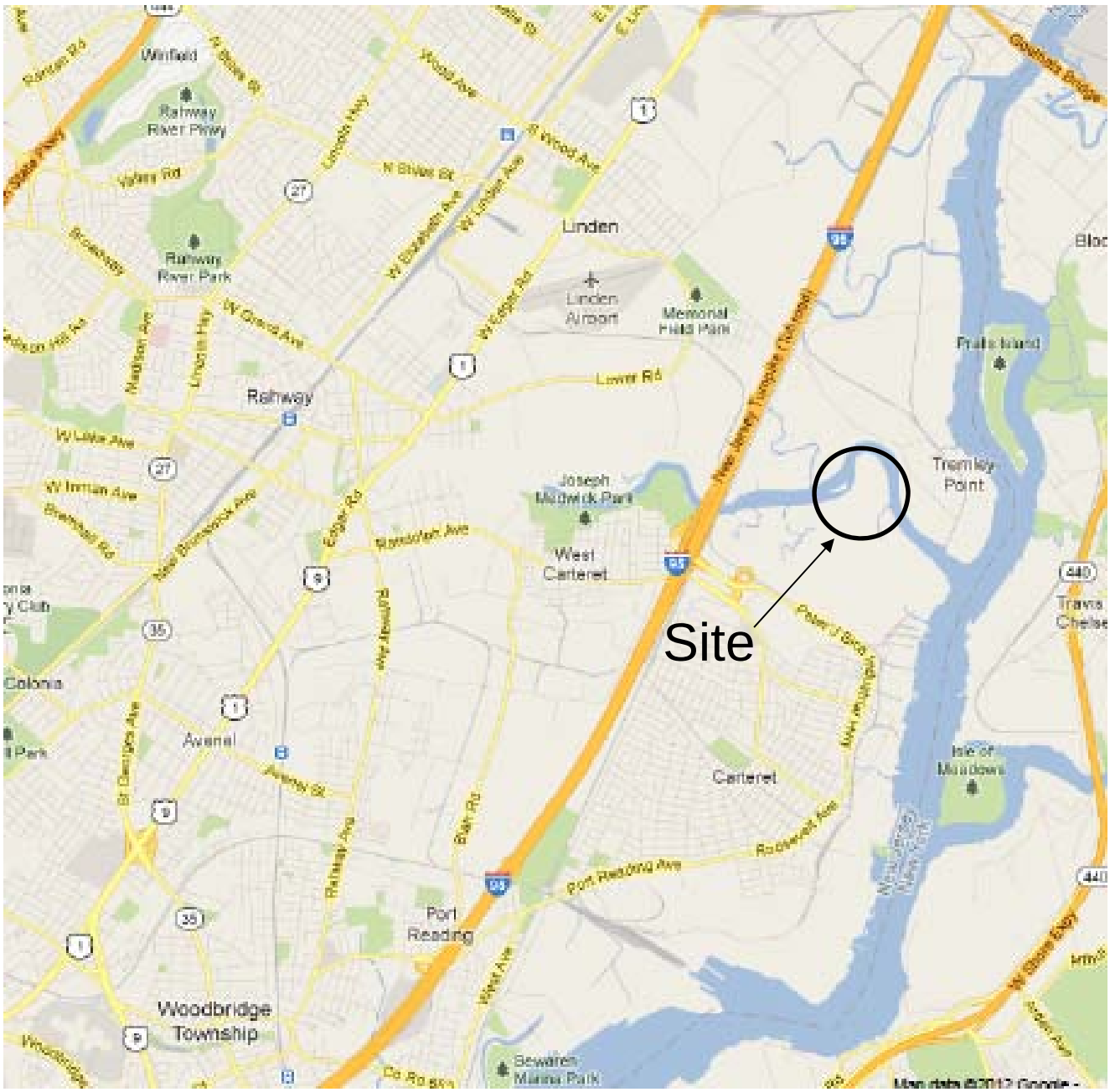
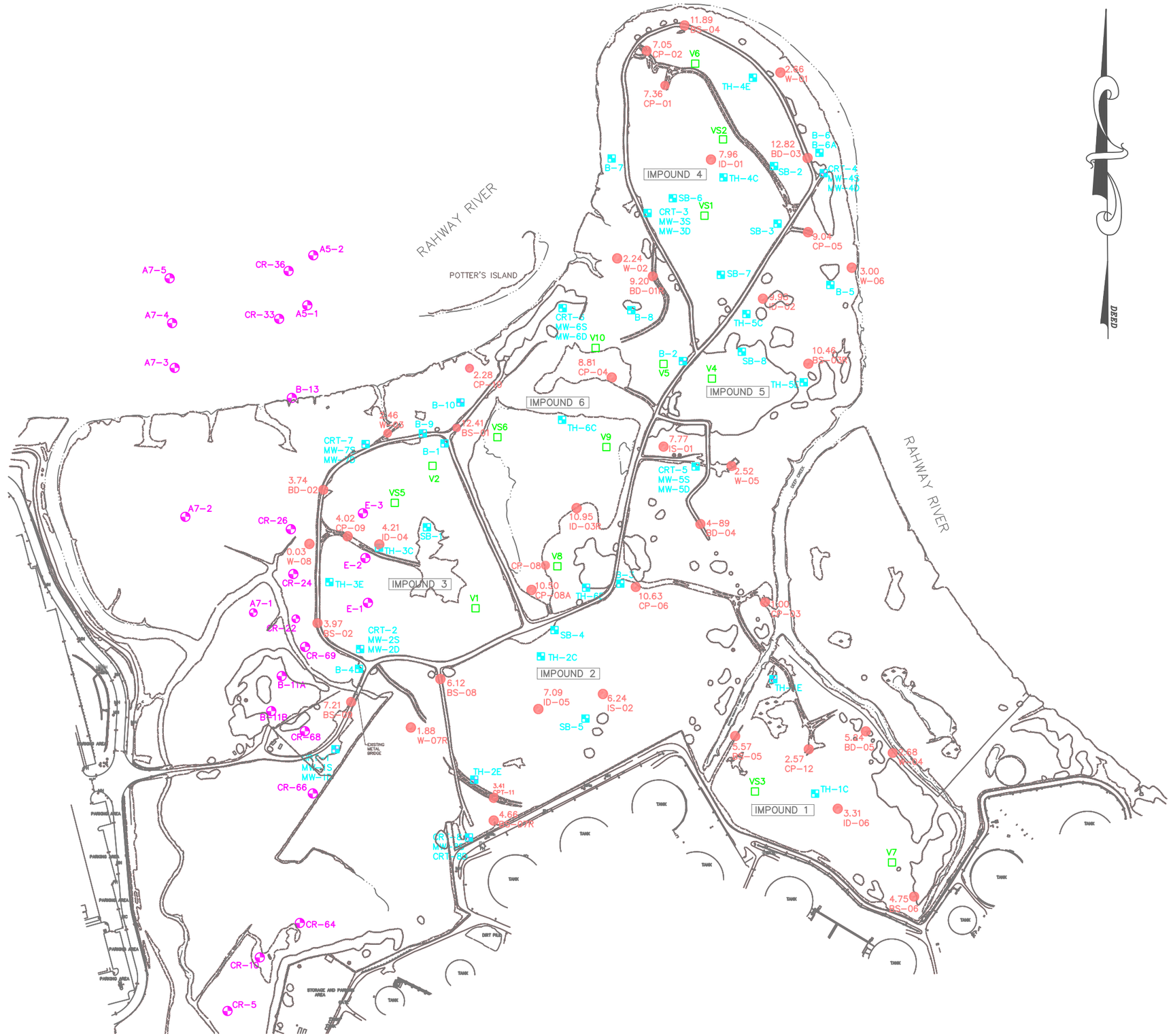
APPENDIX A



Baker	Project Title **Rahway Property**	Project No. **128911**
	Sheet Title **Site Vicinity Map**	Drawing Sheet No. **A-1**
	Scale: NTS / Date: October 2012	



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LEGEND

A5-2	NJTA Borings
B-2	Historical Borings
3.00 W-06	2012 Borings
V5	Historical Vane Shear Test Borings

Figure A-2
BORING LOCATION PLAN

Graphical Scale

400 200 0 400

1 inch = 400 feet

Baker
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Phone: (410) 689-3400

DATE	REVISIONS

RAHWAY ARCH SITE
GEOTECHNICAL AND REMEDIAL INVESTIGATION
BORING LOCATION PLAN

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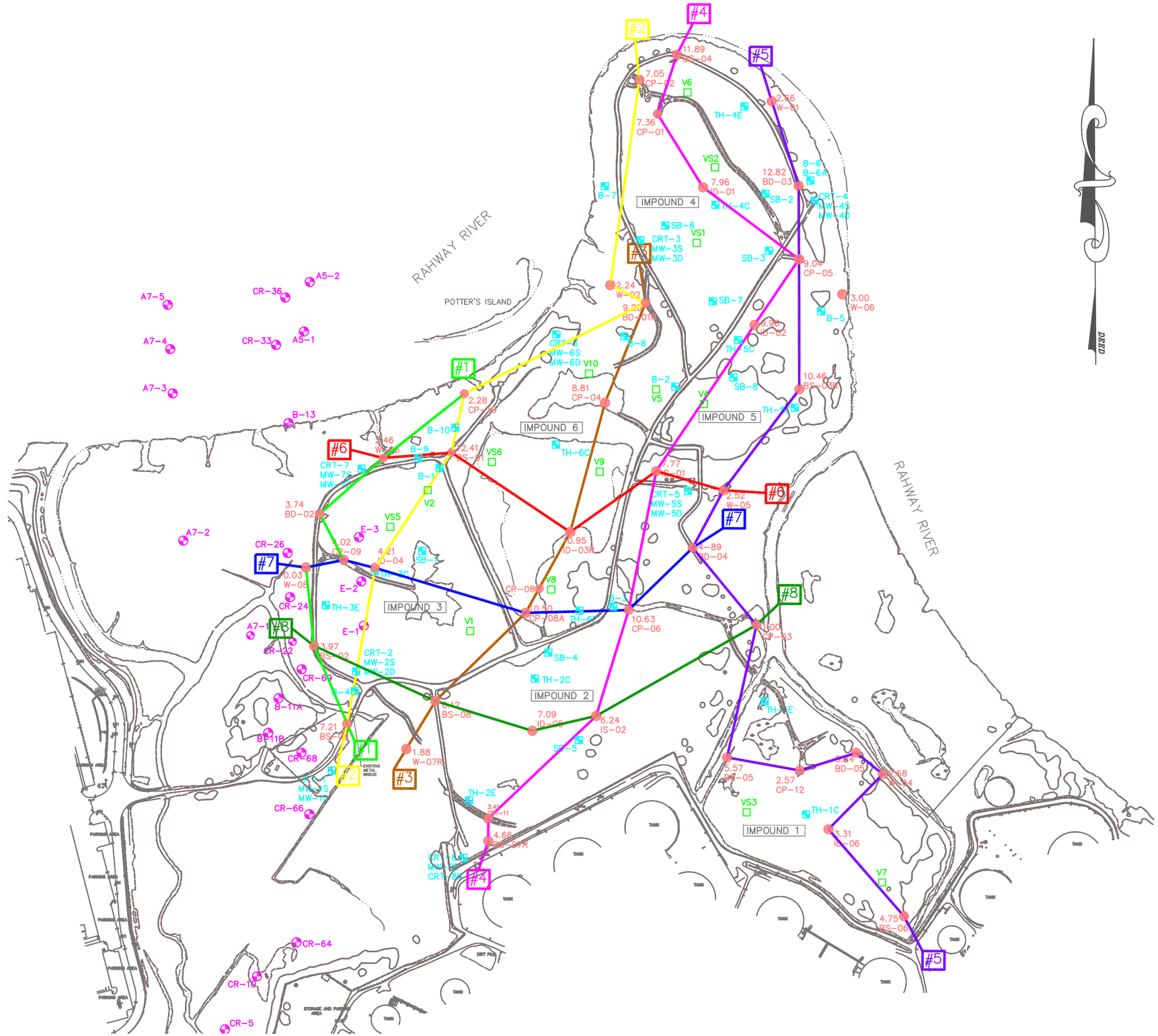
File Name: Boring Location Plan.dwg

Drawn by: DM
Checked by: TM
Sheet ID:
Sheet OF XXX



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LEGEND

A5-2	NJTA Borings
B-2	Historical Borings
3.00 W-06	2012 Borings
V5	Historical Vane Shear Test Borings

Figure A-3
SOIL PROFILE PLAN

Graphical Scale

400 200 0 400

1 inch = 400 feet

Baker
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DATE	REVISIONS

RAHWAY ARCH SITE
GEOTECHNICAL AND REMEDIAL INVESTIGATION
SOIL PROFILE PLAN

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File Name: Boring Plan with Cross Sections.dwg

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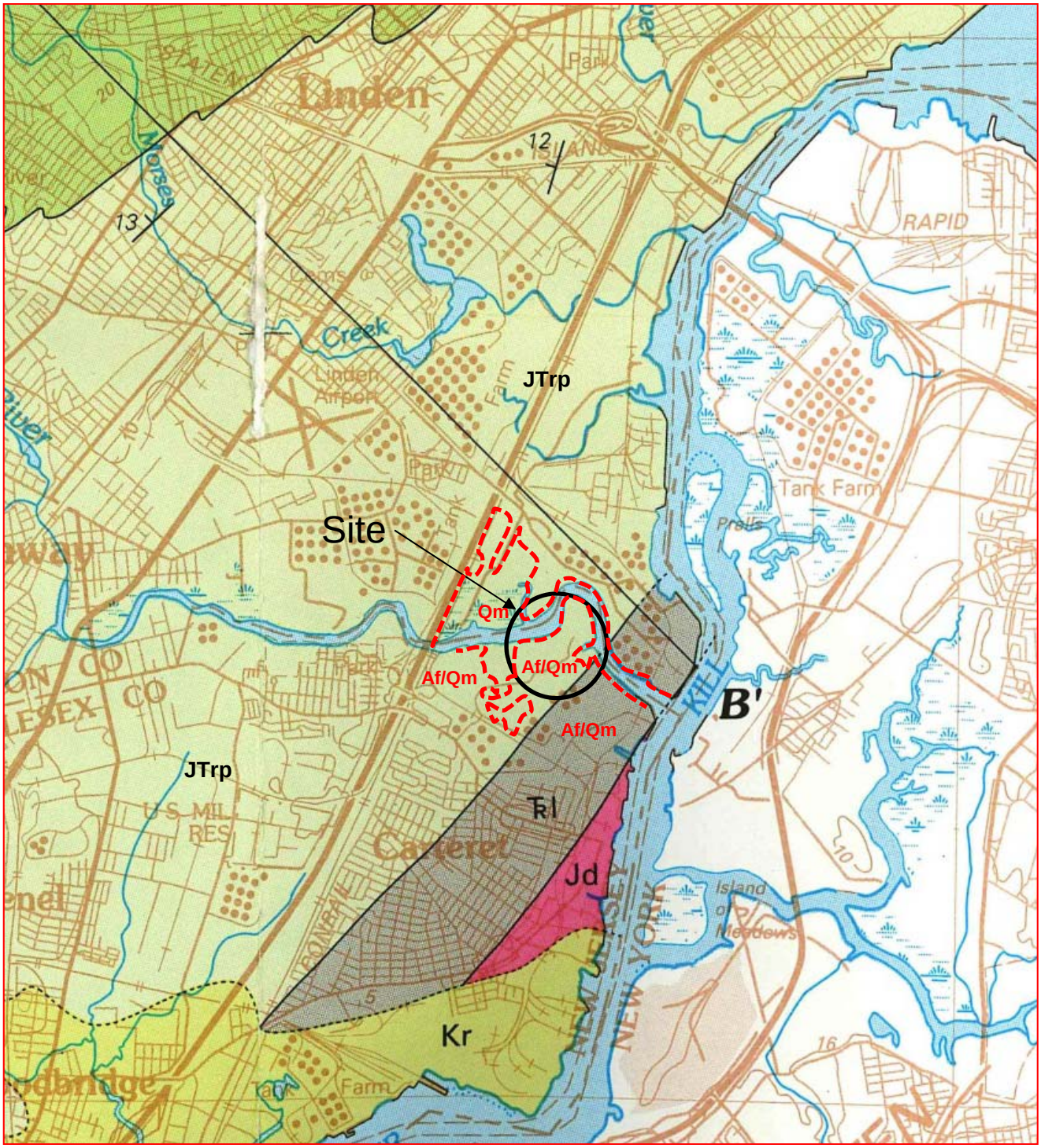
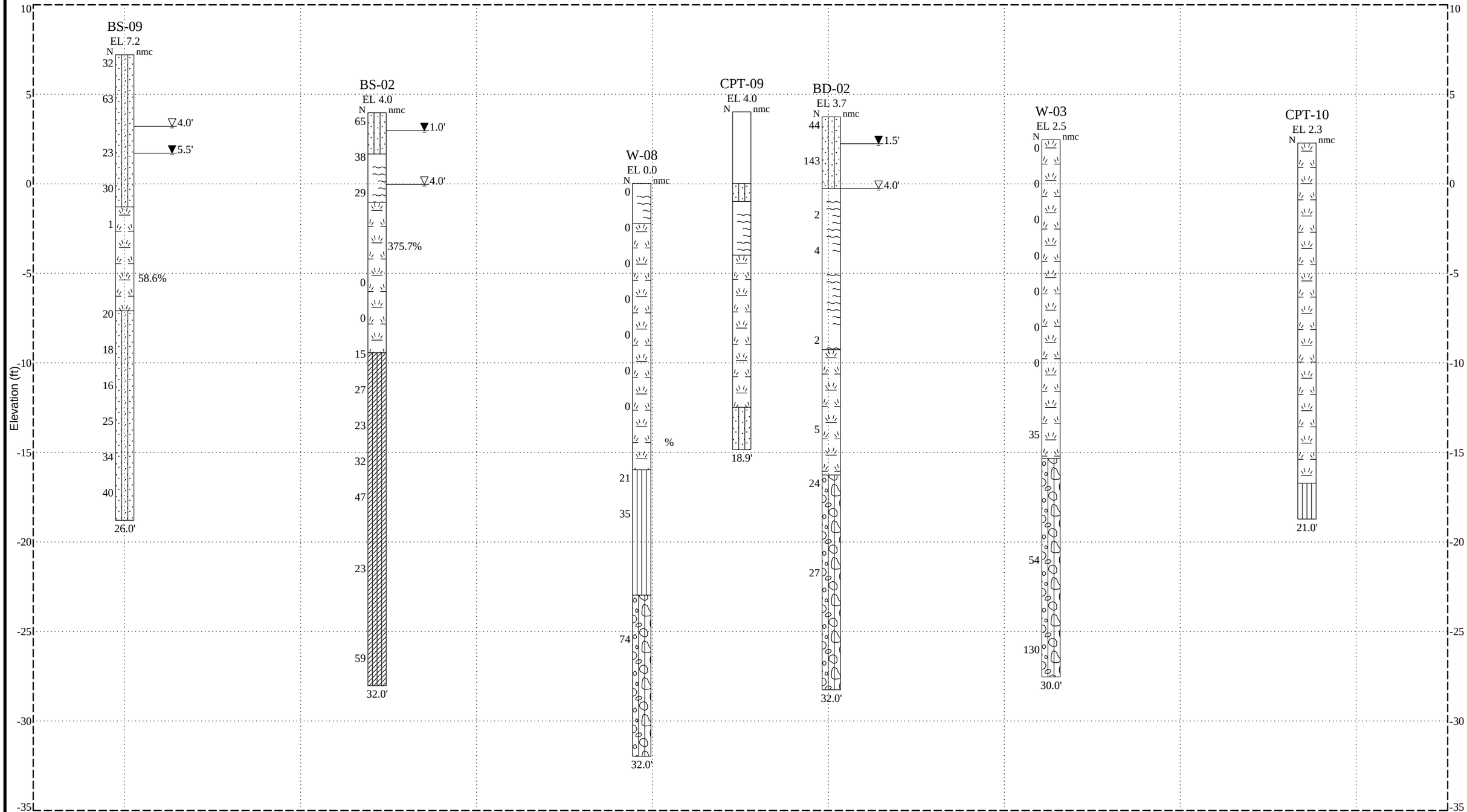


Surficial geology in red (ref.: Stanford, 1999. "Surficial Geology of the Perth Amboy and Arthur Kill Quadrangles, MiddleSex and Union Counties, New Jersey." NJ Open File Map 28, scale 1:24,000.)
Bedrock Geology in black (ref.: Drake etal., 1996. "Bedrock Geologic Map of Northern New Jersey." United states Geological Survey Miscellaneous Investigation Series Map I-2450-A, scale 1:100,000.)

Baker	Project Title **Rahway Property**	Project No. **128911**
	Sheet Title **Site Geology Map**	Drawing Sheet No. **A-4**
	Scale: NTS / Date: October 2012	

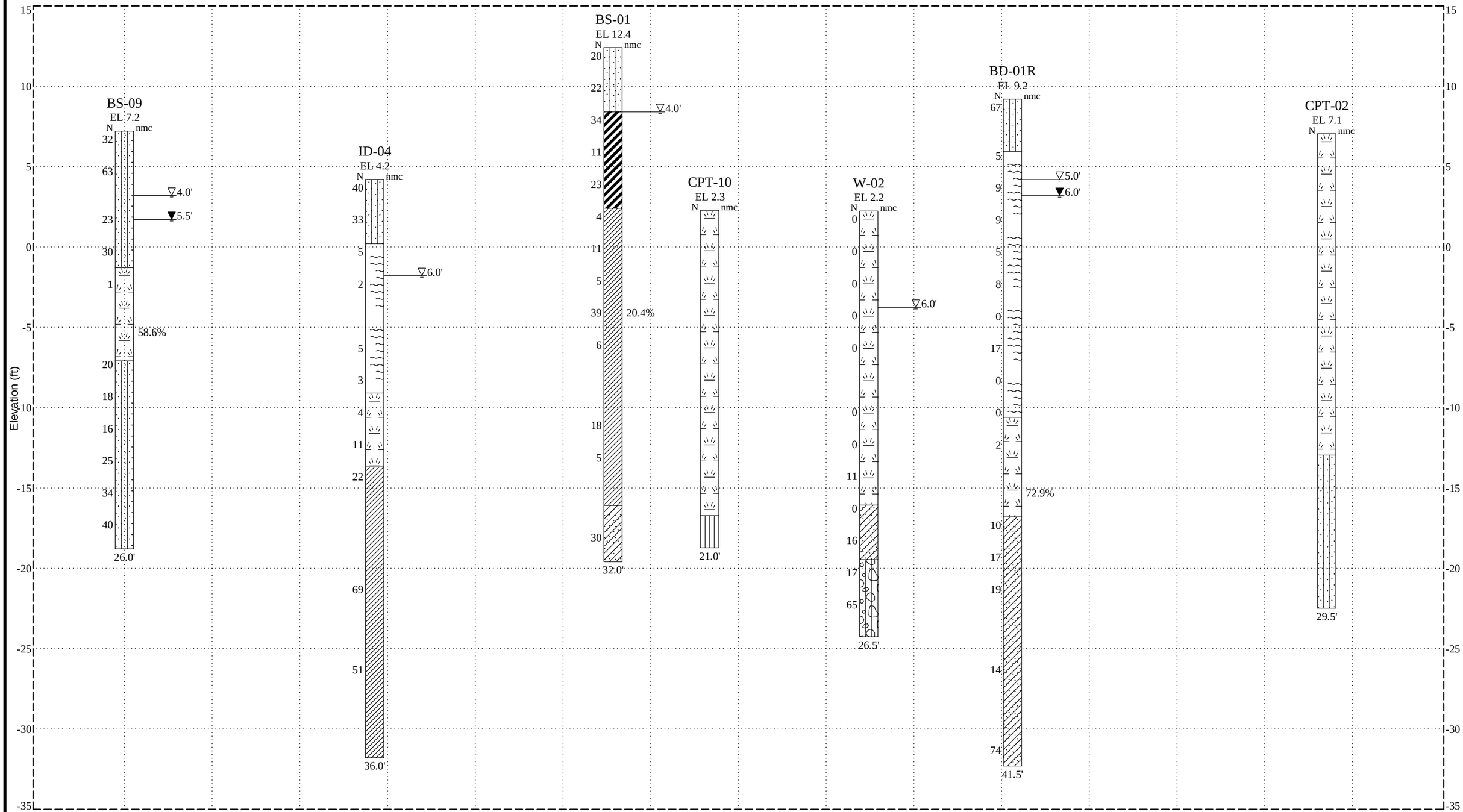


LITHOLOGY GRAPHICS

Silty Sand | Sludge | Peat | Silty Gravel | Low Plasticity Silty Clay | Silt

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #1
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12



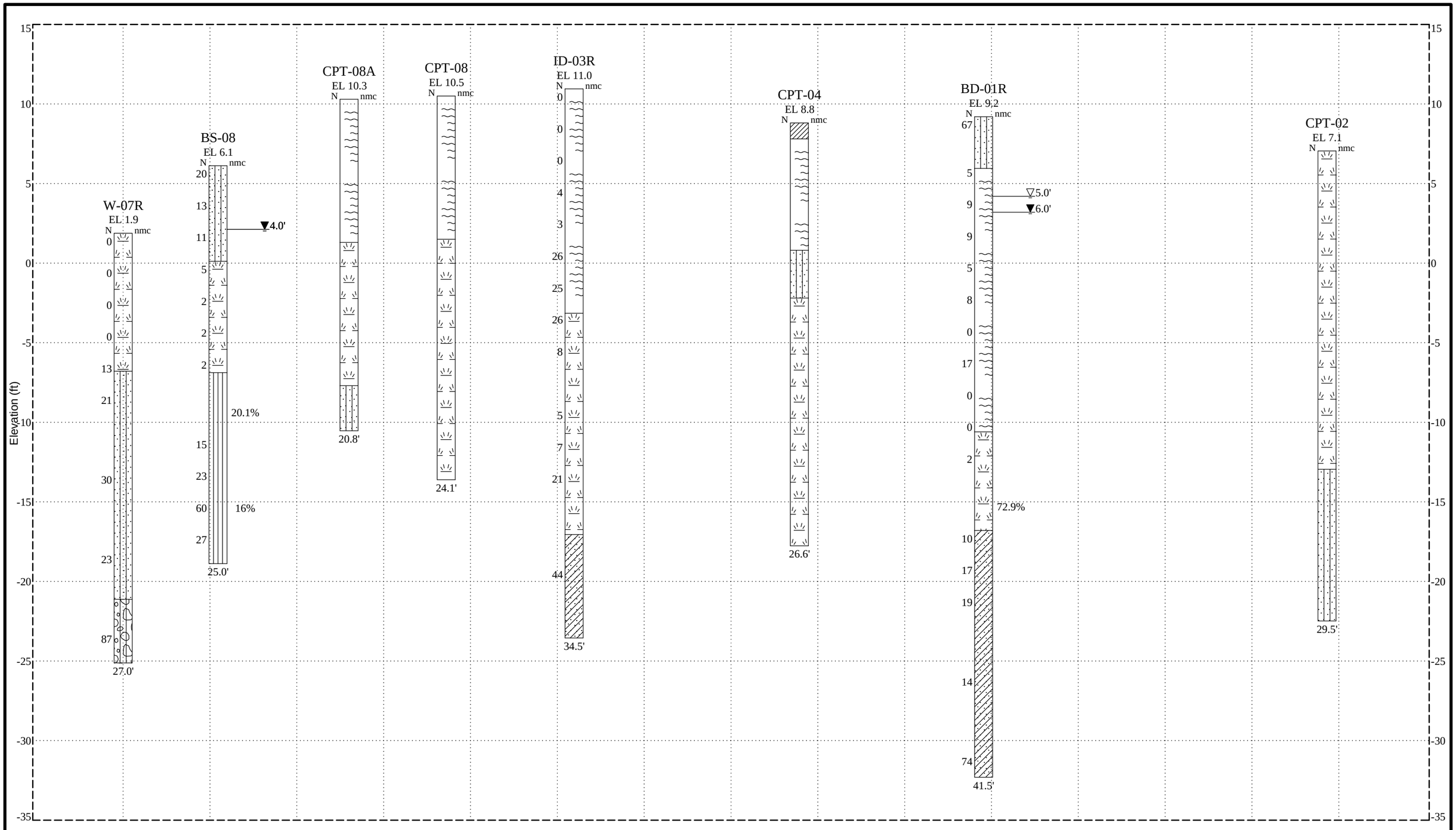
LITHOLOGY GRAPHICS

Silty Sand | Sludge | Peat | Clayey Sand | High Plasticity Clay | Low Plasticity Clay

Silt | Silty Gravel

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #2
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12

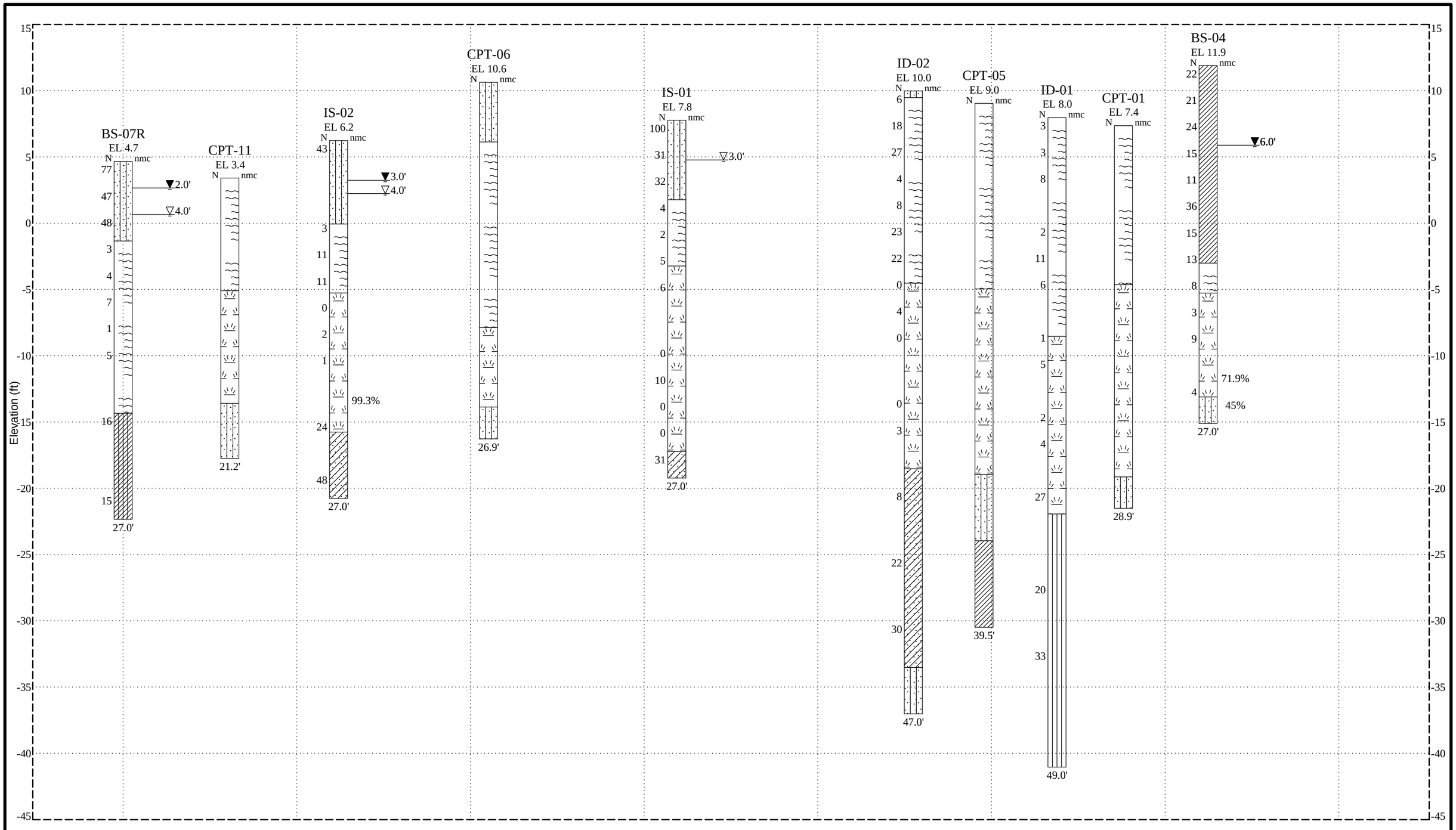


LITHOLOGY GRAPHICS

- Silty Sand
- Sludge
- Peat
- Clayey Sand
- Silt
- Low Plasticity Clay
- Silty Gravel

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #3
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12

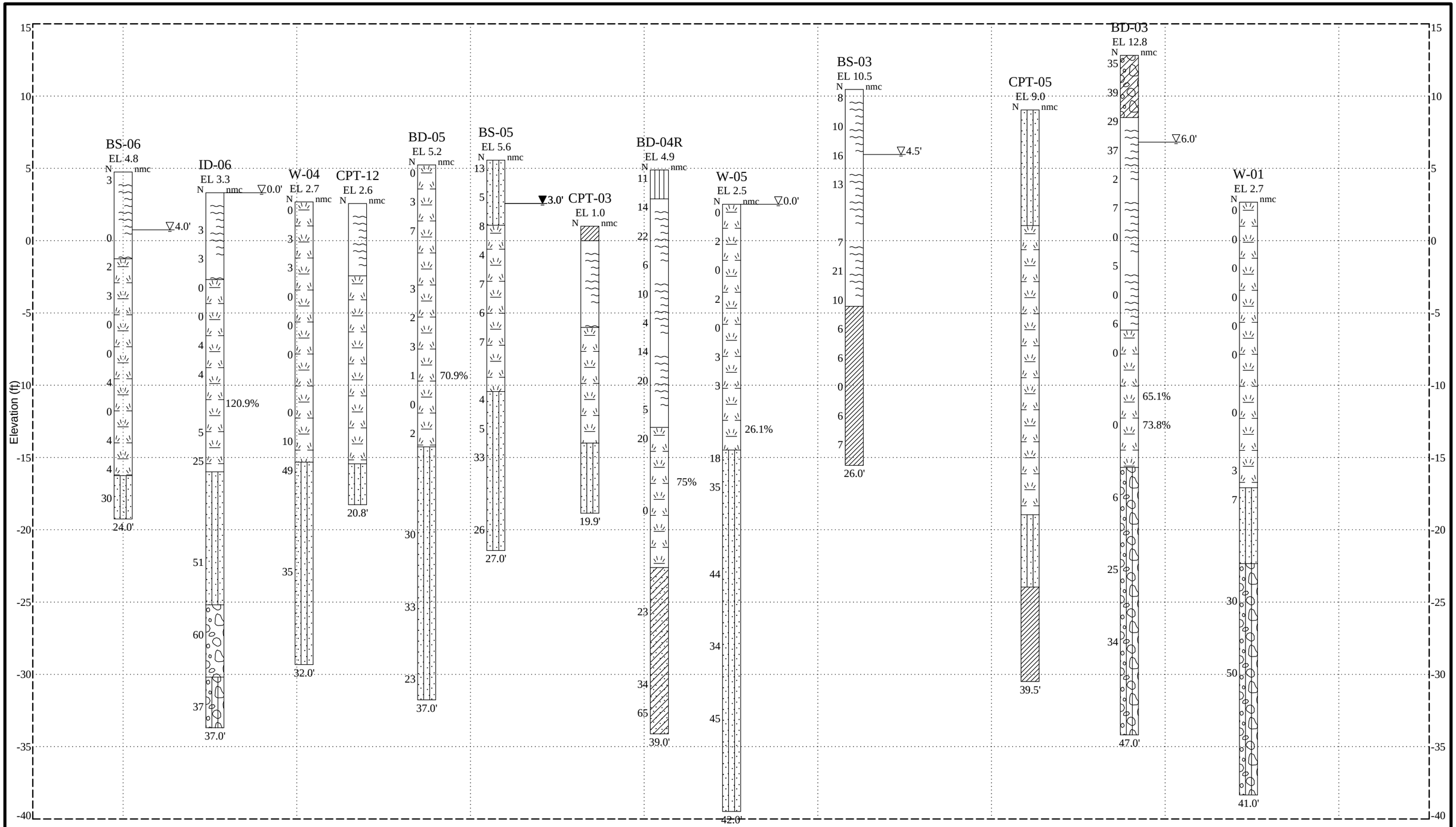


LITHOLOGY GRAPHICS

- Low Plasticity Clay
- Sludge
- Peat
- Silty Sand
- Low Plasticity Silty Clay
- Silt
- Clayey Sand

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #4
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12

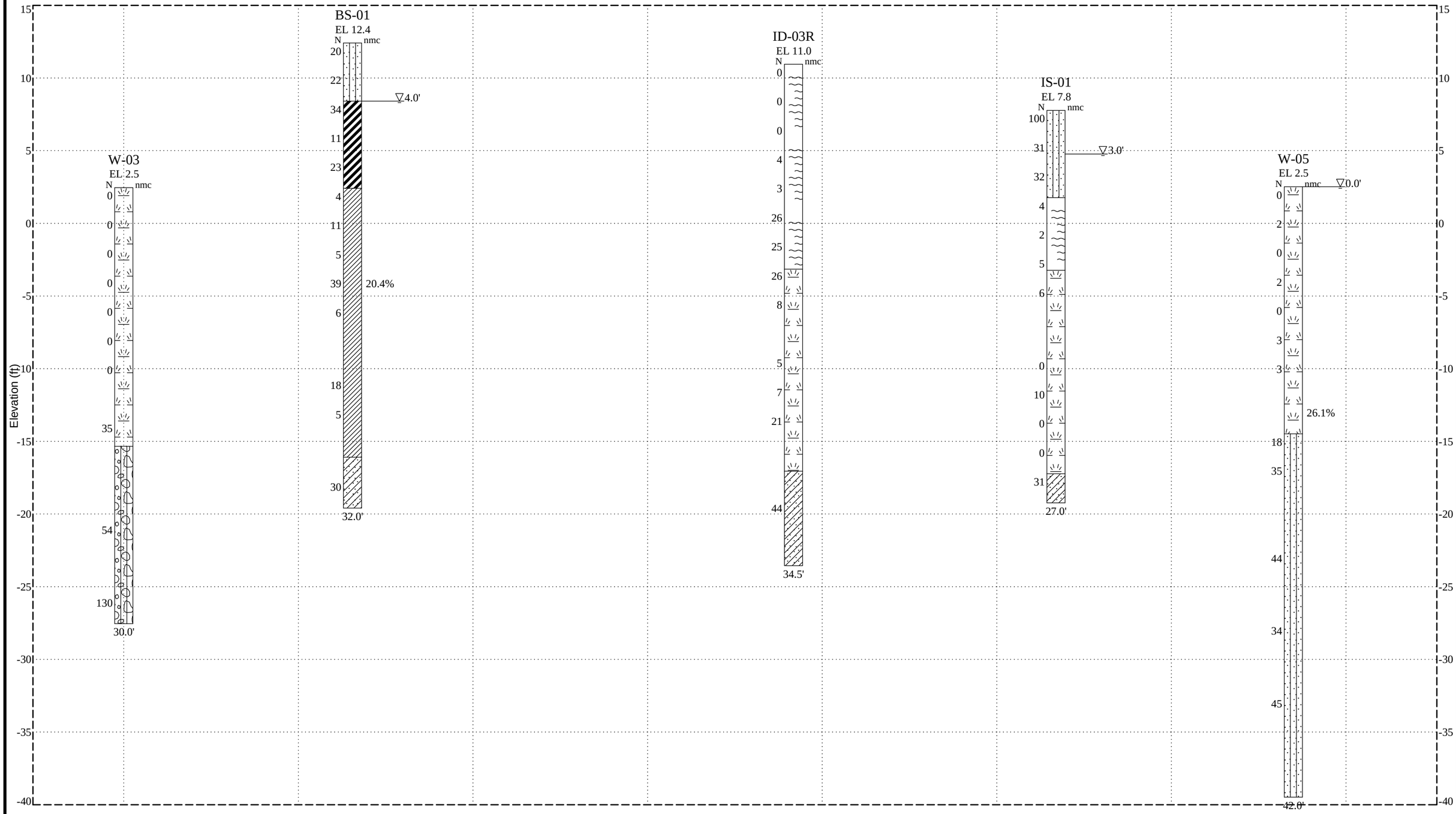


LITHOLOGY GRAPHICS

- Clayey Gravel
- Sludge
- Peat
- Silty Gravel
- Silt
- Clayey Sand
- Silty Sand
- Low Plasticity Clay
- Poorly-graded Gravel

