Memo

To: Elk Street Redevelopment, LLC

From: Rick Egan

CC: John Peterson

Date: February 20, 2017

Ref: OU2 Geotechnical Due Diligence

Amec Foster Wheeler E&I (Amec Foster Wheeler) has prepared this memorandum to summarize a preliminary geotechnical investigation that was conducted during October 2016 to support the redevelopment of Operable Unit 2 (OU2) portion of the former ExxonMobil Terminal located on Elk Street in Buffalo, New York. The intent of the investigation was to collect subsurface data to better define the subsurface conditions at the site.

1.0 Investigation

The investigation included advancing ten geotechnical borings from ground surface to bedrock at widely spaced locations throughout the site. At two of the boring locations, the bedrock was cored to access the type and condition of the bedrock which underlies the site. The approximate locations of the borings, designated OU2-SB-100 through OU2-SB-109, are shown on the attached Figure 1 – Exploration Location Plan. Amec Foster Wheeler contracted Parratt Wolff, Inc. of East Syracuse, New York to advance the borings via 3 ¼" inside diameter hollow stem augers. The drilling operations were monitored on a full-time basis by an Amec Foster Wheeler geologist who directed drilling operations, collected soil samples, and logged the subsurface conditions encountered. As the borings were advanced through overburden soils, geotechnical testing/sampling and characterization was carried out as follows:

- Standard Penetration Test (SPT) sampling was conducted at continuous intervals (i.e., 2 feet) through the overburden soils in OU2-SB101 and OU2-SB102, using a 2-inch outside diameter (OD) split-spoon sampler. Due to consistency within the lacustrine clay stratum, SPTs were conducted at standard five foot intervals in the remaining borings within the clay stratum. SPTs were performed in accordance with ASTM D 1586, Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils;

Amec Foster Wheeler
Environment & Infrastructure Inc.
511 Congress Street
Suite 200
Portland, Maine 04101
207-775-5401
amecfw.com

- Undisturbed thin-walled Shelby tube samples (3-inch diameter) were obtained within the clay stratum in each boring. Shelby tubes were collected in general accordance with ASTM D 1587, Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes;

- Soil samples were described using procedures outlined in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Representative soil samples were sealed in glass jars and submitted to a laboratory for geotechnical testing;

- Coring of bedrock was conducting at OU2-SB100 and OU2-SB108. At each of these borings, a five foot rock core was conducted. The rock cores were conducted in accordance with ASTM D2113.

The Geotechnical Boring Records are provided in Attachment A.

2.0 Geotechnical Laboratory Testing

Amec Foster Wheeler contracted Geotechnics of Pittsburgh, Pennsylvania to conduct geotechnical laboratory testing of selected soils samples obtained from the borings. The following tests were performed.

- 5 Particle-size analysis(ASTM D422);
- 14 Atterberg limits determinations (ASTM D4318);
- 4 One dimensional consolidation tests (ASTM D2435);
- 4 Unconsolidated Undrained Triaxial tests (ASTM D2850); and
- 3 Specific Gravities (ASTM D854)

Geotechnical laboratory testing was performed in accordance with the referenced ASTM standard. Individual test reports are provided in Attachment B.

3.0 Subsurface Conditions

The following subsections describe the site soil and groundwater conditions encountered, based on results of the geotechnical explorations and laboratory testing. Detailed descriptions of the conditions encountered at each boring are provided on the Geotechnical Exploration Records in Appendix A. Refer to the Key to Symbols and Descriptions in Appendix A for definitions of the symbols and/or terminology used on the Geotechnical Exploration Records.

3.1 Fill

Fill was encountered at each boring location and ranged in thickness from 2 feet to 10 feet. The fill generally consisted of fine to coarse sand with varying amounts of gravel and silt to fine, to coarse gravel with varying amounts of fine sand and silt. Varying amounts of demolition debris including brick, concrete and wood fragments were encountered at each location. SPT N-

values ranged from 3 to 42 blows per foot (bpf) which indicates very loose to dense conditions. The presence of construction debris may have resulted in higher N-values.

3.2 Alluvial Deposit

An alluvial deposit was encountered in seven of the boring locations. Alluvium was not encountered at OU2-SB-100, OU2-SB-101 and OU2-SB-107. The alluvial deposits were generally described as fine sand with some silt and clay, to clay with some sand and silt, to silt with trace clay. The soils were classified in accordance with the Unified Soil Classification System (USCS) as SC, SM, CL, ML, and ML-CL. In the coarse grained soils, SPT N-values ranged from 11 to 15 bpf, indicating medium dense conditions. Within the fine grained soils SPT N-values ranged between 4 and 27 bpf indicating medium stiff to very stiff conditions.

3.3 Lacustrine Clay

A lacustrine clay stratum was encountered at each boring location underlying the alluvial deposit, where the alluvium was present, or directly underlying fill. The thickness of the clay stratum ranged between 25 and 39 feet. The lacustrine clay was described as clay with trace silt, to silt with some clay. The clay stratum was classified in accordance with the USCS as ML-CL and CL. SPT N-Values ranged between 0 and 20 bpf, indicating very soft to very stiff conditions. The higher N-values generally occurred within the upper five feet of the clay stratum. Atterberg limit testing indicates that the clay is a low plasticity clay with liquids limits ranging between 34% and 47%, plastic limits ranging between 18% and 21% and plasticity index ranging between 15% and 28%.

3.4 Glacial Till

Immediately underlying the lacustrine clay, a thin layer of glacial till was encountered in all borings with the exception of OU2-SB-106, OU2-SB-108 and OU2-SB-109. The glacial till was described as gravel with silt, to fine sand with silt and clay, to clay with sand, to fine to coarse sand with some gravel. The tills were classified as GM, SC, CL, SM-GM, and GM-GW in accordance with the USCS. The thickness of the glacial till ranged between 1 foot and 9.5 feet where encountered. SPT N-values ranged between 15 and 78 indicating medium dense to very dense conditions.

3.5 Bedrock

Bedrock was interpreted to have been encountered at each boring location by refusal of further advancement of augers. Bedrock cores were conducted in borings OU2-SP-100 and OU2-SP-108. The bedrock was described as dark gray Biosparite Onondaga Dolomite. Rock Quality Designation (RQD) for the two cores were 76 and 95. These values indicate good to excellent rock conditions.

3.6 Groundwater

Groundwater was observed at depths ranging between 2 and 5 feet bgs. Water levels were observed within the boreholes during the subsurface exploration program. Site groundwater levels will fluctuate in response to precipitation events, seasonal conditions, construction

Continued.

activity, site use, and adjacent site use, and therefore may vary from the conditions encountered during this investigation.

FIGURES

Prepared/Date: JVM 02/17/31
Checked/Date: RSE 02/17/17

REMEDIAL DESIGN
ELK STREET PROPERTY
BUFFALO, NEW YORK

amec foster wheeler

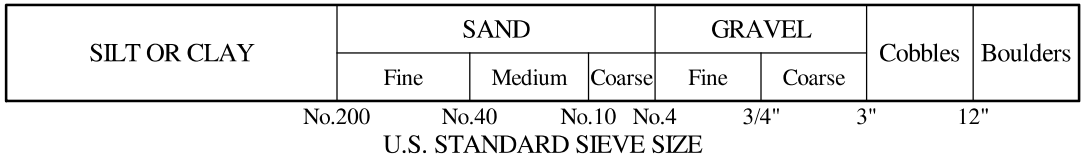
GEOTECHNICAL
BORING LOCATION PLAN
Project 3617-16-7397
Figure 1

ATTACHMENT A

GEOTECHNICAL BORING RECORDS

MAJOR DIVISIONS			GROUP SYMBOLS		GENERAL DESCRIPTIONS
COARSE GRAINED SOILS (More than 50% RETAINED on No. 200 sieve)	GRAVELS (More than 50% of coarse fraction RETAINED on No. 4 sieve)	CLEAN GRAVELS (Less than 5% fines)		GW	Well graded gravels or gravel-sand mixtures; trace or no fines.
				GP	Poorly graded gravels or gravel-sand mixtures; trace or no fines.
		GRAVELS WITH FINES (More than 12% fines)		GM	Silty gravels or gravel-sand-silt mixtures.
				GC	Clayey gravels or gravel-sand-clay mixtures.
	SANDS (50% or more of coarse fraction PASSES the No. 4 sieve)	CLEAN SANDS (Less than 5% fines)		SW	Well graded sands or sand-gravel mixtures; trace or no fines.
				SP	Poorly graded sands or sand-gravel mixtures, trace or no fines.
		SANDS WITH FINES (More than 12% fines)		SM	Silty sands or sand-gravel-silt mixtures.
				SC	Clayey sands or sand-gravel-clay mixtures.
FINE GRAINED SOILS (50% or more PASSES the No. 200 sieve)	SILTS AND CLAYS (Liquid Limit LESS than 50)			ML	Inorganic silts or rock flour. Non-plastic or very slightly plastic. PI < 4 or plots below "A" line.
				CL	Inorganic lean clay. Low to medium plasticity. PI > 7 and plots on or above "A" line.
				OL	Organic silts, clays, and silty clays. Low to medium plasticity.
	SILTS AND CLAYS (Liquid Limit of 50 or GREATER)			MH	Inorganic elastic silt. PI plots below "A" line.
				CH	Inorganic fat clay. High plasticity. PI plots on or above "A" line.
				OH	Organic silts and clays. High plasticity.
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils. Decomposed vegetable tissue. Fibrous to amorphous texture.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.



References: ASTM D 2487 (Unified Soil Classification System) and ASTM D 2488 (Visual-Manual Procedure).

TYPICAL SYMBOLS

Shelby Tube	Auger Cuttings
Standard Split Spoon Sample	3" Split Spoon Sample
Rock Core	Dynamic Cone Penetrometer
Vane Shear	Bulk/Grab Sample
Geoprobe Sample	Sonic or Vibro-Core Sample
Water Table at time of drilling	Water Table after 24 hours

CORRELATION OF STANDARD PENETRATION TEST (SPT) WITH RELATIVE DENSITY AND CONSISTENCY

GRAVEL, SAND, & SILT (NON-PLASTIC)		SILT (PLASTIC) & CLAY		
N-Value	Relative Density	N-Value	Su (psf)	Consistency
0 - 4	Very Loose	0 - 2	0 - 250	Very Soft
4 - 10	Loose	2 - 4	250 - 500	Soft
10 - 30	Medium Dense	4 - 8	500 - 1000	Medium Stiff
30 - 50	Dense	8 - 15	1000 - 2000	Stiff
Over 50	Very Dense	15 - 30	2000 - 4000	Very Stiff
		Over 30	Over 4000	Hard

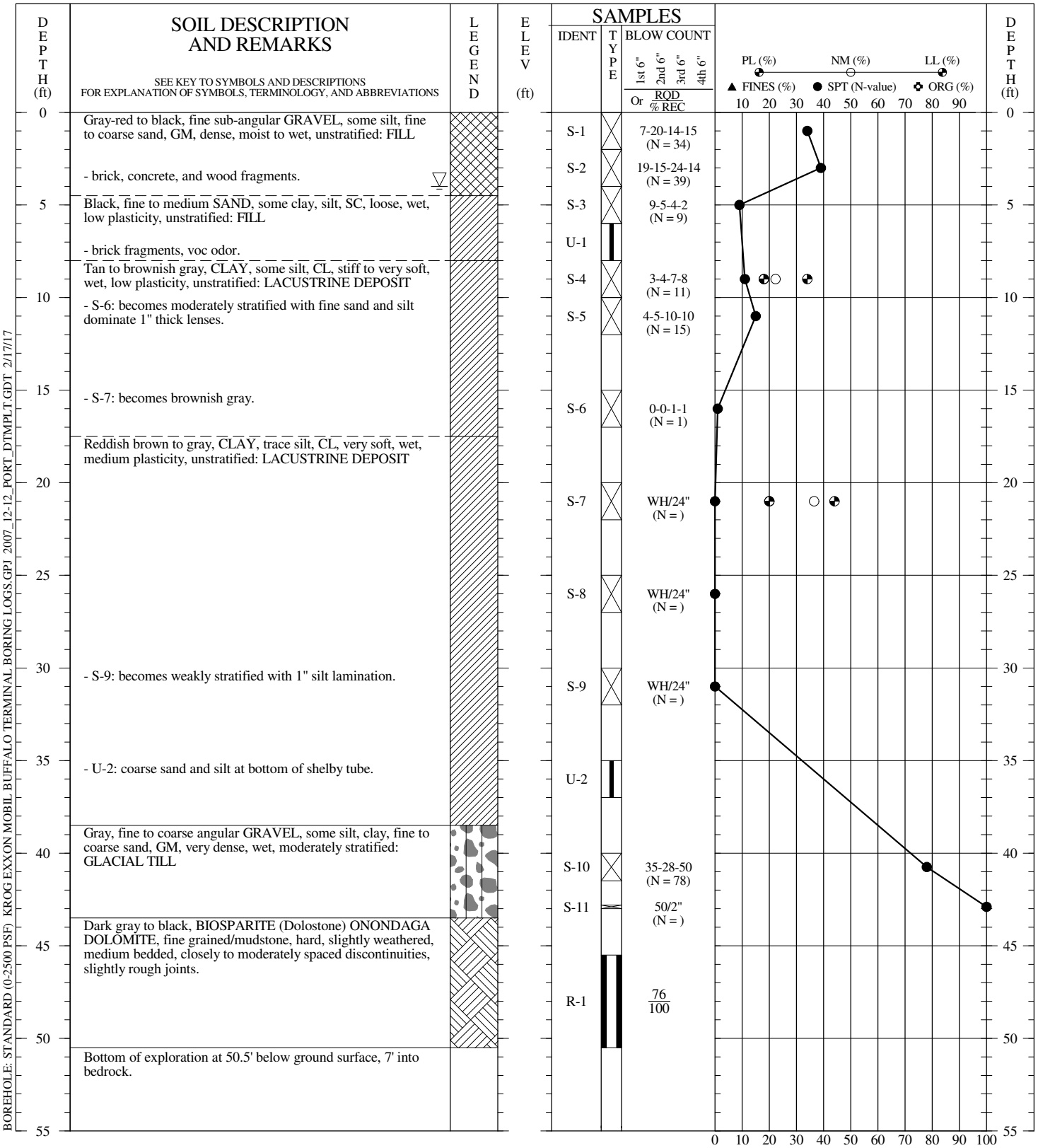
SPT Notes: WR = Weight of Rods; WH = Weight of Hammer

TERMS DESCRIBING SOILS (excludes particles > 3", organics, debris, etc.)	TERMS DESCRIBING MATERIALS (i.e. particles > 3", organics, debris, etc.)
Trace: Particles present, but < 5%	Occasional: Particles present, but < 10%
Few: 5% to 15%	Some: 10% to 25%
Little: 15% to 25%	Frequent: > 25%
Some: 25% to 50%	

TERMS DESCRIBING MOISTURE	TERMS DESCRIBING STRUCTURE
Dry: Absence of moisture; dusty	Layer: > 3" thick
Moist: Damp, but no visible water	Seam: 1/16" to 3" thick
Wet: Visible/free water	Parting: < 1/16" thick

KEY TO SYMBOLS AND DESCRIPTIONS

amec foster wheeler



DRILLER: Parratt Wolff
RIG TYPE: CME-55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

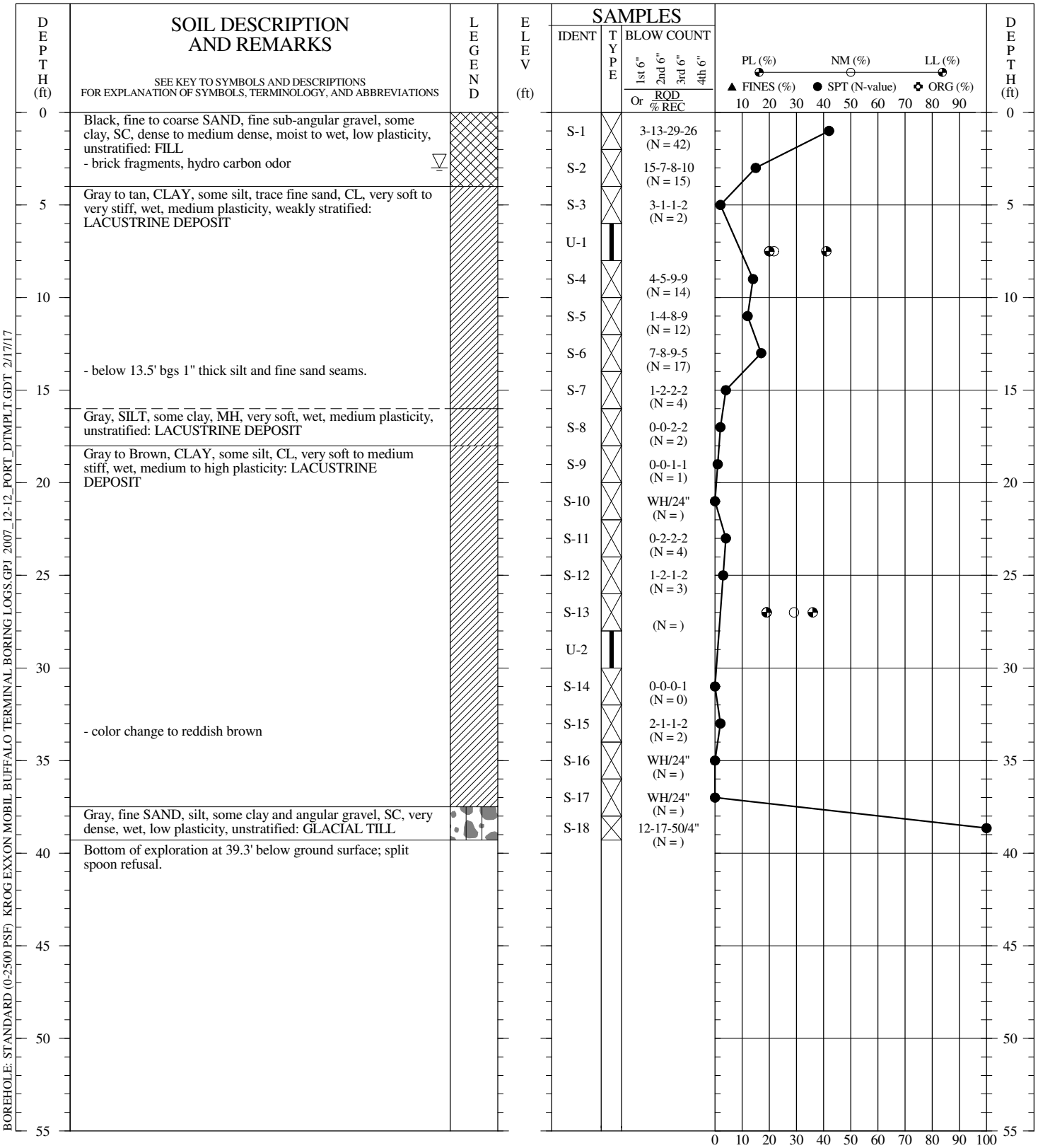
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-100
DRILLED: 10/26/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



DRILLER: Parratt Wolff
RIG TYPE: CME-55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

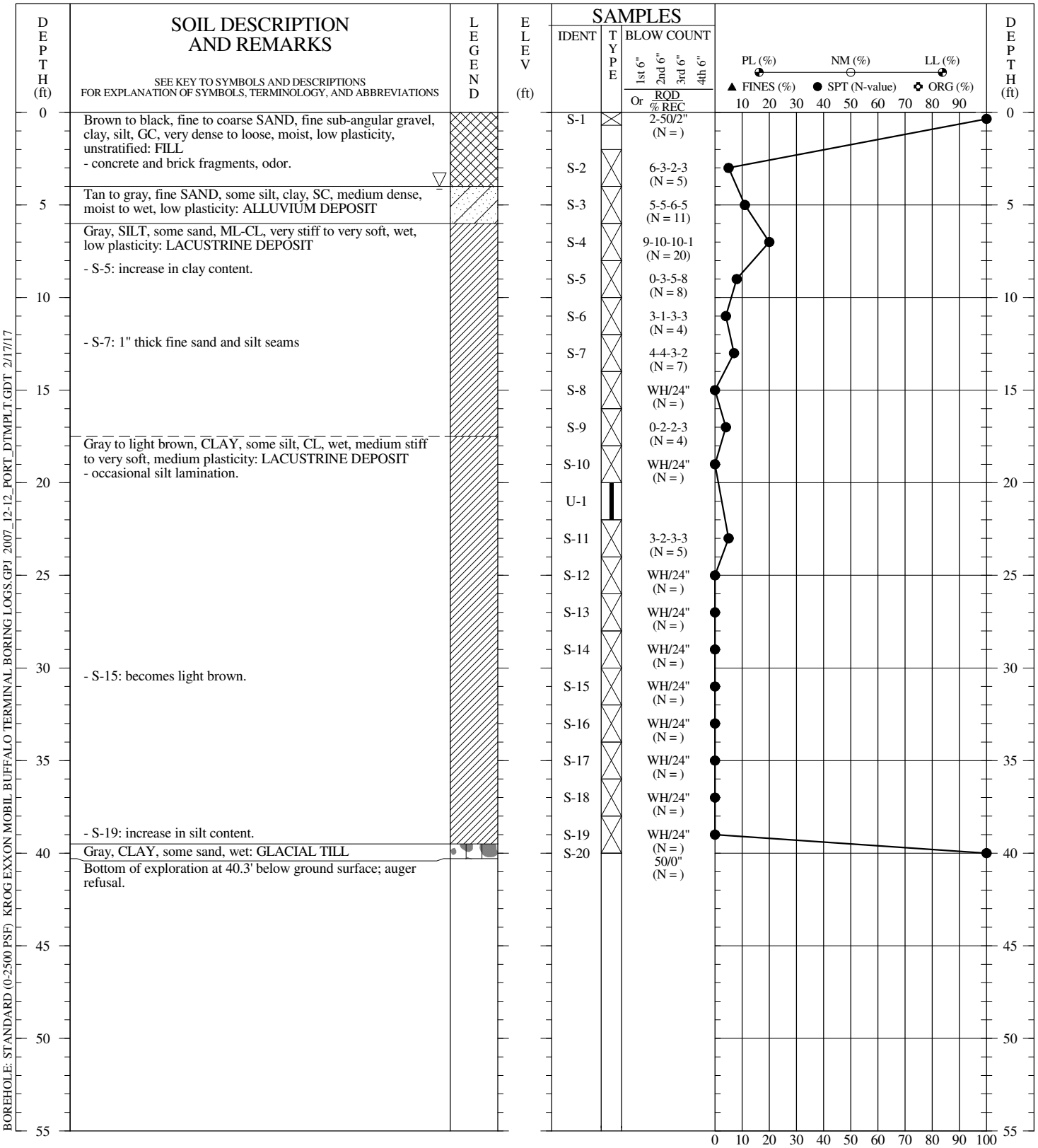
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-101
DRILLED: 10/24/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



DRILLER: Parratt Wolff
RIG TYPE: CME-55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

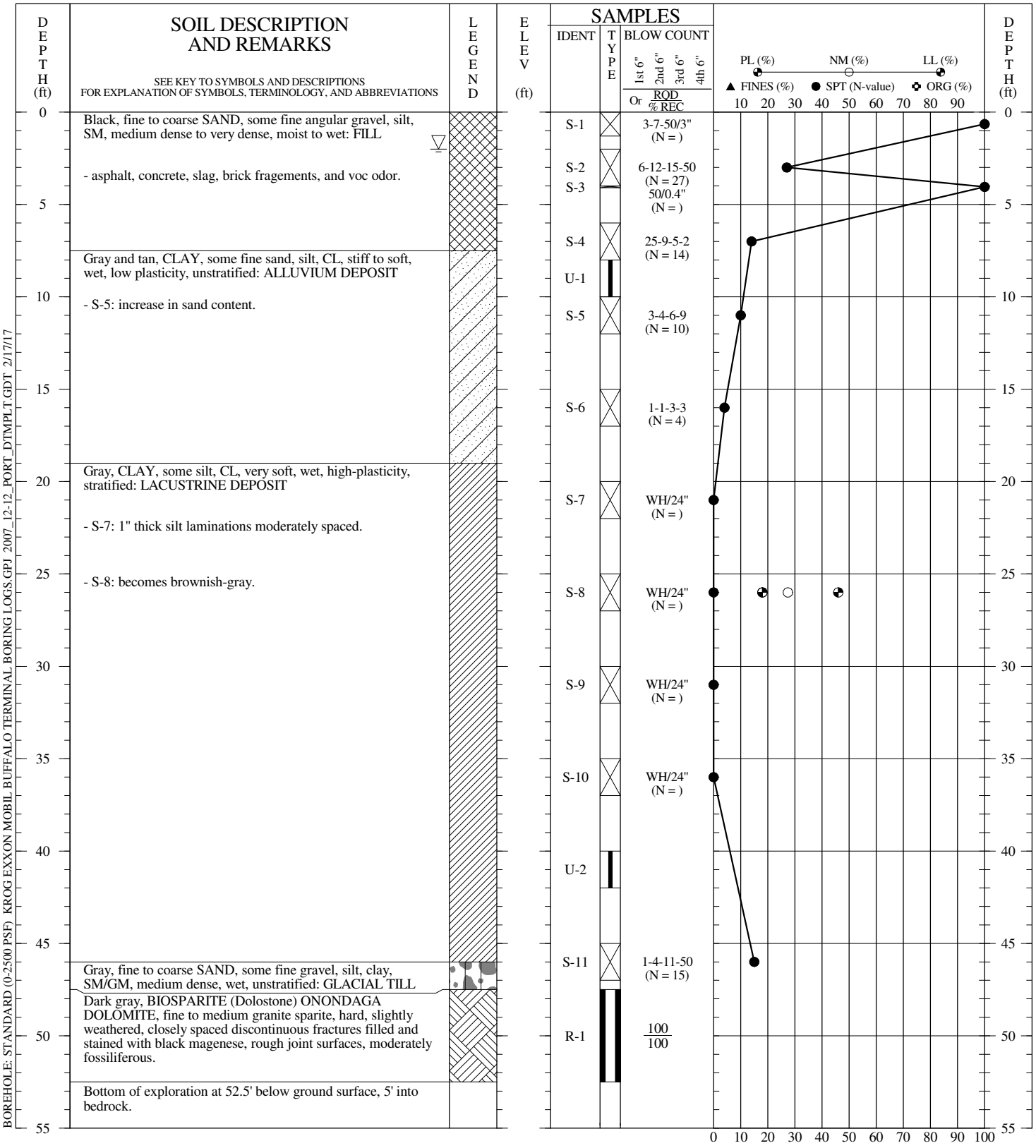
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-102
DRILLED: 10/25/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



DRILLER: Parratt Wolff
RIG TYPE: CME 55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

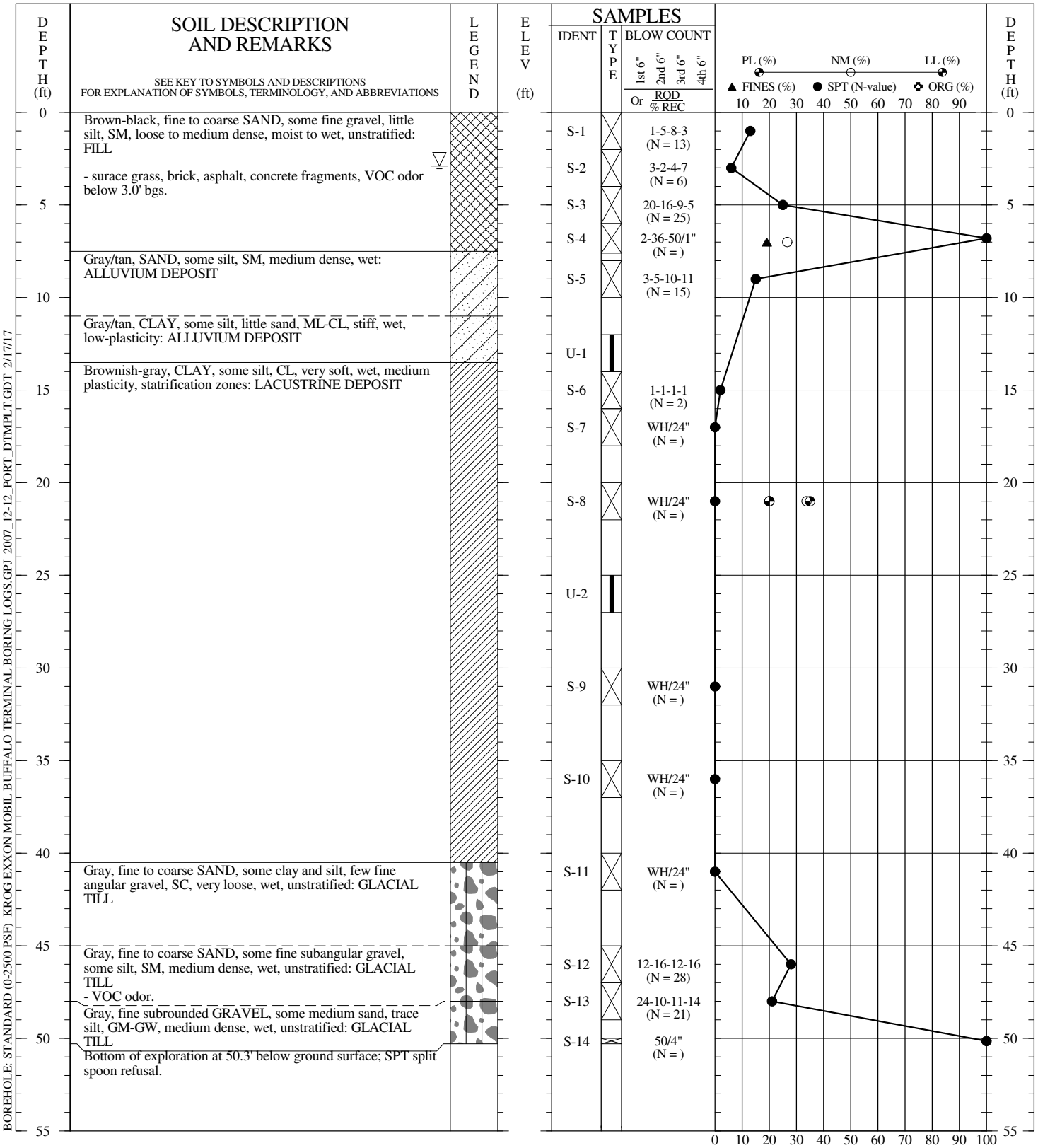
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-103
DRILLED: 11/01/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



DRILLER: Parratt Wolff
RIG TYPE: CME-55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

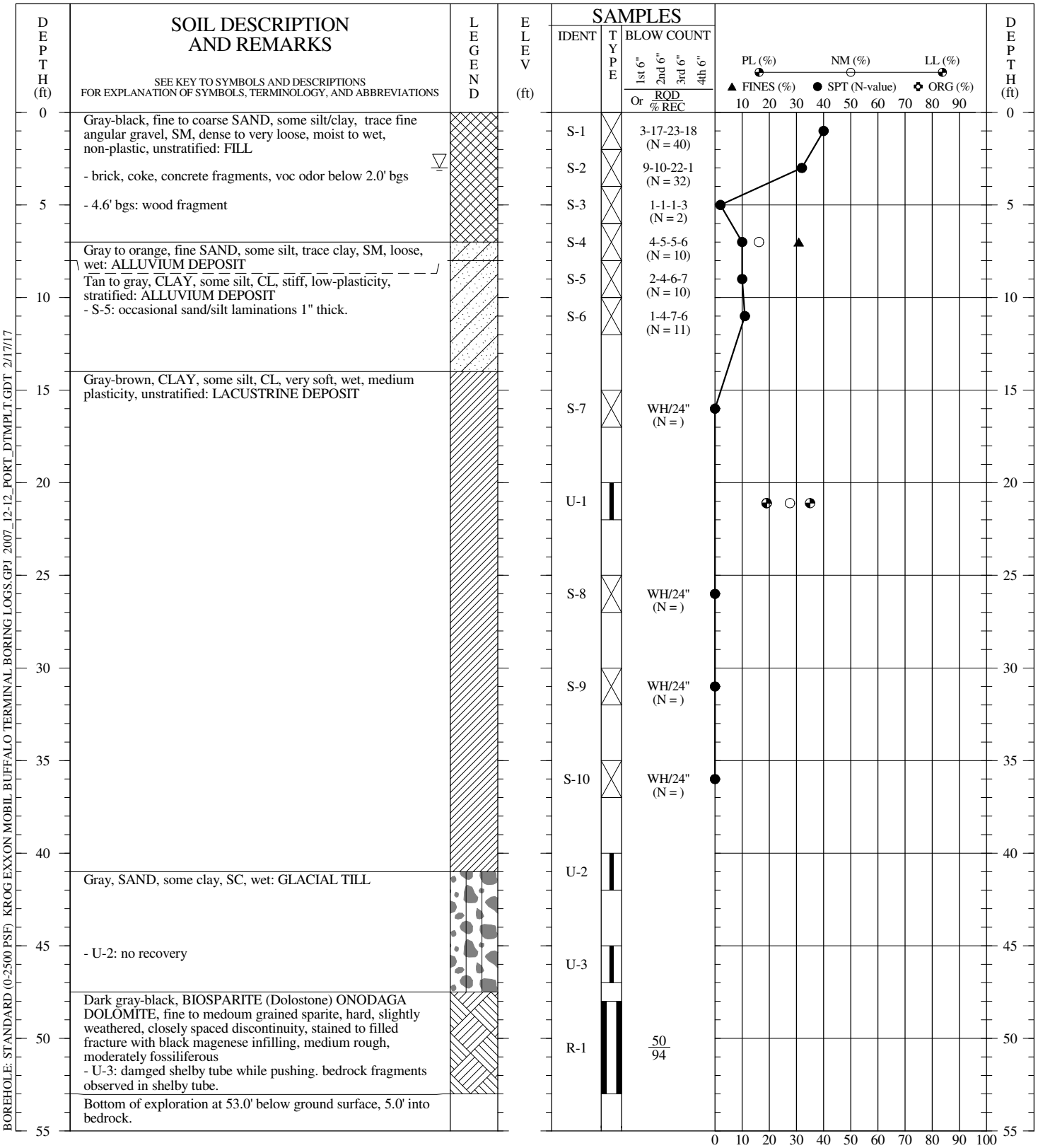
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-104
DRILLED: 11/04/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



DRILLER: Parratt Wolff
RIG TYPE: CME-55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

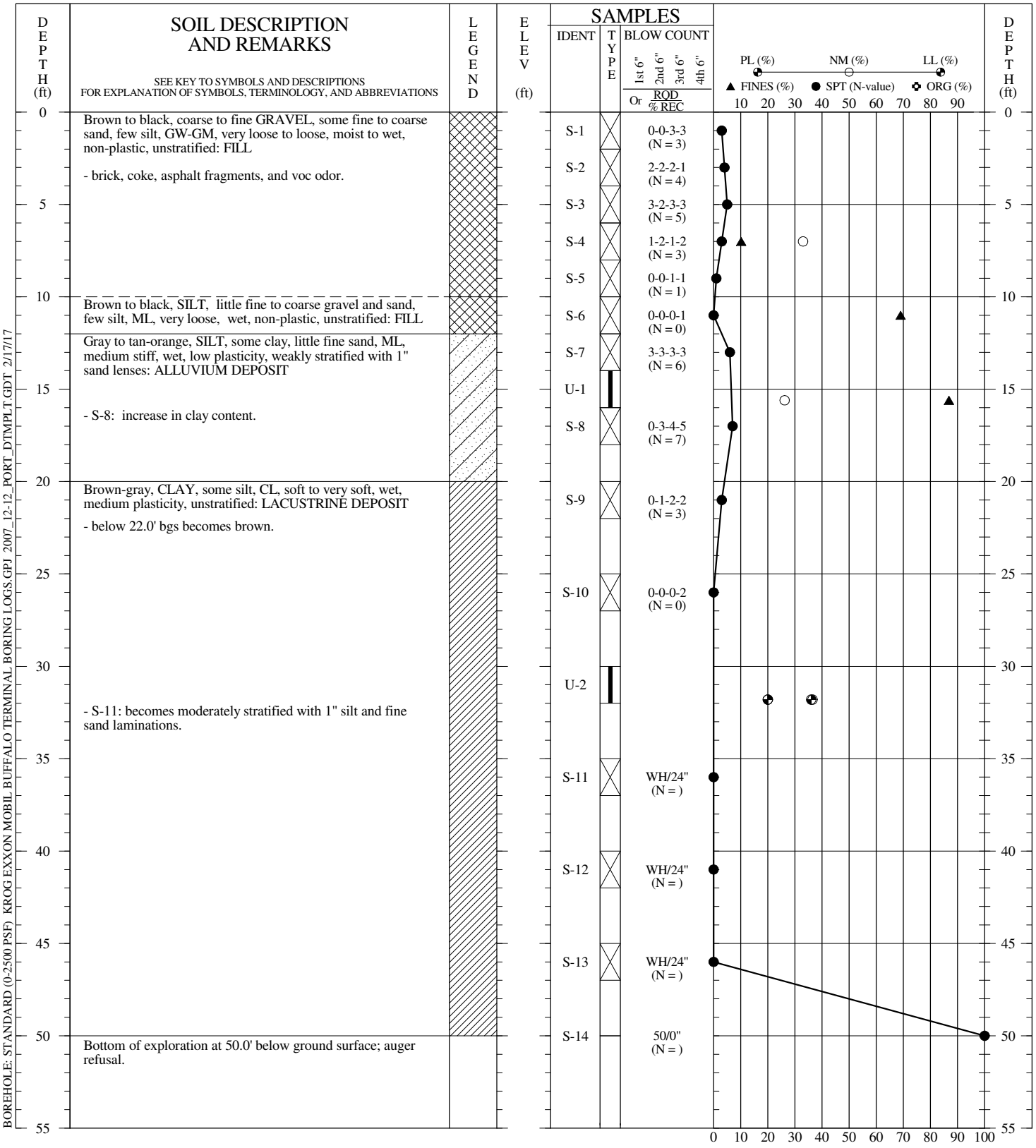
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-105
DRILLED: 10/31/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



BOREHOLE: STANDARD (0-2500 PSF) KROG EXXON MOBIL BUFFALO TERMINAL BORING LOGS.GPJ 2007_12-12_PORT_DTMPLT.GDT 2/17/17

DRILLER:	Parratt Wolff
RIG TYPE:	CME-55
METHOD:	Hollow-Stem Augers
HOLE DIAM.:	3.25" ID
SPTs:	
REMARKS:	Boring was grouted upon completion.

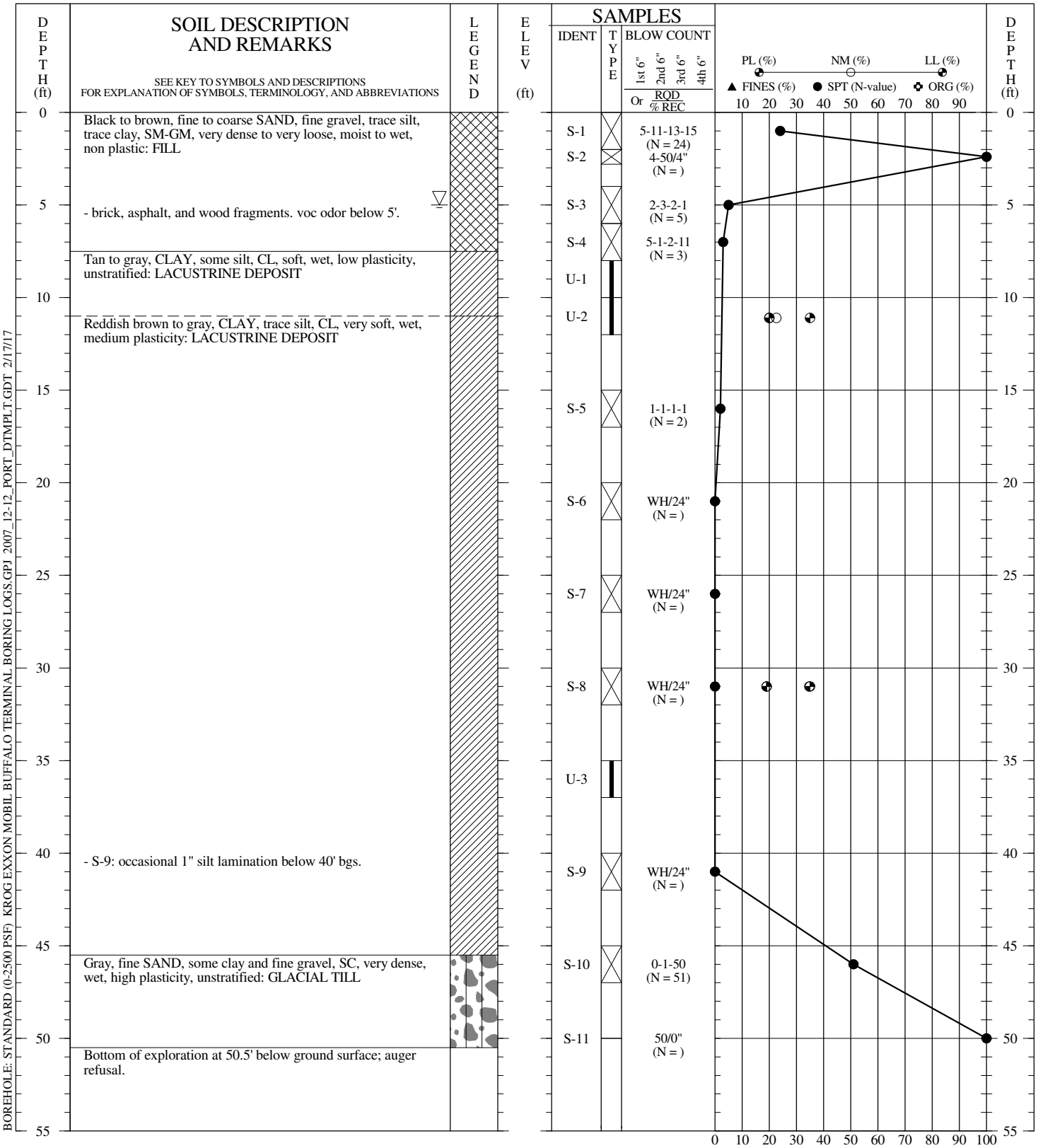
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.:	SB-OU2-106
DRILLED:	10/28/2016
PROJECT:	Krog - Exxon Mobil Buffalo Terminal
LOCATION:	Buffalo, NY
PROJECT NO.:	3617167397

amec foster wheeler



DRILLER:	Parratt Wolff
RIG TYPE:	CME-55
METHOD:	Hollow-Stem Augers
HOLE DIAM.:	3.25" ID
SPTs:	
REMARKS:	Offest 6' South due to encountering rebar in boring hole at about 4' bgs. Boring was grouted upon completion.

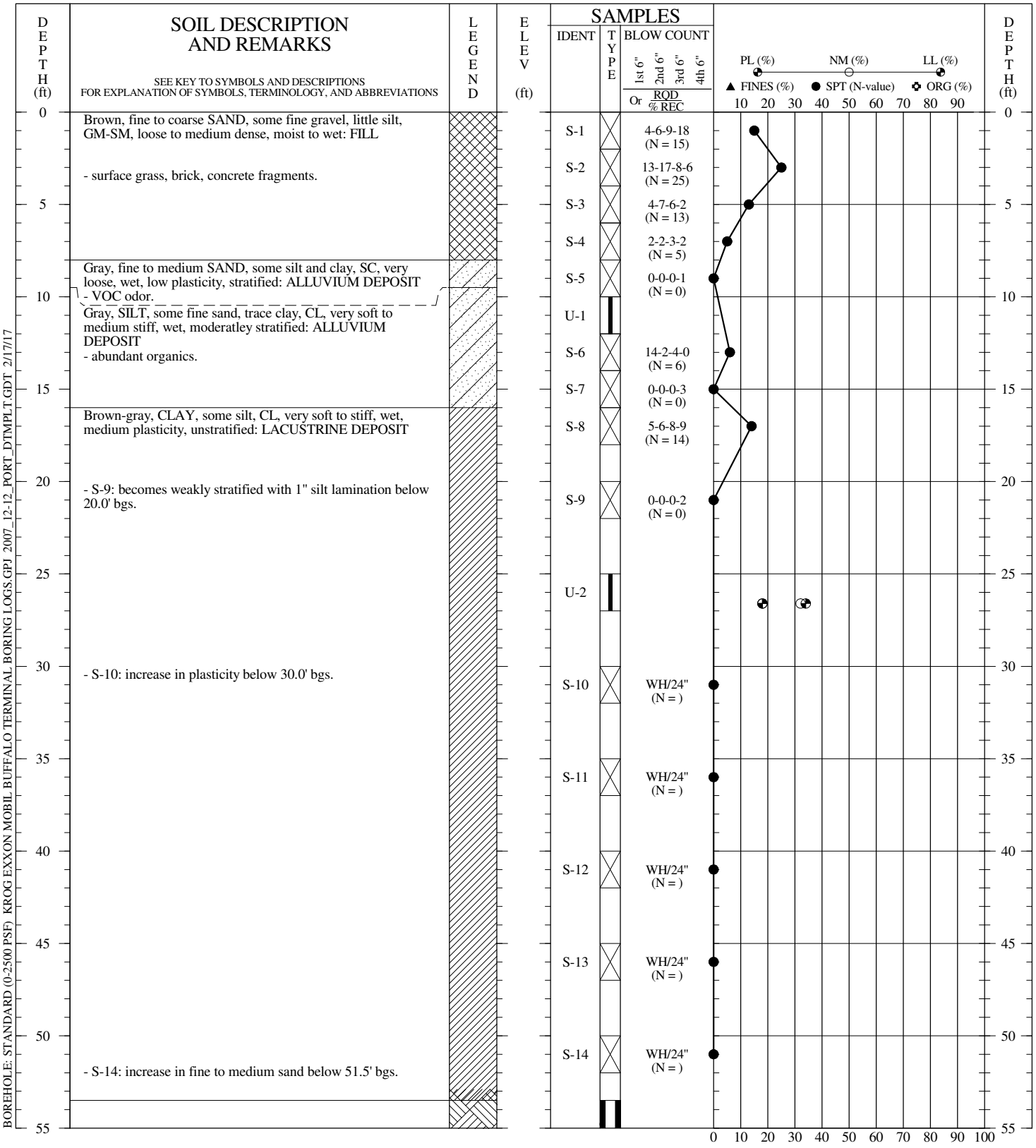
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-107
DRILLED: 10/27/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397 **PAGE** 1 **OF** 1

amec foster wheeler



BOREHOLE: STANDARD (0-2500 PSF) KROG EXXON MOBIL BUFFALO TERMINAL BORING LOGS.GPJ 2007_12-12_PORT_DTMPLT.GDT 2/17/17

DRILLER:	Parratt Wolff
RIG TYPE:	CME-55
METHOD:	Hollow-Stem Augers
HOLE DIAM.:	3.25" ID
SPTs:	
REMARKS:	Boring was grouted upon completion.

LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.:	SB-OU2-108
DRILLED:	11/02/2016
PROJECT:	Krog - Exxon Mobil Buffalo Terminal
LOCATION:	Buffalo, NY
PROJECT NO.:	3617167397

amec foster wheeler

DEPTH (ft)	SOIL DESCRIPTION AND REMARKS SEE KEY TO SYMBOLS AND DESCRIPTIONS FOR EXPLANATION OF SYMBOLS, TERMINOLOGY, AND ABBREVIATIONS	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES BLOW COUNT 1st 6" 2nd 6" 3rd 6" 4th 6" Or RQD % REC	PL (%) NM (%) LL (%) ▲ FINES (%) ● SPT (N-value) ✪ ORG (%) 10 20 30 40 50 60 70 80 90	DEPTH (ft)
55	Dark gray, BIOSPARITE (Dolostone) ONONDAGA DOLOMITE, fine to medium grained sparite, hard, slightly weathered, moderately spaced discontinuity, fractures filled or stained with black maganese, rough fracture surfaces, moderate fossiliferous.			R-1		95/100		55
60	Bottom of exploration at 58.5' below ground surface, 5.6' into bedrock.							60
65								65
70								70
75								75
80								80
85								85
90								90
95								95
100								100
105								105
110							0 10 20 30 40 50 60 70 80 90 100	110

BOREHOLE: STANDARD (0-2500 PSF) KROG EXXON MOBIL BUFFALO TERMINAL BORING LOGS.GPJ 2007_12-12_PORT_DTMPLT.GDT 2/17/17

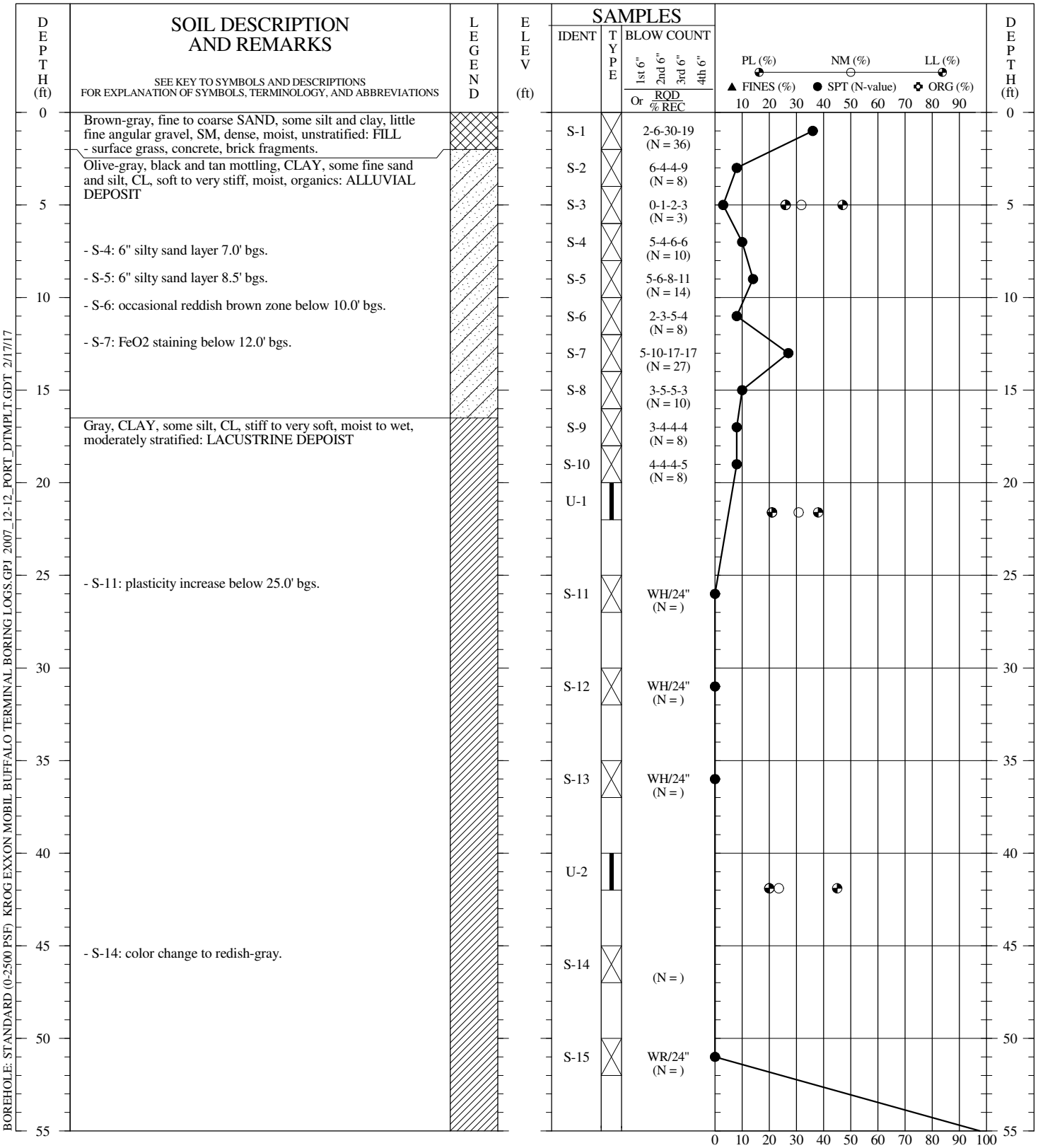
DRILLER: Parratt Wolff
RIG TYPE: CME-55
METHOD: Hollow-Stem Augers
HOLE DIAM.: 3.25" ID
SPTs:
REMARKS: Boring was grouted upon completion.

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.: SB-OU2-108
DRILLED: 11/02/2016
PROJECT: Krog - Exxon Mobil Buffalo Terminal
LOCATION: Buffalo, NY
PROJECT NO.: 3617167397

amec foster wheeler



BOREHOLE: STANDARD (0-2500 PSF) KROG EXXON MOBIL BUFFALO TERMINAL BORING LOGS.GPJ 2007_12-12_PORT_DTMPLT.GDT 2/17/17

DRILLER:	Parratt Wolff
RIG TYPE:	CME-55 (Auto-Hammer)
METHOD:	Hollow-Stem Augers
HOLE DIAM.:	3.25" ID
SPTs:	
REMARKS:	Boring was grouted upon completion.

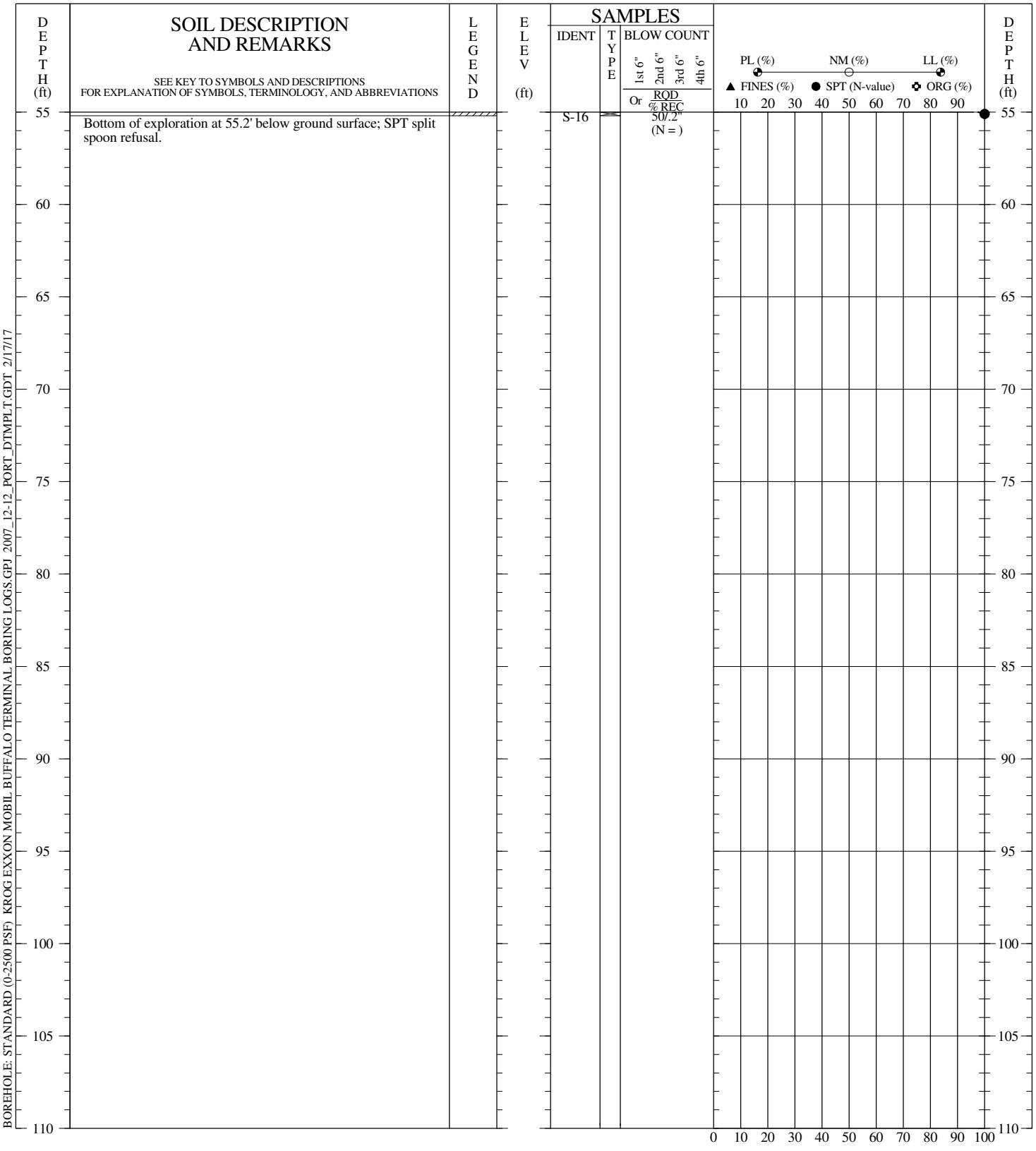
LOGGED BY: SH CHECKED BY/DATE: JMB

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.:	SB-OU2-109
DRILLED:	11/03/2016
PROJECT:	Krog - Exxon Mobil Buffalo Terminal
LOCATION:	Buffalo, NY
PROJECT NO.:	3617167397

amec foster wheeler



BOREHOLE: STANDARD (0-2500 PSF) KROG EXXON MOBIL BUFFALO TERMINAL BORING LOGS.GPJ 2007_12-12_PORT_DTMPLT.GDT 2/17/17

DRILLER:	Parratt Wolff
RIG TYPE:	CME-55 (Auto-Hammer)
METHOD:	Hollow-Stem Augers
HOLE DIAM.:	3.25" ID
SPTs:	
REMARKS:	Boring was grouted upon completion.

