMX - Maximum Force Meaused at PDA gage locationn.
CSX - Maximum Average Compressive Stress at PDA gage location.
BPM - Hammer operation rate (blows/minute)
EMX - Computed, from $\int F v \, dt$, maximum energy transferred to PDA gage location.
ETR - Computed, from EMX/PE, maximum energy transfer efficiency

Appendix A

Results from SPT Dynamic Energy Measurements

Thompson Engineering SPT Rig Calibration

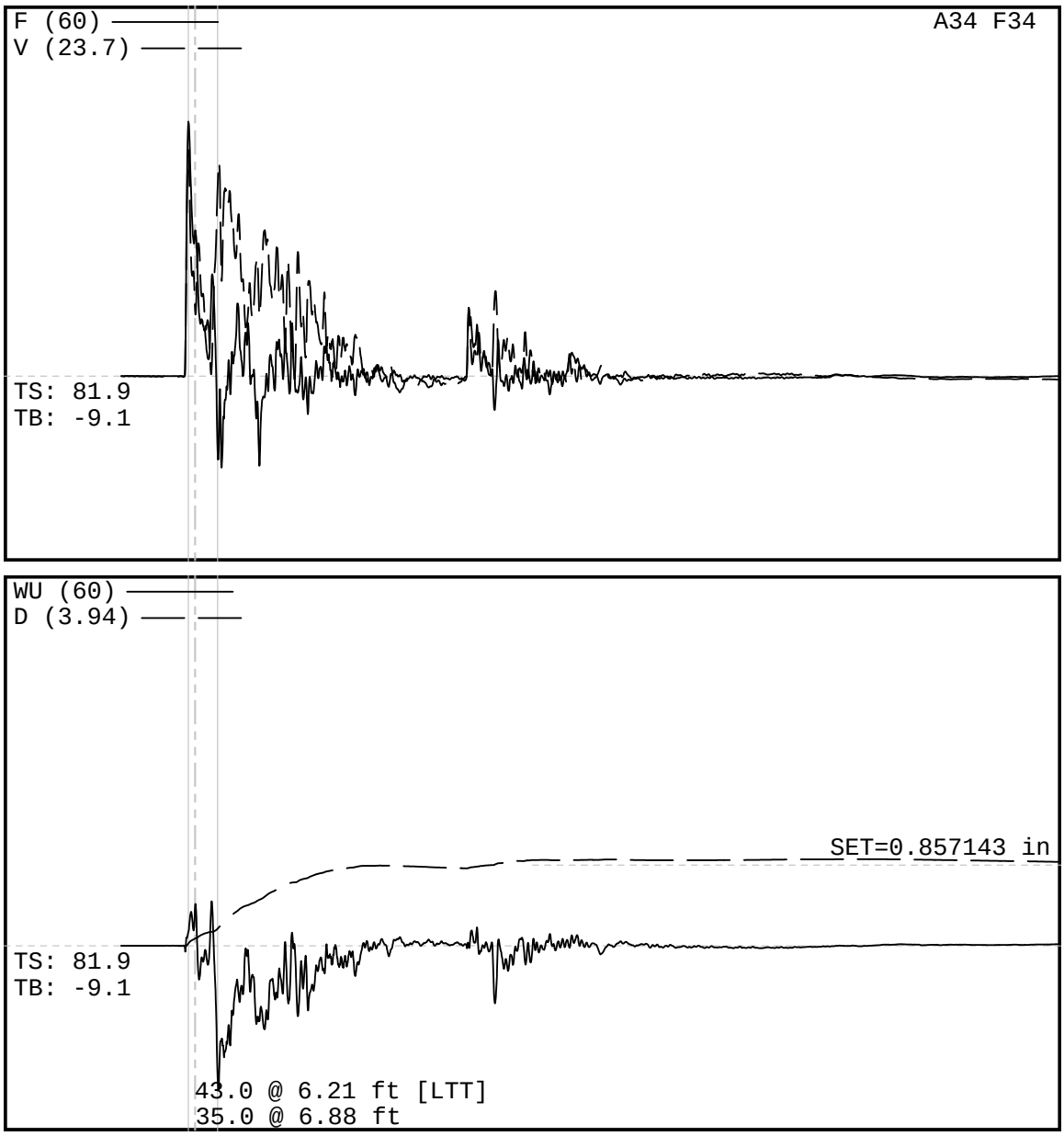
CMX 550X

S/N 355273

(NWJ Rod –Mud Rotary)

Thompson Engineering's CME 550X (S/N 355273)

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 13.5 to 15.0 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 13.5 to 1
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)
9/11/2017 1:11:19 PM
Blow Number 7

Pile Properties

LE	19.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	2.26	ms
JC		[]
LP	14.29	ft

Quantity Results

CSX	29.03	ksi
CSI f	29.28	ksi
EMX	0.286	k-ft
ETR	81.7	(%)
BPM	43.7	bpm
FMX	41	kips
VMX	14.5	f/s
QNV	0.00	[]
QNV	0.00	[]

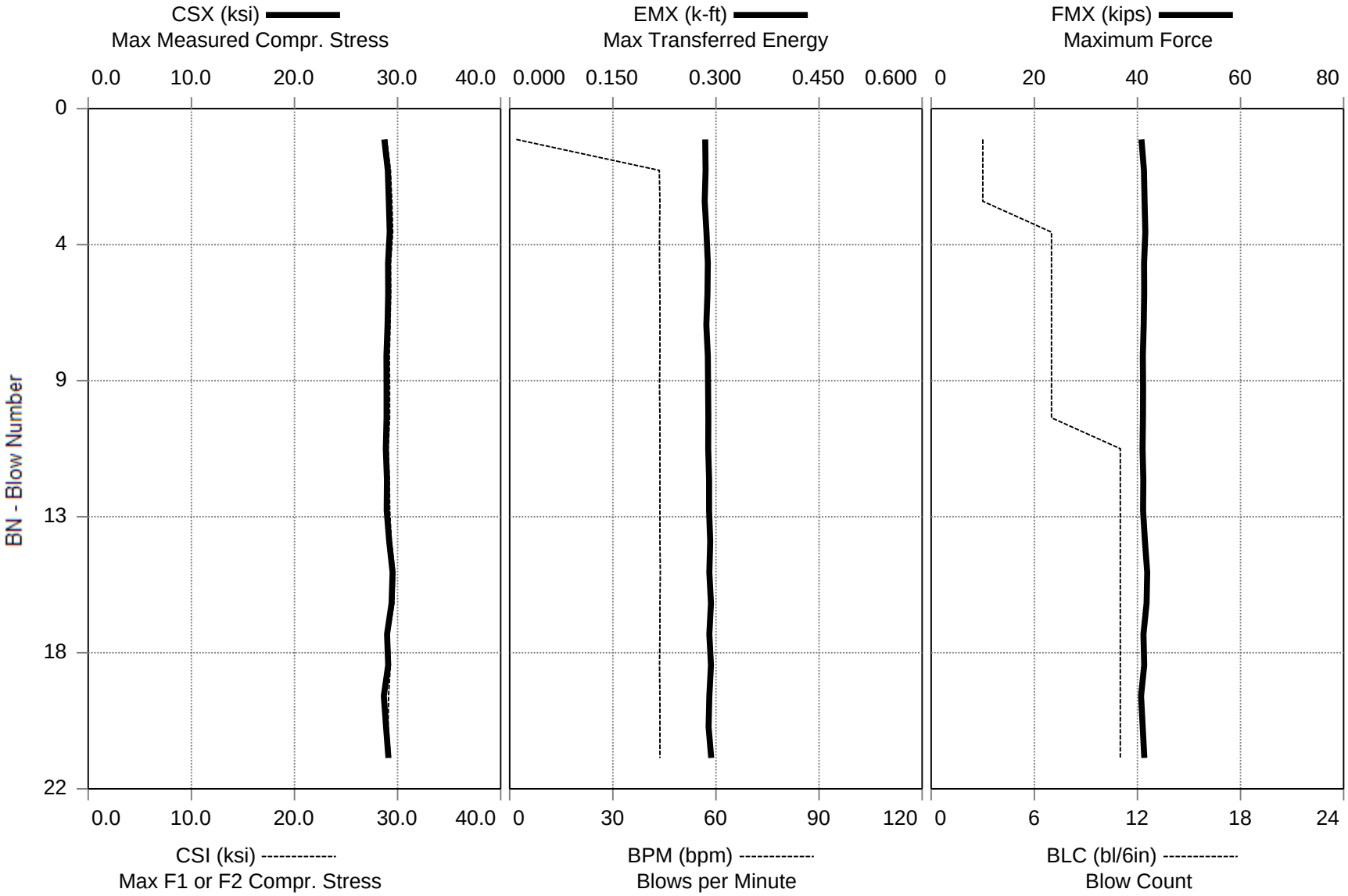
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 13.5 to 15.0 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 13.5 to 15.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 19.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
3	14.00	3	AV3	29.0	29.2	0.284	81.2	29.7	41	14.5
			MAX	29.2	29.4	0.285	81.4	43.7	41	14.8
10	14.50	7	AV7	29.0	29.3	0.288	82.2	43.7	41	14.5
			MAX	29.2	29.5	0.289	82.6	43.7	42	14.6
21	15.00	11	AV11	29.1	29.3	0.291	83.1	43.7	41	14.6
			MAX	29.5	29.7	0.293	83.7	43.8	42	14.7
			Average	29.0	29.3	0.289	82.5	41.7	41	14.6
			Maximum	29.5	29.7	0.293	83.7	43.8	42	14.8

Total number of blows analyzed: 21

BL# Sensors

1-21 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 27 seconds 1:11 PM - 1:11 PM BN 1 - 21

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 13.5 to 15.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 19.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
4	14.07	7	29.2	29.5	0.286	81.7	43.6	42	14.3
5	14.14	7	29.1	29.3	0.288	82.4	43.6	41	14.4
6	14.21	7	29.1	29.3	0.288	82.2	43.7	41	14.5
7	14.29	7	29.0	29.3	0.286	81.7	43.7	41	14.5
8	14.36	7	28.9	29.2	0.288	82.4	43.7	41	14.6
9	14.43	7	28.9	29.2	0.289	82.4	43.6	41	14.6
10	14.50	7	28.9	29.2	0.289	82.6	43.7	41	14.6
11	14.55	11	28.9	29.1	0.289	82.5	43.7	41	14.5
12	14.59	11	29.0	29.2	0.290	82.9	43.7	41	14.6
13	14.64	11	28.9	29.2	0.290	82.9	43.7	41	14.6
14	14.68	11	29.2	29.4	0.292	83.3	43.7	41	14.6
15	14.73	11	29.5	29.7	0.290	82.9	43.8	42	14.7
16	14.77	11	29.4	29.6	0.293	83.6	43.7	42	14.6
17	14.82	11	29.0	29.2	0.290	83.0	43.7	41	14.6
18	14.86	11	29.1	29.3	0.293	83.7	43.6	41	14.7
19	14.91	11	28.7	29.1	0.290	83.0	43.7	41	14.5
20	14.95	11	28.9	29.1	0.289	82.6	43.7	41	14.6
21	15.00	11	29.1	29.3	0.293	83.7	43.7	41	14.7
		Average	29.0	29.3	0.290	82.7	43.7	41	14.6
		Maximum	29.5	29.7	0.293	83.7	43.8	42	14.7

Total number of blows analyzed: 18

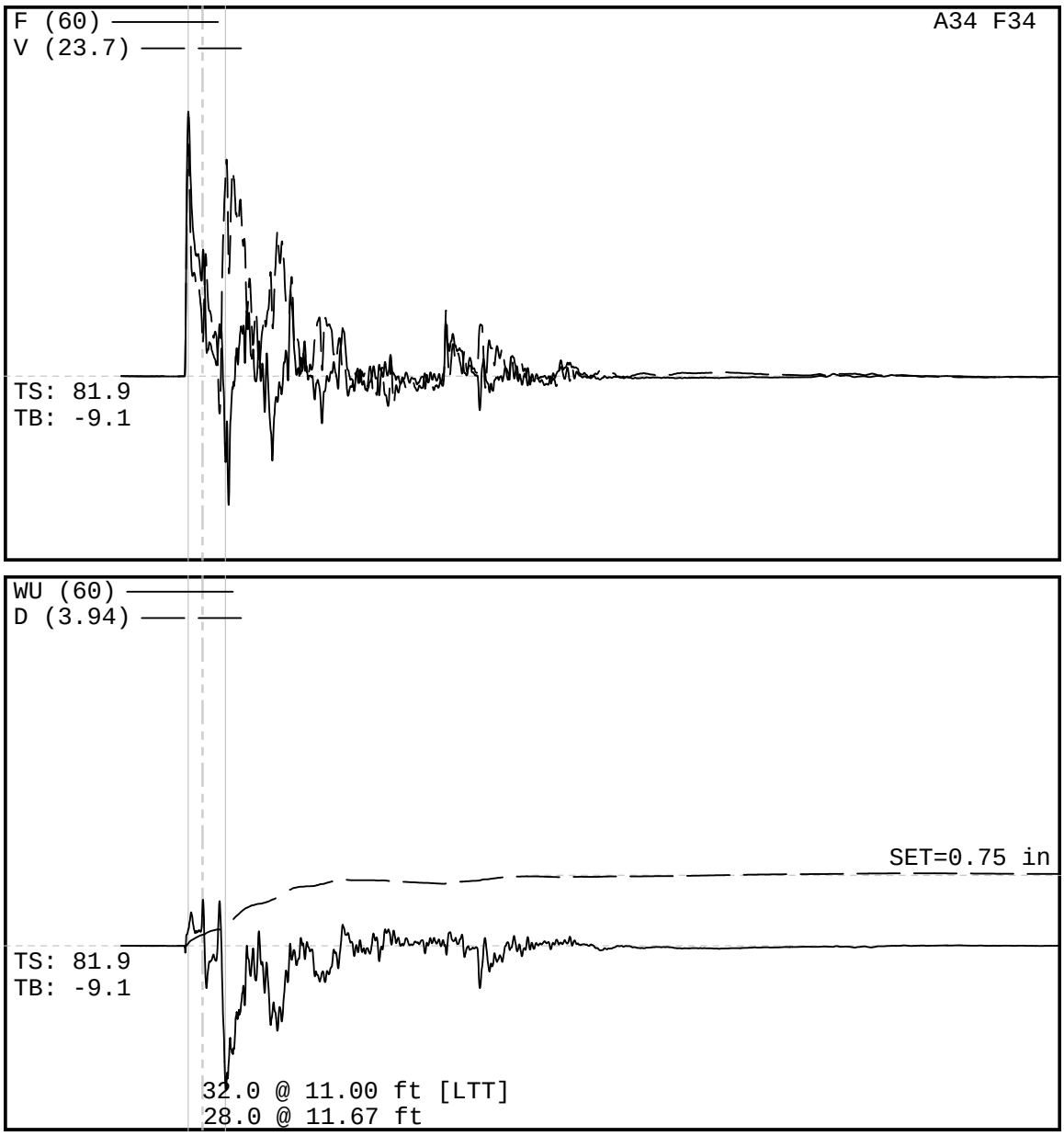
BL# Sensors

4-21 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 27 seconds 1:11 PM - 1:11 PM BN 1 - 21