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #5
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12

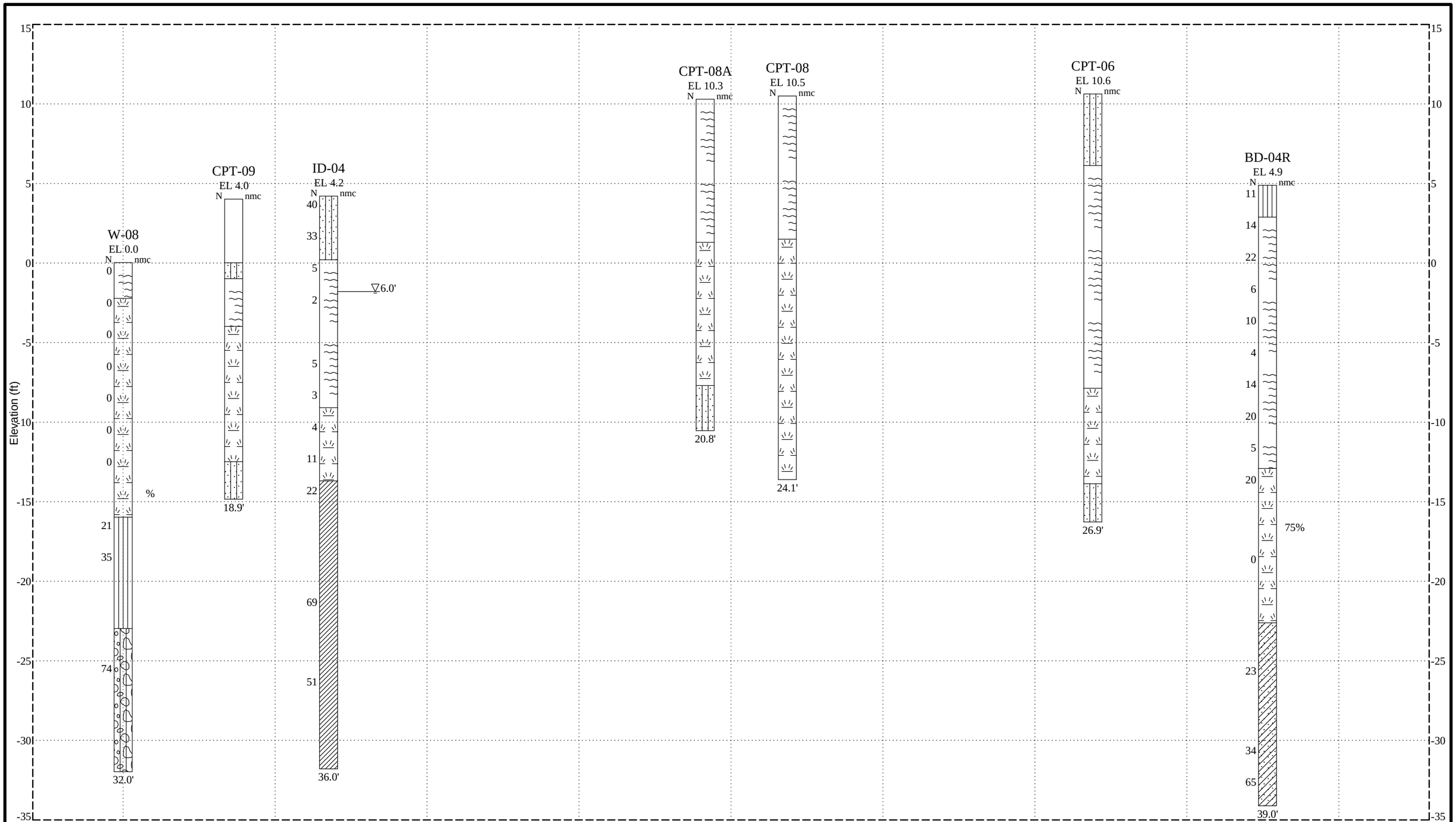


LITHOLOGY GRAPHICS

Silty Sand | High Plasticity Clay | Low Plasticity Clay | Clayey Sand | Sludge | Peat | Silty Gravel

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #6
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12

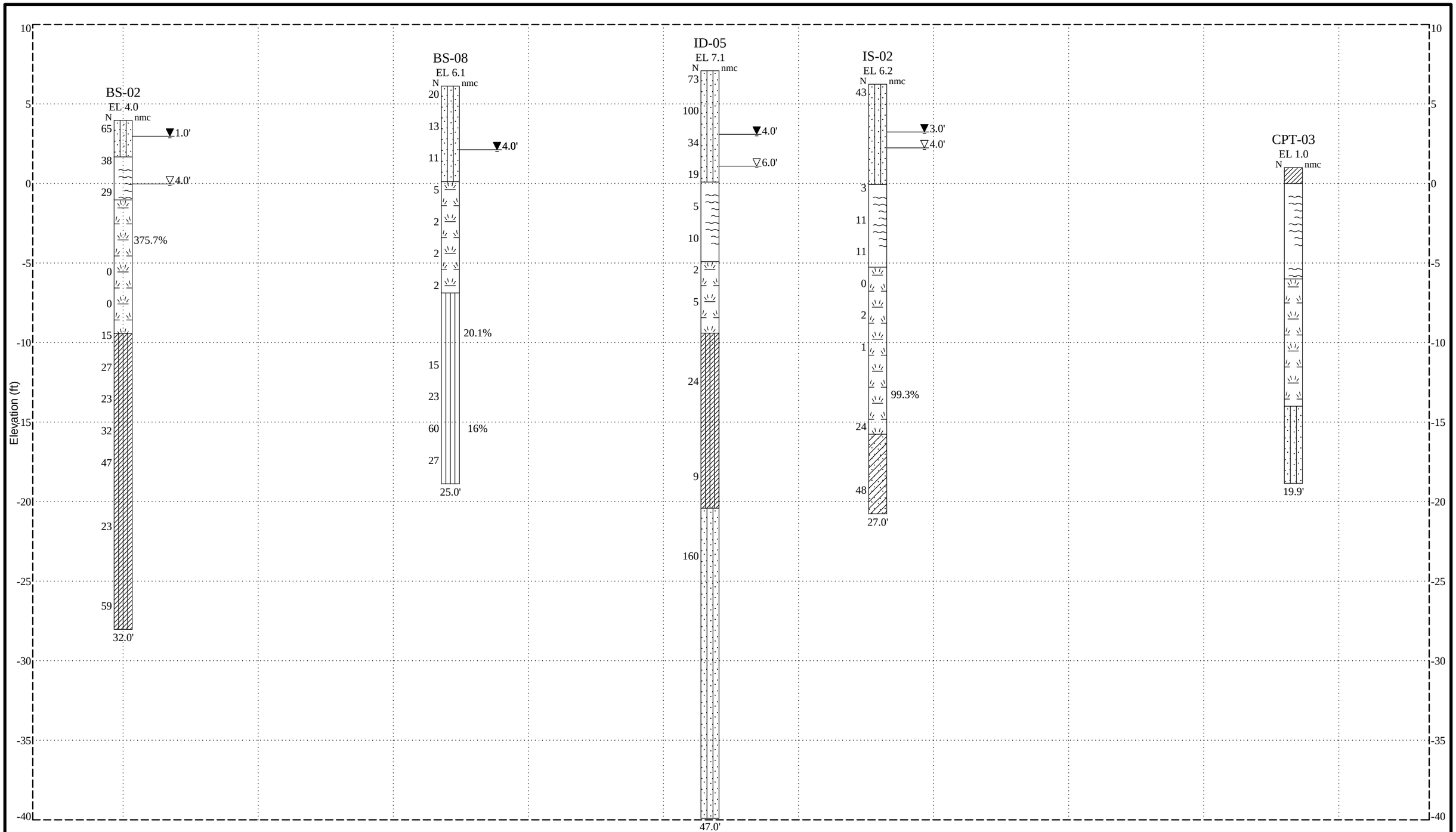


LITHOLOGY GRAPHICS

Silt | Sludge | Peat | Clayey Sand | Silty Sand | Low Plasticity Clay | Silty Gravel

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #7
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12

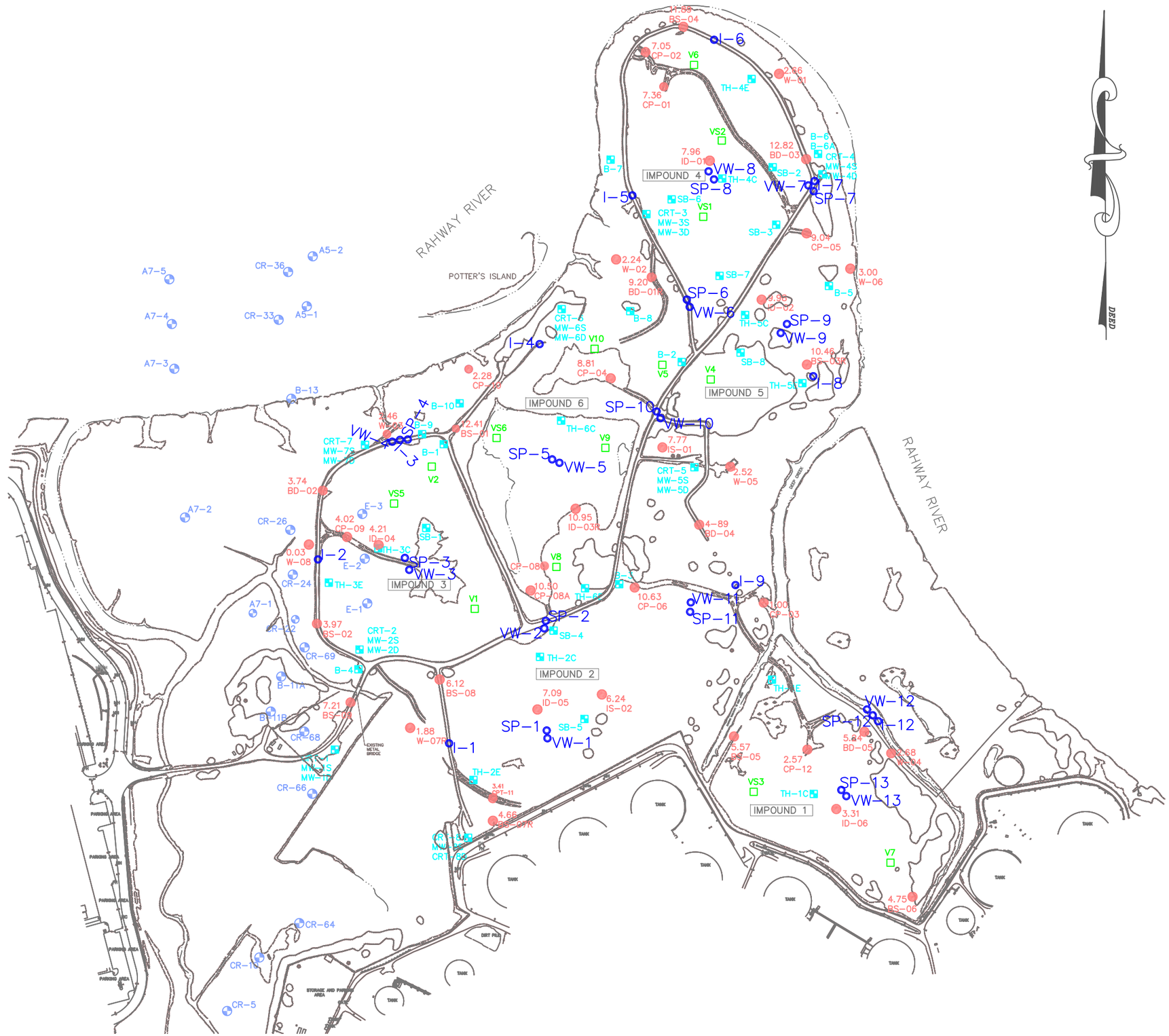


LITHOLOGY GRAPHICS

- Silty Sand
- Sludge
- Peat
- Low Plasticity Silty Clay
- Silt
- Low Plasticity Clay
- Clayey Sand

Title: Rahway Arch Geotech Inv. Soil Profile			Figure No. #8
Drawn: ACO	Approved: MZY	Date: 10/11/12	Job No. 128911

MBAKER (LINTHICUM) 11 X 17 RAHWAY ARCH SITE.GPJ 10/11/12



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LEGEND

A5-2	NJTA Borings
B-2	Historical Borings
3.00 W-06	2012 Borings
V5	Historical Vane Shear Test Borings
SP-1	Settlement Plate
VW-1	Vibrating Wire
I-1	Inclinometer

Figure A-13
INSTRUMENTATION PLAN

Graphical Scale

400 200 0 400

1 inch = 400 feet

Baker
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DATE	REVISIONS

RAHWAY ARCH SITE
GEOTECHNICAL AND REMEDIAL INVESTIGATION
INSTRUMENTATION PLAN

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File Name: INSTRUMENTATION Plan.dwg

Drawn by: DM
Checked by: TM
Sheet ID:
Sheet OF XXX

BORING LOGS AND SUBSURFACE PROFILES

APPENDIX B

TEST BORING LOG

BORING BD-01R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643867.99
EASTING: 571093.53
ELEVATION: 9.2
START DATE: 7/17/2012
END DATE: 7/17/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		5			SIZE, ID	4 1/4"	1 3/8"	
7/18/2012		6			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	6"	7 17 50/5"							Black Silty Sand (sm), with (topsoil, red brick, rail tie and other debris), moist, very dense (Fill).	Safety hammer was used
								EL 6.0 3.3			
S-2	3.0	18"	2 3 2 3							Dark gray Sludge (classified as Elastic Silt (mh)), wet, very loose to m. dense (Fill).	
							5				
S-3	5.0	24"	3 2 7 7								
S-4	7.0	24"	3 5 4 5								
S-5	9.0	22"	1 3 2 4								Started mud rotary drilling @ 9 ft
							10				
S-6	11.0	NR	3 4 4 4								
S-7	13.0	23"	0 0 0 0								
							15				
S-8	15.0	6"	0 8 9 6								
S-9	17.0	20"	0 0 0 0								
S-10	19.0	22"	0 0 0 0					EL -10.6 19.8			
							20			Gray ELASTIC SILT with SAND (MH, fibrous Peat), wet, very loose.	
S-11	21.0	20"	0 1 1 1								

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-01R

TEST BORING LOG

BORING BD-01R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643867.99
EASTING: 571093.53
ELEVATION: 9.2
START DATE: 7/17/2012
END DATE: 7/17/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		5			SIZE, ID	4 1/4"	1 3/8"	
7/18/2012		6			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
T-1	24.0	24"		72.9%	291	118	25				
								EL -16.8 / 26.0		Dark Grey Silty Sand (sm), wet, loose to m. dense.	
S-12	26.0	24"	4 4 6 6								
S-13	28.0	12"	12 8 9 16								
S-14	30.0	12"	6 10 9 11				30	EL -21.6 / 30.8		Red Sandy Lean Clay (sc) with Gravel, wet, stiff to hard.	pp = 1.25 tsf
S-15	35.0	1"	10 8 6 9				35				
S-16	40.0	12"	20 24 50/5"				40	EL -32.3 / 41.5			pp = 4.00 tsf
										Bottom of Boring @ 41.5 ft.	
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-01R

TEST BORING LOG

BORING BD-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643038.72
EASTING: 569814.75
ELEVATION: 3.74
START DATE: 7/11/2012
END DATE: 7/11/2012
DRILLER: J. Wilson/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/11/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/12/2012		1.5			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	12"	15 19 25 28							Brown Silty Sand with Gravel (sm), moist, dense to very dense (Fill).	
S-2	2.0	6"	10 76 67 50					EL -0.3 / 4.0			
							5			Dark gray Sludge (classified as Elastic Silt (mh)), wet, very loose (Fill).	
S-3	5.0	24"	1 1 1 1								
S-4	7.0	12"	1 2 2 1								
							10				
T-1	10.0	NR									
S-5	12.0	NR	1 1 1 1					EL -9.3 / 13.0		Brown Elastic Silt (mh, fibrous Peat), wet, very soft to loose.	
							15				
T-2	15.0	NR									
S-6	17.0	24"	3 2 3 2								Sand encountered @ bottom of S-6
							20	EL -16.3 / 20.0		Gray to brown Sandy Gravel with Sand (gp), wet, medium dense.	
S-7	20.0	10"	10 18 6 6								

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-02

TEST BORING LOG

BORING BD-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643038.72
EASTING: 569814.75
ELEVATION: 3.74
START DATE: 7/11/2012
END DATE: 7/11/2012
DRILLER: J. Wilson/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/11/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/12/2012		1.5			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-8	25.0	12"	3 11 16 19				25	EL -21.8 25.5		Brown Clayey Silt (ml) with Sand and Gravel, wet, m. dense.	
								EL -24.8 28.5		Brown-red Sandy Gravel (gp) with shale fragments, wet, very dense.	
S-9	30.0	3"	50/3"				30	EL -28.3 32.0		Bottom of Boring @ 32 ft.	
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-02

TEST BORING LOG

BORING BD-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 3
NORTHING: 644326.83
EASTING: 571694.34
ELEVATION: 12.82
START DATE: 7/17/2012
END DATE: 7/18/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	12"	14 18 17 13							Red Lean Clay (cl) with Gravel and Sand, moist, dense (Fill).	
S-2	2.0	12"	14 16 23 23								
								EL 8.5 / 4.3			
S-3	4.0	14"	19 13 16 26				5			Gray Sludge (Classified as Elastic Silt (mh)), wet, very loose to dense (Fill).	
S-4	6.0	22"	15 18 19 28								
S-5	8.0	12"	1 1 1 1								Started mud drilling @8 ft
S-6	10.0	12"	3 4 3 2				10				
S-7	12.0	24"	0 0 0 0								
S-8	14.0	24"	0 3 2 2				15				
S-9	16.0	10"	0 0 0 0								
S-10	18.0	24"	0 3 3 4					EL -6.2 / 19.0		Gray SANDY ELASTIC SILT (MH, with fibrous Peat), wet, very loose to loose.	pp = 0 tsf
S-11	20.0	10"	0 0 0 0				20				pp = 0 tsf

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-03

TEST BORING LOG

BORING BD-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 3
NORTHING: 644326.83
EASTING: 571694.34
ELEVATION: 12.82
START DATE: 7/17/2012
END DATE: 7/18/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
T-1	23.0			65.1%	105	60					Some Gravel encountered @ sample S-8
S-12	25.0	24"	0 0 0 0	73.8%	89	54	25				
								EL -15.7 28.5		Gray Silty Sand (sm), wet, loose.	
S-13	30.0	24"	2 4 2 2				30				Sand encountered @ S-13
								EL -20.7 33.5		Gray Sandy Gravel (gw), wet, medium to very dense.	
S-14	35.0	10"	11 10 15 8				35				
S-15	40.0	4"	19 18 16 23				40				
S-16	45.0	5"	50/5"				45			Sandstone fragments	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-03

TEST BORING LOG

BORING BD-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 3 of 3
NORTHING: 644326.83
EASTING: 571694.34
ELEVATION: 12.82
START DATE: 7/17/2012
END DATE: 7/18/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								EL -34.2 / 47.0			Drilling refusal
										Bottom of Boring @ 47 ft.	
							50				
							55				
							60				
							65				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE
		OVER 30	HARD	- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-03

TEST BORING LOG

BORING BD-04R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642905.67
EASTING: 571278.33
ELEVATION: 4.89
START DATE: 7/18/2012
END DATE: 7/18/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	14"	5 5 6 6					EL 2.9		Yellow to light gray Clayey Silt (ml), moist, stiff (Fill).	pp = 4.5 tsf
S-2	2.0	13"	3 3 11 12					2.0		Grey to black SLUDGE (classified as Elastic Silt (mh)), moist to wet, loose to medium dense (Fill).	pp = 1 tsf
S-3	4.0	16"	8 12 10 12				5				
S-4	6.0	24"	0 0 6 6								Started mud rotary drilling @ 6 ft
S-5	8.0	18"	2 4 6 7					EL -5.1			Encountered some Gravel @ S-5
S-6	10.0	8"	0 2 2 3				10	10.0		Red Lean Clay (cl) with Gravel, wet, soft (Fill).	Lean Clay with Gravel (cl) encountered @ S-6, S-7
S-7	12.0	20"	5 5 9 7					EL -7.9			
S-8	14.0	24"	4 7 13 21					12.8		Black SLUDGE (classified as Elastic Silt (mh)), moist to wet, medium dense (Fill).	
							15	EL -10.1			
								15.0		Red Lean Clay (cl) with Gravel, wet, very soft (Fill).	
								EL -11.1			
S-9	16.0	24"	2 2 3 3					16.0		Black SLUDGE (classified as Elastic Silt (mh)), moist to wet, loose (Fill).	Lean Clay with Gravel (cl) encountered @ S-9
								EL -12.6			
S-10	18.0	24"	7 10 10 10					17.5		Gray FAT CLAY (CH, with fibrous Peat and Gravel), wet, very soft to very stiff.	
							20				
T-1	21.0			75%	98	57					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-04R

TEST BORING LOG

BORING BD-04R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642905.67
EASTING: 571278.33
ELEVATION: 4.89
START DATE: 7/18/2012
END DATE: 7/18/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	23.0	24"	0 0 0 0				25				pp = 0 tsf
								EL -22.6 27.5		Red Clayey Sand (sc), wet, medium dense to dense.	
S-12	30.0	24"	0 10 13 12				30				
S-13	35.0	2"	15 18 16 16				35	EL -32.1 37.0			
S-14	37.0	10"	26 25 40 50/4"					EL -34.1 39.0		Red Lean Clay (cl) with Gravel, wet, hard.	
							40			Bottom of Boring @ 39 ft.	Drilling refusal
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING BD-04R

TEST BORING LOG

BORING BD-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642100.92
EASTING: 571920.59
ELEVATION: 5.24
START DATE: 7/26/2012
END DATE: 7/26/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	4"	1 0 0 0							Grey Silt (ml) with some black Peat and Sludge, moist, very loose (Fill).	
S-2	2.0	18"	2 1 2 3					EL 2.7 / 2.5		Gray FAT CLAY with SAND (CH, fibrous Peat), moist, very soft to soft.	
S-3	4.0	18"	3 4 3 3				5				Sludge encountered @ S-3
U-1	6.0	NR									
S-5	8.0	24"	0 1 2 1								Organic odor encountered @ S-5 pp = 0 tsf
S-6	10.0	16"	0 1 1 1				10				
S-7	12.0	24"	1 1 2 2								pp = 0 tsf
S-8	14.0	24"	0 1 0 0	70.9%	78	44	15				
S-9	16.0	24"	0 0 0 0								
S-10	18.0	24"	9 1 1 8					EL -14.3 / 19.5			Medium Sand encountered @ S-10
							20			Gray Silty Fine Sand (sm), wet, medium dense to dense.	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-05

TEST BORING LOG

BORING BD-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642100.92
EASTING: 571920.59
ELEVATION: 5.24
START DATE: 7/26/2012
END DATE: 7/26/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	25.0	20"	10 14 16 21				25				
S-12	30.0	18"	8 16 17 17				30				Gravels encountered @ S-12
S-13	35.0	24"	11 13 10 8				35	EL -31.6			pp = 0.5 to 1.0 tsf
								EL -31.8 37.0		Red-br Grav. Silt (ml), wet, m. dense.	Shale fragments
							40			Bottom of Boring @ 37 ft.	
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BD-05

TEST BORING LOG

BORING BS-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643279.44
EASTING: 570331.75
ELEVATION: 12.41
START DATE: 7/13/2012
END DATE: 7/13/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/13/2012		4			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	6"	5 12 8 4							Brown Gravelly Silty Sand (sm), moist, medium dense (Fill).	
S-2	2.0	10"	5 7 15 16								
							▽	EL 8.4 / 4.0			
S-3	4.0	12"	13 14 20 25				5			Brown Fat Clay with Sand (ch), moist, stiff to very stiff (Fill).	
S-4	6.0	12"	2 5 6 7								
S-5	8.0	12"	7 11 12 11								
							10	EL 2.4 / 10.0			
S-6	10.0	10"	2 2 2 3							Brown SANDY LEAN CLAY (CL), wet, medium to very stiff.	pp = 0.5 tsf
S-7	12.0	16"	2 4 7 8								pp = 0.5 tsf
S-8	14.0	16"	2 3 3 3				15				pp = 1.0 tsf
S-9	16.0	20"	15 26 13 14	20.4%	25	8					Encountered Gravel @ S-9 pp = 2.0 tsf
S-10	18.0	20'	0 2 4 3				20				pp = 1.0 tsf
T-1	21.0										

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE
		OVER 30	HARD	- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-01

TEST BORING LOG

BORING BS-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643279.44
EASTING: 570331.75
ELEVATION: 12.41
START DATE: 7/13/2012
END DATE: 7/13/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/13/2012		4			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	23.0	24"	6 5 13 11								pp = 0.25 tsf pp = 1.0 tsf
S-12	25.0	20"	0 3 2 3				25				Encountered Peat @ S-12 pp = 1.5 tsf
								EL -16.1 28.5		Gray Clayey Sand with Gravel (sc), wet, dense.	
S-13	30.0	10"	10 12 18 15				30				
								EL -19.6 32.0		Bottom of Boring @ 32 ft.	
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-01

TEST BORING LOG

BORING BS-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642521
EASTING: 569792.09
ELEVATION: 3.97
START DATE: 7/11/2012
END DATE: 7/11/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/11/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/12/2012		1			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	10"	17 32 33 50/4"							Brown Silty Sand (sm), moist to wet, very dense (Fill).	
								EL 1.7 2.3			
S-2	2.0	12"	8 13 25 19							Dark gray Sludge (classified as Elastic Silt (mh)), wet, dense (Fill).	
S-3	4.0	24"	11 15 14 13					EL -1.0 5.0			pp = 0 tsf
							5			Dark gray SANDY ELASTIC SILT (MH, fibrous Peat), wet, very loose to medium dense, organic ordor.	
T-1	7.0			375.7%	467	211					
S-4	9.0	24"	0 0 0 0				10				
S-5	11.0	24"	0 0 0 0								
								EL -9.4 13.4			
S-6	13.0	10"	7 8 7 10							Brown Clayey Silt (cl-ml), wet, medium dense to very dense.	
S-7	15.0	24"	10 12 15 14				15				Organic Clay encountered @ S-7
S-8	17.0	16"	2 10 13 14								
S-9	19.0	16"	15 16 16 25				20				
S-10	21.0	16"	15 20 27 26								

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-02

TEST BORING LOG

BORING BS-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642521
EASTING: 569792.09
ELEVATION: 3.97
START DATE: 7/11/2012
END DATE: 7/11/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/11/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/12/2012		1			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	25.0	24"	6 12 11 15				25				
S-12	30.0	24"	5 9 50 24				30	EL -28.0 32.0		Bottom of Boring @ 32 ft.	
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-02

TEST BORING LOG

BORING BS-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643528.08
EASTING: 571697.05
ELEVATION: 10.46
START DATE: 7/31/2012
END DATE: 7/31/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/31/2012		4.5			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	4"	3 3 5 6							Dark Gray Sludge (classified as Elastic Silt (mh)), moist to wet, loose to medium dense (Fill).	Safety Hammer is used
S-2	2.0	1"	4 4 6 11								
S-3	4.0	19"	5 8 8 7				5				
S-4	6.0	24"	5 6 7 6								
T-1	8.0	24"									
S-5	10.0	24"	3 3 4 10				10				
S-6	12.0	24"	2 7 12 9								Peat encountered @ S-6 and S-7
S-7	14.0	24"	4 5 5 6				15	EL -4.5 / 15.0		Dark gray Lean Clay (cl), wet, very soft to medium stiff.	
S-8	16.0	24"	3 4 2 7								
S-9	18.0	24"	3 3 3 3				20				
S-10	20.0	24"	0 0 0 0								
S-11	22.0	24"	1 4								

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-03

TEST BORING LOG

BORING BS-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643528.08
EASTING: 571697.05
ELEVATION: 10.46
START DATE: 7/31/2012
END DATE: 7/31/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/31/2012		4.5			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-12	24.0	24"	2 2 3 3 4 4				25	EL -15.5 / 26.0			
										Bottom of Boring @ 26 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-03

TEST BORING LOG

BORING BS-04

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 644841.43
EASTING: 571216.77
ELEVATION: 11.89
START DATE: 7/17/2012
END DATE: 7/17/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		6			SIZE, ID	4 1/4"	1 3/8"	
7/18/2012		6			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	12"	13 14 8 7							Red-brown Sandy Lean Clay (cl) with concrete debris, moist, stiff to hard (Fill).	
S-2	2.0	6"	3 7 14 21								
S-3	4.0	6"	6 12 12 9				5				Gravel encountered @ S-3
S-4	6.0	4"	8 6 9 10								
S-5	8.0	NR	4 4 7 6								
S-6	10.0	2"	15 22 14 13				10				Color changed to reddish brown with tan and gray
S-7	12.0	2"	12 7 8 7								
S-8	14.0	12"	3 6 7 5				15	EL -3.0 / 14.9			
										Dark grey Sludge (classified as Elastic Silt (mh)), wet, loose (Fill).	
S-9	16.0	24"	7 4 4 4					EL -5.3 / 17.2			
										Dark Gray FAT CLAY (CH, fibrous Peat), wet, soft to stiff.	
S-10	18.0	23"	0 0 3 3				20				
S-11	20.0	24"	4 5 4 5								
T-1	22.0										

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-04

TEST BORING LOG

BORING BS-04

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 644841.43
EASTING: 571216.77
ELEVATION: 11.89
START DATE: 7/17/2012
END DATE: 7/17/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		6			SIZE, ID	4 1/4"	1 3/8"	
7/18/2012		6			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
				71.9%	93	55					
S-12	24.0	24"	1 2 2 5	45%			25	EL -13.1 / 25.0		Brown Silty Sand (sm), wet, very loose.	
								EL -15.1 / 27.0		Bottom of Boring @ 27 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-04

TEST BORING LOG

BORING BS-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642082.5
EASTING: 571413.38
ELEVATION: 5.57
START DATE: 7/24/2012
END DATE: 7/24/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/24/2012		3			SIZE, ID	4 1/4"	1 3/8"	
7/25/2012		3			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	7"	12 7 6 14						Brown Gravely Silty Sand (sm), loose to medium dense (Fill).	
S-2	2.0	3"	4 3 2 3							
S-3	4.0	16"	2 4 4 3				5	EL 1.1 / 4.5	Dark brown to brown Sandy Elastic Silt (mh, fibrous Peat), wet, very loose to loose, organic ordor.	
S-4	6.0	18"	2 2 2 3							
S-5	8.0	24"	3 4 3 4							Yellow color encountered @ S-5
S-6	10.0	NR	3 4 2 4				10			
S-7	12.0	20"	3 4 3 5							Fat Clay encountered @ S-7
U-1	14.0						15			
S-8	16.0	12"	2 3 1 2					EL -10.4 / 16.0	Grey Organic Silt (oh), wet, very soft, some Peat, organic odor	pp = <0.1 tsf
S-9	18.0	24"	2 3 2 3							
S-10	20.0	18"	8 16 17 16				20	EL -14.4 / 20.0	Gray Silty Sand (sm), wet, medium dense to dense, organic ordor.	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-05

TEST BORING LOG

BORING BS-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642082.5
EASTING: 571413.38
ELEVATION: 5.57
START DATE: 7/24/2012
END DATE: 7/24/2012
DRILLER: Buck/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/24/2012		3			SIZE, ID	4 1/4"	1 3/8"	
7/25/2012		3			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	25.0	16"	8 14 12 8				25				
								EL -21.4 27.0		Bottom of Boring @ 27 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-05

TEST BORING LOG

BORING BS-06

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 641459.47
EASTING: 572107.79
ELEVATION: 4.75
START DATE: 7/27/2012
END DATE: 7/27/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/27/2012		4			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	24"	2 2 1 2							Dark gray Sludge (classified as Elastic Silt (mh)), moist to wet, very loose (Fill).	
U-1	2.0	17"									
S-3	4.0	2"	0 0 0 0				5	EL -1.3 / 6.0			
S-4	6.0	24"	2 1 1 1							Gray Organic Fat Clay (oh, fibrous Peat), wet, very soft to soft.	
S-5	8.0	NR	2 1 2 3								
S-6	10.0	1"	0 0 0 0				10				pp = 0
S-7	12.0	NR	0 0 0 0								
S-8	14.0	16"	2 2 2 3				15				
S-9	16.0	16"	0 0 0 0								pp = 0
S-10	18.0	24"	0 2 2 3				20				pp < 0.05 tsf
S-11	20.0	24"	0 0 4 11					EL -16.3 / 21.0		Dark gray Silty Fine Sand (sm), wet, medium dense.	
S-12	22.0	24"	13 13								

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-06

TEST BORING LOG

BORING BS-06

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 641459.47
EASTING: 572107.79
ELEVATION: 4.75
START DATE: 7/27/2012
END DATE: 7/27/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/27/2012		4			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
X			17 18					EL -19.3 24.0			
							25			Bottom of Boring @ 24 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-06

TEST BORING LOG

BORING BS-07R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 641754.64
EASTING: 570476.25
ELEVATION: 4.66
START DATE: 7/16/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/16/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/17/2012		2			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	18"	24 27 50 24							Gray Silty Sand with Gravel (sm), moist to wet, very dense (Fill).	
S-2	2.0	16"	10 15 32 46								
S-3	4.0	4"	10 23 25 28				5	EL -1.3			
S-4	6.0	NR	1 2 1 1					6.0		Dark gray to gray Sludge (classified as Elastic Silt (mh)), wet, very loose (Fill).	
S-5	8.0	12"	2 2 2 2					EL -3.8 8.5		Black Organic Fat Clay (oh, fibrous Peat), wet, soft to medium stiff, organic ordor.	
S-6	10.0	20"	2 3 4 4				10	EL -7.3			
S-7	12.0	6"	0 1 0 1					12.0		Black to gray Sludge (classified as Elastic Silt (mh)), some Peat, wet, very loose to loose (Fill).	
S-8	14.0	12"	1 2 3 2				15				
T-1	17.0							EL -14.3			
S-9	19.0	20"	6 6 10 14				20	19.0		Brown Clayey Silt with Sand (cl-ml), wet, very stiff.	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-07R

TEST BORING LOG

BORING BS-07R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 641754.64
EASTING: 570476.25
ELEVATION: 4.66
START DATE: 7/16/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/16/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/17/2012		2			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-10	25.0	12"	10 6 9 25				25				Gravel encountered @ S-10
								EL -22.3 27.0		Bottom of Boring @ 27 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-07R

TEST BORING LOG

BORING BS-08

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642304.09
EASTING: 570268.9
ELEVATION: 6.12
START DATE: 7/10/2012
END DATE: 7/10/2012
DRILLER: J. Harris/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/10/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/11/2012		4			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	4"	10 8 12 8							Brown Silty Sand with Gravel (sm), moist, medium dense (Fill).	
S-2	2.0	4"	8 4 9 11								
S-3	4.0	4"	2 3 8 5				5	EL 0.1			
S-4	6.0	24"	2 2 3 2					6.0 / EL -1.9		Dark grey Silty Clay (cl-ml), wet, soft (Fill).	pp = 0.25 tsf
S-5	8.0	24"	1 1 1 1					8.0		Dark Organic Clay (oh, fibrous Peat), wet, very soft.	pp = 0 tsf
S-6	10.0	24"	1 1 1 1				10				pp = 0 tsf
S-7	12.0	24"	1 1 1 1					EL -6.9			pp = 0 tsf
								13.0		Dark grey ORGANIC SILT (OL), wet, very loose, organic odor.	pp = 0 tsf
T-1	15.0			20.1%	20	2	15				
								EL -10.9 / 17.0		Brown Silty Sand (sm), some Gravel, wet, medium dense to dense	
S-8	17.0	24"	9 8 7 8								
S-9	19.0	24"	8 9 14 20				20				
S-10	21.0	24"	10 25 35 25	16%							

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-08

TEST BORING LOG

BORING BS-08

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642304.09
EASTING: 570268.9
ELEVATION: 6.12
START DATE: 7/10/2012
END DATE: 7/10/2012
DRILLER: J. Harris/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/10/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/11/2012		4			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	23.0	24"	10 13 14 20								
							25	EL -18.9 25.0			
										Bottom of Boring @ 25 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-08