THIS BORING RECORD PRESENTS A REASONABLE INTERPRETATION OF THE SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER. STRATA INTERFACES (AS SHOWN) ARE APPROXIMATE. ACTUAL TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

GEOTECHNICAL BORING RECORD

BORING NO.:	SB-OU2-109
DRILLED:	11/03/2016
PROJECT:	Krog - Exxon Mobil Buffalo Terminal
LOCATION:	Buffalo, NY
PROJECT NO.:	3617167397

amec foster wheeler

ATTACHMENT B

GEOTECHNICAL LABORATORY REPORTS

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-100
Client Reference:	Elk Street Commerce Park	Depth (ft):	8-10
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-001	Soil Description:	GRAY/BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)

sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

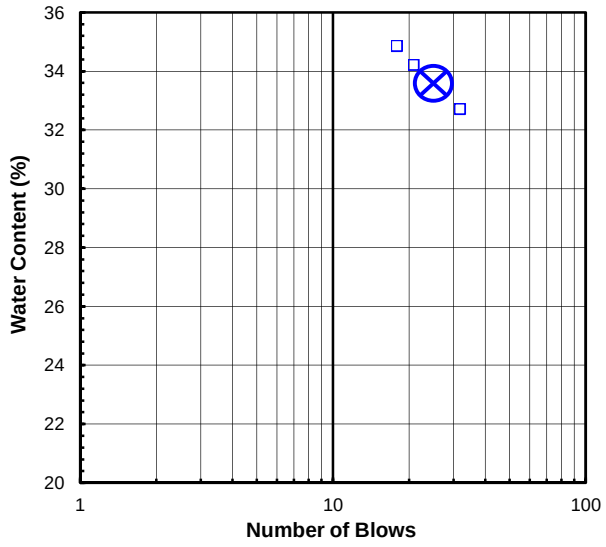
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3122	347	190	1245	U
Wt. of Tare & Wet Sample (g):	48.02	41.39	42.15	43.42	L
Wt. of Tare & Dry Sample (g):	40.48	35.84	36.02	36.30	T
Weight of Tare (g):	6.72	18.86	18.09	15.86	I
Weight of Water (g):	7.5	5.6	6.1	7.1	P
Weight of Dry Sample (g):	33.8	17.0	17.9	20.4	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**22.3**	**32.7**	**34.2**	**34.8**	N
Number of Blows:		**32**	**21**	**18**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	400	5	
Wt. of Tare & Wet Sample (g):	22.28	23.60	
Wt. of Tare & Dry Sample (g):	21.25	22.61	
Weight of Tare (g):	15.69	17.15	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.6	5.5	
Moisture Content (%):	**18.5**	**18.1**	**0.4**

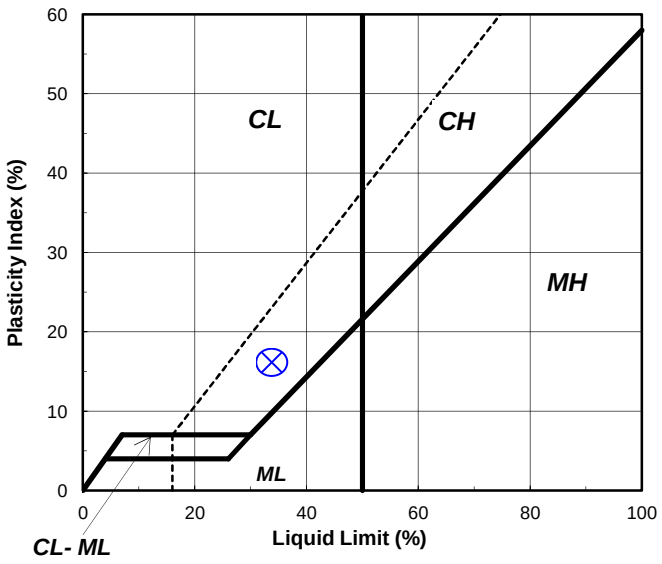
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**34**
Plastic Limit (%):	**18**
Plasticity Index (%):	**16**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By TO *Date* 2/1/17 *Checked By* TMP *Date* 2/3/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-100
Client Reference:	Elk Street Commerice Park	Depth (ft):	20-22
Project No.:	2017-061-001	Sample No.:	S-7
Lab ID:	2017-061-001-002	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

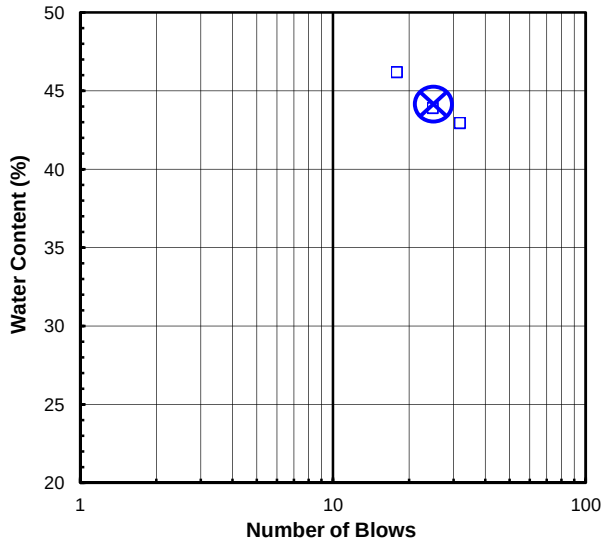
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3030	43	1245	401	U
Wt. of Tare & Wet Sample (g):	38.16	41.13	37.14	42.19	L
Wt. of Tare & Dry Sample (g):	29.75	34.49	30.65	35.33	T
Weight of Tare (g):	6.74	19.01	15.85	20.46	I
Weight of Water (g):	8.4	6.6	6.5	6.9	P
Weight of Dry Sample (g):	23.0	15.5	14.8	14.9	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**36.5**	**42.9**	**43.9**	**46.1**	N
Number of Blows:		**32**	**25**	**18**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	1263	400	
Wt. of Tare & Wet Sample (g):	23.85	22.45	
Wt. of Tare & Dry Sample (g):	22.75	21.32	
Weight of Tare (g):	17.30	15.68	
Weight of Water (g):	1.1	1.1	
Weight of Dry Sample (g):	5.5	5.6	
Moisture Content (%):	**20.2**	**20.0**	**0.1**

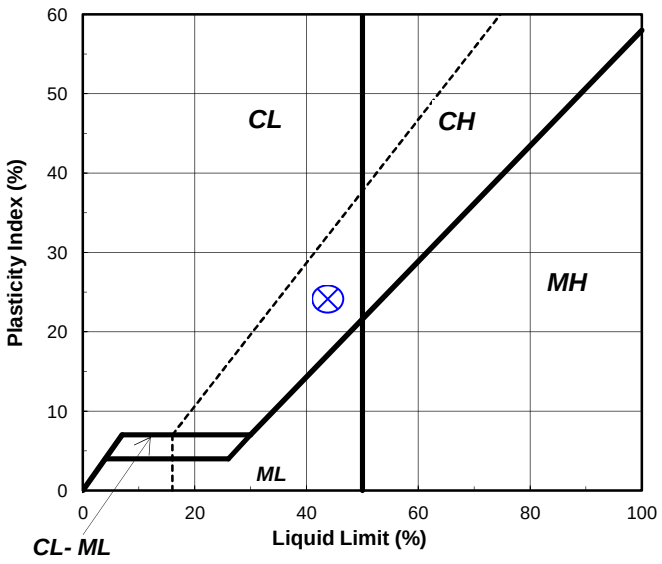
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**44**
Plastic Limit (%):	**20**
Plasticity Index (%):	**24**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By TO *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-101
Client Reference:	Elk Street Commerce Park	Depth (ft):	7.4-7.7
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Soil Description:	GRAY LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

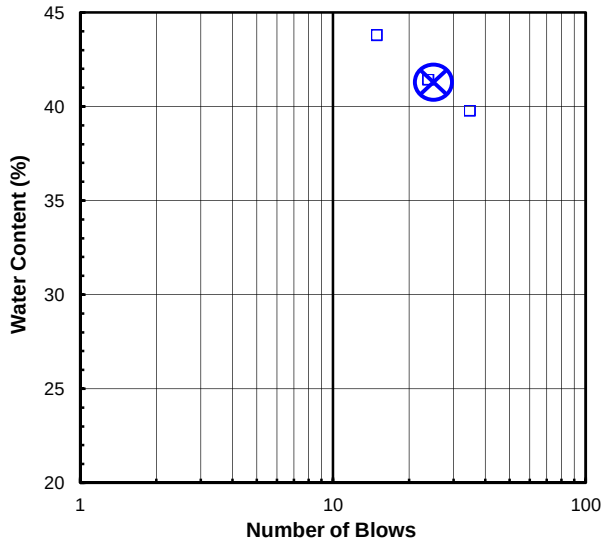
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3247	144	167	146	U
Wt. of Tare & Wet Sample (g):	144.99	38.35	38.42	38.97	L
Wt. of Tare & Dry Sample (g):	120.37	32.15	32.46	33.28	T
Weight of Tare (g):	6.78	17.98	18.06	18.96	I
Weight of Water (g):	24.6	6.2	6.0	5.7	P
Weight of Dry Sample (g):	113.6	14.2	14.4	14.3	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**21.7**	**43.8**	**41.4**	**39.7**	N
Number of Blows:		**15**	**24**	**35**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	3	217	
Wt. of Tare & Wet Sample (g):	25.01	24.77	
Wt. of Tare & Dry Sample (g):	24.00	23.75	
Weight of Tare (g):	18.88	18.66	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.1	5.1	
Moisture Content (%):	**19.7**	**20.0**	**-0.3**

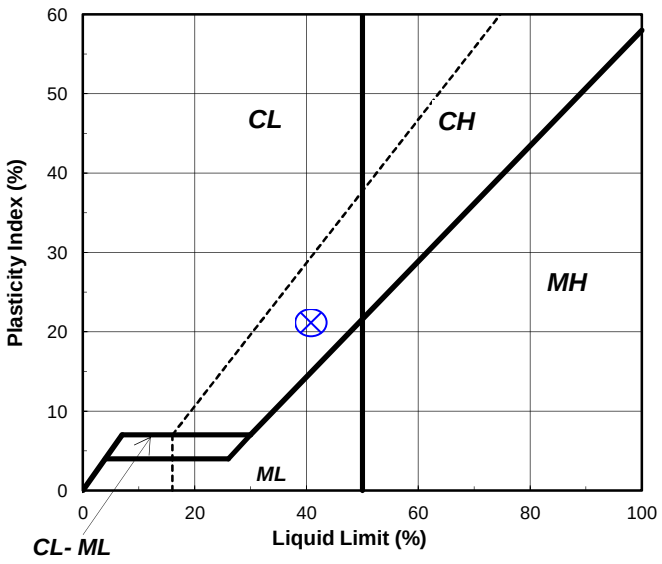
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**41**
Plastic Limit (%):	**20**
Plasticity Index (%):	**21**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SPECIFIC GRAVITY

ASTM D 854-14

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-101
Client Reference:	Elk Street Commerce Park	Depth (ft):	7.4-7.7
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	Gray Clay

(MInus No.4 sieve material,oven dried)

Replicate Number	**1**	**2**
Pycnometer ID:	G 1255	G 1504
Weight of Pycnometer & Soil & Water (g):	747.47	735.04
Temperature (^{o}C):	25.9	26.2
Weight of Pycnometer & Water (g):	684.97	672.09
Tare Number:	1018	922
Weight of Tare & Dry Soil (g):	192.16	199.38
Weight of Tare (g):	92.76	99.2
Weight of Dry Soil (g):	99.40	100.18
Specific Gravity of Soil @ Measured Temperature:	2.694	2.691
Specific Gravity of Water @ Measured Temperature:	0.99682	0.99674
Conversion Factor for Measured Temperature:	0.99861	0.99853
Specific Gravity @ 20^{o} Celsius:	2.697	2.695

Average Specific Gravity @ 20^{o} Celsius	2.70

Tested By TO *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

DCN: CT-S5 Date: 3/5/14 Revision: 20

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-101
Client Reference:	Elk Street Commerce Park	Depth (ft):	26-28
Project No.:	2017-061-001	Sample No.:	S-13
Lab ID:	2017-061-001-004	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

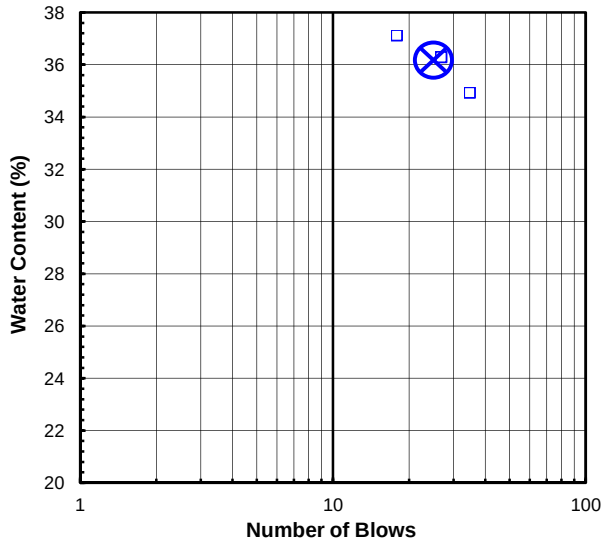
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3154	250	1253	202	U
Wt. of Tare & Wet Sample (g):	40.69	37.83	41.05	37.47	L
Wt. of Tare & Dry Sample (g):	33.09	32.33	35.71	32.25	T
Weight of Tare (g):	6.98	17.50	20.98	17.29	I
Weight of Water (g):	7.6	5.5	5.3	5.2	P
Weight of Dry Sample (g):	26.1	14.8	14.7	15.0	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**29.1**	**37.1**	**36.3**	**34.9**	N
Number of Blows:		**18**	**27**	**35**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	122	231	
Wt. of Tare & Wet Sample (g):	24.97	26.15	
Wt. of Tare & Dry Sample (g):	23.97	25.11	
Weight of Tare (g):	18.67	19.67	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.3	5.4	
Moisture Content (%):	**18.9**	**19.1**	**-0.2**

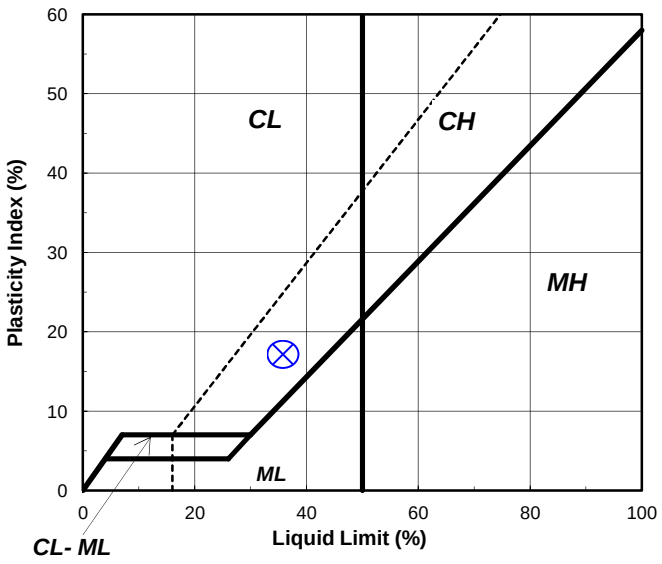
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**36**
Plastic Limit (%):	**19**
Plasticity Index (%):	**17**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/3/17 *Checked By* TMP *Date* 2/8/17

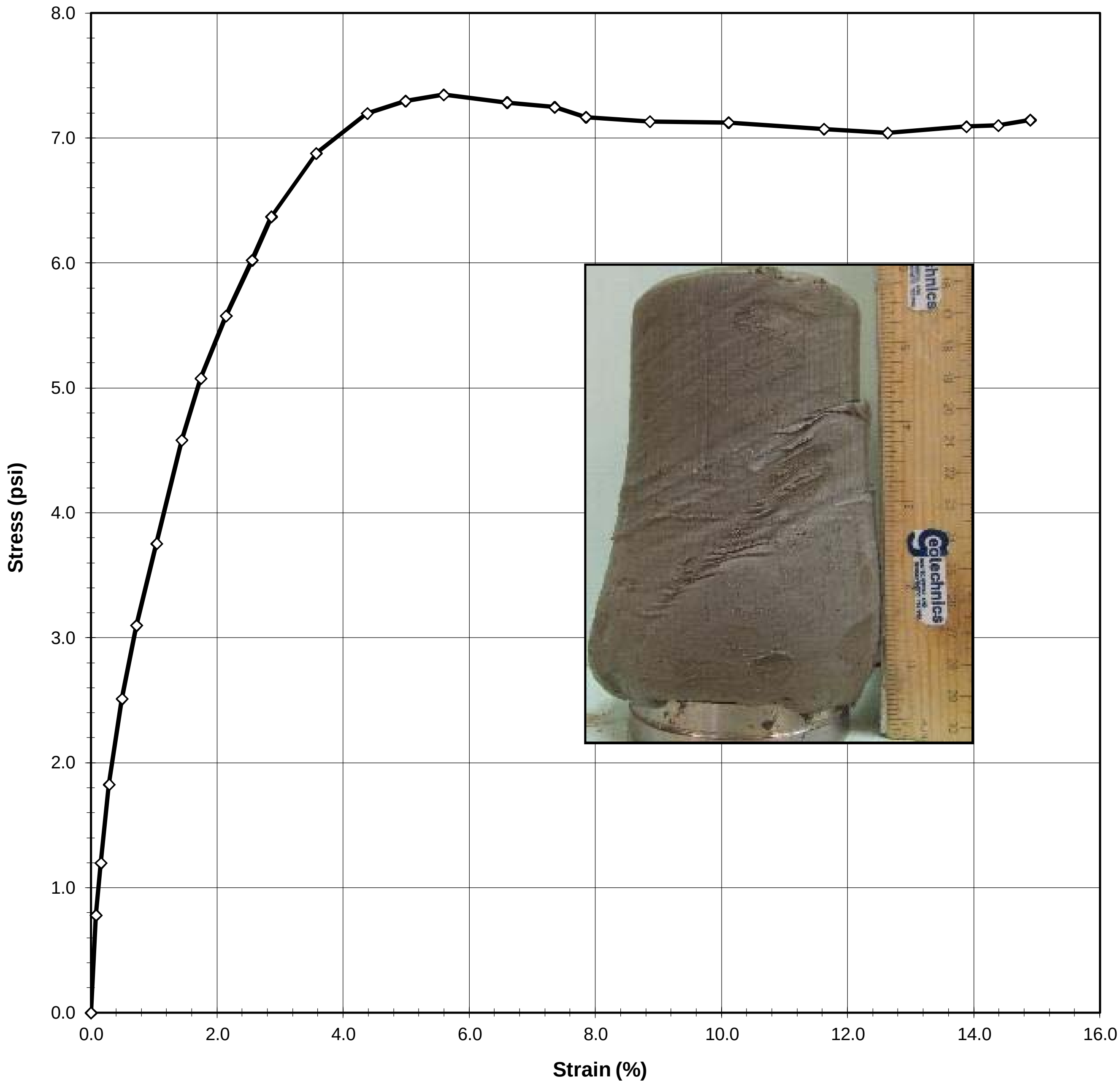
S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL
ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-101
Client Reference:	Elk Street Commerce Park	Depth (ft):	29.3-29.8
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-005	Visual:	Brown Clay

INITIAL CONFINING STRESS (psi) 8.3



Tested By	JAB	Date	1/31/17	Input Checked By	KC	Date	2/10/17

 DCN: CT-S29 DATE: 2/28/16 REVISION: 3 F:\Data\2017 GEOTECHNICAL PROJECTS\AMEC Foster Wheeler\2017-061-001 Elk Street Commerce Park\[2017-061-001-005 UU.xls]Sheet1

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-101
Client Reference:	Elk Street Commerce Park	Depth (ft):	29.3-29.8
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-005	Visual:	Brown Clay

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	5.945	Top Dia. (in):	2.885
Length 2 (in):	5.916	Mid. Dia. (in)	2.874
Length 3 (in):	5.932	Bot. Dia. (in):	2.884
Avg.Length (in)	**5.931**	**Area (in^2):**	**6.519**

WATER CONTENT (AFTER TEST)

Total Weight of Sample (g):	1160.27
Tare No.:	1549
Weight of Tare & Wet Sample (g):	1302.45
Weight of Tare & Dry Sample (g):	980.38
Weight of Tare (g):	143.01
% Moisture:	38.5

UNIT WEIGHT

Undisturbed Sample

Weight of Tube & Wet Sample (g):	1595.7	Sample Volume (cm^3):	633.6
Weight of Tube (g):	426.18	Unit Wet Weight (g/cm^3):	1.85
Weight of Wet Sample (g):	1169.52	Unit Wet Weight (pcf):	115.18
Diameter (in):	2.88	Moisture Content (%):	38.5
Length (in):	5.91	Unit Dry Weight (pcf):	83.2
Length (cm):	15.06		

INITIAL CONFINING STRESS (psi)	**8.3**	Initial Dial Reading (mil)	52
ENDING CONFINING STRESS (psi)	**8.2**	Dial Reading Before Shearing (mil)	69

DEFORMATION (in)	*LOAD (lb)*	*ELAPSED TIME (min)*	*STRAIN (%)*	*STRESS (psi)*
0.000	2.3	0.0	0.0	0.000
0.005	7.4	0.08	0.1	0.781
0.009	10.2	0.17	0.2	1.199
0.017	14.3	0.30	0.3	1.827
0.029	18.8	0.50	0.5	2.513
0.043	22.7	0.73	0.7	3.100
0.062	27.1	1.05	1.0	3.755
0.085	32.7	1.45	1.4	4.582
0.103	36.0	1.75	1.7	5.077
0.127	39.5	2.15	2.1	5.576
0.151	42.6	2.55	2.6	6.022
0.169	45.1	2.85	2.9	6.370
0.211	48.8	3.57	3.6	6.878
0.259	51.4	4.37	4.4	7.197
0.295	52.4	4.98	5.0	7.297
0.331	53.1	5.58	5.6	7.346
0.390	53.2	6.58	6.6	7.285
0.435	53.3	7.33	7.4	7.246
0.464	53.1	7.83	7.8	7.168
0.524	53.4	8.83	8.9	7.132
0.598	54.0	10.10	10.1	7.124
0.687	54.5	11.60	11.6	7.073
0.747	54.9	12.60	12.6	7.041
0.821	56.0	13.85	13.9	7.091
0.851	56.4	14.35	14.4	7.100
0.881	57.1	14.87	14.9	7.145

Tested By JAB Date 1/31/17 Input Checked By KC Date 2/10/17

DCN: CT-S29 DATE: 7/28/16 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-103
Client Reference:	Elk Street Commerce Park	Depth (ft):	25-27
Project No.:	2017-061-001	Sample No.:	S-8
Lab ID:	2017-061-001-007	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

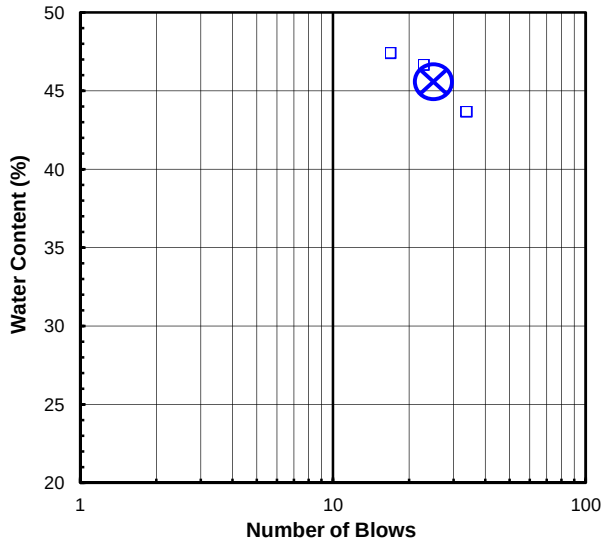
As Received Moisture Content		Liquid Limit Test			
ASTM D2216-10		1	2	3	M
Tare Number:	3024	257	355	203	U
Wt. of Tare & Wet Sample (g):	50.67	40.47	38.30	40.03	L
Wt. of Tare & Dry Sample (g):	41.23	33.73	31.90	33.74	T
Weight of Tare (g):	6.77	19.50	18.17	19.32	I
Weight of Water (g):	9.4	6.7	6.4	6.3	P
Weight of Dry Sample (g):	34.5	14.2	13.7	14.4	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**27.4**	**47.4**	**46.6**	**43.6**	N
Number of Blows:		**17**	**23**	**34**	T

Plastic Limit Test	1	2	Range
Tare Number:	229	1106	
Wt. of Tare & Wet Sample (g):	24.48	23.93	
Wt. of Tare & Dry Sample (g):	23.52	23.00	
Weight of Tare (g):	18.18	17.82	
Weight of Water (g):	1.0	0.9	
Weight of Dry Sample (g):	5.3	5.2	
Moisture Content (%):	**18.0**	**18.0**	**0.0**

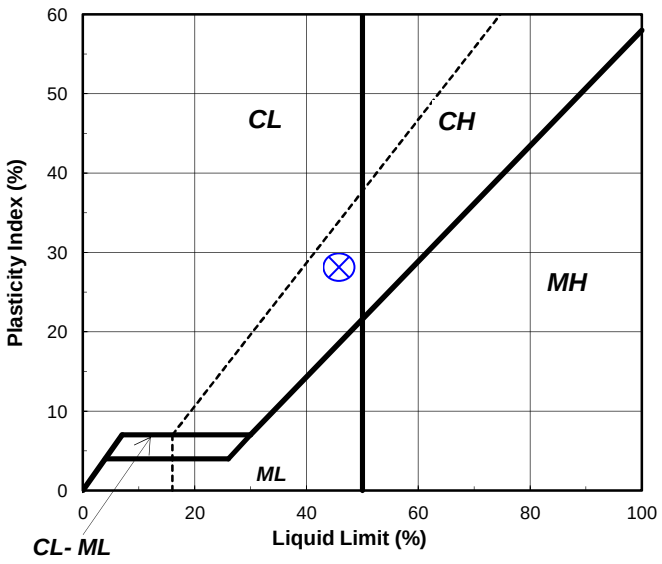
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**46**
Plastic Limit (%):	**18**
Plasticity Index (%):	**28**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/2/17 *Checked By* TMP *Date* 2/3/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

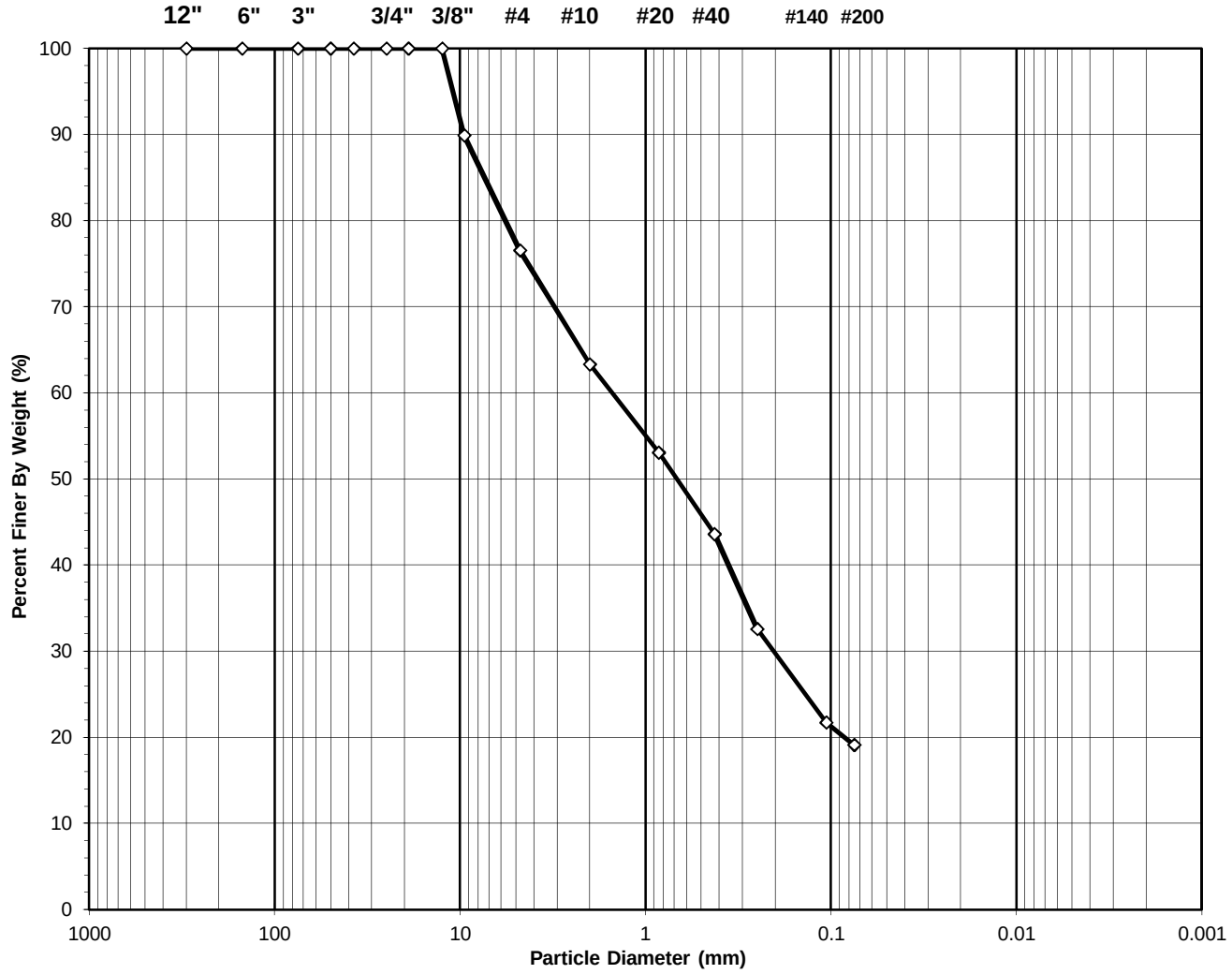
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-104
Client Reference:	Elk Street Commerce Park	Depth (ft):	6-8
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-009	Soil Color:	Black/Brown

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol:
sm, ASSUMED

USCS Classification:
SILTY SAND WITH GRAVEL

Tested By HL Date 2/2/17 Checked By TMP Date 2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-104
Client Reference:	Elk Street Commerce Park	Depth (ft):	6-8
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-009	Soil Color:	Black/Brown

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1551	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	294.81	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	263.65	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.54	Weight of Tare (g):	NA
Weight of Water (g):	31.16	Weight of Water (g):	NA
Weight of Dry Sample (g):	117.11	Weight of Dry Sample (g):	NA
Moisture Content (%):	**26.6**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	117.11
Dry Weight of - 3/4" Sample (g):	94.7	Weight of - #200 Material (g):	22.41
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	94.70
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	11.81	10.08	10.08	89.92	**89.92**
#4	4.75	15.64	13.35	23.44	76.56	**76.56**
#10	2.00	15.51	13.24	36.68	63.32	**63.32**
#20	0.850	12.00	10.25	46.93	53.07	**53.07**
#40	0.425	11.08	9.46	56.39	43.61	**43.61**
#60	0.250	12.91	11.02	67.42	32.58	**32.58**
#140	0.106	12.70	10.84	78.26	21.74	**21.74**
#200	0.075	3.05	2.60	80.86	19.14	**19.14**
Pan	-	22.41	19.14	100.00	-	**-**

Tested By HL Date 2/2/17 Checked By TMP Date 2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-104
Client Reference:	Elk Street Commerce Park	Depth (ft):	20-22
Project No.:	2017-061-001	Sample No.:	S-8
Lab ID:	2017-061-001-010	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

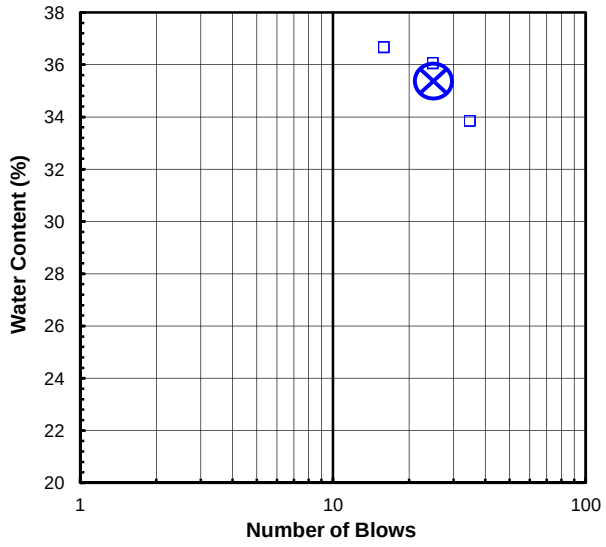
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3229	200	15	158	U
Wt. of Tare & Wet Sample (g):	40.56	39.35	37.75	37.79	L
Wt. of Tare & Dry Sample (g):	32.03	33.77	32.40	32.66	T
Weight of Tare (g):	6.74	18.54	17.55	17.49	I
Weight of Water (g):	8.5	5.6	5.4	5.1	P
Weight of Dry Sample (g):	25.3	15.2	14.9	15.2	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**33.7**	**36.6**	**36.0**	**33.8**	N
Number of Blows:		**16**	**25**	**35**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	135	236	
Wt. of Tare & Wet Sample (g):	25.63	24.77	
Wt. of Tare & Dry Sample (g):	24.60	23.75	
Weight of Tare (g):	19.41	18.50	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.2	5.3	
Moisture Content (%):	**19.8**	**19.4**	**0.4**

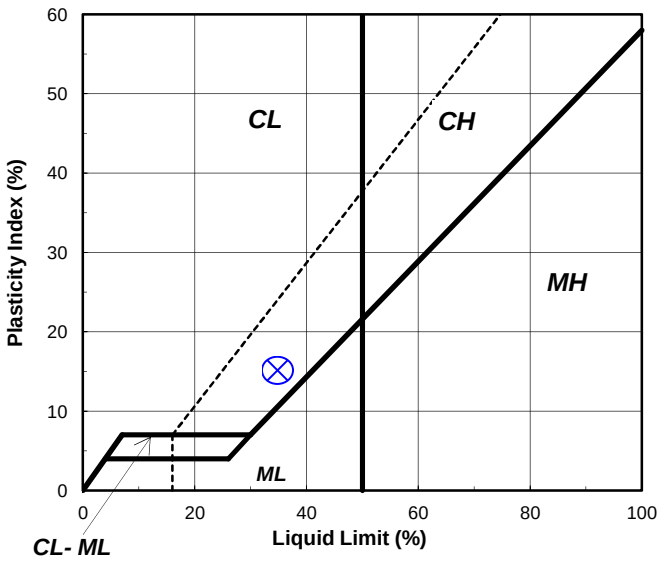
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**35**
Plastic Limit (%):	**20**
Plasticity Index (%):	**15**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/2/17 *Checked By* TMP *Date* 2/3/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

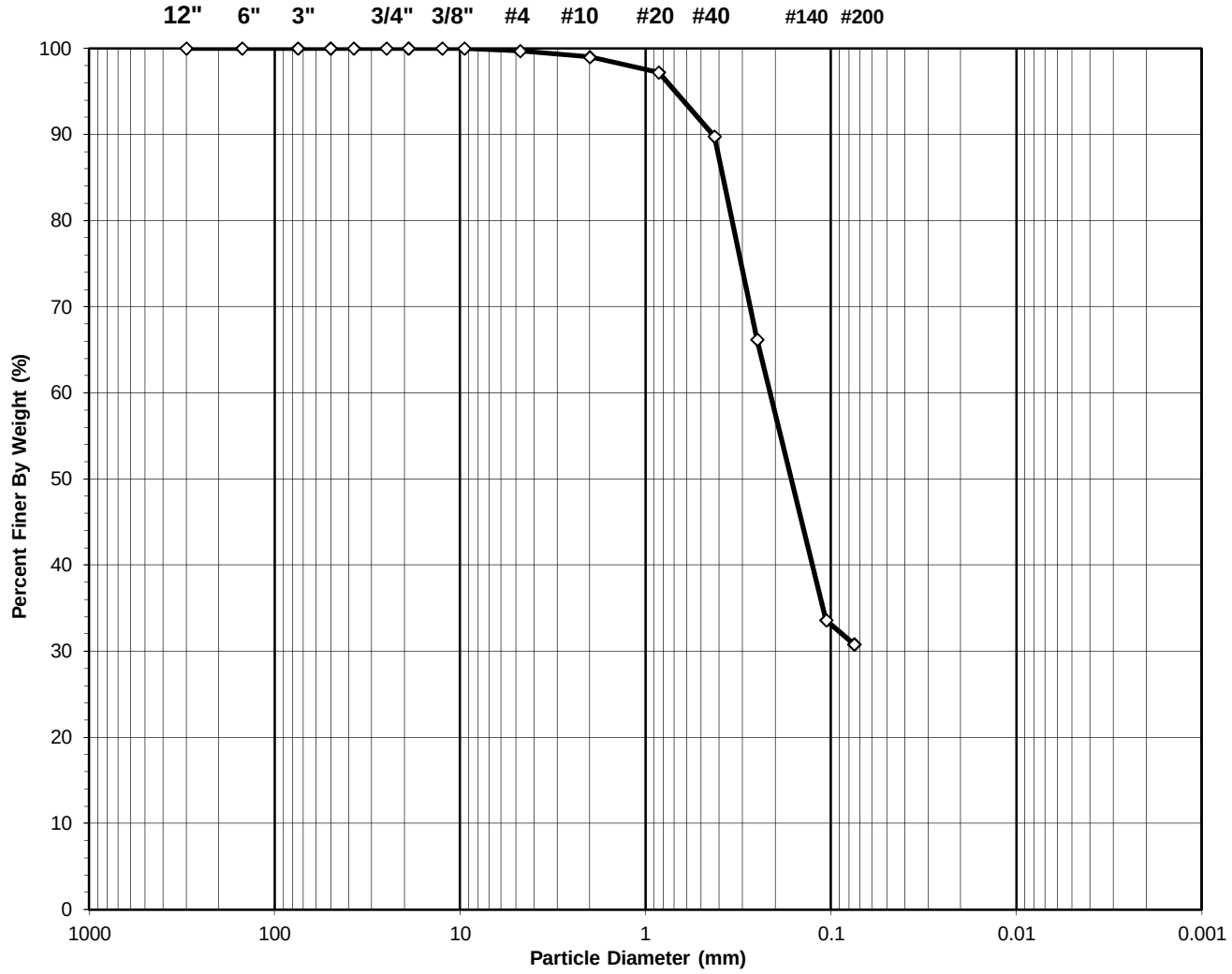
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-105
Client Reference:	Elk Street Commerce Park	Depth (ft):	6-8
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-011	Soil Color:	Brownish Gray

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol:
sm, ASSUMED

USCS Classification:
SILTY SAND

Tested By	HL	Date	2/2/17	Checked By	TMP	Date	2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-105
Client Reference:	Elk Street Commerce Park	Depth (ft):	6-8
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-011	Soil Color:	Brownish Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1452	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	412.42	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	375.12	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.22	Weight of Tare (g):	NA
Weight of Water (g):	37.30	Weight of Water (g):	NA
Weight of Dry Sample (g):	229.90	Weight of Dry Sample (g):	NA
Moisture Content (%):	**16.2**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	229.90
Dry Weight of - 3/4" Sample (g):	159.1	Weight of - #200 Material (g):	70.82
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	159.08
Dry Weight of + 3/4" Sample (g):	0.00		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.70	0.30	0.30	99.70	**99.70**
#10	2.00	1.64	0.71	1.02	98.98	**98.98**
#20	0.850	4.05	1.76	2.78	97.22	**97.22**
#40	0.425	17.09	7.43	10.21	89.79	**89.79**
#60	0.250	54.26	23.60	33.81	66.19	**66.19**
#140	0.106	74.91	32.58	66.40	33.60	**33.60**
#200	0.075	6.43	2.80	69.20	30.80	**30.80**
Pan	-	70.82	30.80	100.00	-	**-**

Tested By HL Date 2/2/17 Checked By TMP Date 2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-105
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.0-21.2
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

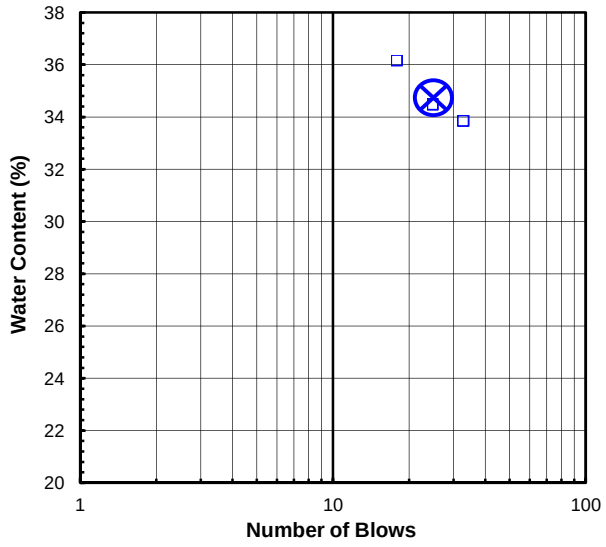
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3179	44	17	315	U
Wt. of Tare & Wet Sample (g):	123.79	37.55	38.26	38.96	L
Wt. of Tare & Dry Sample (g):	98.55	32.21	33.01	33.81	T
Weight of Tare (g):	6.94	17.43	17.77	18.58	I
Weight of Water (g):	25.2	5.3	5.3	5.2	P
Weight of Dry Sample (g):	91.6	14.8	15.2	15.2	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**27.6**	**36.1**	**34.4**	**33.8**	N
Number of Blows:		**18**	**25**	**33**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	227	12	
Wt. of Tare & Wet Sample (g):	24.47	25.92	
Wt. of Tare & Dry Sample (g):	23.44	24.93	
Weight of Tare (g):	18.08	19.72	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.4	5.2	
Moisture Content (%):	**19.2**	**19.0**	**0.2**

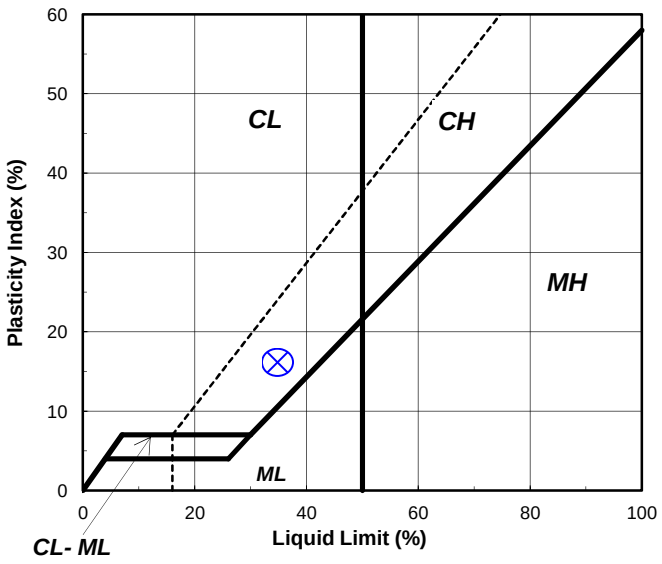
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**35**
Plastic Limit (%):	**19**
Plasticity Index (%):	**16**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/3/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

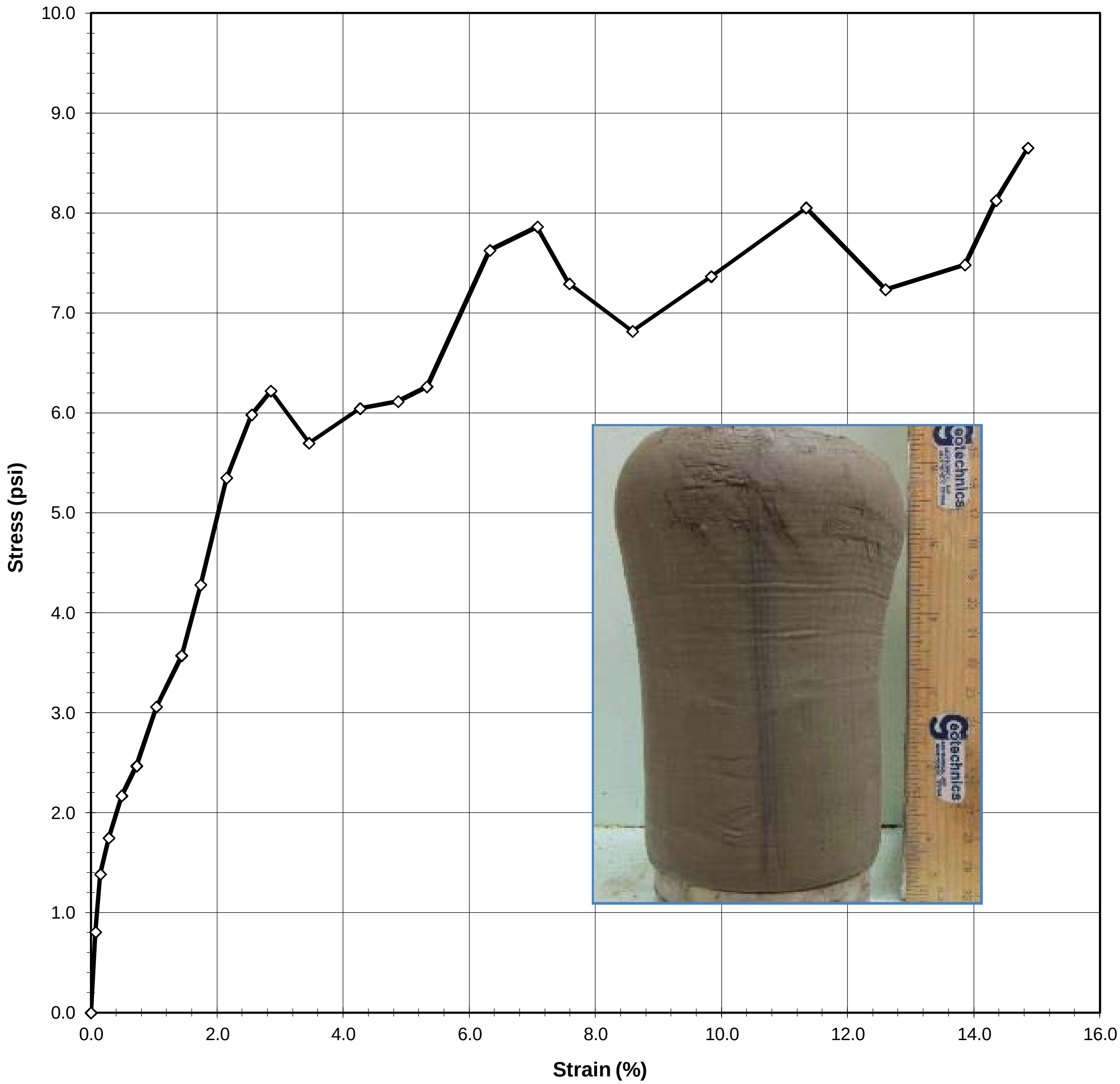
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-105
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.2 - 21.7
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual:	Brown Clay

INITIAL CONFINING STRESS (psi) 6.2



Tested By JAB/TMP Date 2/2/17 Input Checked By KC Date 2/10/17

DCN: CT-S29 DATE: 7/28/16 REVISION: 3 *2017 GEOTECHNICAL PROJECTS\AMEC Foster Wheeler\2017-061-001 Elk Street Commerce Park\[2017-061-001-012 UU.xls]Sheet1*

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-105
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.2 - 21.7
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual:	Brown Clay

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	6.097	Top Dia. (in):	2.880
Length 2 (in):	6.118	Mid. Dia. (in)	2.878
Length 3 (in):	6.102	Bot. Dia. (in):	2.879
Avg.Length (in)	**6.106**	**Area (in^2):**	**6.510**

WATER CONTENT (AFTER TEST)

Total Weight of Sample (g):	1239.09
Tare No.:	1460
Weight of Tare & Wet Sample (g):	1378.92
Weight of Tare & Dry Sample (g):	1093.47
Weight of Tare (g):	142.69
% Moisture:	30.0

UNIT WEIGHT

Undisturbed Sample

Weight of Tube & Wet Sample (g):	1710.88	Sample Volume (cm^3):	651.3
Weight of Tube (g):	437.12	Unit Wet Weight (g/cm^3):	1.96
Weight of Wet Sample (g):	1273.76	Unit Wet Weight (pcf):	122.03
Diameter (in):	2.88	Moisture Content (%):	30.0
Length (in):	6.10	Unit Dry Weight (pcf):	93.9
Length (cm):	15.51		

INITIAL CONFINING STRESS (psi)	**6.2**	Initial Dial Reading (mil)	37
ENDING CONFINING STRESS (psi)	**6.1**	Dial Reading Before Shearing (mil)	41

DEFORMATION (in)	*LOAD (lb)*	*ELAPSED TIME (min)*	*STRAIN (%)*	*STRESS (psi)*
0.000	3.1	0.0	0.0	0.000
0.004	8.3	0.08	0.1	0.806
0.009	12.1	0.17	0.2	1.386
0.017	14.5	0.28	0.3	1.748
0.030	17.3	0.50	0.5	2.171
0.044	19.2	0.73	0.7	2.469
0.063	23.2	1.05	1.0	3.060
0.088	26.7	1.45	1.4	3.573
0.106	31.4	1.75	1.7	4.280
0.131	38.6	2.15	2.2	5.350
0.156	43.0	2.57	2.6	5.982
0.174	44.7	2.87	2.9	6.220
0.211	41.5	3.47	3.5	5.698
0.260	44.2	4.27	4.3	6.045
0.297	44.9	4.88	4.9	6.115
0.325	46.1	5.33	5.3	6.262
0.386	56.1	6.33	6.3	7.626
0.432	58.1	7.08	7.1	7.863
0.463	54.4	7.58	7.6	7.292
0.524	51.6	8.58	8.6	6.817
0.600	56.2	9.85	9.8	7.366
0.692	62.2	11.35	11.3	8.052
0.769	56.9	12.60	12.6	7.234
0.846	59.6	13.85	13.9	7.482
0.876	64.8	14.37	14.4	8.125
0.907	69.2	14.87	14.9	8.652

Tested By JAB/TMP Date 2/2/17 Input Checked By KC Date 2/10/17

DCN: CT-S29 DATE: 7/28/16 REVISION: 3

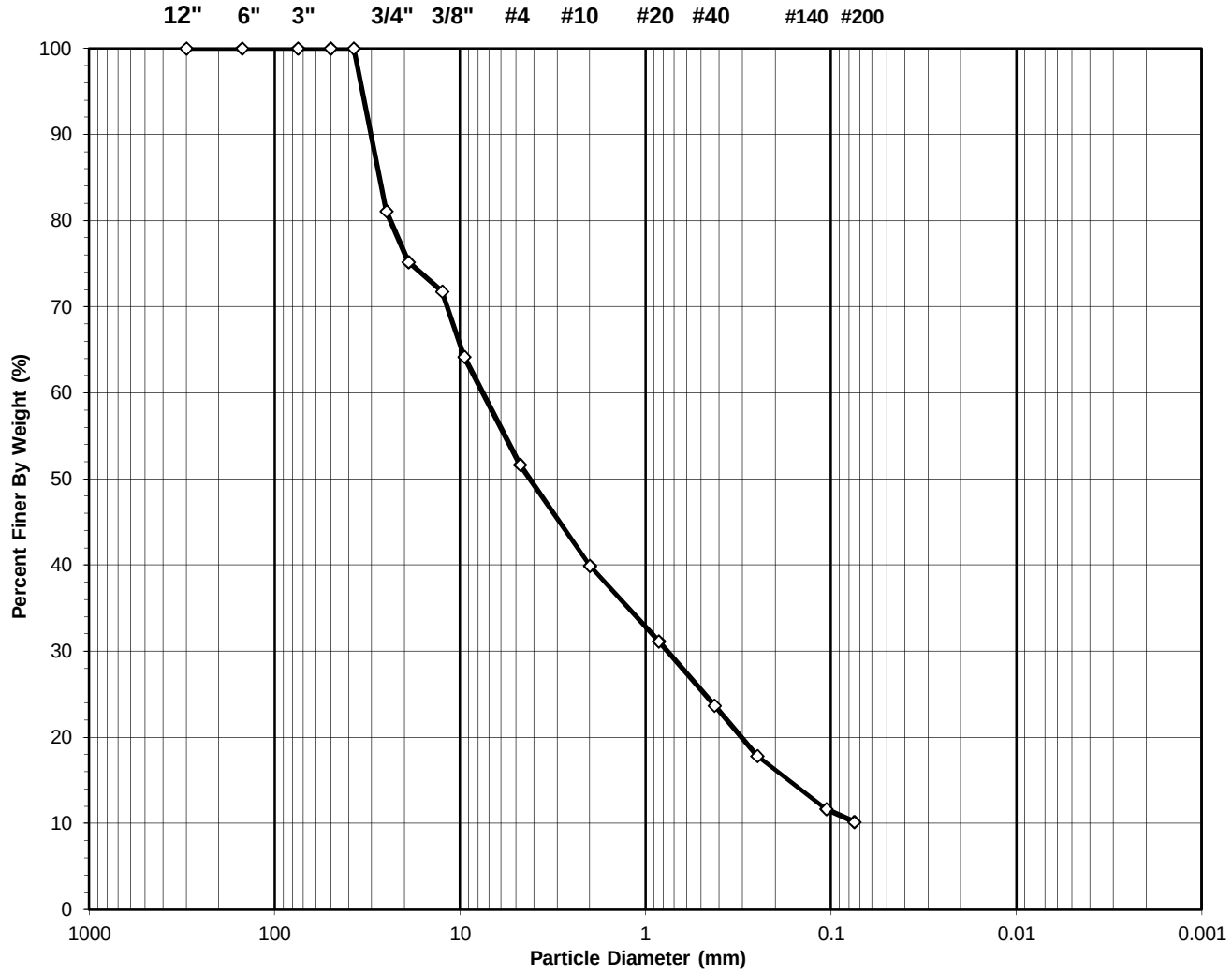
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	6-8
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-013	Soil Color:	Brown/Black

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol:
gw-gm, ASSUMED

USCS Classification:
WELL-GRADED GRAVEL WITH SILT AND SAND

D60 = 7.53 **CC = 1.08**

D30 = 0.76 **CU = 104.58**

D10 = 0.07

Tested By HL Date 2/2/17 Checked By TMP Date 2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	6-8
Project No.:	2017-061-001	Sample No.:	S-4
Lab ID:	2017-061-001-013	Soil Color:	Brown/Black

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1492	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	304.22	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	265.17	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.85	Weight of Tare (g):	NA
Weight of Water (g):	39.05	Weight of Water (g):	NA
Weight of Dry Sample (g):	118.32	Weight of Dry Sample (g):	NA
Moisture Content (%):	**33.0**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	118.32
Dry Weight of - 3/4" Sample (g):	76.9	Weight of - #200 Material (g):	12.04
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	106.28
Dry Weight of + 3/4" Sample (g):	29.35		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	22.37	18.91	18.91	81.09	**81.09**
3/4"	19.0	6.98	5.90	24.81	75.19	**75.19**
1/2"	12.50	4.03	3.41	28.21	71.79	**71.79**
3/8"	9.50	8.98	7.59	35.80	64.20	**64.20**
#4	4.75	14.84	12.54	48.34	51.66	**51.66**
#10	2.00	13.89	11.74	60.08	39.92	**39.92**
#20	0.850	10.38	8.77	68.86	31.14	**31.14**
#40	0.425	8.82	7.45	76.31	23.69	**23.69**
#60	0.250	6.92	5.85	82.16	17.84	**17.84**
#140	0.106	7.29	6.16	88.32	11.68	**11.68**
#200	0.075	1.78	1.50	89.82	10.18	**10.18**
Pan	-	12.04	10.18	100.00	-	**-**