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 18.5 to 20.0 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 18.5 to 2
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_1
9/11/2017 1:23:52 PM
Blow Number 8

Pile Properties

LE	24.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	2.88	ms
JC		[]
LP	19.69	ft

Quantity Results

CSX	30.17	ksi
CSI f	30.53	ksi
EMX	0.312	k-ft
ETR	89.0	(%)
BPM	54.1	bpm
FMX	43	kips
VMX	14.8	f/s
QNV	0.00	[]
QNV	0.00	[]

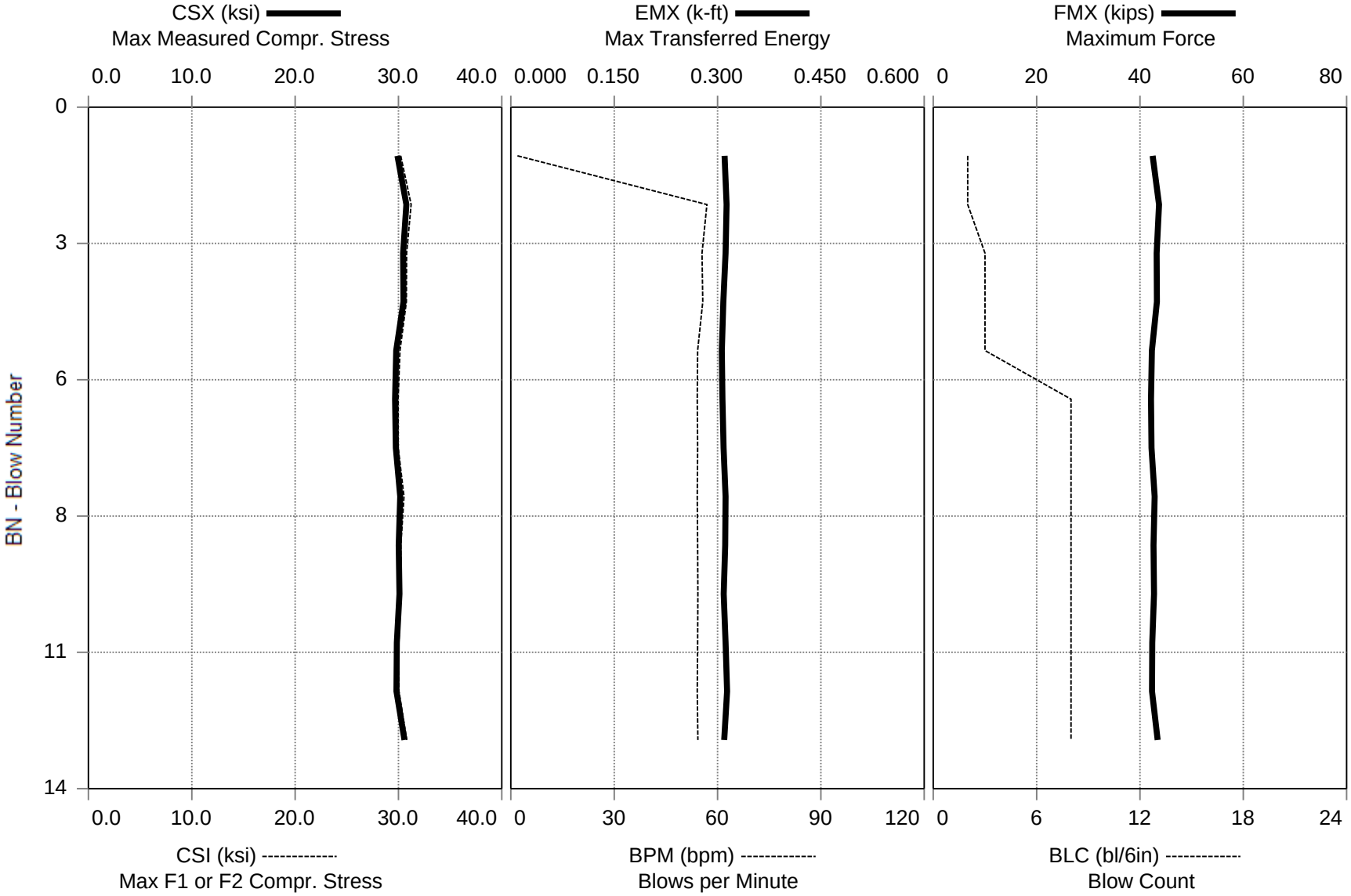
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 18.5 to 20.0 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 18.5 to 20.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 24.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
2	19.00	2	AV2	30.3	30.7	0.312	89.0	29.4	43	16.4
			MAX	30.8	31.2	0.313	89.4	56.9	44	16.4
5	19.50	3	AV3	30.2	30.6	0.309	88.2	55.1	43	15.8
			MAX	30.5	30.8	0.312	89.1	55.7	43	16.2
13	20.00	8	AV8	30.0	30.2	0.310	88.7	54.2	43	14.8
			MAX	30.6	30.8	0.314	89.6	54.3	43	15.0
			Average	30.1	30.4	0.310	88.6	50.6	43	15.3
			Maximum	30.8	31.2	0.314	89.6	56.9	44	16.4

Total number of blows analyzed: 13

BL# Sensors

1-13 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 13 seconds 1:23 PM - 1:23 PM BN 1 - 13

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 18.5 to 20.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 24.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
3	19.17	3	30.4	30.8	0.312	89.1	55.5	43	15.8
4	19.33	3	30.5	30.8	0.308	88.1	55.7	43	16.2
5	19.50	3	29.8	30.1	0.306	87.5	54.2	42	15.5
6	19.56	8	29.7	30.0	0.307	87.8	54.1	42	14.9
7	19.63	8	29.7	30.0	0.309	88.2	54.2	42	14.6
8	19.69	8	30.2	30.5	0.312	89.0	54.1	43	14.8
9	19.75	8	30.0	30.2	0.311	88.9	54.2	43	14.8
10	19.81	8	30.1	30.2	0.309	88.3	54.3	43	14.8
11	19.88	8	29.8	30.0	0.312	89.0	54.2	42	14.8
12	19.94	8	29.8	30.0	0.314	89.6	54.1	42	14.9
13	20.00	8	30.6	30.8	0.310	88.5	54.3	43	15.0
		Average	30.1	30.3	0.310	88.5	54.4	43	15.1
		Maximum	30.6	30.8	0.314	89.6	55.7	43	16.2

Total number of blows analyzed: 11

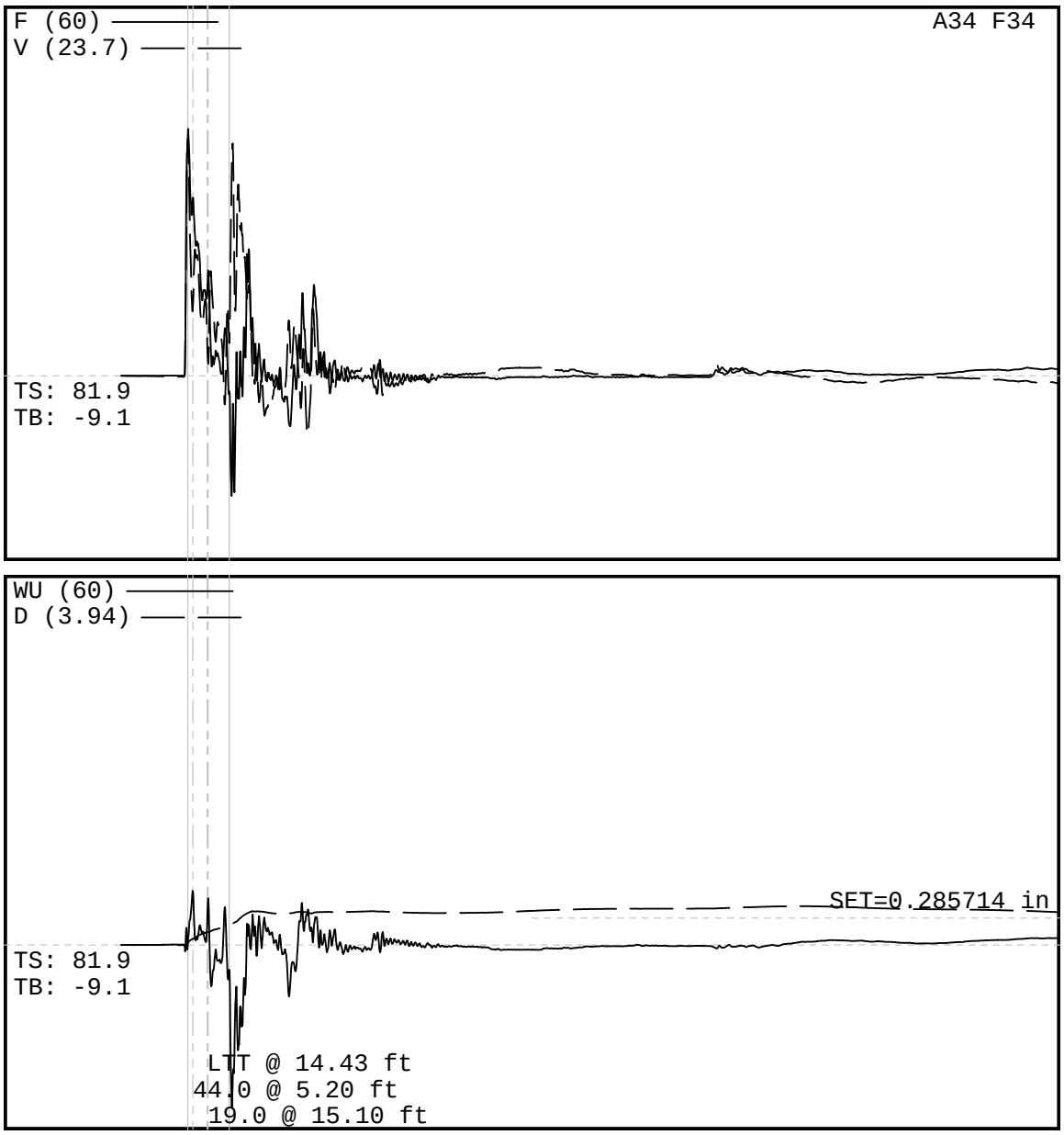
BL# Sensors

3-13 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 13 seconds 1:23 PM - 1:23 PM BN 1 - 13

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 21.0 to 22.5 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 21.0 to 2
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_2
9/11/2017 1:35:14 PM
Blow Number 37

Pile Properties

LE	27.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	3.22	ms
JC		[]
LP	22.02	ft

Quantity Results

CSX	28.20	ksi
CSI f	28.81	ksi
EMX	0.314	k-ft
ETR	89.6	(%)
BPM	56.4	bpm
FMX	40	kips
VMX	15.2	f/s
QNV	0.00	[]
QNV	0.00	[]

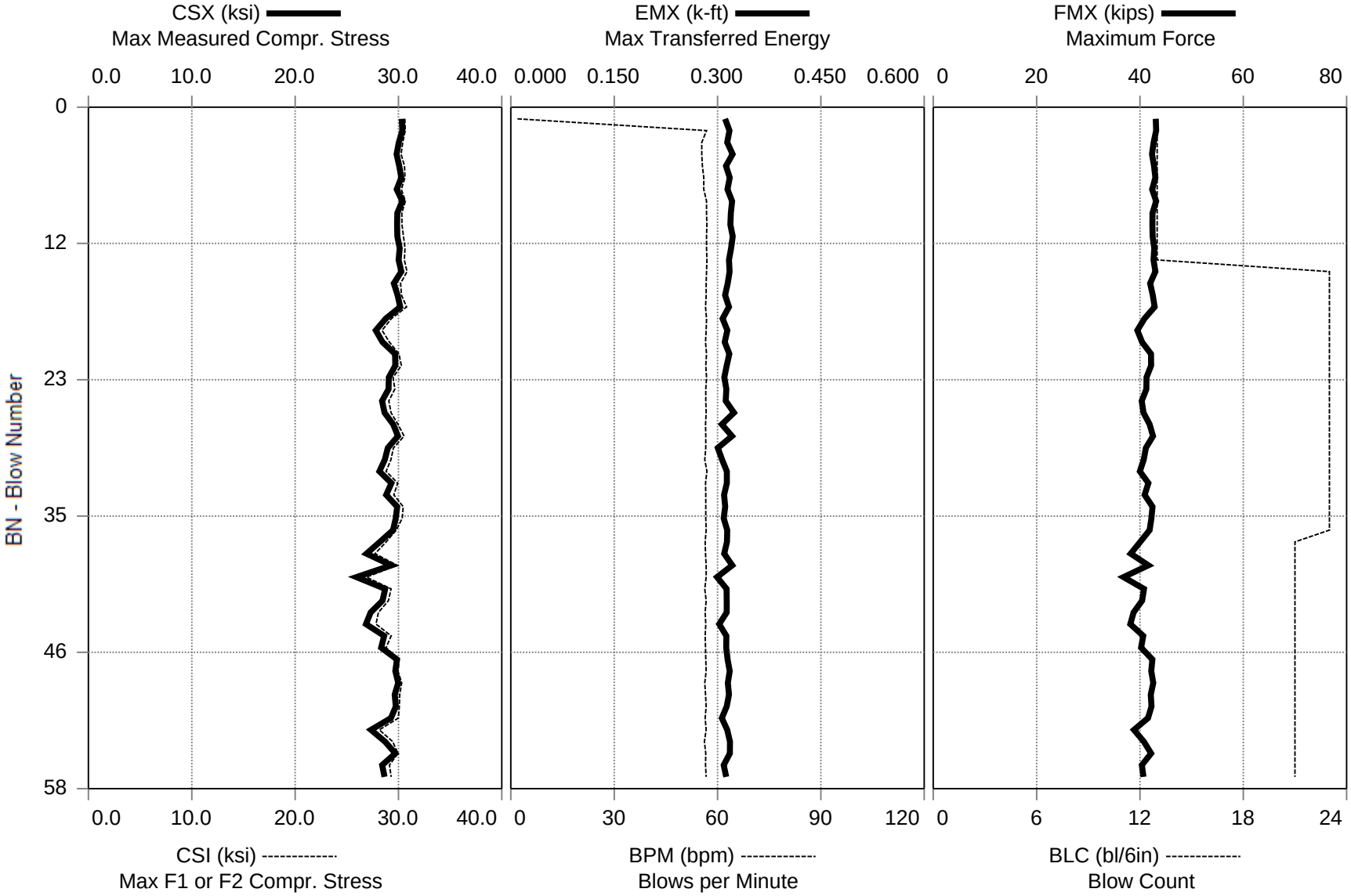
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 21.0 to 22.5 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 21.0 to 22.5 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR:	1.42 in²	SP:	0.492 k/ft³
LE:	27.00 ft	EM:	30,000 ksi
WS:	16,807.9 f/s	JC:	0.00 []