TEST BORING LOG

BORING BS-09

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642214.79
EASTING: 569922.78
ELEVATION: 7.21
START DATE: 7/10/2012
END DATE: 7/10/2012
DRILLER: J. Harris/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/10/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/11/2012		5.5			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	4"	16 15 17 15							Brown to gray Silty Sand with Gravel (sm), moist to wet, medium dense to very dense (Fill).	Donut Hammer is used
S-2	2.0	5"	17 18 45 50/3"								
							5				
S-3	5.0	16"	14 16 7 5								Started mud rotary drilling @ 6 ft.
S-4	7.0	16"	6 14 16 12					EL -1.3 / 8.5			
S-5	9.0	NR	0 1 0 0				10			Brown SILTY SAND (SM, fibrous Peat), wet, very loose.	
T-1	12.0			58.6%	241	128					
S-6	14.0	20"	2 9 11 10				15	EL -7.1 / 14.3		Grey to brown SILTY SAND (SM), wet, medium dense to dense.	
S-7	16.0	20"	8 9 9 23								
S-8	18.0	24"	7 8 8 8				20				
S-9	20.0	24"	4 11 14 17								
S-10	22.0	24"	13 15								

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS	
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	DESCRIPTIVE TERM	PERCENT
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	TRACE	1 TO 10
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	LITTLE	11 TO 20
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	SOME	21 TO 35
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE	AND	35 TO 50
		OVER 30	HARD	- U - UNDISTURBED		

BORING BS-09

TEST BORING LOG

BORING BS-09

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642214.79
EASTING: 569922.78
ELEVATION: 7.21
START DATE: 7/10/2012
END DATE: 7/10/2012
DRILLER: J. Harris/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/10/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/11/2012		5.5			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	24.0	24"	19 15 13 15 25 29				25	EL -18.8 26.0			
										Bottom of Boring @ 26 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING BS-09

TEST BORING LOG

BORING ID-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 3
NORTHING: 644320.93
EASTING: 571319.24
ELEVATION: 7.96
START DATE: 7/23/2012
END DATE: 7/23/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	7"	2 1 2 3							Gray Sludge (classified as Elastic Silt (mh)), wet, very loose to medium dense (Fill).	Safety Hammer is used
S-2	2.0	16"	2 1 2 4								
S-3	4.0	24"	3 5 3 3	134.3%	59	10	5				
U-1	6.0										
S-4	8.0	24"	0 0 2 4								
S-5	10.0	24"	2 1 10 7				10				pp < 0.1 tsf
S-6	12.0	20"	2 2 4 7								pp < 0.1 tsf
U-2	14.0						15				
S-7	16.0	24"	0 0 1 1					EL -8.5 / 16.5		Brown to dark gray Organic Fat Clay (ch, fibrous Peat), wet, very soft to soft, organic odor.	
S-8	18.0	24"	2 3 2 2				20				pp < 0.1 tsf
U-3	20.0	24"									
S-9	22.0	24"	1 1								

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-01

TEST BORING LOG

BORING ID-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 3
NORTHING: 644320.93
EASTING: 571319.24
ELEVATION: 7.96
START DATE: 7/23/2012
END DATE: 7/23/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
			1 2								
S-10	24.0	24"	2 2 2 3				25				pp < 0.1 tsf
U-4	26.0	15"									Fine Sand encountered @ U-4 and S-11
								EL -20.0 28.0		Dark grey Silty Sand, wet, organic odor.	
S-11	28.0	18"	6 15 12 15					EL -21.9 29.9			
							30			Reddish brown Clayey Silt (ml), wet, very stiff to hard.	
S-12	35.0	24"	5 9 11 16				35				Gravel encountered @ S-12 pp = 1.0 tsf
S-13	40.0	24"	26 16 17 19				40				Fine Sand encountered @ S-13
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING ID-01

TEST BORING LOG

BORING ID-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 3 of 3
NORTHING: 644320.93
EASTING: 571319.24
ELEVATION: 7.96
START DATE: 7/23/2012
END DATE: 7/23/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
											Hard drilling from 46 to 49 ft.
								EL -41.0 / 49.0			
							50			Bottom of Boring @ 49 ft.	
							55				
							60				
							65				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-01

TEST BORING LOG

BORING ID-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 3
NORTHING: 643780.57
EASTING: 571521
ELEVATION: 9.98
START DATE: 7/15/2012
END DATE: 7/15/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	12"	2 3 3 3							Brown Silty Sand (sm), moist, loose (Fill).	Safety Hammer is used
S-2	2.0	24"	5 10 8 20							Gray Sludge (classified as Elastic Silt (mh)), moist to wet, very loose to medium dense (Fill).	
S-3	4.0	24"	19 15 12 12				5				
S-4	6.0	24"	3 1 3 4								
S-5	8.0	24"	2 3 5 9								
S-6	10.0	24"	3 8 15 19				10				
S-7	12.0	24"	4 8 14 13								
S-8	14.0	24"	0 0 0 0				15	EL -4.5 / 14.5		Gray Sandy Silty Clay (cl-ml, fibrous Peat), wet, very soft to soft.	pp = 0 tsf
S-9	16.0	24"	1 2 2 3								pp = 0 tsf
S-10	18.0	12"	0 0 0 0				20				pp = 0 tsf
T-1	21.0	24"									

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING ID-02

TEST BORING LOG

BORING ID-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 3
NORTHING: 643780.57
EASTING: 571521
ELEVATION: 9.98
START DATE: 7/15/2012
END DATE: 7/15/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	23.0	24"	0 0 0 0								pp = 0 tsf
							25				
S-12	25.0	24"	0 1 2 3								pp = 0 tsf
								EL -18.5 / 28.5		Gray to brown Clayey Sand with Gravel (sc), wet, loose to medium dense.	
							30				
S-13	30.0	16"	6 4 4 6								
							35				
S-14	35.0	24"	12 10 12 13								
							40				
S-15	40.0	24"	10 12 18 25								
								EL -33.5 / 43.5		Green to gray Silty Sand (sm), wet, very dense.	
							45				
S-16	45.0	5"	50/5"								

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-02

TEST BORING LOG

BORING ID-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 3 of 3
NORTHING: 643780.57
EASTING: 571521
ELEVATION: 9.98
START DATE: 7/15/2012
END DATE: 7/15/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								EL -37.0 / 47.0			
										Bottom of Boring @ 47 ft.	
							50				
							55				
							60				
							65				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-02

TEST BORING LOG

BORING ID-03R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642967.64
EASTING: 570797.8
ELEVATION: 10.95
START DATE: 7/30/2012
END DATE: 7/30/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
T-1	0.0		0 0 0 0							Light to dark gray Sludge (classified as Elastic Silt (mh)), moist to wet, very loose to medium dense (Fill).	Safety Hammer is used
S-2	2.0	15"	0 0 0 0								
S-3	4.0	24"	0 0 0 0				5				
S-4	6.0	24"	0 2 2 9								2" fibrous peat encountered @ S-4
S-5	8.0	6"	2 2 1 0								
S-6	10.0	24"	4 10 16 11				10				
S-7	12.0	24"	5 8 17 21								
								EL -3.2 / 14.1			
S-8	14.0	18"	8 14 12 7				15			Dark gray Organic Fat Clay (oh, fibrous Peat), wet, medium stiff to very stiff.	Sludge encountered @ S-8
S-9	16.0	24"	5 4 4 4								
T-2	18.0										
S-11	20.0	22"	2 2 3 3				20				
S-12	22.0	24"	3 3								

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-03R

TEST BORING LOG

BORING ID-03R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642967.64
EASTING: 570797.8
ELEVATION: 10.95
START DATE: 7/30/2012
END DATE: 7/30/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
			4 4					EL -12.9			
S-13	24.0	24"	6 7 14 19				25	23.8		Dark to light grey Lean Clay (cl) with some Sand and organic matter, wet, very stiff.	Sand encountered @ S-13
								EL -17.1			
								28.0		Red-brown Clayey Sand with Gravel (sc), wet, dense to very dense.	
S-14	30.0	10"	21 19 25 32				30				
							35	EL -24.2			Drill refusal
S-15	35.0	NR	50/1"					35.1		Bottom of Boring @ 34.5 ft.	
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-03R

TEST BORING LOG

BORING ID-04

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642826.52
EASTING: 570031.74
ELEVATION: 4.21
START DATE: 7/30/2012
END DATE: 7/30/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/30/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	6"	8 14 26 17							Brown Silty Sand with Gravel (sm), moist, dense.	Safety Hammer is used
S-2	2.0	6"	3 11 22 22								Sludge encountered @ S-2
								EL 0.2 / 4.0			
S-3	4.0	NR	3 3 2 1				5			Dark gray Sludge (classified as Elastic Silt (mh)), wet, very loose to loose (Fill).	
S-4	6.0	12"	1 1 1 1								
T-1	8.0	14"									
S-5	10.0	24"	2 2 3 2				10				
S-6	12.0	20"	2 2 1 1								
								EL -9.1 / 13.3			
S-7	14.0	24"	3 2 2 4				15			Dark gray Organic Fat Clay (oh, fibrous Peat), wet, soft to stiff.	
S-8	16.0	24"	3 4 7 14								Sand encountered @ S-8
								EL -13.7 / 17.9			
S-9	18.0	14"	9 10 12 13				20			Reddish brown Sandy Lean Clay with Gravel (cl), very stiff to hard.	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-04

TEST BORING LOG

BORING ID-04

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642826.52
EASTING: 570031.74
ELEVATION: 4.21
START DATE: 7/30/2012
END DATE: 7/30/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/30/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-10	25.0	18"	13 25 44 37				25				
S-11	30.0	NR	11 25 26 25				30				
S-12	35.0	6"	48 50/5"				35	EL -31.8 36.0		Bottom of Boring @ 36 ft.	Drill refusal
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-04

TEST BORING LOG

BORING ID-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 3
NORTHING: 642187.4
EASTING: 570649.34
ELEVATION: 7.09
START DATE: 7/13/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/13/2012		6			SIZE, ID	4 1/4"	1 3/8"	
7/16/2012		4			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	10"	8 23 50 50/3"							Brown to gray Silty Sand with Gravel (sm), moist to wet, medium dense to very dense (Fill).	Donut Hammer is used
S-2	2.0	NR	16 50/0"								
S-3	4.0	2"	18 12 22 13				5				
S-4	6.0	NR	2 10 9 8					EL 0.1 7.0		Dark gray to gray Sludge (classified as Elastic Silt (mh)), wet, loose (Fill).	
S-5	8.0	10"	2 2 3 4								
S-6	10.0	4"	6 5 5 7				10	EL -4.9 12.0			
S-7	12.0	24"	1 1 1 1							Dark gray Organic Fat Clay (oh, fibrous Peat), wet, very soft to medium stiff.	
S-8	14.0	6"	1 2 3 3				15	EL -9.4 16.5			
T-1	17.0									Gray to brown Silty Clay (cl-ml), wet, stiff to very stiff.	
S-9	19.0	24"	6 11 13 18				20				Gravel and Sand encountered @ S-9, S-10

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-05

TEST BORING LOG

BORING ID-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 3
NORTHING: 642187.4
EASTING: 570649.34
ELEVATION: 7.09
START DATE: 7/13/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/13/2012		6			SIZE, ID	4 1/4"	1 3/8"	
7/16/2012		4			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-10	25.0	24"	4 5 7 11				25				
								EL -20.4 27.5		Brown Silty Sand with Gravel (sm), wet, very dense.	
S-11	30.0	6"	80/6"				30				
S-12	34.5	20"	73 78 75/3"				35				Less Gravel encountered @ S-12
S-13	40.0	2"	50/2"				40				
S-14	45.0	2"	50/2"				45				No Gravel @ S-14

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-05

TEST BORING LOG

BORING ID-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 3 of 3
NORTHING: 642187.4
EASTING: 570649.34
ELEVATION: 7.09
START DATE: 7/13/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/13/2012		6			SIZE, ID	4 1/4"	1 3/8"	
7/16/2012		4			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								EL -39.9 / 47.0			
										Bottom of Boring @ 47 ft.	
							50				
							55				
							60				
							65				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-05

TEST BORING LOG

BORING ID-06

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 641800.44
EASTING: 571811.34
ELEVATION: 3.31
START DATE: 7/26/2012
END DATE: 7/26/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/26/2012		0			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
U-1	0.0	7"							Gray Sludge (classified as Elastic Silt (mh)), wet, soft.	Safety Hammer is used
S-2	2.0	20"	1 2 1 2	109.2%	62	1				
S-3	4.0	24"	1 2 1 2				5	EL -2.7		
S-4	6.0	24"	0 0 0 0					6.0	Dark Grey Organic FAT CLAY (CH, fibrous Peat), wet, very soft to medium stiff.	
S-5	8.0	24"	0 0 0 0							
S-6	10.0	24"	1 2 2 4				10			
S-7	12.0	24"	1 2 2 2							
U-2	14.0	24"		120.9%	130	87	15			
S-8	16.0	24"	1 2 3 2					EL -14.7		pp = 0 tsf
S-9	18.0	24"	7 8 17 14					18.0	Dark grey Sandy Fat Clay (ch), wet, very stiff, slight odor.	pp = 0.15 tsf Sand encountered @ bottom of S-9 pp = 2.5 tsf
							20	EL -16.0 19.3	Brown Silty Sand (sm), wet, medium dense to very dense.	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-06

TEST BORING LOG

BORING ID-06

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 641800.44
EASTING: 571811.34
ELEVATION: 3.31
START DATE: 7/26/2012
END DATE: 7/26/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/26/2012		0			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-10	25.0	12"	21 25 26 18				25				Rounded Gravel encountered @ S-10
								EL -25.2 / 28.5		Yellow-brown Poorly Graded Gravel with Sand (gp), wet, very dense.	
S-11	30.0	2"	19 31 29 10				30				
								EL -30.2 / 33.5		Red-brown Silty Gravel with Sand (gm), wet, dense.	
S-12	35.0	3"	8 14 23 12				35				
								EL -33.7 / 37.0		Bottom of Boring @ 37 ft.	
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING ID-06

TEST BORING LOG

BORING IS-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643206.36
EASTING: 571135.27
ELEVATION: 7.77
START DATE: 7/18/2012
END DATE: 7/19/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/18/2012		3			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	6"	9 50/5"							Brown Silty Sand with Gravel (sm), moist, dense to very dense (Fill).	Safety Hammer is used
S-2	2.0	6"	20 19 12 11								
S-3	4.0	20"	6 17 15 13				5				
								EL 1.8 6.0			
S-4	6.0	24"	3 2 2 2							Gray Sludge (classified as Elastic Silt (mh)), wet, very loose (Fill).	4" of Silty Clay encountered @ bottom of S-4
S-5	8.0	24"	2 1 1 1								
S-6	10.0	24"	1 2 3 2				10	EL -3.2 11.0			
										Dark gray Organic Lean Clay (oh, fibrous Peat), wet, very soft to stiff.	
S-7	12.0	24"	2 3 3 3								pp = 0 tsf
T-1	15.0						15				
S-8	17.0	24"	0 0 0 0								pp = 0 tsf
S-9	19.0	24"	5 5 5 5				20				
S-10	21.0	24"	0 0 0 0								pp = 0 tsf

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING IS-01

TEST BORING LOG

BORING IS-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643206.36
EASTING: 571135.27
ELEVATION: 7.77
START DATE: 7/18/2012
END DATE: 7/19/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/18/2012		3			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-11	23.0	20"	0 0 0 1								pp = 0 tsf
							25	EL -17.2 25.0			
S-12	25.0	16"	21 21 10 16							Brown to gray Clayey Sand with Gravel (sc), wet, dense.	
								EL -19.2 27.0			
										Bottom of Boring @ 27 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING IS-01

TEST BORING LOG

BORING IS-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642245.9
EASTING: 570899.93
ELEVATION: 6.24
START DATE: 7/16/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/16/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/17/2012		3			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	10"	3 17 26 50/3"							Brown to gray Silty Sand with Gravel (sm), moist to wet, dense to very dense (Fill).	Donut Hammer is used
S-2	4.0	2"	50/5"				5				
								EL -0.1 6.3			
S-3	6.0	24"	1 2 1 3							Dark gray Sludge (classified as Elastic Silt (mh)), wet, very loose to medium dense (Fill).	Sludge encountered @ bottom of S-3
S-4	8.0	24"	4 5 6 10								
S-5	10.0	24"	3 5 6 5				10				
								EL -5.3 11.5			
S-6	12.0	24"	0 0 0 0							Dark Gray SANDY LEAN CLAY (CL, fibrous Peat), wet, very soft.	Sludge encountered @ S-6
S-7	14.0	24"	0 0 2 2				15				pp = 0 tsf
S-8	16.0	24"	0 0 1 2								pp = 0 tsf
T-1	19.0			99.3%	33	11	20				
S-9	21.0	24"	4 12 12 13					EL -15.8 22.0			Sand encountered @ first half of S-9
										Brown Clayey Sand with Gravel (sc),	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING IS-02

TEST BORING LOG

BORING IS-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642245.9
EASTING: 570899.93
ELEVATION: 6.24
START DATE: 7/16/2012
END DATE: 7/16/2012
DRILLER: Buck/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/16/2012		4			SIZE, ID	4 1/4"	1 3/8"	
7/17/2012		3			HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
										wet, medium dense to dense.	
S-10	25.0	20"	7 8 40 37				25				
								EL -20.8 27.0			
										Bottom of Boring @ 27 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE
		OVER 30	HARD	- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING IS-02

TEST BORING LOG

BORING W-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 644658.8
EASTING: 571589.02
ELEVATION: 2.66
START DATE: 8/3/2012
END DATE: 8/3/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	NR	0 0 0 0							Dark gray Organic Fat Clay (oh, fibrous Peat), wet, very soft to soft, organic ordor.	Safety Hammer is used
S-2	2.0	NR	0 0 0 0								
S-3	4.0	NR	0 0 0 0				5				
S-4	6.0	1"	0 0 0 0								
S-5	8.0	10"	0 0 0 0								pp = 0 tsf
S-6	10.0	24"	0 0 0 0				10				
U-1	12.0	NR									
S-7	14.0	24"	0 0 0 0				15				pp = 0 tsf
U-2	16.0	NR									
S-8	18.0	24"	0 0 3 3					EL -17.1			
S-9	20.0	24"	3 3 4 16				20	19.8		Dark gray Silty Sand (sm), wet, loose, slight organic ordor.	Sand encountered @ bottom of S-9

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING W-01

TEST BORING LOG

BORING W-01

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 644658.8
EASTING: 571589.02
ELEVATION: 2.66
START DATE: 8/3/2012
END DATE: 8/3/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							25	EL -22.3 / 25.0		Red-brown Silty Gravel with Sand (gm), wet, medium dense to dense.	
S-10	27.0	12"	14 13 17 20								pp = 2.0 to 2.5 tsf
							30				
S-11	32.0	12"	15 33 17 21								
							35				
							40	EL -38.3 / 41.0			Drill refusal
										Bottom of Boring @ 41 ft.	
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY
0-4	VERY LOOSE	0-2	VERY SOFT
5-10	LOOSE	3-4	SOFT
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF
31-50	DENSE	9-15	STIFF
OVER 50	VERY DENSE	16-30	VERY STIFF
		OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-01

TEST BORING LOG

BORING W-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643937.12
EASTING: 570955.32
ELEVATION: 2.24
START DATE: 7/31/2012
END DATE: 7/31/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/31/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	NR	0 0 0 0							Dark gray Organic Fat Clay (oh, fibrous Peat), wet, very soft to stiff.	Safety hammer is used
S-2	2.0	NR	0 0 0 0								
S-3	4.0	NR	0 0 0 0				5				
S-4	6.0	16"	0 0 0 0								
S-5	8.0	1"	0 0 0 0								4" of fibrous Peat encountered @ S-5
T-1	10.0	NR					10				
S-6	12.0	6"	0 0 0 0								
S-7	14.0	8"	0 0 0 0				15				
S-8	16.0	22"	6 5 6 4								
S-9	18.0	8"	0 0 0 0					EL -16.1 / 18.3		Light gray Clayey Sand (sc), wet, very loose to medium dense.	
S-10	20.0	20"	8 8 8 16				20	EL -19.5 / 21.7			
S-11	22.0	24"	20 8							Red-brown Silty Gravel with Sand (gm), wet, medium dense to very	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-02

TEST BORING LOG

BORING W-02

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643937.12
EASTING: 570955.32
ELEVATION: 2.24
START DATE: 7/31/2012
END DATE: 7/31/2012
DRILLER: C. Moreira/W.G
LOGGED BY: D. Morar

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/31/2012		6			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-12	24.0	17"	9 17 8 13 50/5"				25			dense.	
								EL -24.3 26.5		Bottom of Boring @ 26.5 ft.	Drill refusal
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-02

TEST BORING LOG

BORING W-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643258.26
EASTING: 570064.21
ELEVATION: 2.46
START DATE: 8/2/2012
END DATE: 8/2/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	NR	0 0 0 0							Dark gray Organic Fat Clay (oh, fibrous Peat), wet, very soft.	Safety Hammer is used
S-2	2.0	NR	0 0 0 0								
S-3	4.0	NR	0 0 0 0				5				
S-4	6.0	4"	0 0 0 0								pp = 0 tsf
S-5	8.0	16"	0 0 0 0								pp = 0 tsf
S-6	10.0	16"	0 0 0 0				10				pp = 0 tsf
S-7	12.0	24"	0 0 0 0								
U-1	14.0	NR					15				
S-8	16.0	24"	12 14 21 32					EL -14.7 / 17.2		Red-brown Silty Gravel (gm), wet, dense to very dense.	pp = 2 tsf
							20				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-03

TEST BORING LOG

BORING W-03

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643258.26
EASTING: 570064.21
ELEVATION: 2.46
START DATE: 8/2/2012
END DATE: 8/2/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-9	23.0	6"	18 26 28 18				25				
S-10	28.0	8"	60 50/4"								
							30	EL -27.5 30.0		Bottom of Boring @ 30 ft.	
							35				
							40				
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-03

TEST BORING LOG

BORING W-04

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642017.49
EASTING: 572024.97
ELEVATION: 2.68
START DATE: 7/27/2012
END DATE: 7/27/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	2"	0 0 0 0							Dark gray Elastic Silt (mh, fibrous Peat), wet, very loose to loose, organic ordor.	Safety Hammer is used
S-2	2.0	2"	0 1 2 1								
S-3	4.0	10"	1 1 2 2				5				
S-4	6.0	4"	0 0 0 0								
S-5	8.0	24"	0 0 0 0								pp = 0 tsf
S-6	10.0	18"	0 0 0 0				10				
U-1	12.0	24"									
S-7	14.0	24"	0 0 0 0				15				
S-8	16.0	24"	3 2 8 9								pp = 0 tsf
								EL -15.3			
S-9	18.0	24"	14 17 32 34				20	18.0		Brown to gray Silty Sand with Gravel (gm, rounded), wet, dense to very dense.	

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-04

TEST BORING LOG

BORING W-04

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642017.49
EASTING: 572024.97
ELEVATION: 2.68
START DATE: 7/27/2012
END DATE: 7/27/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-10	25.0	22"	6 16 19 16				25				
								EL -24.1 26.8		Red-brown Gravelly Silt (ml), wet, very dense.	
S-11	30.0	6"	35 50 50/3"				30				
								EL -29.3 32.0		Bottom of Boring @ 32 ft.	
							35				
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE
		OVER 30	HARD	- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-04

TEST BORING LOG

BORING W-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 643131.63
EASTING: 571399.36
ELEVATION: 2.52
START DATE: 7/17/2012
END DATE: 7/17/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		0			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	2"	1 0 0 0							Brown to Gray SANDY LEAN CLAY (CL, fibrous Peat), wet, very soft to soft.	Safety hammer is used
S-2	2.0	4"	1 1 1 1								
S-3	4.0	18"	0 0 0 0				5				pp = 0 tsf
S-4	6.0	24"	1 1 1 1								pp = 0 tsf
S-5	8.0	16"	0 0 0 1								pp = 0 tsf
S-6	10.0	24"	1 1 2 1				10				pp = 0 tsf
S-7	12.0	24"	1 1 2 1								pp = 0 tsf
T-1	15.0			26.1%	25	10	15				
								EL -14.5 / 17.0			
S-8	17.0	12"	0 6 12 16							Gray Silty Sand with Gravel (sm), wet, medium dense to dense.	
S-9	19.0	24"	15 14 21 33				20				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING W-05

TEST BORING LOG

BORING W-05

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 643131.63
EASTING: 571399.36
ELEVATION: 2.52
START DATE: 7/17/2012
END DATE: 7/17/2012
DRILLER: C. Moreira/W.G
LOGGED BY: B. Imamoglu

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
7/17/2012		0			SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								EL -21.0 / 23.5		Brown to grey Sandy Gravel (gp), wet, dense.	
S-10	25.0	24"	14 29 15 28				25				
S-11	30.0	12"	20 15 19 19				30	EL -28.0 / 30.5		Brown to grey Clayey Silt (ml) with Sand and Gravel, wet, dense.	
S-12	35.0	12"	15 21 24 26				35				
								EL -36.5 / 39.0		Brown to grey Sandy Gravel (gp), wet, very dense.	
S-13	40.0	2"	50/2"				40	EL -39.5 / 42.0			Shale fragments encountered @ S-13
										Bottom of Boring @ 42 ft.	
							45				

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-05

TEST BORING LOG

BORING W-07R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642115.88
EASTING: 570154.55
ELEVATION: 1.88
START DATE: 8/2/2012
END DATE: 8/2/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	4"	0 0 0 0							Dark gray Organic Fat Clay (oh, fibrous Peat), wet, very soft.	Safety Hammer is used
S-2	2.0	4"	0 0 0 0								
S-3	4.0	6"	0 0 0 0				5				
S-4	6.0	12"	0 0 0 0								
S-5	8.0	20"	0 7 6 7					EL -6.8 / 8.7		Brown to red Sandy Silt (ml), wet, medium dense.	
S-6	10.0	13"	12 10 11 11				10				
S-7	15.0	13"	10 12 18 20				15				Shale fragment encountered @ S-7 pp = 0.75 to 1.25 tsf
S-8	20.0	12"	13 12 11 18				20	EL -21.1			Gravel encountered @ S-8 pp = 1.5 tsf

BLOWS/FT.	DENSITY
0-4	VERY LOOSE
5-10	LOOSE
11-30	MEDIUM DENSE
31-50	DENSE
OVER 50	VERY DENSE

BLOWS/FT.	CONSISTENCY
0-2	VERY SOFT
3-4	SOFT
5-8	MEDIUM STIFF
9-15	STIFF
16-30	VERY STIFF
OVER 30	HARD

SAMPLE IDENTIFICATION
- S - SPLIT SPOON
- T - THIN WALL TUBE
- SS - 3in. SPLIT SPOON
- R - DIAMOND CORE
- W - WASH SAMPLE
- U - UNDISTURBED

SAMPLE PROPORTIONS	
DESCRIPTIVE TERM	PERCENT
TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	35 TO 50

BORING W-07R

TEST BORING LOG

BORING W-07R

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642115.88
EASTING: 570154.55
ELEVATION: 1.88
START DATE: 8/2/2012
END DATE: 8/2/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								23.0		Red-brown Silty Gravel (gm, weathered shale), wet, very dense.	
S-9	25.0	18"	32 37 50 50/3"				25	EL -25.1			
								27.0		Bottom of Boring @ 27 ft.	
							30				
							35				
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING W-07R

TEST BORING LOG

BORING W-08

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

JOB NUMBER: 128911
SHEET NO. 1 of 2
NORTHING: 642828.5
EASTING: 569760.6
ELEVATION: .03
START DATE: 8/1/2012
END DATE: 8/1/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
S-1	0.0	3"	0 0 0 0							Dark gray Sludge (classified as Elastic Silt (mh)), wet, very loose (Fill).	Safety Hammer is used
								EL -2.2 / 2.3			
S-2	2.0	7"	0 0 0 0							Gray LEAN CLAY (CL, fibrous Peat), wet, very soft.	
S-3	4.0	NR	0 0 0 0				5				
S-4	6.0	8"	0 0 0 0								
S-5	8.0	20"	0 0 0 0								pp = 0 tsf
S-6	10.0	18"	0 0 0 0				10				pp = 0 tsf
S-7	12.0	18"	0 0 0 0								
U-1	14.0	24"			36	20	15				
								EL -16.0 / 16.0			
S-8	16.0	18"	5 11 10 10							Red-brown Silt (ml), moist, medium dense to dense.	pp = 2 tsf
S-9	18.0	18"	19 18 17 15				20				
								EL -23.0			

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING W-08

TEST BORING LOG

BORING W-08

PROJECT : Rahway Arch Geotech Inv.
CLIENT : Soil Safe, Inc.
SITE: Rahway Arch Site

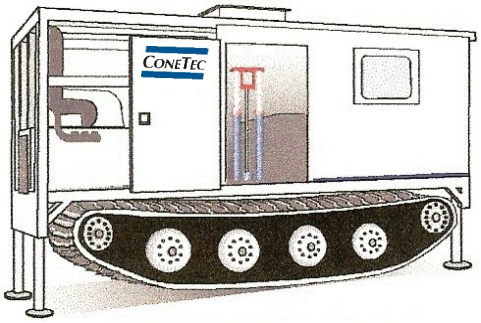
JOB NUMBER: 128911
SHEET NO. 2 of 2
NORTHING: 642828.5
EASTING: 569760.6
ELEVATION: .03
START DATE: 8/1/2012
END DATE: 8/1/2012
DRILLER: C. Moreira/W.G
LOGGED BY: G. Shen

GROUNDWATER DATA (feet)					EQUIPMENT	CASING	SAMPLER	CORE
Date	Time	Water	Inside Casing	Cave-In	TYPE	Mud rotary	SS	
					SIZE, ID	4 1/4"	1 3/8"	
					HAMMER WT.		140 lb	--------
					HAMMER FALL		30"	--------

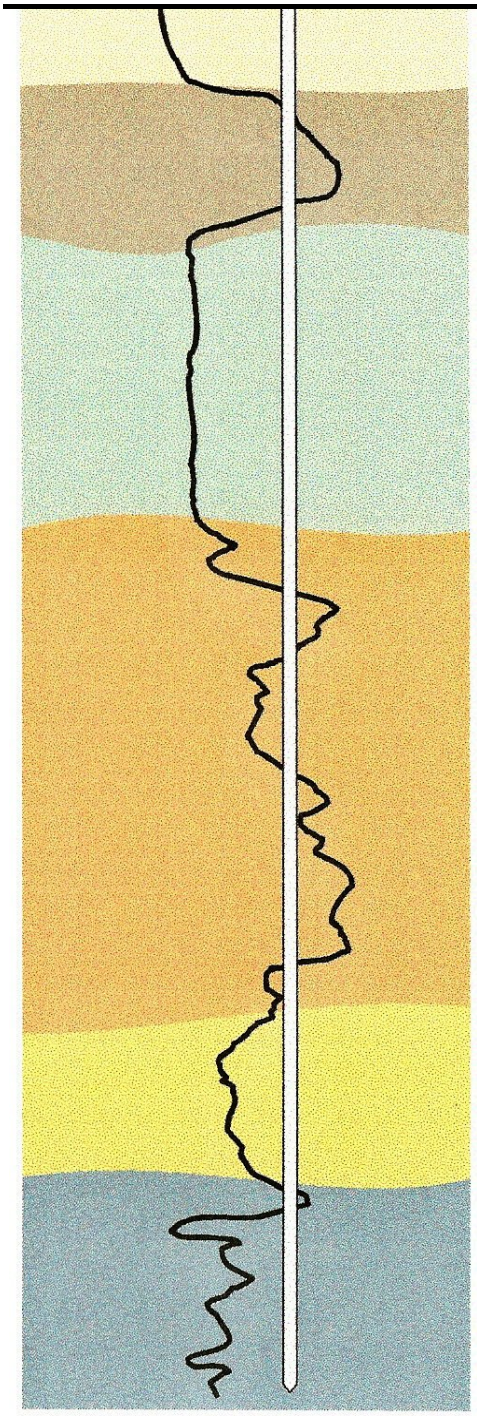
SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE RECOVERY	BLOWS / 6" (%RQD)	LABORATORY TEST RESULTS: NMC / Fract. Freq.	LIQUID LIMIT	PLASTICITY INDEX	DEPTH	ELEV. / DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								23.0		Red-brown Silty Gravel (gm, Shale fragments), wet, very dense.	
S-10	25.0	6"	10 24 50/3"				25				
							30				
								EL -32.0 32.0		Bottom of Boring @ 32 ft.	Drill refusal
							35				
							40				
							45				

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SAMPLE PROPORTIONS: DESCRIPTIVE TERM	PERCENT
0-4	VERY LOOSE	0-2	VERY SOFT	- S - SPLIT SPOON	TRACE	1 TO 10
5-10	LOOSE	3-4	SOFT	- T - THIN WALL TUBE	LITTLE	11 TO 20
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	- SS - 3in. SPLIT SPOON	SOME	21 TO 35
31-50	DENSE	9-15	STIFF	- R - DIAMOND CORE	AND	35 TO 50
OVER 50	VERY DENSE	16-30	VERY STIFF	- W - WASH SAMPLE		
		OVER 30	HARD	- U - UNDISTURBED		

BORING W-08



Geotechnical and Environmental In Situ Testing Contractors



ConeTec Field Report

Presentation of In Situ Test Results for:

Rahway Arch
Carteret, New Jersey

Presented to: Michael Baker Jr., Inc.

Date: July 25th, 2012

Presented by: ConeTec, Inc.
436 Commerce Lane
Unit C
West Berlin, NJ 08091
(856) 767-8600

PRESENTATION OF IN SITU TESTING PROGRAM RESULTS

Rahway Arch
Carteret, New Jersey

July 10th, 12th, 13th & 16th, 2012

Prepared for:

Michael Baker Jr., Inc.
Linthicum, Maryland

Prepared by:

ConeTec Inc.
West Berlin, NJ

July 25th, 2012

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TABLE 1 Summary of CPT Soundings

FIGURES

FIGURE 1 Typical Cone Penetrometer
FIGURE 2 Schematic of Shear Wave Testing Configuration
FIGURE 3 Typical Dissipation Tests

APPENDICES

APPENDIX A CPT Plots (shear wave, non-normalized and normalized)
APPENDIX B CPT Data Interpretation Summary
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1.0 INTRODUCTION

This report presents the results of a piezocone penetrometer testing (CPTU; also CPT) program carried out at the Rahway Arch Site located in Carteret, New Jersey. The work was performed under subcontract to Michael Baker Jr., Inc. of Linthicum, Maryland. The CPT program took place on July 10th, 12th, 13th & 16th, 2012.

A total of eighteen soundings were completed at eleven different sounding locations. The CPT program was performed to evaluate in situ geotechnical criteria relative to the soils.

In addition to the CPT soundings, shear wave velocity tests were performed at eight of the locations with testing at five foot depth intervals.

CPT sounding locations were selected and numbered under the direction and supervision of Baker personnel.

2.0 FIELD EQUIPMENT AND PROCEDURES

2.1 CONE PENETRATION TESTING

The cone penetrometer tests were carried out using an integrated electronic piezocone manufactured by ConeTec in Vancouver, Canada. The piezocone used was a compression model cone penetrometer with a 15 cm^2 tip and a 225 cm^2 friction sleeve. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.80. The piezocone dimensions and the operating procedure were in accordance with ASTM standard D-5778-07. A diagram of the cone penetrometer used for this project is shown as Figure 1.

Pore pressure filter elements, made of porous plastic, were saturated under a vacuum using silicone fluid as the saturating medium. The pore pressure element was six millimeters thick and was located immediately behind the tip (the u_2 location) for all soundings.

The cone was advanced using a skid drill rig, mounted on a Kori rig operated by Warren George, Inc. The following data were recorded onto magnetic media every five centimeters (approximately every two inches) as the cone was advanced into the ground:

- Tip Resistance (q_c)
- Sleeve Friction (f_s)
- Dynamic Pore Pressure (u)

Before each sounding a complete set of analog baseline readings are taken with a multi-meter and compared with the digitized value on the computer screen. This provides a check on the analog to digital conversion board.

Evaluation of the analog baselines is key to consistent readings. The baseline data should be stable and should not wander excessively during the course of a sounding. Baseline data can be used to apply corrections to the cone data where necessary. For this project, the baseline shift from sounding to sounding was small, typically less than 0.1% of full scale, and no data corrections were applied.

During seismic testing, the seismic signals were recorded using a geophone mounted in the cone as shown in Figure 1 and an up-hole digital oscilloscope. A sledge hammer, struck against a steel wedge was used as the seismic source. A schematic of the shear wave testing configuration, used with our truck rigs, is shown in Figure 2.