Tested By HL Date 2/2/17 Checked By TMP Date 2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

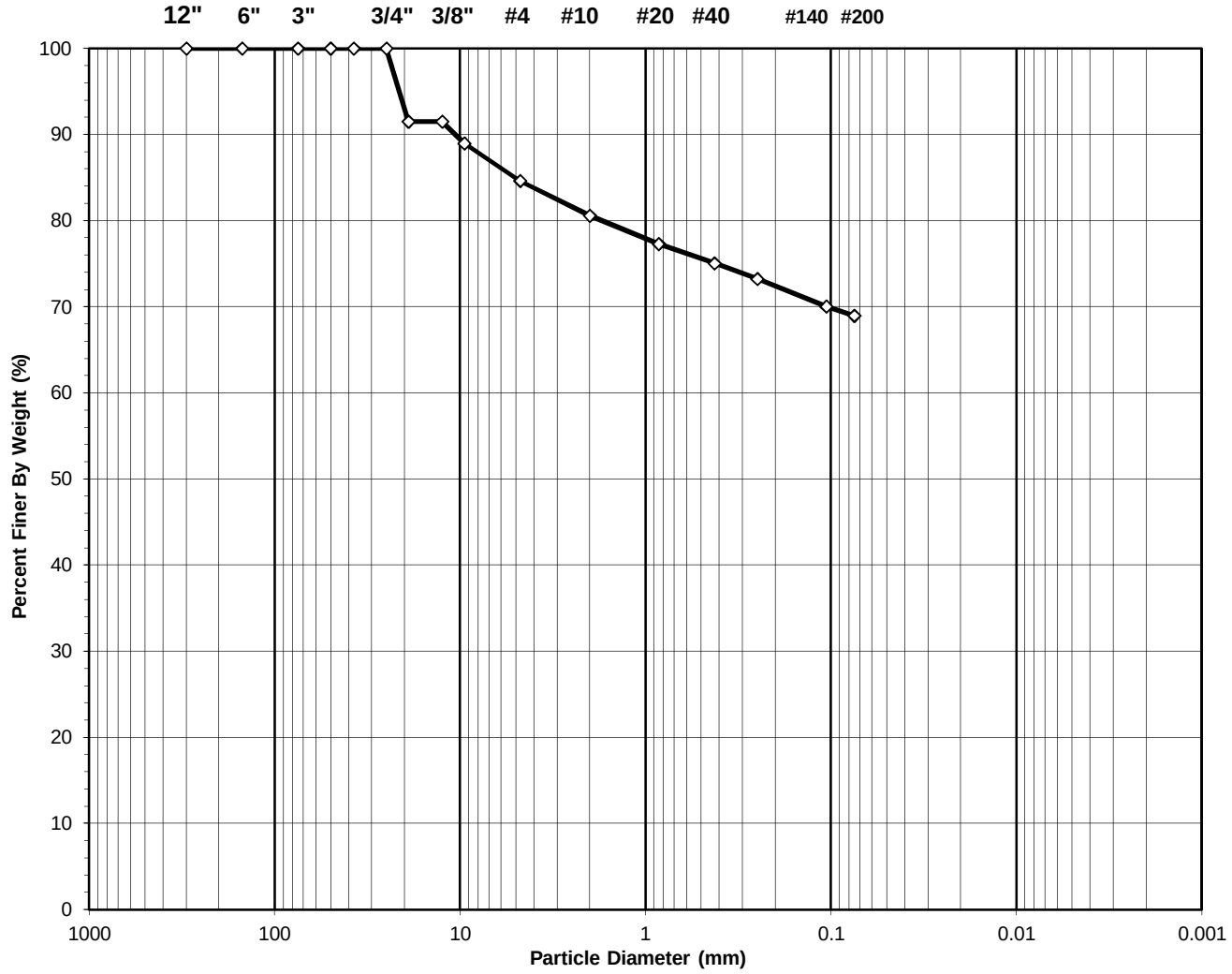
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	10-12
Project No.:	2017-061-001	Sample No.:	S-6
Lab ID:	2017-061-001-014	Soil Color:	Brown/Gray

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol:
cl, ASSUMED

USCS Classification:
SANDY LEAN CLAY WITH GRAVEL

Tested By	HL	Date	2/2/17	Checked By	TMP	Date	2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	10-12
Project No.:	2017-061-001	Sample No.:	S-6
Lab ID:	2017-061-001-014	Soil Color:	Brown/Gray

Moisture Content of Passing 3/4" Sample		Water Content of Retained 3/4" Sample	
Tare No.:	1532	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	275.49	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	245.73	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.32	Weight of Tare (g):	NA
Weight of Water (g):	29.76	Weight of Water (g):	NA
Weight of Dry Sample (g):	98.41	Weight of Dry Sample (g):	NA
Moisture Content (%):	**30.2**	**Moisture Content (%):**	**NA**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	98.41
Dry Weight of - 3/4" Sample (g):	22.2	Weight of - #200 Material (g):	67.87
Wet Weight of +3/4" Sample (g):	NA	Weight of + #200 Material (g):	30.54
Dry Weight of + 3/4" Sample (g):	8.35		
Total Dry Weight of Sample (g):	NA		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	8.35	8.48	8.48	91.52	**91.52**
1/2"	12.50	0.00	0.00	8.48	91.52	**91.52**
3/8"	9.50	2.50	2.54	11.03	88.97	**88.97**
#4	4.75	4.27	4.34	15.36	84.64	**84.64**
#10	2.00	3.99	4.05	19.42	80.58	**80.58**
#20	0.850	3.23	3.28	22.70	77.30	**77.30**
#40	0.425	2.22	2.26	24.96	75.04	**75.04**
#60	0.250	1.78	1.81	26.77	73.23	**73.23**
#140	0.106	3.14	3.19	29.96	70.04	**70.04**
#200	0.075	1.06	1.08	31.03	68.97	**68.97**
Pan	-	67.87	68.97	100.00	-	**-**

Tested By HL Date 2/2/17 Checked By TMP Date 2/3/17

DCN: CT-S3C DATE 3/20/13 REVISION: 3

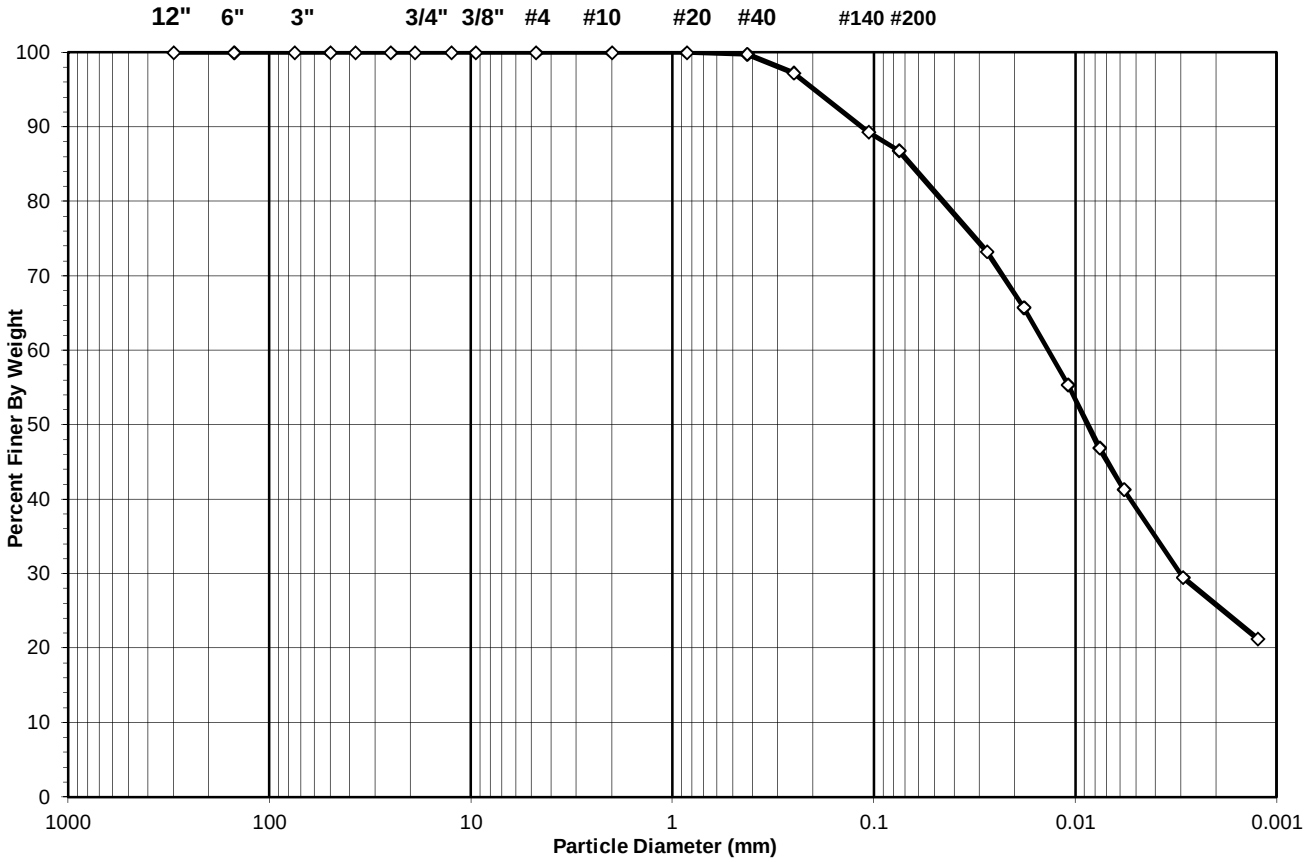
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	15.4-15.8
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-015	Soil Color:	Gray

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	13.18
Finer Than #200	*Silt & Clay*	86.82

USCS Symbol:

cl, ASSUMED

USCS Classification:

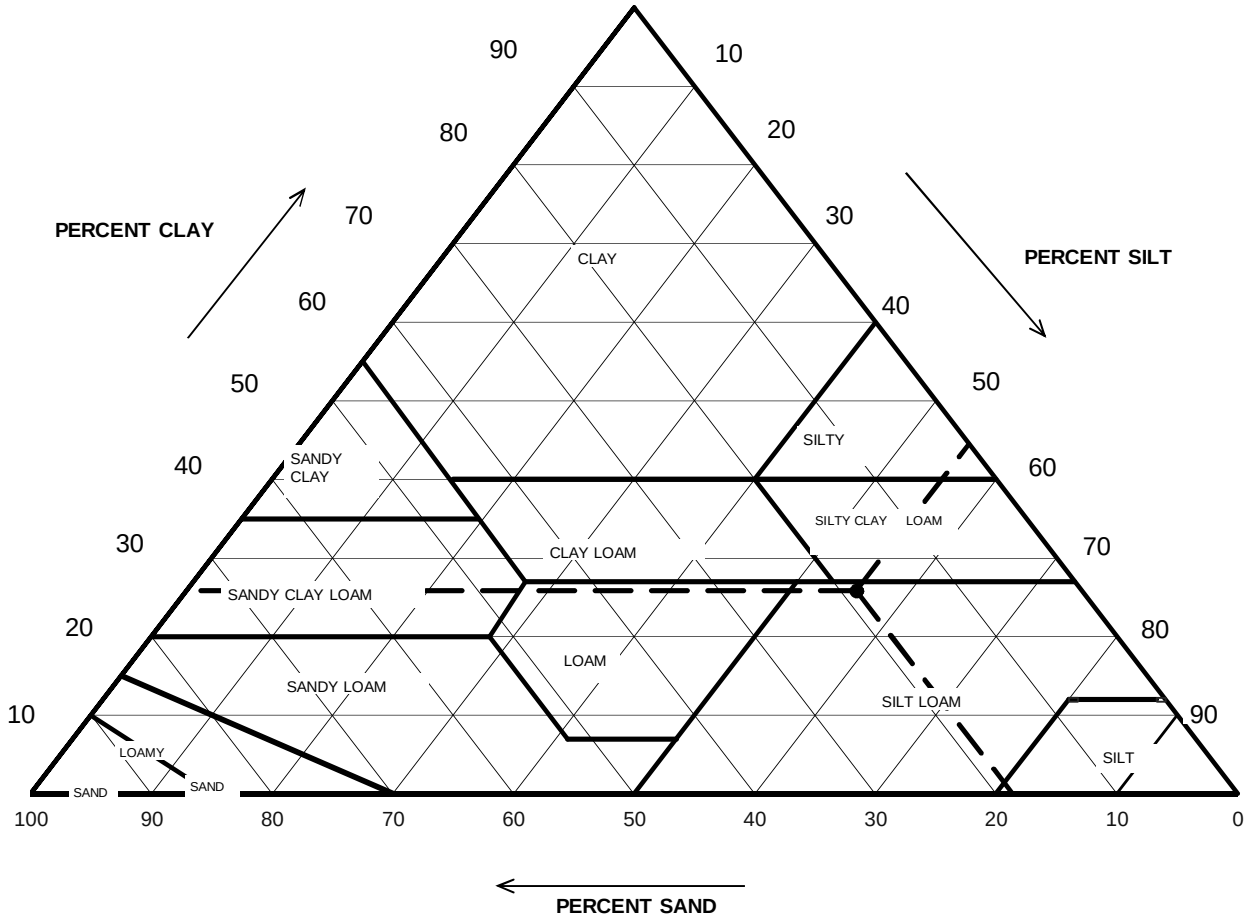
LEAN CLAY

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

USDA CLASSIFICATION CHART

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	15.4-15.8
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-015	Soil Color:	Gray



Particle Size	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
(mm)	(%)		(%)	(%)
		Gravel	0.00	**0.00**
2	100.00	*Sand*	18.65	**18.65**
0.05	81.35	*Silt*	55.52	**55.52**
0.002	25.83	*Clay*	25.83	**25.83**

USDA Classification: ***SILT LOAM***

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	15.4-15.8
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-015	Soil Color:	Gray

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1415	Tare No.	NA
Weight of Tare & Wet Sample (g)	1157.62	Weight of Tare & Wet Sample (g)	NA
Weight of Tare & Dry Sample (g)	947.30	Weight of Tare & Dry Sample (g)	NA
Weight of Tare (g)	145.75	Weight of Tare (g)	NA
Weight of Water (g)	210.32	Weight of Water (g)	NA
Weight of Dry Sample (g)	801.55	Weight of Dry Sample (g)	NA
Moisture Content (%)	**26.2**	**Moisture Content (%)**	**NA**

Wet Weight of -3/4" Sample (g)	NA	Weight of the Dry Sample (g)	801.55
Dry Weight of -3/4" Sample (g)	105.64	Weight of - #200 Material (g)	695.91
Wet Weight of +3/4" Sample (g)	NA	Weight of + #200 Material (g)	105.64
Dry Weight of +3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g)	NA		

Sieve Size	Sieve Opening	Weight of Soil Retained	Percent Retained	Accumulated Percent Retained		Percent Finer	Accumulated Percent Finer
	(mm)	(g)	(%)	(%)		(%)	(%)
12"	300	0.00	0.00	0.00		100.00	**100.00**
6"	150	0.00	0.00	0.00		100.00	**100.00**
3"	75	0.00	0.00	0.00		100.00	**100.00**
2"	50	0.00	0.00	0.00		100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00		100.00	**100.00**
1"	25.0	0.00	0.00	0.00		100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00		100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00		100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00		100.00	**100.00**
#4	4.75	0.00	0.00	0.00		100.00	**100.00**
#10	2.00	0.04	0.00	0.00		100.00	**100.00**
#20	0.85	0.05	0.01	0.01		99.99	**99.99**
#40	0.425	1.74	0.22	0.23		99.77	**99.77**
#60	0.250	20.14	2.51	2.74		97.26	**97.26**
#140	0.106	63.77	7.96	10.70		89.30	**89.30**
#200	0.075	19.90	2.48	13.18		86.82	**86.82**
Pan	-	695.91	86.82	100.00		-	**-**

Tested By MLF Date 2/7/17 Checked By TMP Date 2/8/17

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

HYDROMETER ANALYSIS

ASTM D 422-63 (2007)

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	15.4-15.8
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-015	Soil Color:	Gray

Elapsed Time		R Measured	Temp.	Composite Correction	R Corrected	N	K Factor	Diameter	N'
(min)			(°C)			(%)		(mm)	(%)
0		NA	NA	NA	NA	NA	NA	NA	NA
2		45.0	22.7	6.11	38.9	84.4	0.01302	0.0275	**73.3**
5		41.0	22.7	6.11	34.9	75.7	0.01302	0.0180	**65.7**
15		35.5	22.7	6.11	29.4	63.8	0.01302	0.0109	**55.4**
33		31.0	22.7	6.11	24.9	54.0	0.01302	0.0076	**46.9**
60		28.0	22.8	6.07	21.9	47.6	0.01300	0.0057	**41.3**
250		21.5	23.4	5.86	15.6	33.9	0.01291	0.0029	**29.5**
1481		17.5	22.4	6.22	11.3	24.5	0.01307	0.0012	**21.3**

Soil Specimen Data		**Other Corrections**		
Tare No.	633			
Weight of Tare & Dry Material (g)	145.91	a - Factor	0.99	
Weight of Tare (g)	95.29			
Weight of Deflocculant (g)	5.0	Percent Finer than # 200	86.82	
Weight of Dry Material (g)	45.6			
		Specific Gravity	2.7	Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 2/7/17 Checked By TMP Date 2/8/17

DCN: CT-S3A DATE: 3/18/13 REVISION: 11

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-106
Client Reference:	Elk Street Commerce Park	Depth (ft):	31.7-32.0
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-016	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

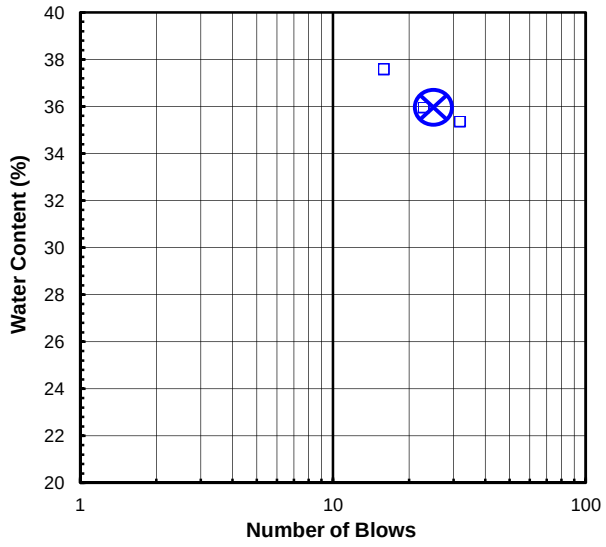
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3127	454	160	438	U
Wt. of Tare & Wet Sample (g):	180.20	35.19	39.20	37.74	L
Wt. of Tare & Dry Sample (g):	133.80	29.64	33.74	32.37	T
Weight of Tare (g):	6.85	14.86	18.54	17.17	I
Weight of Water (g):	46.4	5.6	5.5	5.4	P
Weight of Dry Sample (g):	127.0	14.8	15.2	15.2	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**36.5**	**37.6**	**35.9**	**35.3**	N
Number of Blows:		**16**	**23**	**32**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	179	228	
Wt. of Tare & Wet Sample (g):	24.58	23.80	
Wt. of Tare & Dry Sample (g):	23.54	22.79	
Weight of Tare (g):	18.33	17.66	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.2	5.1	
Moisture Content (%):	**20.0**	**19.7**	**0.3**

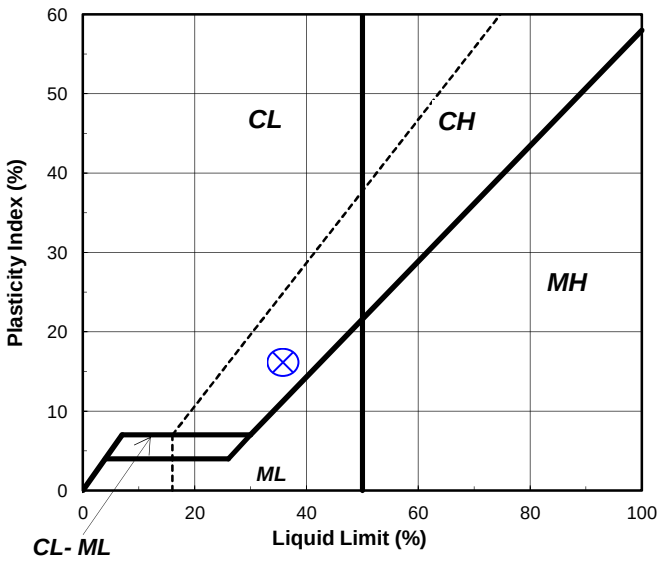
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**36**
Plastic Limit (%):	**20**
Plasticity Index (%):	**16**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/2/17 *Checked By* TMP *Date* 2/3/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-107
Client Reference:	Elk Street Commerce Park	Depth (ft):	11.0-11.2
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

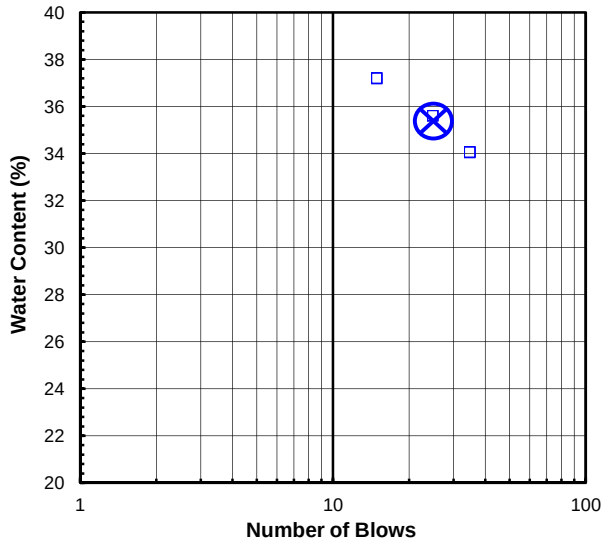
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	2907	1101	212	1121	U
Wt. of Tare & Wet Sample (g):	128.72	38.50	39.49	39.05	L
Wt. of Tare & Dry Sample (g):	106.21	33.00	34.19	33.92	T
Weight of Tare (g):	6.80	18.20	19.29	18.84	I
Weight of Water (g):	22.5	5.5	5.3	5.1	P
Weight of Dry Sample (g):	99.4	14.8	14.9	15.1	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**22.6**	**37.2**	**35.6**	**34.0**	N
Number of Blows:		**15**	**25**	**35**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	124	220	
Wt. of Tare & Wet Sample (g):	24.93	25.49	
Wt. of Tare & Dry Sample (g):	23.88	24.47	
Weight of Tare (g):	18.50	19.27	
Weight of Water (g):	1.1	1.0	
Weight of Dry Sample (g):	5.4	5.2	
Moisture Content (%):	**19.5**	**19.6**	**-0.1**

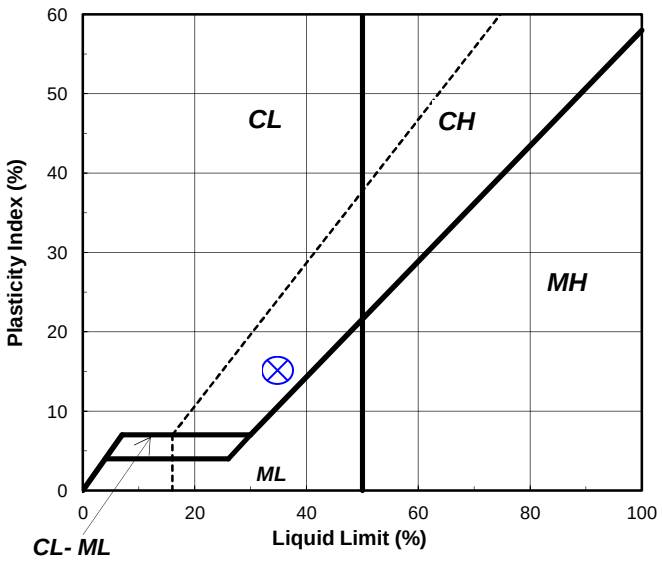
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**35**
Plastic Limit (%):	**20**
Plasticity Index (%):	**15**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/3/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

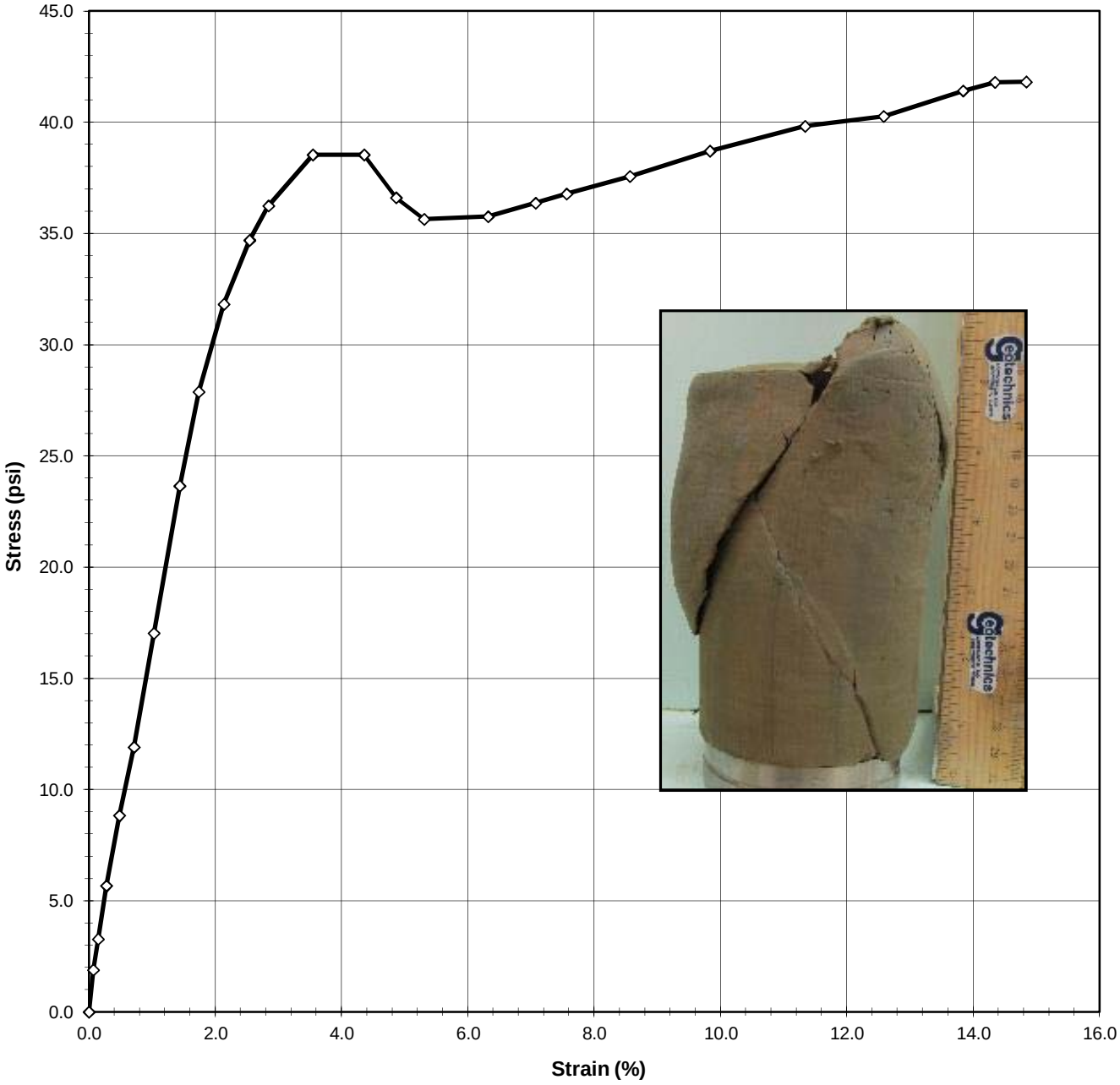
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-107
Client Reference:	Elk Street Commerce Park	Depth (ft):	11.2-11.7
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual:	Brown Clay

INITIAL CONFINING STRESS (psi) 4.9



Tested By	JAB	Date	2/2/17	Input Checked By		KC	Date	2/10/17

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-107
Client Reference:	Elk Street Commerce Park	Depth (ft):	11.2-11.7
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual:	Brown Clay

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	6.129	Top Dia. (in):	2.877
Length 2 (in):	6.126	Mid. Dia. (in)	2.881
Length 3 (in):	6.131	Bot. Dia. (in):	2.881
Avg.Length (in)	**6.129**	**Area (in^2):**	**6.513**

WATER CONTENT (AFTER TEST)

Total Weight of Sample (g):	1384.14
Tare No.:	1420
Weight of Tare & Wet Sample (g):	1528.19
Weight of Tare & Dry Sample (g):	1293.55
Weight of Tare (g):	144.61
% Moisture:	20.4

UNIT WEIGHT

Undisturbed Sample

Weight of Tube & Wet Sample (g):	1820.9	Sample Volume (cm^3):	654.1
Weight of Tube (g):	434.84	Unit Wet Weight (g/cm^3):	2.12
Weight of Wet Sample (g):	1386.06	Unit Wet Weight (pcf):	132.23
Diameter (in):	2.88	Moisture Content (%):	20.4
Length (in):	6.13	Unit Dry Weight (pcf):	109.8
Length (cm):	15.57		

INITIAL CONFINING STRESS (psi)	**4.9**	Initial Dial Reading (mil)	32
ENDING CONFINING STRESS (psi)	**4.9**	Dial Reading Before Shearing (mil)	31

DEFORMATION (in)	*LOAD (lb)*	*ELAPSED TIME (min)*	*STRAIN (%)*	*STRESS (psi)*
0.000	2.6	0.0	0.0	0.000
0.004	14.9	0.07	0.1	1.891
0.009	24.0	0.15	0.1	3.275
0.017	39.7	0.28	0.3	5.672
0.030	60.4	0.48	0.5	8.832
0.044	80.7	0.72	0.7	11.906
0.063	114.6	1.03	1.0	17.023
0.088	158.9	1.43	1.4	23.648
0.107	187.4	1.73	1.7	27.882
0.131	214.4	2.13	2.1	31.820
0.156	234.5	2.55	2.5	34.690
0.174	245.6	2.85	2.8	36.240
0.217	262.8	3.55	3.5	38.533
0.267	265.0	4.35	4.4	38.536
0.298	253.2	4.87	4.9	36.601
0.325	247.7	5.32	5.3	35.635
0.387	251.2	6.32	6.3	35.754
0.433	257.4	7.07	7.1	36.359
0.464	261.7	7.57	7.6	36.775
0.525	270.2	8.57	8.6	37.566
0.603	282.2	9.83	9.8	38.706
0.695	295.1	11.33	11.3	39.815
0.771	302.6	12.58	12.6	40.264
0.848	315.7	13.83	13.8	41.411
0.879	320.4	14.35	14.3	41.797
0.910	322.4	14.85	14.8	41.813

Tested By JAB Date 2/2/17 Input Checked By KC Date 2/10/17

DCN: CT-S29 DATE: 7/28/16 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-107
Client Reference:	Elk Street Commerce Park	Depth (ft):	30-32
Project No.:	2017-061-001	Sample No.:	S-8
Lab ID:	2017-061-001-019	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

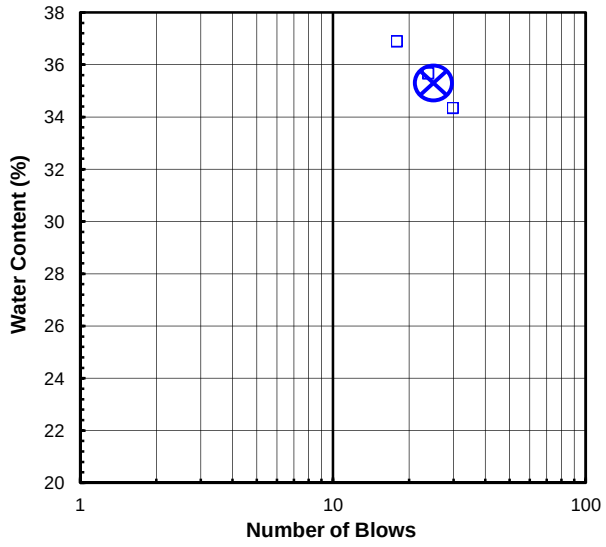
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3074	433	115	156	U
Wt. of Tare & Wet Sample (g):	40.19	39.20	42.37	39.72	L
Wt. of Tare & Dry Sample (g):	30.82	33.26	36.28	34.11	T
Weight of Tare (g):	3.78	15.95	19.19	18.89	I
Weight of Water (g):	9.4	5.9	6.1	5.6	P
Weight of Dry Sample (g):	27.0	17.3	17.1	15.2	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**34.7**	**34.3**	**35.6**	**36.9**	N
Number of Blows:		**30**	**24**	**18**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	319	1289	
Wt. of Tare & Wet Sample (g):	24.65	27.49	
Wt. of Tare & Dry Sample (g):	23.66	26.48	
Weight of Tare (g):	18.32	21.09	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.3	5.4	
Moisture Content (%):	**18.5**	**18.7**	**-0.2**

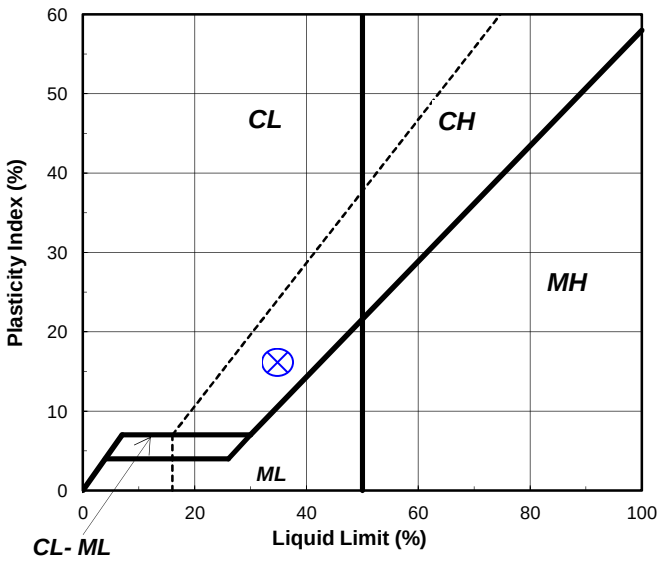
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**35**
Plastic Limit (%):	**19**
Plasticity Index (%):	**16**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By TO *Date* 2/3/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SPECIFIC GRAVITY

ASTM D 854-14

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-107
Client Reference:	Elk Street Commerce Park	Depth (ft):	30-32
Project No.:	2017-061-001	Sample No.:	S-8
Lab ID:	2017-061-001-019	Visual Description:	Brown Clay

(MInus No.4 sieve material,oven dried)

Replicate Number	**1**	**2**
Pycnometer ID:	G 1255	G 1504
Weight of Pycnometer & Soil & Water (g):	717.92	705.17
Temperature (^{o}C):	26.7	26.6
Weight of Pycnometer & Water (g):	684.86	672.04
Tare Number:	2343	506
Weight of Tare & Dry Soil (g):	146.05	151.46
Weight of Tare (g):	92.84	98.08
Weight of Dry Soil (g):	53.21	53.38
Specific Gravity of Soil @ Measured Temperature:	2.640	2.636
Specific Gravity of Water @ Measured Temperature:	0.99660	0.99663
Conversion Factor for Measured Temperature:	0.99839	0.99842
Specific Gravity @ 20^{o} Celsius:	2.645	2.641

Average Specific Gravity @ 20^{o} Celsius	2.64

Tested By TO *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

DCN: CT-S5 Date: 3/5/14 Revision: 20

S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-108
Client Reference:	Elk Street Commerce Park	Depth (ft):	26.5-26.7
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

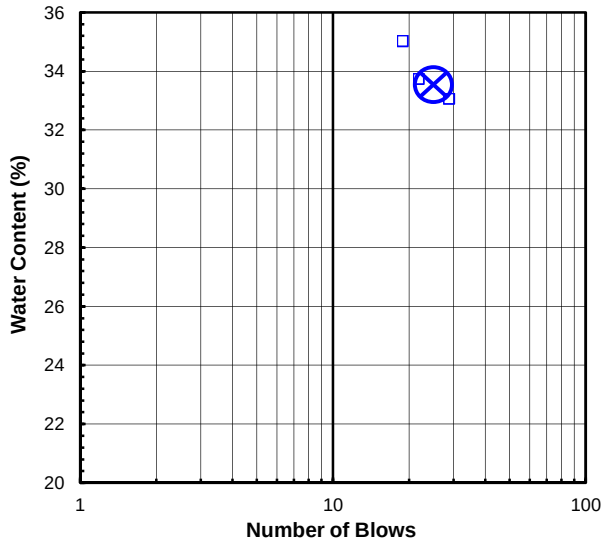
As Received Moisture Content ASTM D2216-10		Liquid Limit Test 1	2	3	M
Tare Number:	3008	349	245	151	U
Wt. of Tare & Wet Sample (g):	155.07	41.80	38.81	41.81	L
Wt. of Tare & Dry Sample (g):	119.06	35.98	33.39	35.86	T
Weight of Tare (g):	6.83	18.36	17.31	18.86	I
Weight of Water (g):	36.0	5.8	5.4	6.0	P
Weight of Dry Sample (g):	112.2	17.6	16.1	17.0	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**32.1**	**33.0**	**33.7**	**35.0**	N
Number of Blows:		**29**	**22**	**19**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	319	290	
Wt. of Tare & Wet Sample (g):	28.43	30.37	
Wt. of Tare & Dry Sample (g):	26.86	28.81	
Weight of Tare (g):	18.30	20.25	
Weight of Water (g):	1.6	1.6	
Weight of Dry Sample (g):	8.6	8.6	
Moisture Content (%):	**18.3**	**18.2**	**0.1**

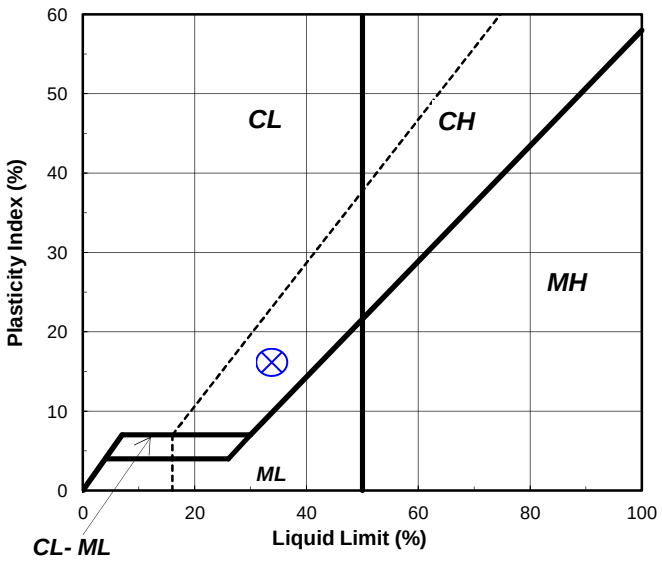
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**34**
Plastic Limit (%):	**18**
Plasticity Index (%):	**16**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By TO *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-109
Client Reference:	Elk Street Commerce Park	Depth (ft):	4-6
Project No.:	2017-061-001	Sample No.:	S-3
Lab ID:	2017-061-001-021	Soil Description:	GRAY/BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)

sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

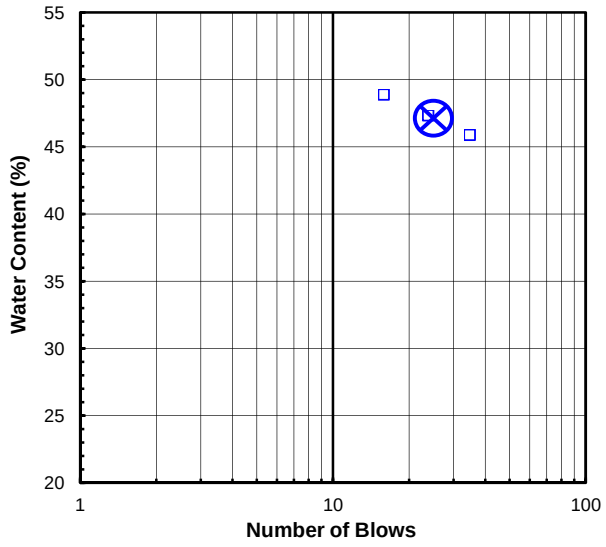
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3085	162	247	158	U
Wt. of Tare & Wet Sample (g):	46.24	37.75	39.71	38.27	L
Wt. of Tare & Dry Sample (g):	36.74	31.10	33.11	31.74	T
Weight of Tare (g):	6.84	17.48	19.15	17.49	I
Weight of Water (g):	9.5	6.7	6.6	6.5	P
Weight of Dry Sample (g):	29.9	13.6	14.0	14.3	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**31.8**	**48.8**	**47.3**	**45.8**	N
Number of Blows:		**16**	**24**	**35**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	224	176	
Wt. of Tare & Wet Sample (g):	25.99	25.57	
Wt. of Tare & Dry Sample (g):	24.69	24.28	
Weight of Tare (g):	19.76	19.40	
Weight of Water (g):	1.3	1.3	
Weight of Dry Sample (g):	4.9	4.9	
Moisture Content (%):	**26.4**	**26.4**	**-0.1**

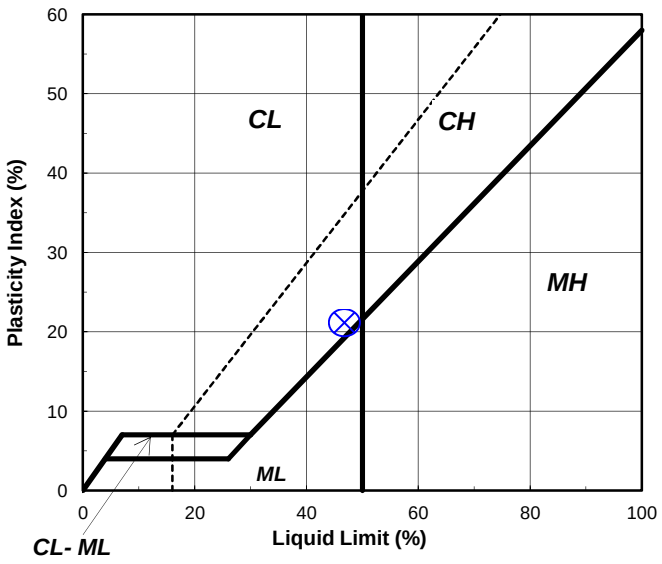
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**47**
Plastic Limit (%):	**26**
Plasticity Index (%):	**21**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-109
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.4-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-022	Soil Description:	BROWN LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

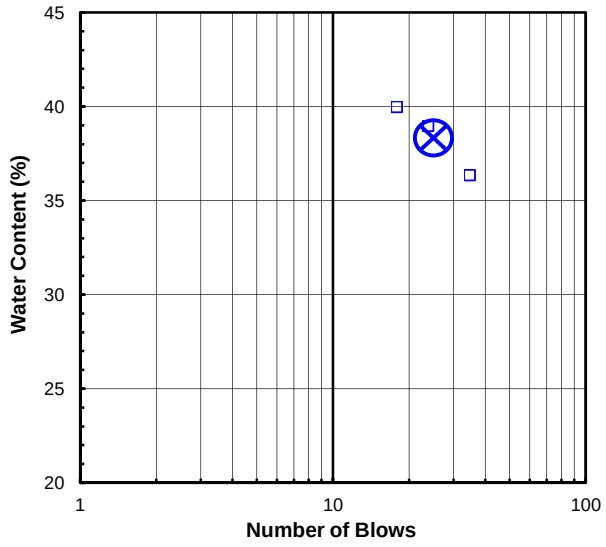
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	562	1101	212	1121	U
Wt. of Tare & Wet Sample (g):	164.72	38.71	39.56	39.54	L
Wt. of Tare & Dry Sample (g):	145.77	32.86	33.88	34.03	T
Weight of Tare (g):	84.17	18.21	19.29	18.85	I
Weight of Water (g):	19.0	5.9	5.7	5.5	P
Weight of Dry Sample (g):	61.6	14.7	14.6	15.2	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**30.8**	**39.9**	**38.9**	**36.3**	N
Number of Blows:		**18**	**24**	**35**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	124	175	
Wt. of Tare & Wet Sample (g):	24.62	25.77	
Wt. of Tare & Dry Sample (g):	23.57	24.72	
Weight of Tare (g):	18.51	19.68	
Weight of Water (g):	1.1	1.1	
Weight of Dry Sample (g):	5.1	5.0	
Moisture Content (%):	**20.8**	**20.8**	**-0.1**

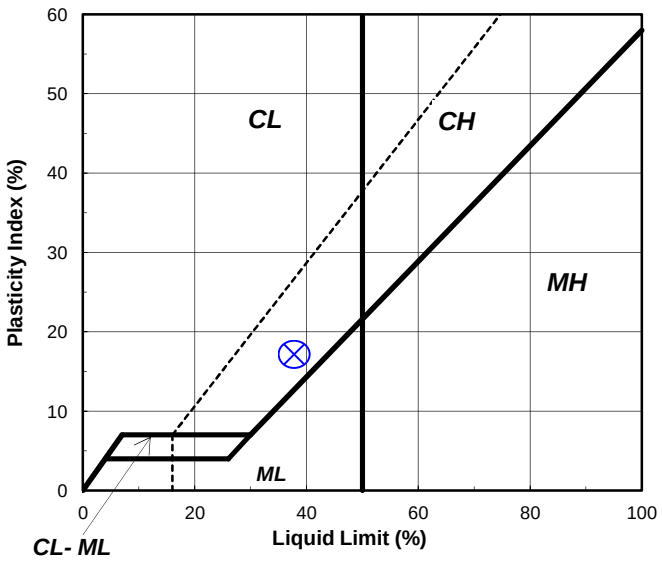
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**38**
Plastic Limit (%):	**21**
Plasticity Index (%):	**17**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By RAL *Date* 2/8/17 *Checked By* TMP *Date* 2/9/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

SPECIFIC GRAVITY

ASTM D 854-14

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-109
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.4-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-022	Visual Description:	Brown Clay

(MInus No.4 sieve material,oven dried)

Replicate Number	**1**	**2**
Pycnometer ID:	G 1255	G 1504
Weight of Pycnometer & Soil & Water (g):	743.78	732.74
Temperature (^{o}C):	25.7	25.7
Weight of Pycnometer & Water (g):	685.00	672.16
Tare Number:	976	520
Weight of Tare & Dry Soil (g):	192.7	186.58
Weight of Tare (g):	99.37	90.24
Weight of Dry Soil (g):	93.33	96.34
Specific Gravity of Soil @ Measured Temperature:	2.702	2.694
Specific Gravity of Water @ Measured Temperature:	0.99687	0.99687
Conversion Factor for Measured Temperature:	0.99866	0.99866
Specific Gravity @ 20^{o} Celsius:	2.705	2.698

Average Specific Gravity @ 20^{o} Celsius	2.70

Tested By TO *Date* 2/6/17 *Checked By* TMP *Date* 2/8/17

DCN: CT-S5 Date: 3/5/14 Revision: 20

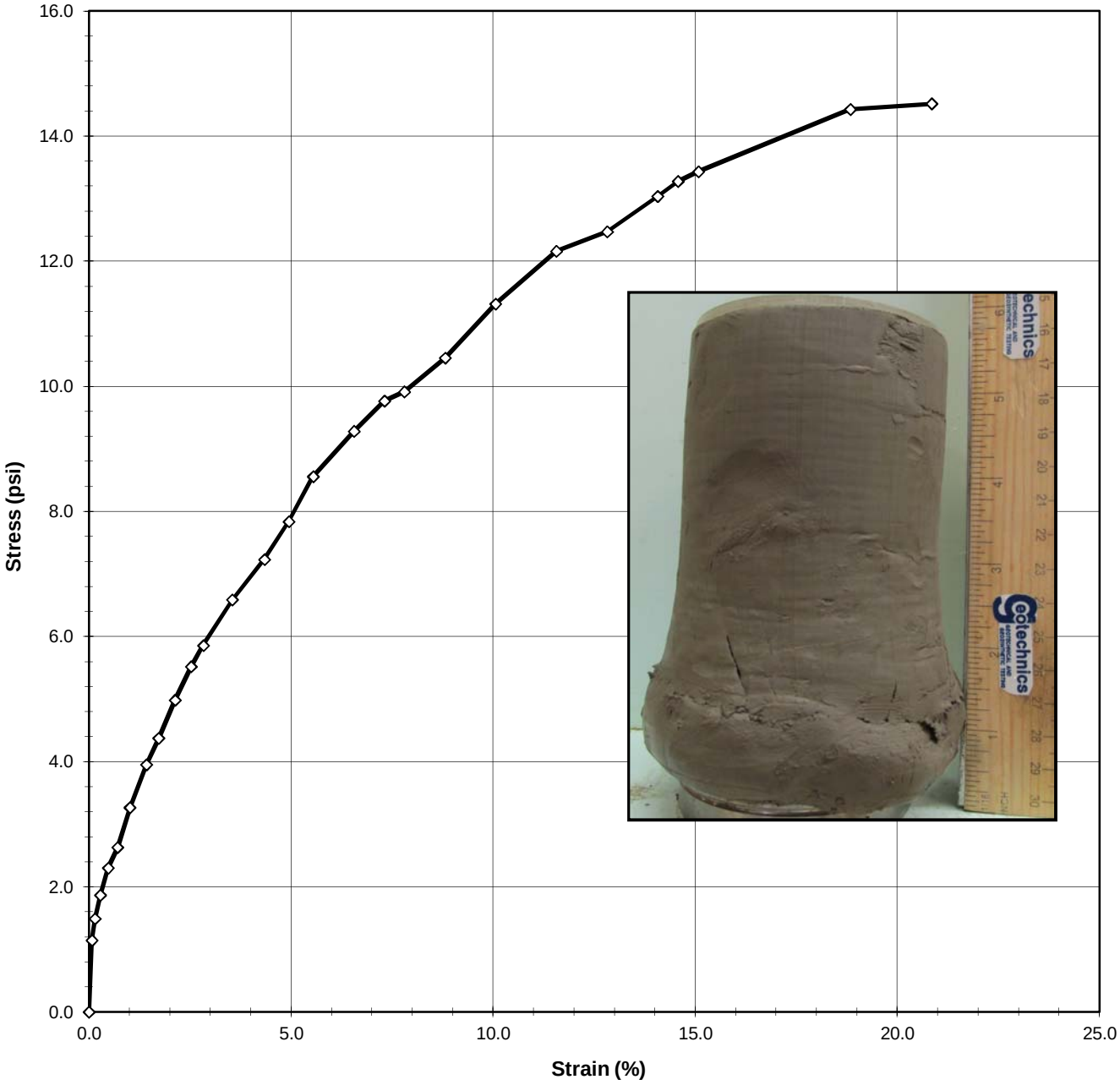
S:\Excel\Excel QA\Spreadsheets\Specific Gravity.xls

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-109
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.4-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-022	Visual:	Brown Clay

INITIAL CONFINING STRESS (psi) 6.1



Tested By	JAB	Date	2/2/17	Input Checked By	KC	Date	2/10/17

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

UNCONSOLIDATED UNDRAINED TRIAXIAL

ASTM D2850-15

geotechnics
geotechnical & geosynthetic testing

Client:	AMEC Foster Wheeler	Boring No.:	SB-0U2-109
Client Reference:	Elk Street Commerce Park	Depth (ft):	21.4-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-022	Visual:	Brown Clay

INITIAL SAMPLE DIMENSIONS

Length 1 (in):	5.915	Top Dia. (in):	2.878
Length 2 (in):	5.919	Mid. Dia. (in)	2.872
Length 3 (in):	5.905	Bot. Dia. (in):	2.895
Avg.Length (in)	**5.913**	**Area (in^2):**	**6.522**

WATER CONTENT (AFTER TEST)

Total Weight of Sample (g):	1231.00
Tare No.:	1472
Weight of Tare & Wet Sample (g):	902.91
Weight of Tare & Dry Sample (g):	750.54
Weight of Tare (g):	144.06
% Moisture:	25.1

UNIT WEIGHT

Undisturbed Sample

Weight of Tube & Wet Sample (g):	1682.77	Sample Volume (cm^3):	632.0
Weight of Tube (g):	424.17	Unit Wet Weight (g/cm^3):	1.99
Weight of Wet Sample (g):	1258.6	Unit Wet Weight (pcf):	124.28
Diameter (in):	2.88	Moisture Content (%):	25.1
Length (in):	5.91	Unit Dry Weight (pcf):	99.3
Length (cm):	15.02		

INITIAL CONFINING STRESS (psi)	**6.1**	Initial Dial Reading (mil)	32
ENDING CONFINING STRESS (psi)	**6.2**	Dial Reading Before Shearing (mil)	31

DEFORMATION (in)	*LOAD (lb)*	*ELAPSED TIME (min)*	*STRAIN (%)*	*STRESS (psi)*
0.000	2.8	0.0	0.0	0.000
0.004	10.3	0.07	0.1	1.145
0.009	12.6	0.15	0.1	1.490
0.017	15.1	0.28	0.3	1.866
0.028	17.9	0.48	0.5	2.301
0.042	20.1	0.72	0.7	2.630
0.060	24.4	1.02	1.0	3.268
0.084	29.0	1.42	1.4	3.952
0.102	31.9	1.73	1.7	4.376
0.126	36.1	2.13	2.1	4.983
0.150	39.8	2.53	2.5	5.520
0.168	42.2	2.83	2.8	5.857
0.210	47.4	3.55	3.5	6.588
0.257	52.2	4.35	4.3	7.232
0.293	56.6	4.95	4.9	7.838
0.328	61.9	5.55	5.6	8.558
0.388	67.6	6.57	6.6	9.283
0.432	71.6	7.32	7.3	9.765
0.462	73.0	7.82	7.8	9.914
0.521	77.6	8.82	8.8	10.454
0.595	84.9	10.07	10.1	11.317
0.684	92.5	11.57	11.6	12.161
0.758	96.2	12.82	12.8	12.471
0.832	101.8	14.08	14.1	13.037
0.862	104.2	14.58	14.6	13.277
0.892	106.0	15.08	15.1	13.431
1.114	118.8	18.85	18.8	14.427
1.233	122.5	20.85	20.9	14.518

Tested By JAB Date 2/2/17 Input Checked By KC Date 2/10/17

DCN: CT-S29 DATE: 7/28/16 REVISION: 3

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ATTERBERG LIMITS

ASTM D 4318-10

Client:	AMEC Foster Wheeler	Boring No.:	SB-OU2-109
Client Reference:	Elk Street Commerce Park	Depth (ft):	41.8-42.0
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-023	Soil Description:	BROWNISH GRAY LEAN CLAY

Note: The* USCS *symbol used with this test refers only to the minus No. 40 (Minus No. 40 sieve material, Air dried)

sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

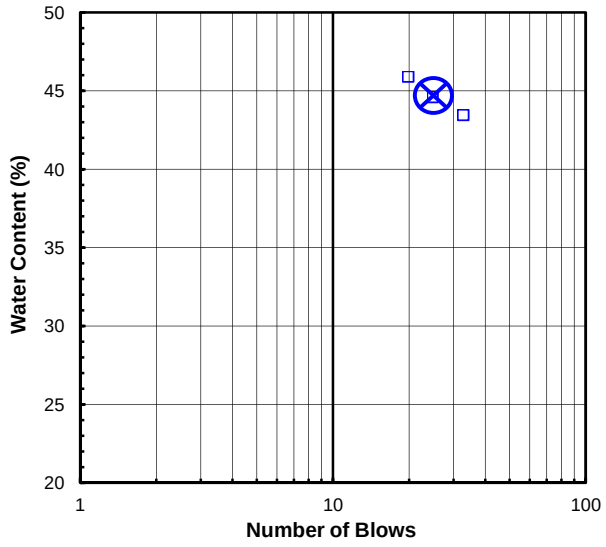
As Received Moisture Content ASTM D2216-10		**Liquid Limit Test** 1	2	3	M
Tare Number:	3123	400	1289	190	U
Wt. of Tare & Wet Sample (g):	111.61	36.11	45.34	42.14	L
Wt. of Tare & Dry Sample (g):	91.66	29.93	37.86	34.58	T
Weight of Tare (g):	6.71	15.69	21.07	18.09	I
Weight of Water (g):	20.0	6.2	7.5	7.6	P
Weight of Dry Sample (g):	85.0	14.2	16.8	16.5	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**23.5**	**43.4**	**44.6**	**45.8**	N
Number of Blows:		**33**	**25**	**20**	T