CSX: Max Measured Compr. Stress
CSI: Max F1 or F2 Compr. Stress
EMX: Max Transferred Energy
ETR: Energy Transfer Ratio
BPM: Blows per Minute
FMX: Maximum Force
VMX: Maximum Velocity

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
13	21.50	13	AV13	30.1	30.5	0.317	90.7	52.2	43	15.0
			MAX	30.4	30.7	0.322	92.0	56.9	43	15.2
36	22.00	23	AV23	29.2	29.8	0.312	89.3	56.6	41	15.0
			MAX	30.3	30.8	0.324	92.5	56.9	43	15.5
57	22.50	21	AV21	28.6	29.1	0.313	89.3	56.5	41	15.6
			MAX	30.0	30.3	0.321	91.8	56.7	43	16.2
			Average	29.2	29.7	0.314	89.6	55.6	41	15.2
			Maximum	30.4	30.8	0.324	92.5	56.9	43	16.2

Total number of blows analyzed: 57

BL# Sensors

1-57 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 59 seconds 1:34 PM - 1:35 PM BN 1 - 57

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 21.0 to 22.5 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 27.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress
CSI: Max F1 or F2 Compr. Stress
EMX: Max Transferred Energy
ETR: Energy Transfer Ratio
BPM: Blows per Minute
FMX: Maximum Force
VMX: Maximum Velocity

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
14	21.52	23	30.3	30.8	0.317	90.7	56.8	43	15.3
15	21.54	23	29.6	30.2	0.315	89.9	56.7	42	15.0
16	21.57	23	29.9	30.3	0.311	88.8	56.7	42	15.2
17	21.59	23	30.2	30.8	0.317	90.5	56.5	43	14.9
18	21.61	23	28.8	29.3	0.307	87.8	56.8	41	15.2
19	21.63	23	27.8	28.4	0.314	89.8	56.7	39	15.4
20	21.65	23	28.5	29.1	0.310	88.7	56.5	40	15.2
21	21.67	23	29.7	30.0	0.317	90.6	56.8	42	14.9
22	21.70	23	29.7	30.3	0.313	89.5	56.6	42	14.8
23	21.72	23	29.1	29.5	0.310	88.5	56.8	41	15.1
25	21.76	23	28.4	29.1	0.312	89.1	56.6	40	15.3
27	21.80	23	29.5	30.0	0.306	87.5	56.5	42	15.2
29	21.85	23	29.0	29.5	0.300	85.8	56.6	41	14.5
31	21.89	23	28.2	28.8	0.314	89.6	56.9	40	15.1
33	21.93	23	28.8	29.6	0.309	88.4	56.6	41	15.0
35	21.98	23	29.7	30.4	0.309	88.3	56.6	42	14.4
37	22.02	21	28.2	28.8	0.314	89.6	56.4	40	15.2
39	22.07	21	29.3	29.9	0.321	91.8	56.7	42	15.2
41	22.12	21	28.7	29.3	0.313	89.5	56.3	41	15.2
43	22.17	21	27.3	28.1	0.313	89.5	56.4	39	15.6
45	22.21	21	28.6	29.3	0.313	89.4	56.4	41	15.5
47	22.26	21	29.9	30.1	0.315	89.9	56.6	42	15.3
49	22.31	21	30.0	30.3	0.315	90.0	56.3	43	15.2
51	22.36	21	29.7	30.1	0.313	89.5	56.7	42	15.6
53	22.40	21	27.3	28.1	0.314	89.7	56.7	39	16.2
55	22.45	21	29.7	29.9	0.318	90.8	56.6	42	15.8
57	22.50	21	28.7	29.3	0.313	89.3	56.7	41	15.9
		Average	28.9	29.5	0.313	89.3	56.6	41	15.3
		Maximum	30.3	30.8	0.324	92.5	56.9	43	16.2

Total number of blows analyzed: 44

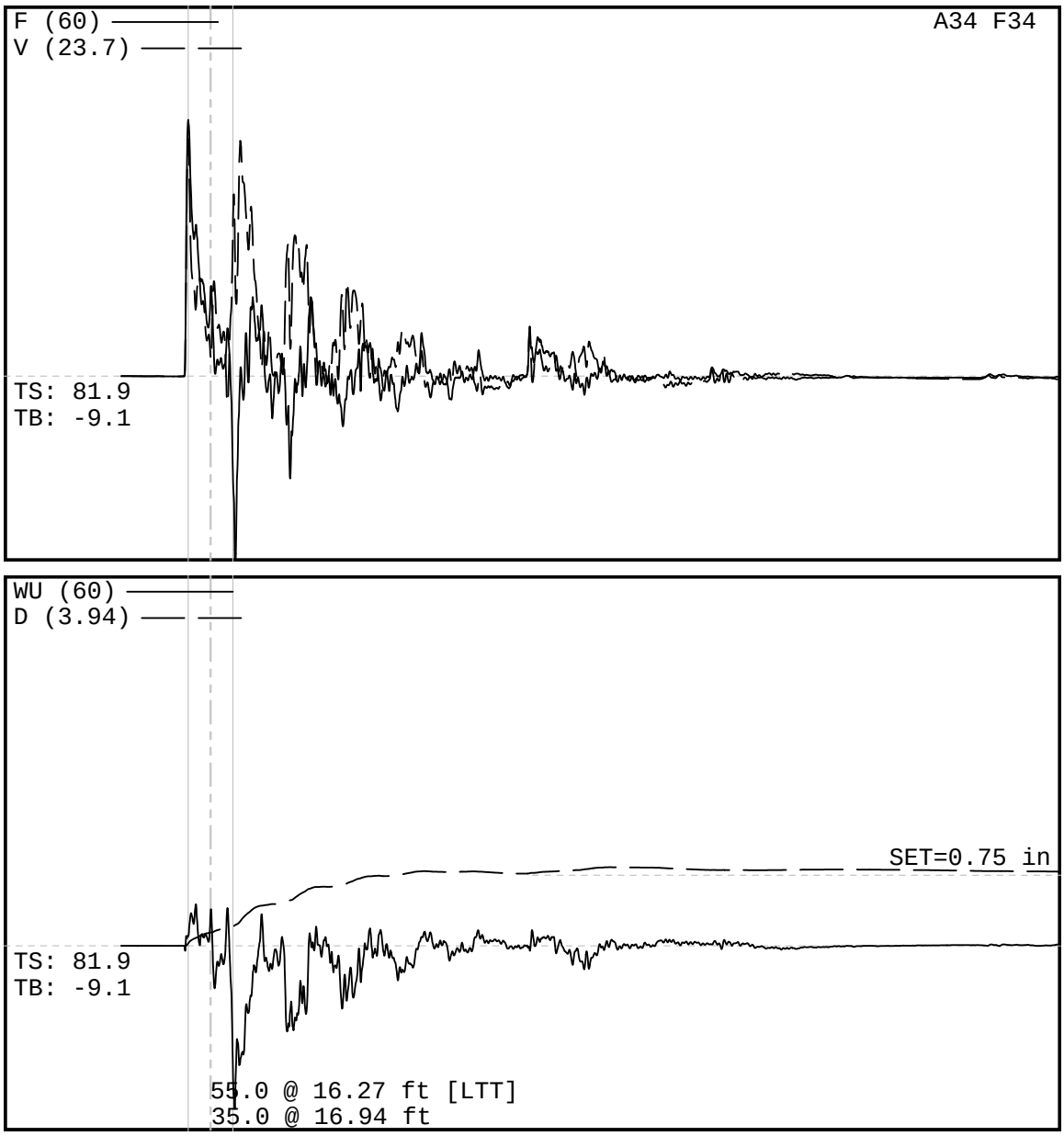
BL# Sensors

14-57 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 59 seconds 1:34 PM - 1:35 PM BN 1 - 57

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 23.5 to 25.0 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 23.5 to 2
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_3
9/11/2017 1:45:51 PM
Blow Number 10

Pile Properties

LE	29.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	3.46	ms
JC		[]
LP	24.13	ft

Quantity Results

CSX	29.23	ksi
CSI f	29.76	ksi
EMX	0.314	k-ft
ETR	89.7	(%)
BPM	50.5	bpm
FMX	42	kips
VMX	15.2	f/s
QNV	0.00	[]
QNV	0.00	[]

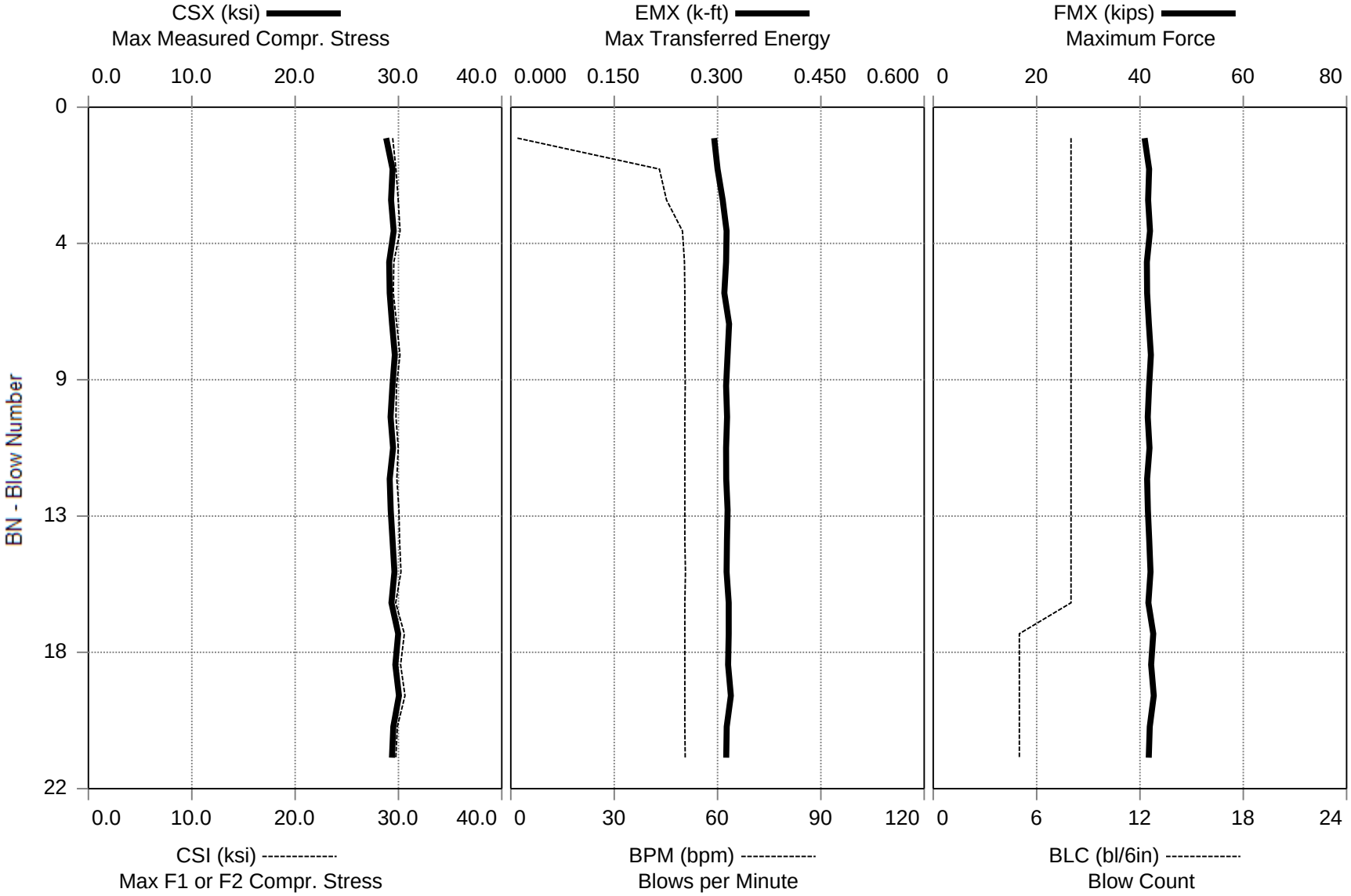
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 23.5 to 25.0 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 23.5 to 25.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR:	1.42 in²	SP:	0.492 k/ft³
LE:	29.00 ft	EM:	30,000 ksi
WS:	16,807.9 f/s	JC:	0.00 []