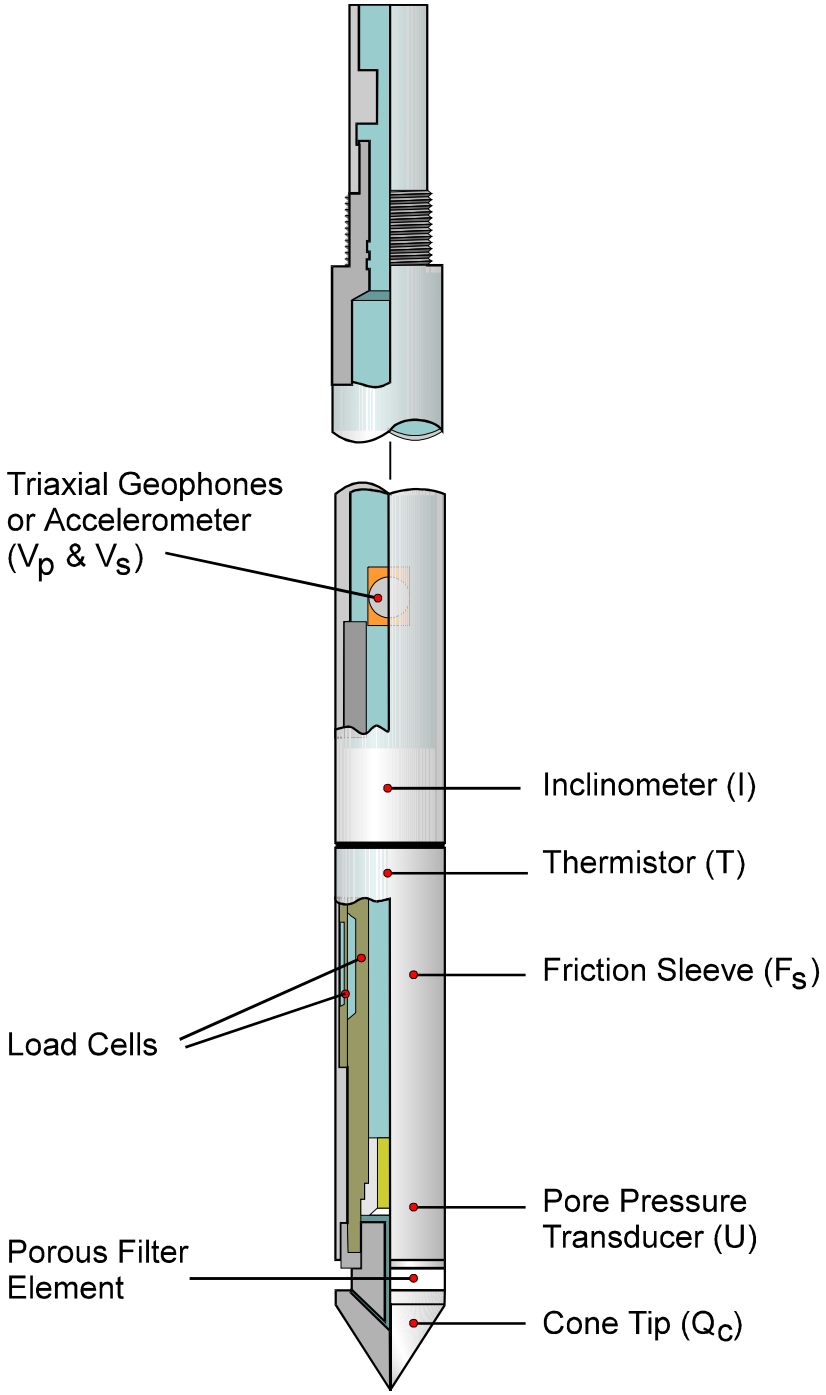


FIGURE 1 - TYPICAL CONE PENETROMETER

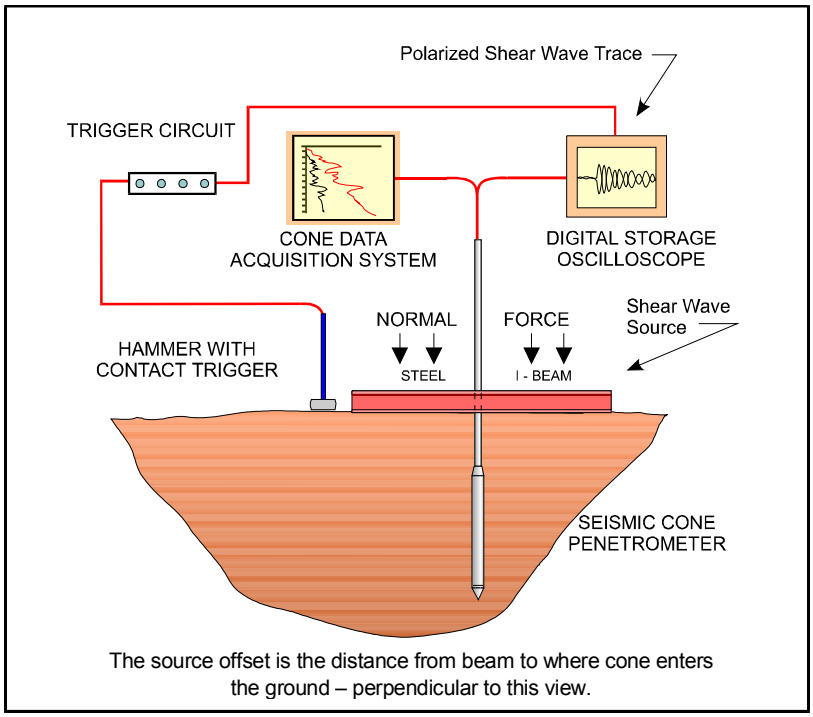


FIGURE 2 - SCHEMATIC OF SHEAR WAVE TESTING CONFIGURATION

2.2 PORE PRESSURE DISSIPATION TESTS

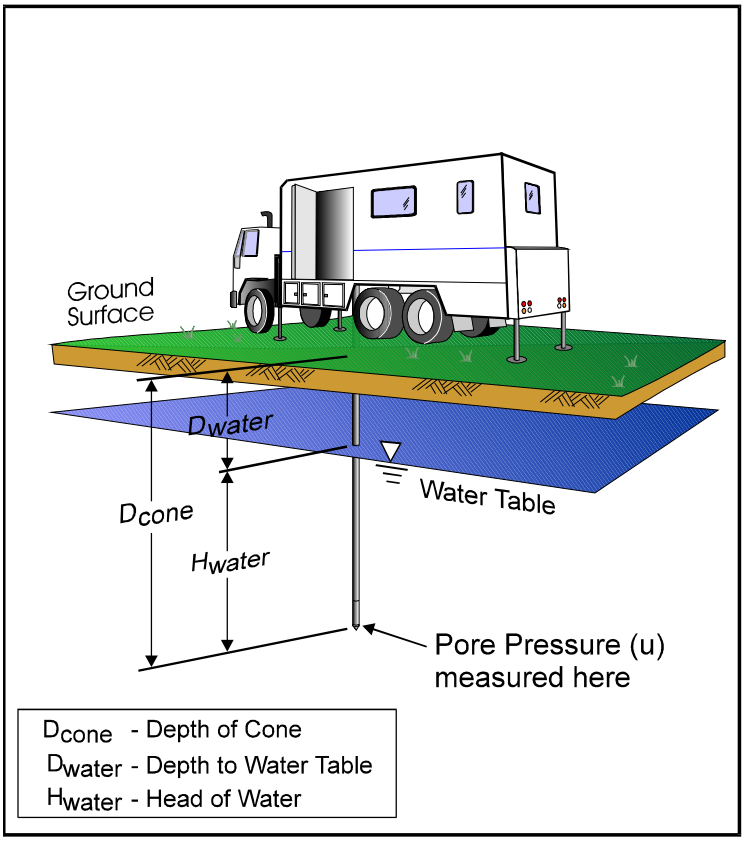
When cone penetration is stopped, the piezocone essentially becomes a piezometer. While stopped, pore water pressures are automatically recorded at five-second intervals and the readings are stored in a dissipation file (.ppd). Dissipation data can then be plotted onto a graph displaying a dissipation curve consisting of pore water pressure (u) verses time (t). The shapes of dissipation curves are very useful in evaluating soil type, drainage characteristics and in situ static water level.

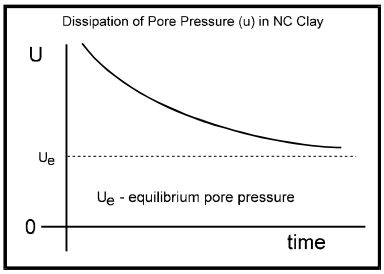
A flat curve that stabilizes quickly (i.e. less than 30 seconds) is typical of a free draining soil, generally sand. In this case, the final measured pore water represents the hydrostatic pressure in situ.

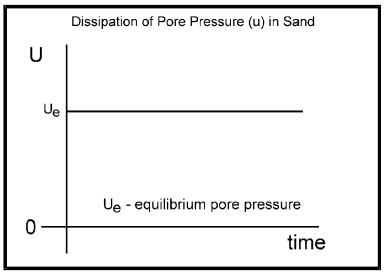
Soils that generate excess dynamic pore water pressure during penetration will dissipate this excess pressure when penetration stops. The shape of the dissipation curve and the time of dissipation can be used to estimate C_h, the coefficient of consolidation that can in turn be used to calculate K_h, the horizontal hydraulic conductivity.

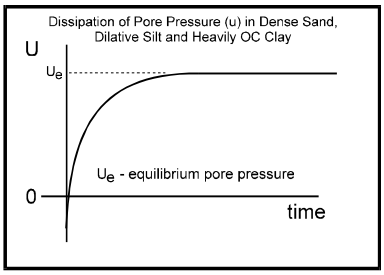
Figure 3 shows some idealized shapes of various pore water pressure dissipation curves. The reader is referred Robertson et. al., 1992 to reference dissipation test data analytical techniques.

Estimation of Ground Water Table from CPT Dissipation Tests









Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors:

1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

FIGURE 3 - TYPICAL DISSIPATION TESTS

3.0 CONE PENETRATION TEST DATA AND INTERPRETATION

3.1 ANALYSIS OF PIEZOCONE DATA - GENERAL

A total of eighteen CPT soundings, involving approximately 310.69 feet of testing, were completed at eleven locations.

The interpretation of cone data is based on the relationship between cone bearing, qc, sleeve friction, fs, and penetration pore water pressure, u. The friction ratio, Rf , (sleeve friction divided by cone bearing) is a calculated parameter which is used to infer soil behavior type. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

The interpretation of soils encountered on this project was carried out using correlations developed by Robertson et al., 1992. It should be noted that it is not always possible to clearly identify a soil type based on q_c, f_s and u. Occasionally soils will fall within different soil categories on the classification charts. In these situations, experience and judgment and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type. Computer tabulations of the interpreted soil types along with certain other geotechnical parameters for each sounding are presented in Appendix B.

Each of the parameters measured in the sounding are discussed briefly below. A detailed explanation of CPT testing and interpretation of the results can be found in Robertson, 1989.

TIP RESISTANCE (q_c): The resistance to penetration, measured at the cone tip, provides an accurate profile of subsurface strata. The recorded tip resistance is a composite of the penetration resistance of the soils located five to ten cone diameters (7 to 14 inches) in front of and behind the tip. The actual resistance "sensed" by the tip depends on the soil properties and on the relative stiffness of the layers encountered. Tip resistance is often corrected for pore pressure effects when testing in soft saturated cohesive soils.

For this project the correction was made and the tip resistance shown, q_t is the corrected tip resistance.

The correction used is: $q_t = q_c + (1-a)u$

Where:
- q_t = corrected tip resistance
- q_c = measured tip resistance
- a = net area ratio for cone (0.80 for this project)
- u = dynamic pore water pressure measured behind tip

SLEEVE FRICTION (f_s) The resistance recorded on the friction sleeve, is a measure of the remolded strength of the soil. Values of sleeve friction in very soft soils (such as peat) may fluctuate due to the measured force being small relative to the capacity of the measuring load cell.

FRICTION RATIO (R_f) The ratio of sleeve friction to tip resistance expressed as a percentage, is an indicator of soil type. Cohesive soils generally have friction ratios that are greater than two, while sands and non-plastic silts have friction ratios that are lower than two.

PORE PRESSURE (u) Dynamic pore water pressure is measured during penetration. Dynamic pore water pressure data can be found in the .cor and ifi.xls files. Static pore water pressure is measured when cone penetration is stopped. Static pore water pressure data can be found in the .ppd and -ppd.xls files. The measured dynamic pore water pressure changes with the location of the porous filter and negative readings are possible when the filter is located behind the tip.

It is important to note that the CPT classifies soil by physical behavior, not by grain size; therefore, the CPT classification should be verified against samples obtained from a conventional drilling program. While the CPT soil classification may not always be accurate in terms of the actual label it applies to a particular soil, it is very accurate in grouping soils with similar mechanical properties.

Table 1 presents a summary of CPT soundings, including sounding depths and pore pressure dissipation test results (when appropriate).

3.2 CONE PLOTS

The data from each sounding was plotted using the computer program SCREENzW. The plots are included in Appendix A. SCREENzW was developed by ConeTec Inc. and it incorporates soil behavior type (SBT) classification as part of the plot. The soil classification is based on the classification chart reproduced in Appendix B.

3.3 PORE PRESSURE DISSIPATION TEST RESULTS

When conducting CPT investigations, pore water pressure dissipations are automatically recorded during pauses in penetration. The pore water pressure dissipation data is recorded at five second intervals. Dynamic and static pore pressure measurements, for each CPT, are included in the electronic data package. Numerous pore water dissipation tests were completed during this project. Those plots can be found in Appendix D.

3.4 SHEAR WAVE VELOCITY MEASUREMENTS

Shear wave velocity measurements were conducted during eight of the CPT soundings. Shear wave velocity measurements were recorded at five foot depth intervals. The shear wave velocity data can be found in Appendix C.

3.5 CPT DATA PROCESSING

The electronic data files were processed using the program SCREENzW. SCREENzW is a program developed by ConeTec to calculate common engineering parameters from CPT data. The data files (.xls) can be found in the electronic data package. The calculations used are summarized in the table found in Appendix B. Each calculation is derived according to the referenced article.

For this project, the piezometric surface was determined from the dissipation data and the dynamic pore water pressure responses recorded during the CPT. The exact depth used can be found in the headers of the IFI.xls files.

3.6 ELECTRONIC DATA PACKAGE

Along with the report, all of the project data can be downloaded from ConeTec's "ConeTec Data Services" (CDS) website (www.conetecdataservices.com) using a secure, project-specific user name and password. These electronic files contain all important project information including tabular data (.xls and ASCII formats), GPS coordinates of approximate sounding locations, dynamic and static pore water pressure and some basic interpretation files in Microsoft™ Excel format (.xls). Information regarding the digital file formats of the electronic files is included in Appendix E.

5.0 REFERENCES

Robertson, P.K., 1989, “Soil Classification using the Cone Penetration Test”, Canadian Geotechnical Journal, vol. 27, pages 151-158.

Robertson, P.K., Sully, J., Woeller, D.G., Lunne, T., Powell, J.M., and Gillespie, D.J., 1992, “Estimating Coefficient of Consolidation from Piezocone Tests”, Canadian Geotechnical Journal, vol. 29, pages 539-550.

Appendix A

TABLE 1 - SUMMARY OF CPT SOUNDINGS

Job No.: 12-741
Location: Rahway Arch - Carteret, New Jersey
Client: Michael Baker Jr.
Date: July 10, 12, 13 & 16, 2012

Date	CPTU Sounding	Filename	Total Depth (ft)	Shear Wave Velocity Tests	Northing UTM Zone 18 (m)	Easting UTM Zone 18 (m)
7/12/2012	CPT-01	741CP01.COR	28.87	6	4494960.099	566384.254
7/13/2012	CPT-02	741CP02.COR	29.53	4	4495002.412	566357.083
7/13/2012	CPT-03	741CP03.COR	19.85		4494350.587	566502.512
7/10/2012	CPT-04	741CP04.COR	26.57	5	4494609.823	566318.272
7/10/2012	CPT-05	741CP05.COR	39.53	8	4494785.778	566546.575
7/12/2012	CPT-06	741CP06.COR	1.31		4494389.830	566338.565
7/12/2012	CPT-06A	741CP06A.COR	26.90		4494362.192	566351.504
7/10/2012	CPT-08	741CP08.COR	24.11	5	4494351.925	566237.360
7/10/2012	CPT-08A	741CP08A.COR	20.83		4494361.037	566221.765
7/12/2012	CPT-09	741CP09.COR	1.80		4494425.712	566004.003
7/12/2012	CPT-09A	741CP09A.COR	1.15		4494425.675	565999.772
7/12/2012	CPT-09B	741CP09B.COR	1.31		4494422.012	566004.036
7/12/2012	CPT-09C	741CP09C.COR	2.13		4494412.962	566026.681
7/13/2012	CPT-09D	741CP09D.COR	18.87	4	4494423.887	566006.840
7/13/2012	CPT-10	741CP10.COR	21.00		4494621.281	566150.348
7/12/2012	CPT-11	741CP11.COR	4.92		4494109.305	566209.899
7/12/2012	CPT-11A	741CP11A.COR	21.16	4	4494116.517	566188.679
7/16/2012	CPT-12	741CP12.COR	20.83	4	4494164.223	566559.179
Totals:		18	310.69	40		

Note: Coordinates are in UTM-NAD83 (meters) Zone 18.

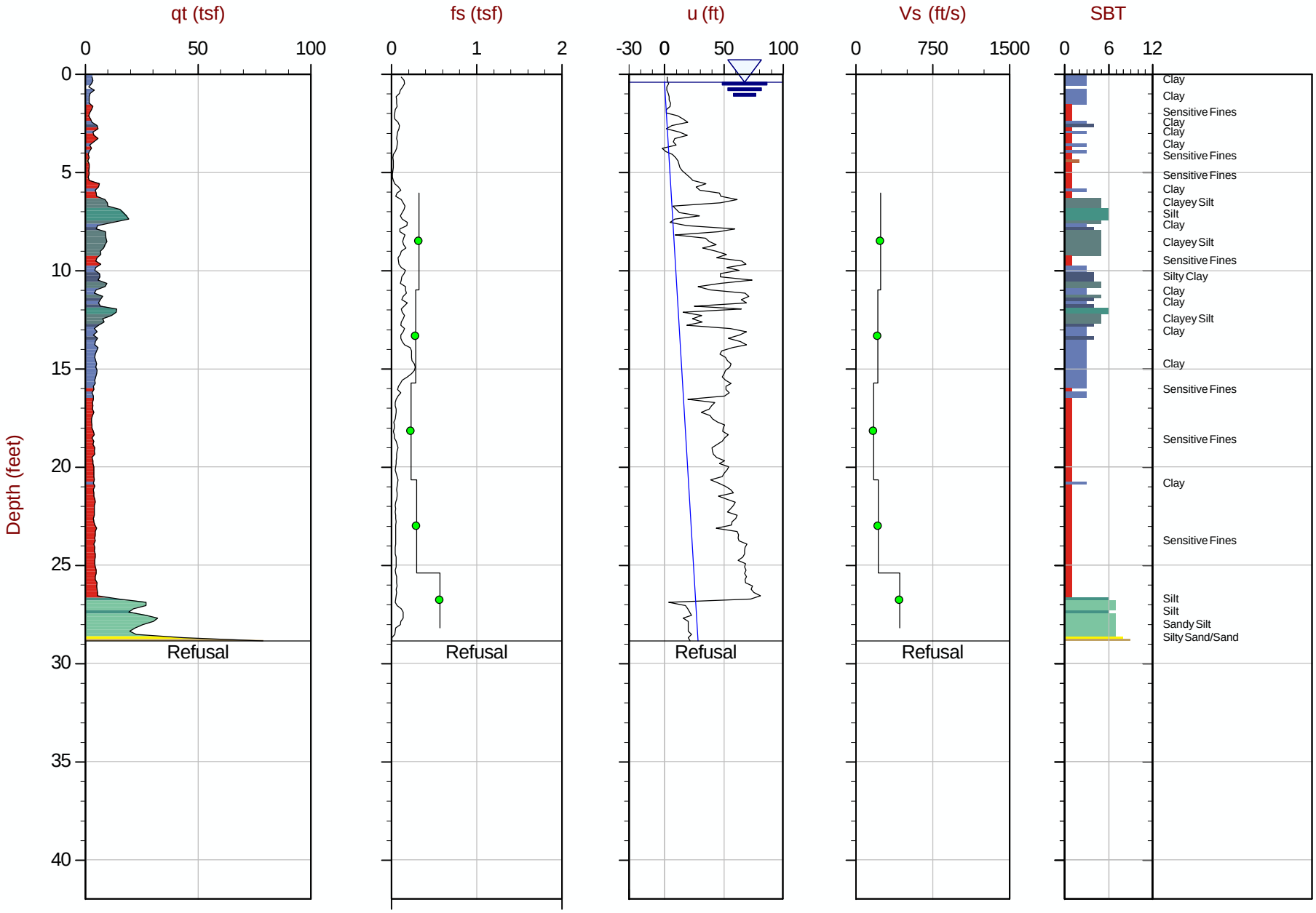
Shear Wave Velocity CPT Plots

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 07:18
Site: Rahway Arch

Sounding: CPT-01
Cone: 302:T1500F15U500



Max Depth: 8.800 m / 28.87 ft
Depth Inc: 0.050 m / 0.164 ft

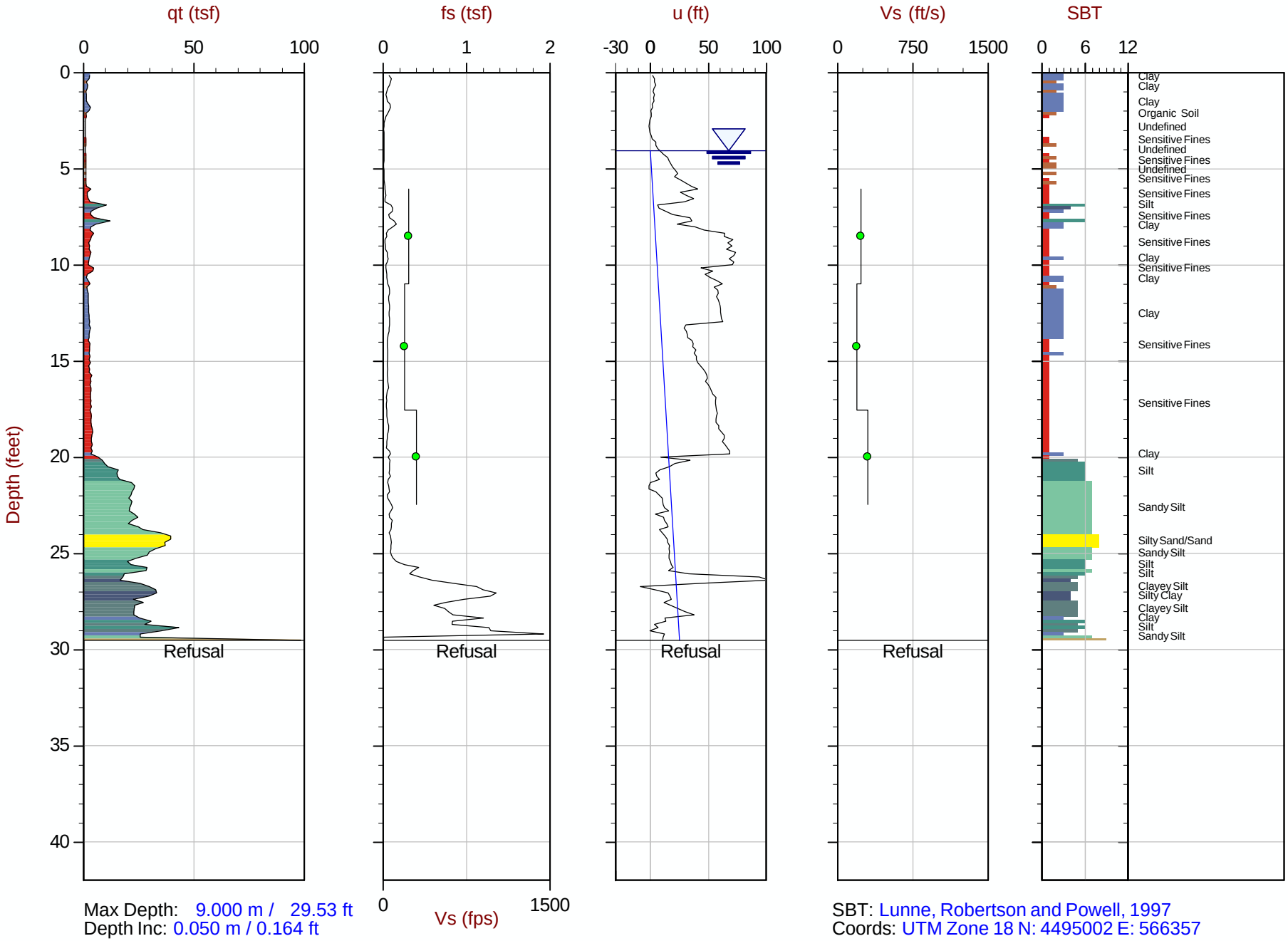
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494960 E: 566384

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 10:57
Site: Rahway Arch

Sounding: CPT-02
Cone: 302:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.050 m / 0.164 ft

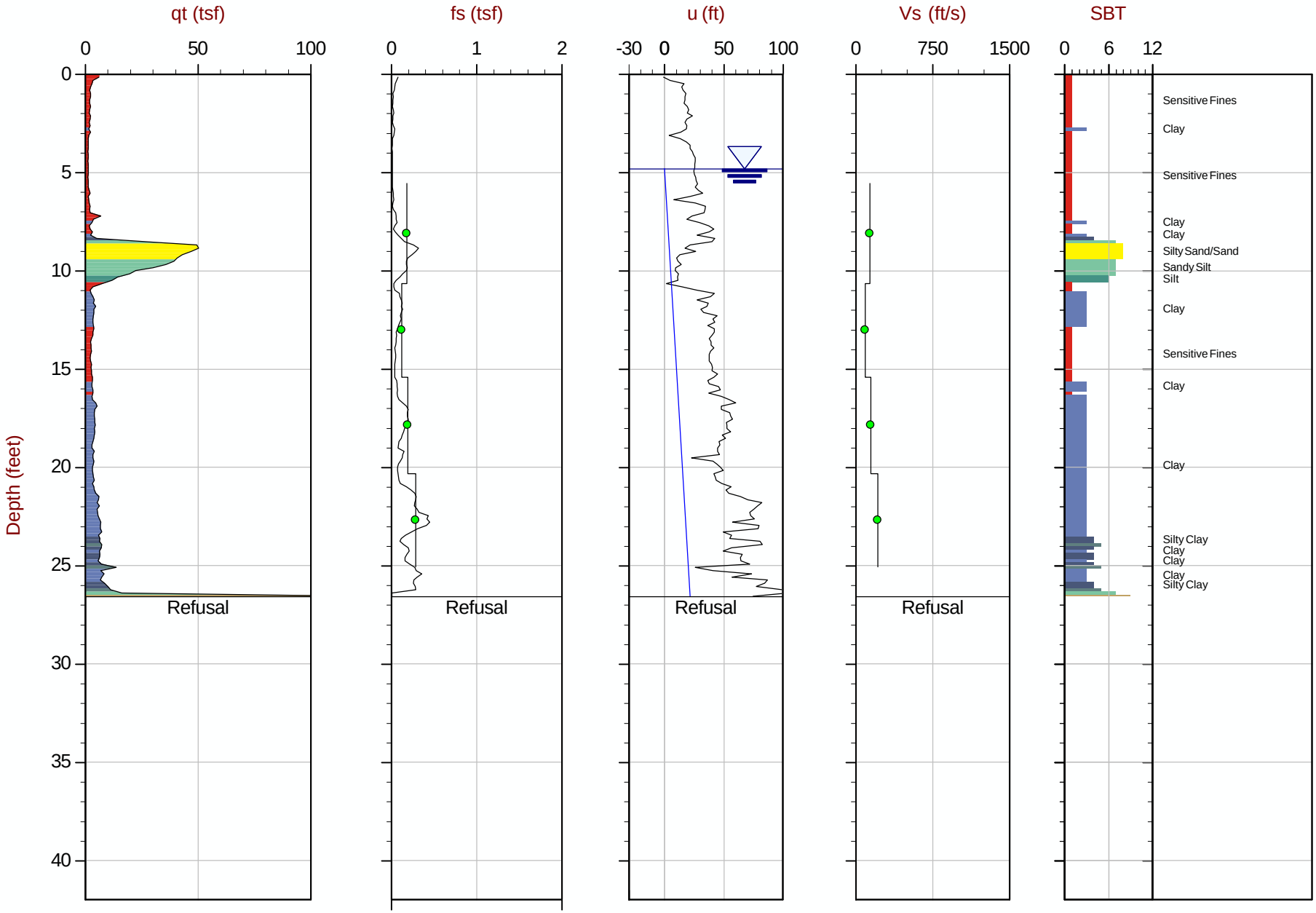
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4495002 E: 566357

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 12:07
Site: Rahway Arch

Sounding: CPT-04
Cone: 302:T1500F15U500



Max Depth: 8.100 m / 26.57 ft
Depth Inc: 0.050 m / 0.164 ft

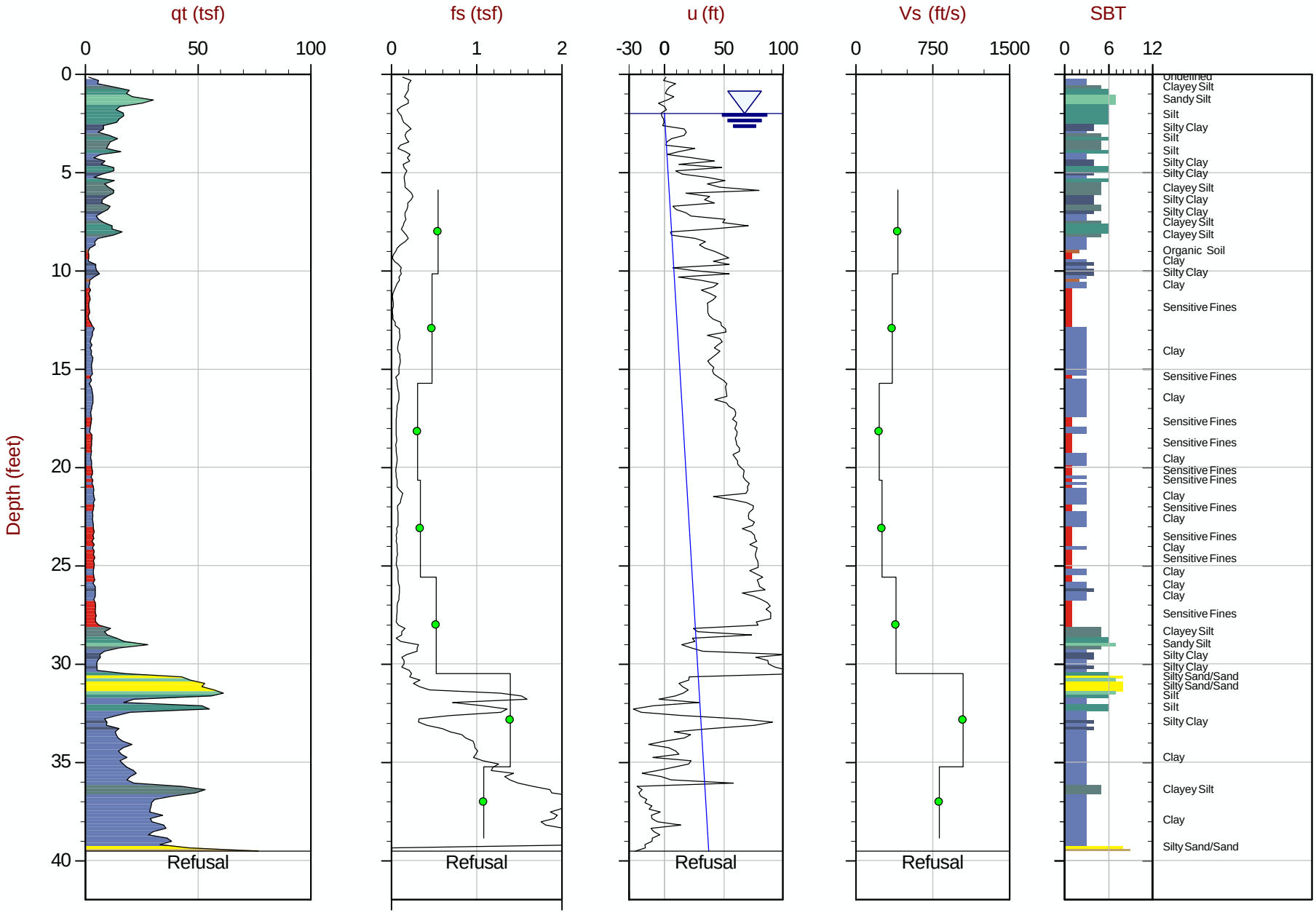
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494610 E: 566318

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 13:34
Site: Rahway Arch

Sounding: CPT-05
Cone: 302:T1500F15U500



Max Depth: 12.050 m / 39.53 ft
Depth Inc: 0.050 m / 0.164 ft

0 Vs (fps) 1500

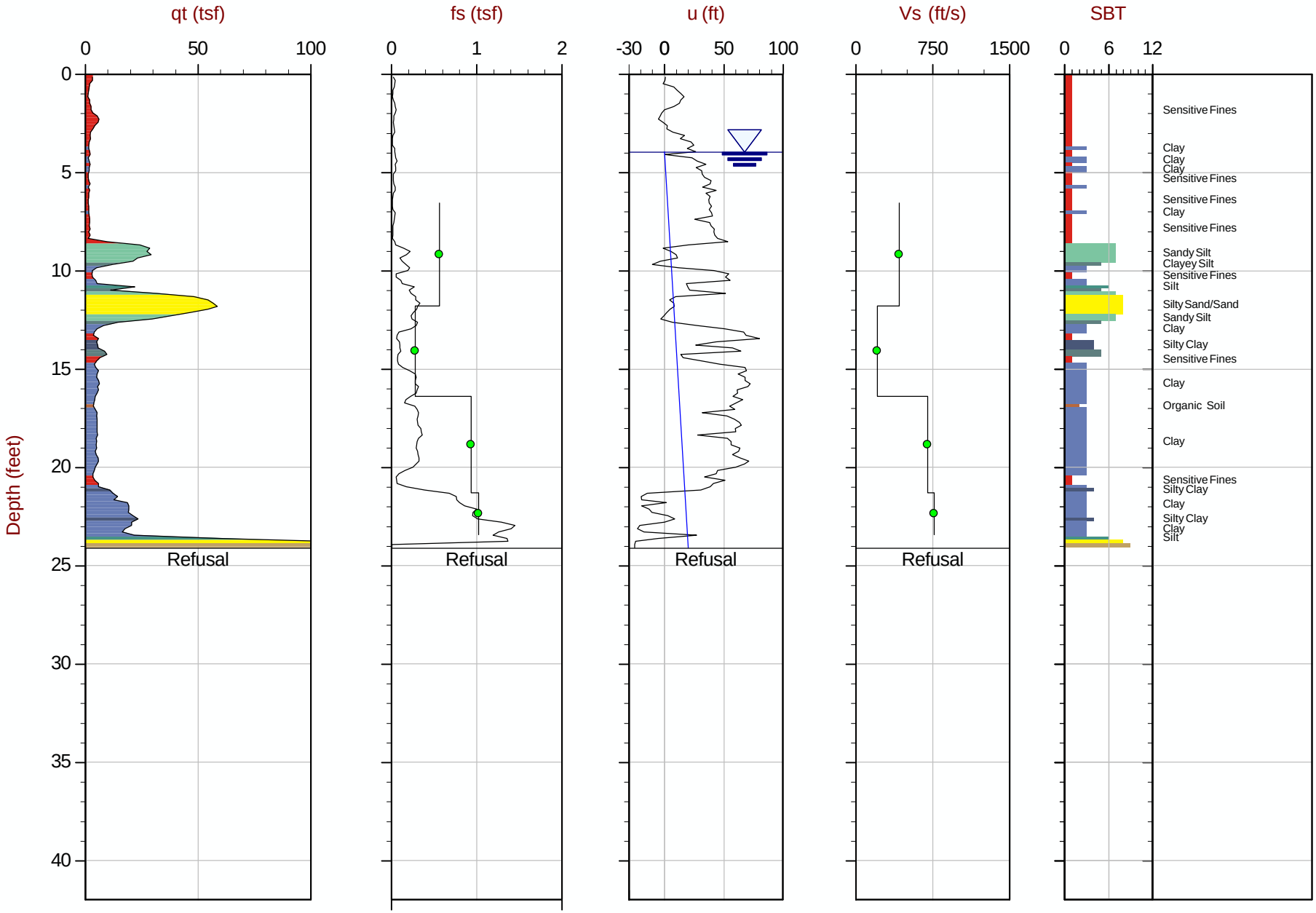
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494786 E: 566547

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 09:49
Site: Rahway Arch

Sounding: CPT-08
Cone: 302:T1500F15U500



Max Depth: 7.350 m / 24.11 ft
Depth Inc: 0.050 m / 0.164 ft

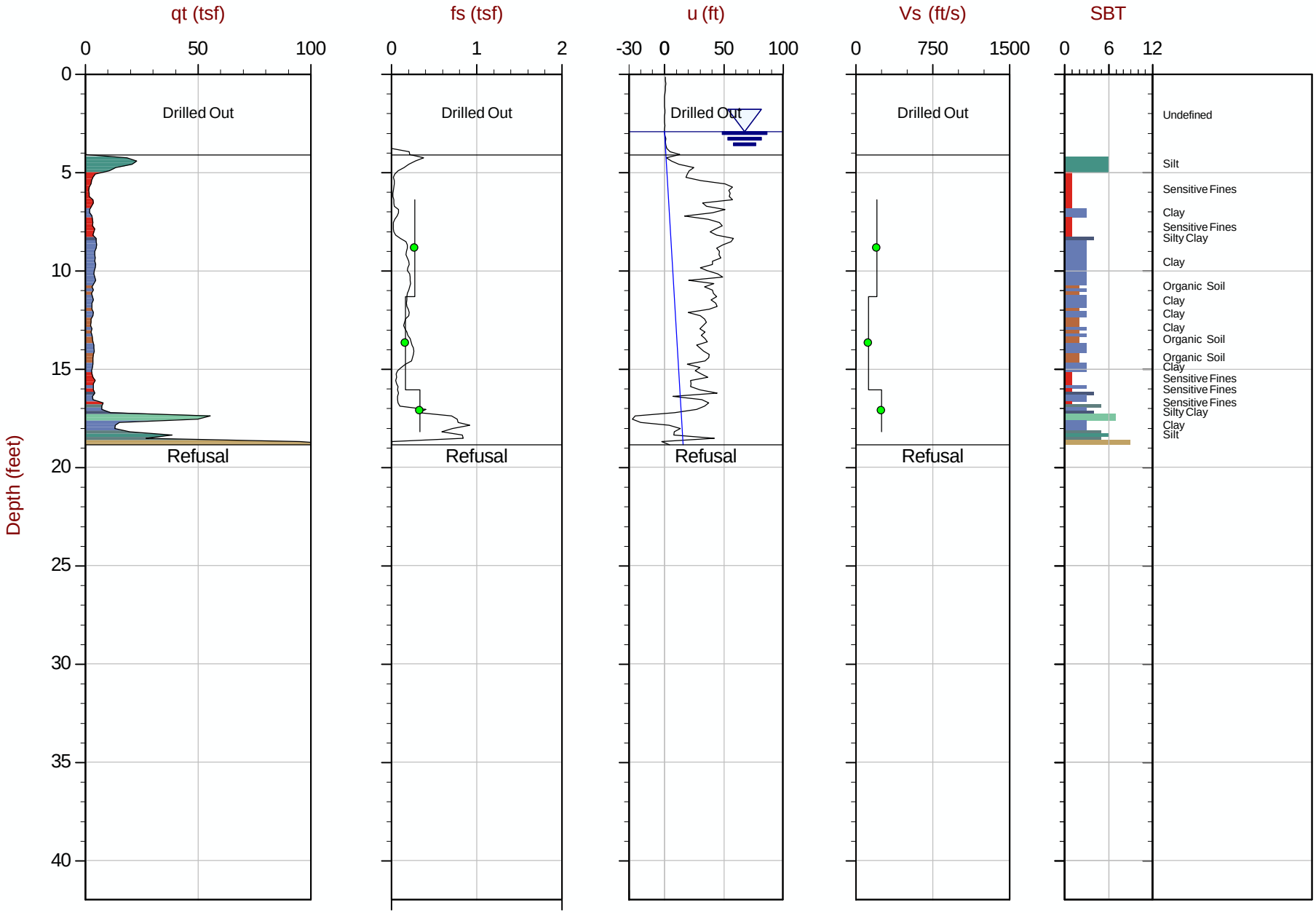
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494352 E: 566237