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	2289	1254	
Wt. of Tare & Wet Sample (g):	30.49	26.52	
Wt. of Tare & Dry Sample (g):	28.80	24.79	
Weight of Tare (g):	20.42	16.23	
Weight of Water (g):	1.7	1.7	
Weight of Dry Sample (g):	8.4	8.6	
Moisture Content (%):	**20.2**	**20.2**	**0.0**

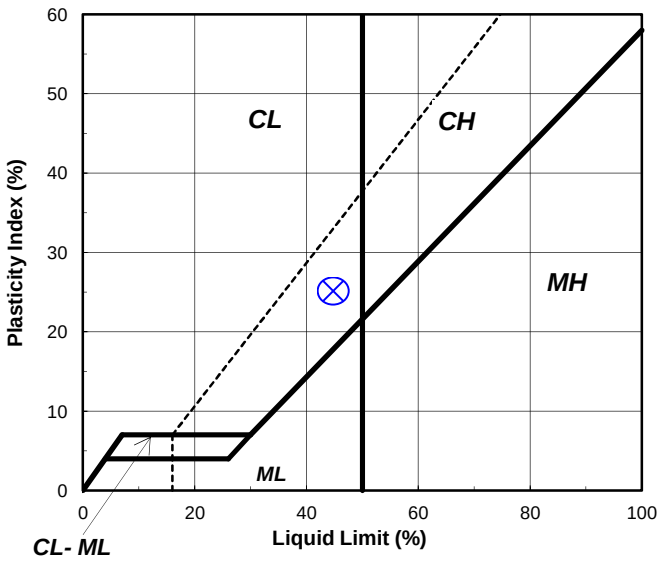
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%):	**45**
Plastic Limit (%):	**20**
Plasticity Index (%):	**25**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By TO *Date* 2/7/17 *Checked By* TMP *Date* 2/9/17

S:\Excel\Excel QA\Spreadsheets\Limit 3Pt.xls

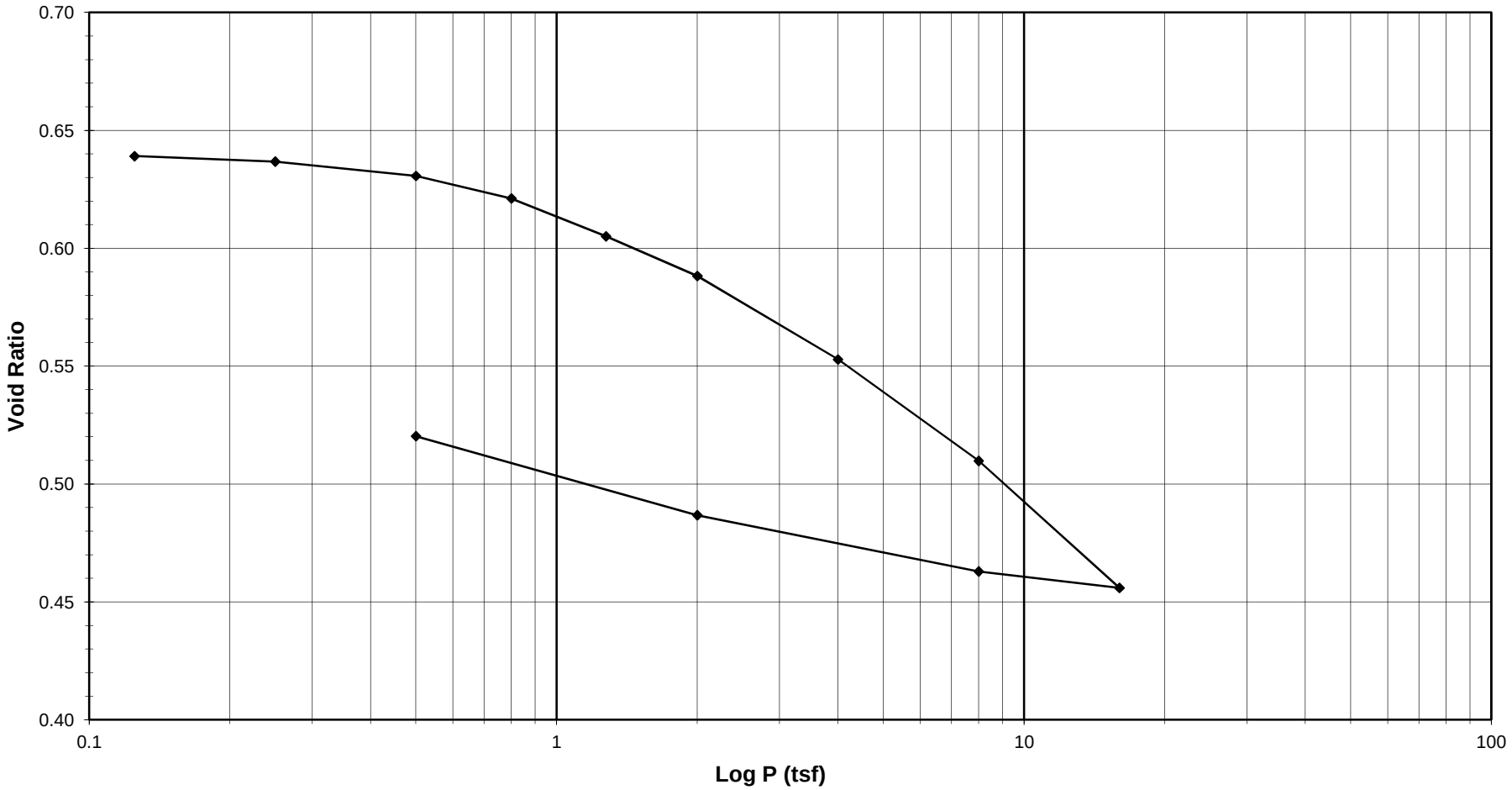
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By TM *Date* 2/3/17 *Approved By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. G1418
1 Division = 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	3085	3245
Wt. of Tare & WS (g)	151.84	164.76
Wt. of Tare & DS (g)	125.83	137.28
Wt. of Water (g)	26.01	27.48
Wt. of Tare (g)	6.79	6.81
Wt. of DS (g)	119.04	130.47
Water Content (%)	21.85	21.06
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.9274
Sample Volume (cm^3)	80.44	74.60
Wt. of Wet Sample + Ring (g)	375.61	374.57
Wt. of Ring (g)	214.18	214.18
Wt. of Wet Sample (g)	161.43	160.39
Wet Density (pcf)	125.23	134.16
Wet Density (g/cm^3)	2.01	2.15
Water Content (%)	21.85	21.06
Wt. of Dry Sample (g)	132.48	132.48
Dry Density (pcf)	102.77	110.82
Dry Density (g/cm^3)	1.65	1.78
Void Ratio	0.6394	0.5203
Saturation (%)	92.27	109.30
Specific Gravity	2.70	*Measured*

Test Data Summary

Applied Pressure (tsf)	**Final Dial Reading** (div)	**Machine Deflection** (div)	**Corrected Reading** (div)	**Height of Sample** (mm)	**Volume** (cm^3)	**Dry Density** (g/cm^3)	**Void Ratio**
Seating	0	0	0	25.400	80.440	1.64698	**0.63936**
0.125	4.9	3.2	1.6	25.396	80.427	1.64725	**0.63910**
0.25	22.2	6.5	15.7	25.360	80.313	1.64958	**0.63678**
0.5	65.0	12.1	52.9	25.266	80.014	1.65574	**0.63069**
0.8	128.9	17.7	111.1	25.118	79.546	1.66549	**0.62114**
1.275	233.1	23.9	209.1	24.869	78.758	1.68216	**0.60508**
2	345.9	34.1	311.8	24.608	77.932	1.69998	**0.58826**
4	577.2	49.5	527.7	24.060	76.195	1.73873	**0.55286**
8	865.5	75.6	790.0	23.393	74.085	1.78825	**0.50986**
16	1234.0	115.3	1118.7	22.558	71.441	1.85444	**0.45596**
8	1160.3	84.0	1076.3	22.666	71.782	1.84562	**0.46292**
2	975.3	44.5	930.8	23.036	72.953	1.81601	**0.48678**
0.5	750.1	23.9	726.2	23.555	74.598	1.77596	**0.52031**

Tested By *TM* *Date* *2/3/17* *Input Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

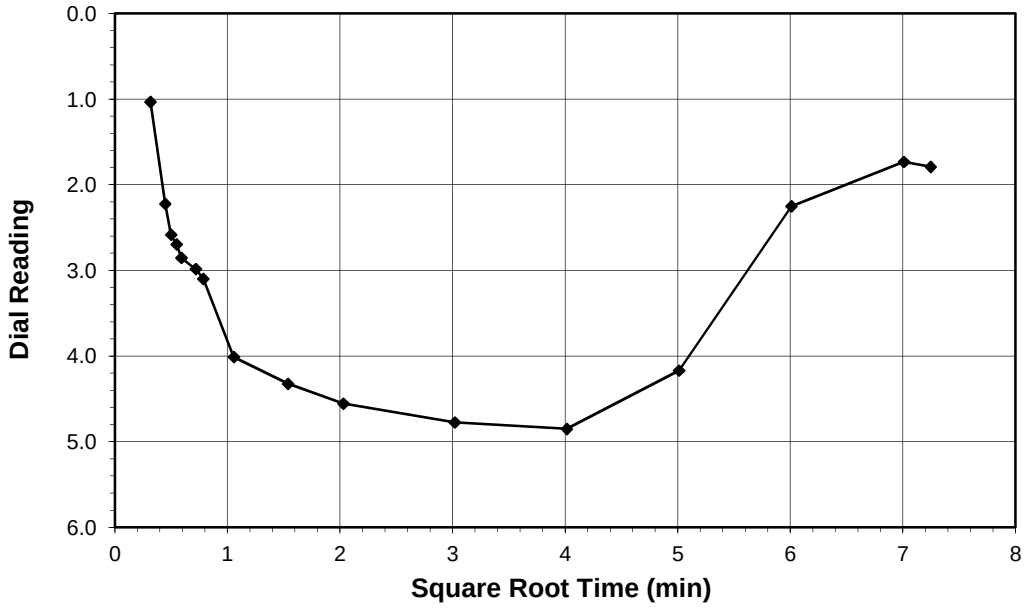
544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

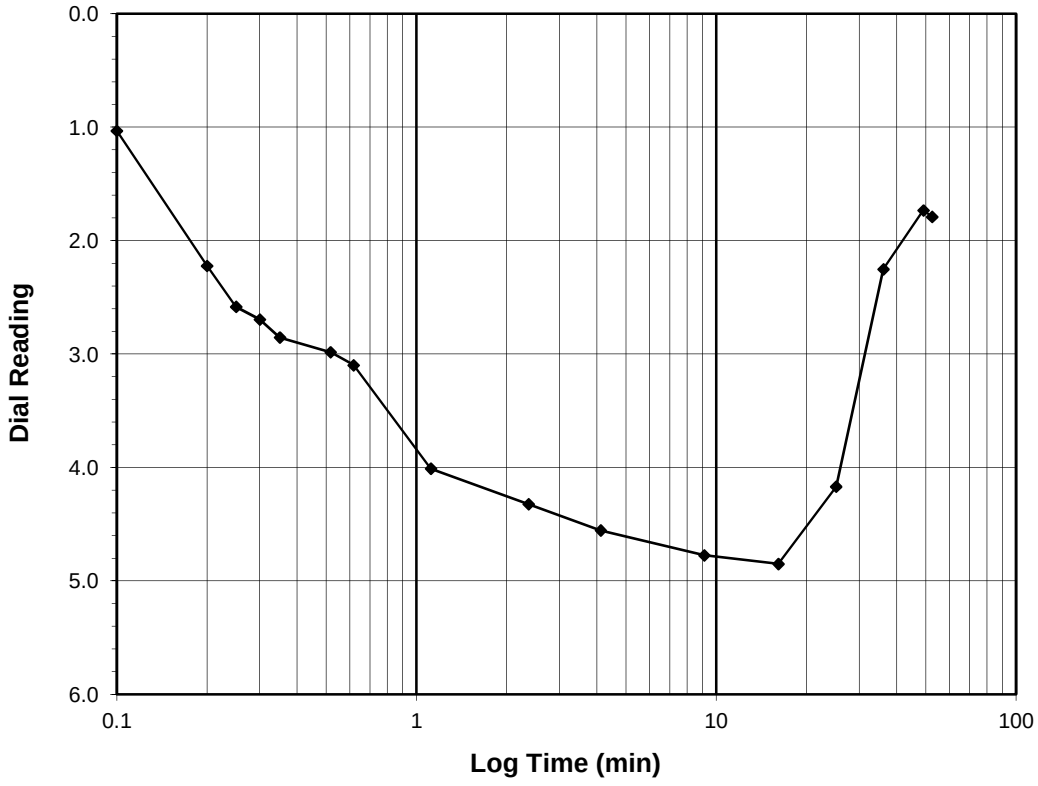
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0 - 0.125**
Final Reading	**(div)**	**4.9**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		7:16:02

Elapsed Time (min)	Dial Reading (div)
Initial	**0.0**
0.10	1.0
0.20	2.2
0.25	2.6
0.30	2.7
0.35	2.9
0.52	3.0
0.62	3.1
1.12	4.0
2.37	4.3
4.12	4.6
9.12	4.8
16.12	4.9
25.12	4.2
36.12	2.3
49.12	1.7
52.52	1.8

Load was advanced due to specimen swelling.

Tested By TM *Date* 2/3/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

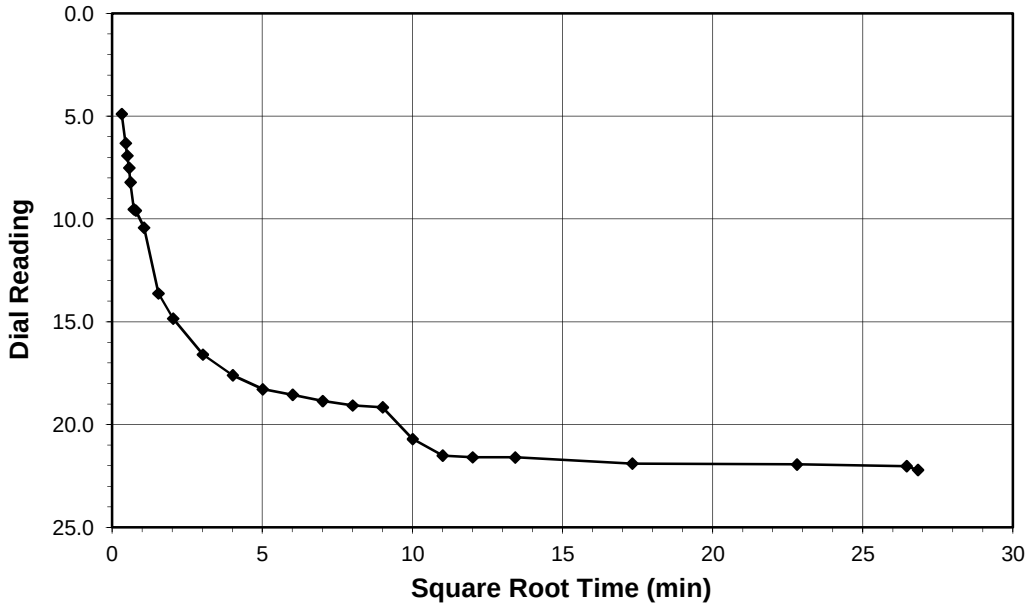
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

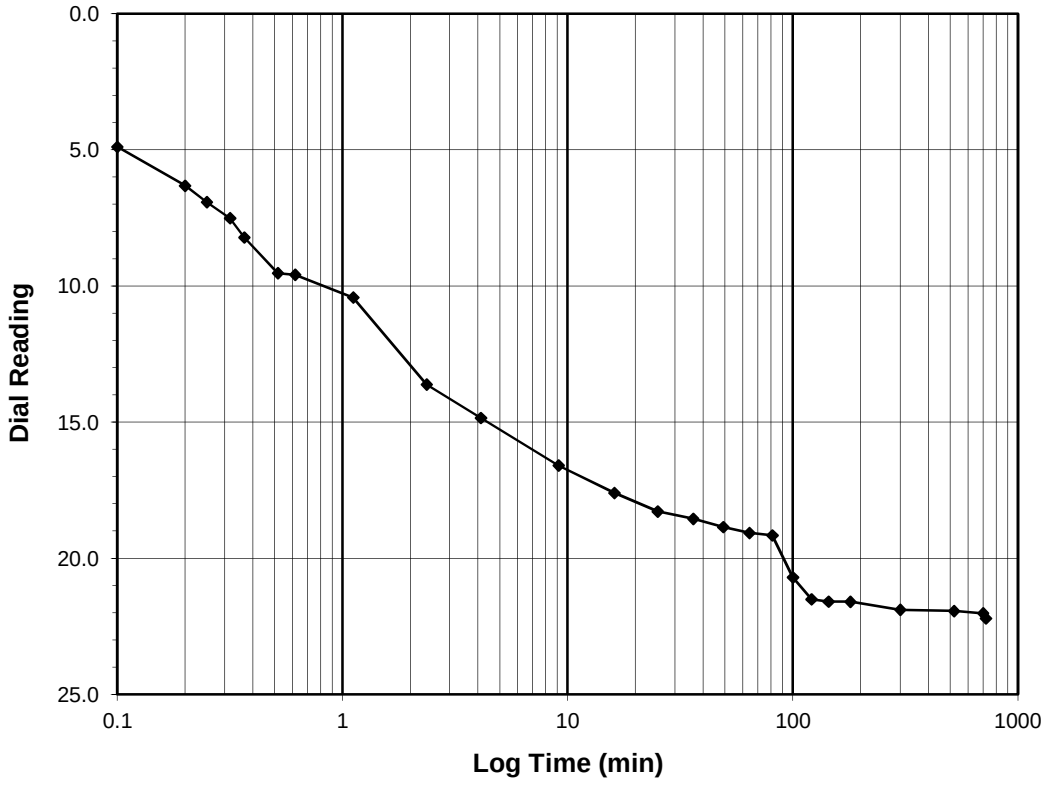
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.125 - 0.25**
Final Reading	**(div)**	**22.2**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		8:08:41

Elapsed Time (min)	Dial Reading (div)
Initial	**4.9**
0.10	4.9
0.20	6.3
0.25	6.9
0.32	7.5
0.37	8.2
0.52	9.5
0.62	9.6
1.12	10.4
2.37	13.6
4.12	14.8
9.12	16.6
16.12	17.6
25.12	18.3
36.12	18.6
49.12	18.9
64.12	19.1
81.12	19.2
100.12	20.7
121.12	21.5
144.12	21.6
180.13	21.6
300.13	21.9
520.13	21.9
700.13	22.0
720.22	22.2

Tested By *TM* *Date* *2/3/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

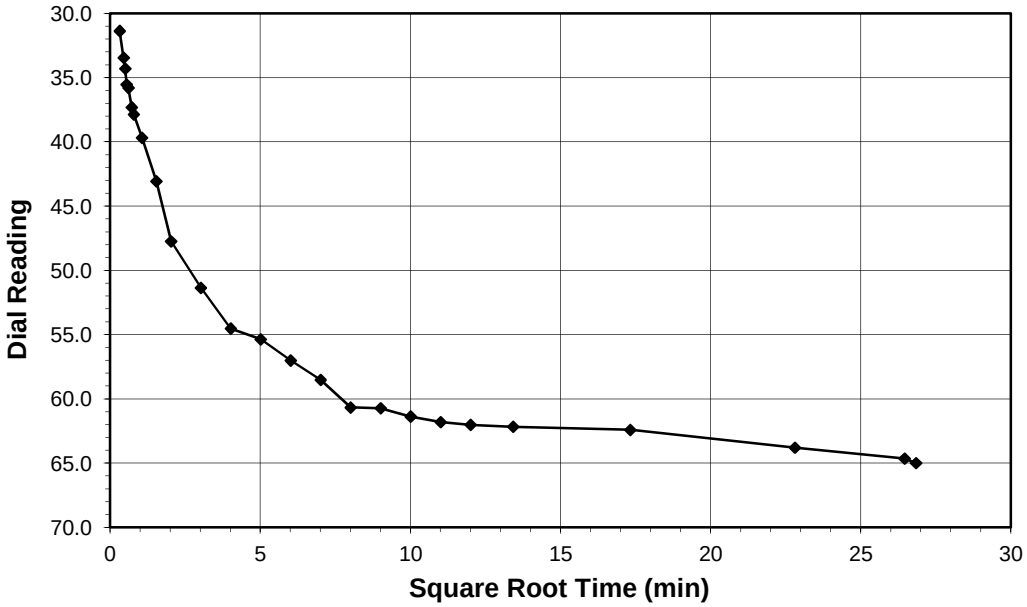
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

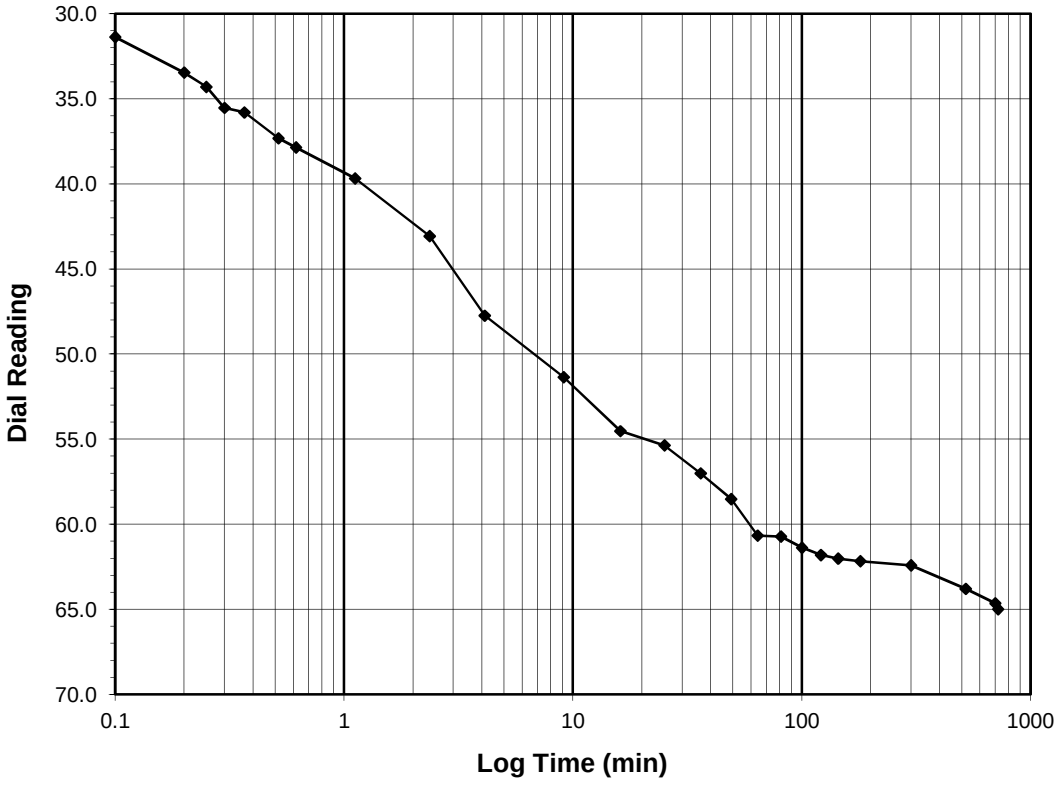
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.25 - 0.5**
Final Reading	**(div)**	**65.0**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		20:08:54

Elapsed Time (min)	Dial Reading (div)
Initial	**22.2**
0.10	31.4
0.20	33.5
0.25	34.3
0.30	35.5
0.37	35.8
0.52	37.3
0.62	37.9
1.12	39.7
2.37	43.1
4.12	47.7
9.12	51.4
16.12	54.5
25.12	55.4
36.12	57.0
49.12	58.5
64.12	60.7
81.12	60.7
100.13	61.4
121.13	61.8
144.13	62.0
180.13	62.2
300.13	62.4
520.13	63.8
700.13	64.6
720.30	65.0

Tested By *TM* *Date* *2/3/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

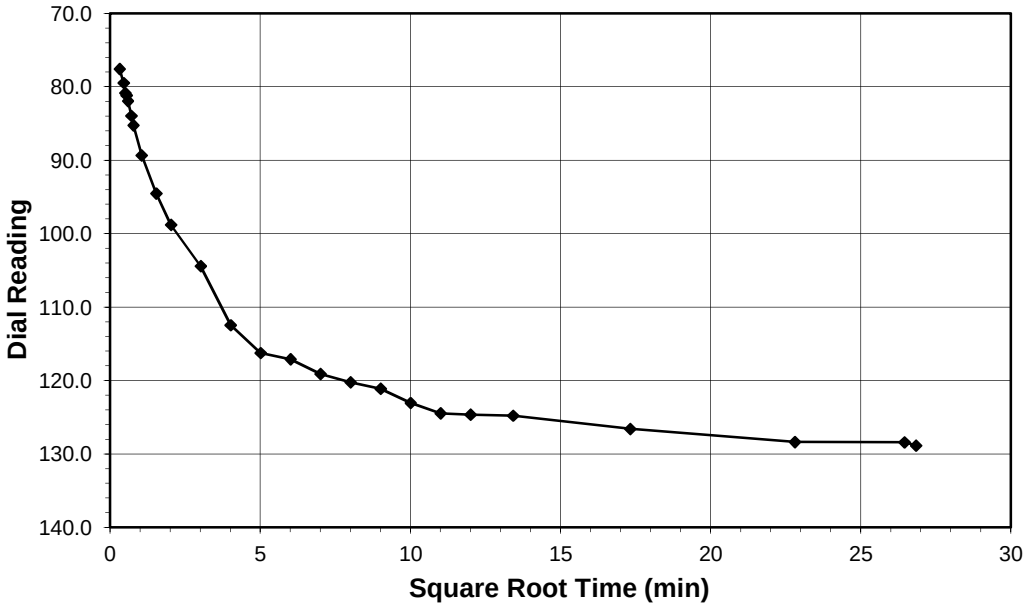
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

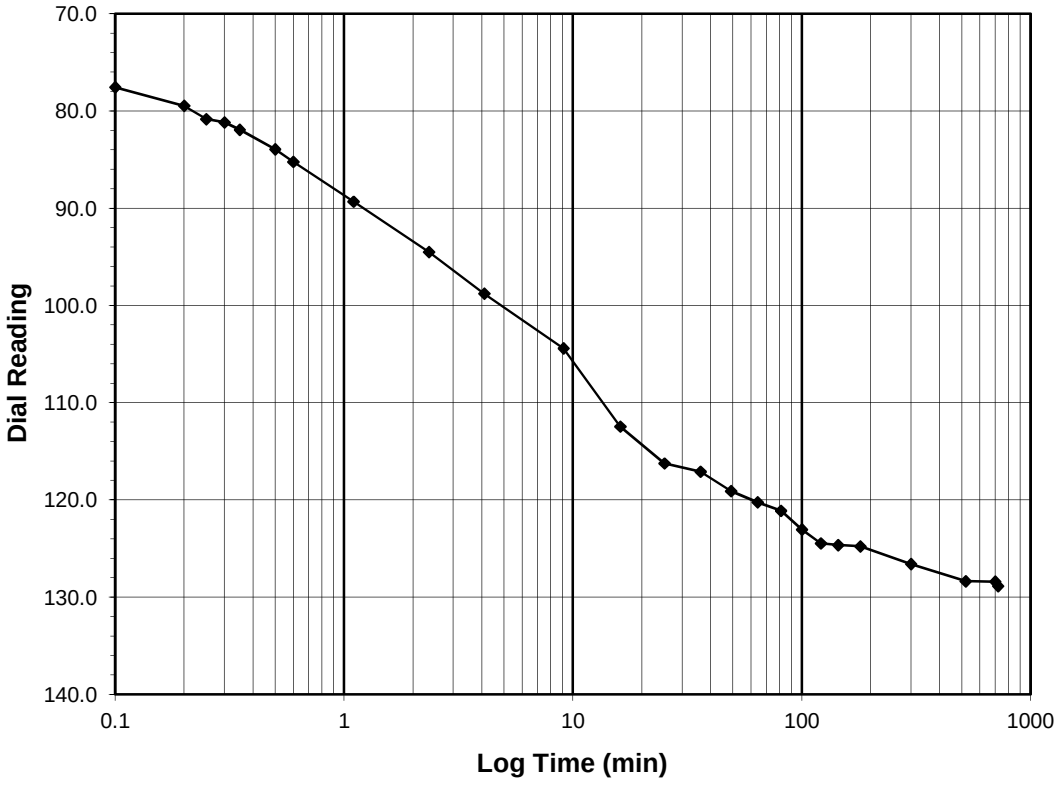
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.5 - 0.8**
Final Reading	**(div)**	**128.9**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		8:09:12

Elapsed Time (min)	Dial Reading (div)
Initial	**65.0**
0.10	77.6
0.20	79.5
0.25	80.8
0.30	81.2
0.35	81.9
0.50	83.9
0.60	85.2
1.10	89.3
2.35	94.5
4.10	98.8
9.10	104.4
16.10	112.5
25.10	116.2
36.10	117.1
49.10	119.1
64.10	120.2
81.12	121.1
100.12	123.0
121.12	124.5
144.12	124.6
180.12	124.8
300.12	126.6
520.12	128.4
700.12	128.4
720.33	128.9

Tested By *TM* *Date* *2/4/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

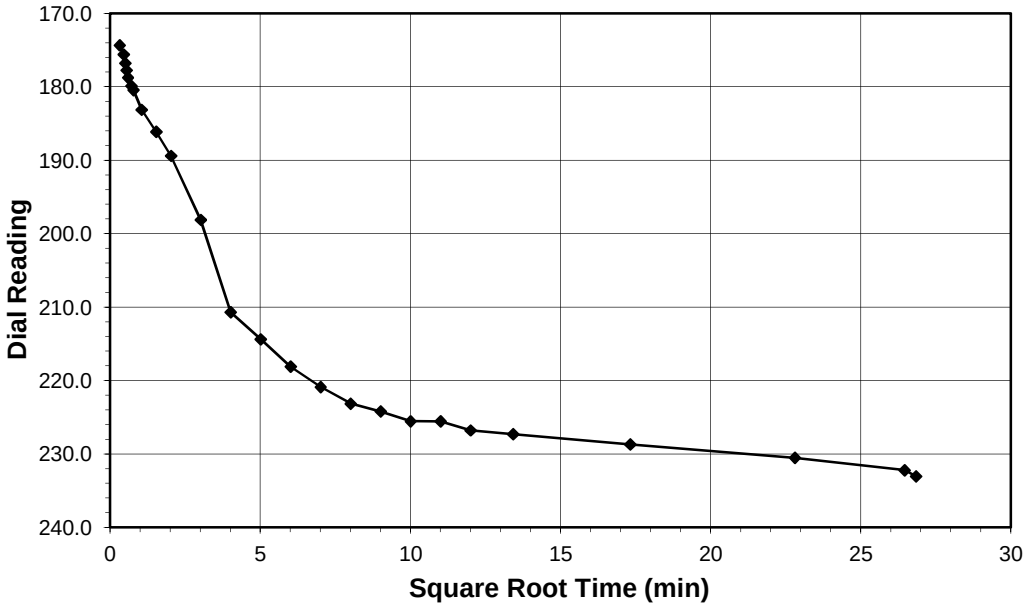
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

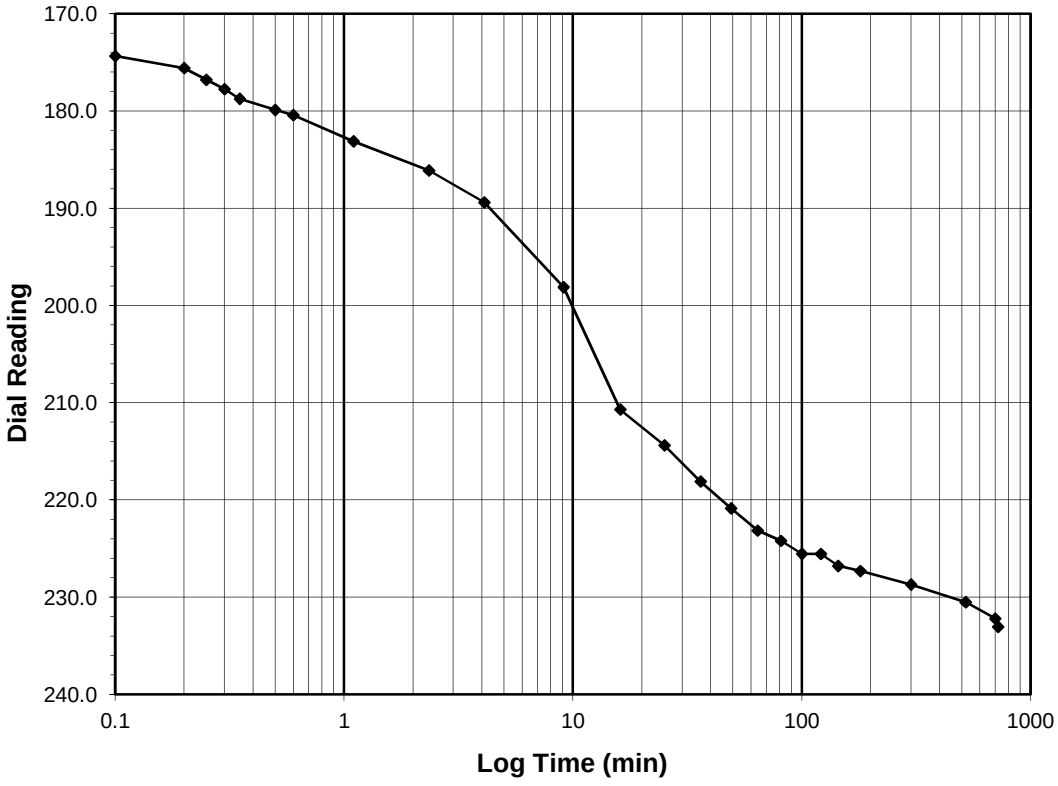
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.8 - 1.275**
Final Reading	**(div)**	**233.1**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		20:09:33

Elapsed Time (min)	Dial Reading (div)
Initial	**128.9**
0.10	174.3
0.20	175.6
0.25	176.8
0.30	177.7
0.35	178.7
0.50	179.9
0.60	180.4
1.10	183.1
2.35	186.1
4.10	189.4
9.10	198.1
16.10	210.7
25.12	214.4
36.12	218.1
49.12	220.9
64.12	223.2
81.12	224.2
100.12	225.5
121.12	225.6
144.12	226.8
180.13	227.3
300.13	228.7
520.13	230.5
700.13	232.2
720.28	233.1

Tested By *TM* *Date* *2/4/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

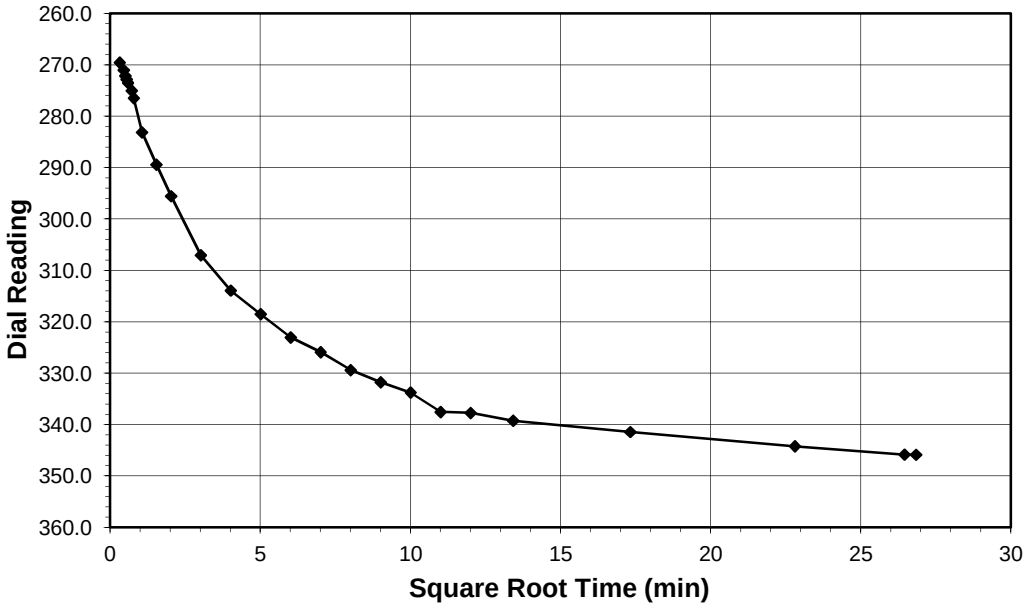
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

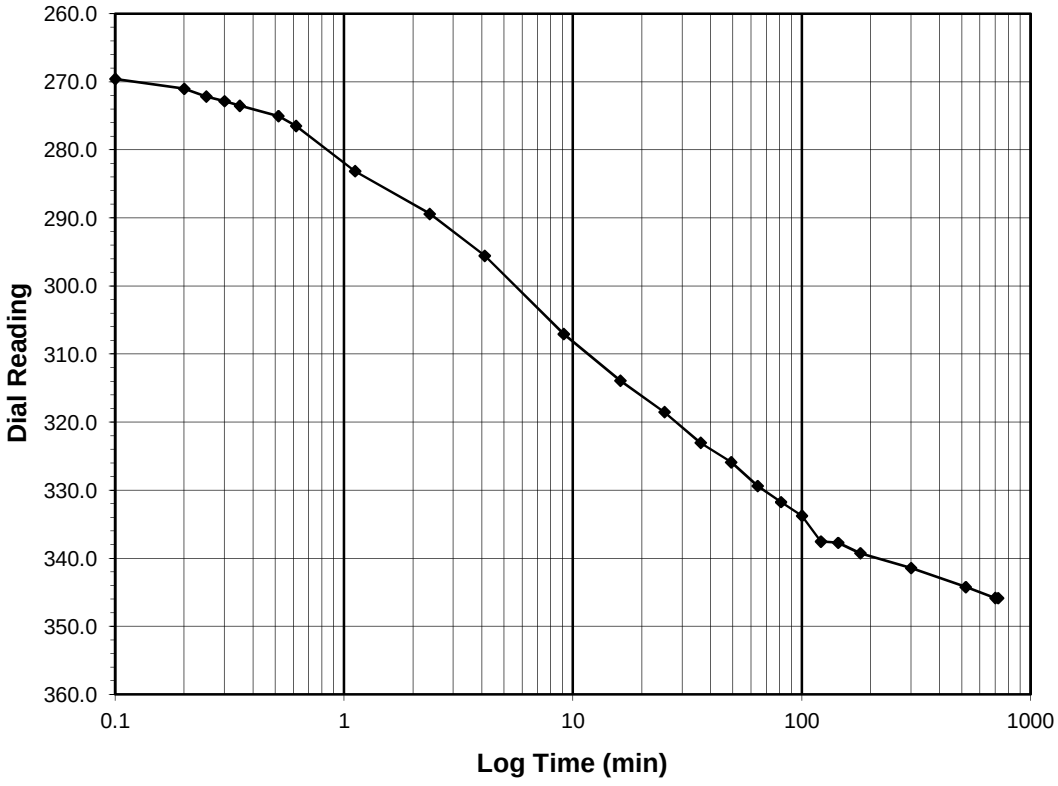
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**1.275 - 2**
Final Reading	**(div)**	**345.9**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		8:09:50

Elapsed Time (min)	Dial Reading (div)
Initial	**233.1**
0.10	269.6
0.20	271.0
0.25	272.2
0.30	272.8
0.35	273.5
0.52	275.0
0.62	276.5
1.12	283.1
2.37	289.4
4.12	295.6
9.12	307.1
16.12	313.9
25.12	318.5
36.12	323.0
49.12	325.9
64.12	329.4
81.12	331.7
100.12	333.8
121.12	337.5
144.12	337.7
180.12	339.3
300.12	341.4
520.12	344.2
700.12	345.8
720.37	345.9

Tested By TM *Date* 2/5/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

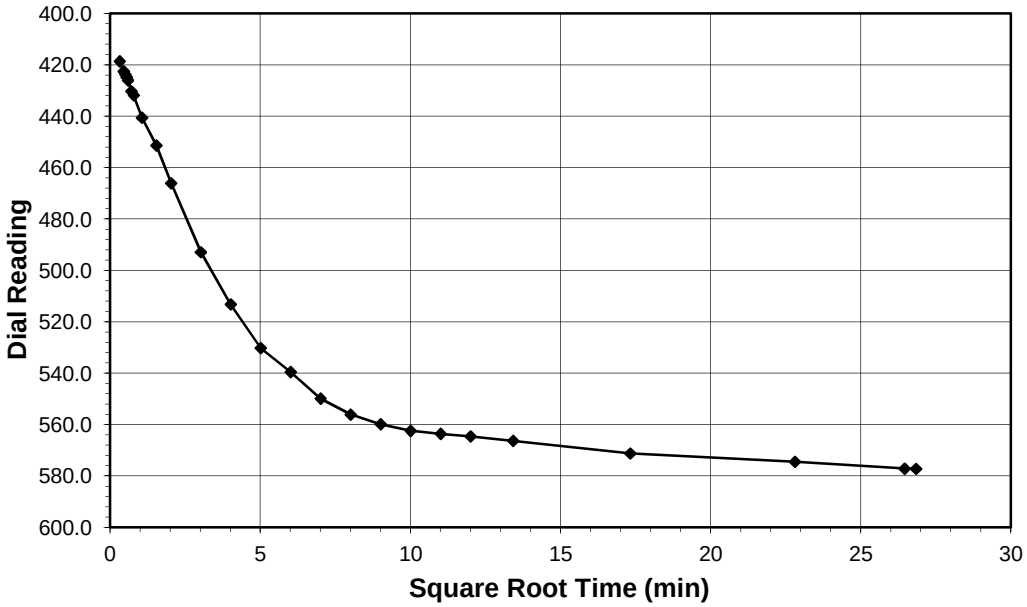
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

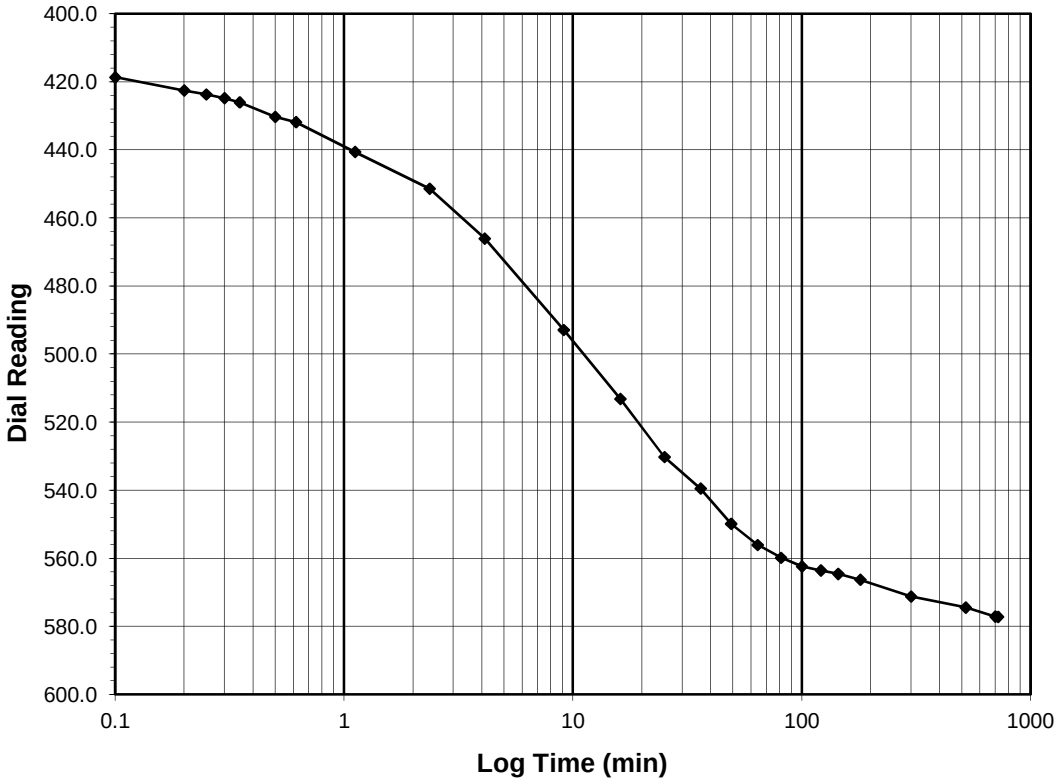
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 4**
Final Reading	**(div)**	**577.2**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		20:10:12

Elapsed Time (min)	Dial Reading (div)
Initial	**345.9**
0.10	418.7
0.20	422.5
0.25	423.7
0.30	424.8
0.35	426.0
0.50	430.3
0.62	431.8
1.12	440.6
2.37	451.4
4.12	466.0
9.12	492.9
16.12	513.2
25.12	530.2
36.12	539.5
49.12	549.9
64.12	556.1
81.12	559.9
100.12	562.4
121.13	563.6
144.13	564.6
180.13	566.3
300.13	571.2
520.13	574.5
700.13	577.1
720.33	577.2

Tested By TM *Date* 2/5/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

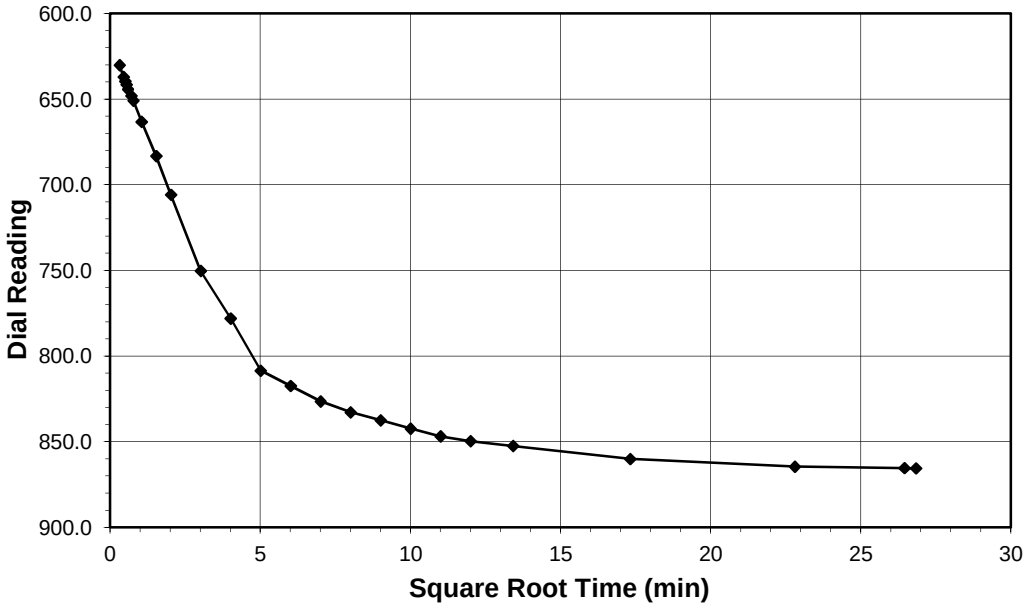
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

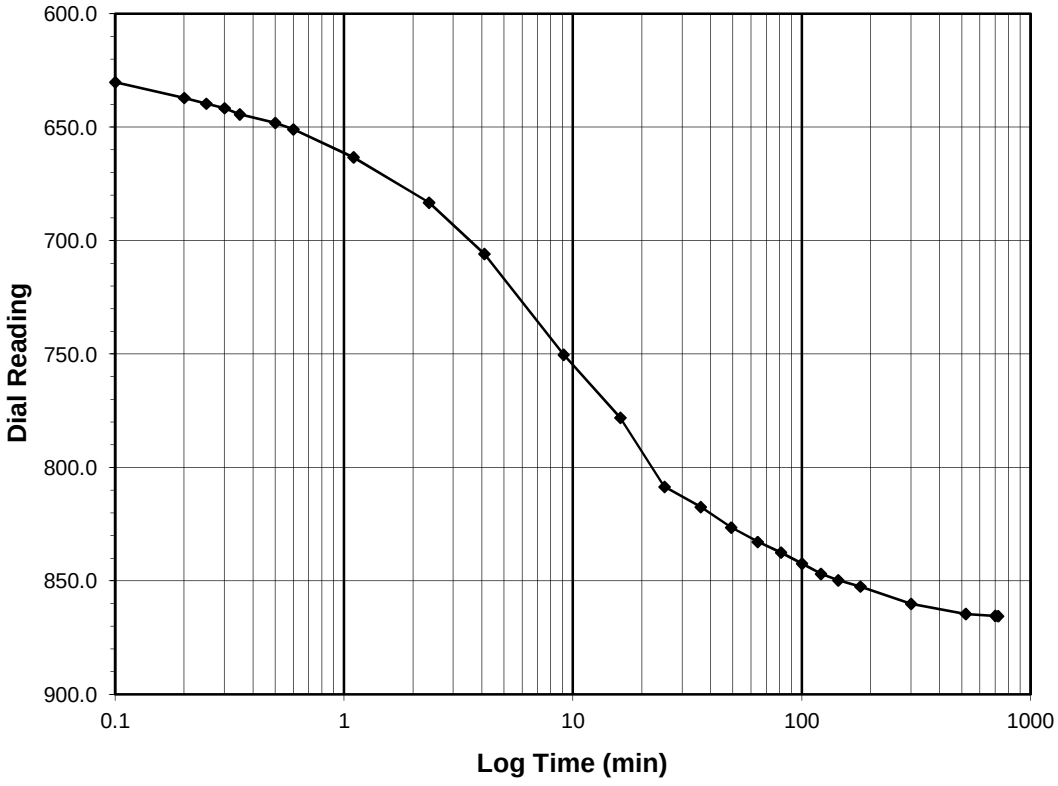
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**4 - 8**
Final Reading	**(div)**	**865.5**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		8:10:32

Elapsed Time (min)	Dial Reading (div)
Initial	**577.2**
0.10	630.2
0.20	637.1
0.25	639.6
0.30	641.6
0.35	644.3
0.50	648.1
0.60	650.9
1.10	663.3
2.35	683.3
4.10	705.9
9.10	750.3
16.10	778.0
25.12	808.5
36.12	817.4
49.12	826.4
64.12	832.8
81.12	837.5
100.12	842.3
121.12	846.9
144.12	849.7
180.12	852.5
300.12	860.1
520.12	864.6
700.12	865.4
720.28	865.5

Tested By TM *Date* 2/6/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

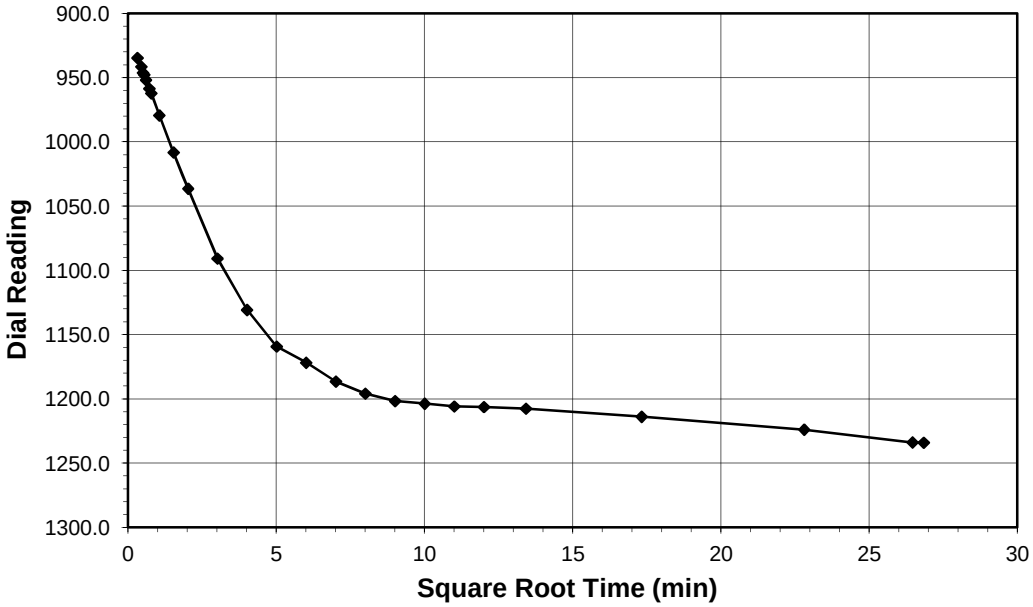
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

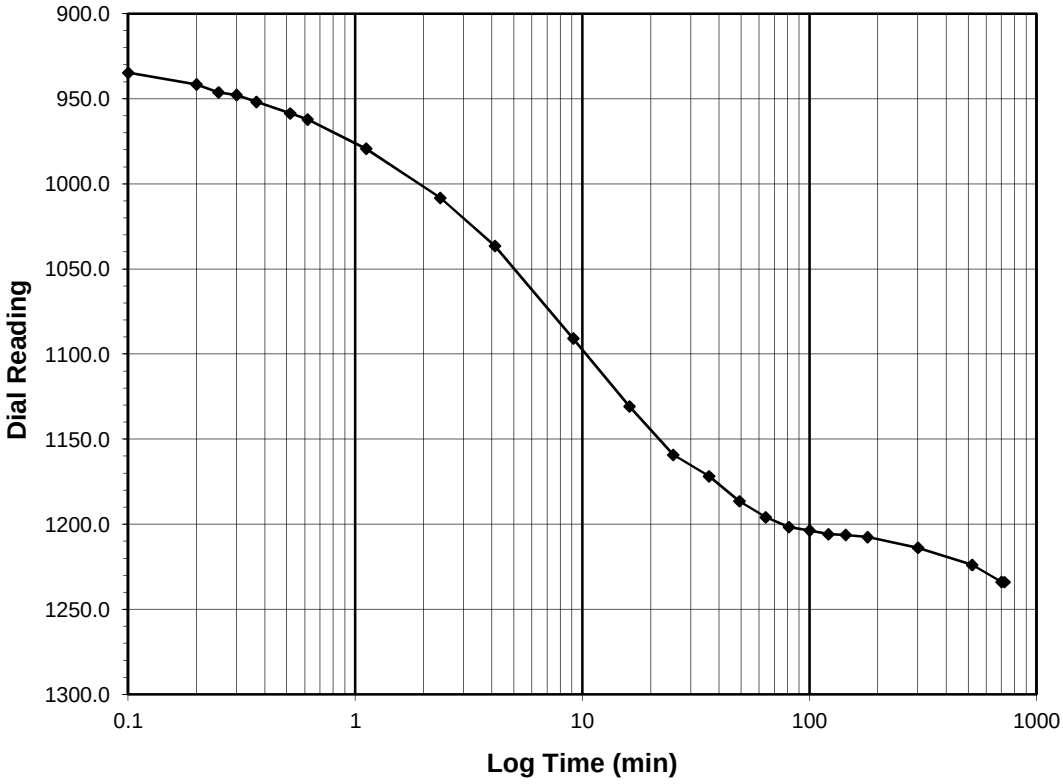
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 16**
Final Reading	**(div)**	**1234.0**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		20:10:49

Elapsed Time (min)	Dial Reading (div)
Initial	**865.5**
0.10	934.7
0.20	941.5
0.25	946.2
0.30	947.7
0.37	951.8
0.52	958.5
0.62	962.1
1.12	979.3
2.37	1008.2
4.12	1036.4
9.12	1090.8
16.12	1130.7
25.12	1159.2
36.12	1171.8
49.12	1186.5
64.12	1195.9
81.12	1201.6
100.12	1203.7
121.12	1205.9
144.13	1206.3
180.13	1207.6
300.13	1213.9
520.13	1223.9
700.13	1233.9
720.37	1234.0

Tested By TM *Date* 2/6/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

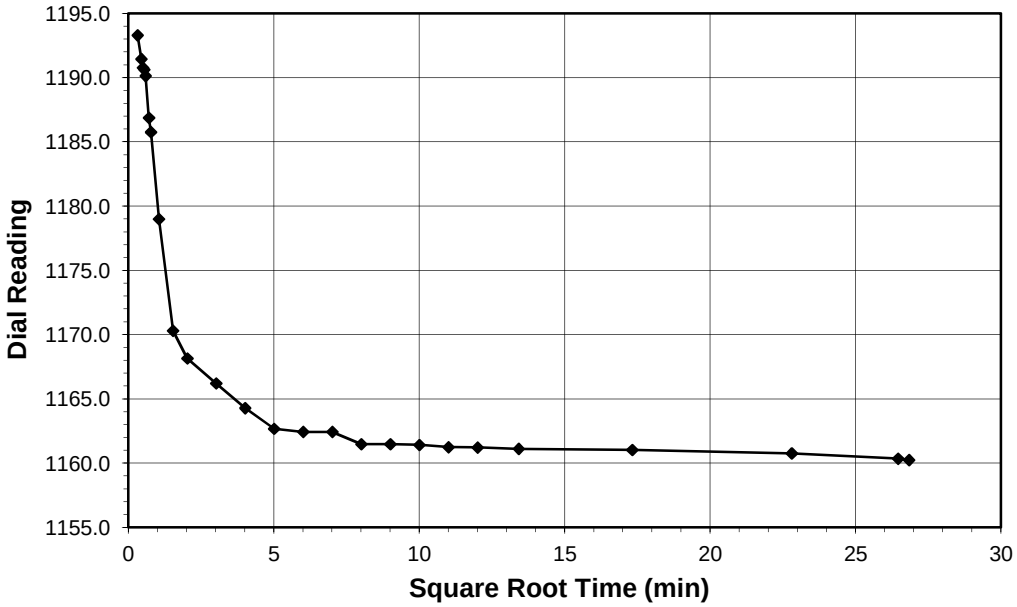
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