CSX: Max Measured Compr. Stress
CSI: Max F1 or F2 Compr. Stress
EMX: Max Transferred Energy
ETR: Energy Transfer Ratio
BPM: Blows per Minute
FMX: Maximum Force
VMX: Maximum Velocity

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
8	24.00	8	AV8	29.3	29.8	0.309	88.2	42.7	42	15.4
			MAX	29.6	30.2	0.317	90.5	50.5	42	16.1
16	24.50	8	AV8	29.4	29.9	0.314	89.6	50.5	42	15.2
			MAX	29.6	30.2	0.316	90.4	50.7	42	15.4
21	25.00	5	AV5	29.7	30.2	0.315	90.1	50.5	42	16.3
			MAX	30.0	30.6	0.319	91.2	50.6	43	17.1
			Average	29.4	29.9	0.312	89.2	47.6	42	15.6
			Maximum	30.0	30.6	0.319	91.2	50.7	43	17.1

Total number of blows analyzed: 21

BL# Sensors

1-21 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 24 seconds 1:45 PM - 1:46 PM BN 1 - 21

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 23.5 to 25.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 29.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
9	24.06	8	29.4	29.8	0.312	89.3	50.6	42	15.1
10	24.13	8	29.2	29.8	0.314	89.7	50.5	42	15.2
11	24.19	8	29.5	30.0	0.312	89.2	50.5	42	15.2
12	24.25	8	29.1	29.8	0.313	89.3	50.5	41	15.1
13	24.31	8	29.2	30.0	0.315	89.9	50.5	42	15.3
14	24.38	8	29.4	30.1	0.314	89.6	50.5	42	15.2
15	24.44	8	29.6	30.2	0.313	89.5	50.7	42	15.4
16	24.50	8	29.3	29.7	0.316	90.4	50.5	42	15.2
17	24.60	5	30.0	30.6	0.316	90.4	50.5	43	15.5
18	24.70	5	29.7	30.2	0.315	90.1	50.5	42	15.9
19	24.80	5	30.0	30.6	0.319	91.2	50.5	43	16.3
20	24.90	5	29.5	29.9	0.313	89.5	50.5	42	17.1
21	25.00	5	29.4	29.7	0.313	89.3	50.6	42	16.9
		Average	29.5	30.0	0.314	89.8	50.5	42	15.6
		Maximum	30.0	30.6	0.319	91.2	50.7	43	17.1

Total number of blows analyzed: 13

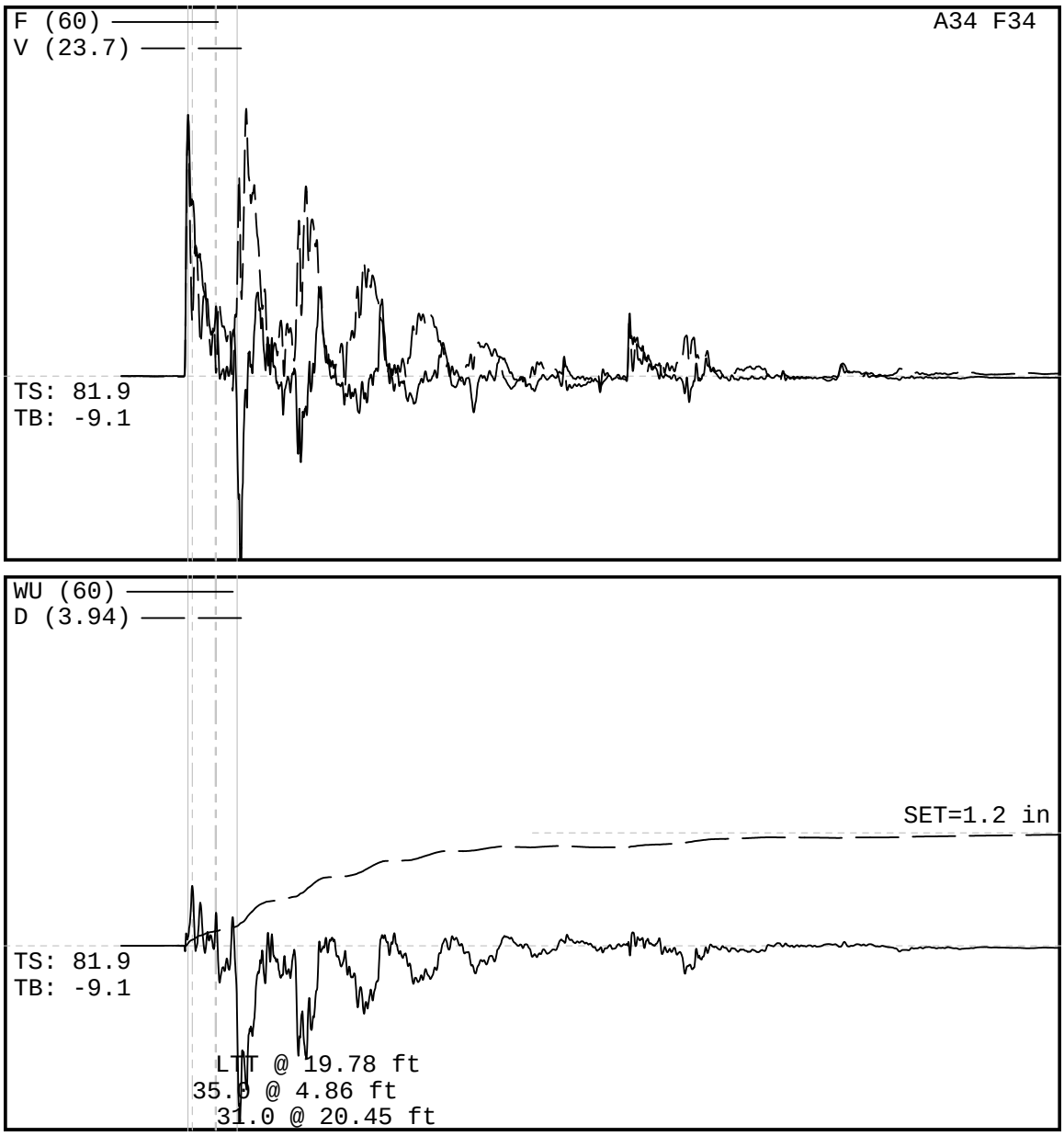
BL# Sensors

9-21 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 24 seconds 1:45 PM - 1:46 PM BN 1 - 21

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 26.0 to 27.5 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 26.0 to 2
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_4
9/11/2017 1:53:32 PM
Blow Number 8

Pile Properties

LE	32.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	3.82	ms
JC		[]
LP	26.60	ft

Quantity Results

CSX	29.81	ksi
CSI f	30.00	ksi
EMX	0.326	k-ft
ETR	93.2	(%)
BPM	55.6	bpm
FMX	42	kips
VMX	17.1	f/s
QNV	0.00	[]
QNV	0.00	[]

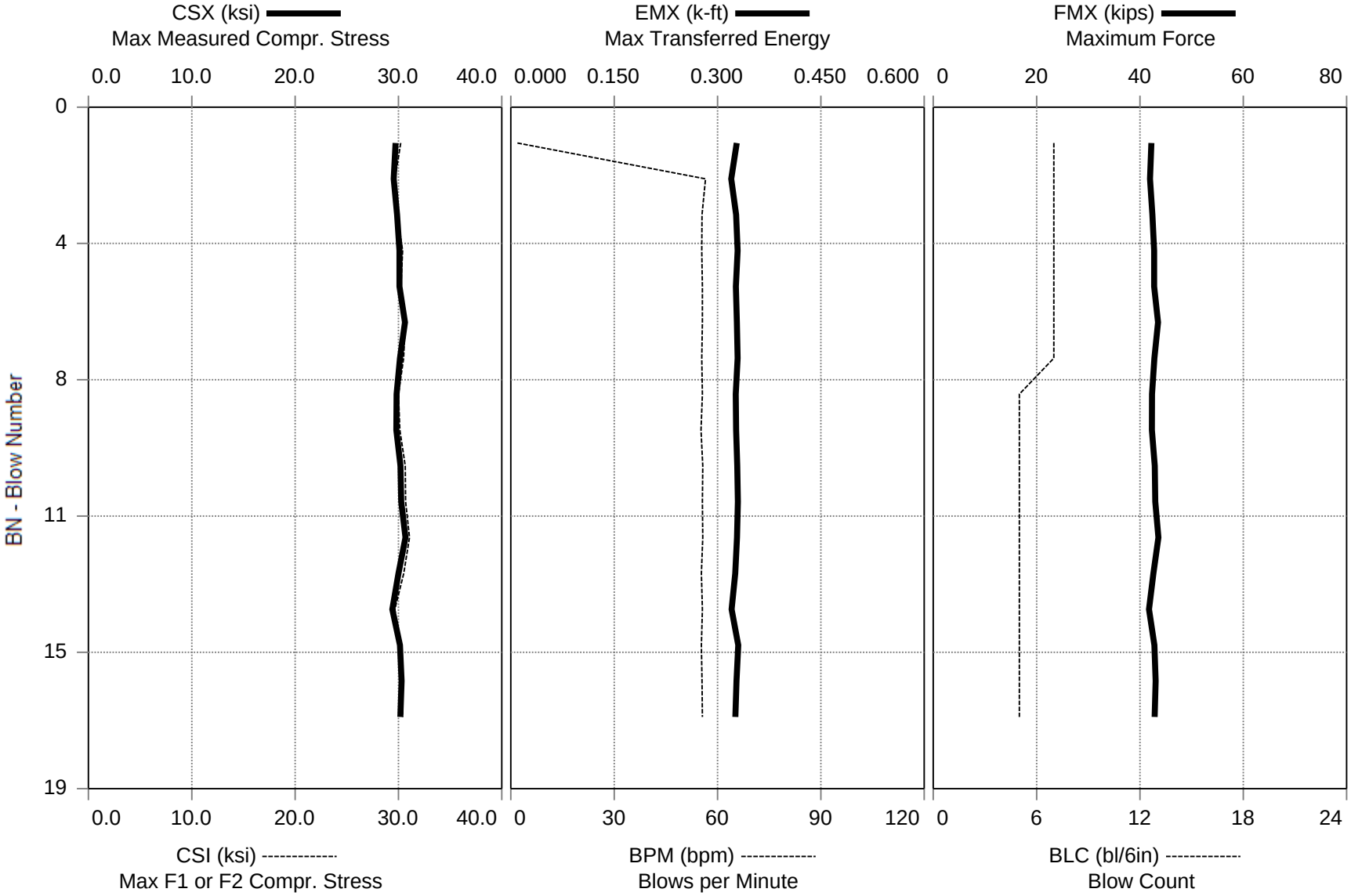
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 26.0 to 27.5 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 26.0 to 27.5 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 32.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
7	26.50	7	AV7	30.0	30.2	0.327	93.4	48.0	43	17.3
			MAX	30.6	30.7	0.329	94.0	56.5	44	18.2
12	27.00	5	AV5	30.1	30.5	0.328	93.7	55.6	43	17.8
			MAX	30.7	31.1	0.330	94.2	55.7	44	18.4
17	27.50	5	AV5	30.0	30.2	0.326	93.1	55.5	43	17.9
			MAX	30.3	30.5	0.330	94.3	55.6	43	18.1
			Average	30.0	30.3	0.327	93.4	52.4	43	17.6
			Maximum	30.7	31.1	0.330	94.3	56.5	44	18.4

Total number of blows analyzed: 17

BL# Sensors

1-17 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 18 seconds 1:53 PM - 1:53 PM BN 1 - 18

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 26.0 to 27.5 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 32.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
8	26.60	5	29.8	30.0	0.326	93.2	55.6	42	17.1
9	26.70	5	29.8	30.1	0.327	93.4	55.2	42	17.7
10	26.80	5	30.2	30.7	0.329	93.9	55.7	43	17.8
11	26.90	5	30.3	30.7	0.330	94.2	55.6	43	18.4
12	27.00	5	30.7	31.1	0.328	93.8	55.7	44	18.1
13	27.10	5	30.0	30.5	0.326	93.1	55.3	43	18.1
14	27.20	5	29.4	29.7	0.320	91.5	55.6	42	18.1
15	27.30	5	30.1	30.2	0.330	94.3	55.3	43	18.0
16	27.40	5	30.3	30.4	0.327	93.6	55.5	43	17.6
17	27.50	5	30.2	30.4	0.326	93.1	55.6	43	17.8
		Average	30.1	30.4	0.327	93.4	55.5	43	17.9
		Maximum	30.7	31.1	0.330	94.3	55.7	44	18.4