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 08:40
Site: Rahway Arch

Sounding: CPT-09D
Cone: 302:T1500F15U500



Max Depth: 5.750 m / 18.86 ft
Depth Inc: 0.050 m / 0.164 ft

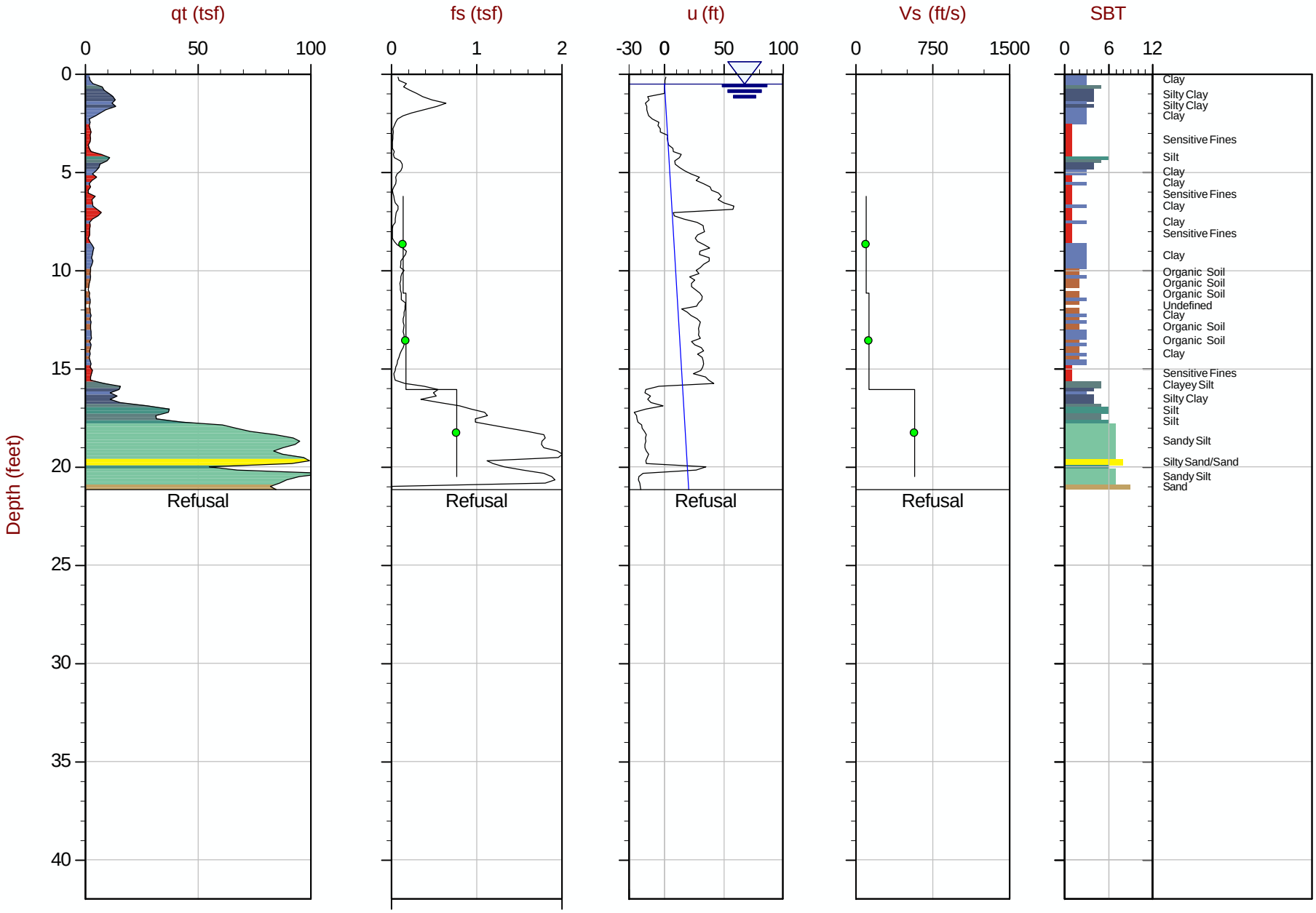
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494424 E: 566007

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 12:10
Site: Rahway Arch

Sounding: CPT-11A
Cone: 302:T1500F15U500



Max Depth: 6.450 m / 21.16 ft
Depth Inc: 0.050 m / 0.164 ft

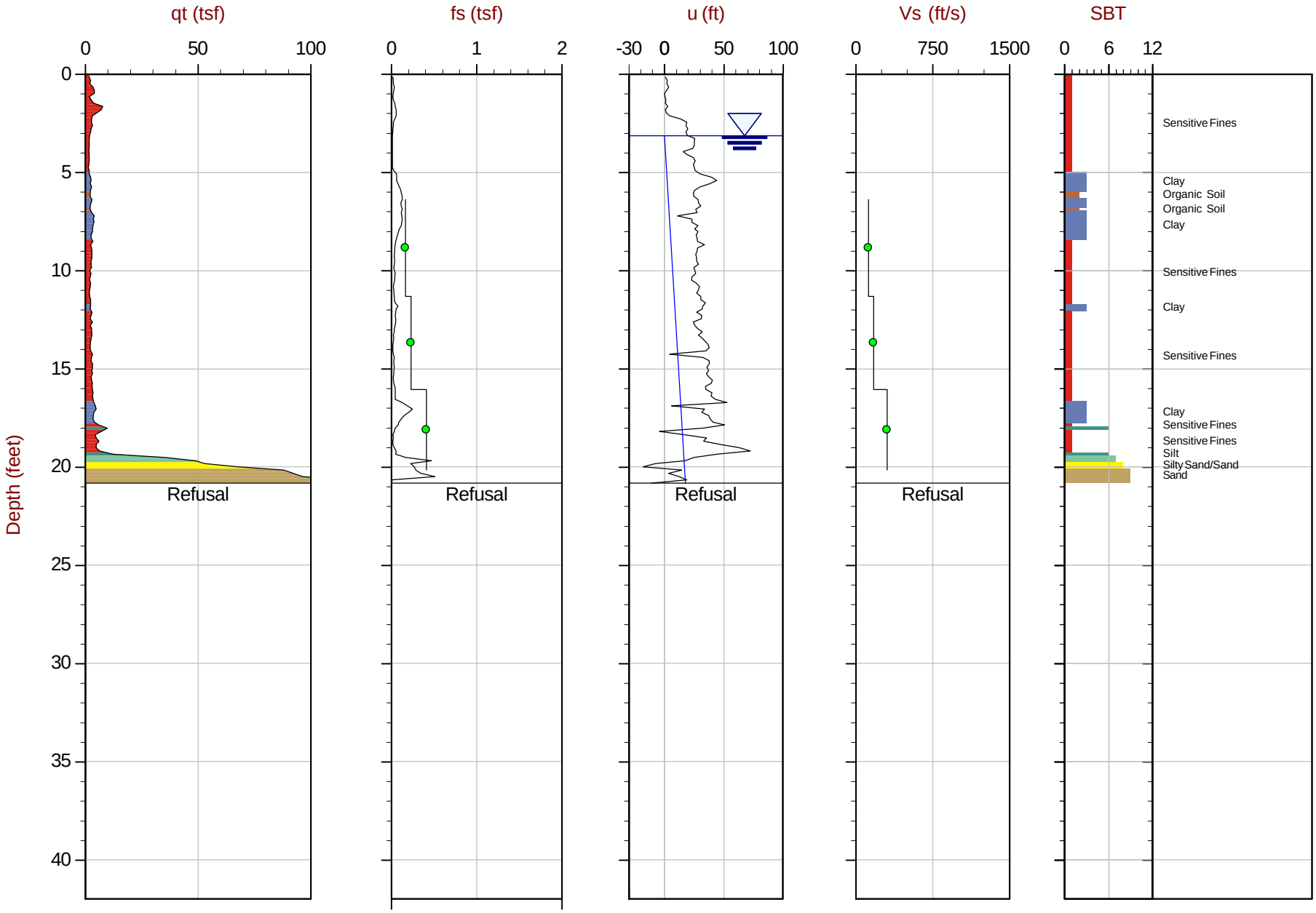
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494117 E: 566189

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:16:12 06:56
Site: Rahway Arch

Sounding: CPT-12
Cone: 302:T1500F15U500



Max Depth: 6.350 m / 20.83 ft
Depth Inc: 0.050 m / 0.164 ft

SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494164 E: 566559

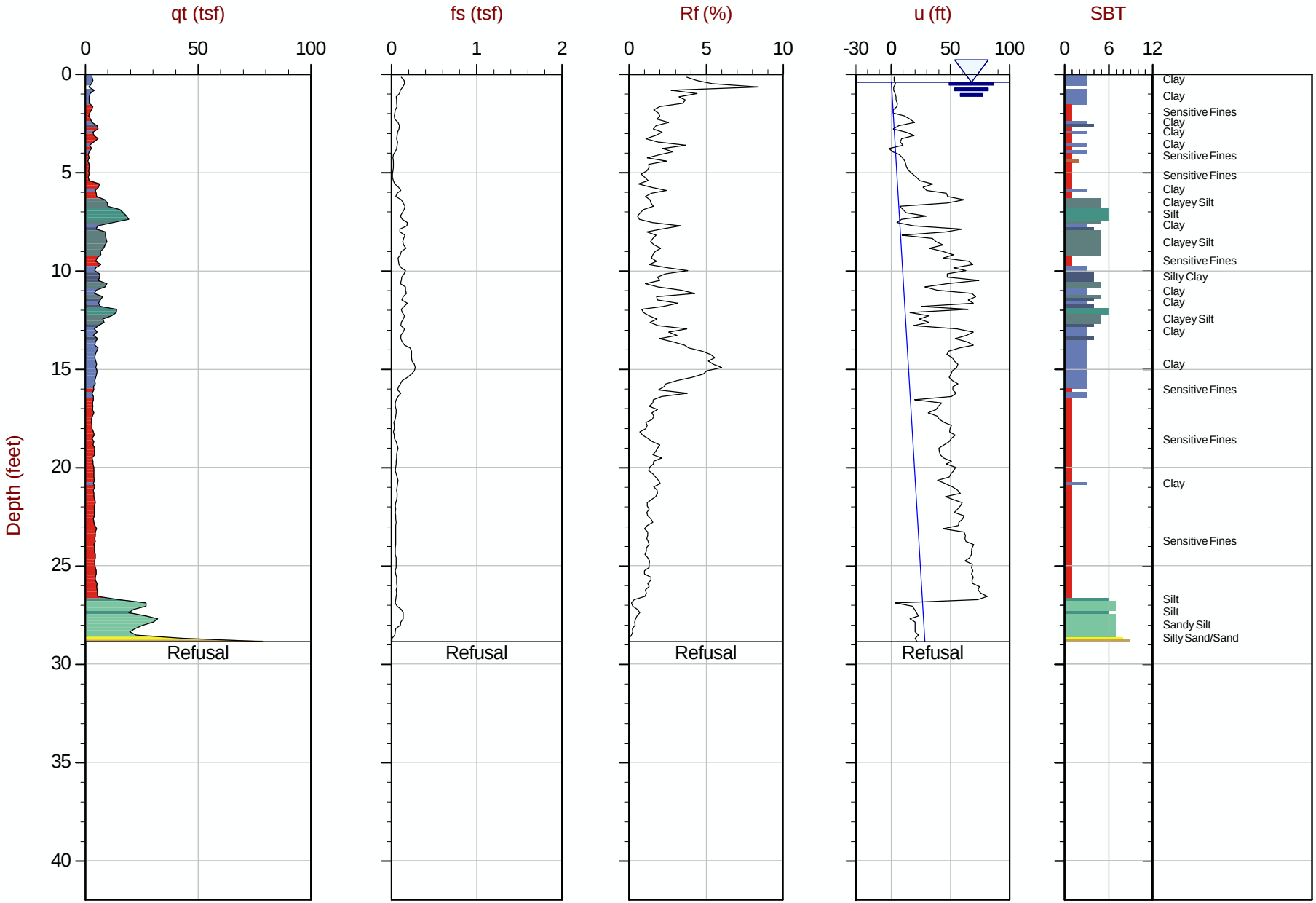
Non-Normalized CPT Plots

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 07:18
Site: Rahway Arch

Sounding: CPT-01
Cone: 302:T1500F15U500



Max Depth: 8.800 m / 28.87 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP01.COR

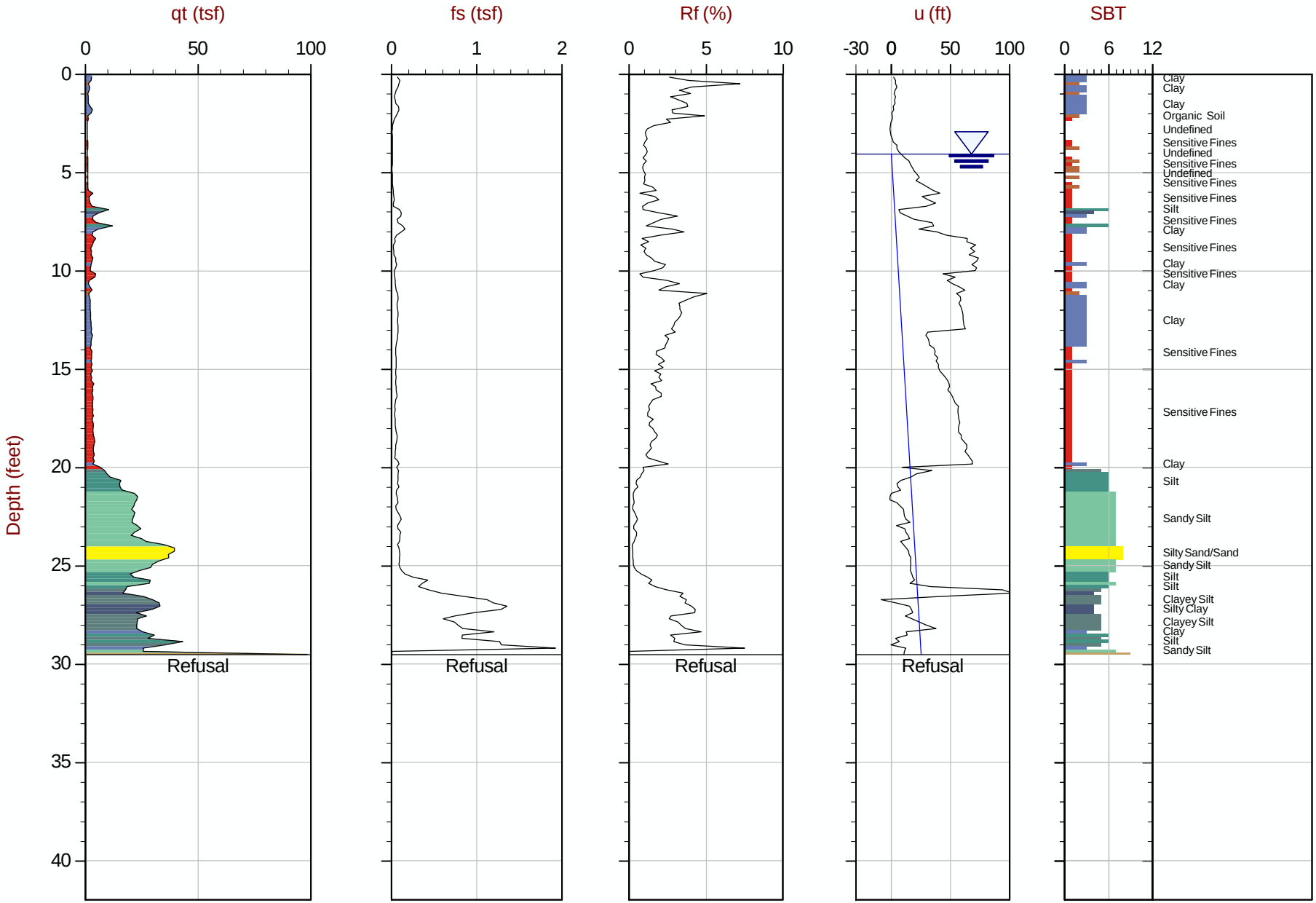
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494960 E: 566384

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 10:57
Site: Rahway Arch

Sounding: CPT-02
Cone: 302:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP02.COR

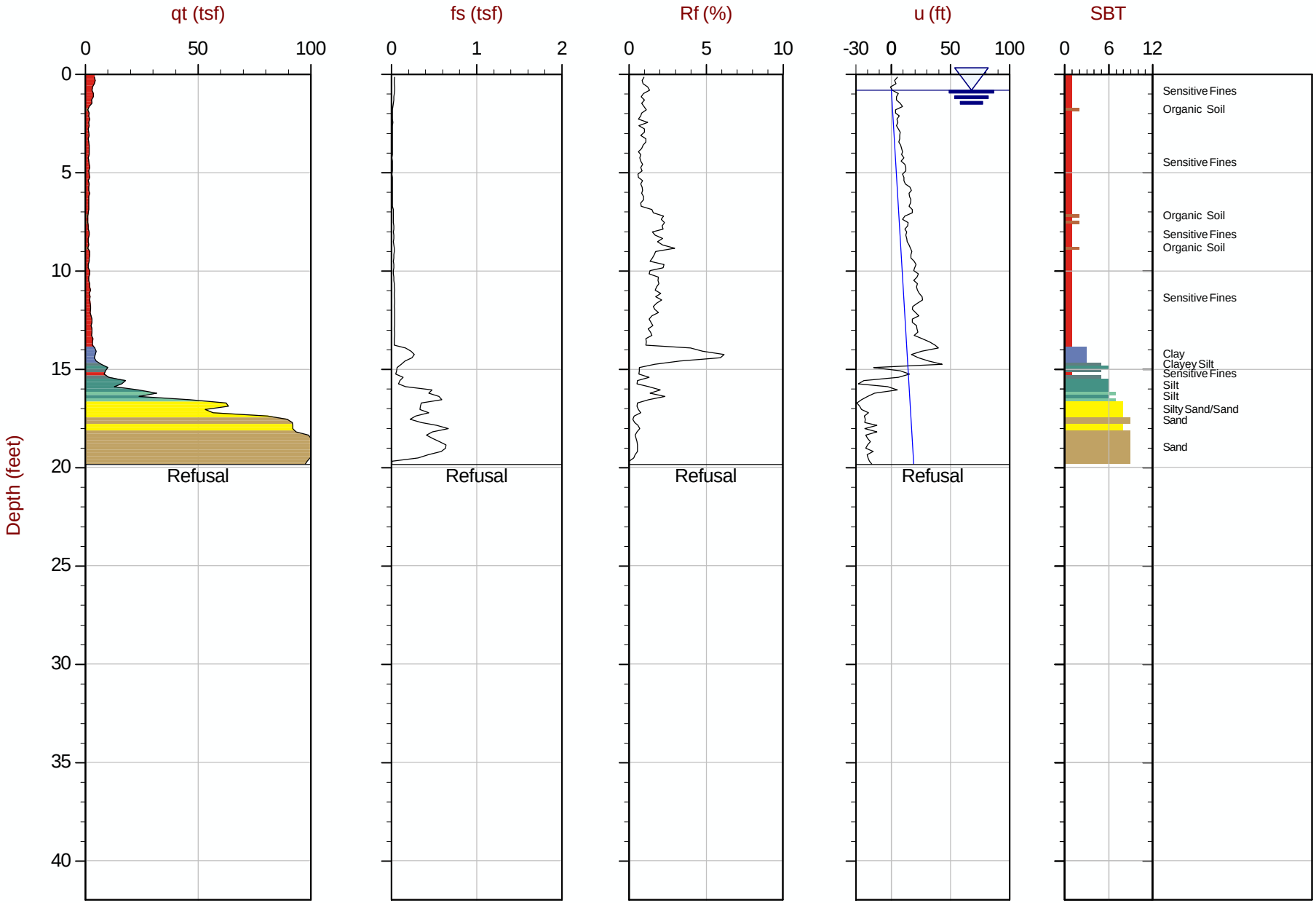
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4495002 E: 566357

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 13:02
Site: Rahway Arch

Sounding: CPT-03
Cone: 302:T1500F15U500



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Depth Inc: 0.050 m / 0.164 ft

File: 741CP03.COR

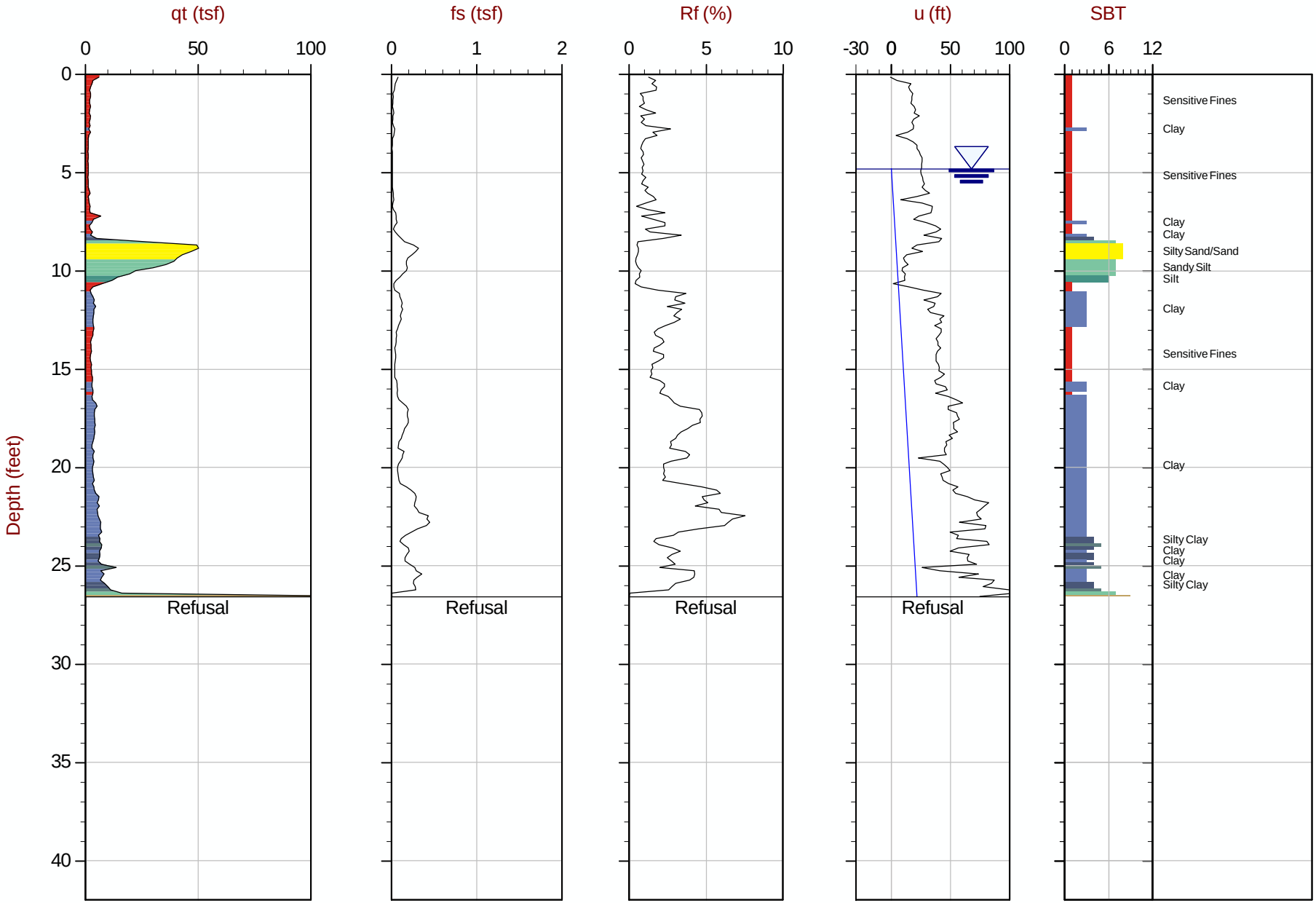
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494351 E: 566503

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 12:07
Site: Rahway Arch

Sounding: CPT-04
Cone: 302:T1500F15U500



Max Depth: 8.100 m / 26.57 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP04.COR

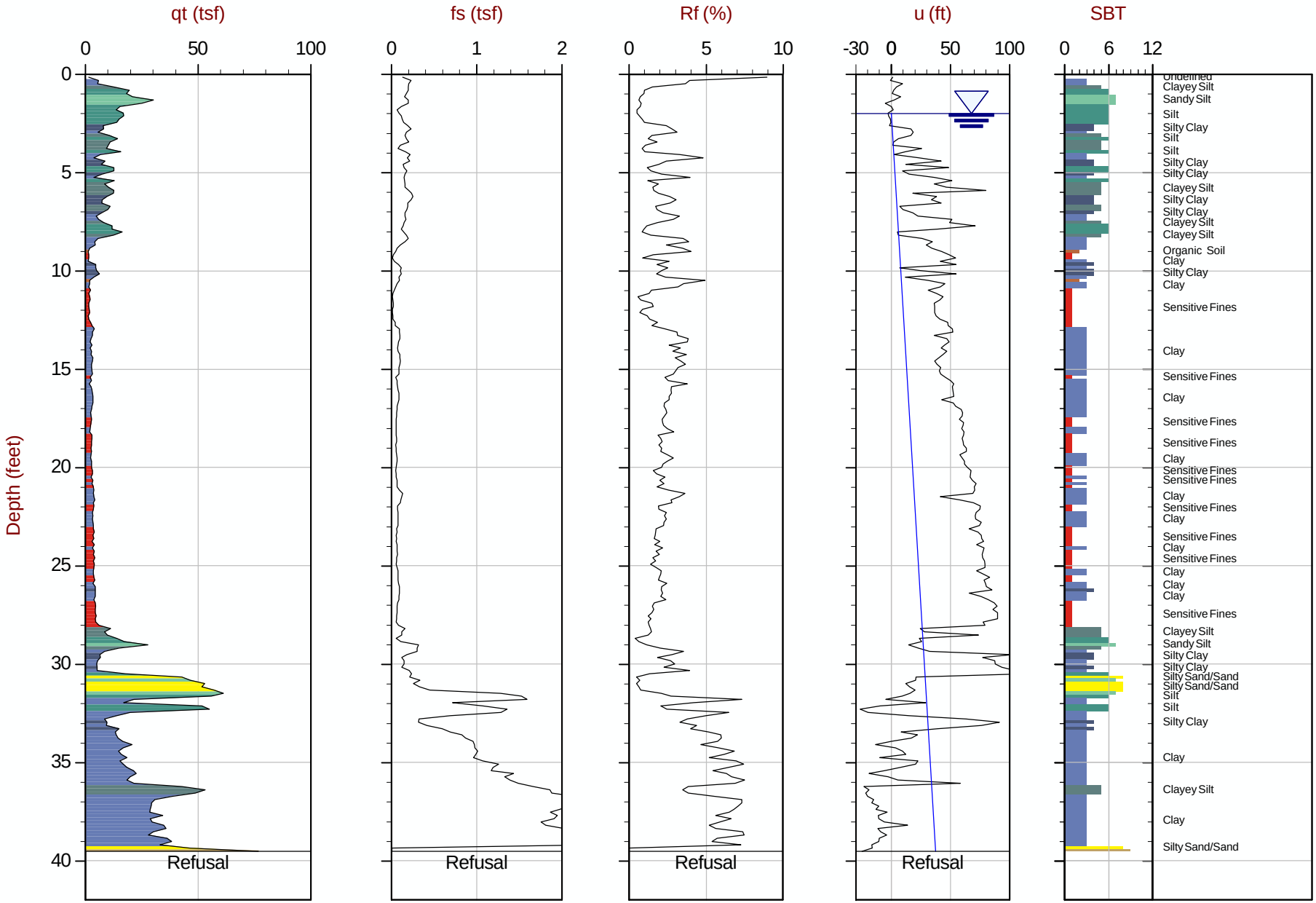
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494610 E: 566318

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 13:34
Site: Rahway Arch

Sounding: CPT-05
Cone: 302:T1500F15U500



Max Depth: 12.050 m / 39.53 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP05.COR

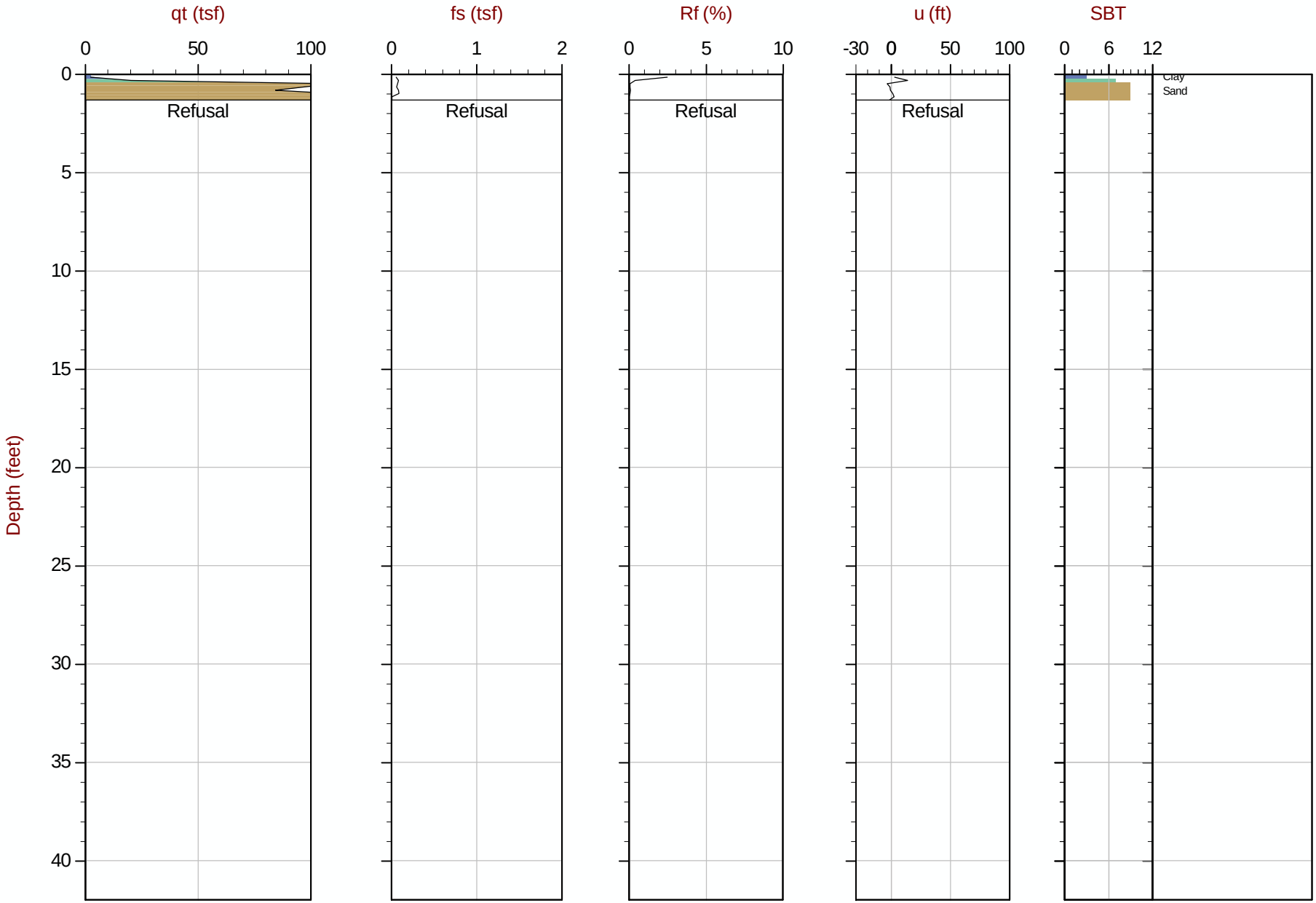
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494786 E: 566547

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 13:35
Site: Rahway Arch

Sounding: CPT-06
Cone: 302:T1500F15U500



Max Depth: 0.400 m / 1.31 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP06.COR

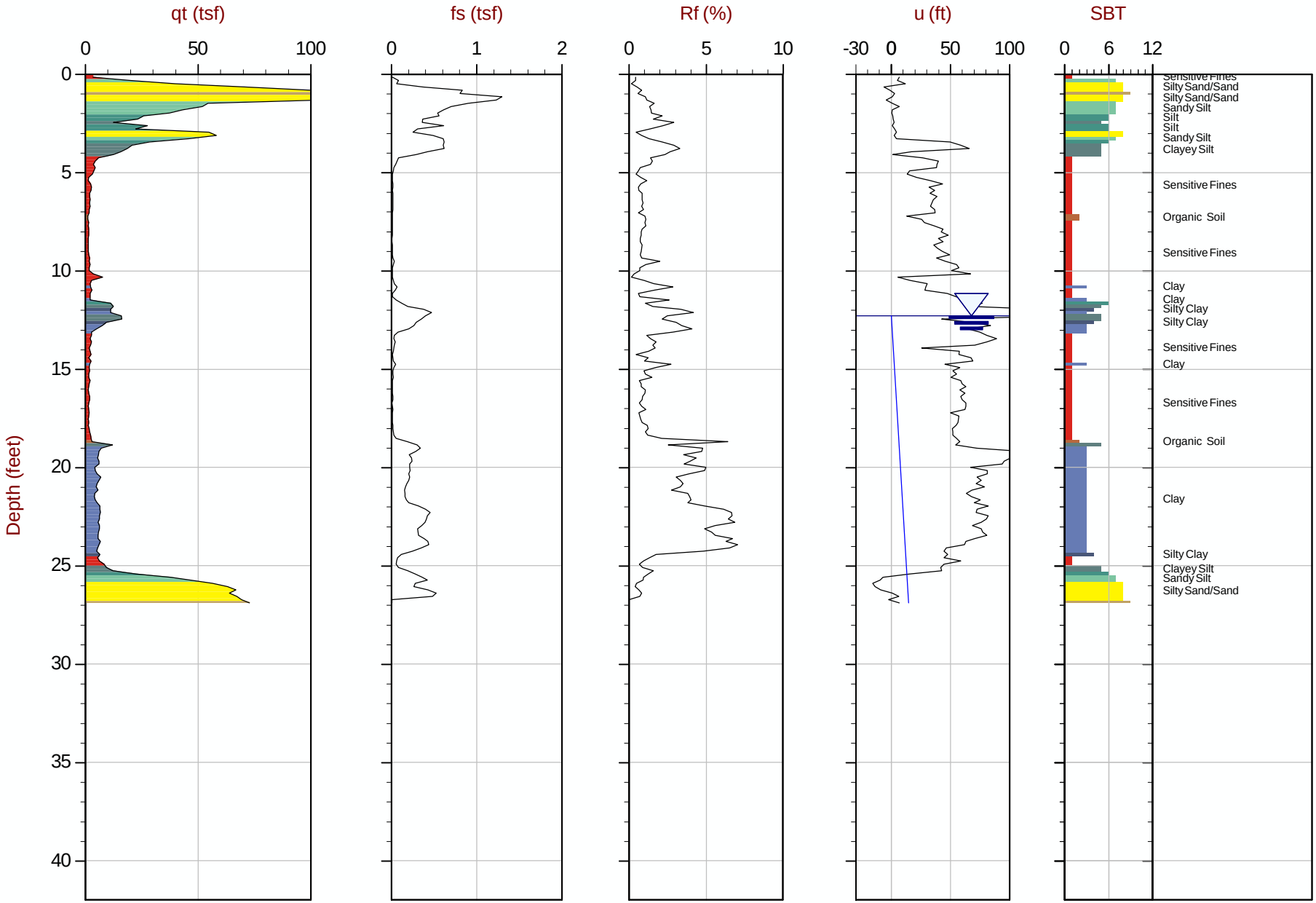
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494390 E: 566339

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 13:47
Site: Rahway Arch

Sounding: CPT-06A
Cone: 302:T1500F15U500



Max Depth: 8.200 m / 26.90 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP06A.COR

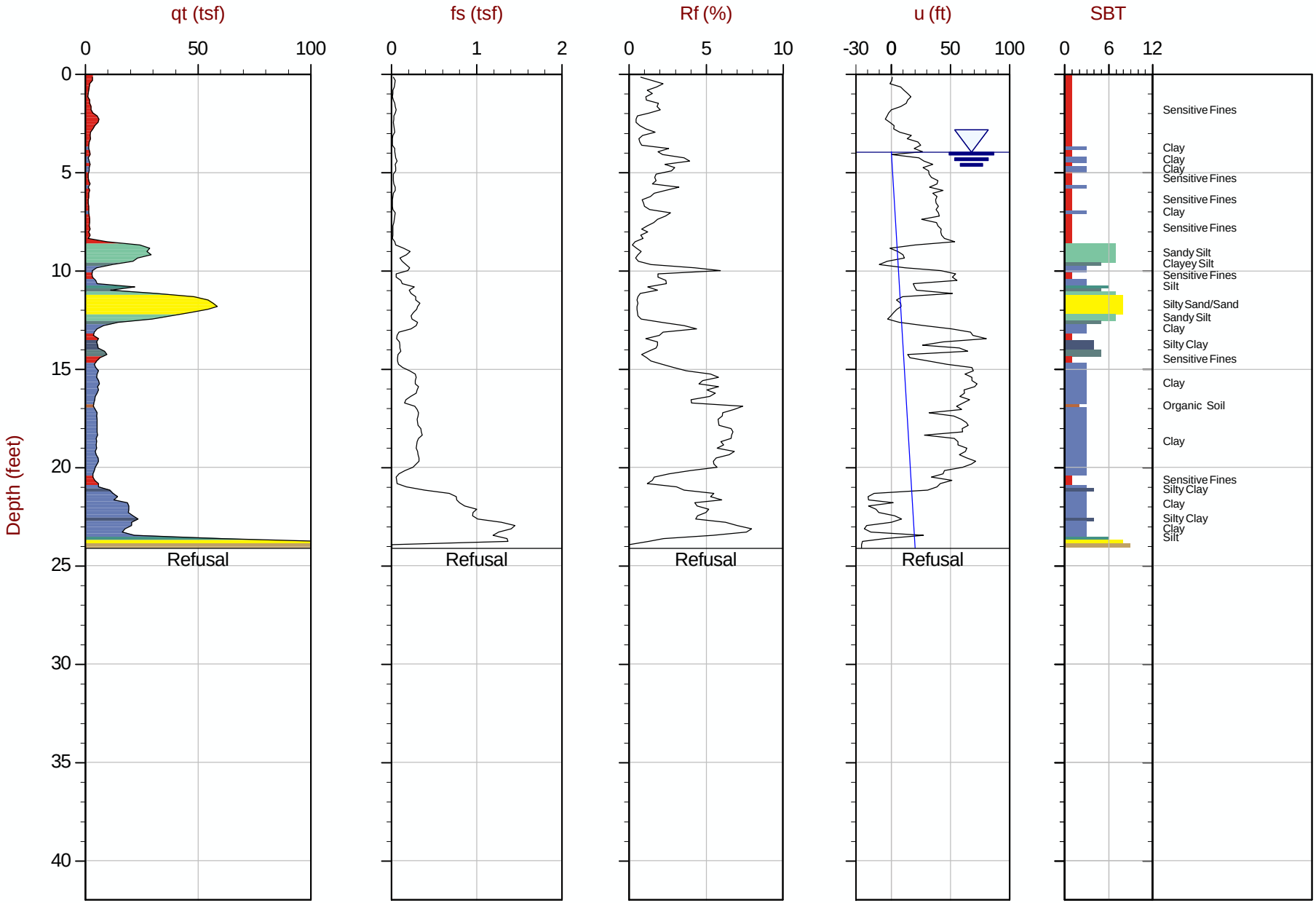
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494362 E: 566352