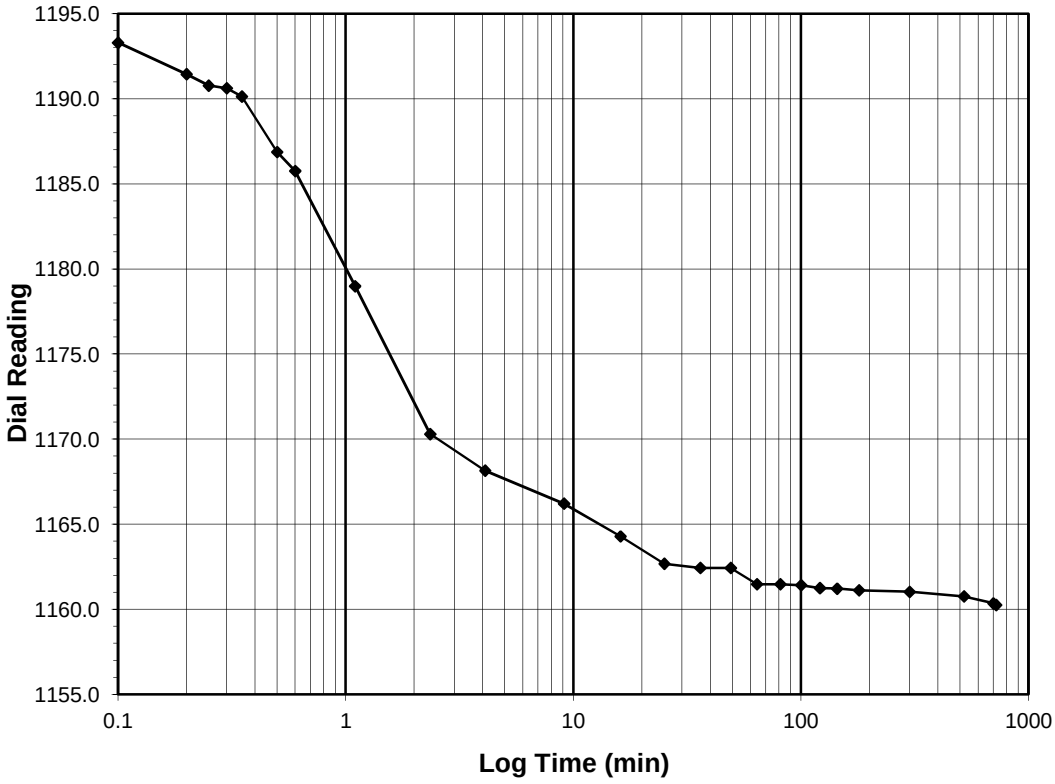
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**16 - 8**
Final Reading	**(div)**	**1160.3**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		8:11:11

Elapsed Time (min)	Dial Reading (div)
Initial	**1234.0**
0.10	1193.3
0.20	1191.4
0.25	1190.8
0.30	1190.6
0.35	1190.1
0.50	1186.9
0.60	1185.8
1.10	1179.0
2.35	1170.3
4.10	1168.1
9.10	1166.2
16.12	1164.3
25.12	1162.7
36.12	1162.4
49.12	1162.4
64.12	1161.5
81.12	1161.5
100.12	1161.4
121.12	1161.2
144.12	1161.2
180.12	1161.1
300.12	1161.0
520.12	1160.8
700.12	1160.4
720.37	1160.3

Tested By TM *Date* 2/7/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

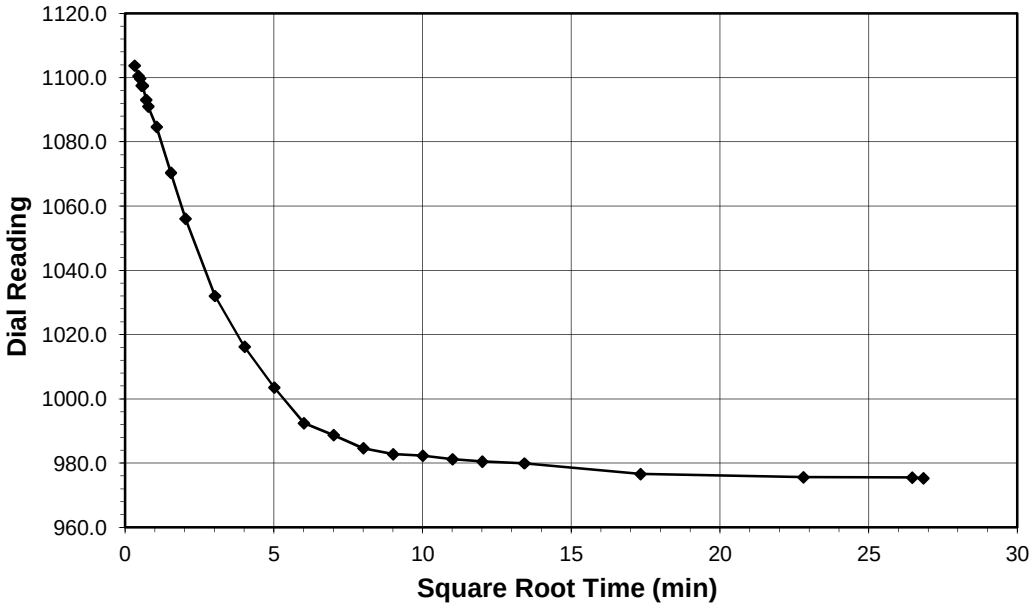
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

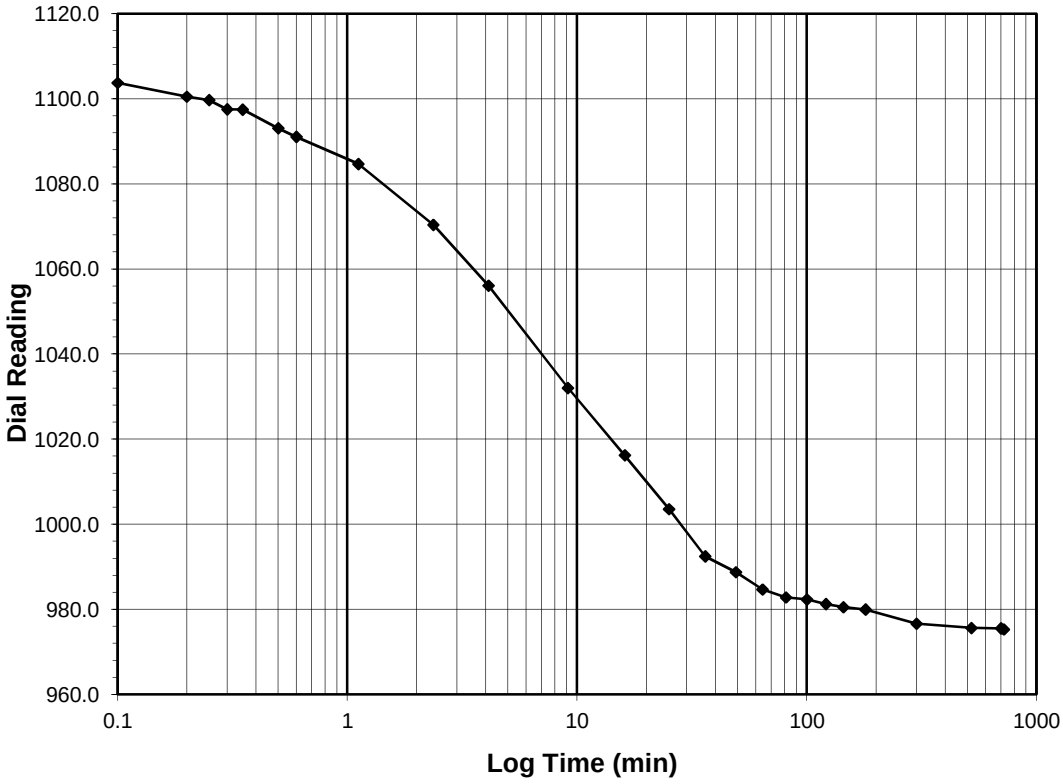
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 2**
Final Reading	**(div)**	**975.3**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		20:11:33

Elapsed Time (min)	Dial Reading (div)
Initial	**1160.3**
0.10	1103.7
0.20	1100.5
0.25	1099.7
0.30	1097.5
0.35	1097.5
0.50	1093.1
0.60	1091.1
1.12	1084.7
2.37	1070.4
4.12	1056.1
9.12	1032.0
16.12	1016.2
25.12	1003.5
36.12	992.4
49.12	988.7
64.12	984.7
81.12	982.8
100.12	982.3
121.12	981.2
144.12	980.5
180.12	979.9
300.13	976.6
520.13	975.6
700.13	975.5
720.37	975.3

Tested By TM *Date* 2/7/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

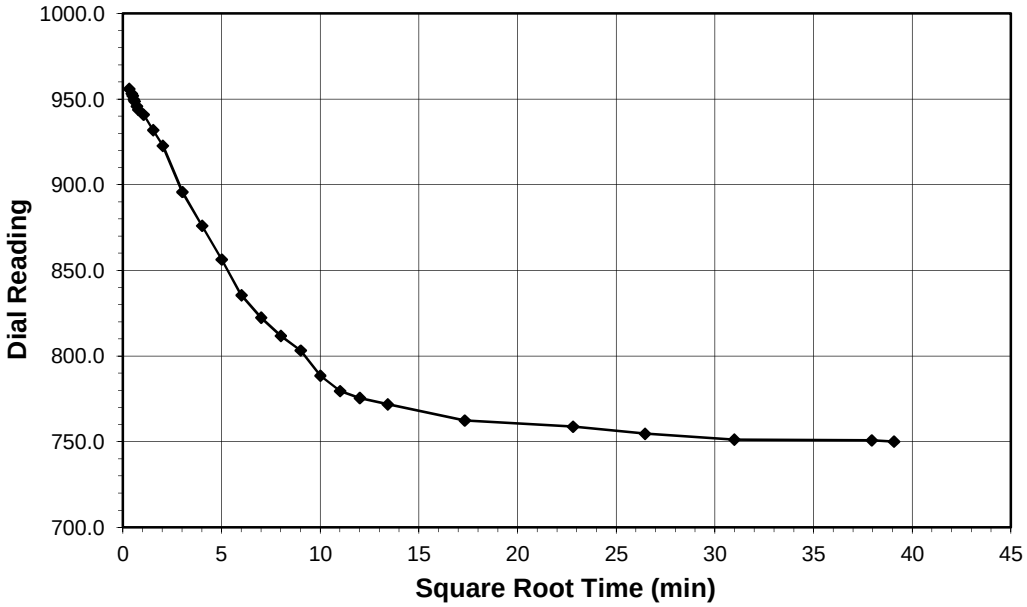
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

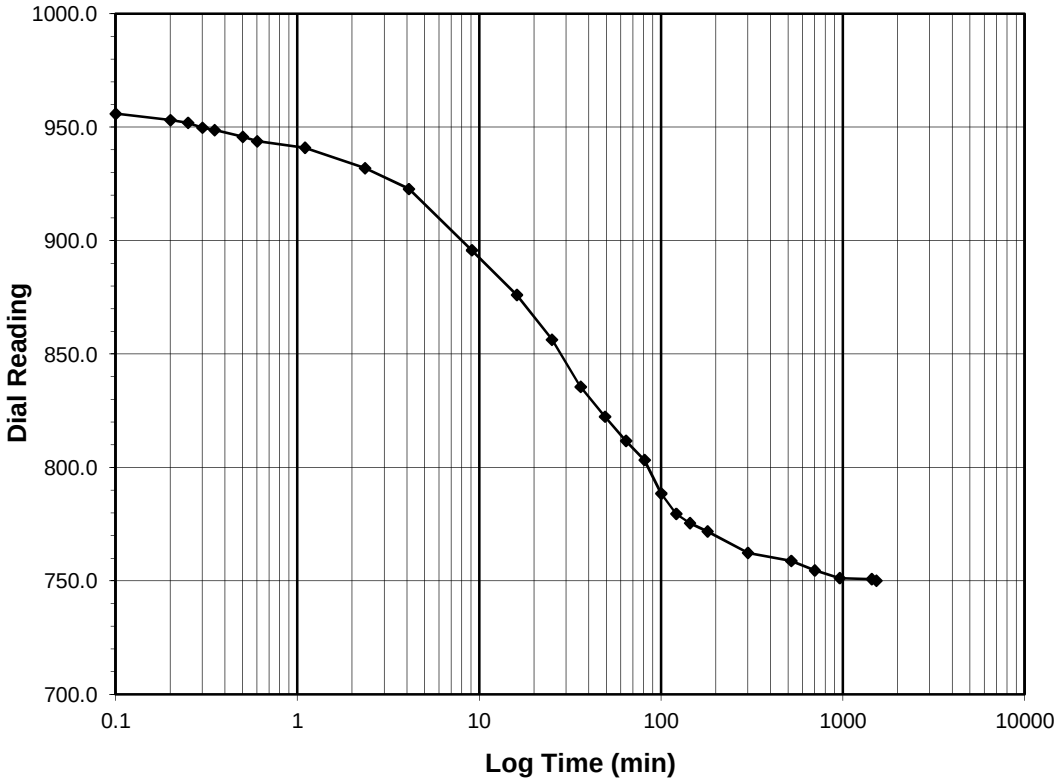
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-101
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	7.7-7.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-003	Visual Description:	GRAY CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 0.5**
Final Reading	**(div)**	**750.1**
Consolidometer No.		**G1418**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		8:11:56

Elapsed Time (min)	Dial Reading (div)
Initial	**975.3**
0.10	955.9
0.20	953.1
0.25	951.9
0.30	949.8
0.35	948.7
0.50	945.8
0.60	943.8
1.10	940.9
2.35	931.9
4.10	922.8
9.10	895.8
16.10	876.1
25.10	856.4
36.10	835.6
49.10	822.4
64.12	811.8
81.12	803.3
100.12	788.5
121.12	779.6
144.12	775.5
180.12	771.8
300.12	762.4
520.12	758.8
700.12	754.7
960.12	751.2
1440.12	750.8
1526.62	750.1

Tested By TM *Date* 2/8/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

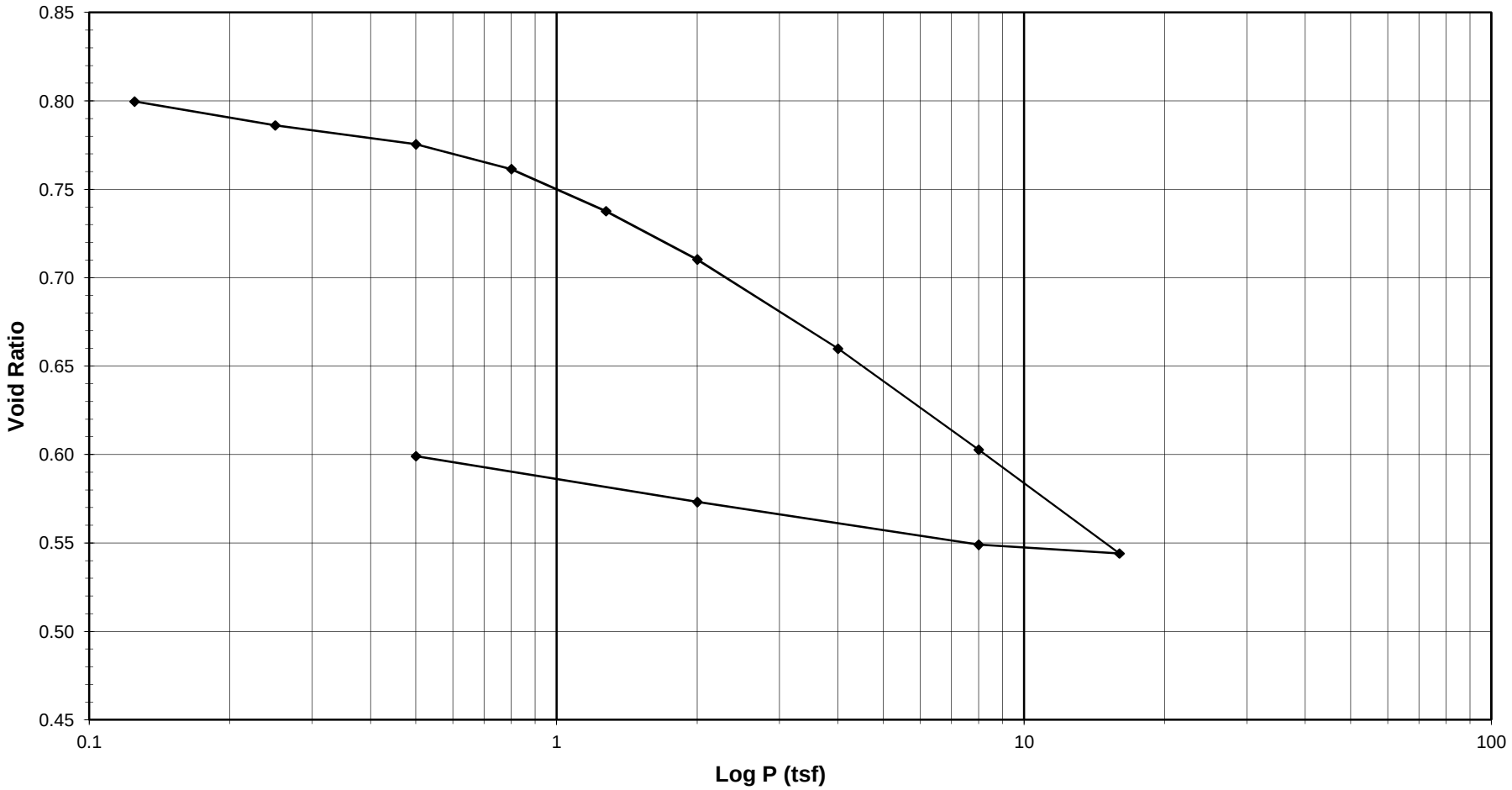
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By TM *Date* 2/3/17 *Approved By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. G1421
1 Division = 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	3240	3128
Wt. of Tare & WS (g)	140.65	154.12
Wt. of Tare & DS (g)	108.28	126.33
Wt. of Water (g)	32.37	27.79
Wt. of Tare (g)	6.79	6.75
Wt. of DS (g)	101.49	119.58
Water Content (%)	31.89	23.24
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.8758
Sample Volume (cm^3)	80.44	70.45
Wt. of Wet Sample + Ring (g)	371.73	361.44
Wt. of Ring (g)	214.85	214.85
Wt. of Wet Sample (g)	156.88	146.59
Wet Density (pcf)	121.70	129.84
Wet Density (g/cm^3)	1.95	2.08
Water Content (%)	31.89	23.24
Wt. of Dry Sample (g)	118.94	118.94
Dry Density (pcf)	92.27	105.36
Dry Density (g/cm^3)	1.48	1.69
Void Ratio	0.8260	0.5991
Saturation (%)	104.26	104.73
Specific Gravity	2.70	*Assumed*

Test Data Summary

Applied Pressure (tsf)	**Final Dial Reading** (div)	**Machine Deflection** (div)	**Corrected Reading** (div)	**Height of Sample** (mm)	**Volume** (cm^3)	**Dry Density** (g/cm^3)	**Void Ratio**
Seating	0	0	0	25.400	80.440	1.47866	**0.82597**
0.125	144.5	0.3	144.2	25.034	79.280	1.50029	**0.79965**
0.25	219.9	1.7	218.1	24.846	78.685	1.51163	**0.78615**
0.5	281.6	5.0	276.5	24.698	78.216	1.52071	**0.77548**
0.8	363.9	10.3	353.6	24.502	77.596	1.53286	**0.76141**
1.275	504.7	21.0	483.8	24.171	76.548	1.55383	**0.73764**
2	666.6	33.2	633.4	23.791	75.345	1.57866	**0.71031**
4	960.9	51.3	909.6	23.090	73.123	1.62662	**0.65989**
8	1297.7	75.3	1222.4	22.295	70.607	1.68459	**0.60277**
16	1663.3	119.4	1543.9	21.479	68.021	1.74863	**0.54407**
8	1604.5	87.9	1516.6	21.548	68.240	1.74301	**0.54905**
2	1436.3	52.0	1384.3	21.884	69.305	1.71624	**0.57321**
0.5	1265.7	23.3	1242.4	22.244	70.446	1.68844	**0.59911**

Tested By *TM* *Date* *2/3/17* *Input Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

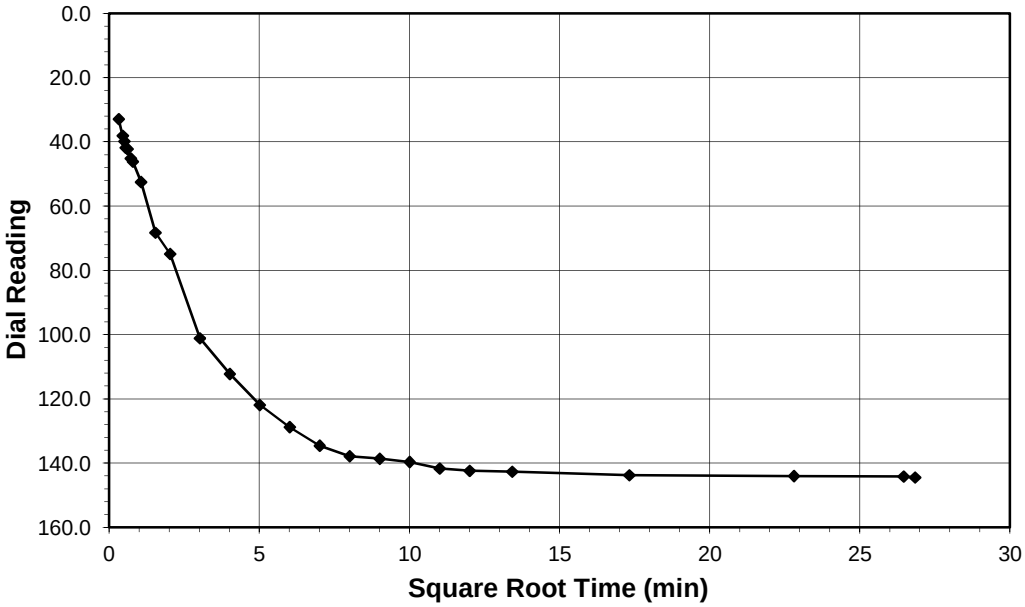
544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

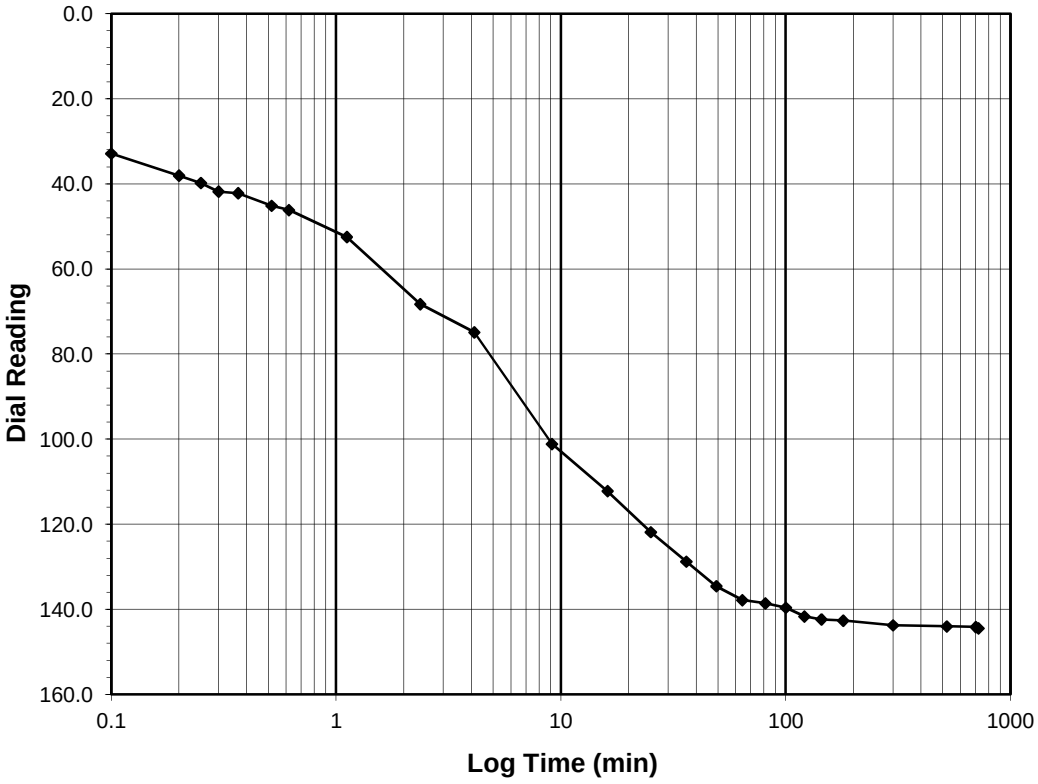
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0 - 0.125**
Final Reading	**(div)**	**144.5**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		8:24:19

Elapsed Time (min)	Dial Reading (div)
Initial	**0.0**
0.10	32.9
0.20	38.1
0.25	39.8
0.30	41.8
0.37	42.2
0.52	45.1
0.62	46.1
1.12	52.5
2.37	68.3
4.12	74.9
9.12	101.1
16.12	112.2
25.12	121.9
36.12	128.8
49.12	134.6
64.12	137.9
81.12	138.6
100.12	139.6
121.12	141.7
144.12	142.4
180.13	142.7
300.13	143.8
520.13	144.0
700.13	144.2
720.38	144.5

Tested By TM *Date* 2/3/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

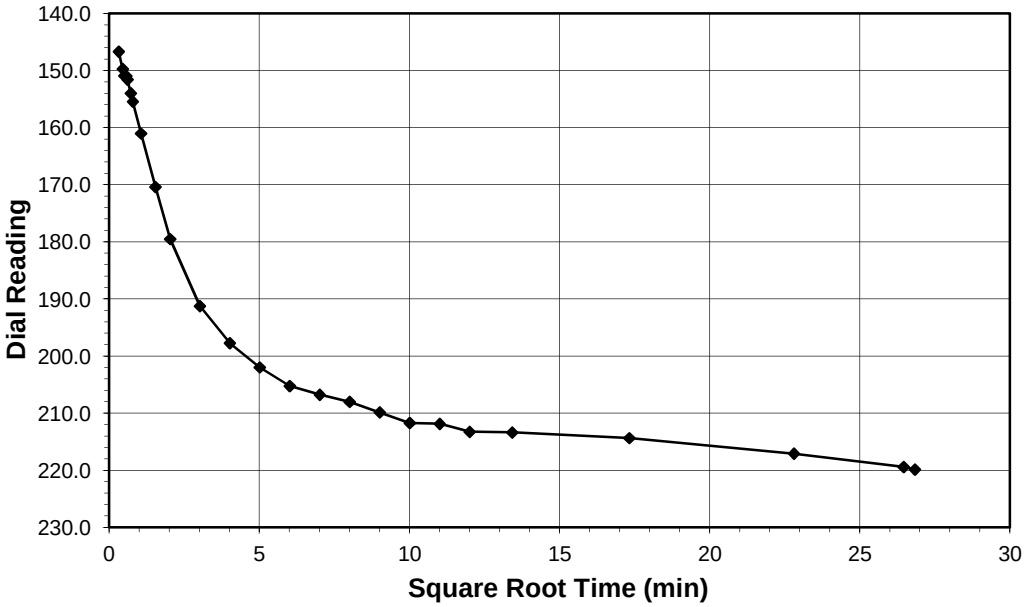
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

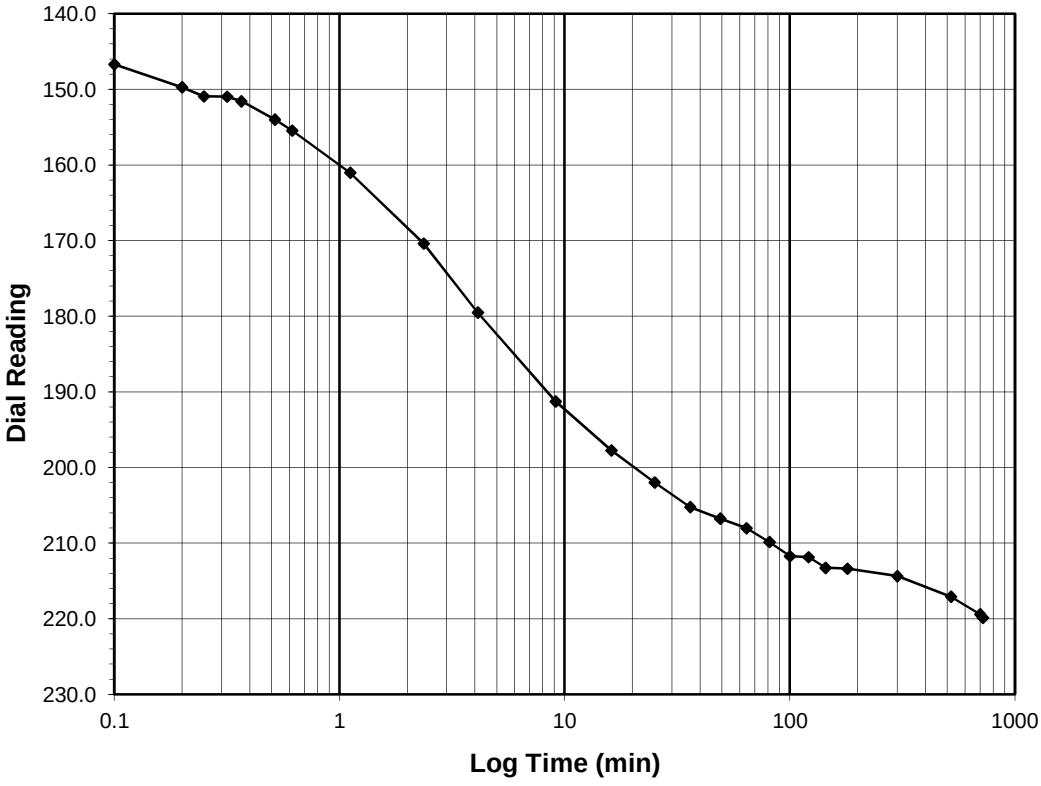
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.125 - 0.25**
Final Reading	**(div)**	**219.9**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		20:24:42

Elapsed Time (min)	Dial Reading (div)
Initial	**144.5**
0.10	146.7
0.20	149.7
0.25	150.9
0.32	151.0
0.37	151.6
0.52	154.0
0.62	155.5
1.12	161.0
2.37	170.4
4.12	179.5
9.12	191.3
16.12	197.7
25.12	202.0
36.12	205.2
49.12	206.8
64.13	208.0
81.13	209.9
100.13	211.7
121.13	211.9
144.13	213.3
180.13	213.4
300.13	214.4
520.13	217.1
700.13	219.4
720.12	219.9

Tested By *TM* *Date* *2/3/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

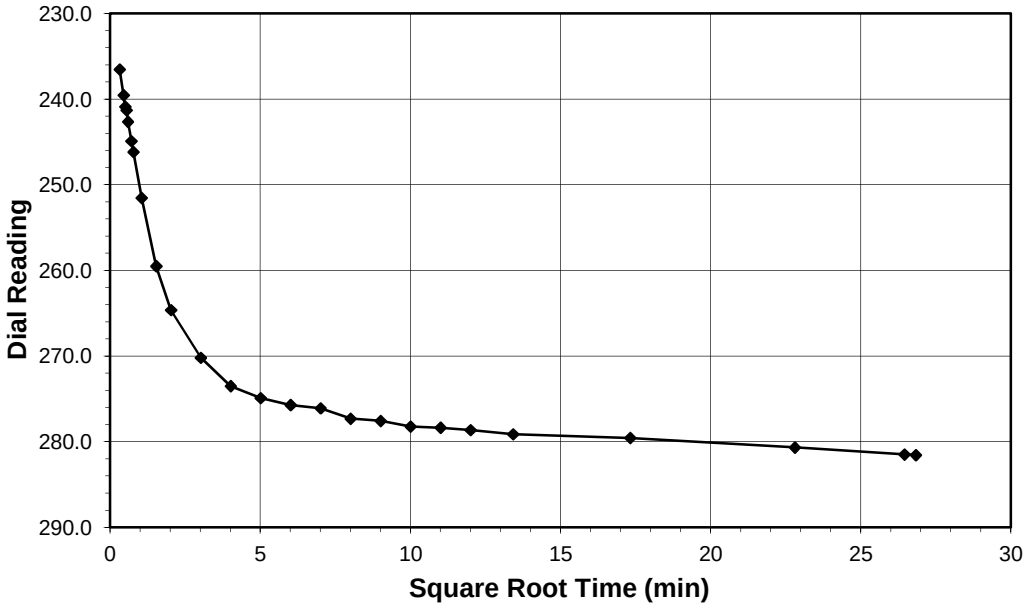
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

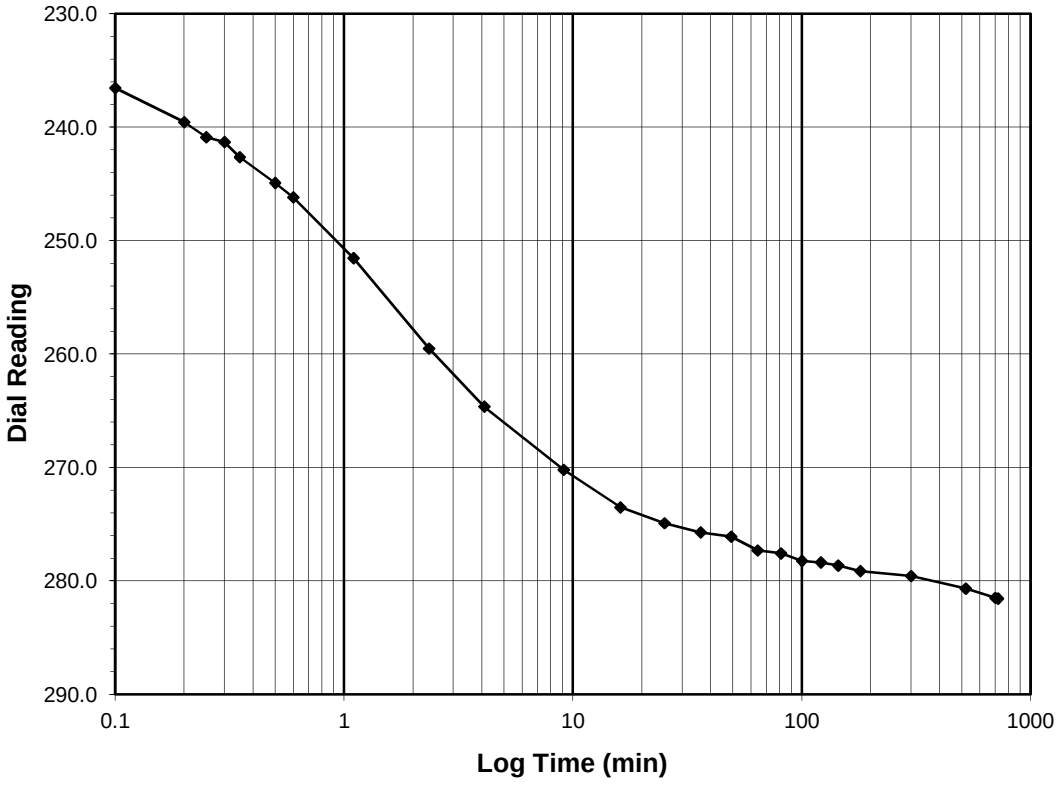
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.25 - 0.5**
Final Reading	**(div)**	**281.6**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		8:24:49

Elapsed Time (min)	Dial Reading (div)
Initial	**219.9**
0.10	236.5
0.20	239.5
0.25	240.9
0.30	241.3
0.35	242.6
0.50	244.9
0.60	246.2
1.10	251.5
2.35	259.5
4.10	264.6
9.12	270.2
16.12	273.5
25.12	274.9
36.12	275.7
49.12	276.1
64.12	277.3
81.12	277.6
100.12	278.2
121.12	278.4
144.12	278.6
180.12	279.1
300.12	279.6
520.12	280.7
700.12	281.5
720.17	281.6

Tested By TM *Date* 2/4/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

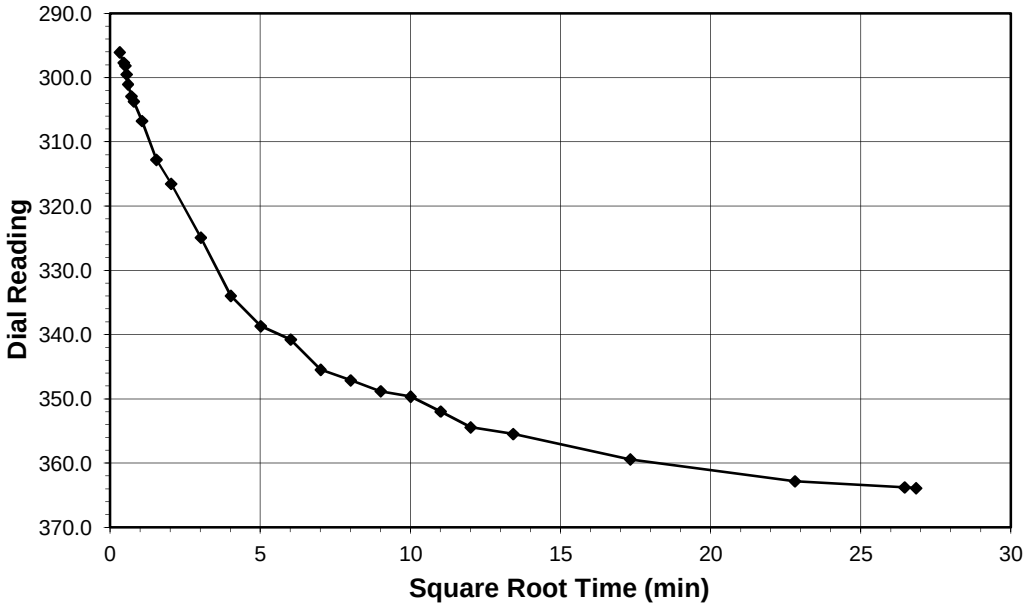
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

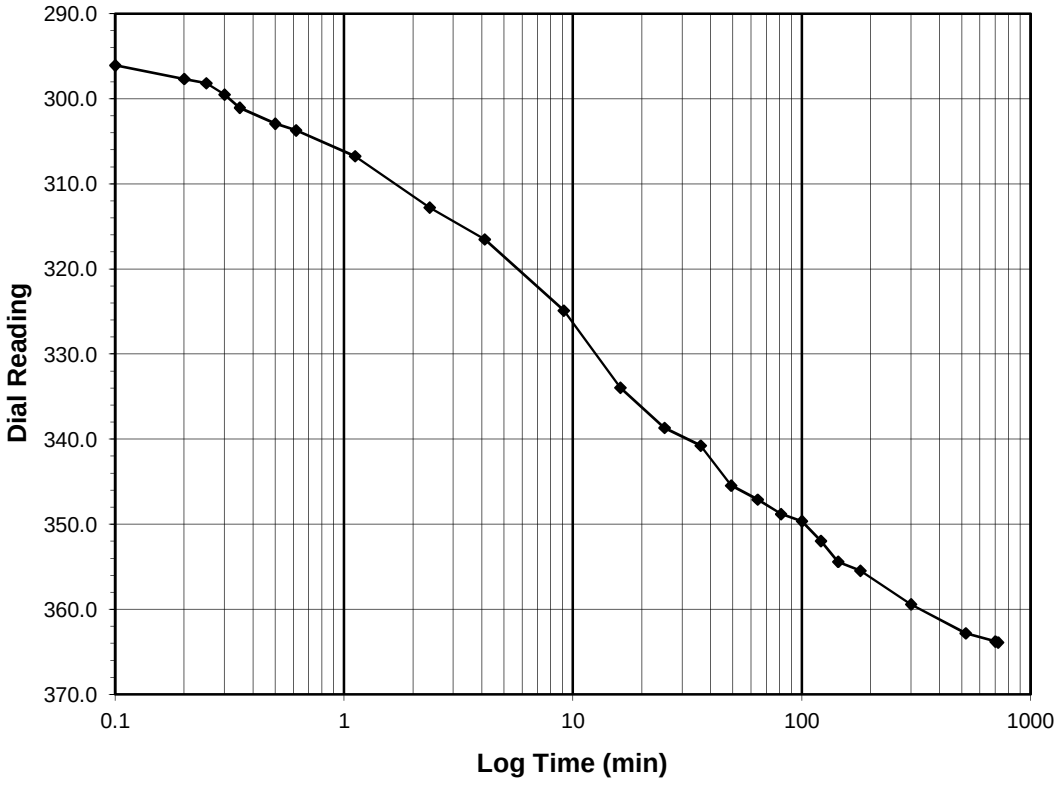
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.5 - 0.8**
Final Reading	**(div)**	**363.9**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		20:24:59

Elapsed Time (min)	Dial Reading (div)
Initial	**281.6**
0.10	296.1
0.20	297.7
0.25	298.2
0.30	299.5
0.35	301.1
0.50	302.9
0.62	303.7
1.12	306.7
2.37	312.8
4.12	316.5
9.12	324.9
16.12	334.0
25.12	338.7
36.12	340.8
49.12	345.5
64.12	347.1
81.12	348.8
100.12	349.6
121.12	352.0
144.12	354.4
180.13	355.5
300.13	359.4
520.13	362.8
700.13	363.8
720.32	363.9

Tested By *TM* *Date* *2/4/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

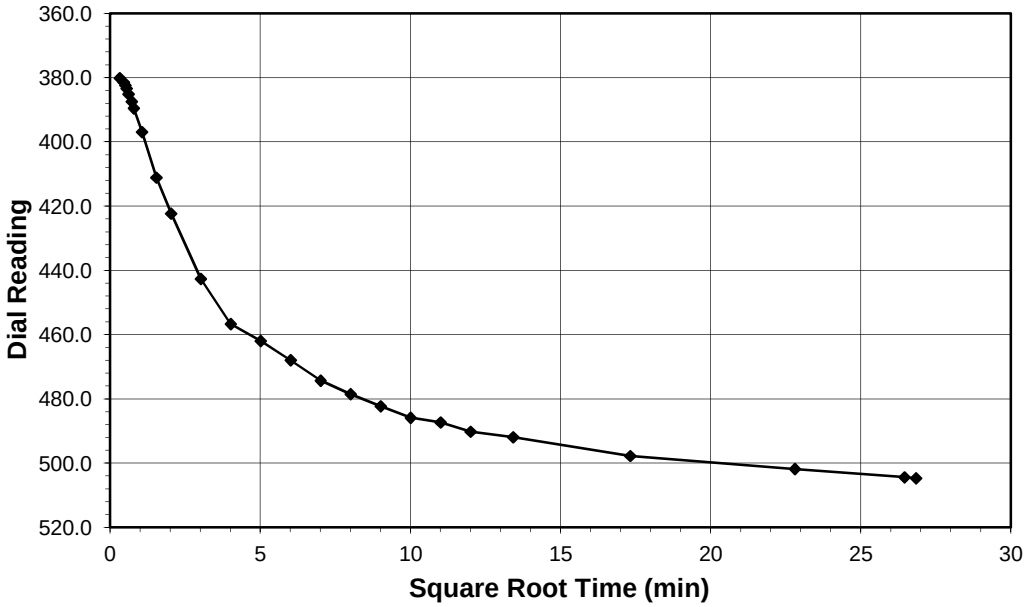
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

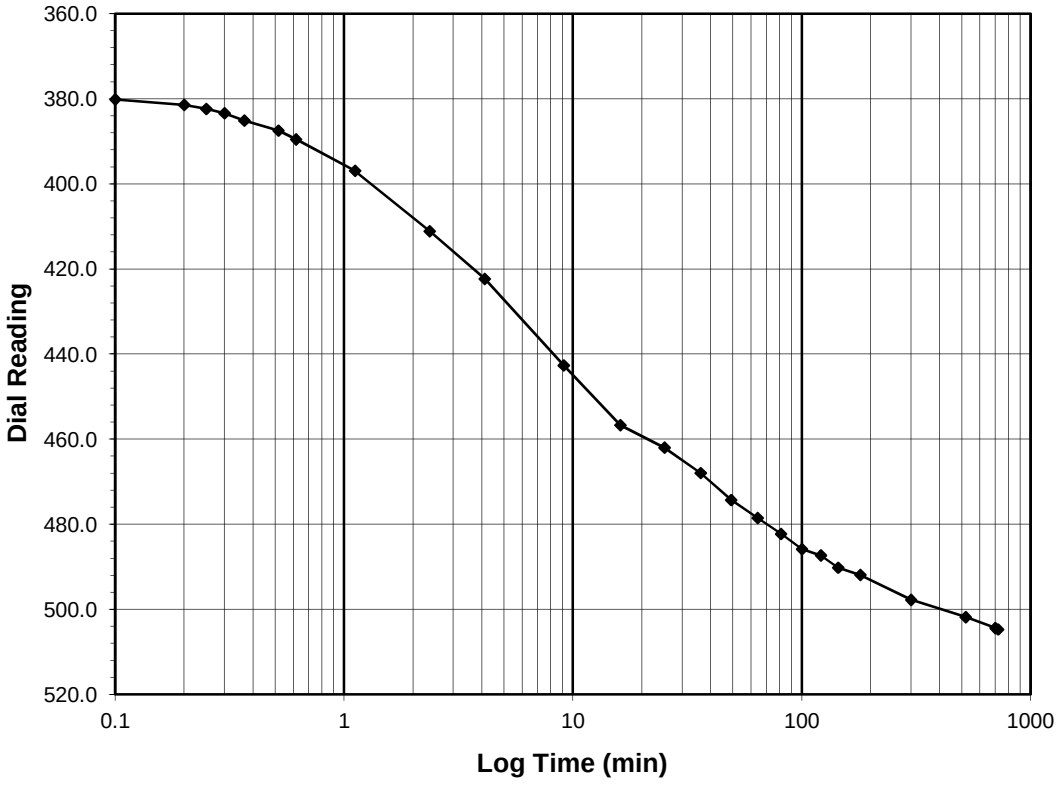
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.8 - 1.275**
Final Reading	**(div)**	**504.7**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		8:25:18

Elapsed Time (min)	Dial Reading (div)
Initial	**363.9**
0.10	380.1
0.20	381.4
0.25	382.4
0.30	383.4
0.37	385.1
0.52	387.5
0.62	389.5
1.12	396.9
2.37	411.1
4.12	422.3
9.12	442.7
16.12	456.7
25.12	462.0
36.12	468.0
49.12	474.3
64.12	478.5
81.12	482.3
100.12	485.9
121.12	487.3
144.12	490.2
180.12	491.9
300.12	497.8
520.12	501.8
700.12	504.4
720.33	504.7

Tested By TM *Date* 2/5/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

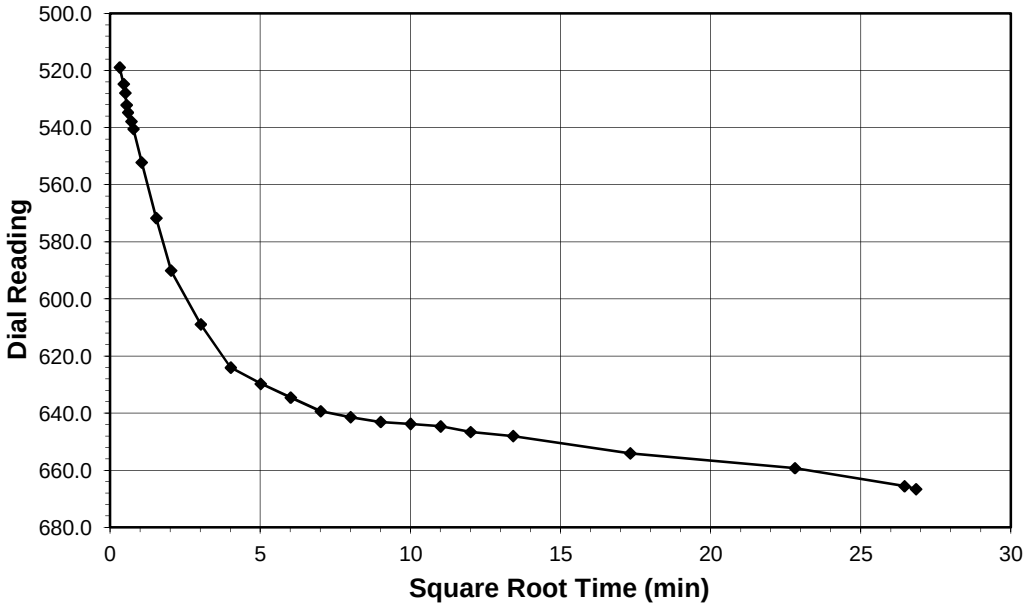
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

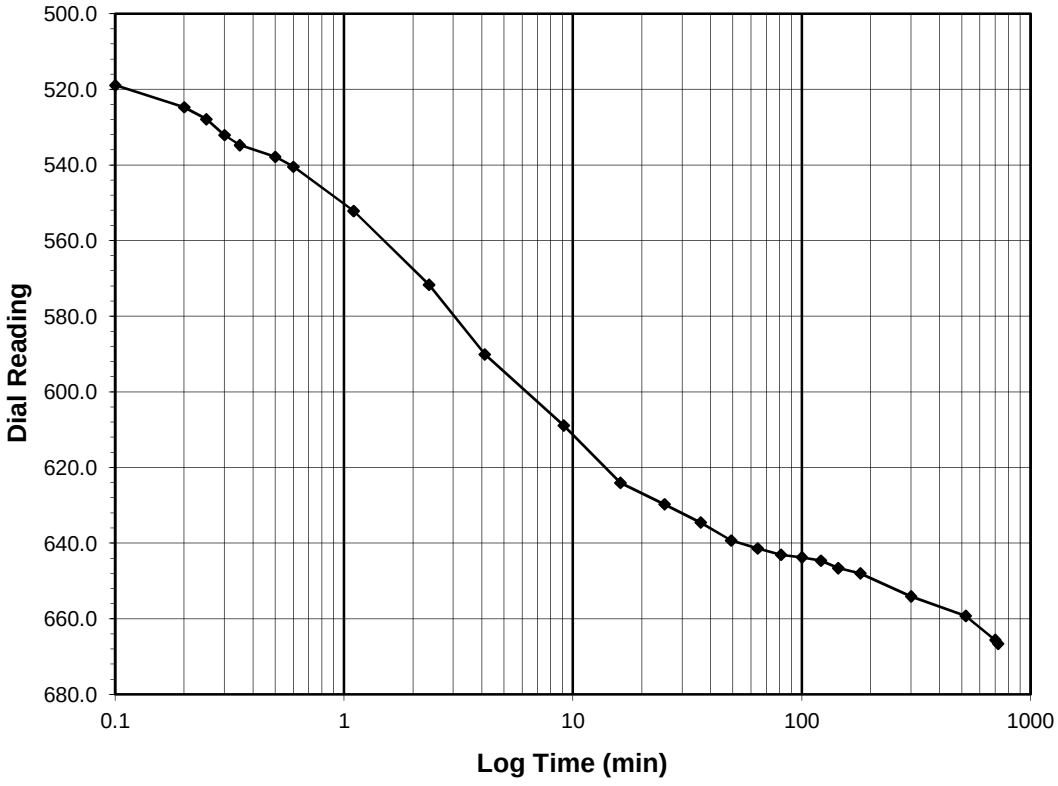
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**1.275 - 2**
Final Reading	**(div)**	**666.6**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		20:25:38

Elapsed Time (min)	Dial Reading (div)
Initial	**504.7**
0.10	518.9
0.20	524.7
0.25	527.9
0.30	532.1
0.35	534.7
0.50	537.8
0.60	540.5
1.10	552.1
2.35	571.7
4.12	590.1
9.12	608.9
16.12	624.1
25.12	629.7
36.12	634.5
49.12	639.3
64.12	641.4
81.12	643.1
100.12	643.8
121.12	644.6
144.12	646.6
180.12	648.0
300.12	654.1
520.12	659.2
700.12	665.6
720.37	666.6

Tested By TM *Date* 2/5/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

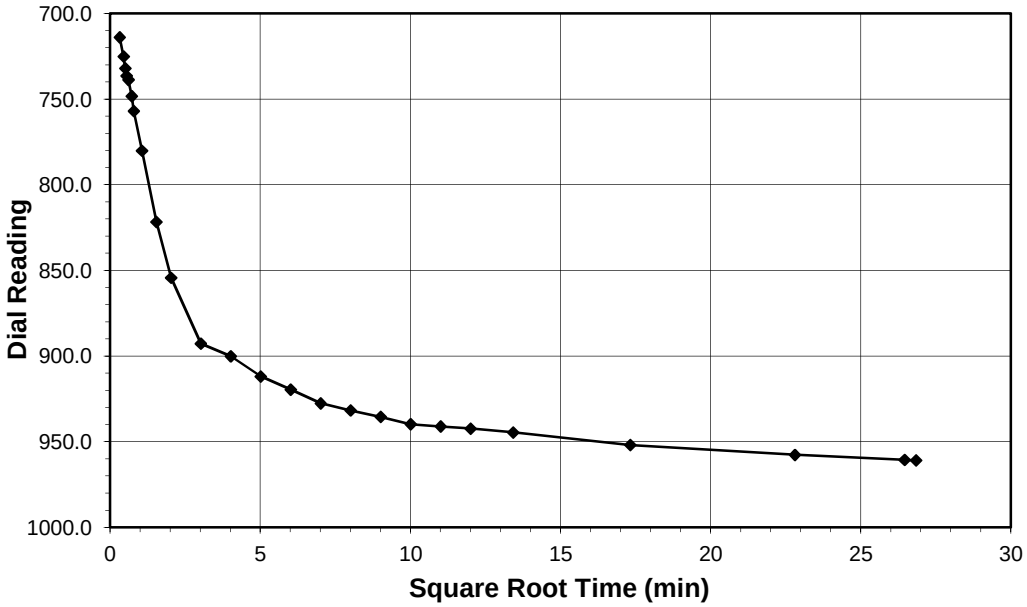
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

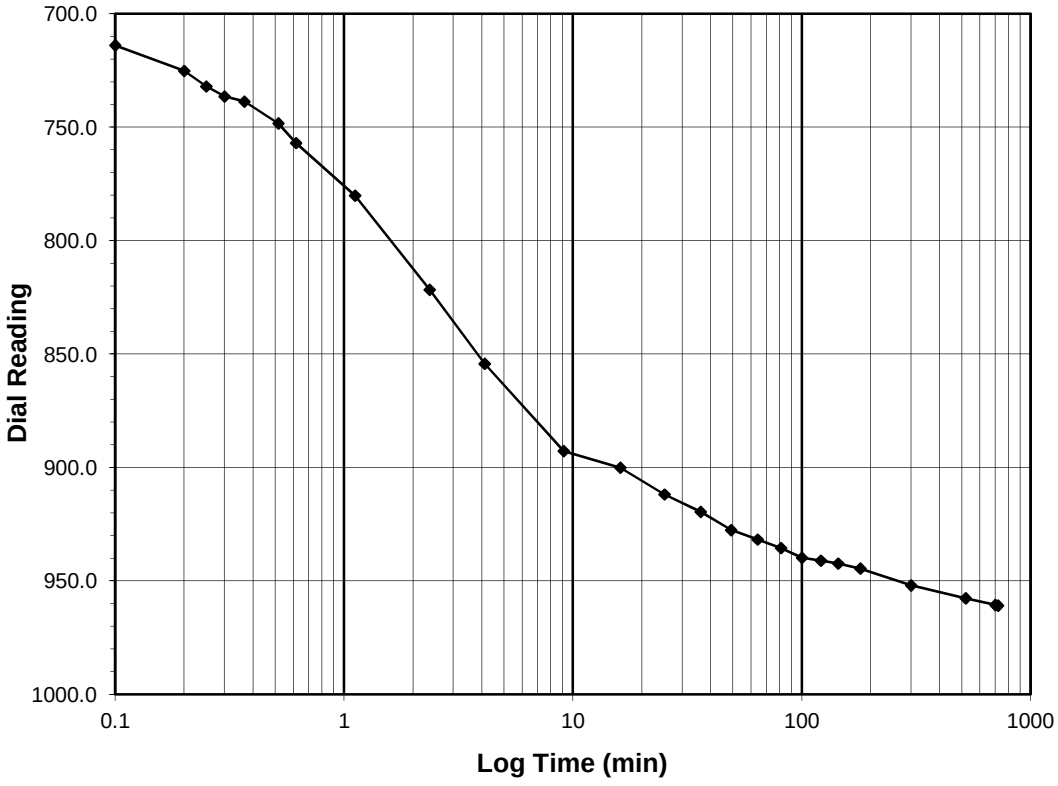
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 4**
Final Reading	**(div)**	**960.9**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		8:26:00