Total number of blows analyzed: 10

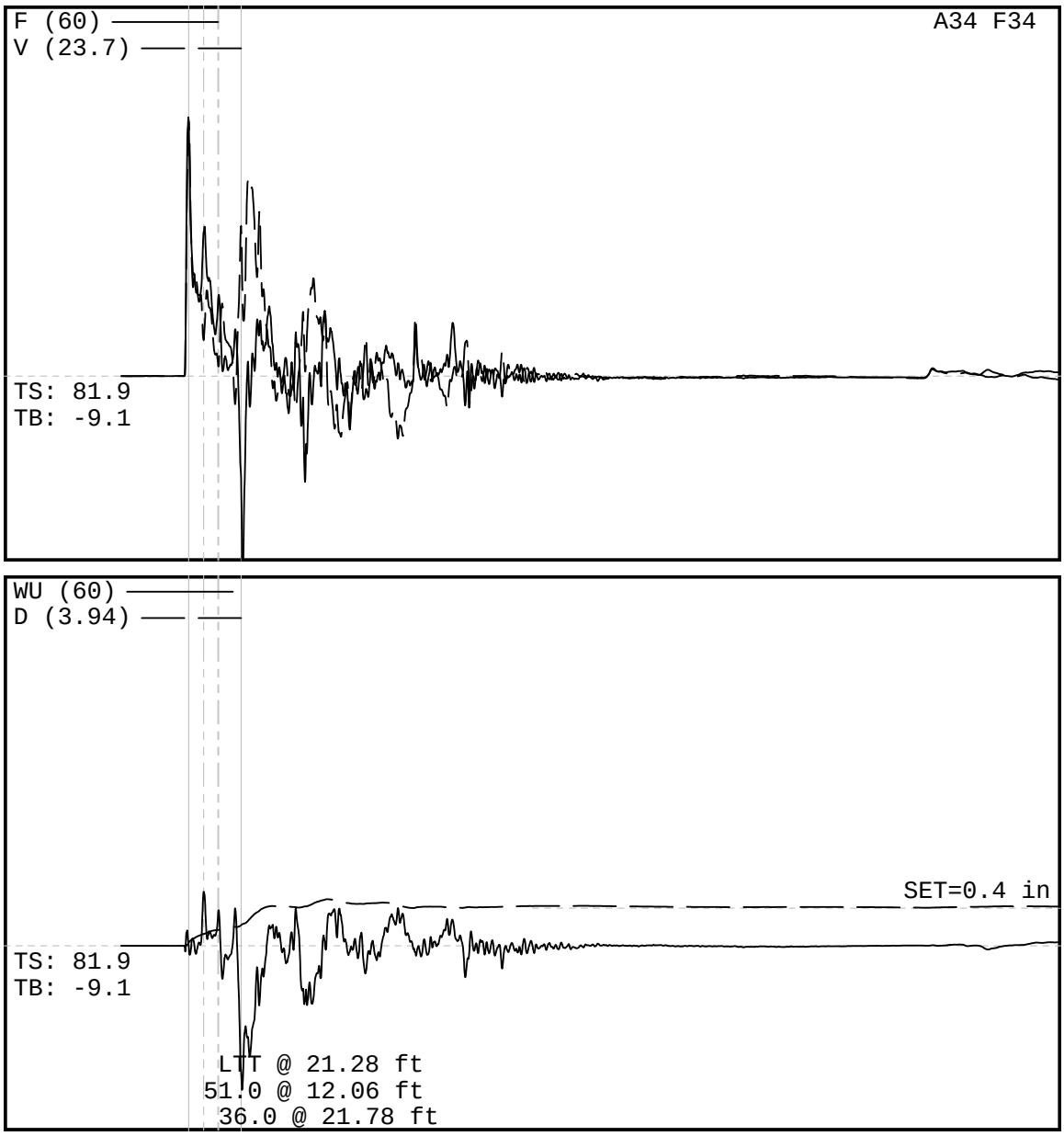
BL# Sensors

8-17 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 18 seconds 1:53 PM - 1:53 PM BN 1 - 18

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 28.5 to 30.0 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 28.5 to 3
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_5
9/11/2017 2:03:38 PM
Blow Number 18

Pile Properties

LE	34.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	4.06	ms
JC		[]
LP	29.63	ft

Quantity Results

CSX	29.53	ksi
CSI f	29.80	ksi
EMX	0.325	k-ft
ETR	92.9	(%)
BPM	50.5	bpm
FMX	42	kips
VMX	16.3	f/s
QNV	0.00	[]
QNV	0.00	[]

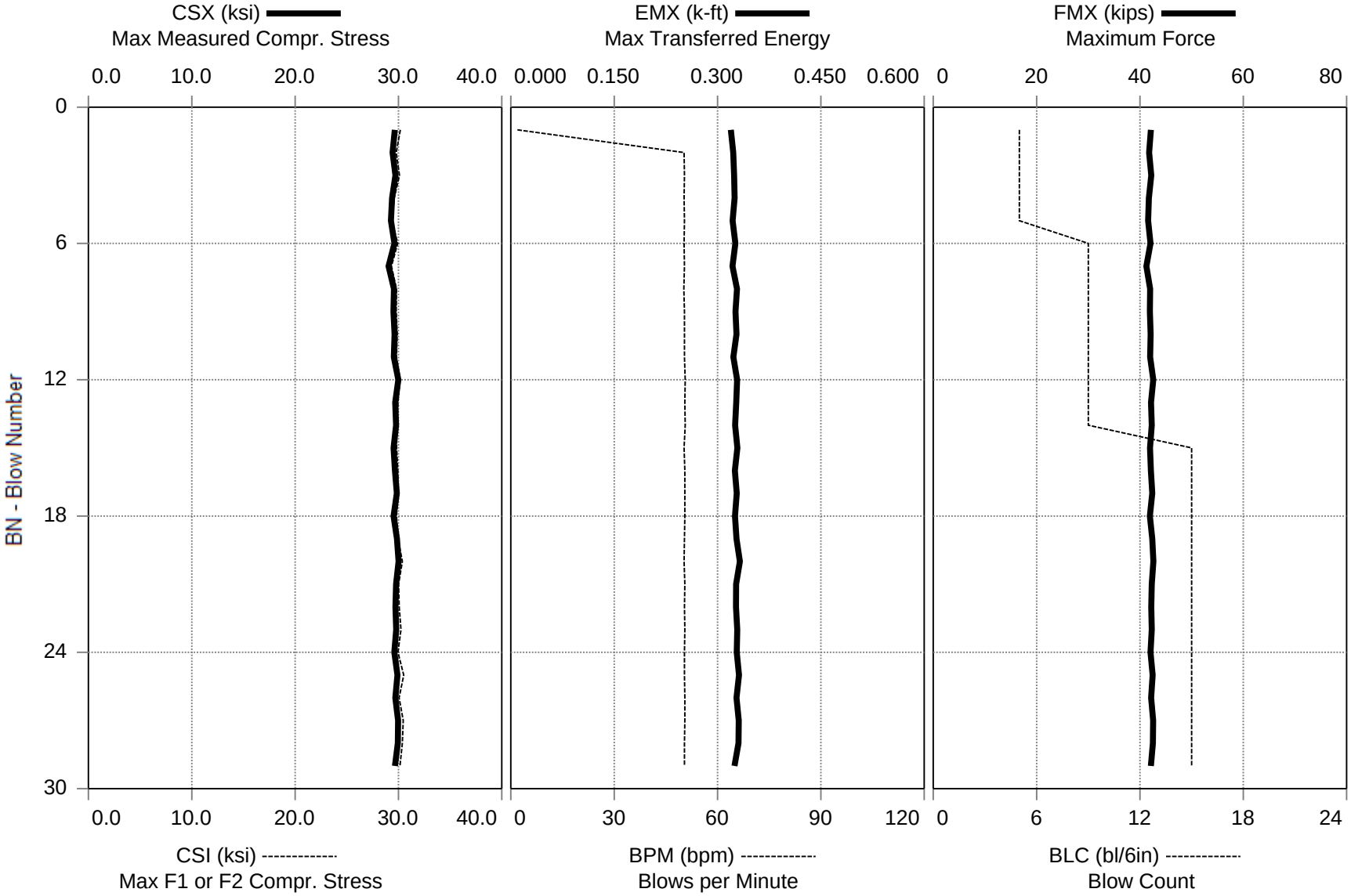
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 28.5 to 30.0 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 28.5 to 30.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 34.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
5	29.00	5	AV5	29.5	29.8	0.323	92.2	40.7	42	16.2
			MAX	29.7	30.2	0.325	92.8	50.4	42	16.3
14	29.50	9	AV9	29.6	29.8	0.326	93.1	50.4	42	16.3
			MAX	30.0	30.2	0.328	93.9	50.6	43	16.5
29	30.00	15	AV15	29.8	30.1	0.328	93.7	50.4	42	16.4
			MAX	30.0	30.5	0.332	95.0	50.5	43	16.6
			Average	29.7	30.0	0.326	93.3	48.7	42	16.4
			Maximum	30.0	30.5	0.332	95.0	50.6	43	16.6

Total number of blows analyzed: 29

BL# Sensors

1-29 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 33 seconds 2:03 PM - 2:03 PM BN 1 - 29

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 28.5 to 30.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 34.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
6	29.06	9	29.6	29.9	0.326	93.1	50.3	42	16.3
7	29.11	9	29.0	29.3	0.322	91.9	50.4	41	16.1
8	29.17	9	29.6	29.8	0.328	93.8	50.2	42	16.4
9	29.22	9	29.5	29.8	0.326	93.2	50.4	42	16.3
10	29.28	9	29.6	29.9	0.327	93.6	50.4	42	16.3
11	29.33	9	29.5	29.8	0.323	92.3	50.4	42	16.3
12	29.39	9	30.0	30.2	0.328	93.9	50.6	43	16.5
13	29.44	9	29.7	30.0	0.327	93.5	50.5	42	16.3
14	29.50	9	29.8	29.8	0.326	93.0	50.6	42	16.3
15	29.53	15	29.5	29.8	0.329	94.0	50.3	42	16.3
16	29.57	15	29.7	29.9	0.325	92.9	50.5	42	16.3
17	29.60	15	29.8	30.0	0.328	93.7	50.5	42	16.4
18	29.63	15	29.5	29.8	0.325	92.9	50.5	42	16.3
19	29.67	15	29.8	30.0	0.327	93.5	50.4	42	16.4
20	29.70	15	30.0	30.4	0.332	95.0	50.3	43	16.6
21	29.73	15	29.8	30.0	0.327	93.4	50.5	42	16.4
22	29.77	15	29.7	30.1	0.327	93.4	50.4	42	16.4
23	29.80	15	29.8	30.2	0.329	93.9	50.5	42	16.5
24	29.83	15	29.6	29.9	0.328	93.7	50.4	42	16.3
25	29.87	15	29.9	30.5	0.331	94.6	50.4	42	16.6
26	29.90	15	29.7	30.1	0.327	93.6	50.5	42	16.4
27	29.93	15	30.0	30.5	0.331	94.5	50.5	43	16.6
28	29.97	15	29.9	30.4	0.330	94.4	50.4	43	16.6
29	30.00	15	29.7	30.1	0.325	92.7	50.4	42	16.4
		Average	29.7	30.0	0.327	93.5	50.4	42	16.4
		Maximum	30.0	30.5	0.332	95.0	50.6	43	16.6

Total number of blows analyzed: 24

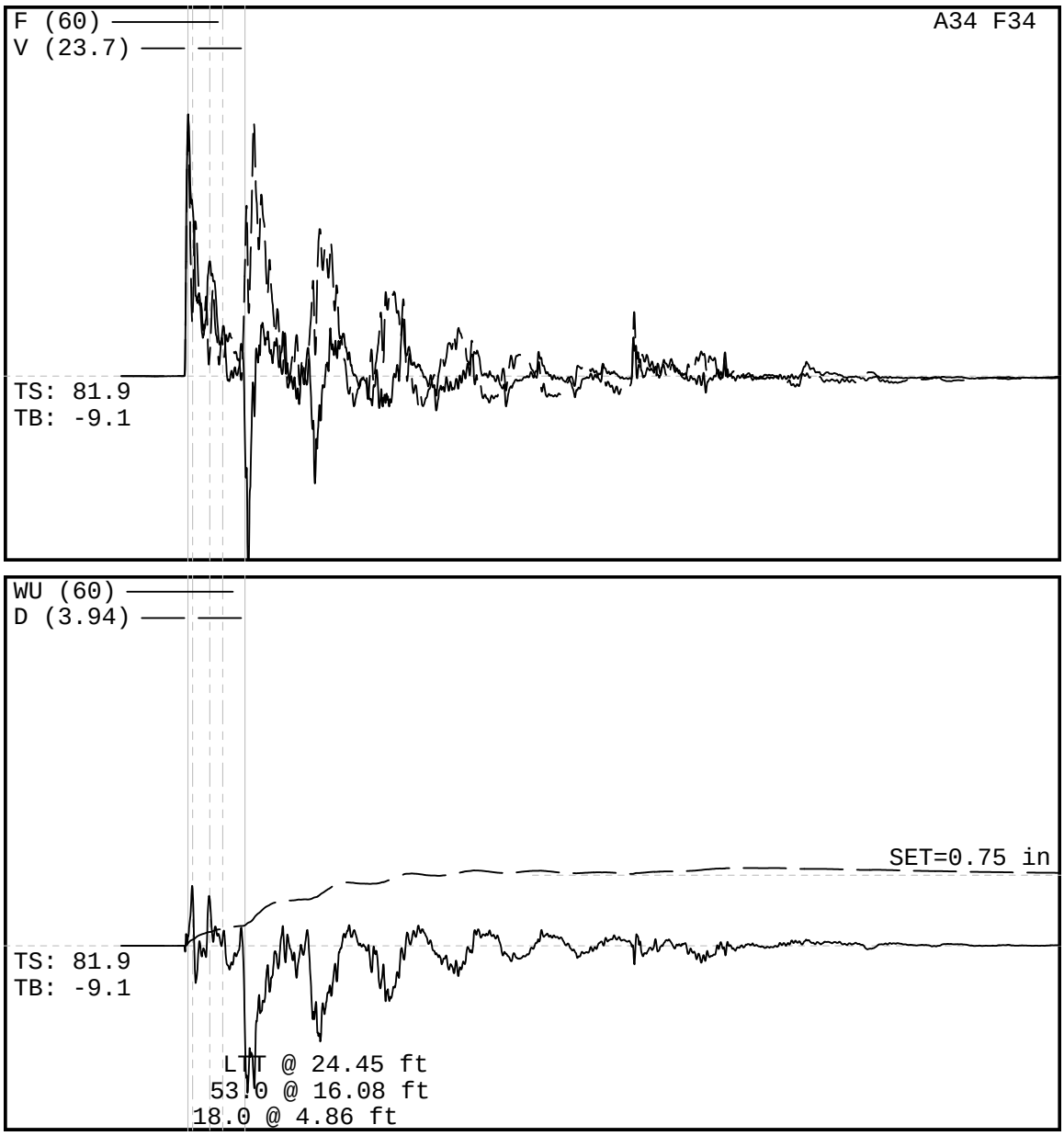
BL# Sensors

6-29 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 33 seconds 2:03 PM - 2:03 PM BN 1 - 29

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 31.0 to 32.5 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 31.0 to 3
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_6
9/11/2017 2:13:12 PM
Blow Number 12

Pile Properties

LE	37.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	4.42	ms
JC		[]
LP	32.13	ft

Quantity Results

CSX	29.87	ksi
CSI f	30.48	ksi
EMX	0.322	k-ft
ETR	91.9	(%)
BPM	50.4	bpm
FMX	42	kips
VMX	16.2	f/s
QNV	0.00	[]
QNV	0.00	[]