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 09:49
Site: Rahway Arch

Sounding: CPT-08
Cone: 302:T1500F15U500



Max Depth: 7.350 m / 24.11 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP08.COR

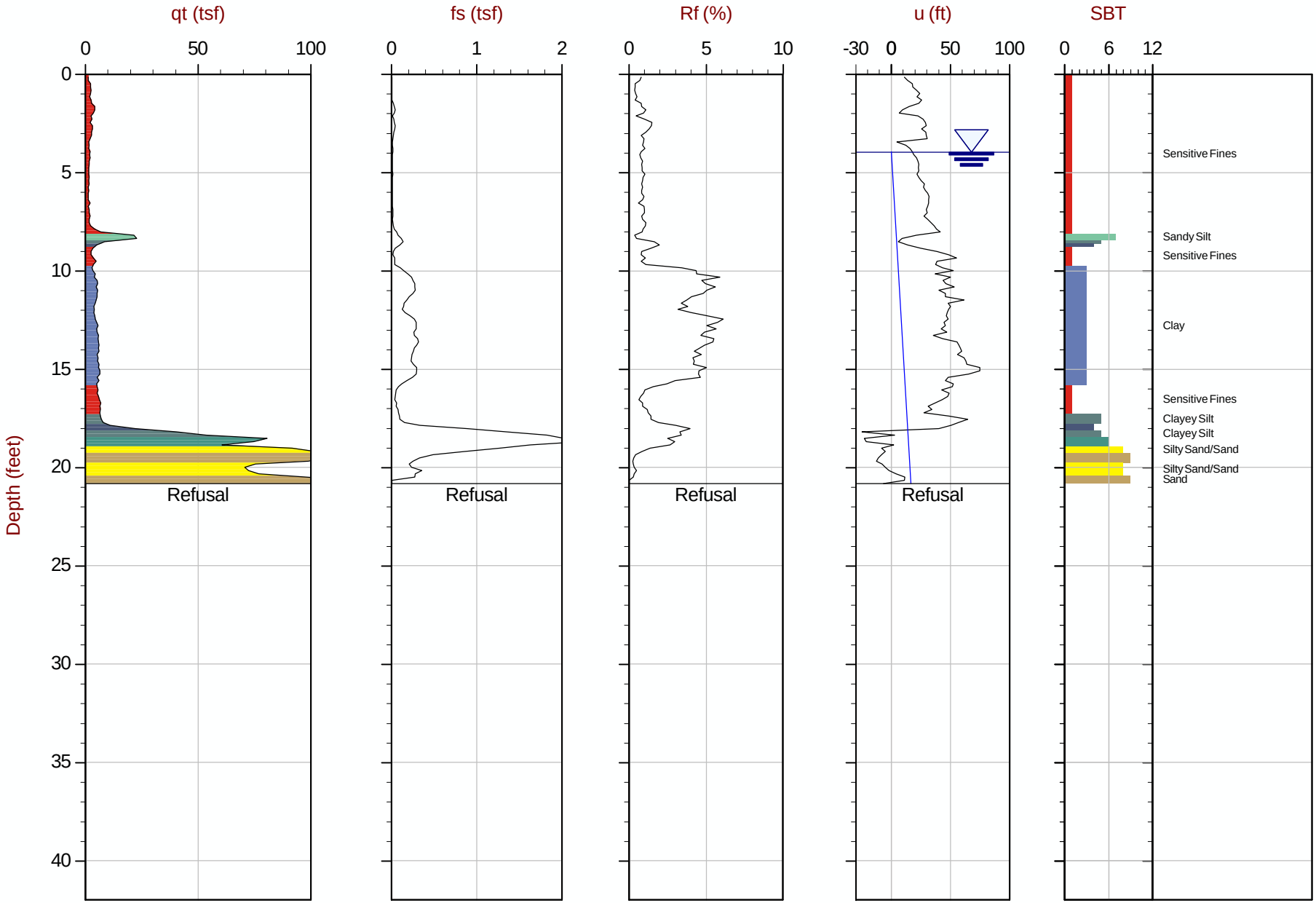
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494352 E: 566237

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 11:01
Site: Rahway Arch

Sounding: CPT-08A
Cone: 302:T1500F15U500



Max Depth: 6.350 m / 20.83 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP08A.COR

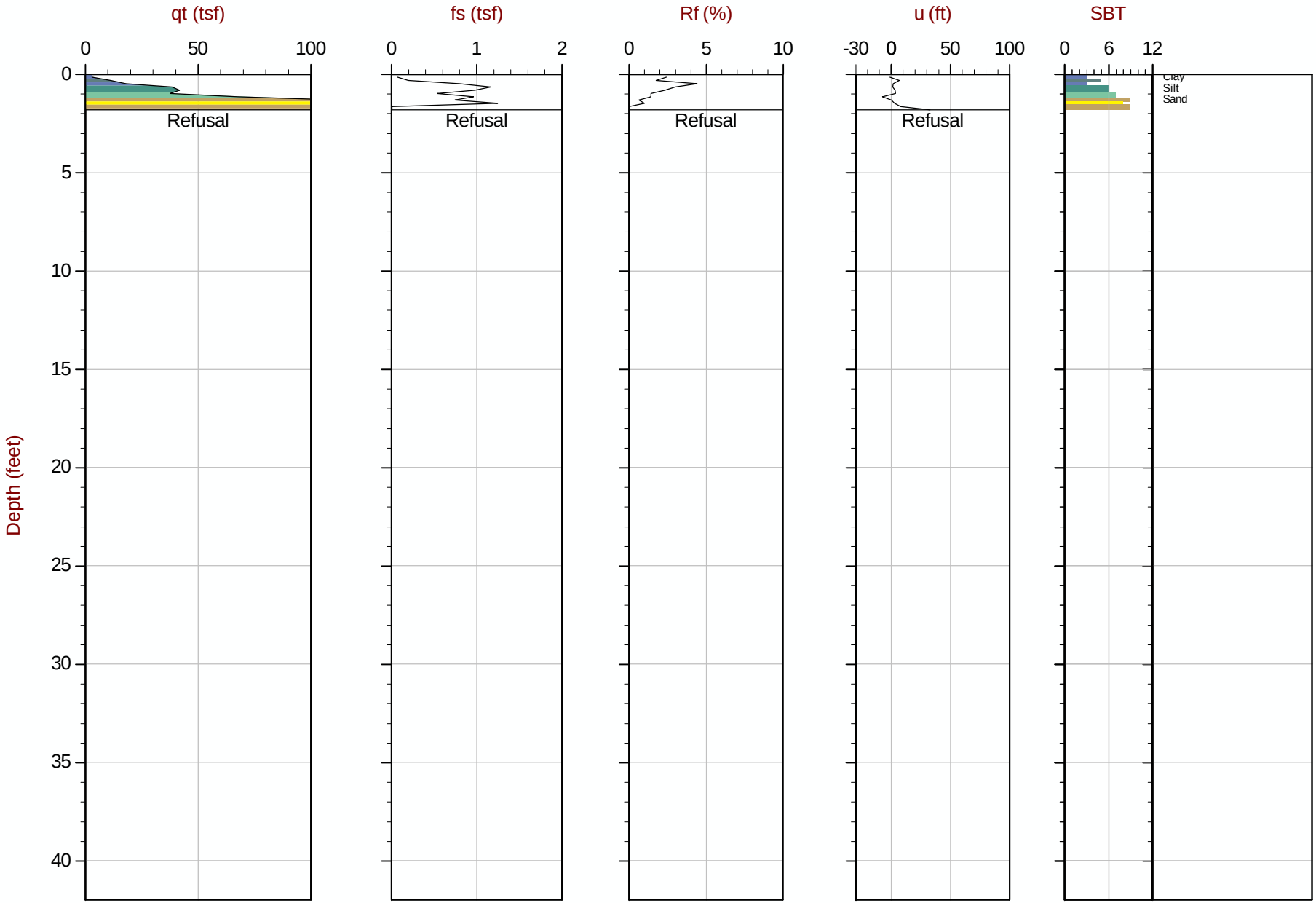
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494361 E: 566222

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 10:18
Site: Rahway Arch

Sounding: CPT-09
Cone: 302:T1500F15U500



Max Depth: 0.550 m / 1.80 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09.COR

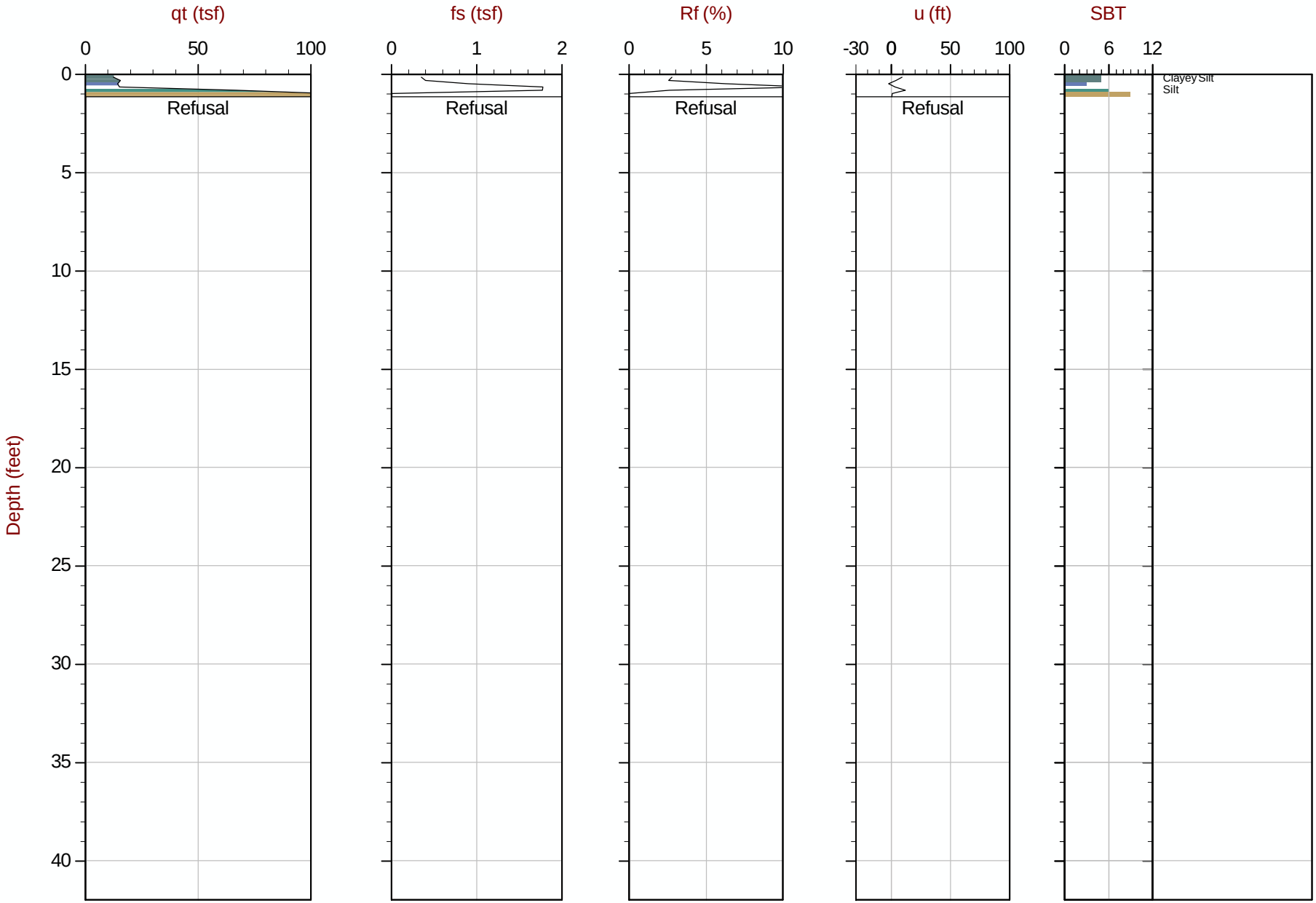
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494426 E: 566004

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 10:32
Site: Rahway Arch

Sounding: CPT-09A
Cone: 302:T1500F15U500



Max Depth: 0.350 m / 1.15 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09A.COR

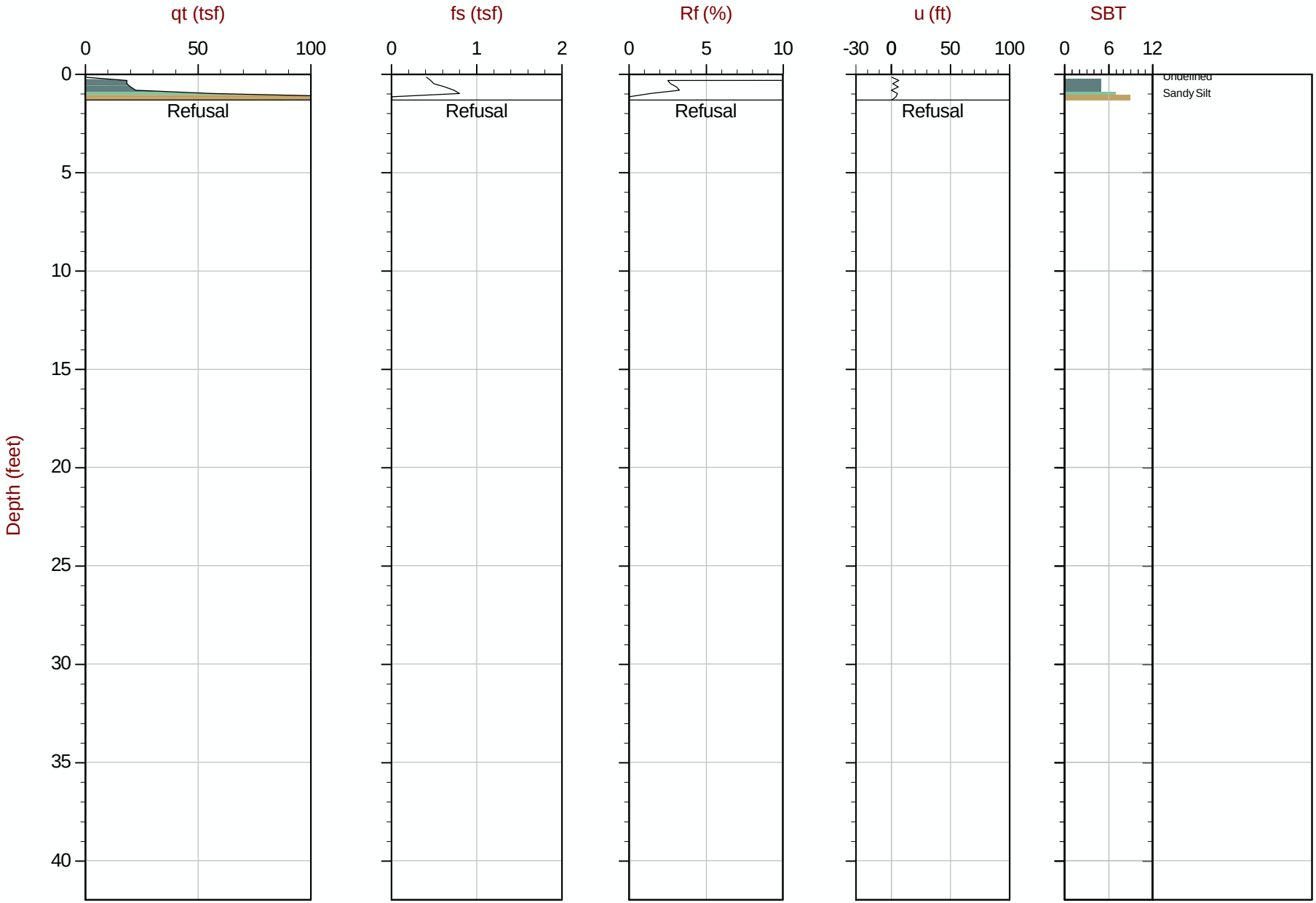
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494426 E: 566000

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 10:40
Site: Rahway Arch

Sounding: CPT-09B
Cone: 302:T1500F15U500



Max Depth: 0.400 m / 1.31 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09B.COR

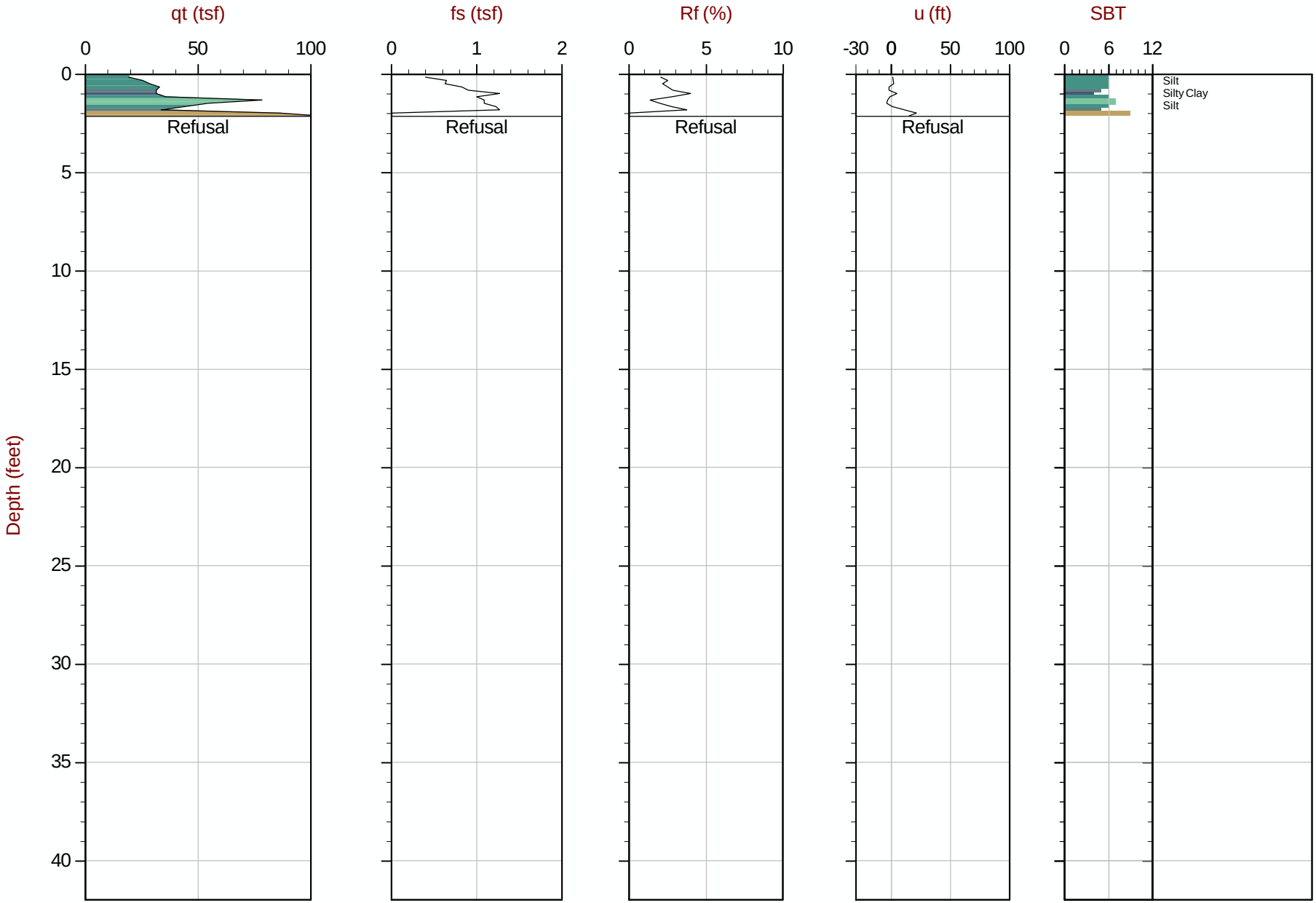
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494422 E: 566004

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 11:00
Site: Rahway Arch

Sounding: CPT-09C
Cone: 302:T1500F15U500



Max Depth: 0.650 m / 2.13 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09C.COR

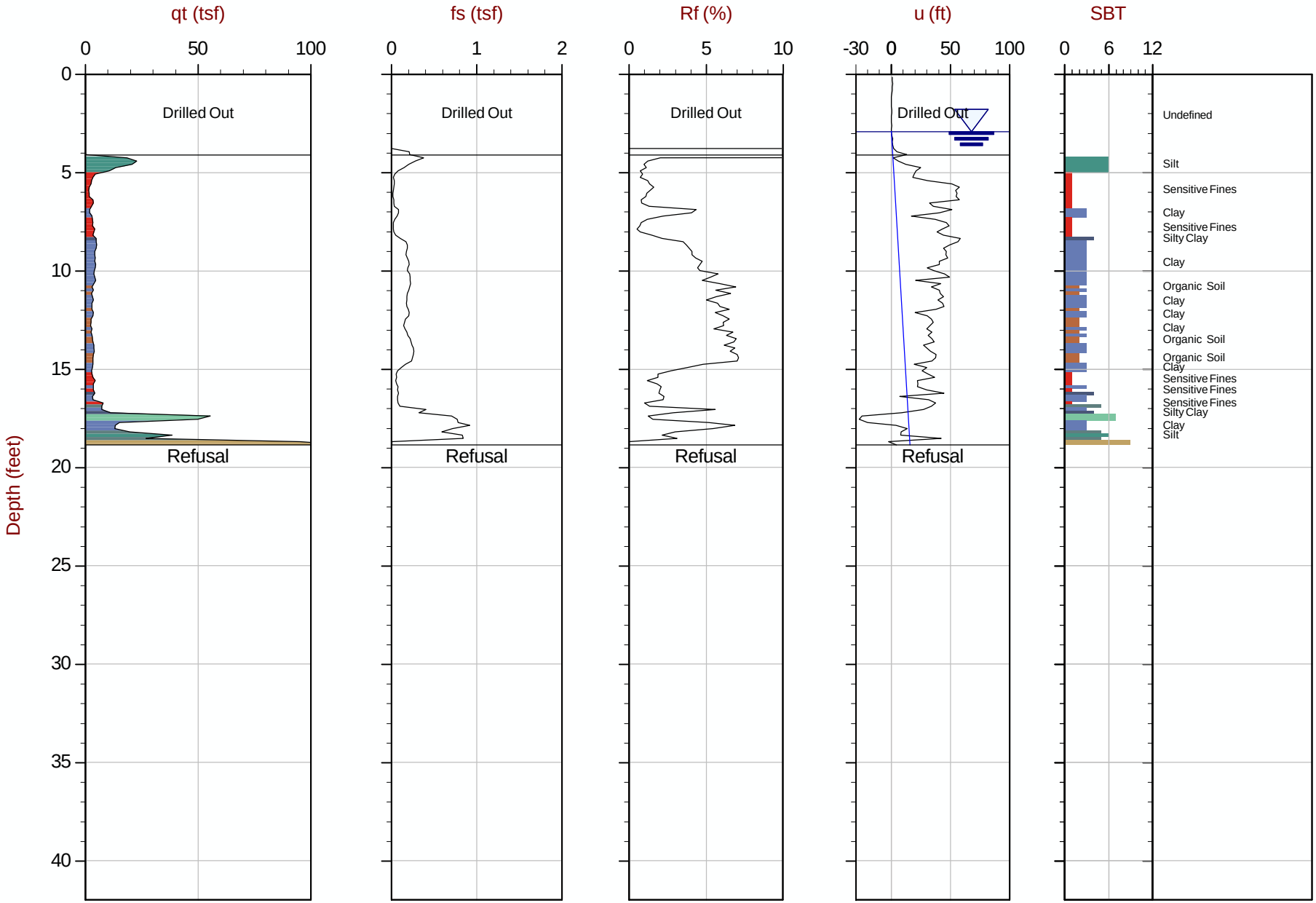
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494413 E: 566027

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 08:40
Site: Rahway Arch

Sounding: CPT-09D
Cone: 302:T1500F15U500



Max Depth: 5.750 m / 18.86 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09D.COR

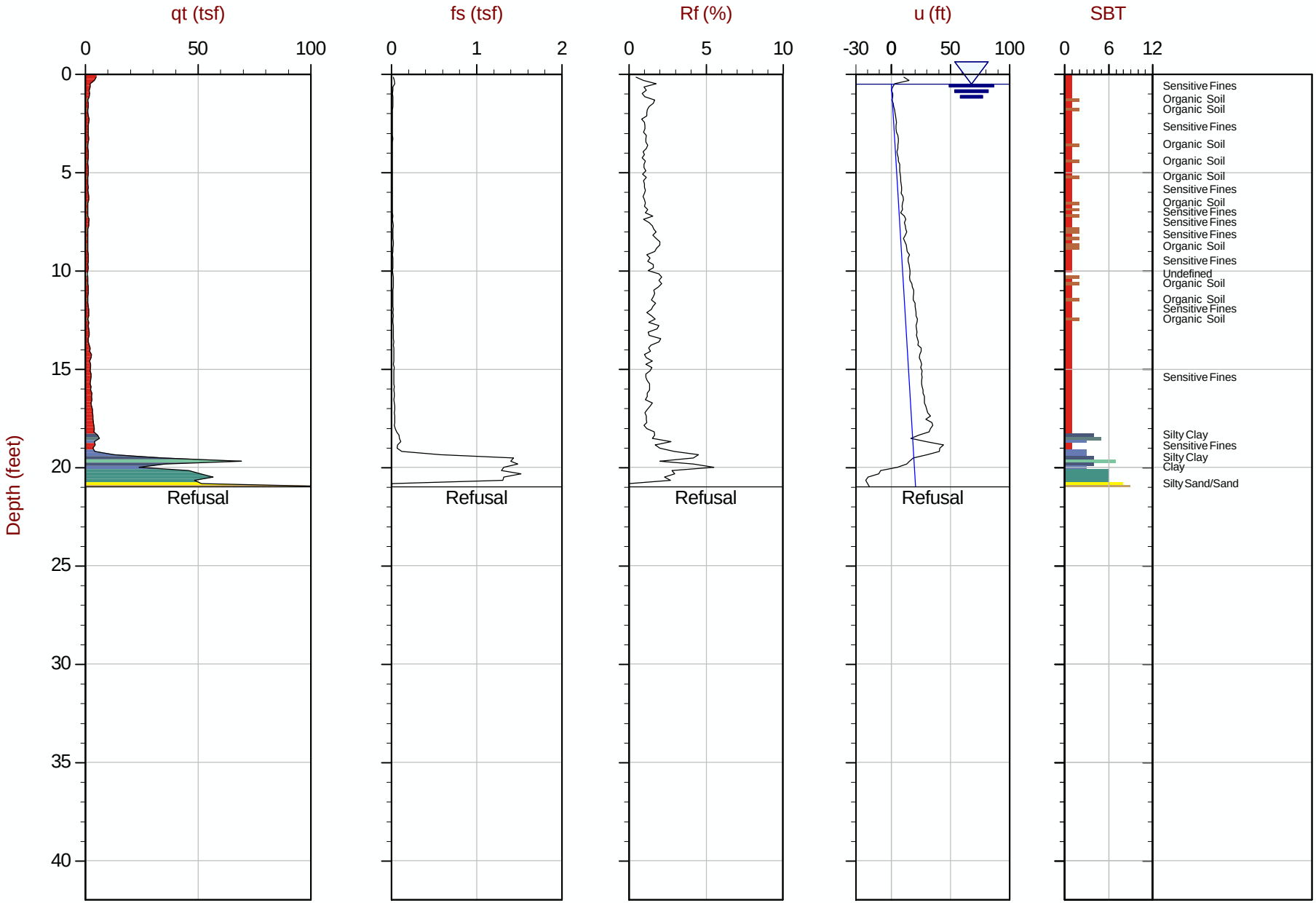
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494424 E: 566007

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 09:38
Site: Rahway Arch

Sounding: CPT-10
Cone: 302:T1500F15U500



Max Depth: 6.400 m / 21.00 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP10.COR

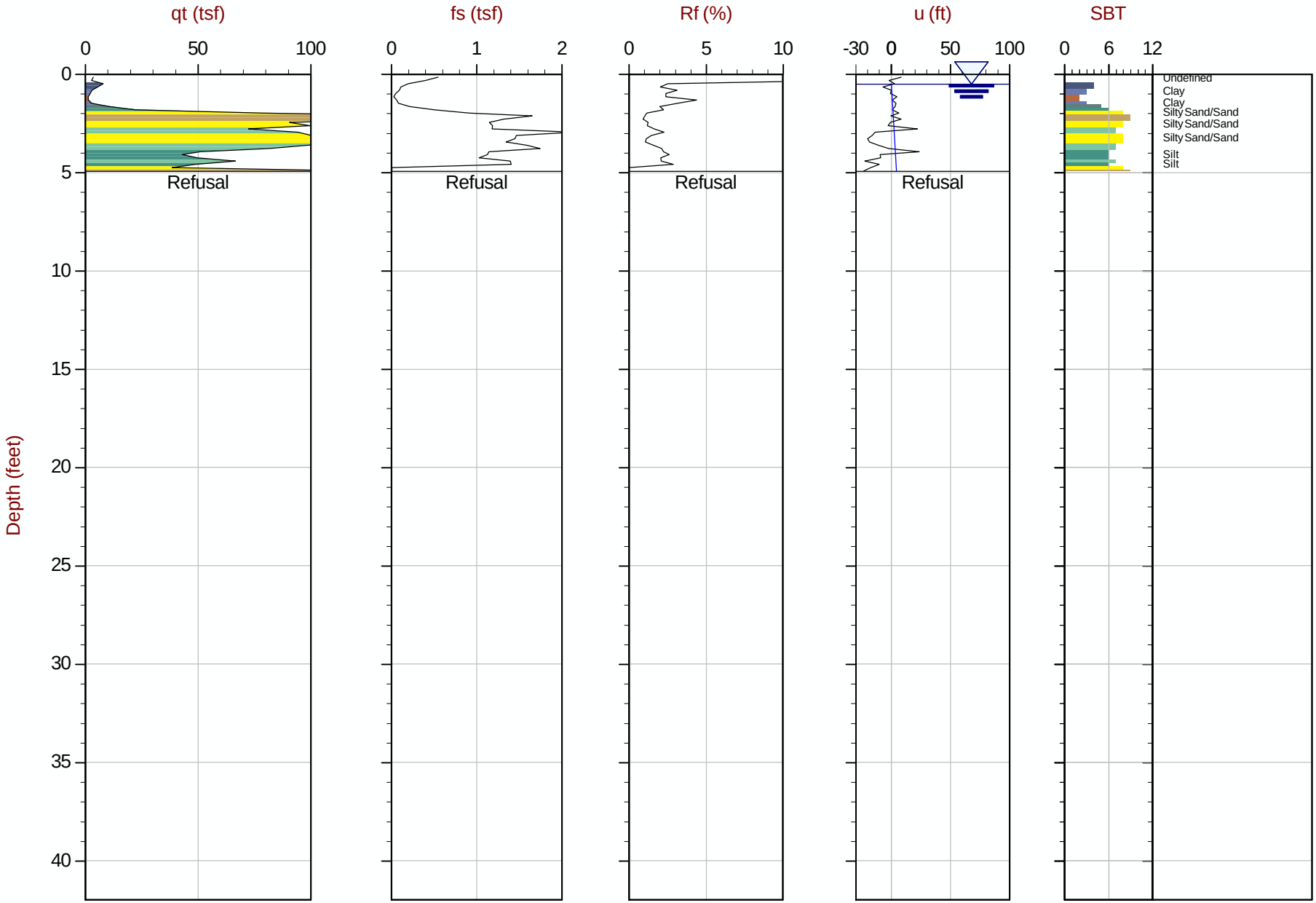
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494621 E: 566150

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 11:49
Site: Rahway Arch

Sounding: CPT-11
Cone: 302:T1500F15U500



Max Depth: 1.500 m / 4.92 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP11.COR

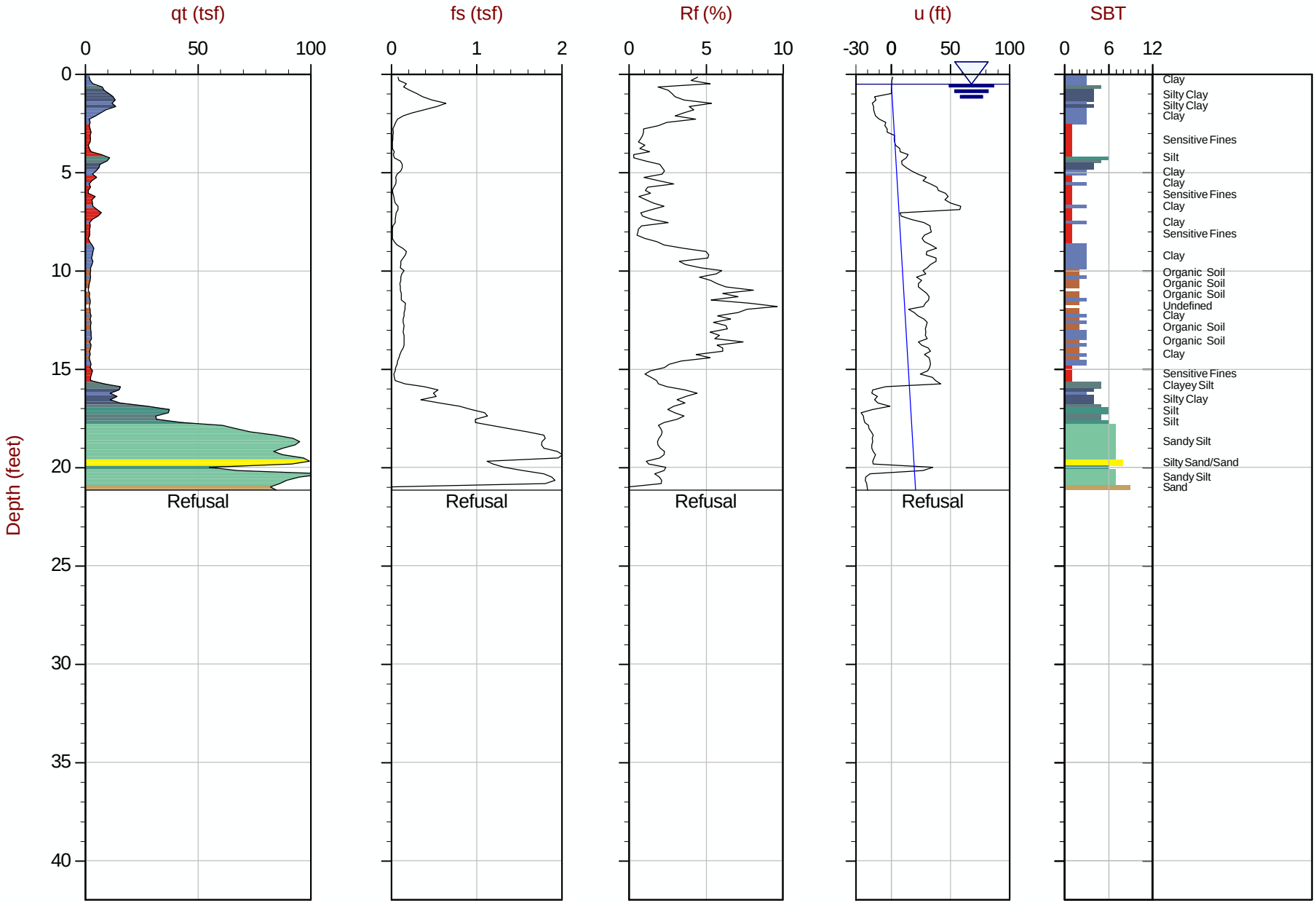
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494109 E: 566210

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 12:10
Site: Rahway Arch

Sounding: CPT-11A
Cone: 302:T1500F15U500



Max Depth: 6.450 m / 21.16 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP11A.COR

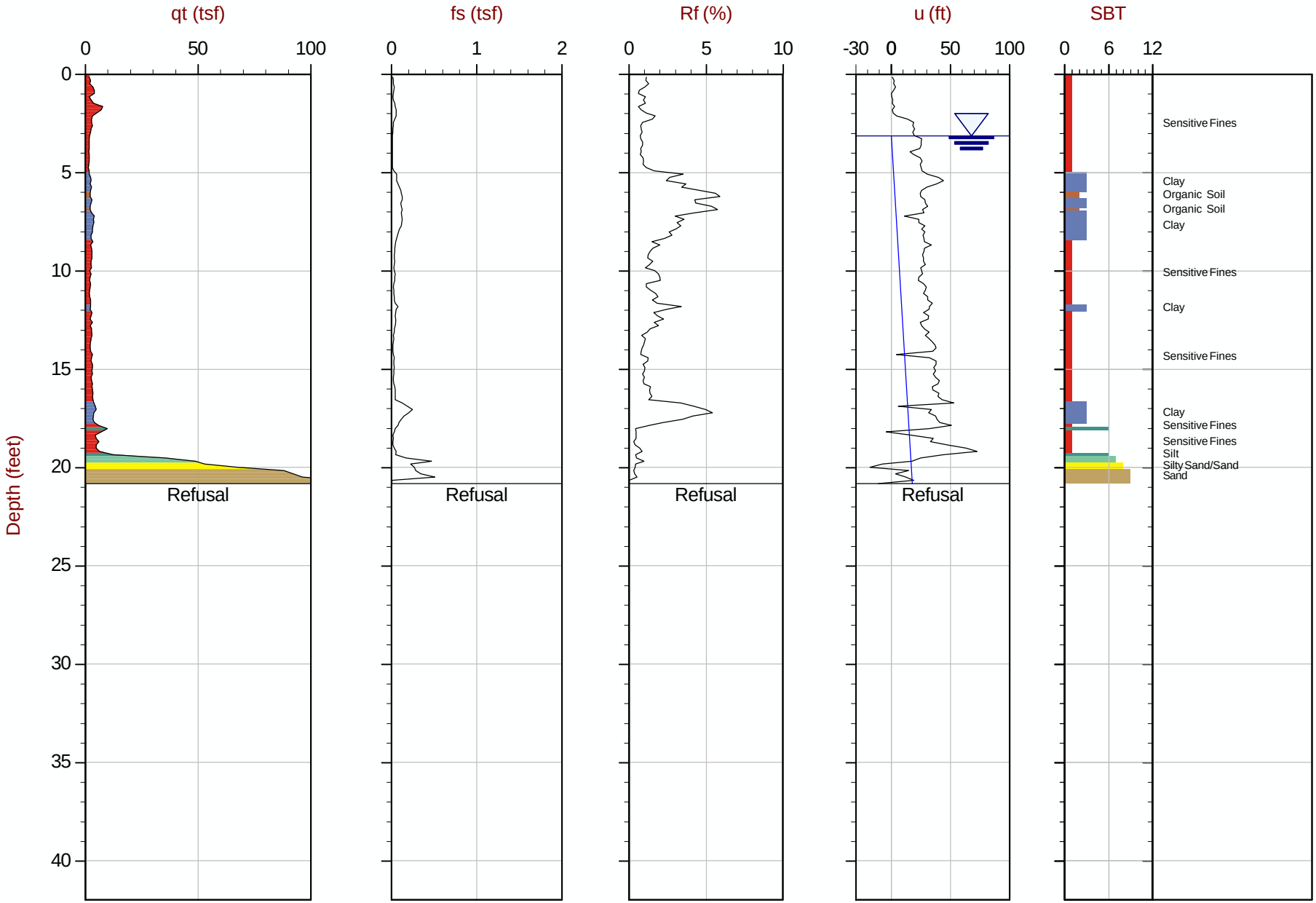
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494117 E: 566189