Elapsed Time (min)	Dial Reading (div)
Initial	**666.6**
0.10	713.9
0.20	725.2
0.25	732.0
0.30	736.4
0.37	738.7
0.52	748.3
0.62	757.0
1.12	780.1
2.37	821.7
4.12	854.3
9.12	892.8
16.12	900.1
25.12	911.9
36.12	919.5
49.12	927.6
64.13	931.7
81.13	935.5
100.13	939.8
121.13	941.1
144.13	942.3
180.13	944.6
300.13	951.9
520.13	957.7
700.13	960.6
720.27	960.9

Tested By TM *Date* 2/6/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

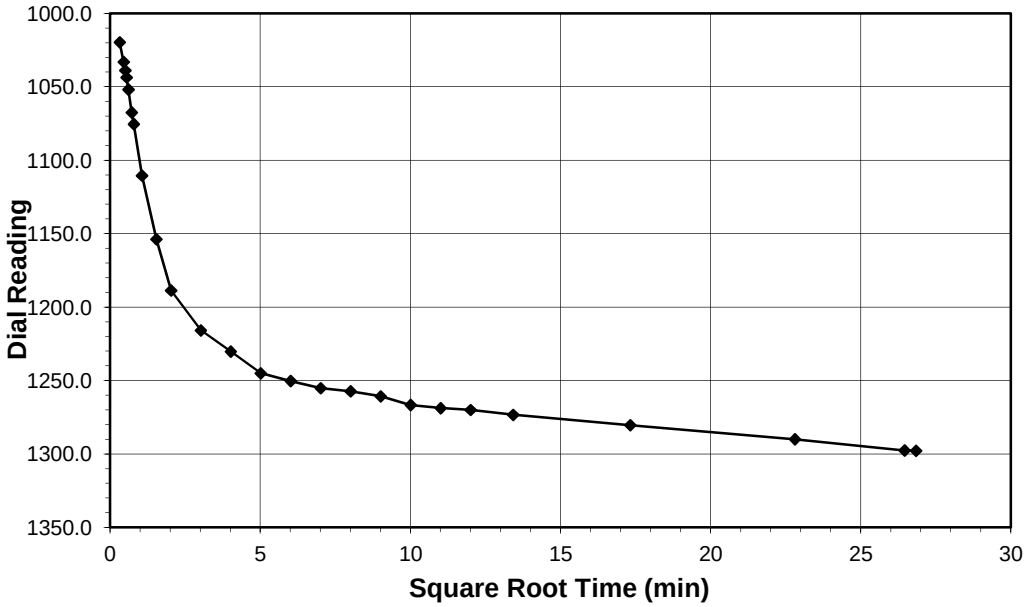
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

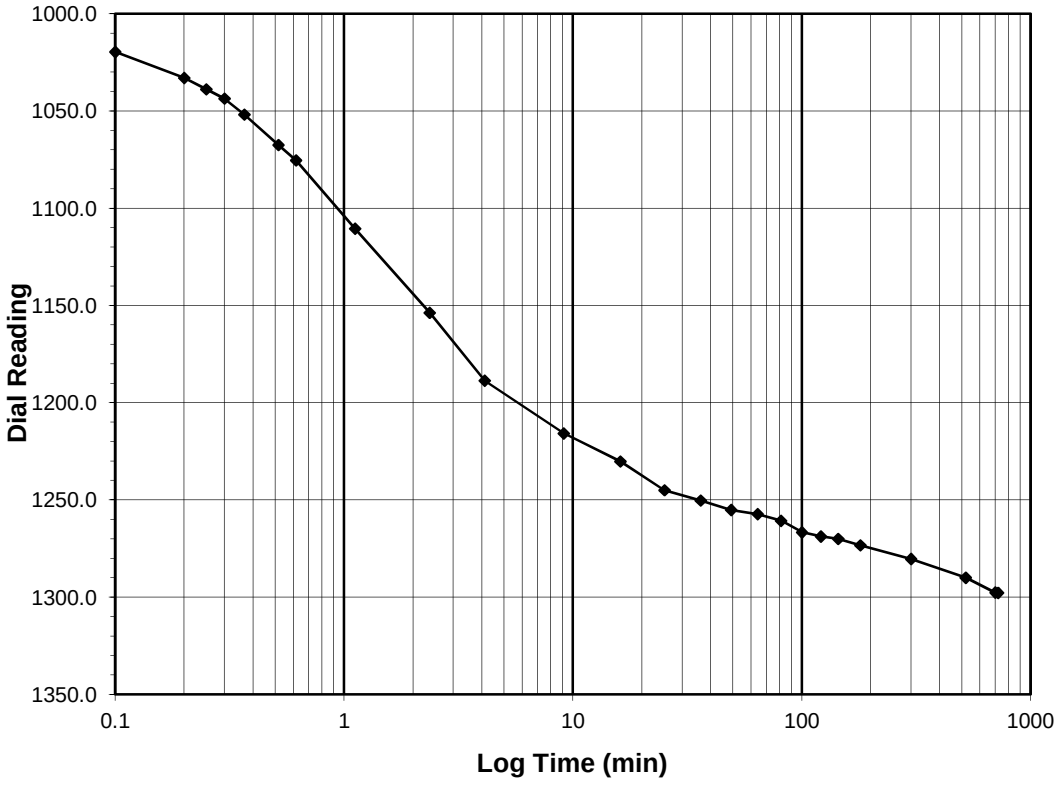
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**4 - 8**
Final Reading	**(div)**	**1297.7**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		20:26:16

Elapsed Time (min)	Dial Reading (div)
Initial	**960.9**
0.10	1019.6
0.20	1033.0
0.25	1038.8
0.30	1043.6
0.37	1051.8
0.52	1067.5
0.62	1075.4
1.12	1110.5
2.37	1153.8
4.12	1188.7
9.12	1215.8
16.12	1230.2
25.12	1245.0
36.12	1250.3
49.12	1255.2
64.13	1257.3
81.13	1260.7
100.13	1266.6
121.13	1268.8
144.13	1270.0
180.13	1273.3
300.13	1280.4
520.13	1290.0
700.13	1297.6
720.43	1297.7

Tested By *TM* *Date* *2/6/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

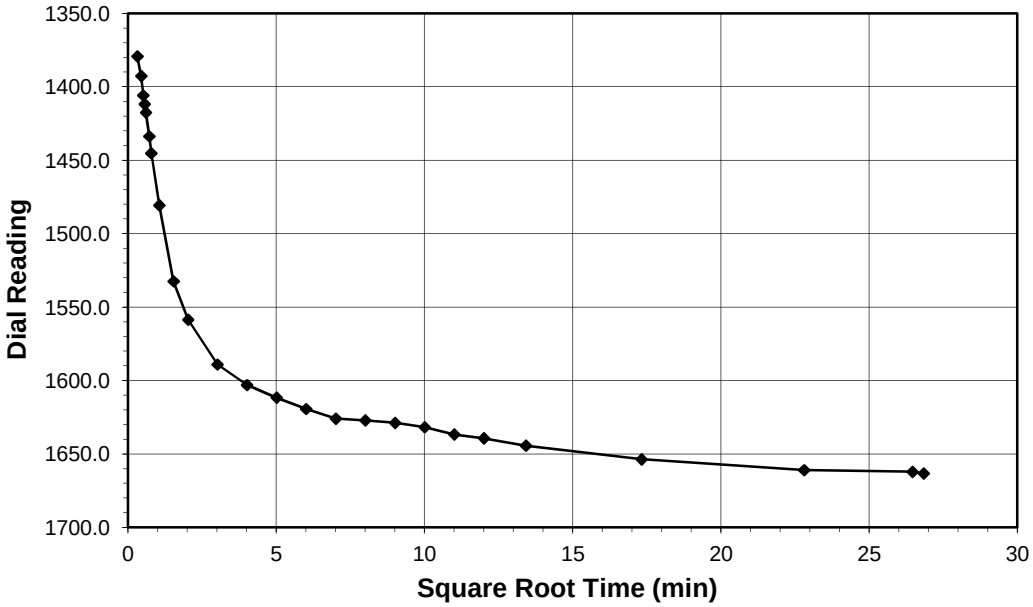
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

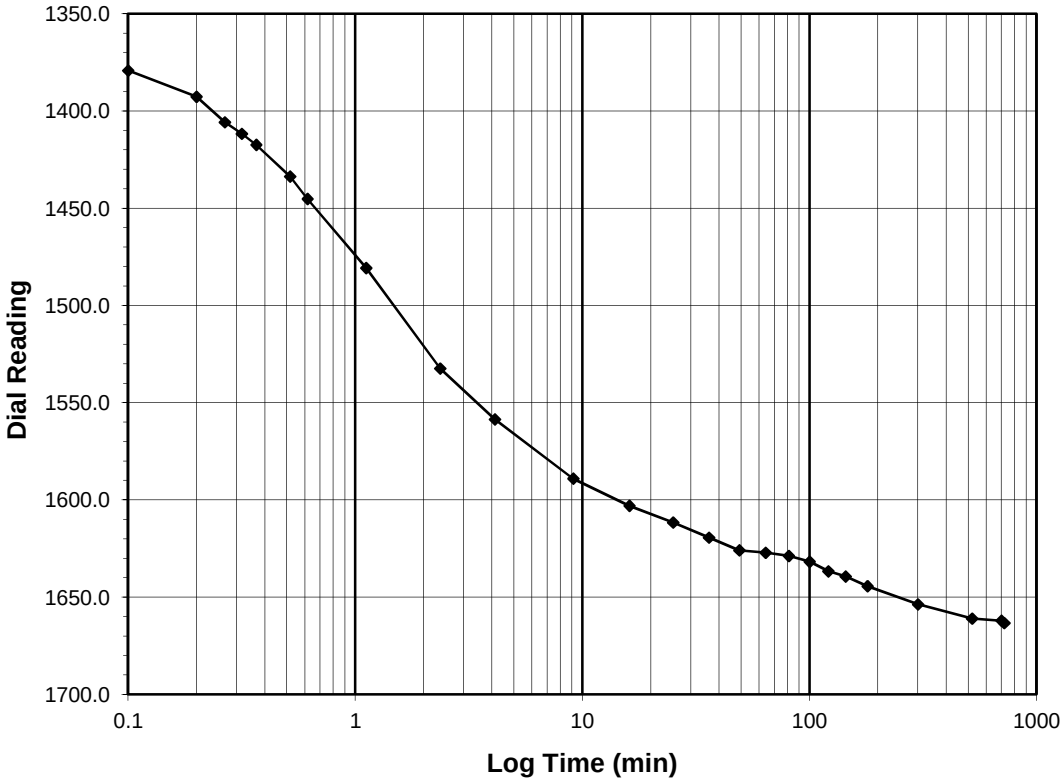
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 16**
Final Reading	**(div)**	**1663.3**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		8:26:42

Elapsed Time (min)	Dial Reading (div)
Initial	**1297.7**
0.10	1379.2
0.20	1392.7
0.27	1405.8
0.32	1411.7
0.37	1417.4
0.52	1433.7
0.62	1445.2
1.12	1480.7
2.37	1532.4
4.12	1558.6
9.12	1589.1
16.12	1603.0
25.12	1611.6
36.12	1619.4
49.12	1625.9
64.12	1627.1
81.12	1628.8
100.12	1631.8
121.12	1636.7
144.12	1639.3
180.12	1644.4
300.12	1653.7
520.12	1661.0
700.12	1662.1
720.25	1663.3

Tested By *TM* *Date* *2/7/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

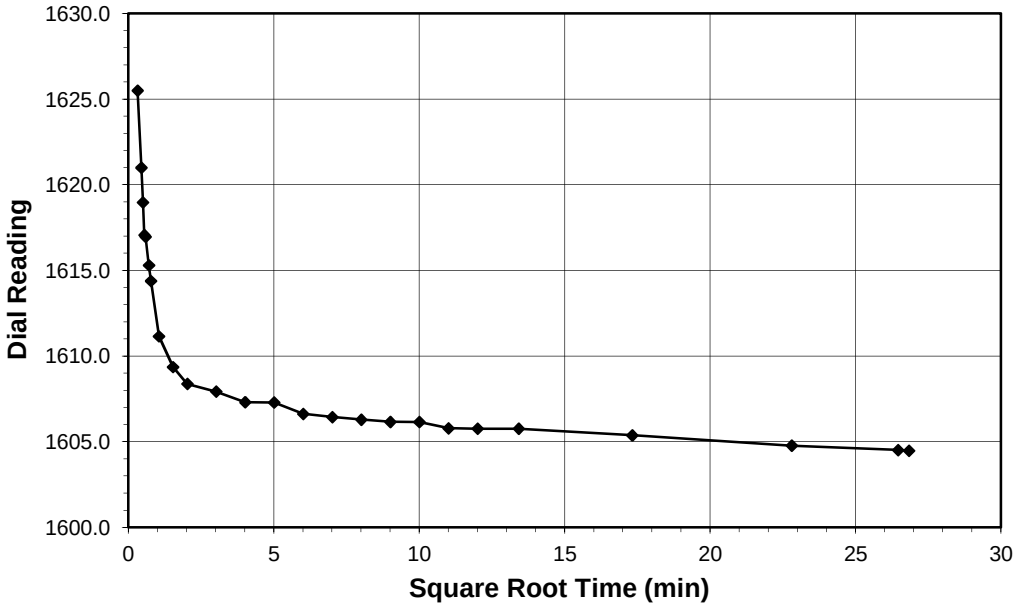
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

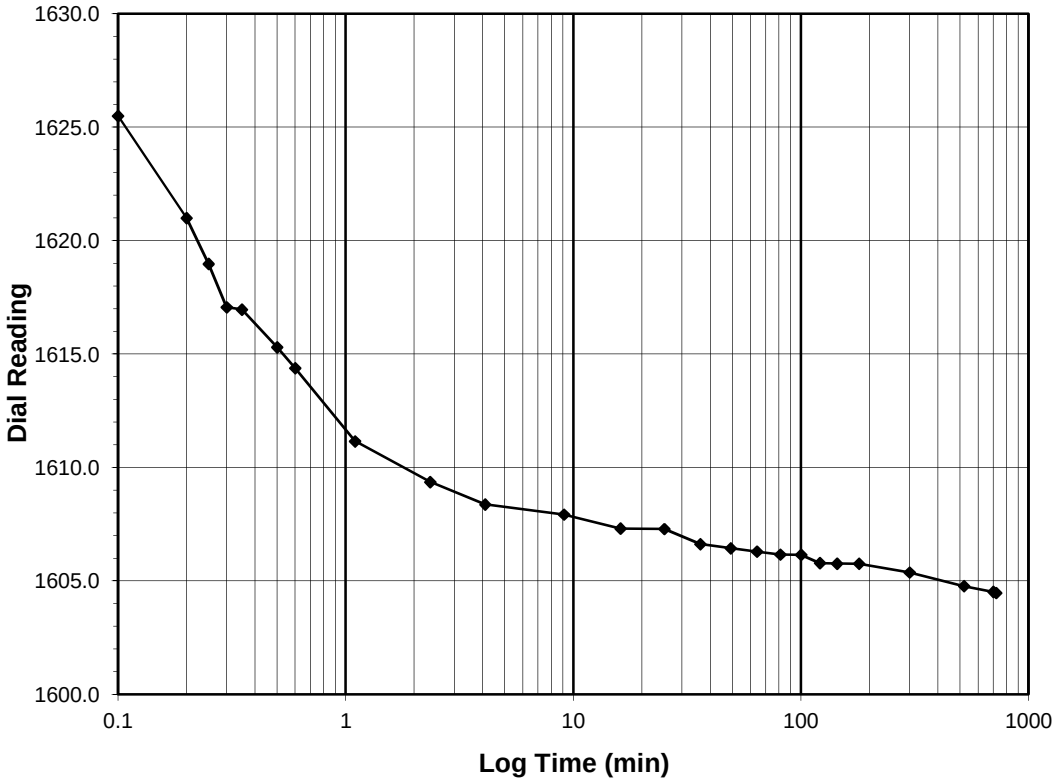
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**16 - 8**
Final Reading	**(div)**	**1604.5**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		20:26:58

Elapsed Time (min)	Dial Reading (div)
Initial	**1663.3**
0.10	1625.5
0.20	1621.0
0.25	1619.0
0.30	1617.1
0.35	1617.0
0.50	1615.3
0.60	1614.4
1.10	1611.2
2.35	1609.4
4.10	1608.4
9.10	1607.9
16.12	1607.3
25.12	1607.3
36.12	1606.6
49.12	1606.4
64.12	1606.3
81.12	1606.2
100.12	1606.2
121.12	1605.8
144.12	1605.8
180.12	1605.8
300.12	1605.4
520.12	1604.8
700.12	1604.5
720.18	1604.5

Tested By *TM* *Date* *2/7/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

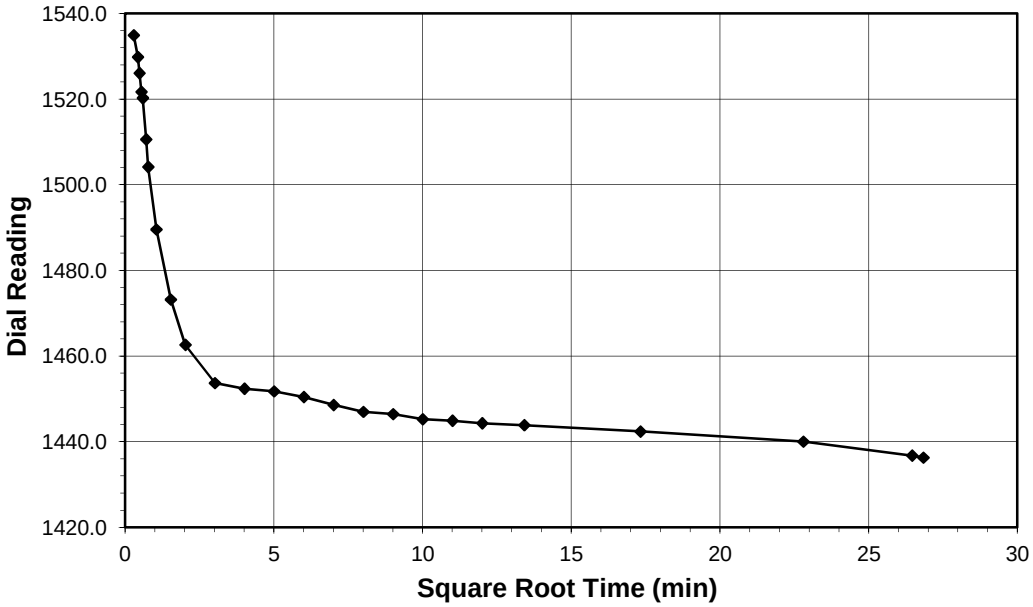
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

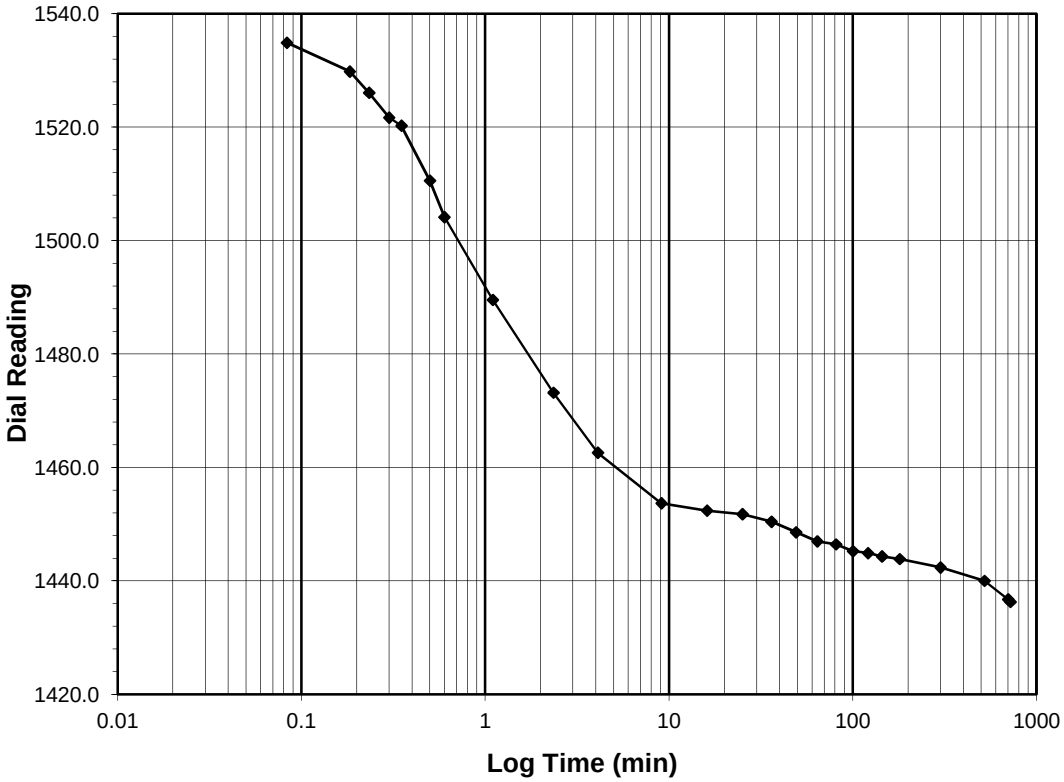
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 2**
Final Reading	**(div)**	**1436.3**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		8:27:09

Elapsed Time (min)	Dial Reading (div)
Initial	**1604.5**
0.08	1534.9
0.18	1529.8
0.23	1526.1
0.30	1521.7
0.35	1520.3
0.50	1510.6
0.60	1504.2
1.10	1489.6
2.35	1473.2
4.10	1462.6
9.10	1453.7
16.10	1452.4
25.10	1451.8
36.10	1450.5
49.10	1448.6
64.10	1447.0
81.12	1446.4
100.12	1445.3
121.12	1444.9
144.12	1444.3
180.12	1443.9
300.12	1442.4
520.12	1440.0
700.12	1436.8
720.45	1436.3

Tested By *TM* *Date* *2/8/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

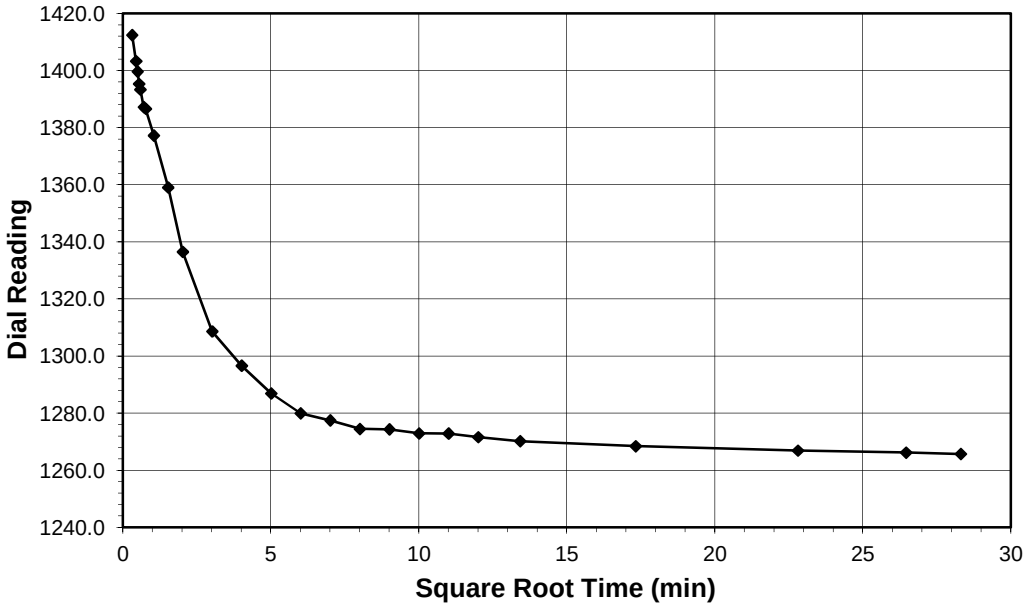
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

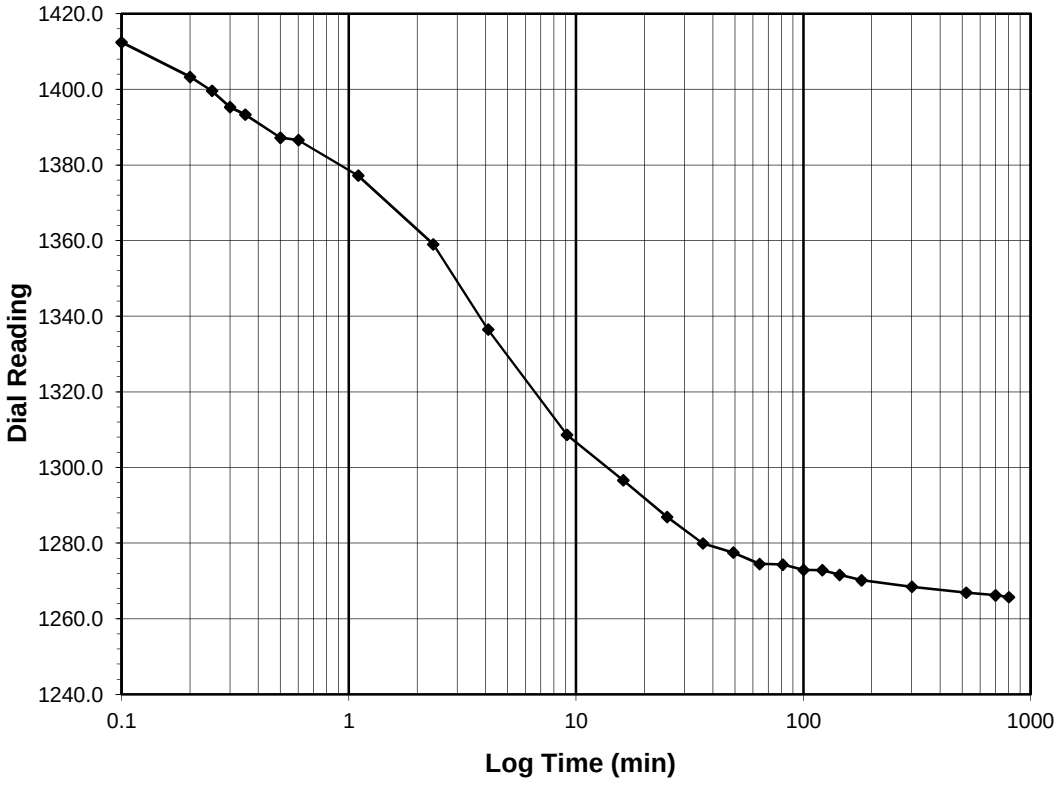
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-105
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	21.7-21.9
Project No.:	2017-061-001	Sample No.:	U-1
Lab ID:	2017-061-001-012	Visual Description:	SOFT BROWN CLAY WITH SILT

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 0.5**
Final Reading	**(div)**	**1265.7**
Consolidometer No.		**G1421**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		20:27:37

Elapsed Time (min)	Dial Reading (div)
Initial	**1436.3**
0.10	1412.5
0.20	1403.3
0.25	1399.6
0.30	1395.3
0.35	1393.3
0.50	1387.2
0.60	1386.6
1.10	1377.2
2.35	1359.0
4.10	1336.5
9.12	1308.6
16.12	1296.6
25.12	1286.9
36.12	1279.9
49.12	1277.5
64.12	1274.5
81.12	1274.3
100.12	1272.9
121.12	1272.9
144.12	1271.6
180.12	1270.2
300.12	1268.5
520.12	1266.9
700.12	1266.2
801.32	1265.7

Tested By *TM* *Date* *2/8/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

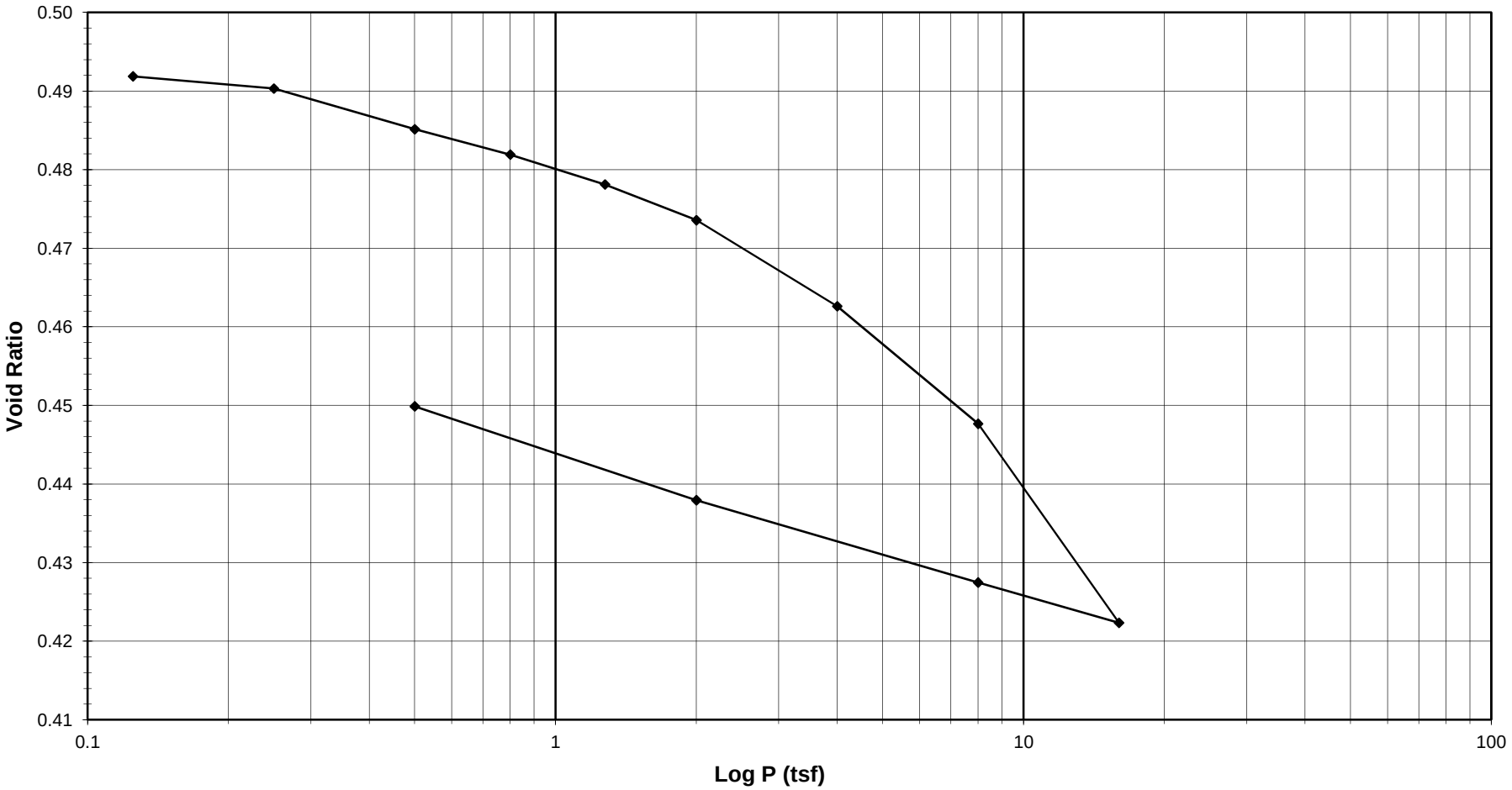
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By TM *Date* 2/3/17 *Approved By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. G1427
1 Division = 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	3009	2991
Wt. of Tare & WS (g)	152.88	177.26
Wt. of Tare & DS (g)	130.42	151.45
Wt. of Water (g)	22.46	25.81
Wt. of Tare (g)	6.49	6.81
Wt. of DS (g)	123.93	144.64
Water Content (%)	18.12	17.84
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.9679
Sample Volume (cm^3)	80.44	77.86
Wt. of Wet Sample + Ring (g)	385.77	385.37
Wt. of Ring (g)	214.51	214.51
Wt. of Wet Sample (g)	171.26	170.86
Wet Density (pcf)	132.85	136.94
Wet Density (g/cm^3)	2.13	2.19
Water Content (%)	18.12	17.84
Wt. of Dry Sample (g)	144.98	144.98
Dry Density (pcf)	112.47	116.20
Dry Density (g/cm^3)	1.80	1.86
Void Ratio	0.4980	0.4499
Saturation (%)	98.26	107.09
Specific Gravity	2.70	*Assumed*

Test Data Summary

Applied Pressure (tsf)	**Final Dial Reading** (div)	**Machine Deflection** (div)	**Corrected Reading** (div)	**Height of Sample** (mm)	**Volume** (cm^3)	**Dry Density** (g/cm^3)	**Void Ratio**
Seating	0	0	0	25.400	80.440	1.80239	**0.49801**
0.125	42.9	2.0	40.9	25.296	80.110	1.80980	**0.49187**
0.25	57.3	6.0	51.3	25.270	80.027	1.81169	**0.49032**
0.5	95.8	10.0	85.8	25.182	79.750	1.81799	**0.48515**
0.8	124.4	17.0	107.4	25.127	79.576	1.82196	**0.48192**
1.275	160.7	28.0	132.7	25.063	79.372	1.82664	**0.47812**
2	199.1	36.0	163.1	24.986	79.128	1.83227	**0.47358**
4	293.2	57.0	236.2	24.800	78.540	1.84600	**0.46262**
8	419.0	83.0	336.0	24.547	77.737	1.86506	**0.44767**
16	629.1	124.0	505.1	24.117	76.377	1.89827	**0.42235**
8	566.9	96.0	470.9	24.204	76.652	1.89146	**0.42747**
2	449.0	48.0	401.0	24.382	77.215	1.87768	**0.43794**
0.5	346.2	25.0	321.2	24.584	77.856	1.86222	**0.44989**

Tested By *TM* *Date* *2/3/17* *Input Checked By* *DB* *Date* *2/13/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

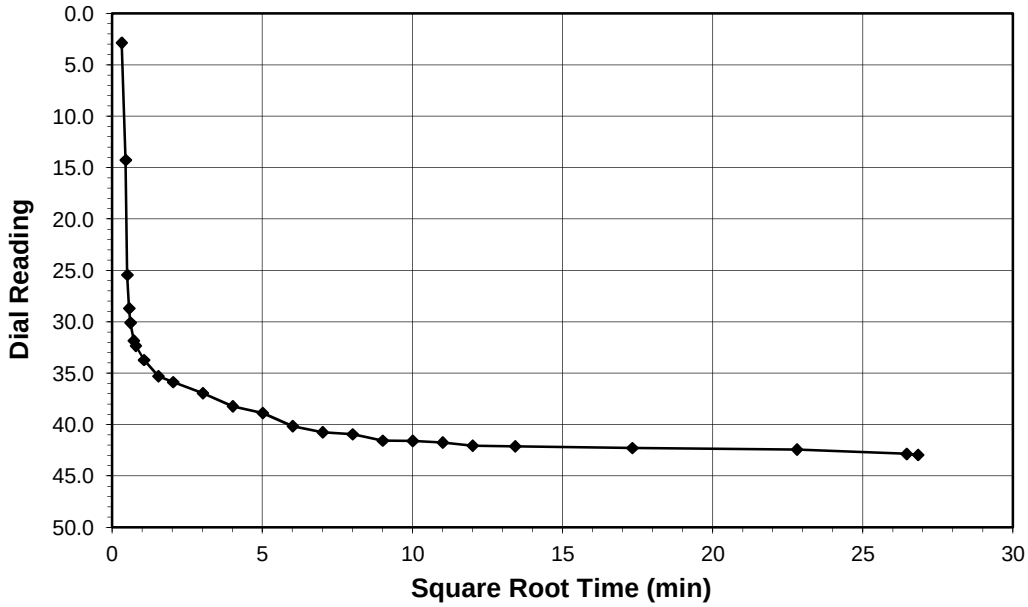
544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

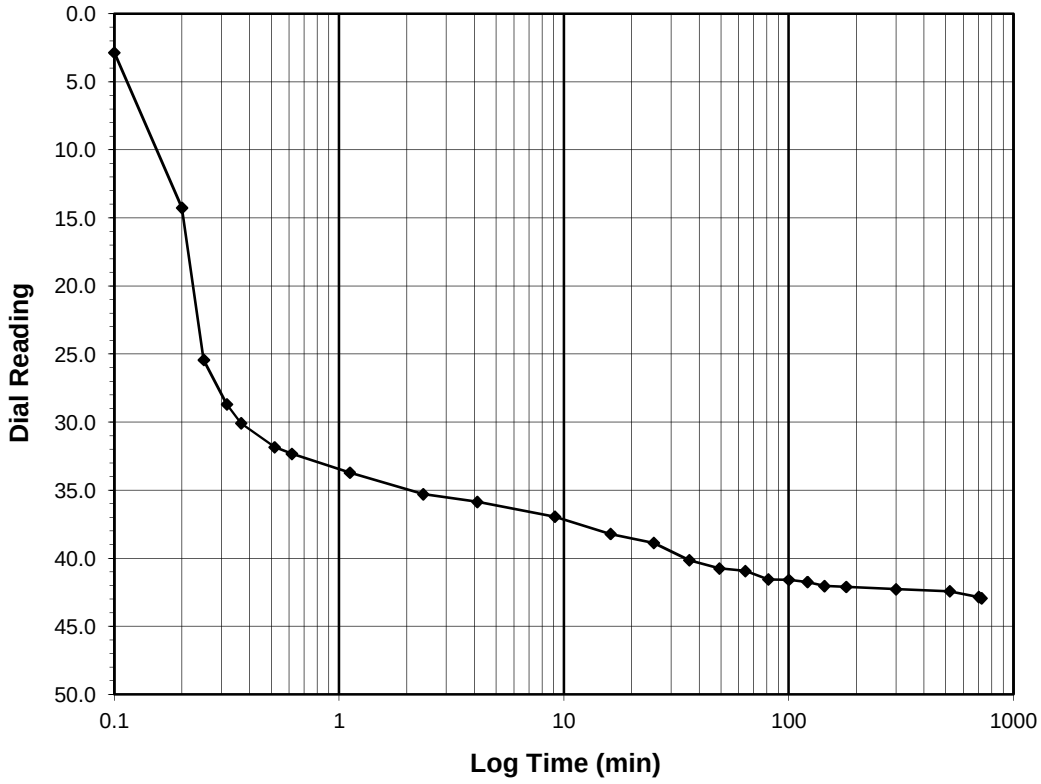
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0 - 0.125**
Final Reading	**(div)**	**42.9**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		12:05:53

Elapsed Time (min)	Dial Reading (div)
Initial	**0.0**
0.10	2.9
0.20	14.3
0.25	25.4
0.32	28.7
0.37	30.1
0.52	31.8
0.62	32.3
1.12	33.7
2.37	35.3
4.12	35.9
9.12	36.9
16.12	38.2
25.12	38.9
36.12	40.1
49.12	40.7
64.13	40.9
81.13	41.6
100.13	41.6
121.13	41.7
144.13	42.0
180.13	42.1
300.13	42.3
520.13	42.4
700.13	42.8
720.42	42.9

Tested By TM *Date* 2/3/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

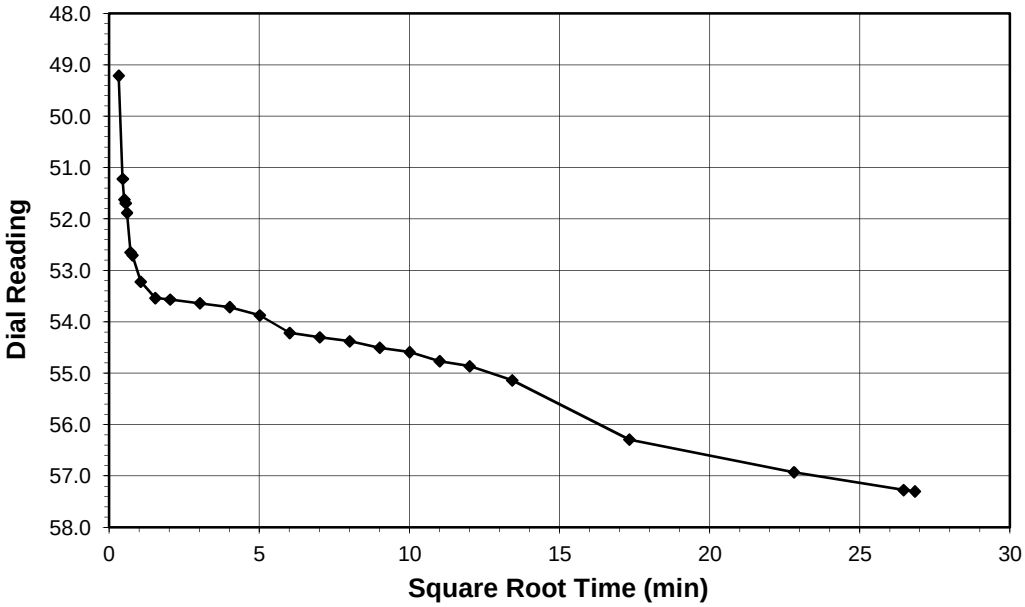
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

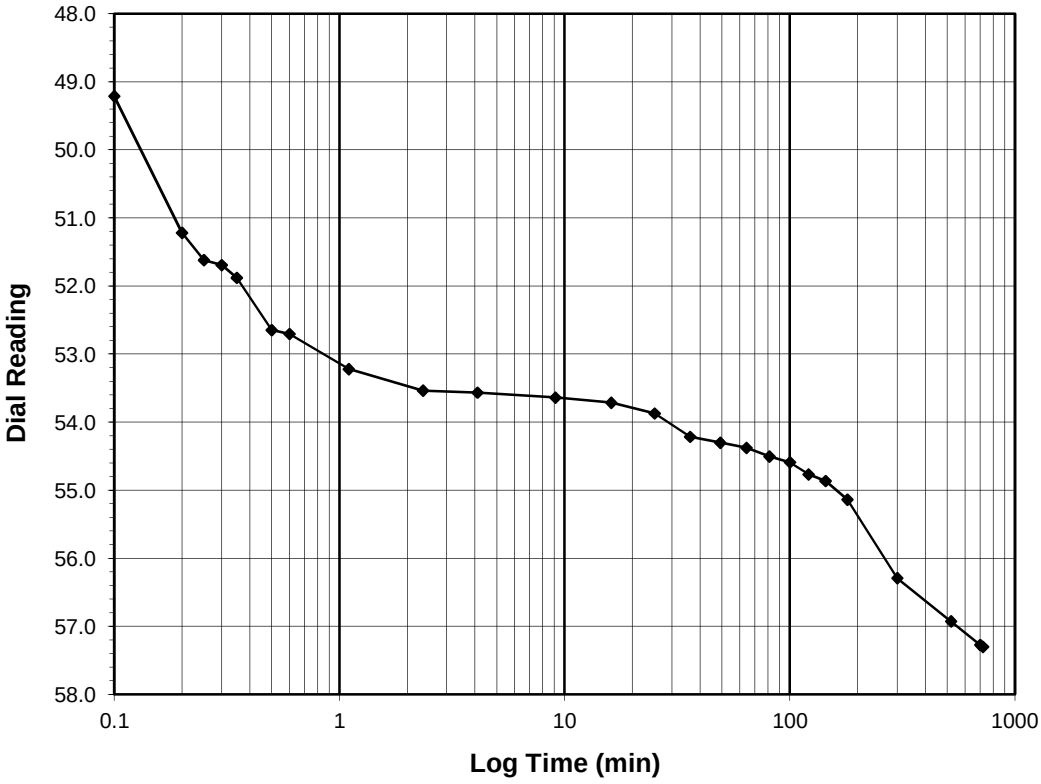
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.125 - 0.25**
Final Reading	**(div)**	**57.3**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		0:06:18

Elapsed Time (min)	Dial Reading (div)
Initial	**42.9**
0.10	49.2
0.20	51.2
0.25	51.6
0.30	51.7
0.35	51.9
0.50	52.6
0.60	52.7
1.10	53.2
2.35	53.5
4.10	53.6
9.10	53.6
16.10	53.7
25.10	53.9
36.10	54.2
49.12	54.3
64.12	54.4
81.12	54.5
100.12	54.6
121.12	54.8
144.12	54.9
180.12	55.1
300.12	56.3
520.12	56.9
700.12	57.3
720.17	57.3

Tested By TM *Date* 2/4/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

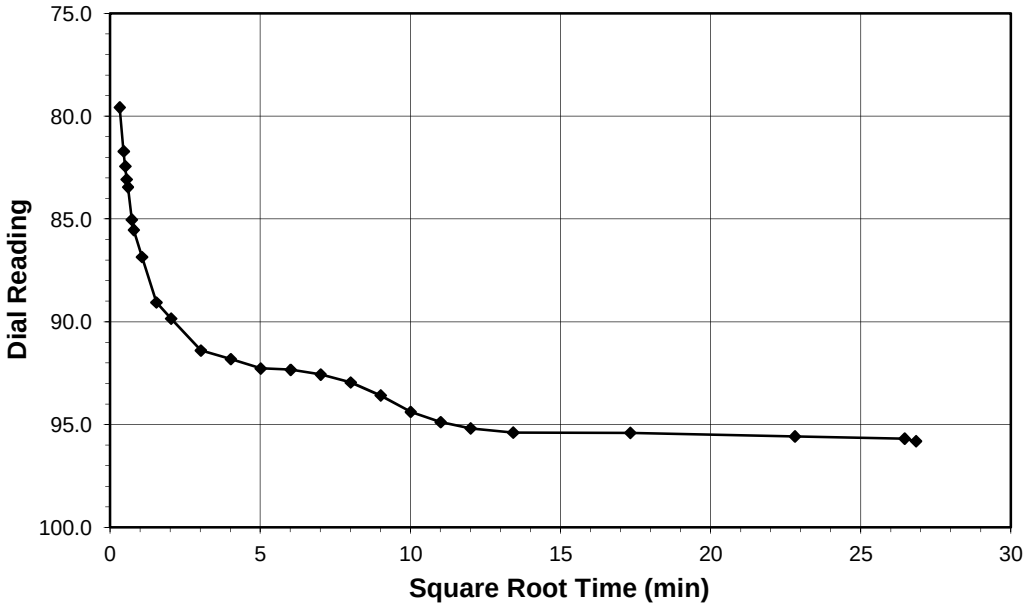
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

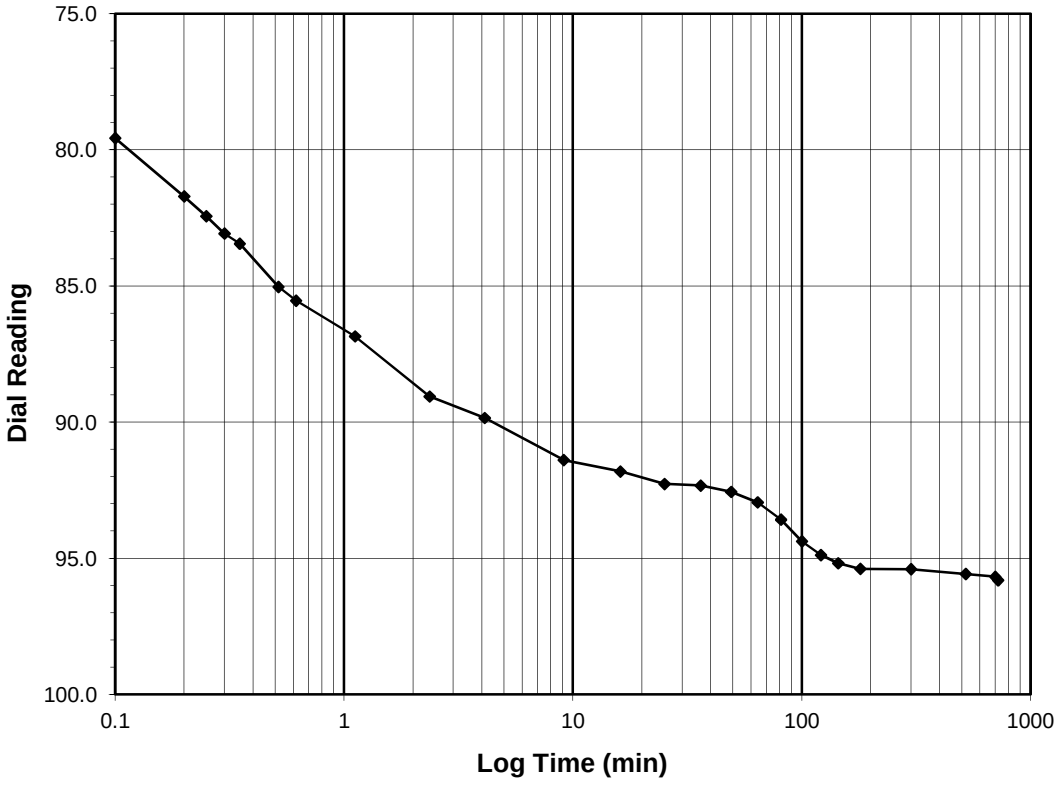
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.25 - 0.5**
Final Reading	**(div)**	**95.8**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		12:06:28

Elapsed Time (min)	Dial Reading (div)
Initial	**57.3**
0.10	79.6
0.20	81.7
0.25	82.4
0.30	83.1
0.35	83.4
0.52	85.0
0.62	85.5
1.12	86.8
2.37	89.1
4.12	89.8
9.12	91.4
16.12	91.8
25.12	92.3
36.12	92.3
49.12	92.6
64.12	92.9
81.12	93.6
100.12	94.4
121.12	94.9
144.13	95.2
180.13	95.4
300.13	95.4
520.13	95.6
700.13	95.7
720.35	95.8

Tested By TM *Date* 2/4/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

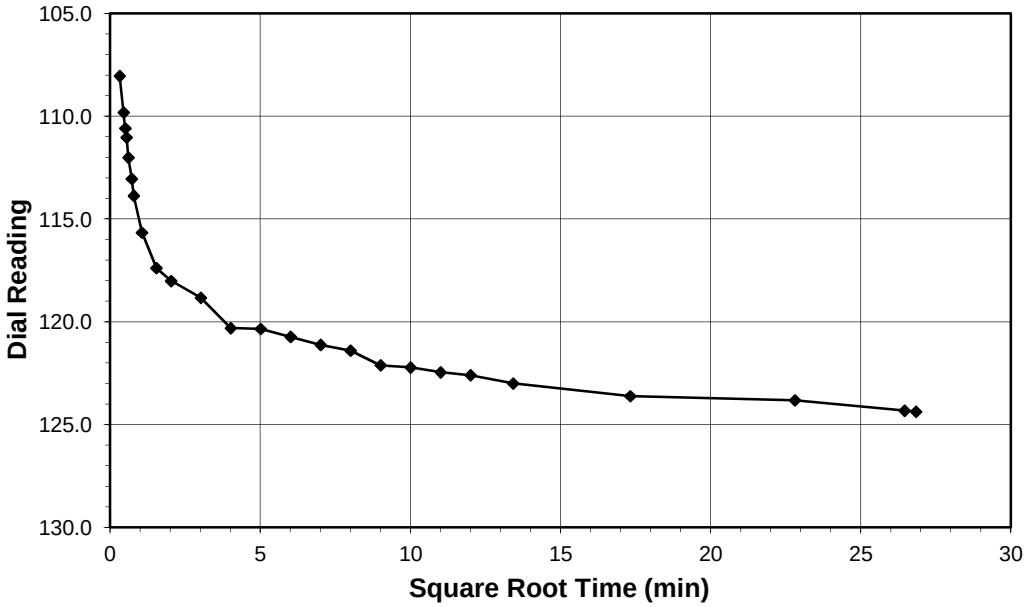
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

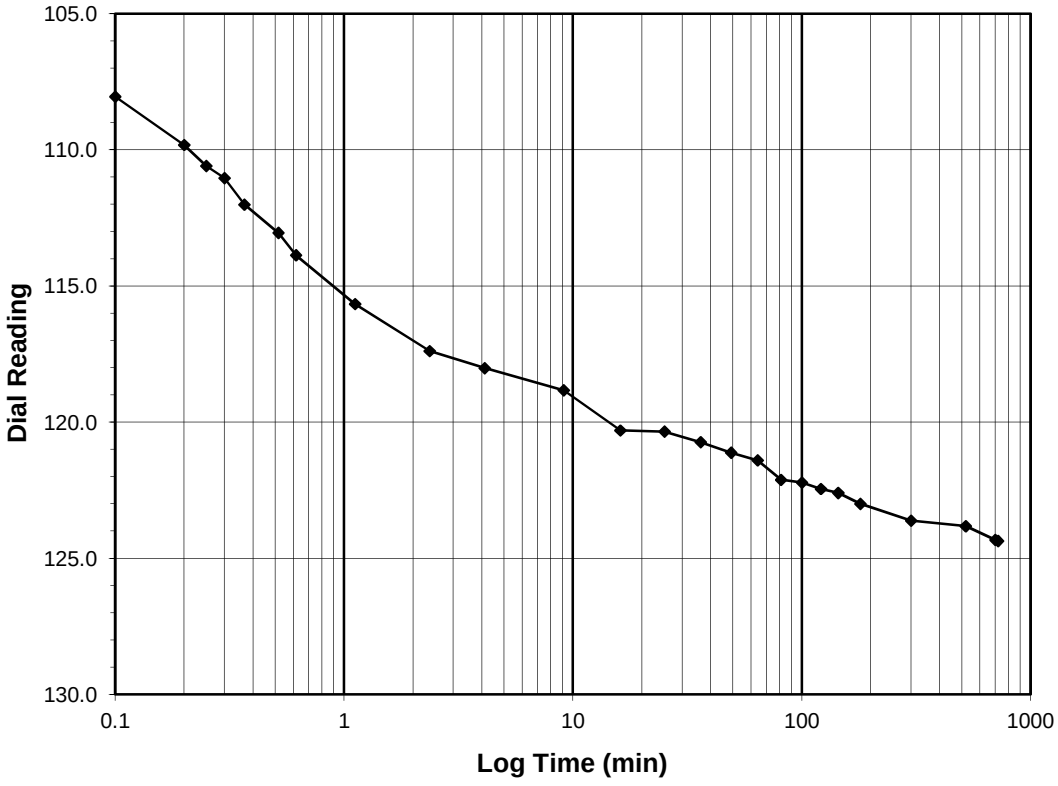
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.5 - 0.8**
Final Reading	**(div)**	**124.4**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		0:06:49

Elapsed Time (min)	Dial Reading (div)
Initial	**95.8**
0.10	108.0
0.20	109.8
0.25	110.6
0.30	111.0
0.37	112.0
0.52	113.0
0.62	113.9
1.12	115.7
2.37	117.4
4.12	118.0
9.12	118.8
16.12	120.3
25.12	120.3
36.12	120.7
49.12	121.1
64.12	121.4
81.12	122.1
100.12	122.2
121.13	122.5
144.13	122.6
180.13	123.0
300.13	123.6
520.13	123.8
700.13	124.3
720.33	124.4

Tested By *TM* *Date* *2/5/17* *Checked By* *DB* *Date* *2/13/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