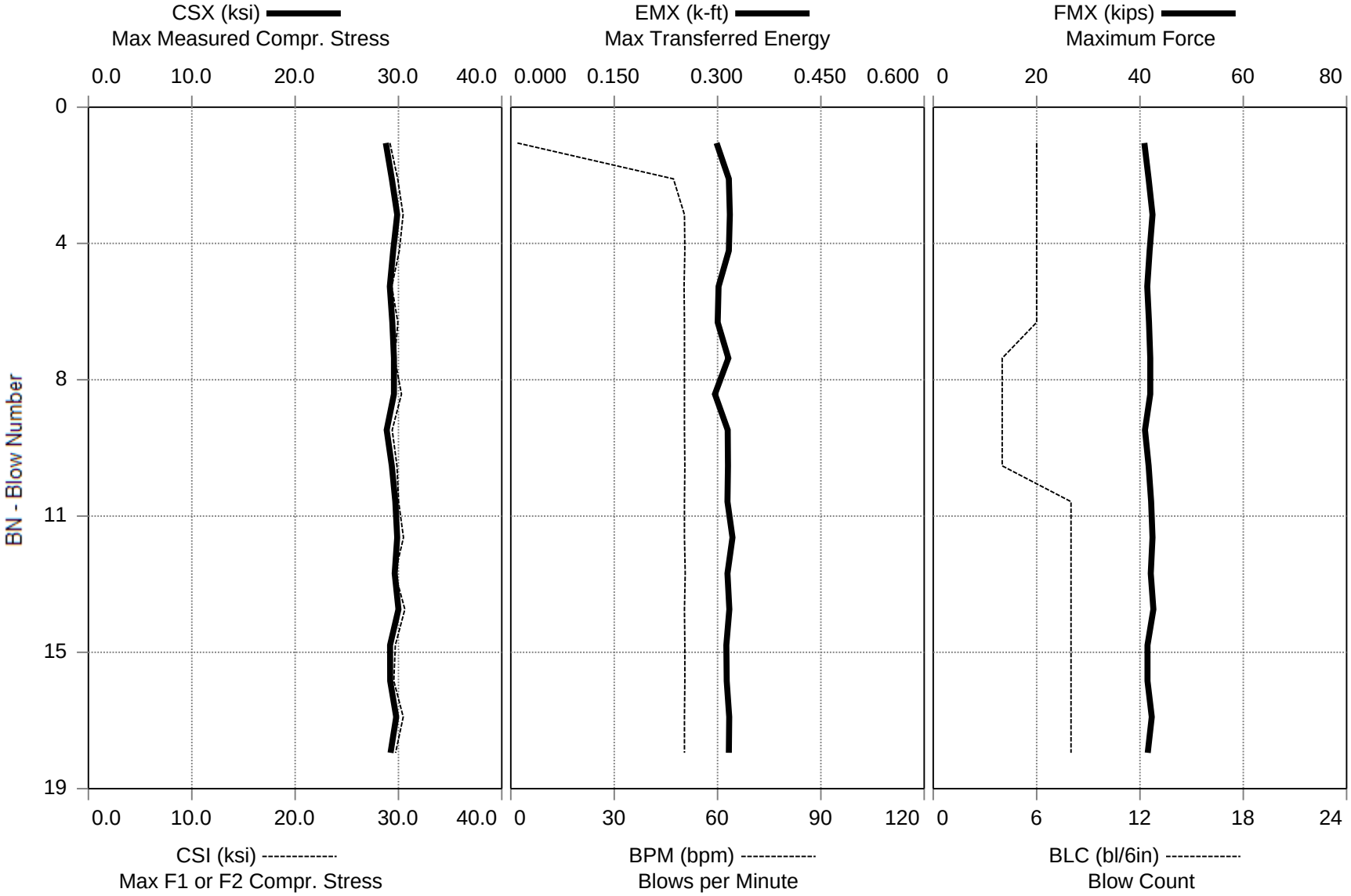
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 31.0 to 32.5 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 31.0 to 32.5 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 37.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
6	31.50	6	AV6	29.3	29.8	0.308	88.1	41.8	42	15.2
			MAX	29.9	30.4	0.318	90.8	50.5	42	15.5
10	32.00	4	AV4	29.3	29.8	0.310	88.7	50.4	42	16.0
			MAX	29.6	30.3	0.316	90.2	50.5	42	16.4
18	32.50	8	AV8	29.6	30.0	0.316	90.3	50.5	42	15.6
			MAX	30.0	30.6	0.322	91.9	50.6	43	16.2
			Average	29.4	29.9	0.312	89.2	47.6	42	15.5
			Maximum	30.0	30.6	0.322	91.9	50.6	43	16.4

Total number of blows analyzed: 18

BL# Sensors

1-18 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 20 seconds 2:12 PM - 2:13 PM BN 1 - 18

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 31.0 to 32.5 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 37.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
7	31.63	4	29.6	29.6	0.316	90.2	50.4	42	16.1
8	31.75	4	29.6	30.3	0.296	84.6	50.4	42	15.8
9	31.88	4	28.9	29.4	0.315	89.9	50.4	41	15.5
10	32.00	4	29.4	29.9	0.315	90.0	50.5	42	16.4
11	32.06	8	29.7	30.0	0.314	89.8	50.4	42	15.4
12	32.13	8	29.9	30.5	0.322	91.9	50.4	42	16.2
13	32.19	8	29.6	29.7	0.314	89.8	50.6	42	15.9
14	32.25	8	30.0	30.6	0.317	90.6	50.4	43	15.9
15	32.31	8	29.2	29.7	0.313	89.3	50.5	41	15.2
16	32.38	8	29.2	29.6	0.313	89.5	50.5	41	15.3
17	32.44	8	29.8	30.5	0.317	90.6	50.4	42	15.6
18	32.50	8	29.2	29.7	0.316	90.4	50.4	42	15.2
		Average	29.5	29.9	0.314	89.7	50.4	42	15.7
		Maximum	30.0	30.6	0.322	91.9	50.6	43	16.4

Total number of blows analyzed: 12

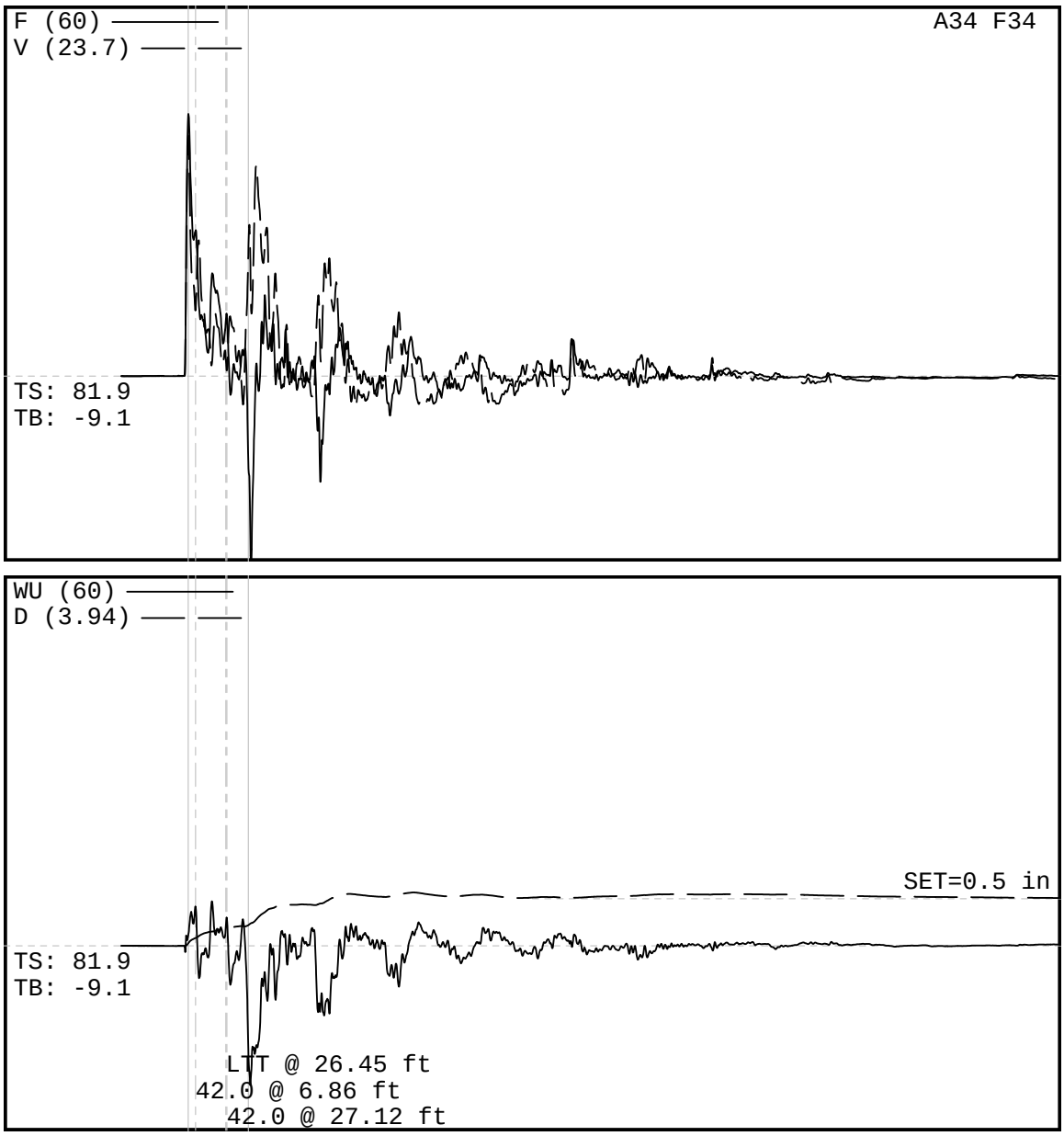
BL# Sensors

7-18 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 20 seconds 2:12 PM - 2:13 PM BN 1 - 18

Thompson Engineering SPT Calibration CME 550X (SN 355273) - 33.5 to 35.0 ft



Project Information

PROJECT: Thompson Engineering SPT Calibratic
PILE NAME: CME 550X (SN 355273) - 33.5 to 3
DESCR: NWJ Rod - Mud Rotary
OPERATOR: MJN
FILE: CME 550X (SN 355273)_7
9/11/2017 2:22:47 PM
Blow Number 22

Pile Properties

LE	39.00	ft
AR	1.42	in^2
EM	30000	ksi
SP	0.492	k/ft3
WS	16807.9	f/s
EA/C	2.5	ksec/ft
2L/C	4.66	ms
JC		[]
LP	34.54	ft

Quantity Results

CSX	29.91	ksi
CSI f	30.50	ksi
EMX	0.320	k-ft
ETR	91.3	(%)
BPM	50.6	bpm
FMX	42	kips
VMX	15.4	f/s
QNV	0.00	[]
QNV	0.00	[]

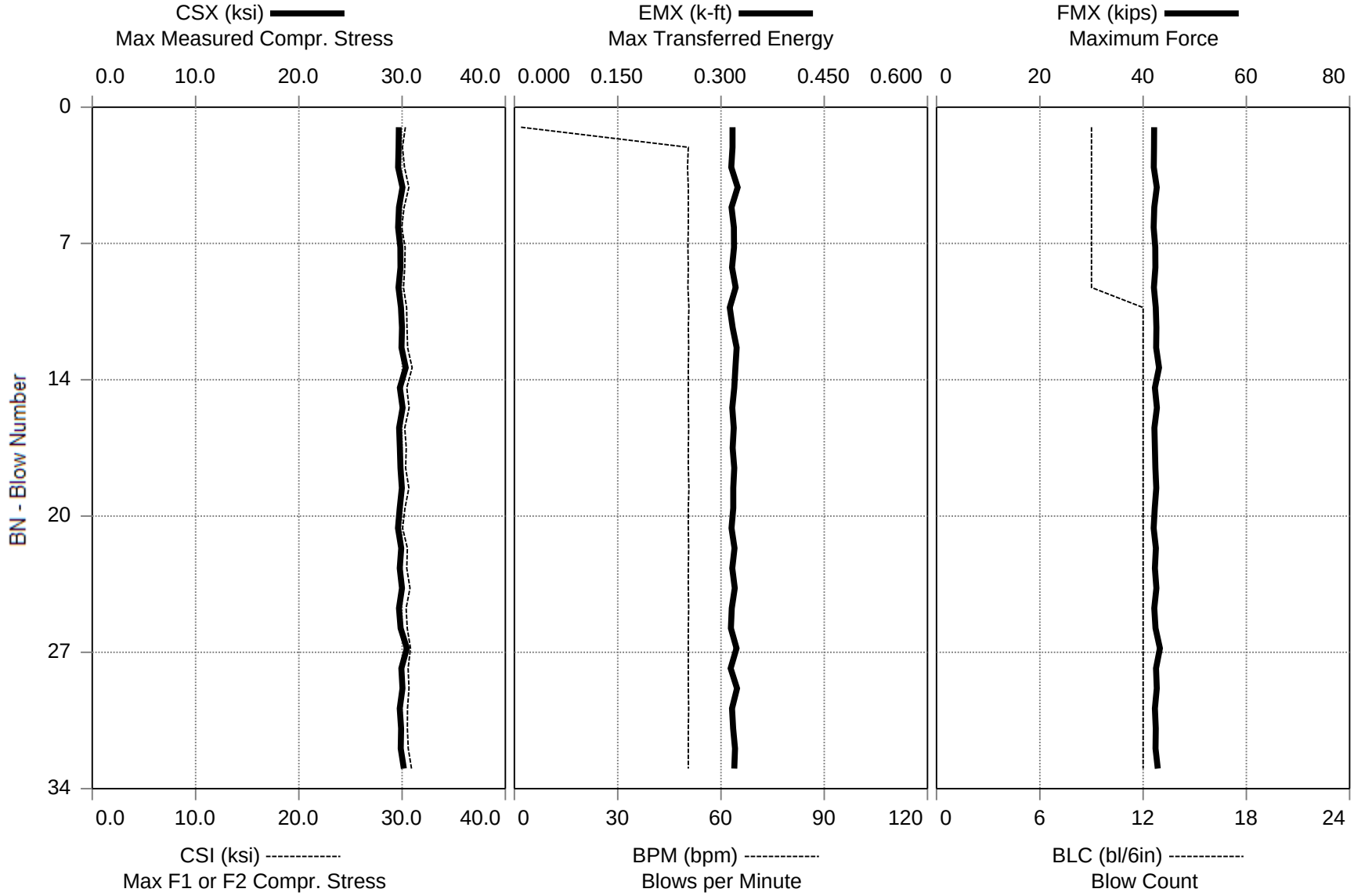
Sensors

F3: [413 NWJ-1] 212.28 (1)
F4: [413 NWJ-2] 213.94 (1)
A3: [K3773] 380 mv/5000g's (1)
A4: [K4822] 355 mv/5000g's (1)
CLIP: OK