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:16:12 06:56
Site: Rahway Arch

Sounding: CPT-12
Cone: 302:T1500F15U500



Max Depth: 6.350 m / 20.83 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP12.COR

SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494164 E: 566559

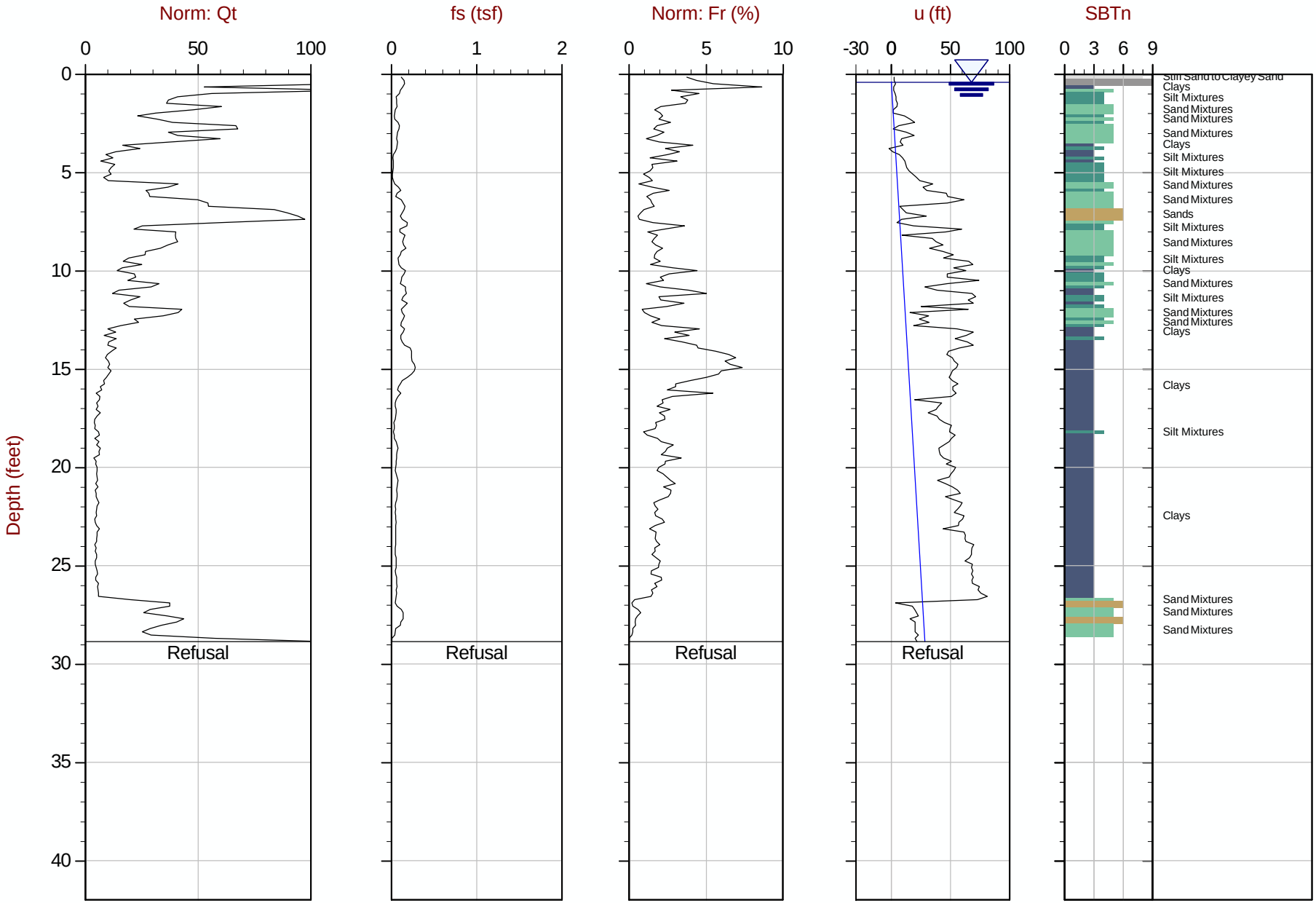
Normalized CPT Plots

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 07:18
Site: Rahway Arch

Sounding: CPT-01
Cone: 302:T1500F15U500



Max Depth: 8.800 m / 28.87 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP01.COR

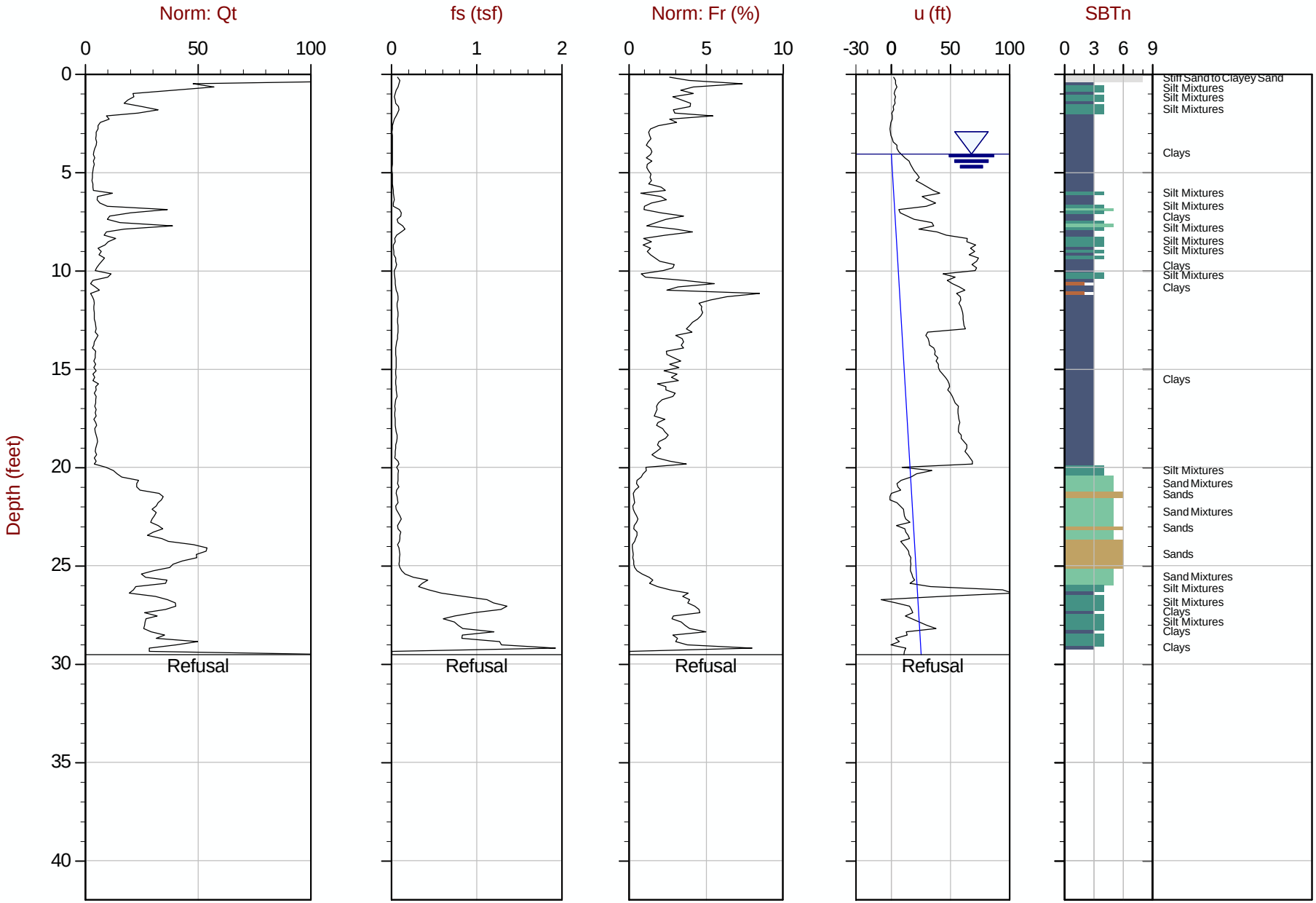
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494960 E: 566384

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 10:57
Site: Rahway Arch

Sounding: CPT-02
Cone: 302:T1500F15U500



Max Depth: 9.000 m / 29.53 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP02.COR

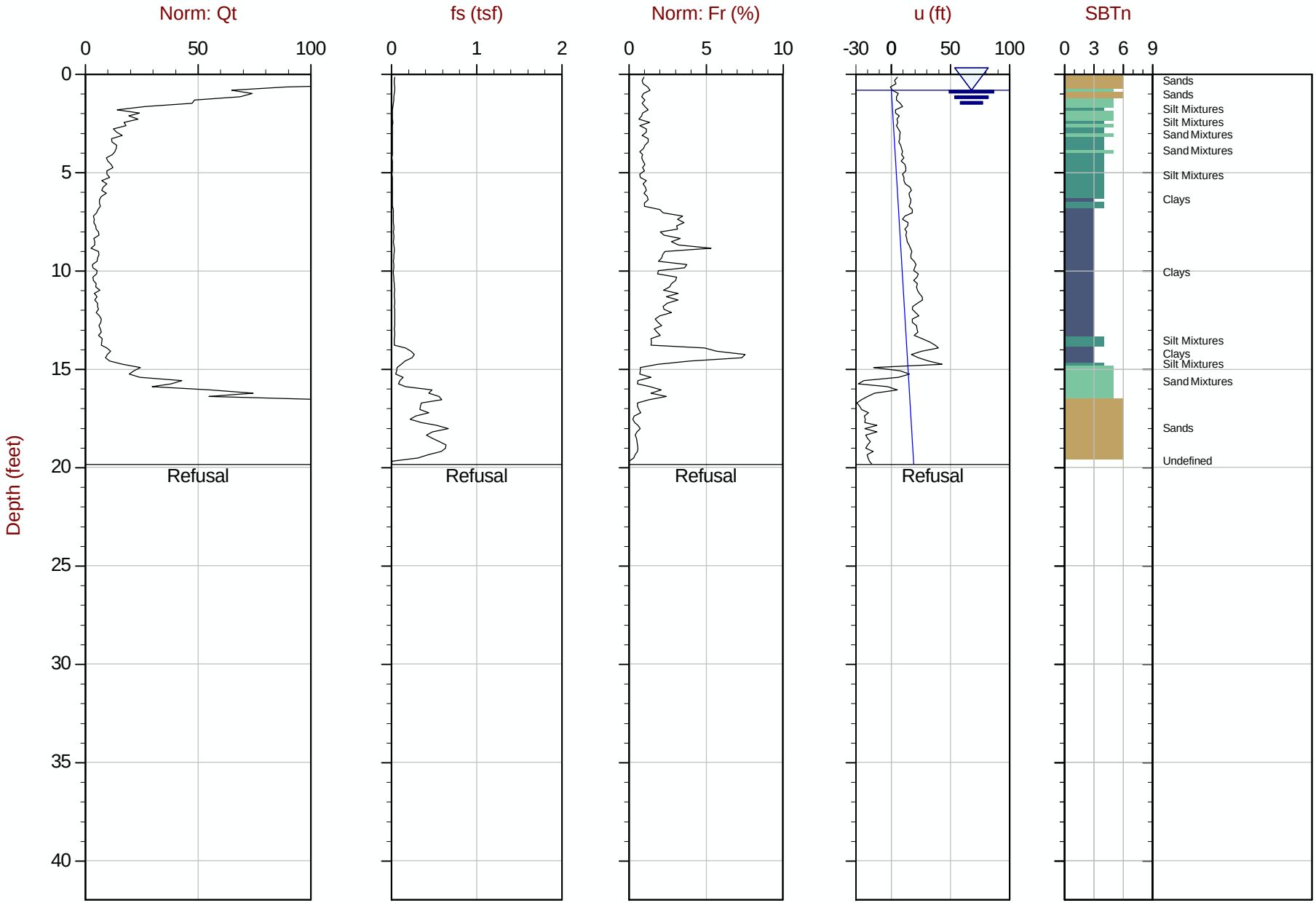
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4495002 E: 566357

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 13:02
Site: Rahway Arch

Sounding: CPT-03
Cone: 302:T1500F15U500



Max Depth: 6.050 m / 19.85 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP03.COR

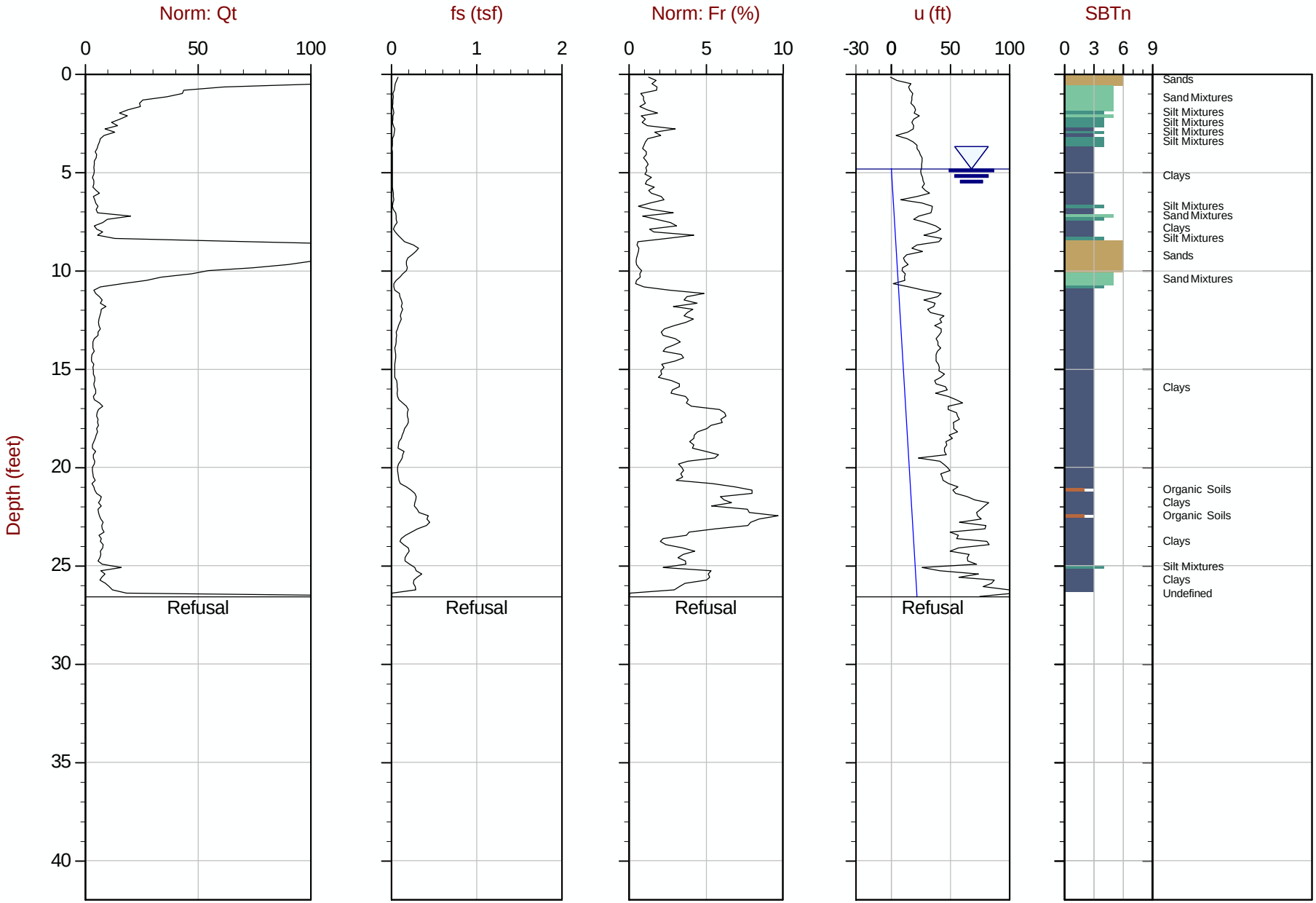
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494351 E: 566503

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 12:07
Site: Rahway Arch

Sounding: CPT-04
Cone: 302:T1500F15U500



Max Depth: 8.100 m / 26.57 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP04.COR

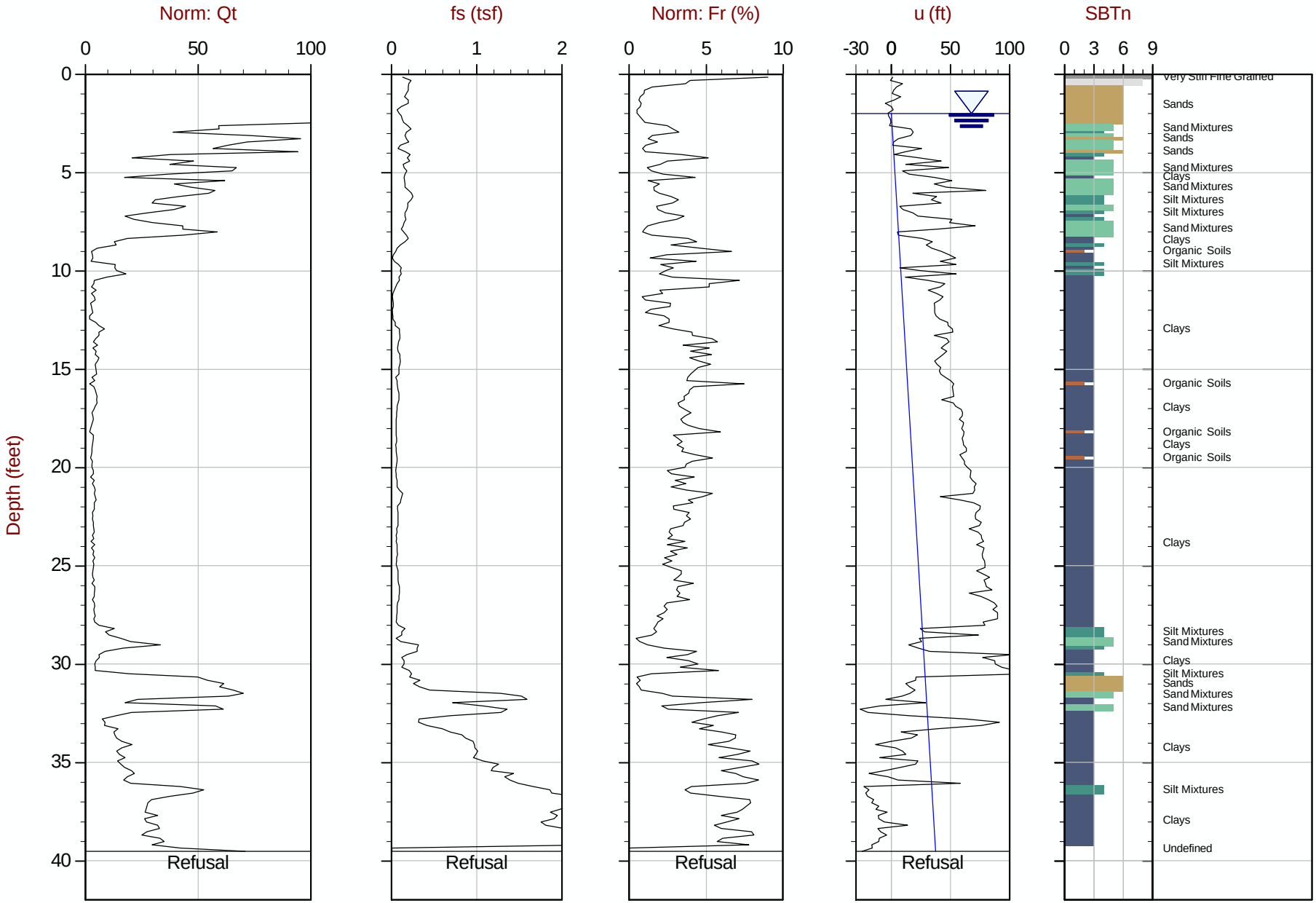
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494610 E: 566318

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 13:34
Site: Rahway Arch

Sounding: CPT-05
Cone: 302:T1500F15U500



Max Depth: 12.050 m / 39.53 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP05.COR

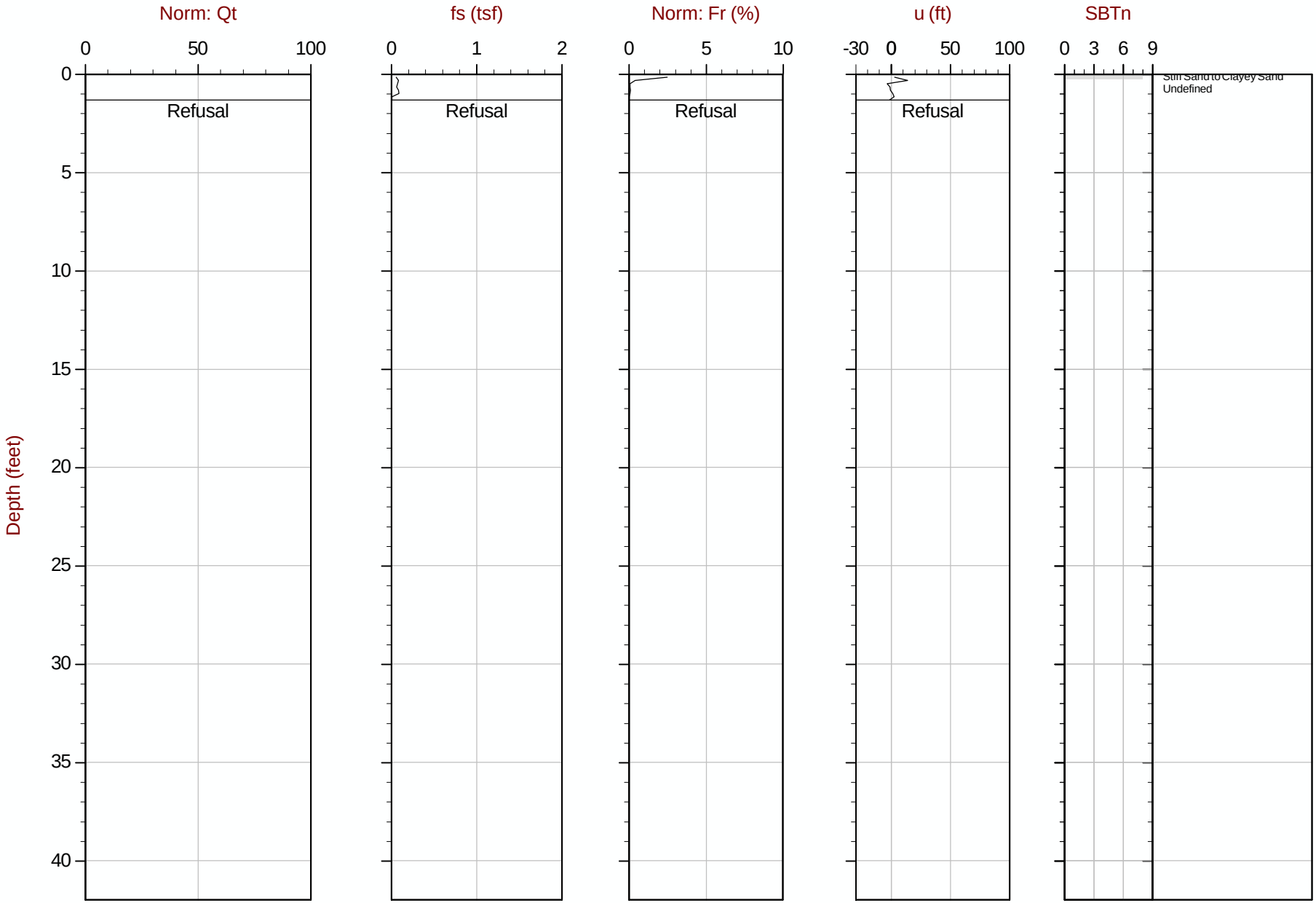
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494786 E: 566547

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 13:35
Site: Rahway Arch

Sounding: CPT-06
Cone: 302:T1500F15U500



Max Depth: 0.400 m / 1.31 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP06.COR

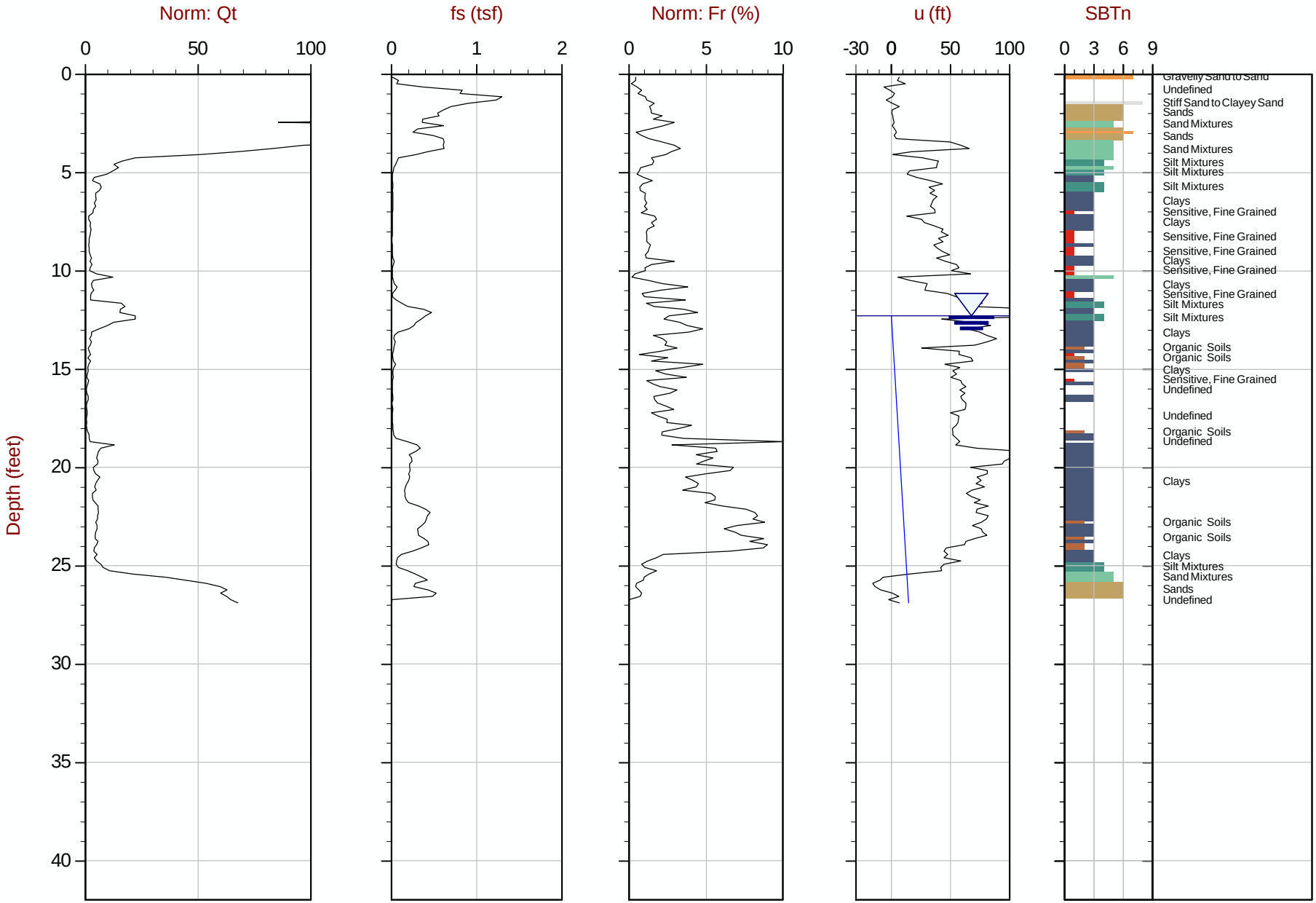
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494390 E: 566339

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 13:47
Site: Rahway Arch

Sounding: CPT-06A
Cone: 302:T1500F15U500



Max Depth: 8.200 m / 26.90 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP06A.COR

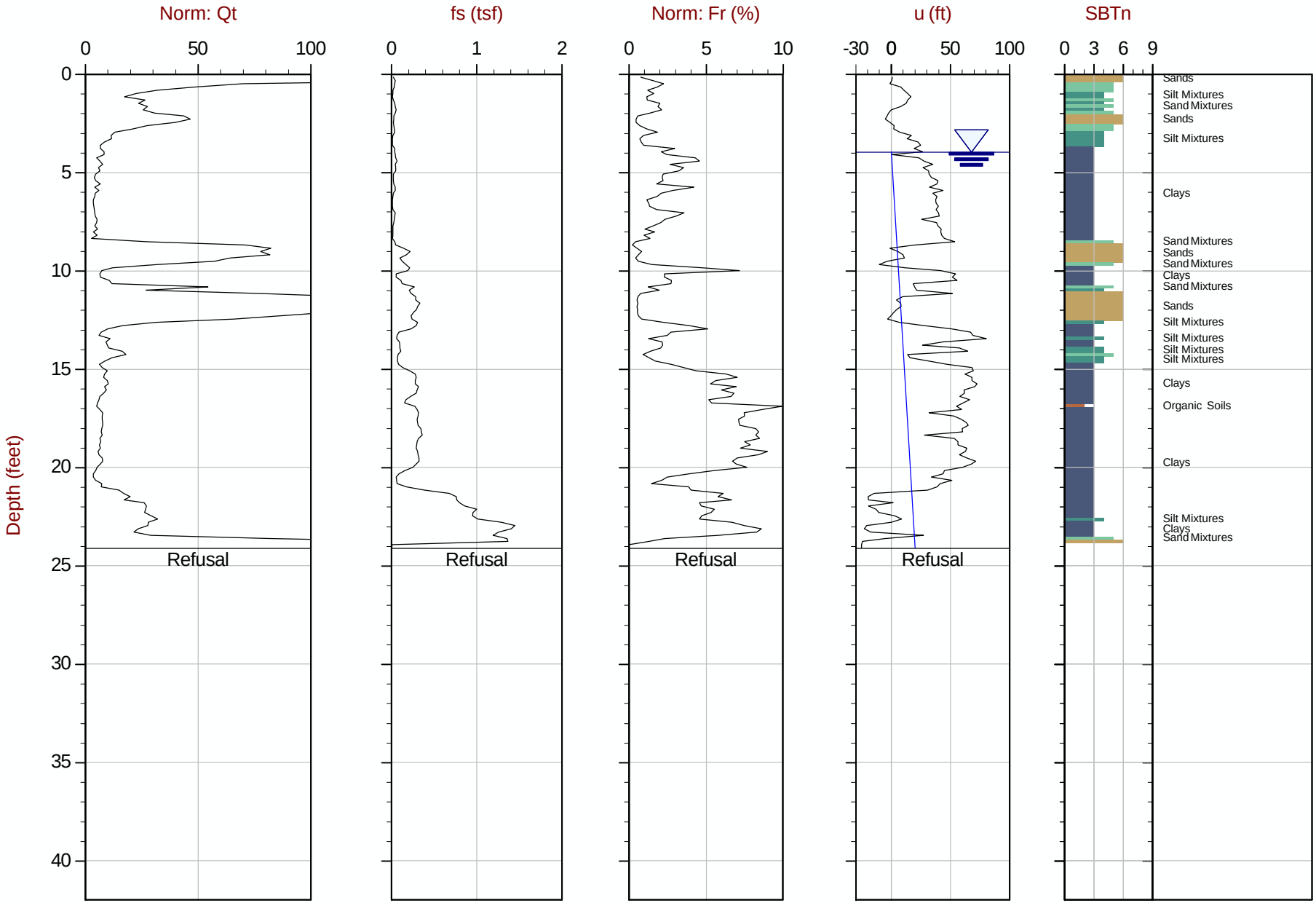
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494362 E: 566352

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 09:49
Site: Rahway Arch

Sounding: CPT-08
Cone: 302:T1500F15U500



Max Depth: 7.350 m / 24.11 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP08.COR

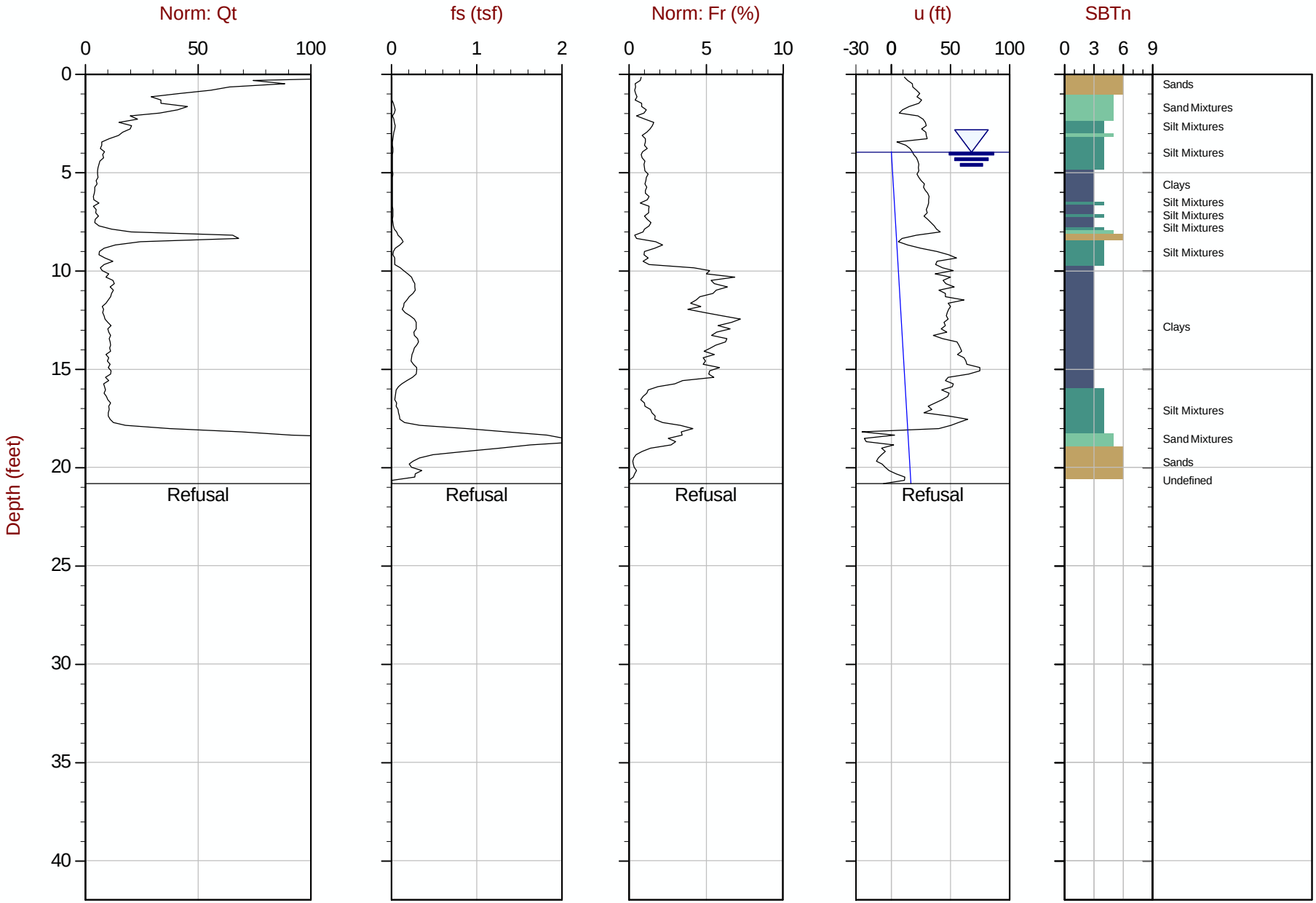
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494352 E: 566237

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:10:12 11:01
Site: Rahway Arch

Sounding: CPT-08A
Cone: 302:T1500F15U500



Max Depth: 6.350 m / 20.83 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP08A.COR