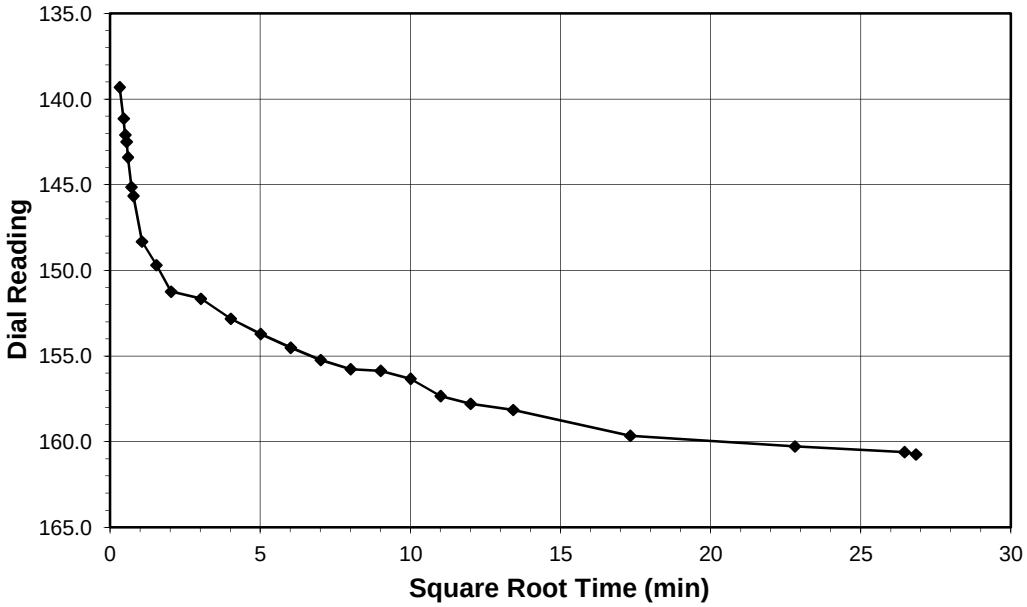
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

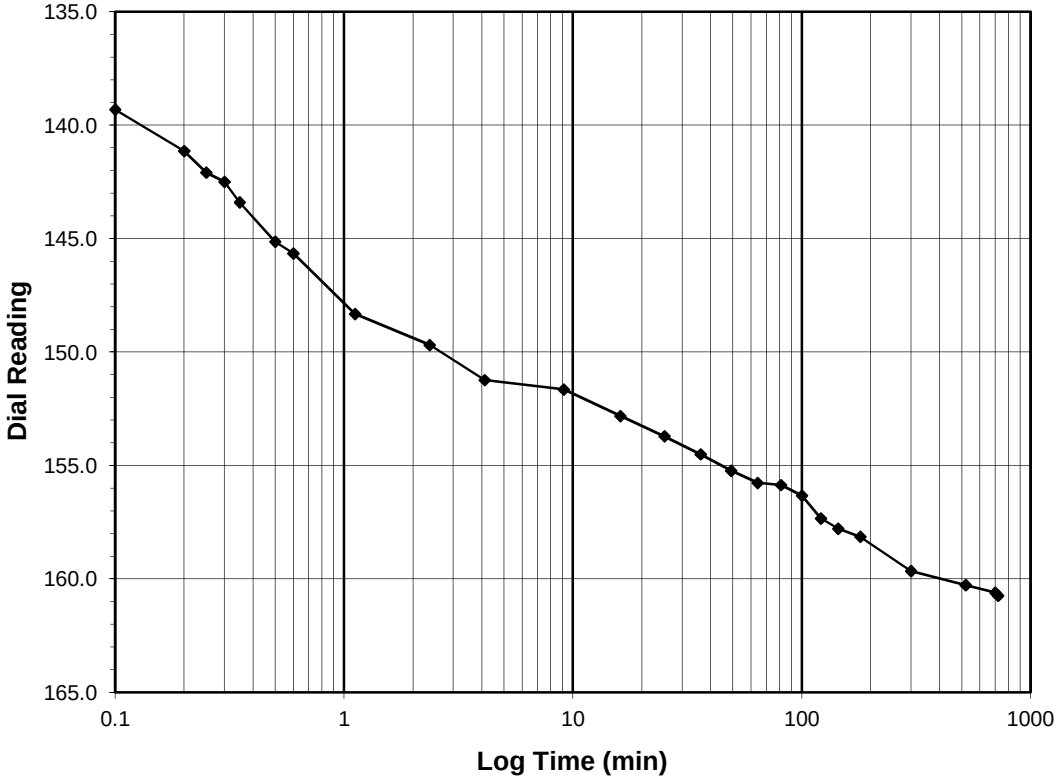
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.8 - 1.275**
Final Reading	**(div)**	**160.7**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		12:07:09

Elapsed Time (min)	Dial Reading (div)
Initial	**124.4**
0.10	139.3
0.20	141.1
0.25	142.1
0.30	142.5
0.35	143.4
0.50	145.1
0.60	145.7
1.12	148.3
2.37	149.7
4.12	151.2
9.12	151.7
16.12	152.8
25.12	153.7
36.12	154.5
49.12	155.2
64.12	155.8
81.12	155.9
100.12	156.3
121.12	157.3
144.12	157.8
180.12	158.1
300.12	159.7
520.12	160.3
700.12	160.6
720.23	160.7

Tested By TM *Date* 2/5/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

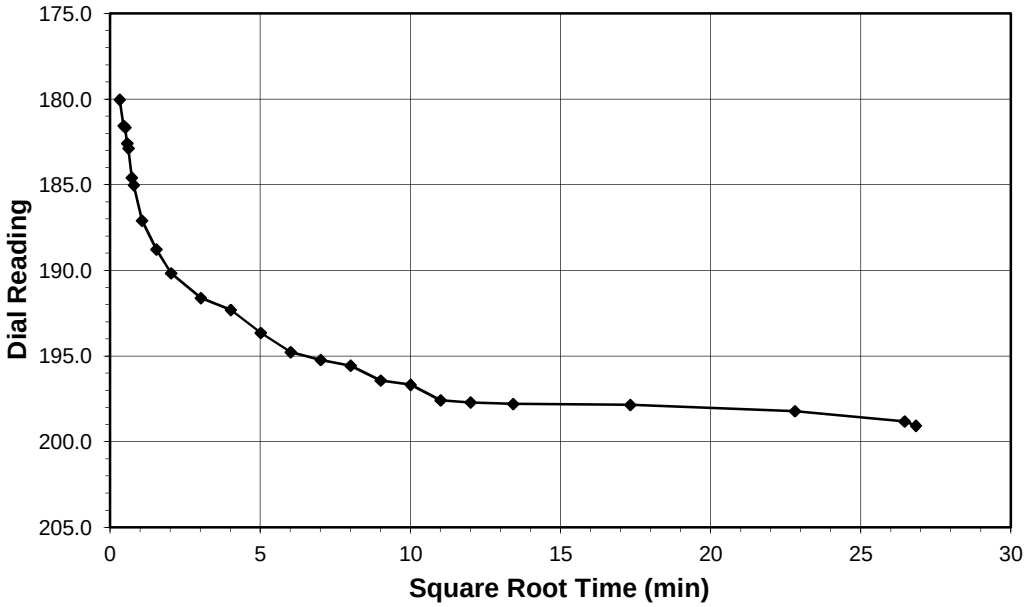
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

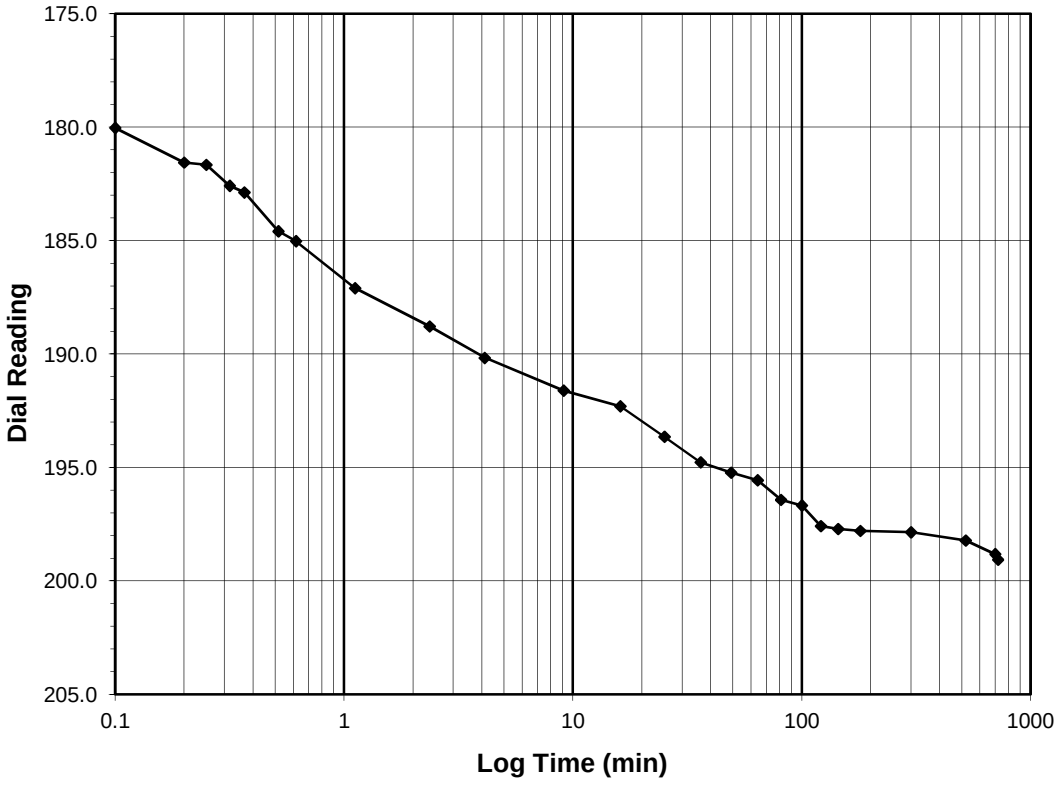
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**1.275 - 2**
Final Reading	**(div)**	**199.1**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		0:07:23

Elapsed Time (min)	Dial Reading (div)
Initial	**160.7**
0.10	180.0
0.20	181.6
0.25	181.7
0.32	182.6
0.37	182.9
0.52	184.6
0.62	185.0
1.12	187.1
2.37	188.8
4.12	190.2
9.12	191.6
16.12	192.3
25.12	193.6
36.12	194.8
49.12	195.2
64.12	195.6
81.12	196.4
100.12	196.7
121.12	197.6
144.12	197.7
180.12	197.8
300.12	197.9
520.13	198.2
700.13	198.8
720.20	199.1

Tested By TM *Date* 2/6/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

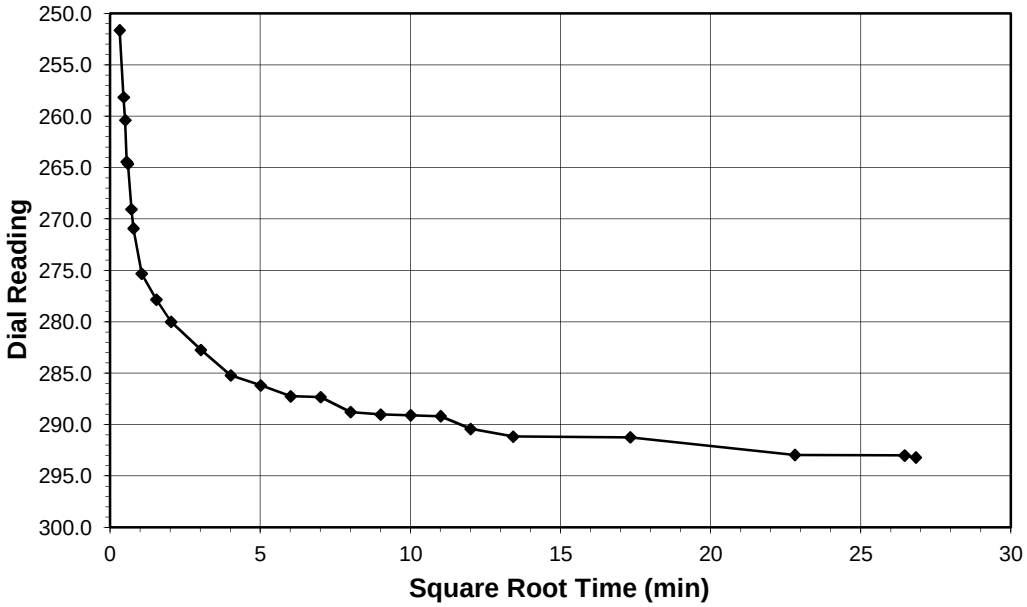
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

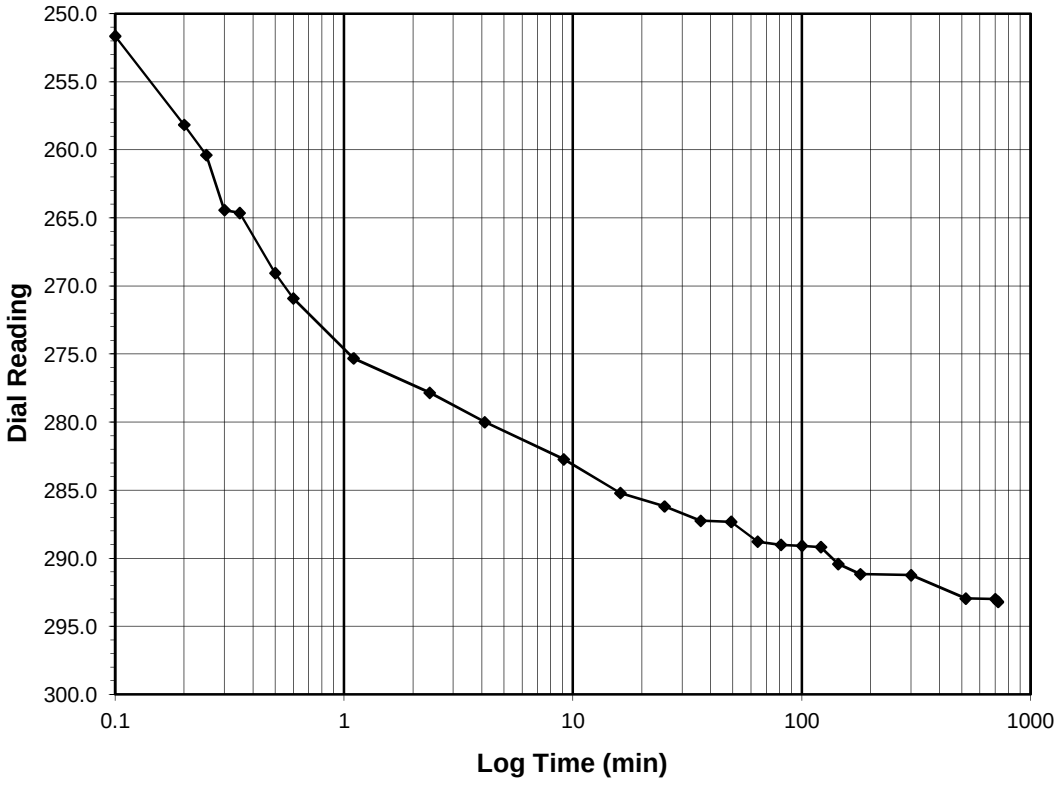
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 4**
Final Reading	**(div)**	**293.2**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		12:07:35

Elapsed Time (min)	Dial Reading (div)
Initial	**199.1**
0.10	251.6
0.20	258.2
0.25	260.4
0.30	264.4
0.35	264.6
0.50	269.1
0.60	270.9
1.10	275.3
2.37	277.8
4.12	280.0
9.12	282.7
16.12	285.2
25.12	286.2
36.12	287.2
49.12	287.3
64.12	288.8
81.13	289.0
100.13	289.1
121.13	289.2
144.13	290.4
180.13	291.2
300.13	291.2
520.13	293.0
700.13	293.0
720.18	293.2

Tested By TM *Date* 2/6/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

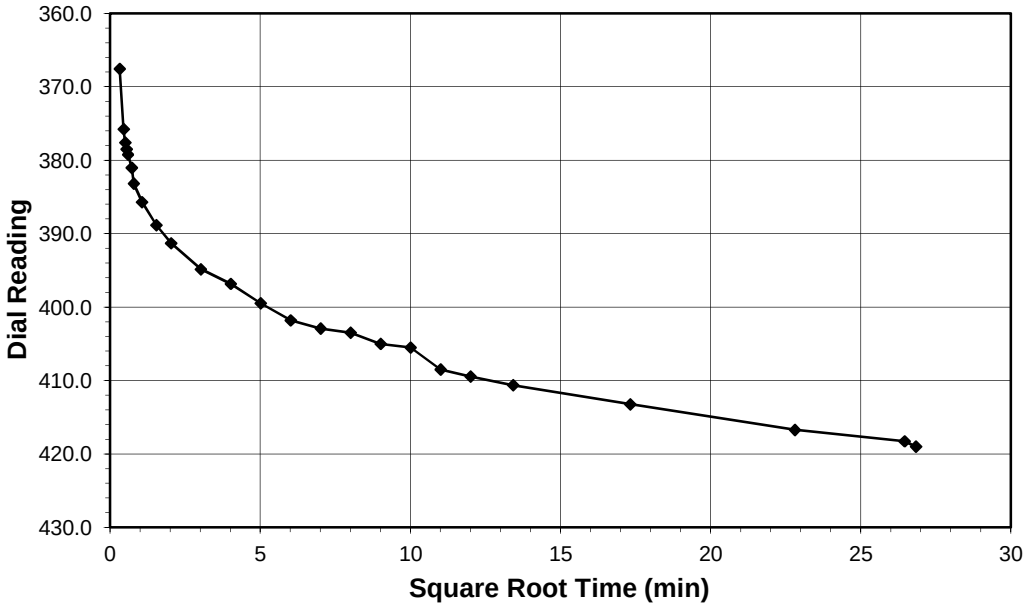
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

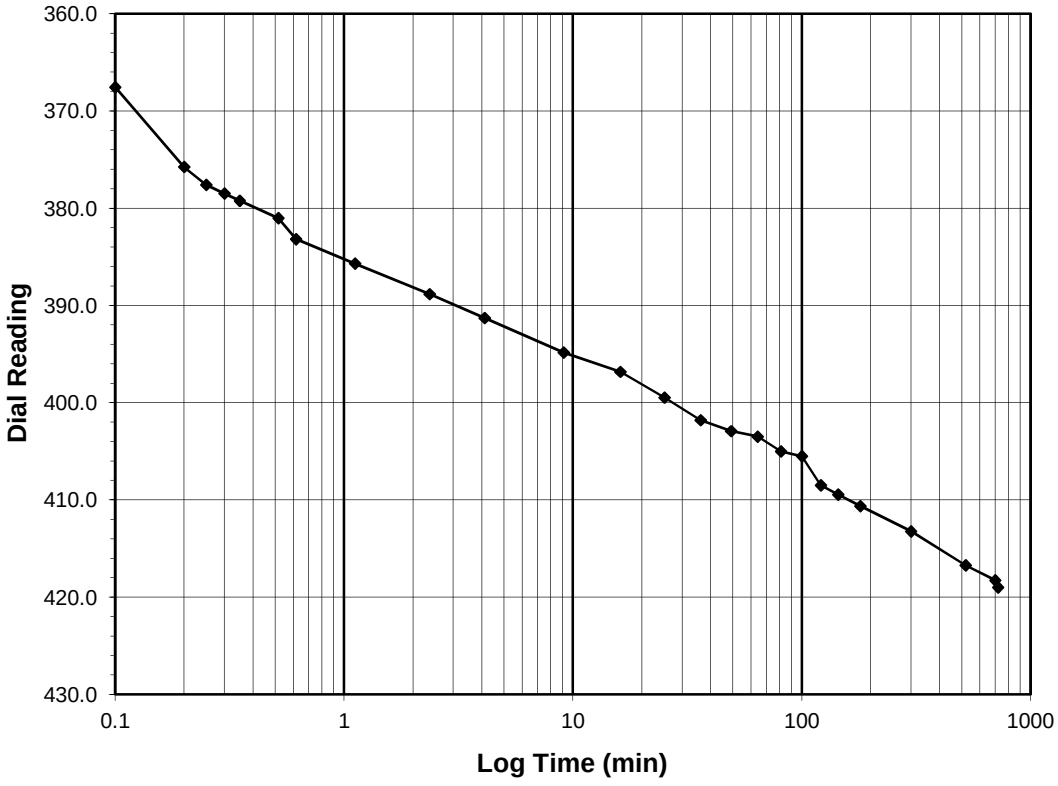
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**4 - 8**
Final Reading	**(div)**	**419.0**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		0:07:46

Elapsed Time (min)	Dial Reading (div)
Initial	**293.2**
0.10	367.5
0.20	375.8
0.25	377.6
0.30	378.5
0.35	379.2
0.52	381.0
0.62	383.2
1.12	385.7
2.37	388.8
4.12	391.3
9.12	394.8
16.12	396.8
25.12	399.5
36.12	401.8
49.12	402.9
64.12	403.5
81.12	405.0
100.12	405.5
121.12	408.5
144.12	409.5
180.12	410.6
300.12	413.2
520.12	416.7
700.13	418.3
720.25	419.0

Tested By *TM* *Date* *2/7/17* *Checked By* *DB* *Date* *2/13/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

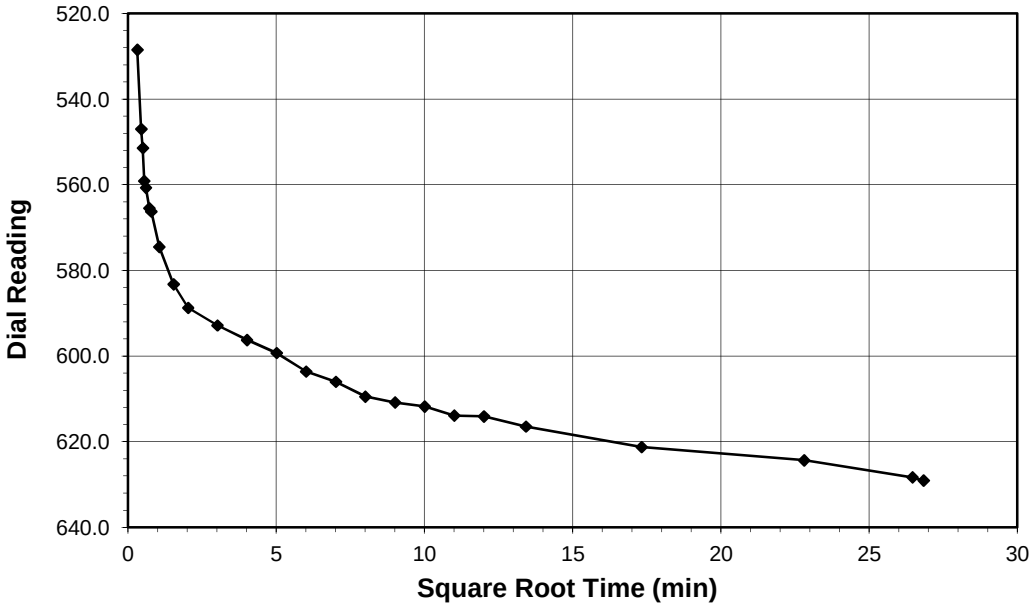
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

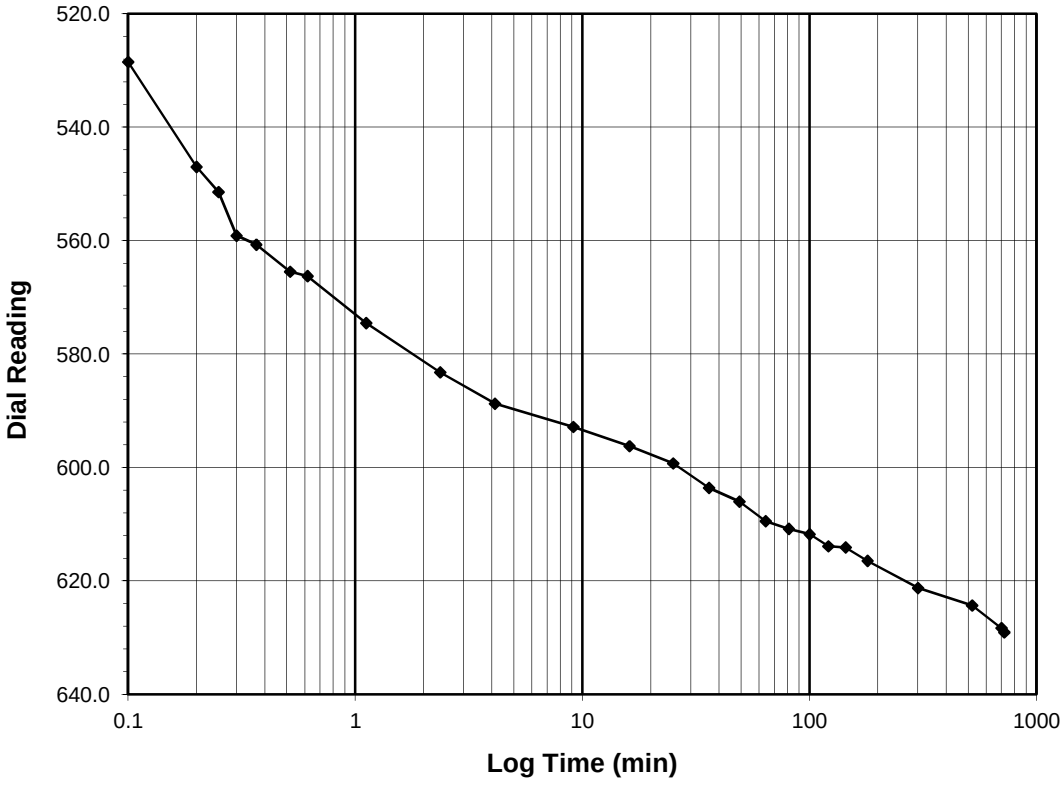
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 16**
Final Reading	**(div)**	**629.1**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		12:08:01

Elapsed Time (min)	Dial Reading (div)
Initial	**419.0**
0.10	528.5
0.20	547.0
0.25	551.4
0.30	559.1
0.37	560.7
0.52	565.5
0.62	566.3
1.12	574.5
2.37	583.2
4.12	588.7
9.12	592.8
16.12	596.2
25.12	599.3
36.12	603.6
49.12	606.0
64.12	609.5
81.12	610.8
100.12	611.8
121.12	613.9
144.12	614.1
180.12	616.5
300.12	621.2
520.12	624.3
700.13	628.3
720.13	629.1

Tested By TM *Date* 2/7/17 *Checked By* DB *Date* 2/13/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

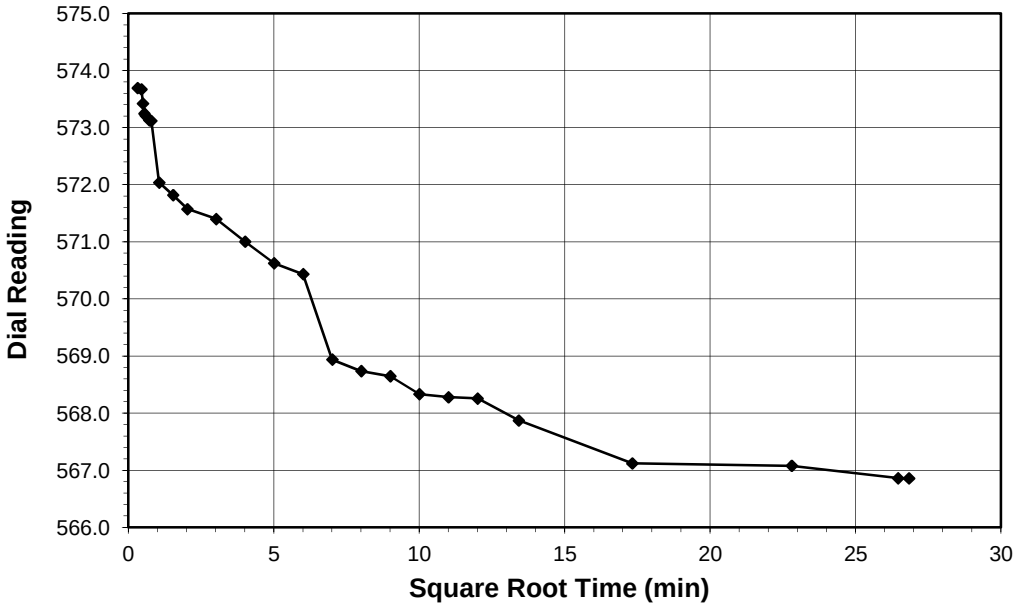
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

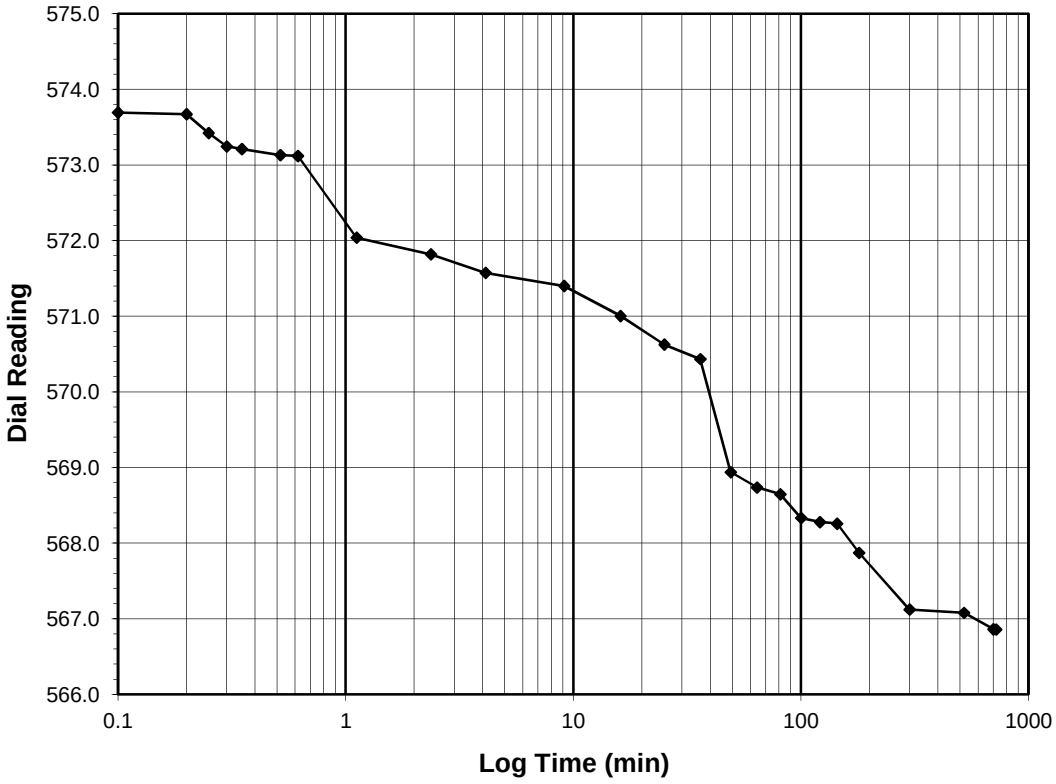
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**16 - 8**
Final Reading	**(div)**	**566.9**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		0:08:09

Elapsed Time (min)	Dial Reading (div)
Initial	**629.1**
0.10	573.7
0.20	573.7
0.25	573.4
0.30	573.2
0.35	573.2
0.52	573.1
0.62	573.1
1.12	572.0
2.37	571.8
4.12	571.6
9.12	571.4
16.12	571.0
25.12	570.6
36.12	570.4
49.12	568.9
64.12	568.7
81.12	568.6
100.12	568.3
121.12	568.3
144.12	568.3
180.12	567.9
300.12	567.1
520.13	567.1
700.13	566.9
720.33	566.9

Tested By *TM* *Date* *2/8/17* *Checked By* *DB* *Date* *2/13/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

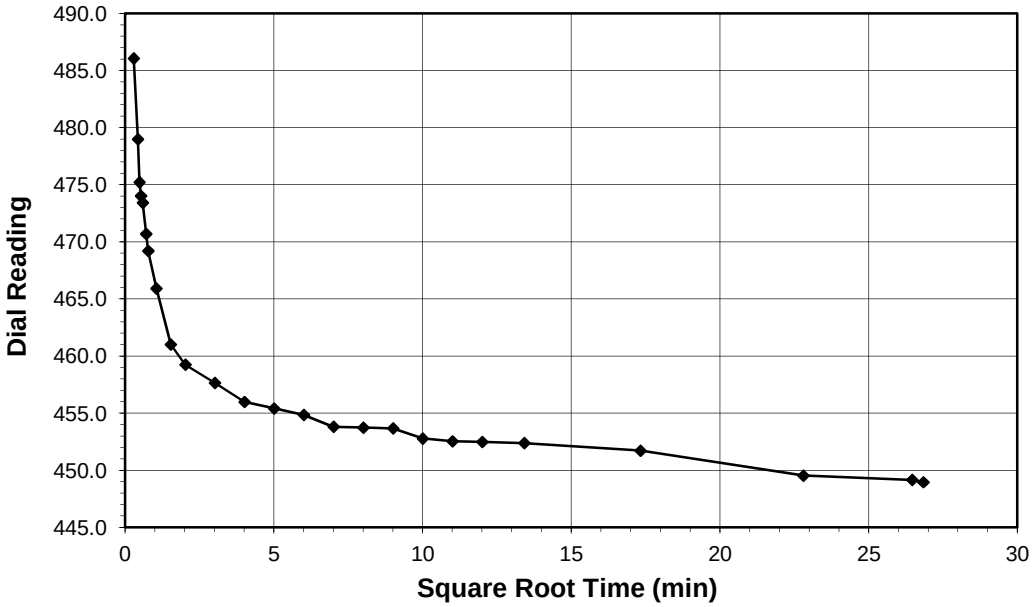
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

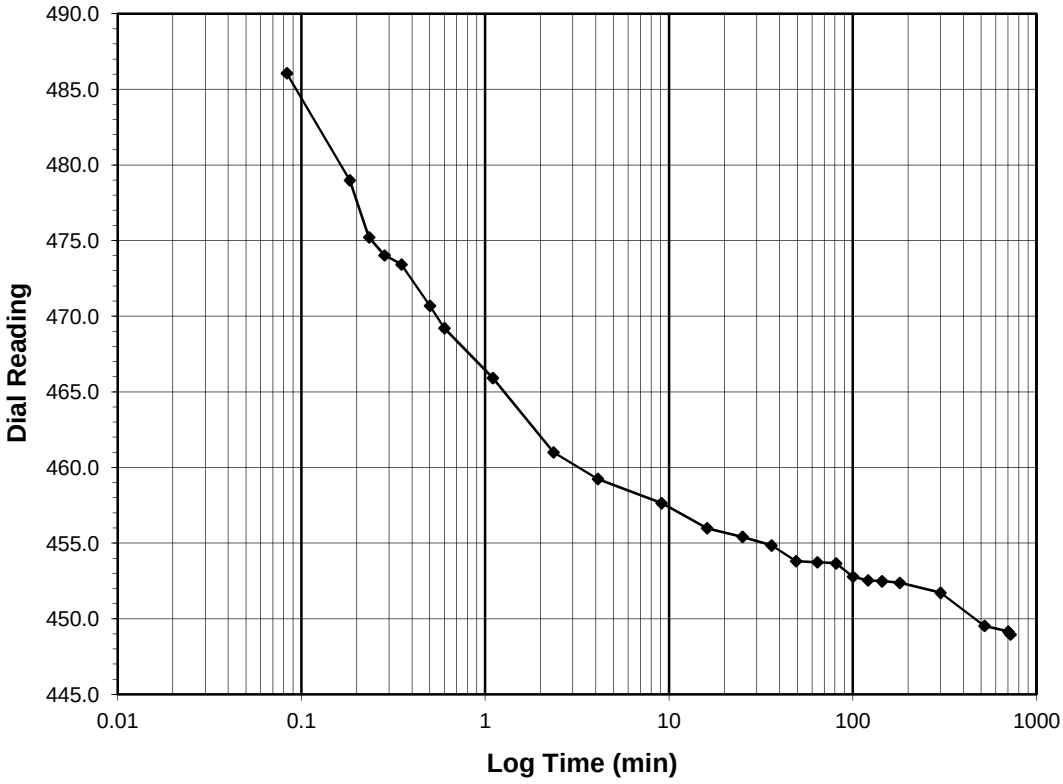
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 2**
Final Reading	**(div)**	**449.0**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		12:08:29

Elapsed Time (min)	Dial Reading (div)
Initial	**566.9**
0.08	486.1
0.18	479.0
0.23	475.2
0.28	474.0
0.35	473.4
0.50	470.7
0.60	469.2
1.10	465.9
2.35	461.0
4.10	459.2
9.10	457.6
16.10	456.0
25.10	455.4
36.10	454.8
49.10	453.8
64.10	453.7
81.12	453.7
100.12	452.8
121.12	452.5
144.12	452.5
180.12	452.4
300.12	451.7
520.12	449.5
700.12	449.2
720.25	449.0

Tested By *TM* *Date* *2/8/17* *Checked By* *DB* *Date* *2/13/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

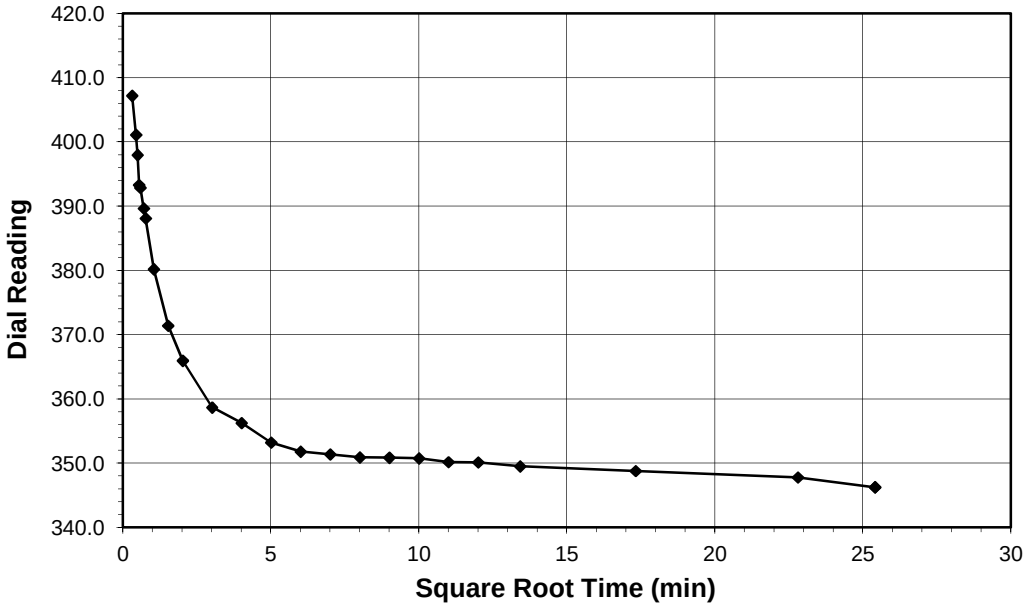
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

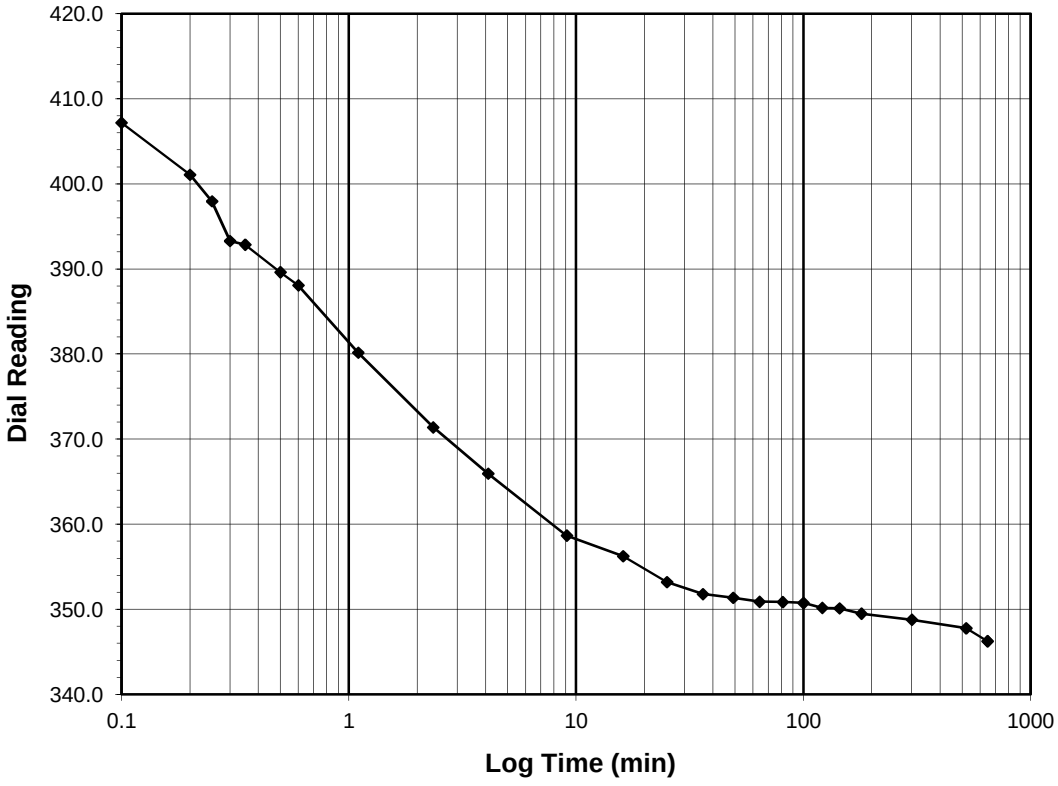
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-107
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	11.7-11.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-018	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 0.5**
Final Reading	**(div)**	**346.2**
Consolidometer No.		**G1427**
1 Division	(in)	0.0001
Start Date		2/9/17
Start Time		0:08:46

Elapsed Time (min)	Dial Reading (div)
Initial	**449.0**
0.10	407.2
0.20	401.1
0.25	398.0
0.30	393.3
0.35	392.9
0.50	389.6
0.60	388.1
1.10	380.2
2.35	371.4
4.10	365.9
9.10	358.7
16.10	356.2
25.10	353.2
36.10	351.8
49.10	351.4
64.10	350.9
81.10	350.9
100.10	350.7
121.10	350.2
144.10	350.1
180.10	349.5
300.10	348.8
520.10	347.8
645.68	346.3
645.70	346.2

Tested By *TM* *Date* *2/9/17* *Checked By* *DB* *Date* *2/13/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

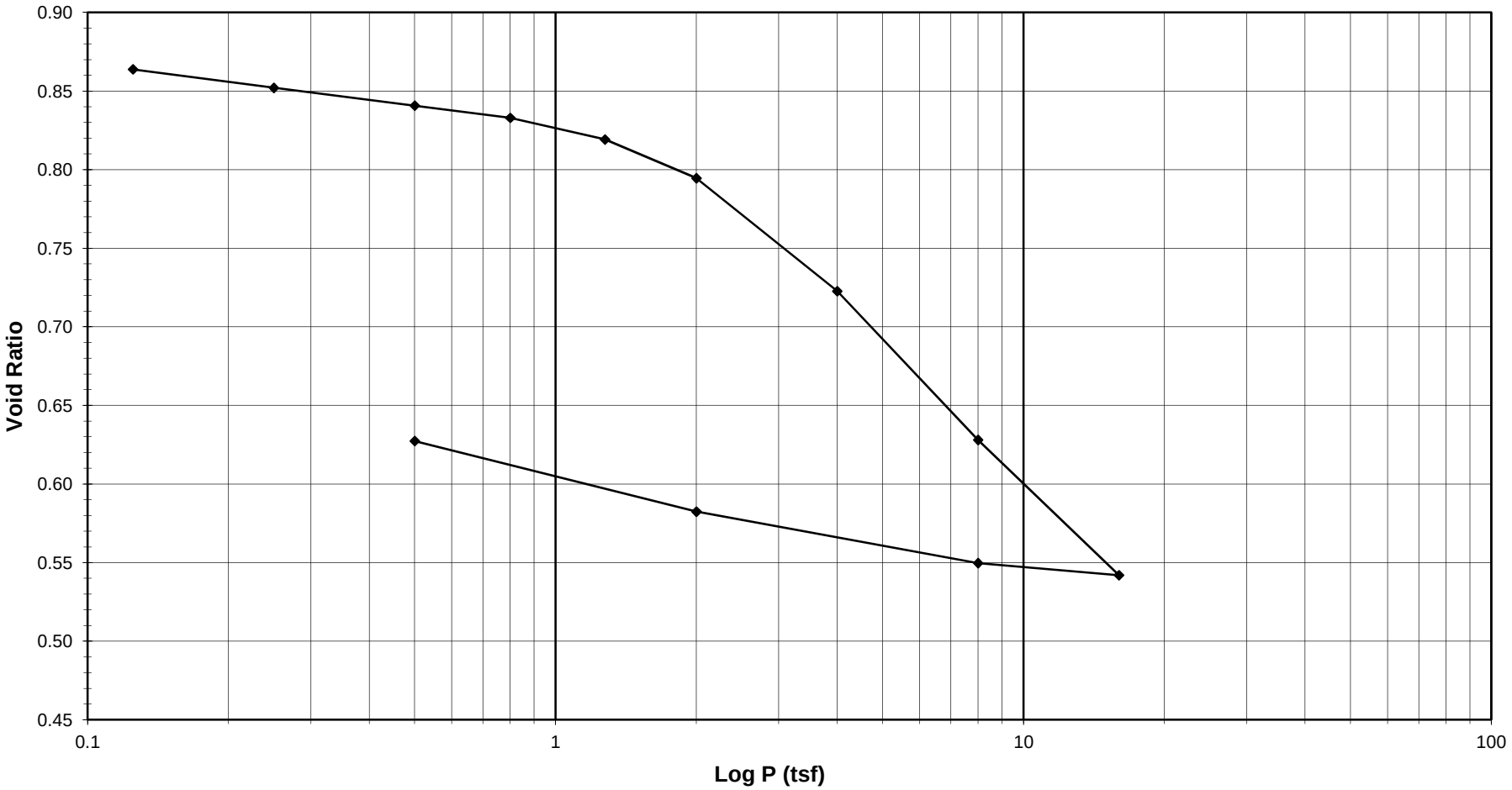
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By *TM* *Date* *2/3/17* *Approved By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. G1424
**1 Division = ** 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	3128	3145
Wt. of Tare & WS (g)	150.84	149.73
Wt. of Tare & DS (g)	117.50	117.75
Wt. of Water (g)	33.34	31.98
Wt. of Tare (g)	6.74	6.76
Wt. of DS (g)	110.76	110.99
Water Content (%)	30.10	28.81
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.8686
Sample Volume (cm^3)	80.44	69.87
Wt. of Wet Sample + Ring (g)	365.42	363.93
Wt. of Ring (g)	214.61	214.61
Wt. of Wet Sample (g)	150.81	149.32
Wet Density (pcf)	116.99	133.36
Wet Density (g/cm^3)	1.87	2.14
Water Content (%)	30.10	28.81
Wt. of Dry Sample (g)	115.92	115.92
Dry Density (pcf)	89.92	103.53
Dry Density (g/cm^3)	1.44	1.66
Void Ratio	0.8736	0.6274
Saturation (%)	93.03	124.00
Specific Gravity	2.70	*Assumed*

Test Data Summary

Applied Pressure (tsf)	**Final Dial Reading** (div)	**Machine Deflection** (div)	**Corrected Reading** (div)	**Height of Sample** (mm)	**Volume** (cm^3)	**Dry Density** (g/cm^3)	**Void Ratio**
Seating	0	0	0	25.400	80.440	1.44105	**0.87364**
0.125	55.3	2.9	52.3	25.267	80.019	1.44863	**0.86383**
0.25	119.8	4.7	115.1	25.108	79.514	1.45783	**0.85207**
0.5	187.8	12.1	175.7	24.954	79.027	1.46682	**0.84072**
0.8	239.0	22.0	217.0	24.849	78.695	1.47300	**0.83299**
1.275	317.9	27.5	290.4	24.663	78.104	1.48414	**0.81924**
2	458.7	36.7	422.0	24.328	77.045	1.50454	**0.79457**
4	864.7	59.3	805.3	23.354	73.962	1.56726	**0.72275**
8	1394.8	84.2	1310.6	22.071	69.897	1.65840	**0.62808**
16	1905.2	135.3	1769.9	20.904	66.202	1.75096	**0.54202**
8	1820.7	91.8	1728.9	21.009	66.533	1.74226	**0.54971**
2	1604.7	50.7	1554.0	21.453	67.939	1.70619	**0.58247**
0.5	1339.5	25.1	1314.4	22.061	69.867	1.65912	**0.62737**

Tested By *TM* *Date* *2/3/17* *Input Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

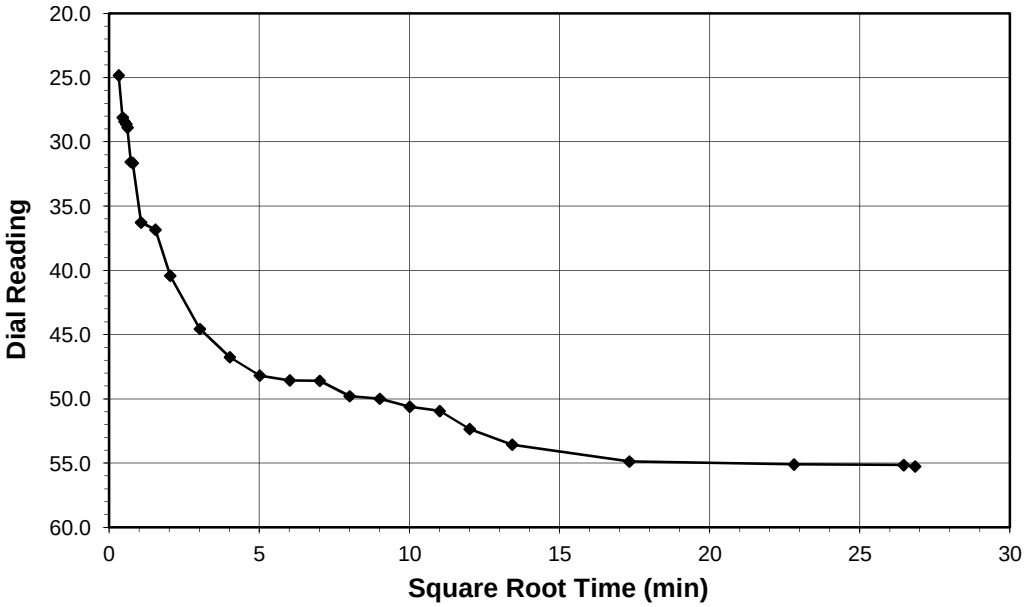
544 Braddock Avenue • East Pittsburgh, PA 15112 • 412/823-7600 • FAX 412/823-8999 • www.geotechnics.net

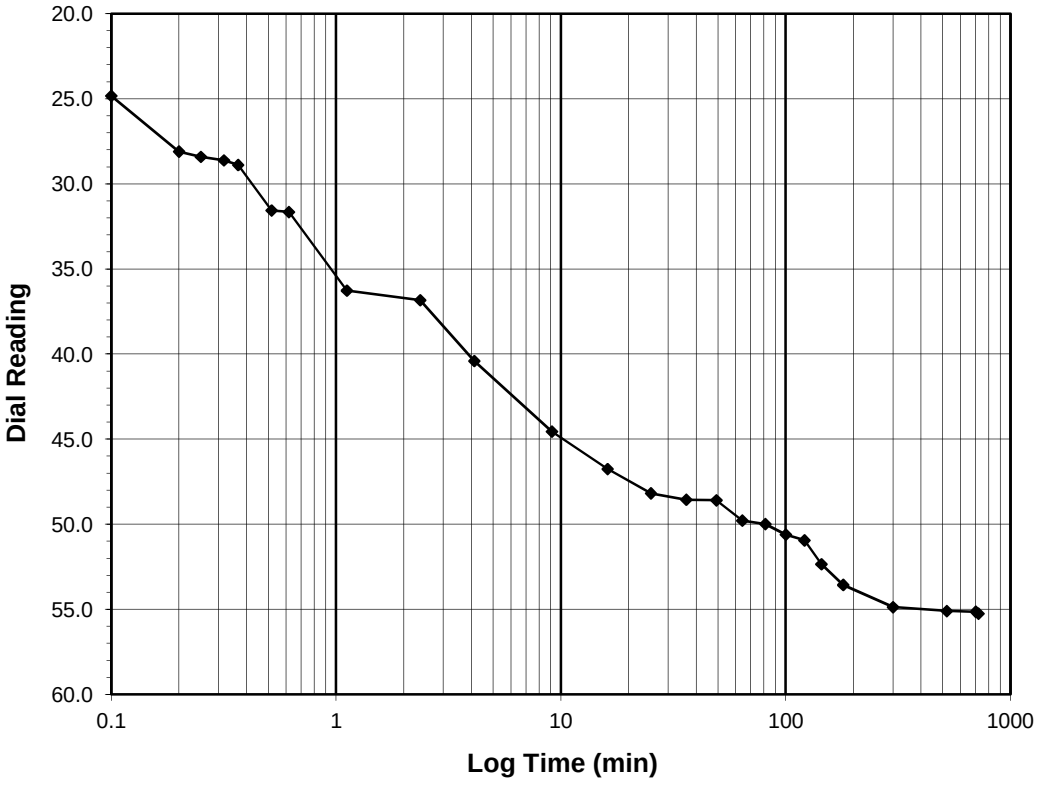
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0 - 0.125**
Final Reading	**(div)**	**55.3**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		10:52:40

Elapsed Time (min)	Dial Reading (div)
Initial	**0.0**
0.10	24.8
0.20	28.1
0.25	28.4
0.32	28.6
0.37	28.9
0.52	31.6
0.62	31.6
1.12	36.3
2.37	36.8
4.12	40.4
9.12	44.6
16.12	46.8
25.13	48.2
36.13	48.6
49.13	48.6
64.13	49.8
81.13	50.0
100.13	50.6
121.13	50.9
144.13	52.3
180.13	53.6
300.13	54.9
520.13	55.1
700.13	55.1
720.30	55.3

Tested By *TM* *Date* *2/3/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

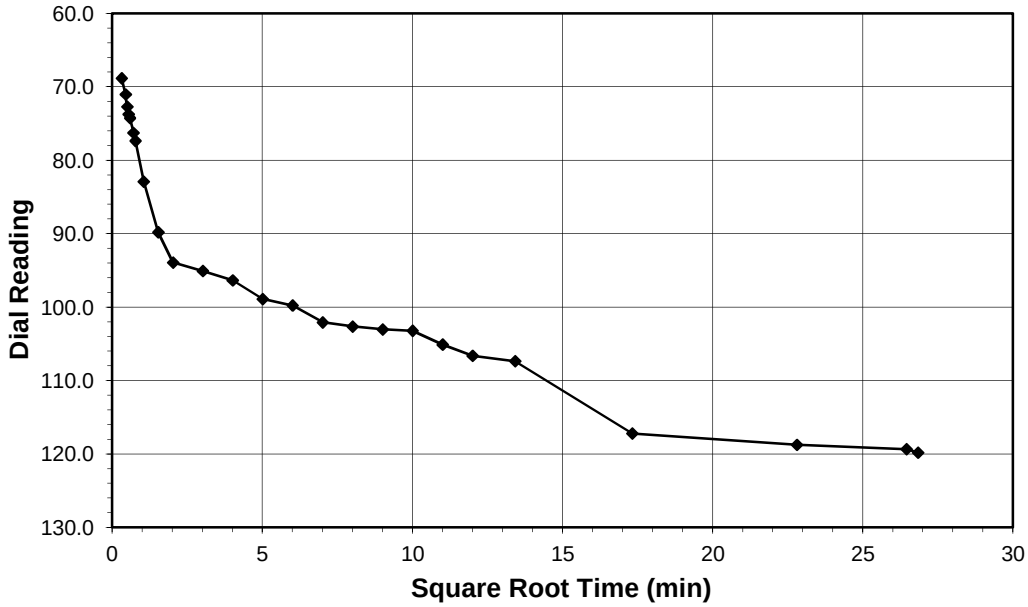
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