Nagy Engineers, Inc. - PDIPLOT2 Ver 2016.1.56.1 - Case Method & iCAP® Results

Printed: 13-September-2017 Test started: 11-September-2017

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 33.5 to 35.0 ft - NWJ Rod - Mud Rotary



Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 33.5 to 35.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 39.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress BPM: Blows per Minute
CSI: Max F1 or F2 Compr. Stress FMX: Maximum Force
EMX: Max Transferred Energy VMX: Maximum Velocity
ETR: Energy Transfer Ratio

BL#	Depth ft	BLC bl/6in	TYPE	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
9	34.00	9	AV9	29.7	30.2	0.318	90.9	45.1	42	15.2
			MAX	30.0	30.6	0.324	92.6	50.5	43	15.5
21	34.50	12	AV12	29.9	30.5	0.318	90.8	50.6	42	15.3
			MAX	30.3	31.0	0.323	92.2	50.7	43	15.6
33	35.00	12	AV12	29.9	30.6	0.318	90.9	50.5	43	15.4
			MAX	30.5	30.9	0.323	92.4	50.6	43	15.7
			Average	29.9	30.4	0.318	90.9	49.0	42	15.3
			Maximum	30.5	31.0	0.324	92.6	50.7	43	15.7

Total number of blows analyzed: 33

BL# Sensors

1-33 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 37 seconds 2:22 PM - 2:23 PM BN 1 - 33

Thompson Engineering SPT Calibration - CME 550X (SN 355273) - 33.5 to 35.0 ft NWJ Rod - Mud Rotary
OP: MJN Date: 11-September-2017

AR: 1.42 in² SP: 0.492 k/ft³
LE: 39.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 0.00 []

CSX: Max Measured Compr. Stress
CSI: Max F1 or F2 Compr. Stress
EMX: Max Transferred Energy
ETR: Energy Transfer Ratio
BPM: Blows per Minute
FMX: Maximum Force
VMX: Maximum Velocity

BL#	Depth ft	BLC bl/6in	CSX ksi	CSI ksi	EMX k-ft	ETR (%)	BPM bpm	FMX kips	VMX f/s
10	34.04	12	29.9	30.4	0.313	89.3	50.7	42	15.3
11	34.08	12	30.0	30.5	0.317	90.5	50.5	43	15.4
12	34.13	12	29.9	30.5	0.323	92.2	50.6	43	15.4
13	34.17	12	30.3	31.0	0.321	91.7	50.5	43	15.6
14	34.21	12	29.8	30.4	0.319	91.2	50.5	42	15.3
15	34.25	12	30.0	30.7	0.316	90.4	50.5	43	15.4
16	34.29	12	29.7	30.2	0.319	91.0	50.6	42	15.2
17	34.33	12	29.8	30.4	0.317	90.6	50.5	42	15.3
18	34.38	12	29.8	30.3	0.319	91.2	50.5	42	15.2
19	34.42	12	30.0	30.6	0.318	90.8	50.7	43	15.4
20	34.46	12	29.8	30.3	0.318	90.8	50.5	42	15.3
21	34.50	12	29.6	30.1	0.315	90.1	50.5	42	15.1
22	34.54	12	29.9	30.5	0.320	91.3	50.6	42	15.4
23	34.58	12	29.8	30.4	0.316	90.4	50.5	42	15.3
24	34.63	12	30.0	30.8	0.320	91.4	50.5	43	15.4
25	34.67	12	29.7	30.4	0.316	90.2	50.6	42	15.2
26	34.71	12	29.9	30.5	0.314	89.8	50.5	42	15.3
27	34.75	12	30.5	30.8	0.323	92.2	50.5	43	15.7
28	34.79	12	29.9	30.6	0.314	89.7	50.5	42	15.3
29	34.83	12	30.0	30.7	0.323	92.4	50.5	43	15.4
30	34.88	12	29.8	30.5	0.316	90.3	50.6	42	15.3
31	34.92	12	29.9	30.5	0.318	90.8	50.5	42	15.3
32	34.96	12	29.9	30.6	0.320	91.5	50.5	42	15.4
33	35.00	12	30.2	30.9	0.319	91.2	50.5	43	15.4
		Average	29.9	30.5	0.318	90.9	50.5	42	15.3
		Maximum	30.5	31.0	0.323	92.4	50.7	43	15.7

Total number of blows analyzed: 24

BL# Sensors

10-33 F3: [413 NWJ-1] 212.3 (1.00); F4: [413 NWJ-2] 213.9 (1.00); A3: [K3773] 380.0 (1.00); A4: [K4822] 355.0 (1.00)

Time Summary

Drive 37 seconds 2:22 PM - 2:23 PM BN 1 - 33

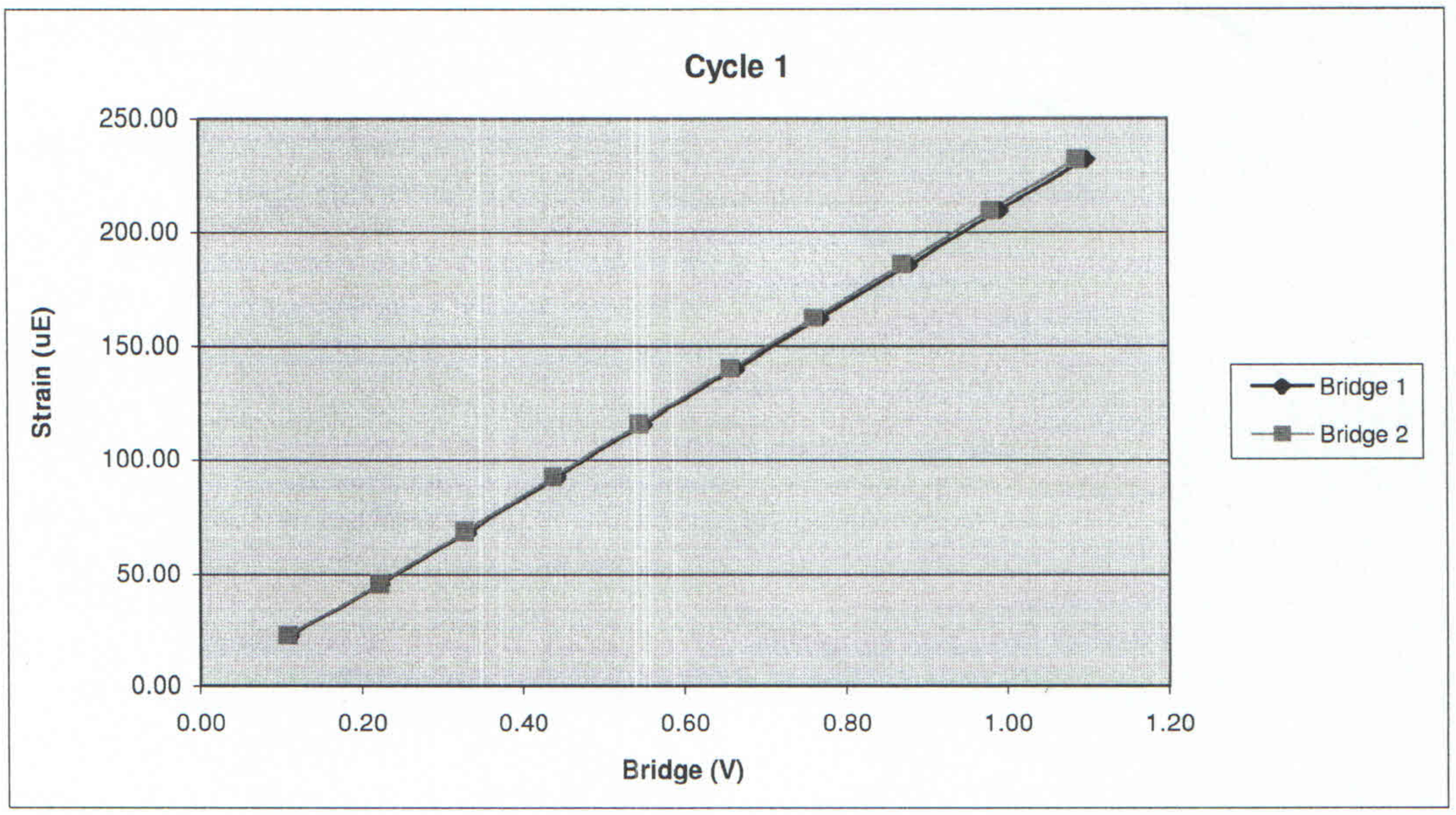
Appendix B

Dynamic Measurement Calibration Sheets

413NWJ		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	990.99	22.25	0.11	0.11
3	2002.63	46.15	0.22	0.22
4	2988.10	69.17	0.33	0.33
5	3994.04	92.72	0.44	0.44
6	4963.98	115.99	0.55	0.54
7	5994.11	140.04	0.66	0.66
8	6930.41	162.12	0.77	0.76
9	7939.49	185.78	0.88	0.87
10	8950.34	209.60	0.99	0.98
11	9926.18	232.15	1.10	1.09

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**9036.37**	**Force Calibration (lb/V)**	**9125.33**
Offset	-9.46	Offset	-2.08
Correlation	1.000000	Correlation	0.999997
Strain Calibration (µE/V)	**212.51**	**Strain Calibration (µE/V)**	**214.61**
Offset	-1.22	Offset	-1.05
Correlation	0.999996	Correlation	0.999998

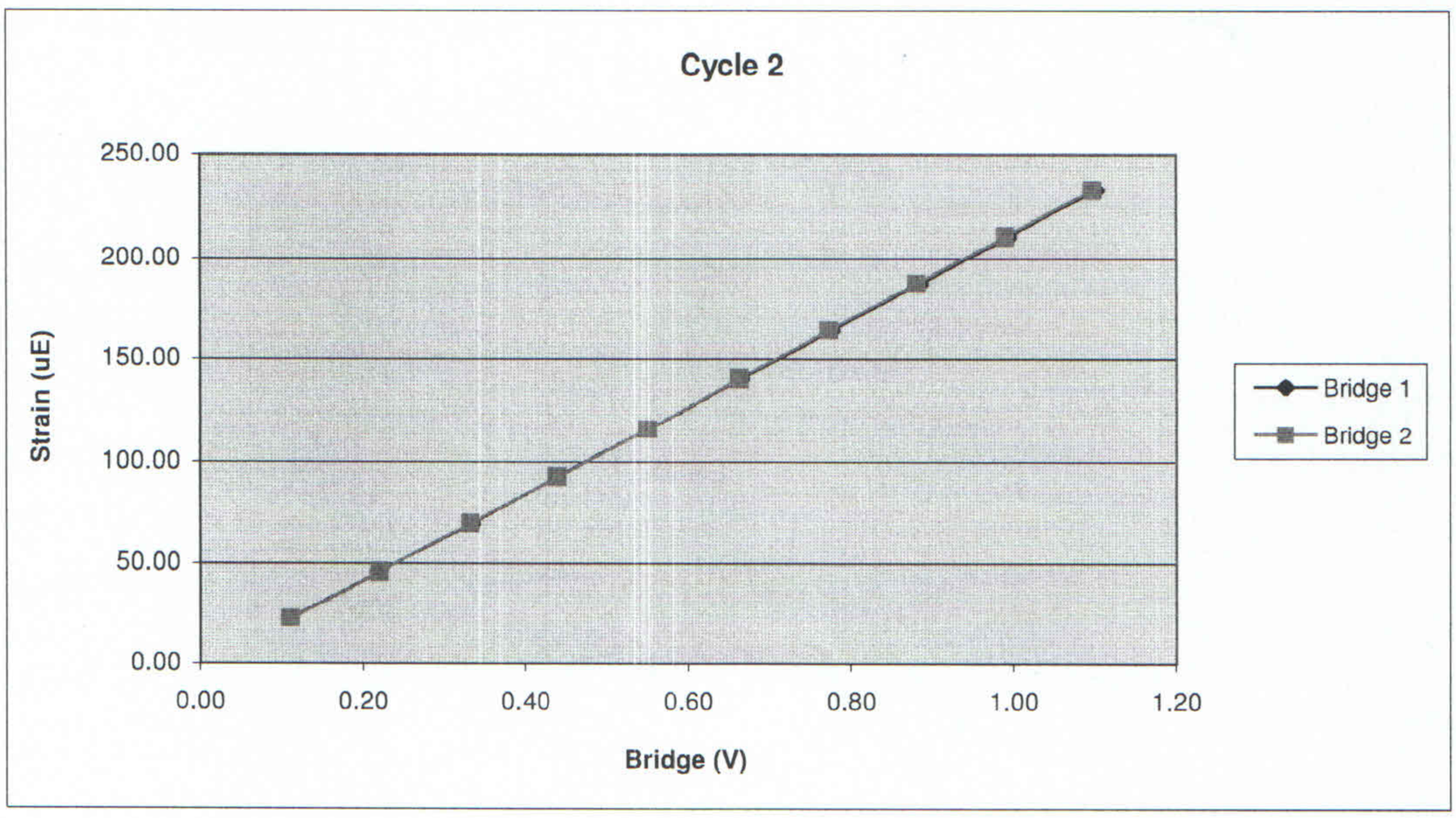
Force Strain Calibration	
EA (Kips)	**42521.15**
Offset	42.49
Correlation	0.999997



413NWJ		Cycle 2		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	987.05	22.73	0.11	0.11
3	1966.04	45.88	0.22	0.22
4	2986.33	69.92	0.33	0.33
5	3951.35	92.68	0.44	0.44
6	4949.03	116.49	0.55	0.55
7	5960.47	140.42	0.66	0.66
8	6953.03	163.97	0.78	0.77
9	7934.77	187.50	0.88	0.88
10	8928.90	210.76	0.99	0.99
11	9905.13	233.34	1.10	1.10

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**8992.65**	**Force Calibration (lb/V)**	**9034.81**
Offset	**-7.95**	Offset	**-19.15**
Correlation	**0.999996**	Correlation	**0.999998**
Strain Calibration (µE/V)	**212.81**	**Strain Calibration (µE/V)**	**213.81**
Offset	**-0.84**	Offset	**-1.11**
Correlation	**0.999997**	Correlation	**0.999996**

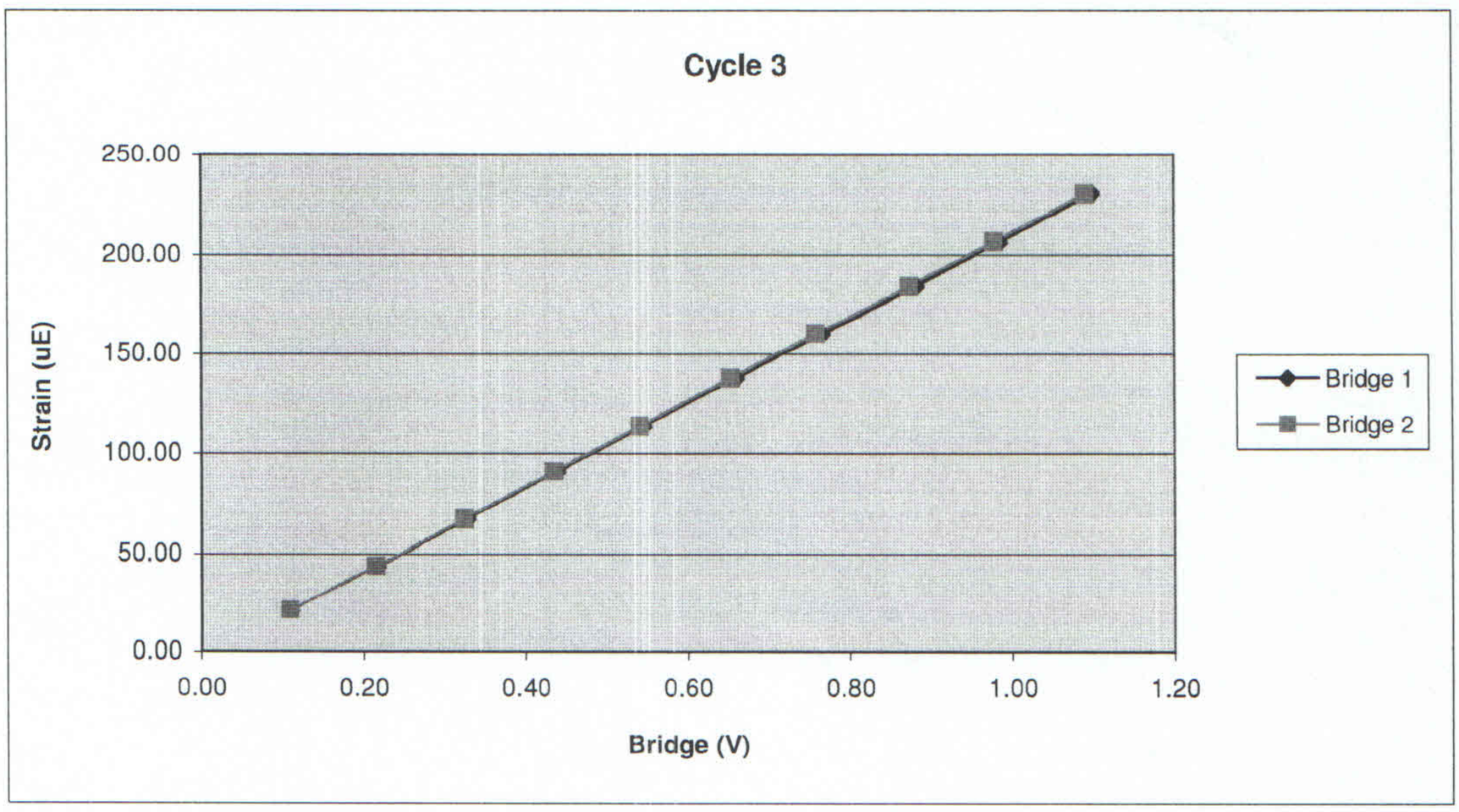
Force Strain Calibration	
EA (Kips)	**42256.93**
Offset	**27.76**
Correlation	**0.999996**



413NWJ		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	978.00	21.53	0.11	0.11
3	1923.94	43.44	0.22	0.21
4	2938.53	67.46	0.33	0.32
5	3944.67	91.22	0.44	0.44
6	4898.87	113.58	0.54	0.54
7	5921.72	137.82	0.66	0.65
8	6874.74	160.10	0.77	0.76
9	7926.90	184.40	0.88	0.87
10	8859.86	206.60	0.98	0.98
11	9889.59	230.60	1.10	1.09

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**9008.15**	**Force Calibration (lb/V)**	**9088.85**
Offset	**-7.86**	Offset	**-13.21**
Correlation	**0.999998**	Correlation	**0.999998**
Strain Calibration (µE/V)	**211.51**	**Strain Calibration (µE/V)**	**213.41**
Offset	**-1.67**	Offset	**-1.80**
Correlation	**0.999995**	Correlation	**0.999993**

Force Strain Calibration	
EA (Kips)	**42588.80**
Offset	**63.31**
Correlation	**0.999997**



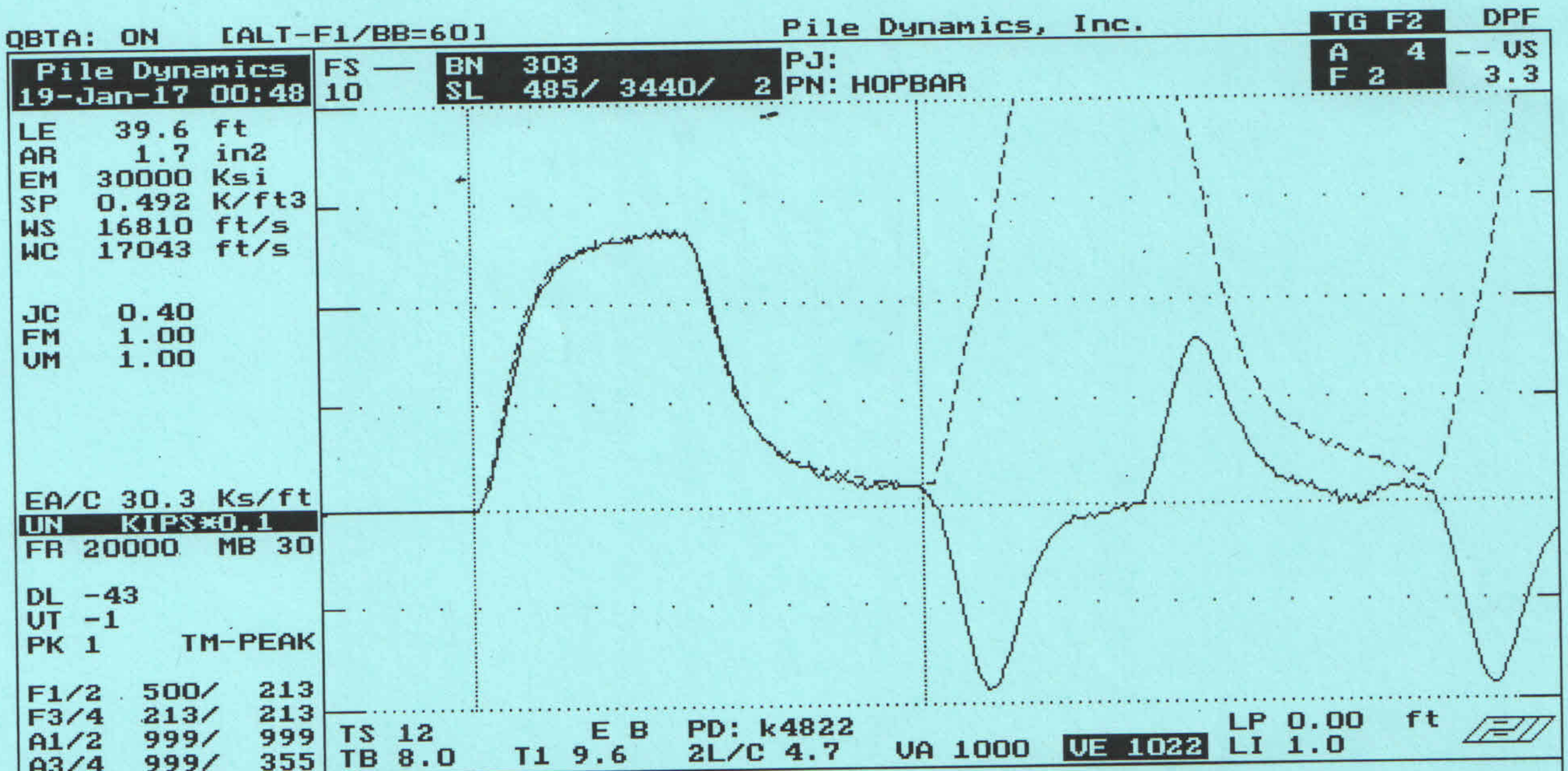
Bridge Excitation (V) 5
Shunt Resitor (ohm) 60.4k

Calibration Factors	413NWJ		
Bridge 1 (µE/V)	212.28	Bridge 2 (µE/V)	213.94
EA Factor (Kips)	42455.63	Area (in^2)	1.42

Calibrated by: _____
Calibrated Date: 6/10/2016

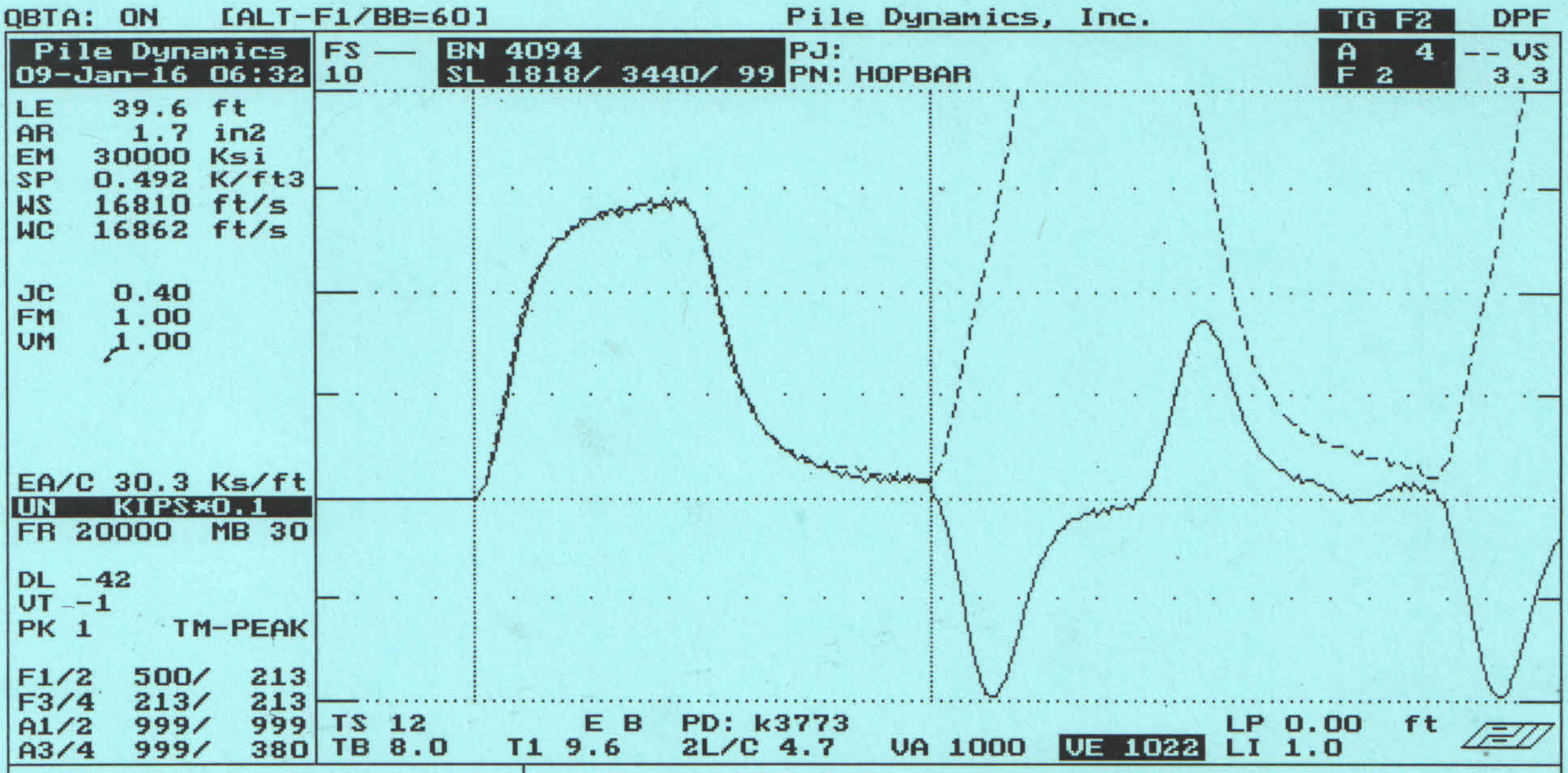
Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.



Smart Sensor

Smart Chip Programmed By K.M.W. **on** 19JAN17 **CRC Value** 5839



Smart Sensor

Smart Chip Programmed By T.M.W. **on** 14JAN16 **CRC Value** 317C