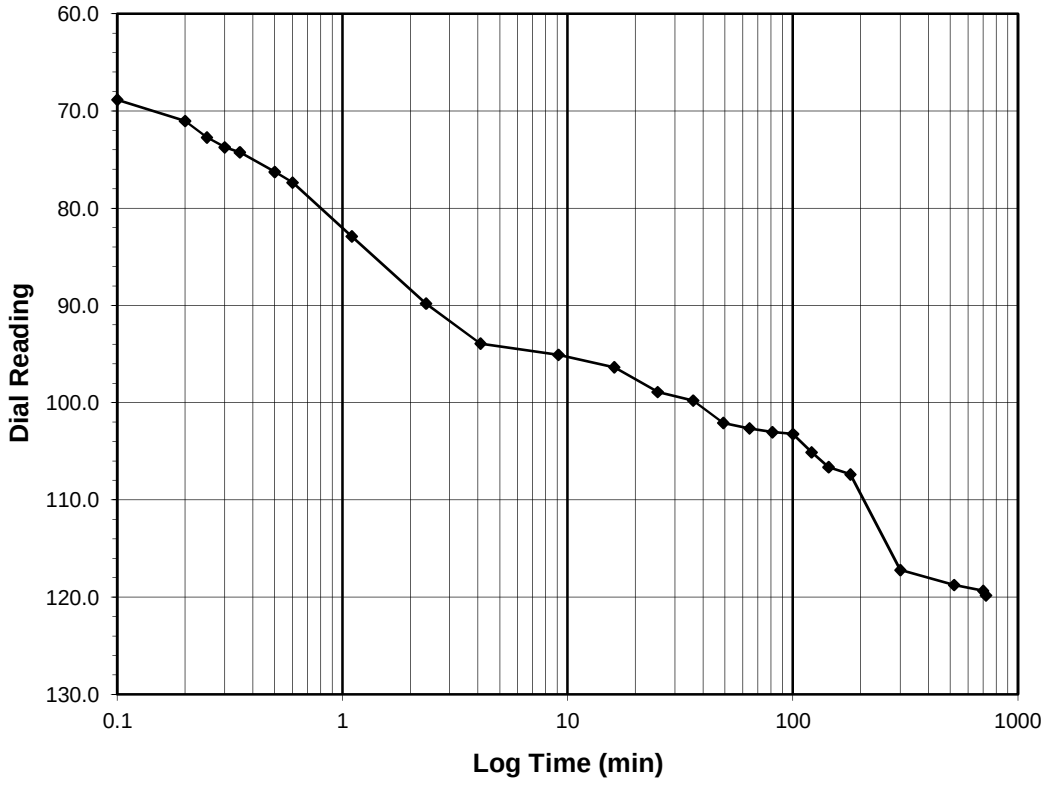
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.125 - 0.25**
Final Reading	**(div)**	**119.8**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/3/17
Start Time		22:52:58

Elapsed Time (min)	Dial Reading (div)
Initial	**55.3**
0.10	68.8
0.20	71.0
0.25	72.7
0.30	73.7
0.35	74.2
0.50	76.3
0.60	77.4
1.10	82.9
2.35	89.8
4.10	93.9
9.10	95.1
16.10	96.4
25.10	98.9
36.10	99.8
49.12	102.1
64.12	102.6
81.12	103.0
100.12	103.2
121.12	105.1
144.12	106.6
180.12	107.4
300.12	117.2
520.12	118.7
700.12	119.4
720.32	119.8

Tested By TM *Date* 2/3/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

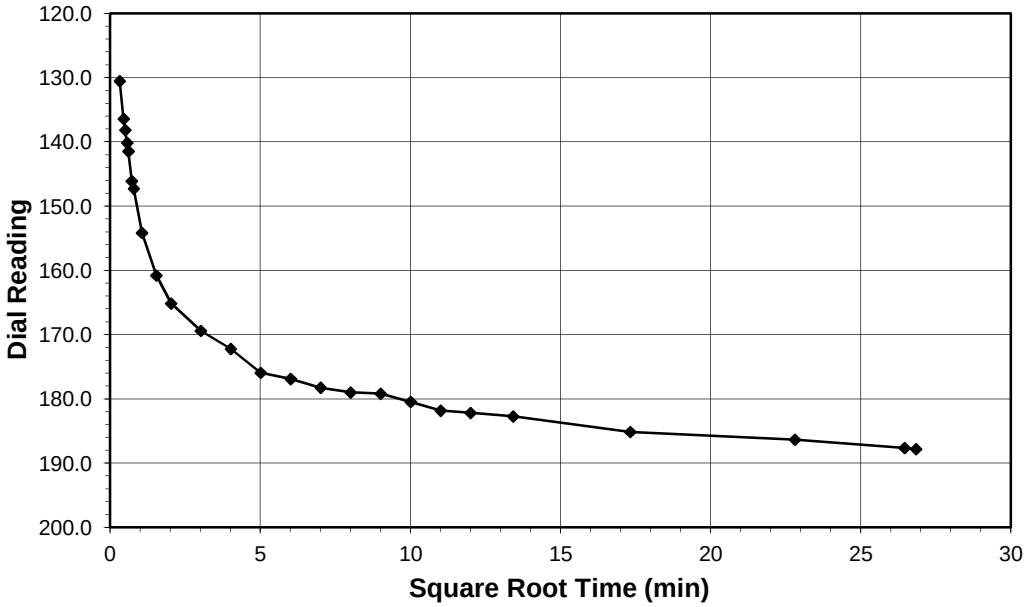
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

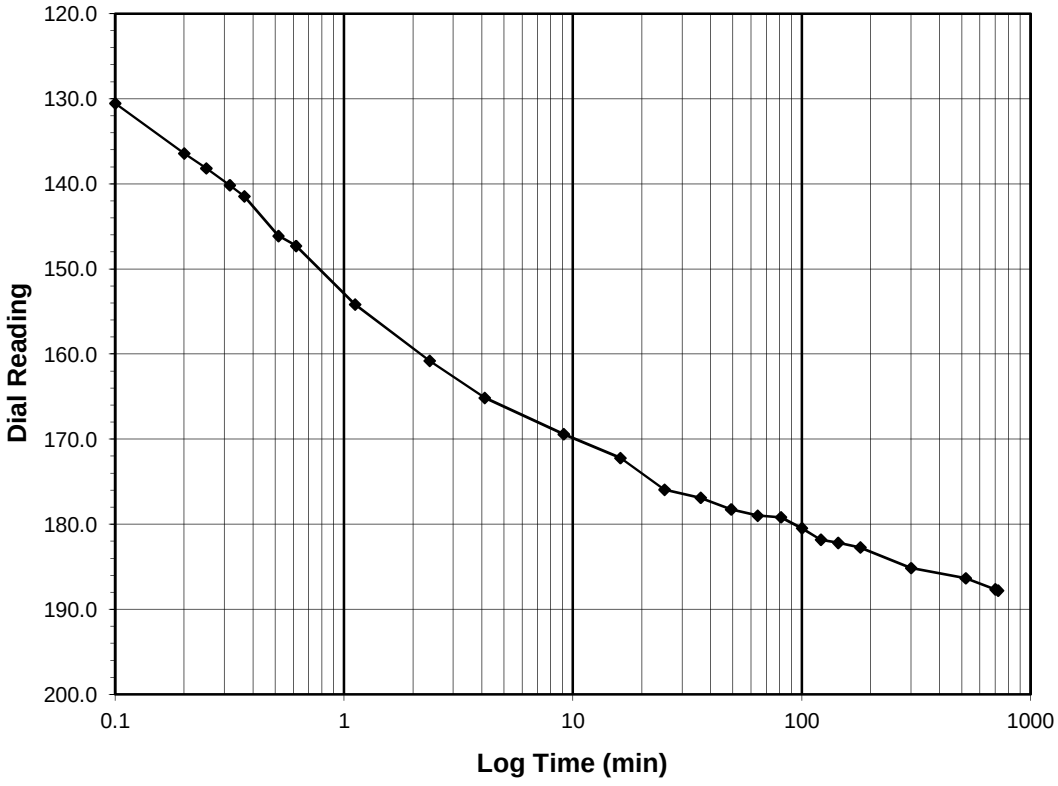
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.25 - 0.5**
Final Reading	**(div)**	**187.8**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		10:53:17

Elapsed Time (min)	Dial Reading (div)
Initial	**119.8**
0.10	130.5
0.20	136.4
0.25	138.2
0.32	140.2
0.37	141.5
0.52	146.1
0.62	147.3
1.12	154.2
2.37	160.8
4.12	165.2
9.12	169.4
16.12	172.2
25.12	175.9
36.12	176.9
49.12	178.3
64.12	179.0
81.12	179.2
100.13	180.5
121.13	181.8
144.13	182.2
180.13	182.7
300.13	185.2
520.13	186.4
700.13	187.6
720.30	187.8

Tested By TM *Date* 2/4/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

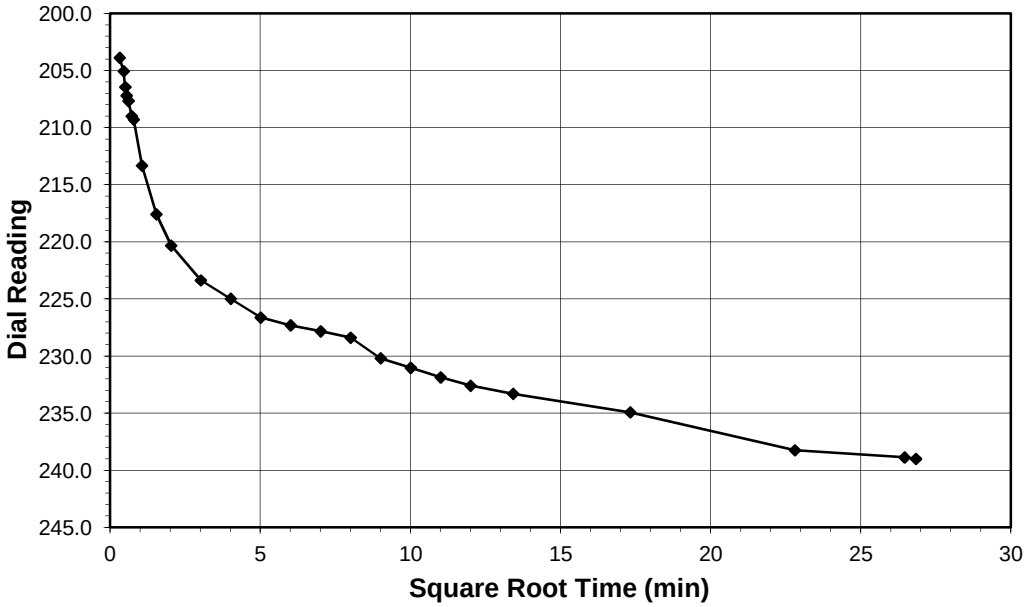
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

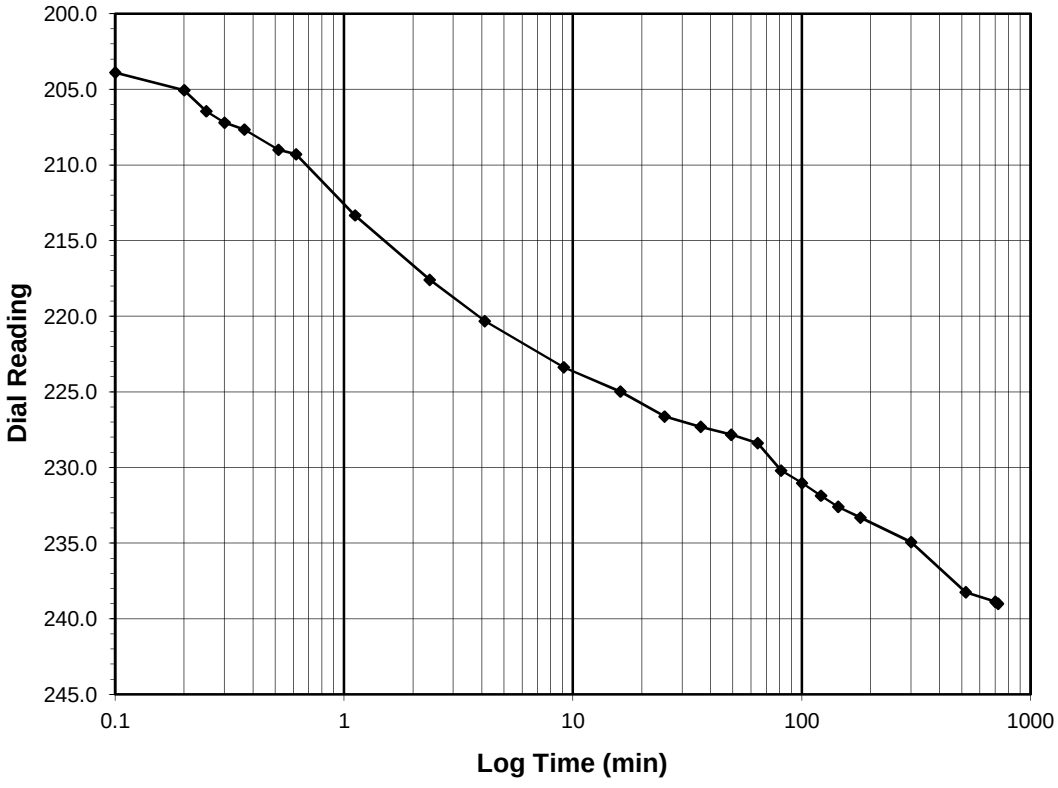
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.5 - 0.8**
Final Reading	**(div)**	**239.0**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/4/17
Start Time		22:53:35

Elapsed Time (min)	Dial Reading (div)
Initial	**187.8**
0.10	203.9
0.20	205.1
0.25	206.4
0.30	207.2
0.37	207.7
0.52	209.0
0.62	209.3
1.12	213.3
2.37	217.6
4.12	220.3
9.12	223.4
16.12	225.0
25.12	226.6
36.12	227.3
49.12	227.8
64.13	228.4
81.13	230.2
100.13	231.0
121.13	231.9
144.13	232.6
180.13	233.3
300.13	234.9
520.13	238.2
700.13	238.9
720.22	239.0

Tested By TM *Date* 2/4/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

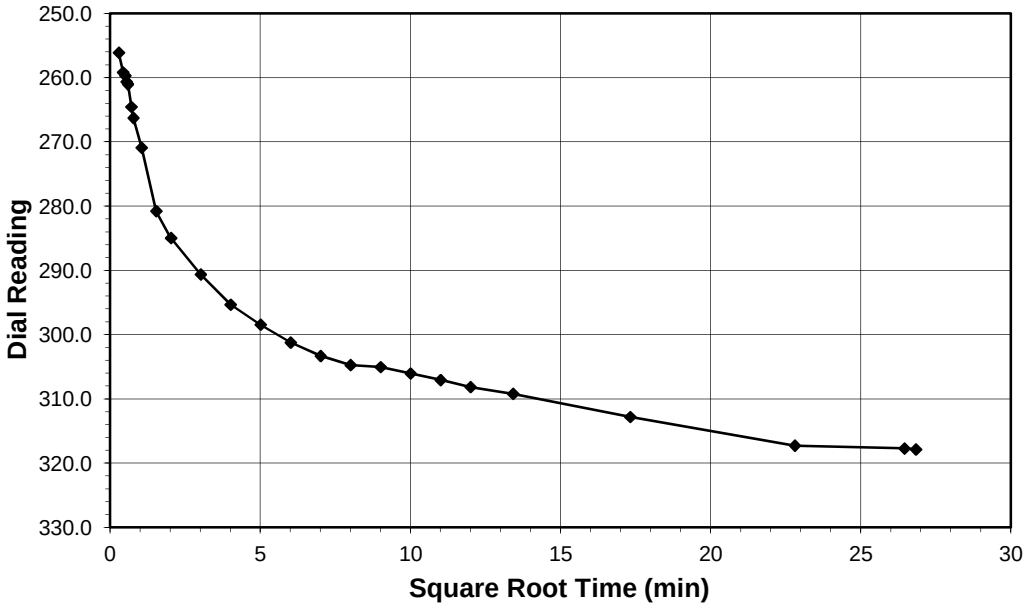
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

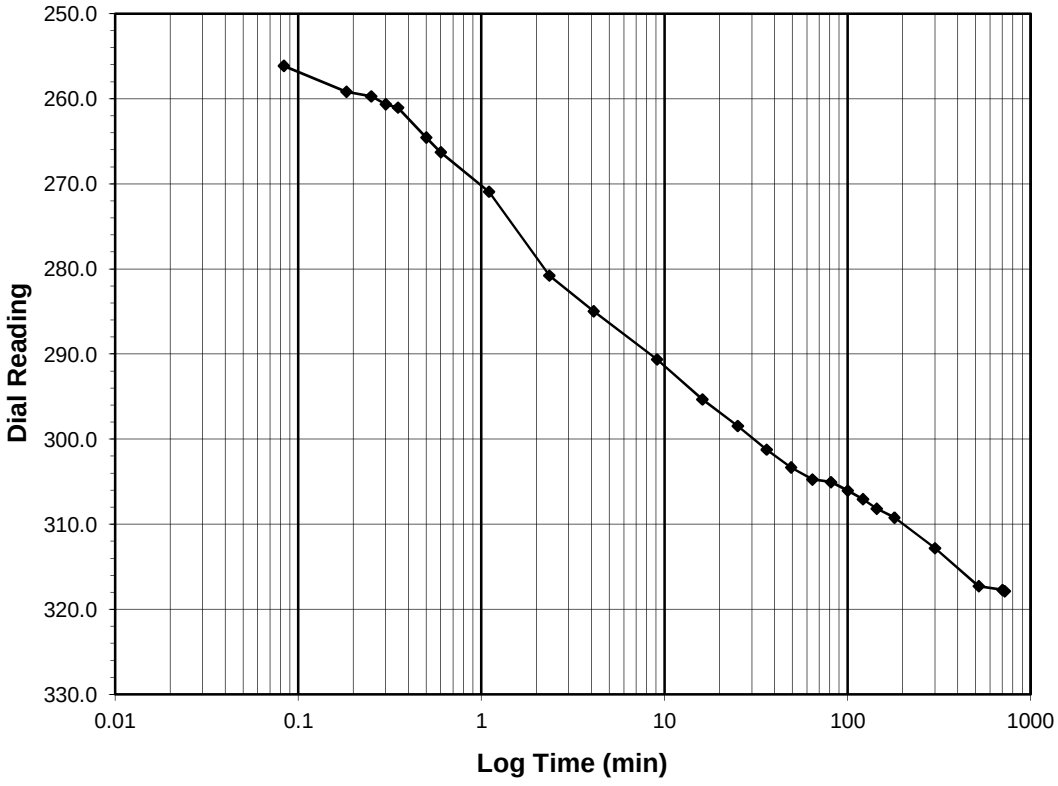
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.8 - 1.275**
Final Reading	**(div)**	**317.9**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		10:53:48

Elapsed Time (min)	Dial Reading (div)
Initial	**239.0**
0.08	256.1
0.18	259.2
0.25	259.7
0.30	260.6
0.35	261.0
0.50	264.5
0.60	266.3
1.10	270.9
2.35	280.8
4.10	285.0
9.10	290.6
16.10	295.3
25.10	298.5
36.12	301.2
49.12	303.3
64.12	304.7
81.12	305.0
100.12	306.0
121.12	307.1
144.12	308.2
180.12	309.2
300.12	312.8
520.12	317.3
700.12	317.7
720.25	317.9

Tested By *TM* *Date* *2/5/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

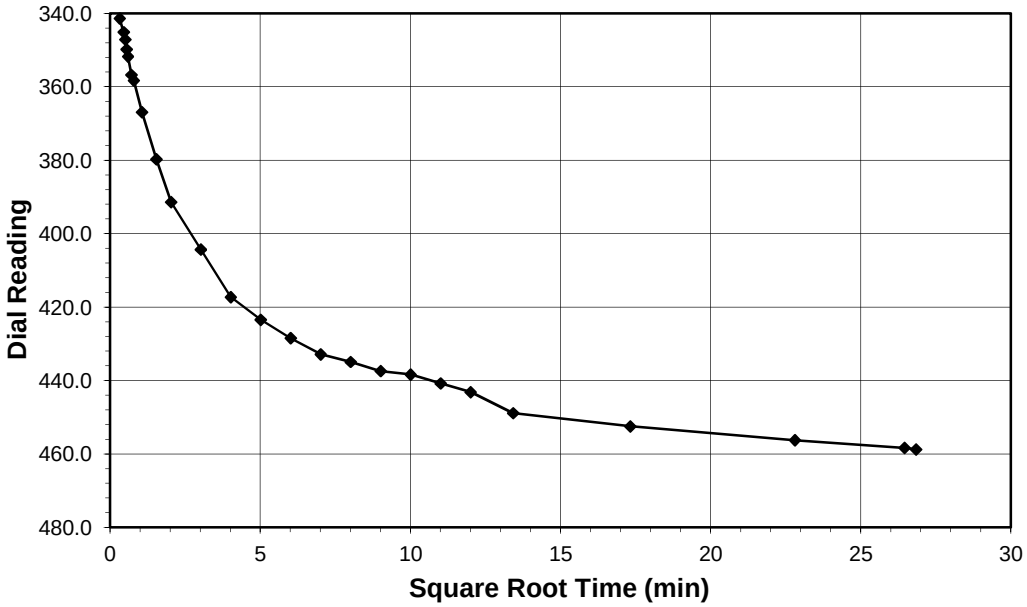
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

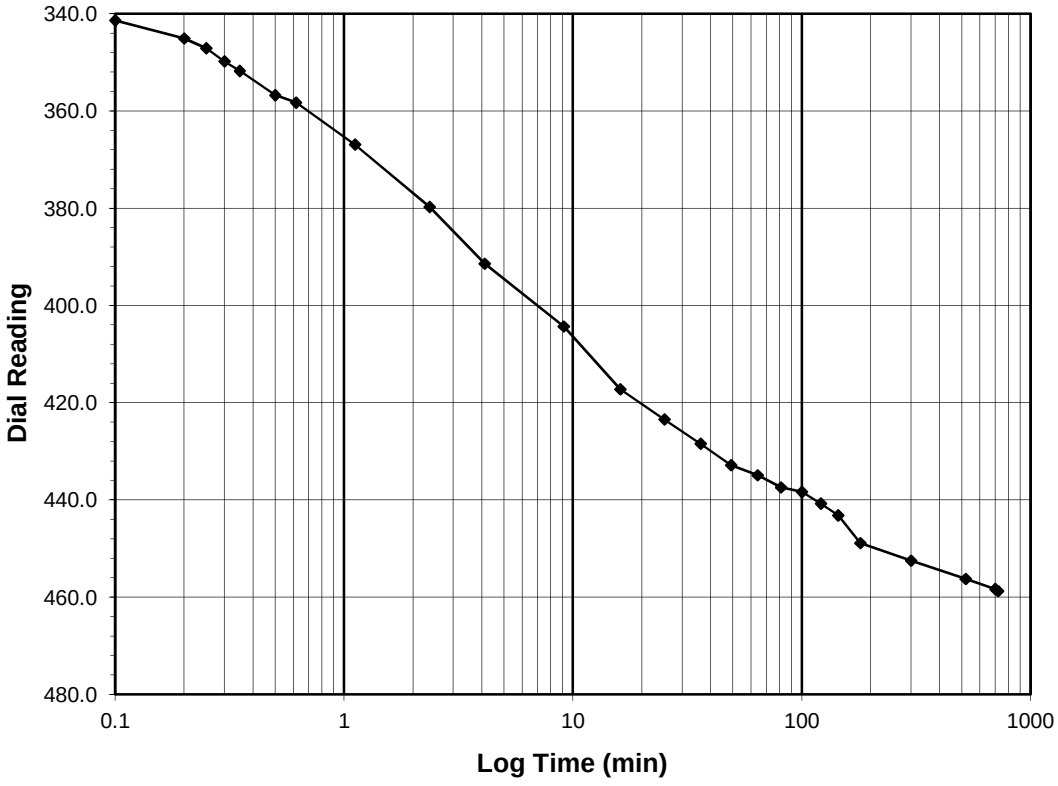
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**1.275 - 2**
Final Reading	**(div)**	**458.7**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/5/17
Start Time		22:54:04

Elapsed Time (min)	Dial Reading (div)
Initial	**317.9**
0.10	341.4
0.20	345.1
0.25	347.1
0.30	349.8
0.35	351.8
0.50	356.7
0.62	358.3
1.12	366.9
2.37	379.7
4.12	391.4
9.12	404.3
16.12	417.3
25.12	423.4
36.12	428.4
49.12	432.9
64.12	434.9
81.12	437.4
100.12	438.4
121.12	440.8
144.12	443.2
180.12	448.9
300.12	452.5
520.12	456.2
700.12	458.3
720.32	458.7

Tested By *TM* *Date* *2/5/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

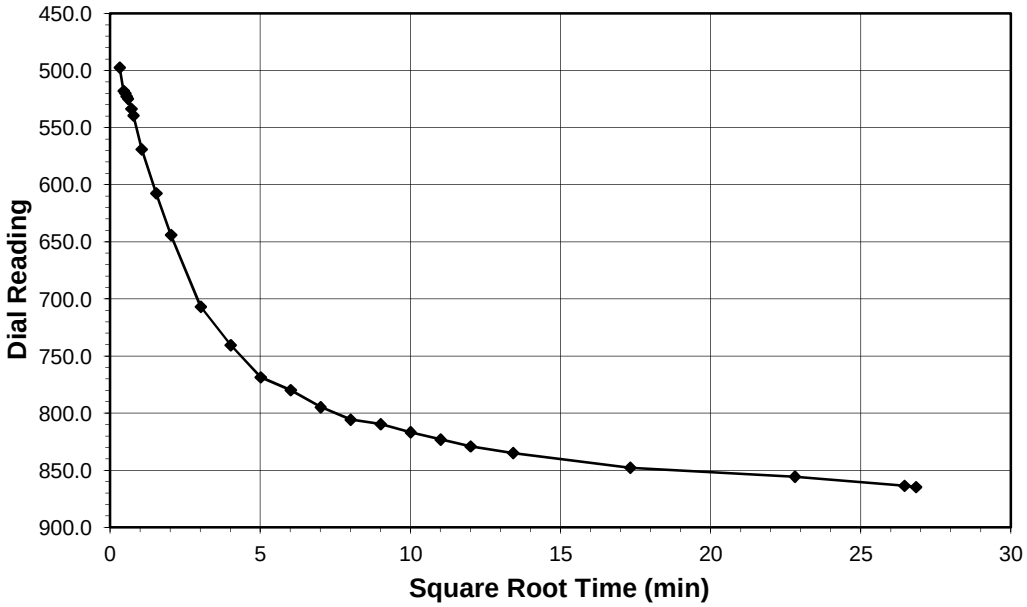
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

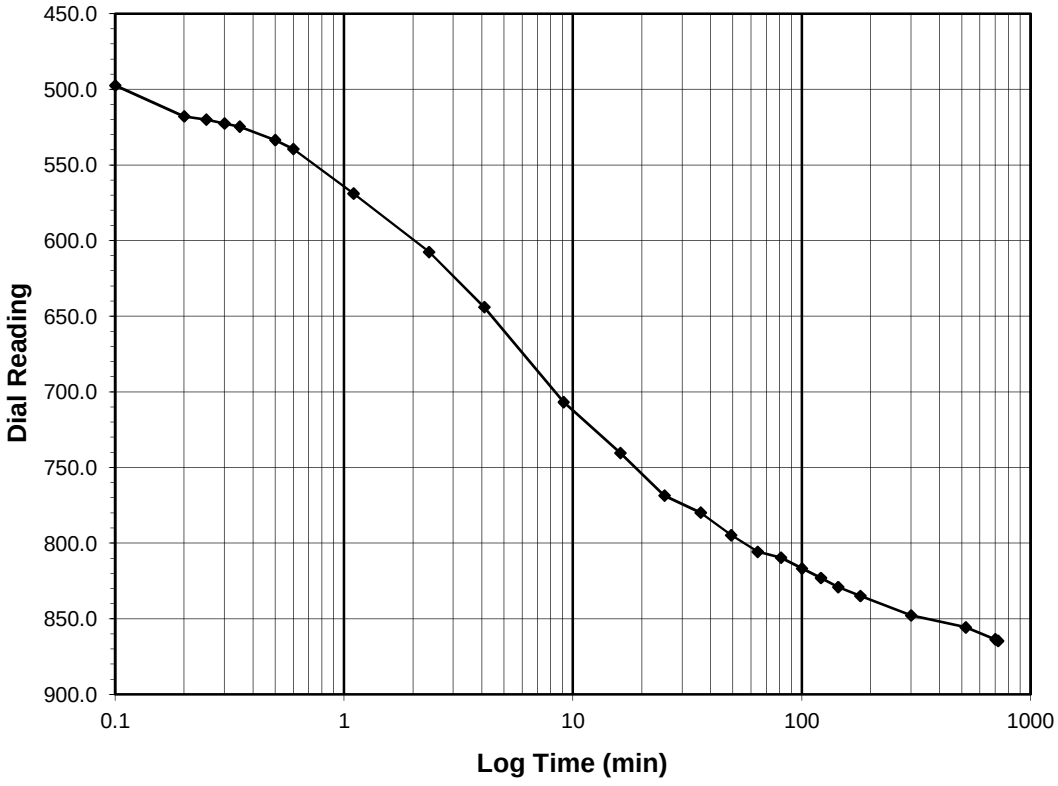
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 4**
Final Reading	**(div)**	**864.7**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		10:54:23

Elapsed Time (min)	Dial Reading (div)
Initial	**458.7**
0.10	497.4
0.20	517.9
0.25	520.0
0.30	522.5
0.35	524.6
0.50	533.5
0.60	539.4
1.10	568.9
2.35	607.5
4.10	644.0
9.10	706.7
16.10	740.4
25.12	768.6
36.12	779.8
49.12	794.8
64.12	805.7
81.12	809.6
100.12	816.7
121.12	823.0
144.12	829.1
180.12	834.9
300.12	847.8
520.12	855.7
700.12	863.6
720.35	864.7

Tested By *TM* *Date* *2/6/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

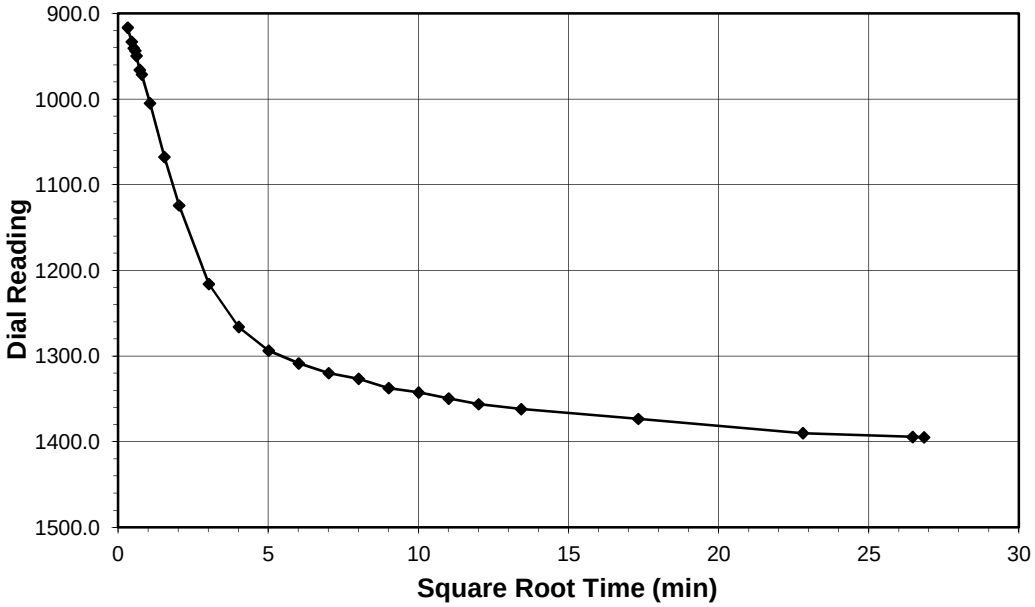
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

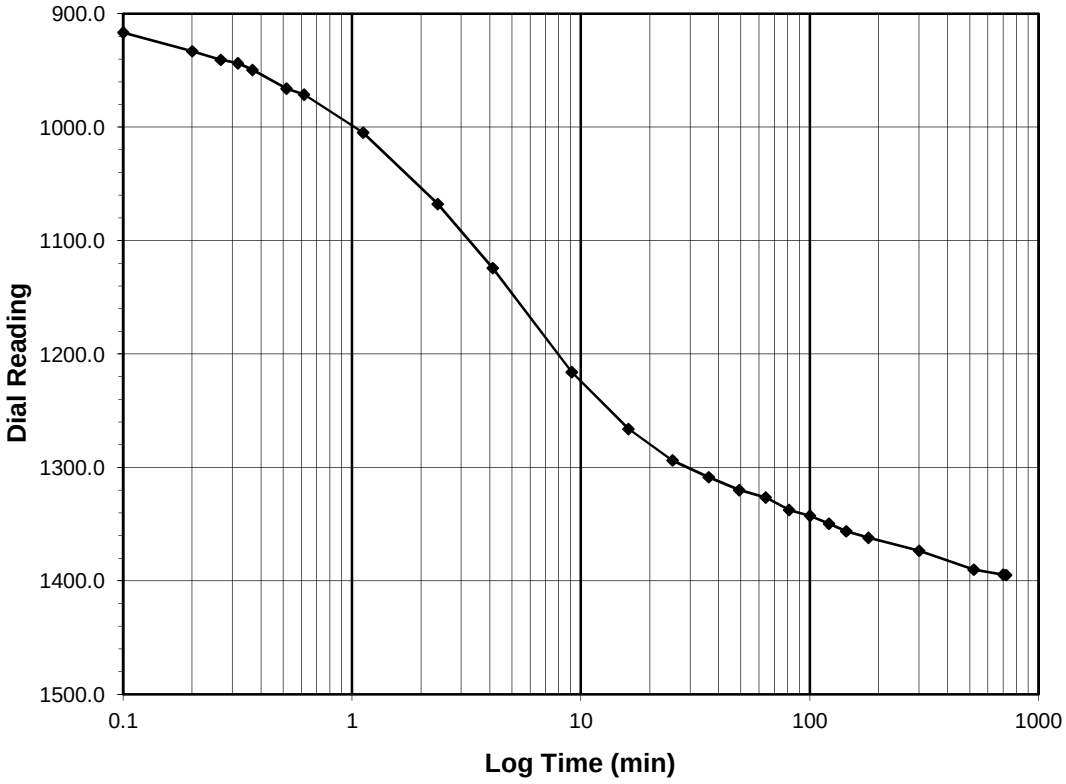
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**4 - 8**
Final Reading	**(div)**	**1394.8**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/6/17
Start Time		22:54:44

Elapsed Time (min)	Dial Reading (div)
Initial	**864.7**
0.10	916.5
0.20	933.0
0.27	940.6
0.32	943.6
0.37	949.5
0.52	966.0
0.62	971.2
1.12	1004.7
2.37	1067.7
4.12	1124.2
9.12	1215.9
16.12	1266.0
25.12	1293.7
36.12	1308.5
49.12	1319.9
64.12	1326.5
81.12	1337.4
100.12	1342.5
121.12	1349.5
144.12	1356.1
180.12	1361.9
300.12	1373.4
520.12	1390.0
700.13	1394.4
720.32	1394.8

Tested By *TM* *Date* *2/6/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

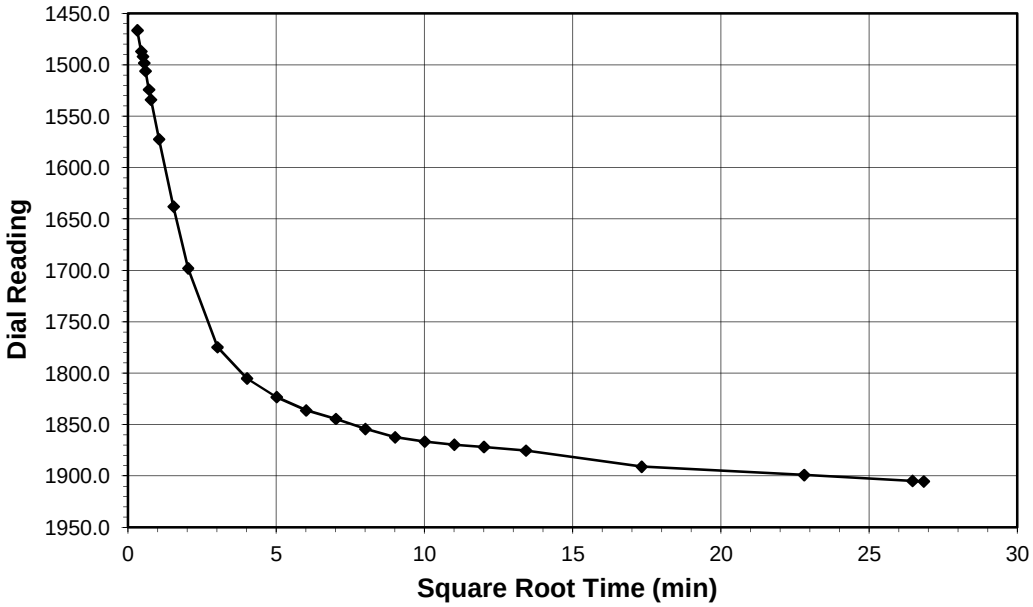
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

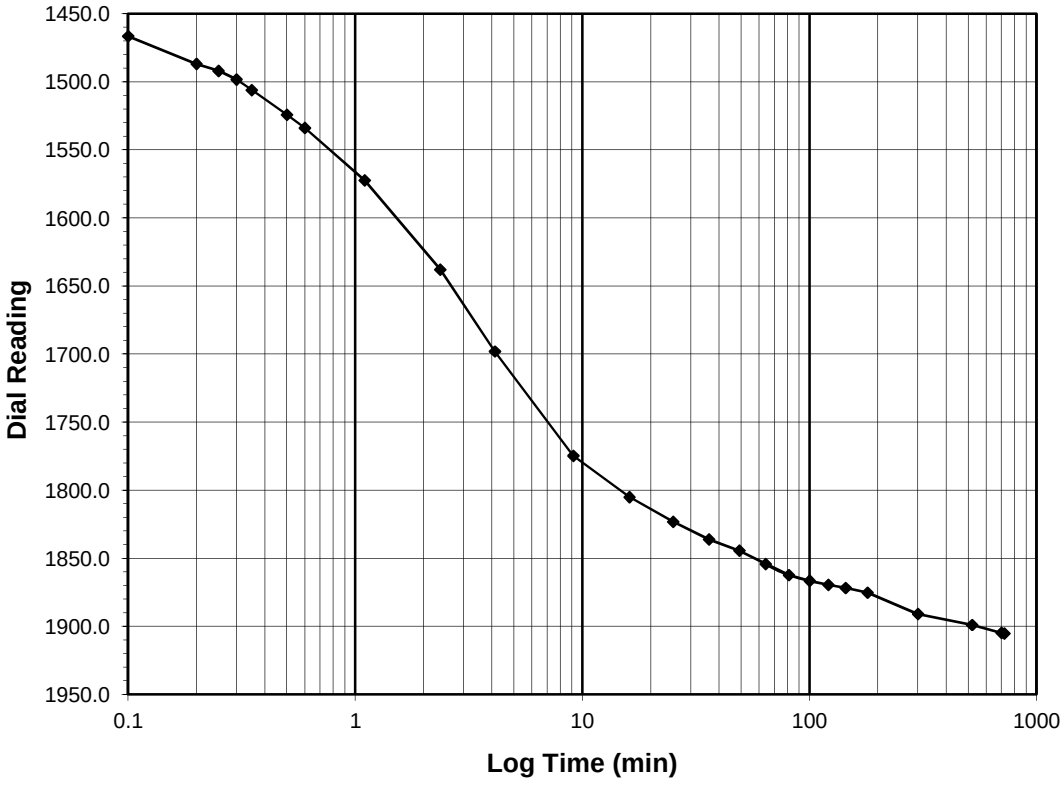
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 16**
Final Reading	**(div)**	**1905.2**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		10:55:03

Elapsed Time (min)	Dial Reading (div)
Initial	**1394.8**
0.10	1466.5
0.20	1486.8
0.25	1491.9
0.30	1498.2
0.35	1506.1
0.50	1524.1
0.60	1533.9
1.10	1572.4
2.37	1638.0
4.12	1698.0
9.12	1774.7
16.12	1805.1
25.12	1823.2
36.12	1836.2
49.12	1844.4
64.12	1854.2
81.12	1862.3
100.12	1866.5
121.12	1869.6
144.12	1871.8
180.12	1875.3
300.12	1890.9
520.12	1899.0
700.12	1904.8
720.32	1905.2

Tested By TM *Date* 2/7/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

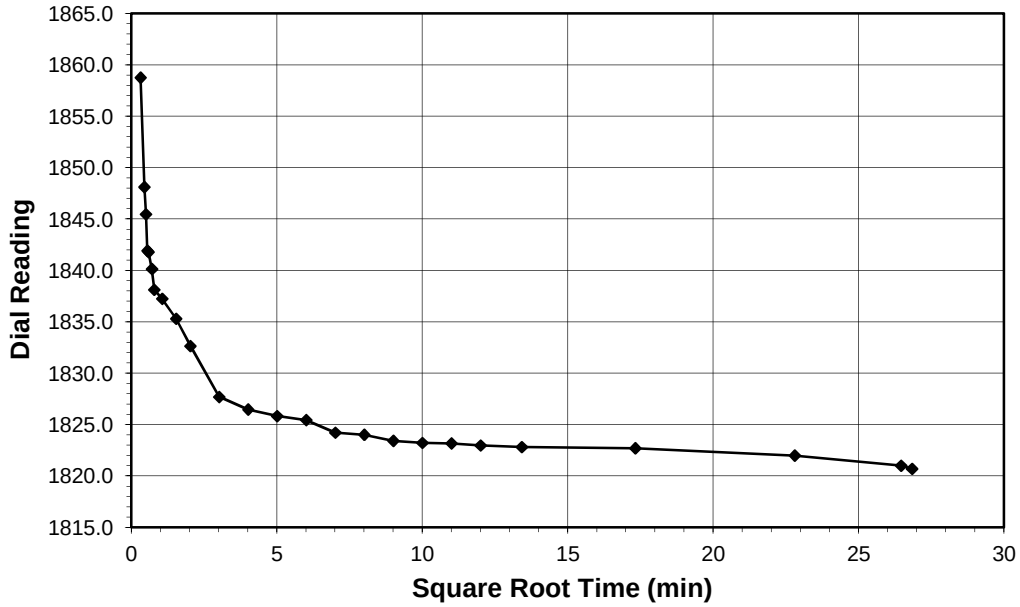
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

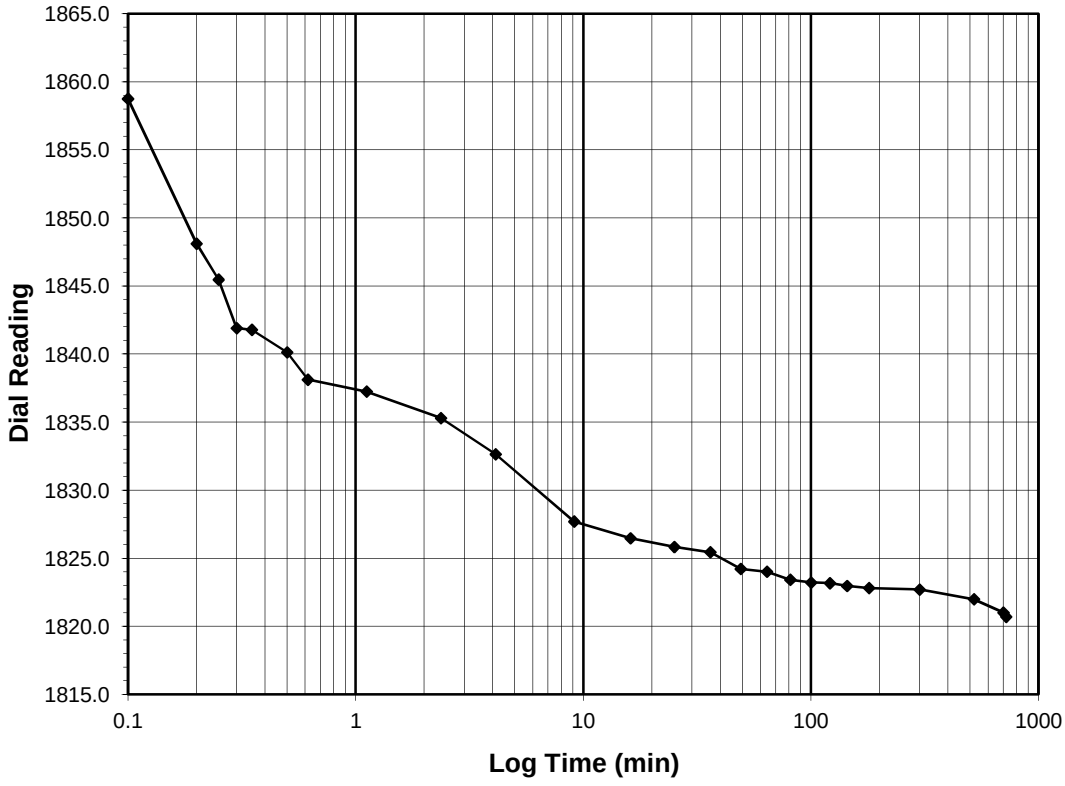
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**16 - 8**
Final Reading	**(div)**	**1820.7**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/7/17
Start Time		22:55:22

Elapsed Time (min)	Dial Reading (div)
Initial	**1905.2**
0.10	1858.7
0.20	1848.1
0.25	1845.5
0.30	1841.9
0.35	1841.8
0.50	1840.1
0.62	1838.1
1.12	1837.2
2.37	1835.3
4.12	1832.6
9.12	1827.7
16.12	1826.5
25.12	1825.8
36.12	1825.4
49.12	1824.2
64.12	1824.0
81.12	1823.4
100.12	1823.2
121.12	1823.2
144.12	1823.0
180.13	1822.8
300.13	1822.7
520.13	1822.0
700.13	1821.0
720.37	1820.7

Tested By TM *Date* 2/7/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2

GeoJac-16tsf.xlt

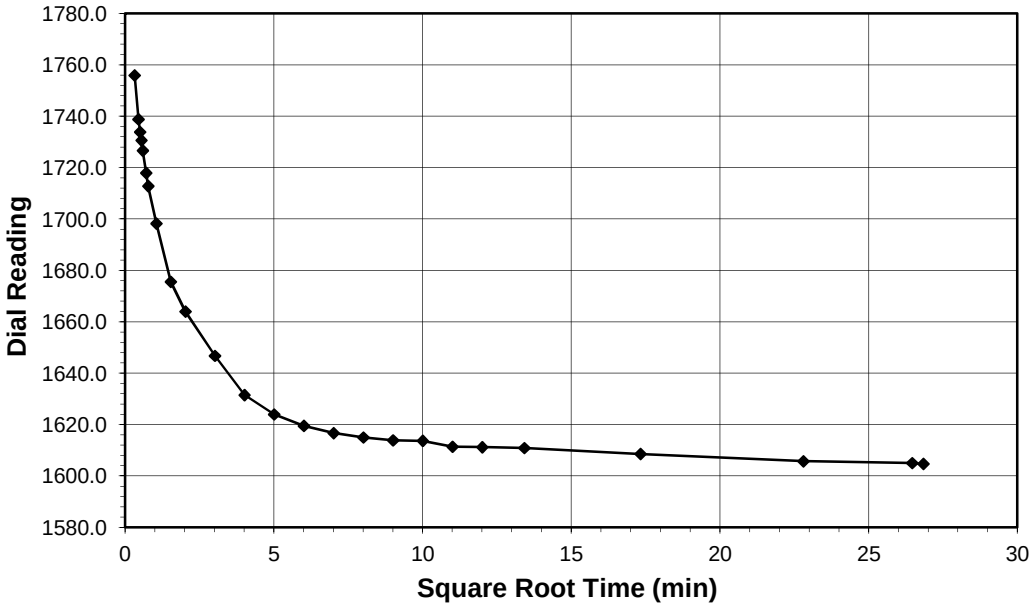
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

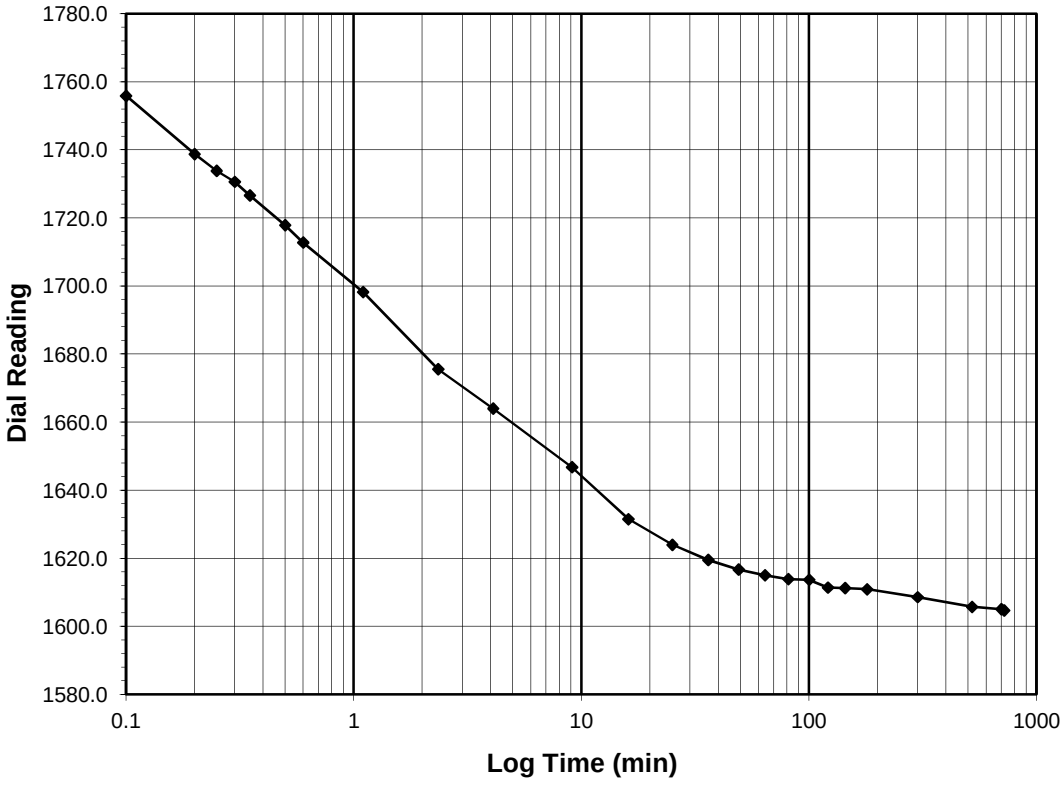
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**8 - 2**
Final Reading	**(div)**	**1604.7**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		10:55:45

Elapsed Time (min)	Dial Reading (div)
Initial	**1820.7**
0.10	1755.9
0.20	1738.8
0.25	1733.8
0.30	1730.6
0.35	1726.6
0.50	1717.9
0.60	1712.8
1.10	1698.2
2.35	1675.6
4.10	1664.0
9.10	1646.8
16.10	1631.5
25.10	1624.0
36.10	1619.5
49.10	1616.7
64.10	1615.0
81.10	1613.9
100.12	1613.7
121.12	1611.4
144.12	1611.2
180.12	1610.9
300.12	1608.6
520.12	1605.7
700.12	1605.0
720.25	1604.7

Tested By *TM* *Date* *2/8/17* *Checked By* *DB* *Date* *2/10/17*

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

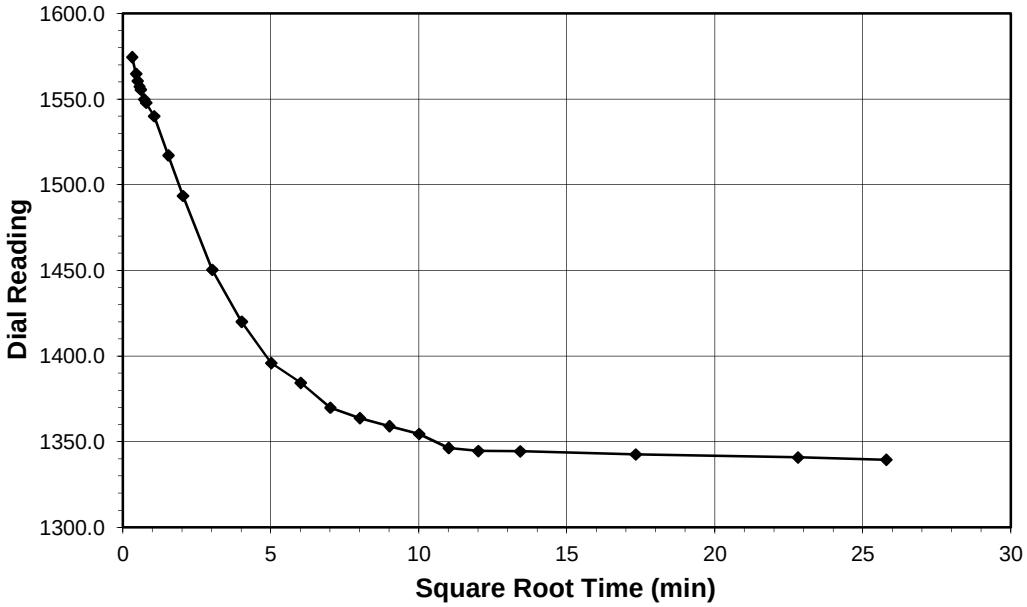
544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net

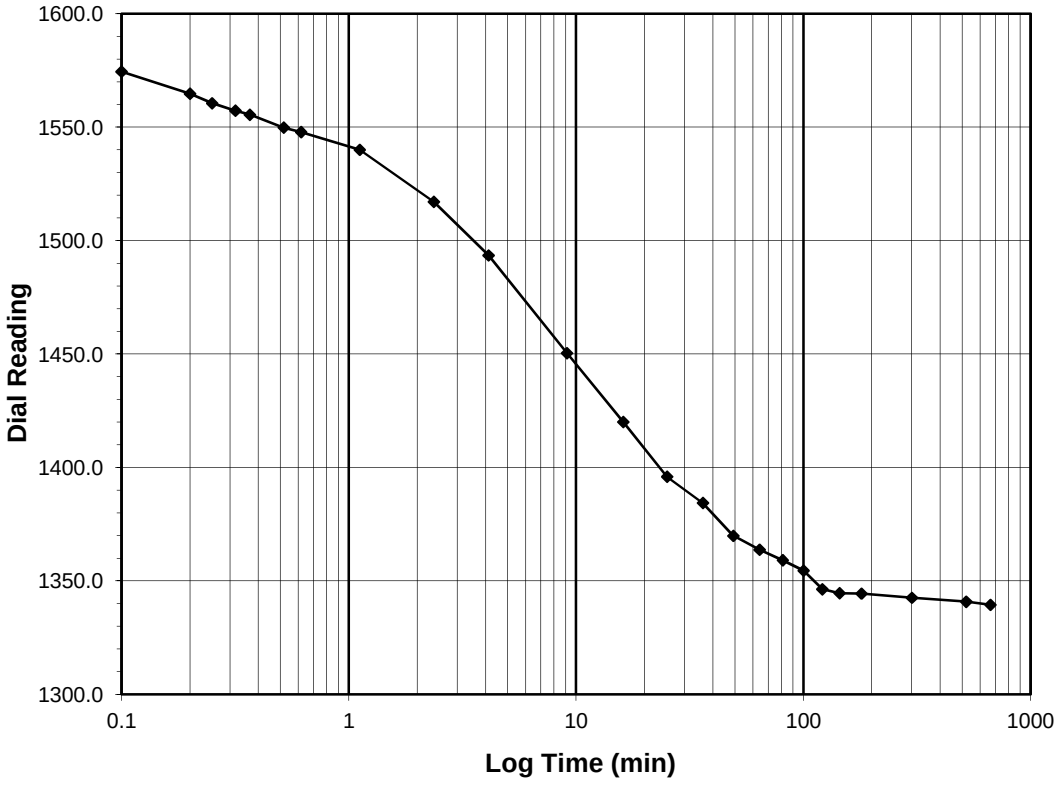
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client:	AMEC FOSTER WHEELER	Boring No.:	SB-OU2-108
Client Project:	ELK STREET COMMERCE PARK	Depth (ft):	26.7-26.9
Project No.:	2017-061-001	Sample No.:	U-2
Lab ID:	2017-061-001-020	Visual Description:	BROWN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**2 - 0.5**
Final Reading	**(div)**	**1339.5**
Consolidometer No.		**G1424**
1 Division	(in)	0.0001
Start Date		2/8/17
Start Time		22:56:00

Elapsed Time (min)	Dial Reading (div)
Initial	**1604.7**
0.10	1574.5
0.20	1564.8
0.25	1560.6
0.32	1557.3
0.37	1555.5
0.52	1549.9
0.62	1547.9
1.12	1540.0
2.37	1517.1
4.12	1493.5
9.12	1450.4
16.12	1420.1
25.12	1395.9
36.12	1384.4
49.12	1369.9
64.12	1363.8
81.13	1359.1
100.13	1354.6
121.13	1346.4
144.13	1344.6
180.13	1344.4
300.13	1342.6
520.13	1340.9
665.05	1339.5

Tested By TM *Date* 2/8/17 *Checked By* DB *Date* 2/10/17

DCN: CT-24E Date: 8/15/12 Revision: 2 GeoJac-16tsf.xlt

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999 • www.geotechnics.net