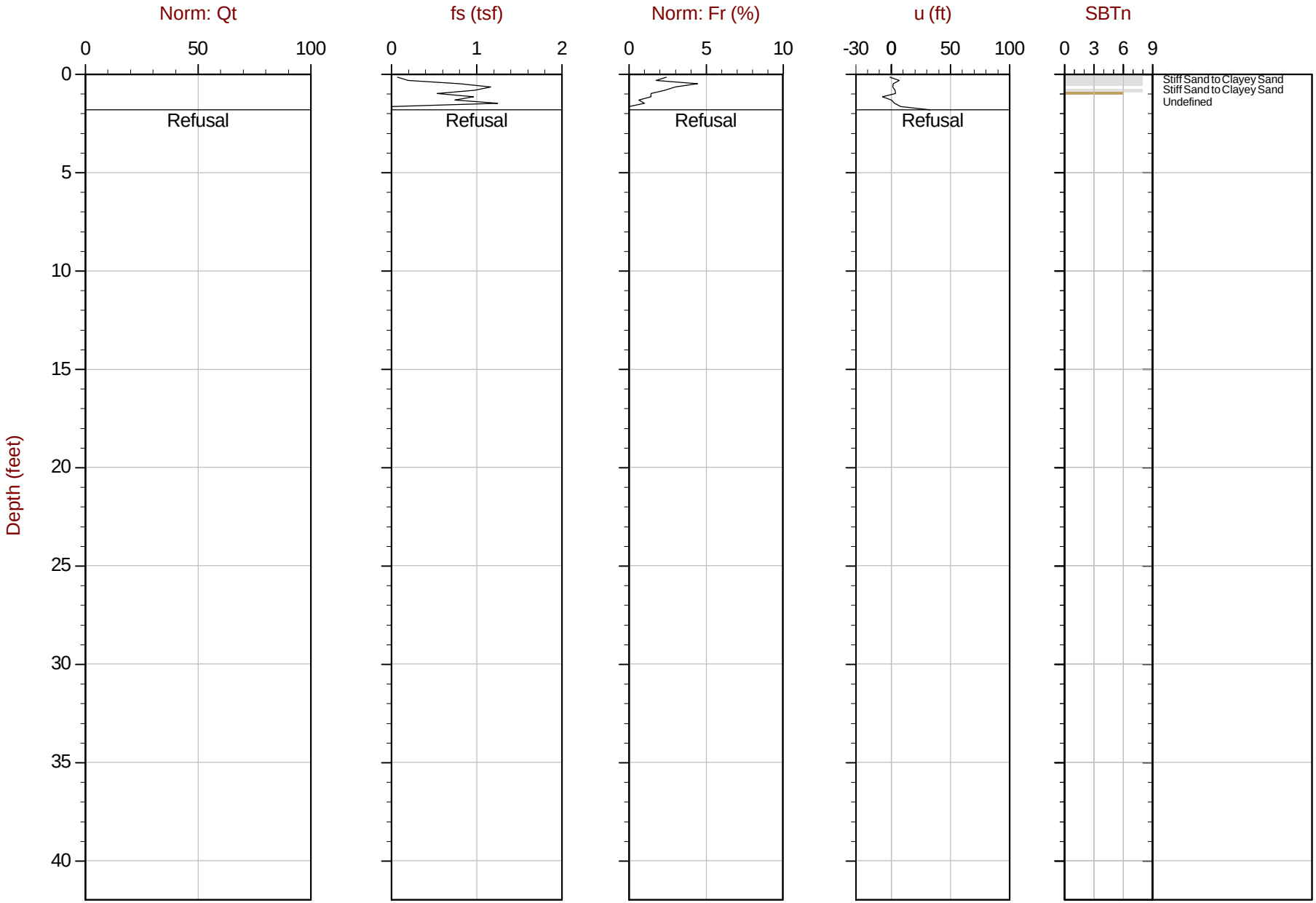
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494361 E: 566222

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 10:18
Site: Rahway Arch

Sounding: CPT-09
Cone: 302:T1500F15U500



Max Depth: 0.550 m / 1.80 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09.COR

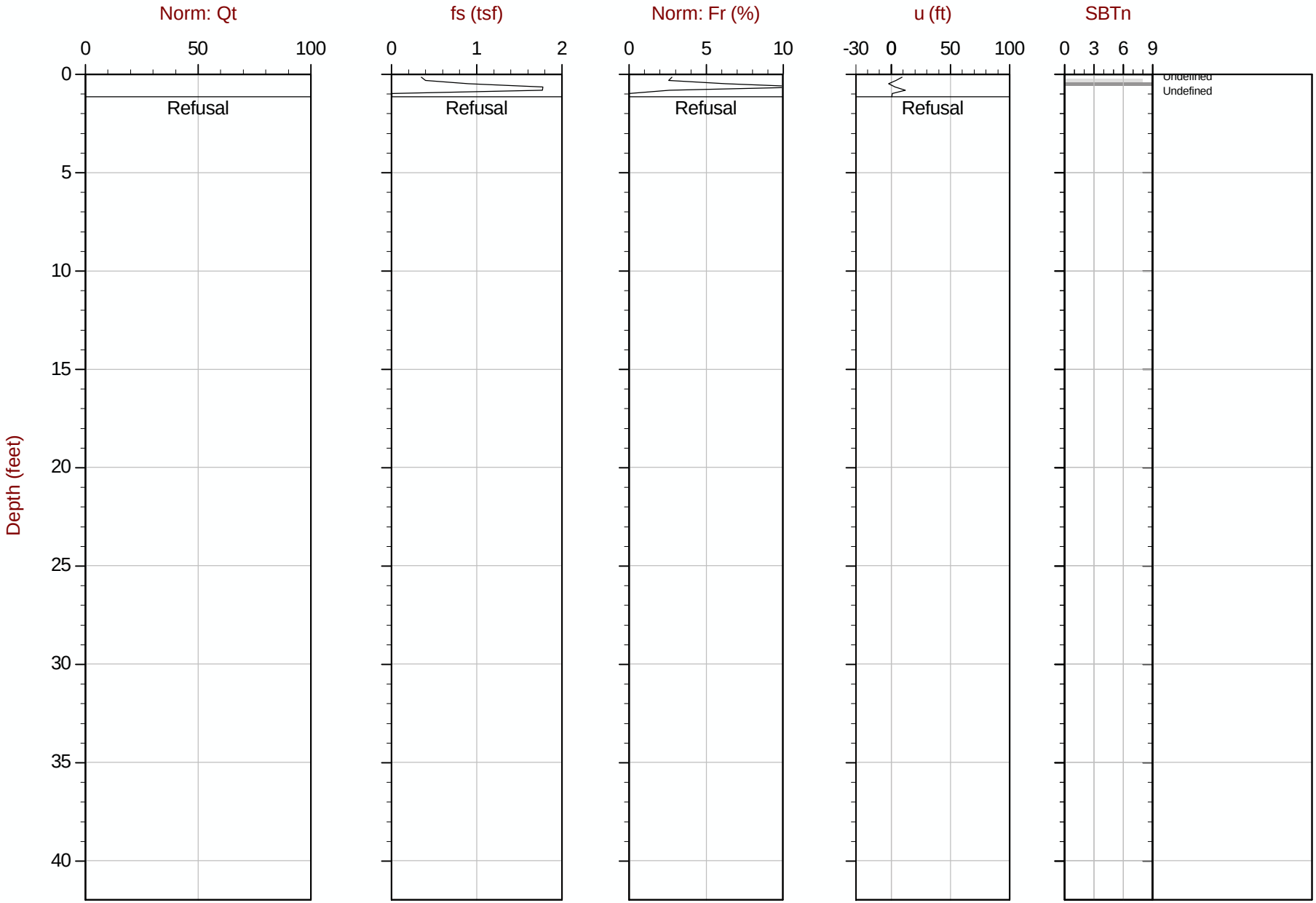
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494426 E: 566004

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 10:32
Site: Rahway Arch

Sounding: CPT-09A
Cone: 302:T1500F15U500



Max Depth: 0.350 m / 1.15 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09A.COR

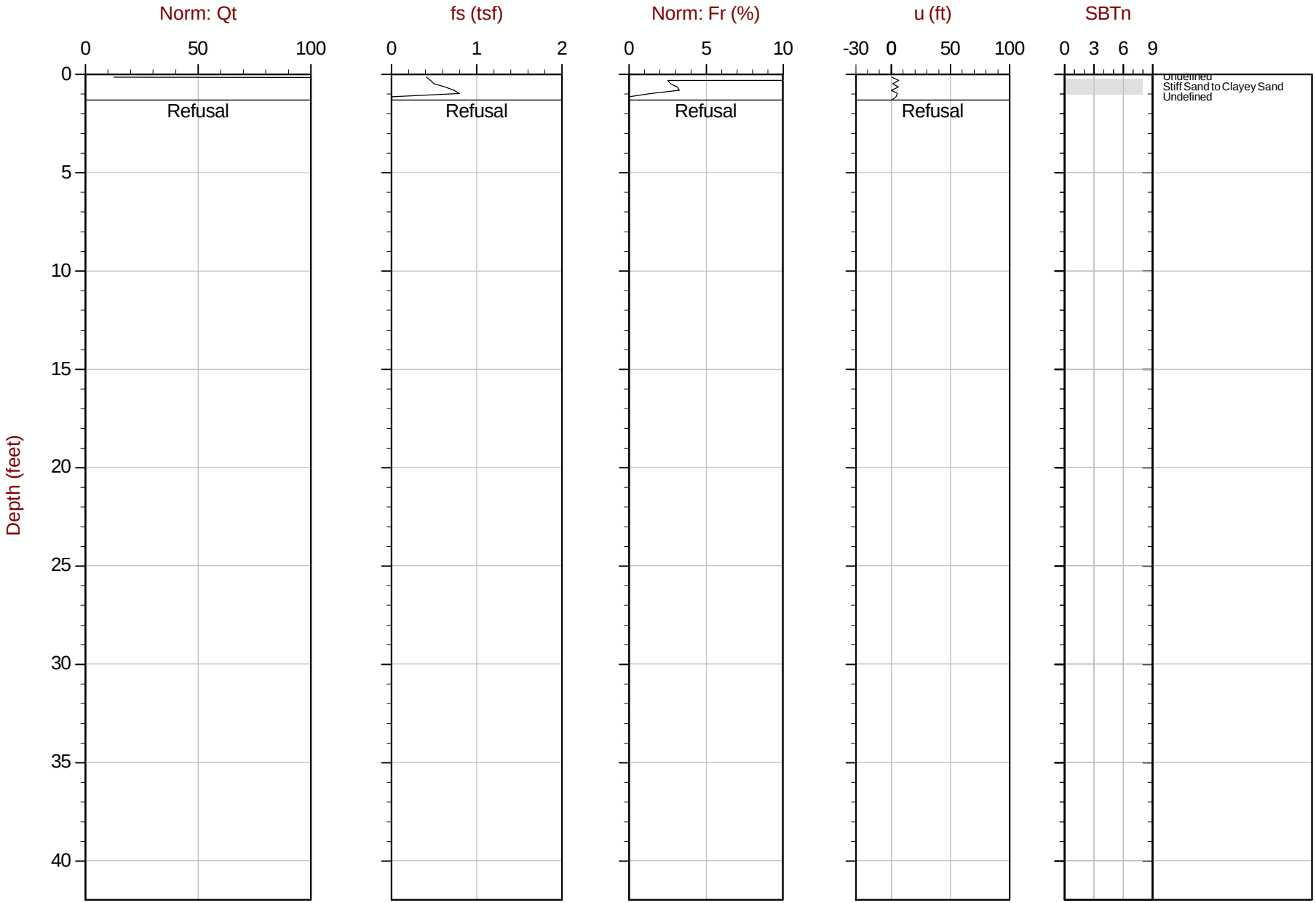
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494426 E: 566000

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 10:40
Site: Rahway Arch

Sounding: CPT-09B
Cone: 302:T1500F15U500



Max Depth: 0.400 m / 1.31 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09B.COR

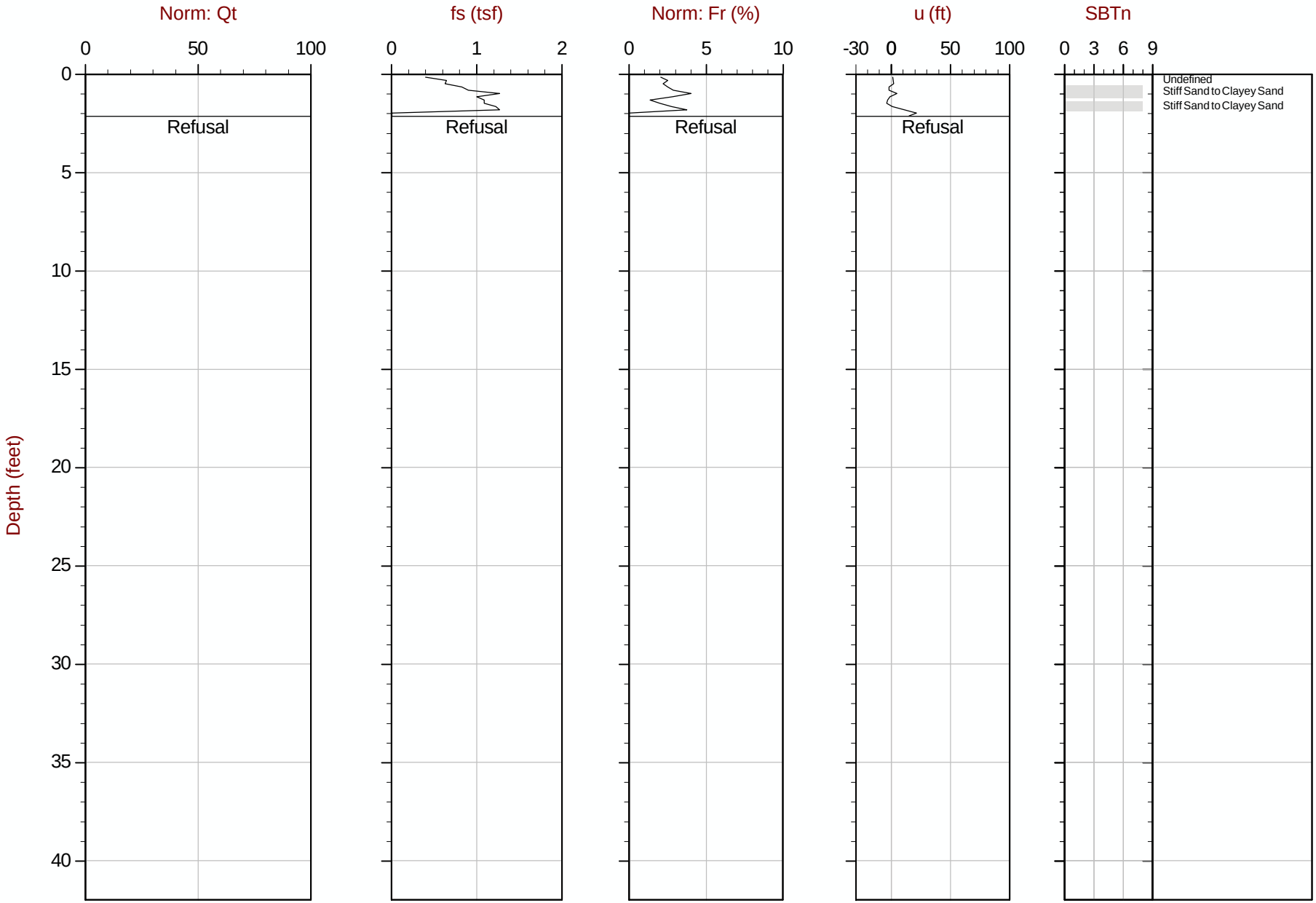
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494422 E: 566004

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 11:00
Site: Rahway Arch

Sounding: CPT-09C
Cone: 302:T1500F15U500



Max Depth: 0.650 m / 2.13 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09C.COR

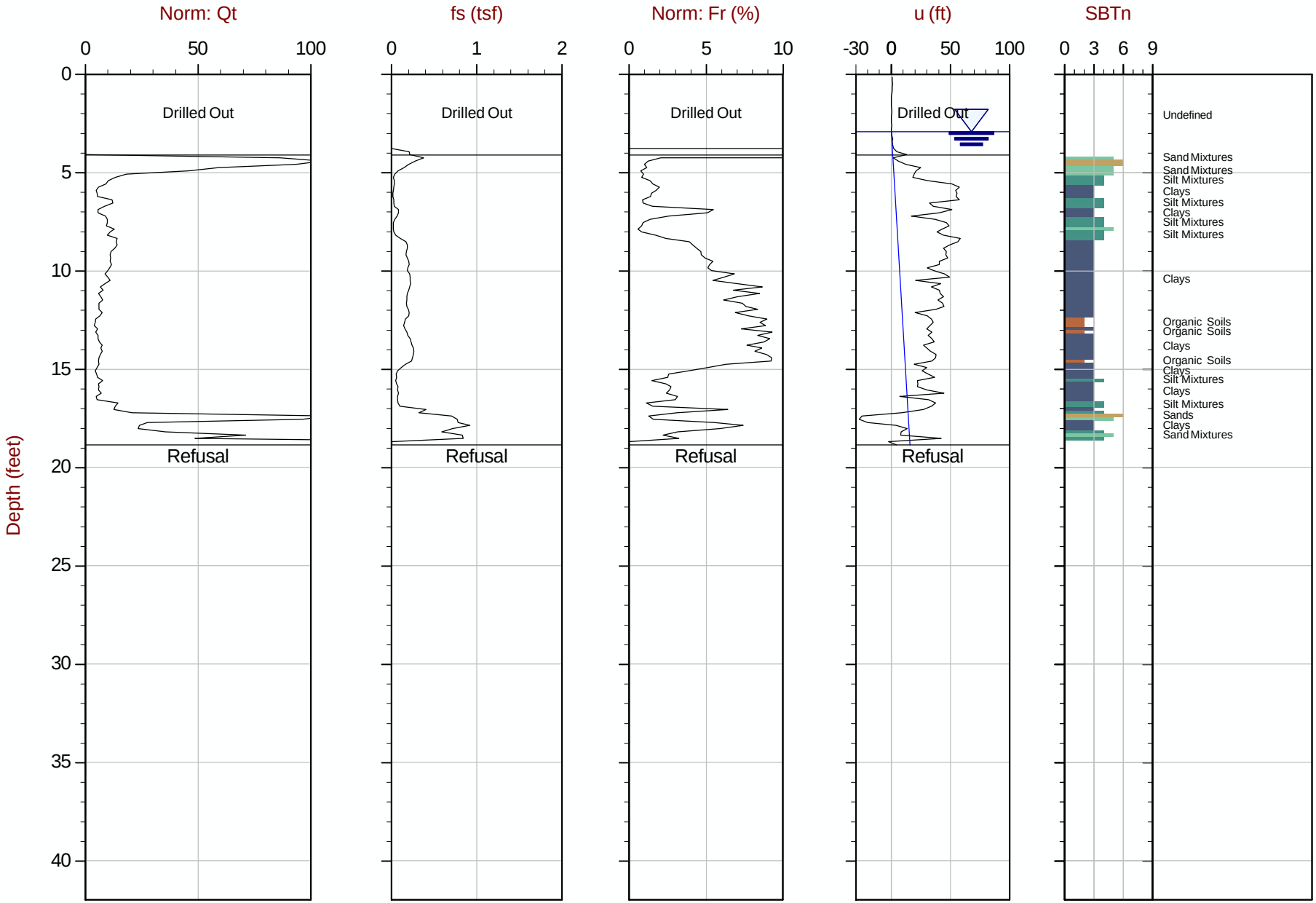
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494413 E: 566027

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 08:40
Site: Rahway Arch

Sounding: CPT-09D
Cone: 302:T1500F15U500



Max Depth: 5.750 m / 18.86 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP09D.COR

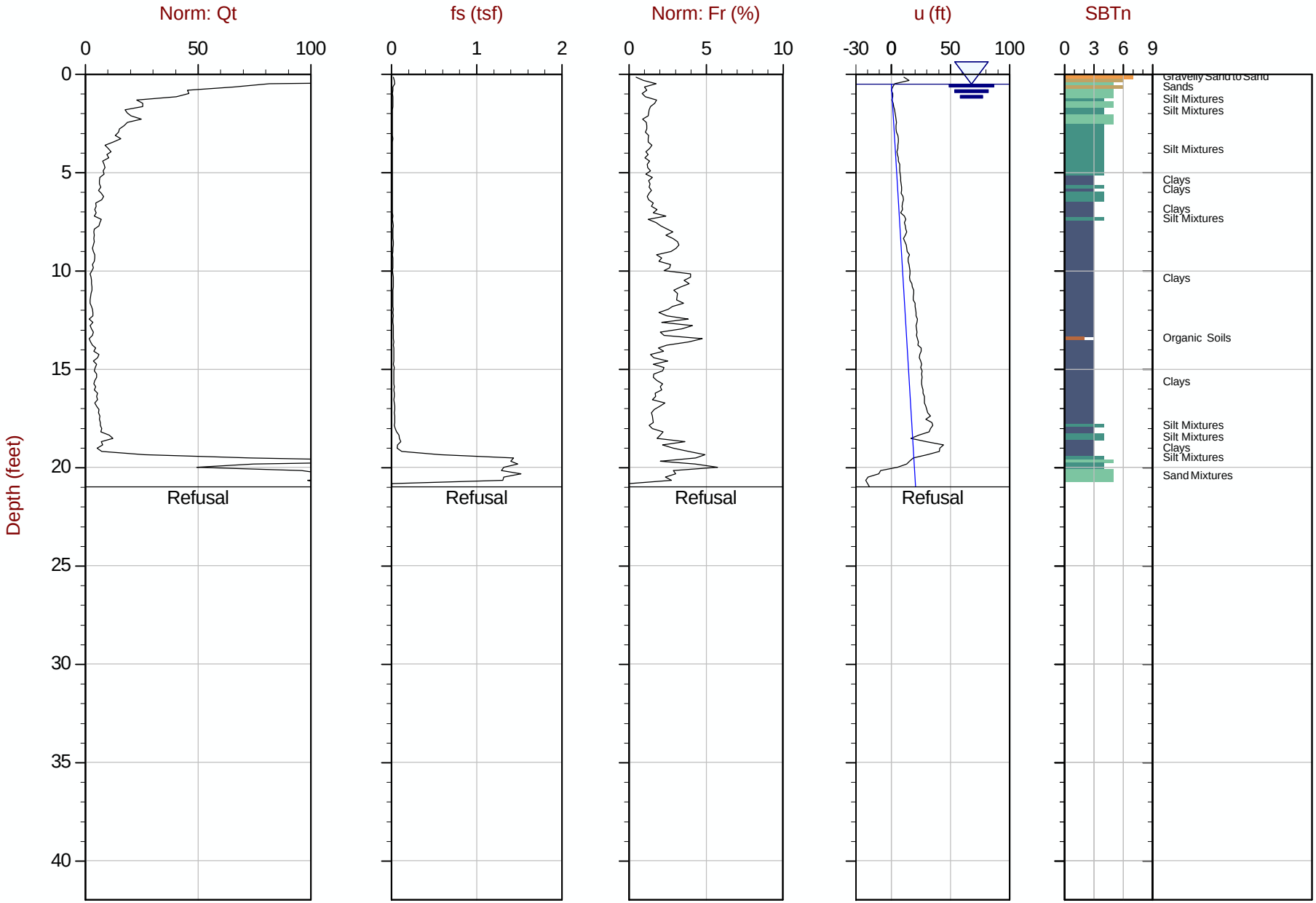
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494424 E: 566007

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:13:12 09:38
Site: Rahway Arch

Sounding: CPT-10
Cone: 302:T1500F15U500



Max Depth: 6.400 m / 21.00 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP10.COR

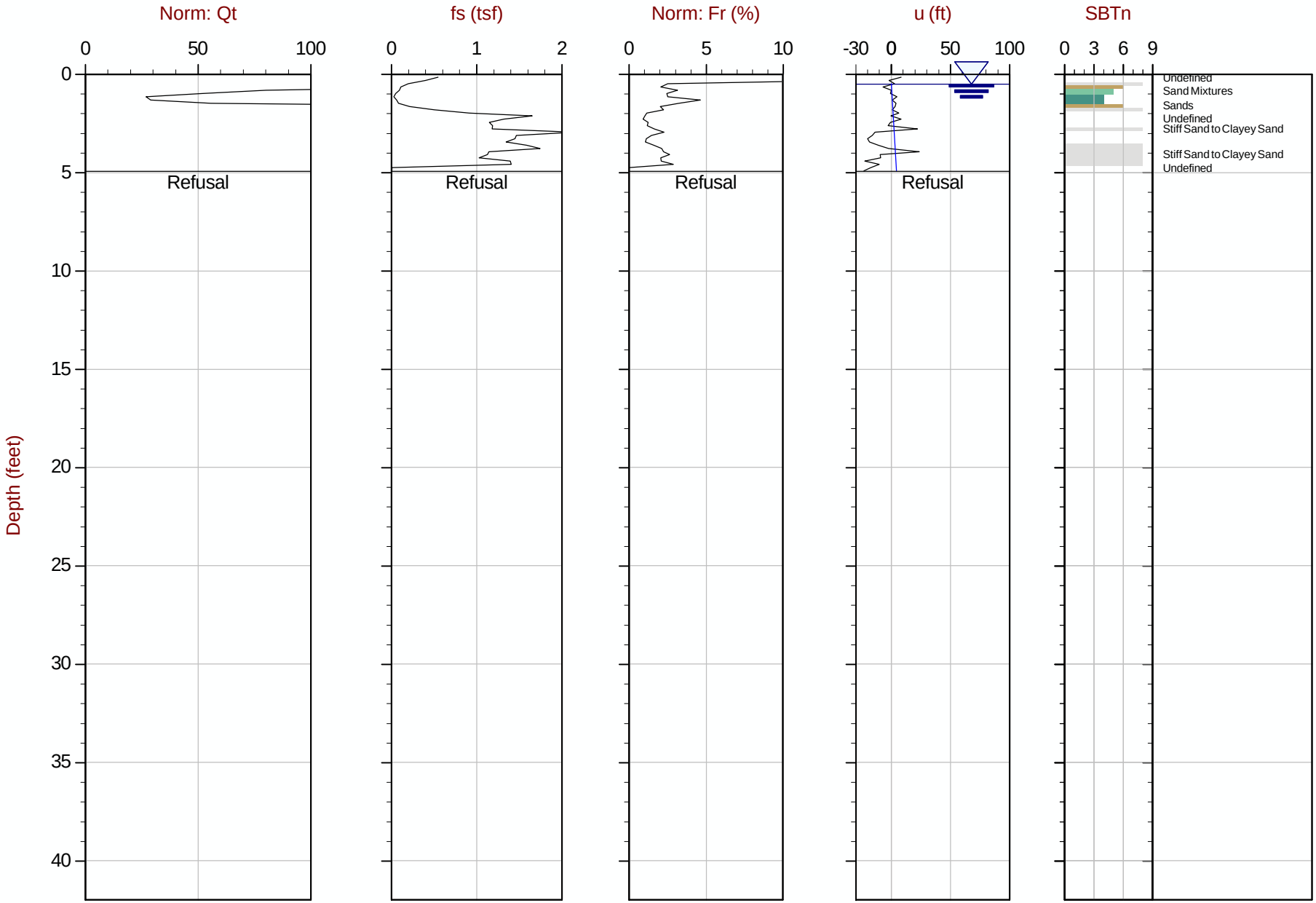
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494621 E: 566150

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 11:49
Site: Rahway Arch

Sounding: CPT-11
Cone: 302:T1500F15U500



Max Depth: 1.500 m / 4.92 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP11.COR

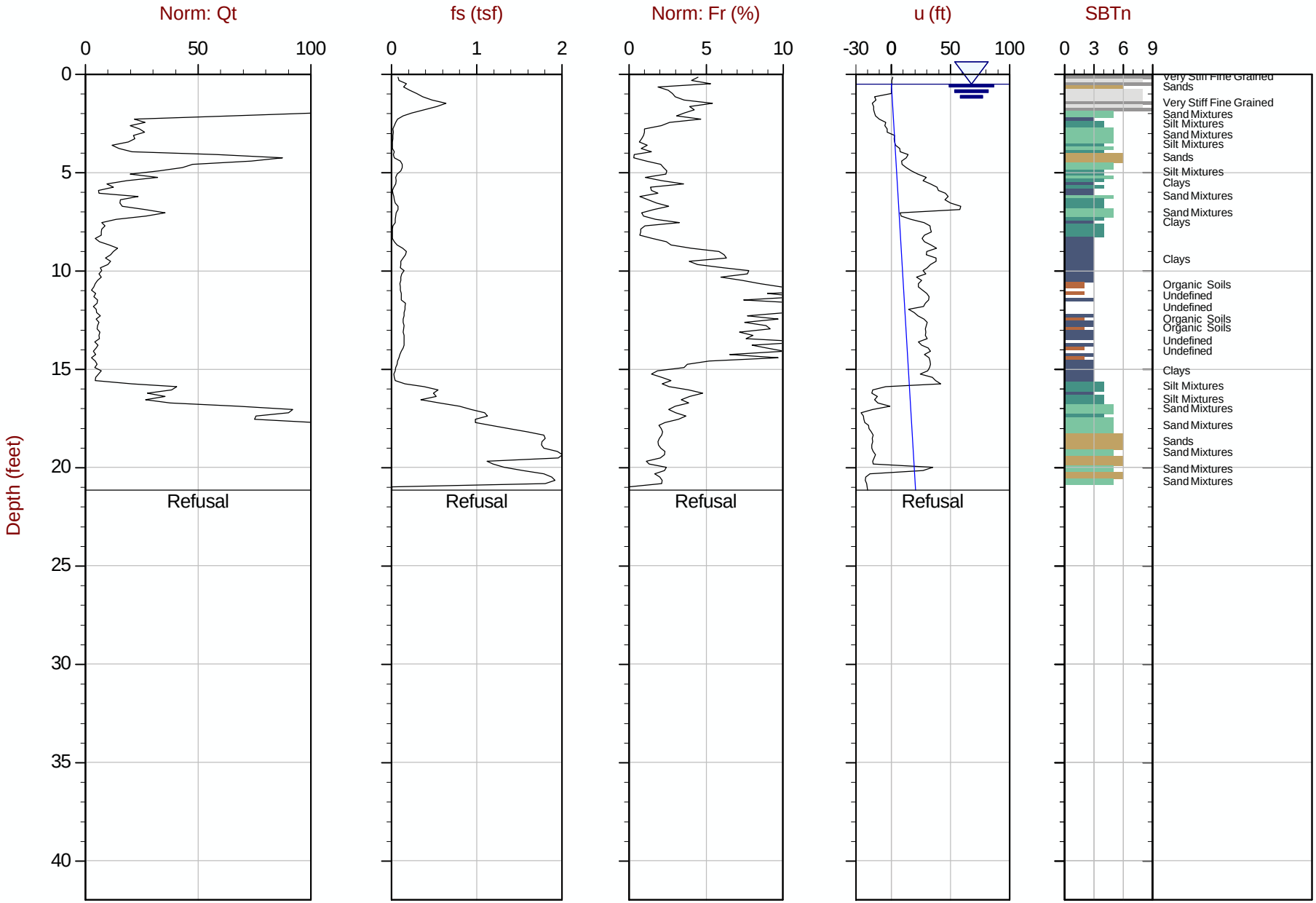
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494109 E: 566210

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:12:12 12:10
Site: Rahway Arch

Sounding: CPT-11A
Cone: 302:T1500F15U500



Max Depth: 6.450 m / 21.16 ft
Depth Inc: 0.050 m / 0.164 ft

File: 741CP11A.COR

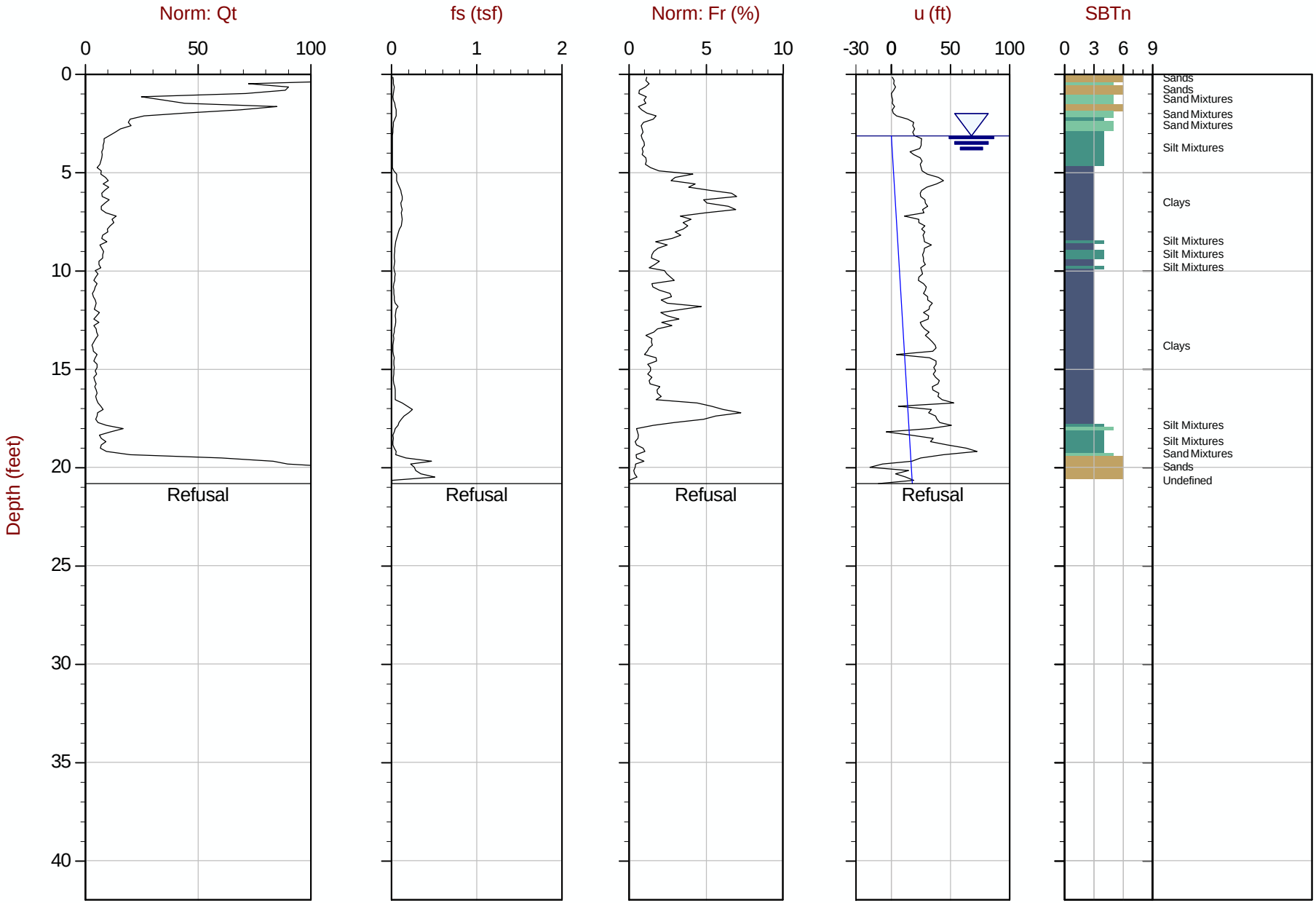
SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494117 E: 566189

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07:16:12 06:56
Site: Rahway Arch

Sounding: CPT-12
Cone: 302:T1500F15U500



Max Depth: 6.350 m / 20.83 ft
Depth Inc: 0.050 m / 0.164 ft

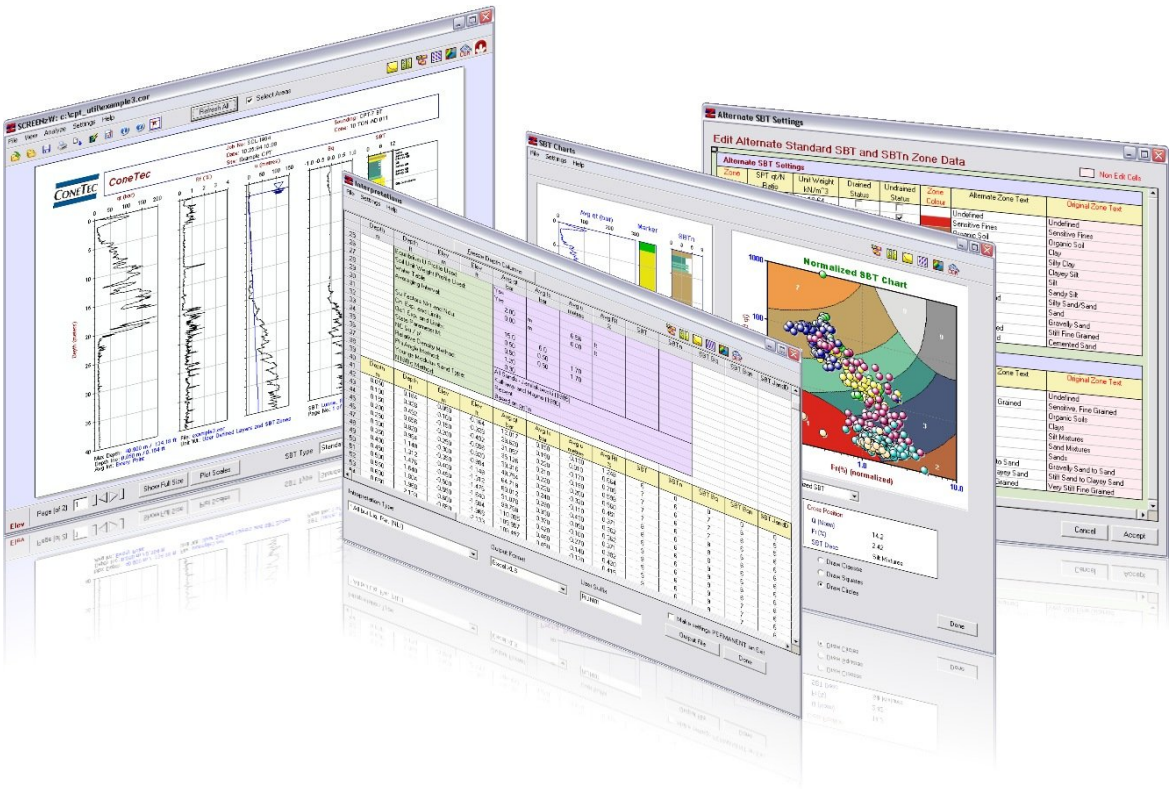
File: 741CP12.COR

SBT: Lunne, Robertson and Powell, 1997
Coords: UTM Zone 18 N: 4494164 E: 566559

Appendix B

CONETEC INTERPRETATION METHODS

A Detailed Description of the Methods Used in ConeTec's CPT Interpretation and Plotting Software



Revision SZW-Rev 05
January 16, 2011

Prepared by Jim Greig

ConeTec Interpretations as of January 16, 2011

ConeTec's interpretation routine provides a tabular output of geotechnical parameters based on current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended. ConeTec does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the program and does not assume liability for any use of the results in any design or review. Representative hand calculations should be made for any parameter that is critical for design purposes. The end user of the interpreted output should also be fully aware of the techniques and the limitations of any method used in this program. The purpose of this document is to inform the user as to which methods were used and what the appropriate papers and/or publications are for further reference.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (e.g. 0.20m). Note that q_t is the tip resistance corrected for pore pressure effects and q_c is the recorded tip resistance. Since all ConeTec cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, f_s, are not required.

The tip correction is: $q_t = q_c + (1-a) \cdot u_2$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the cone (typically 0.80 for ConeTec cones)

The total stress calculations are based on soil unit weights that have been assigned to the Soil Behavior Type zones, from a user defined unit weight profile or by using a single value throughout the profile.

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). For over water projects the effects of the column of water have been taken into account as has the appropriate unit weight of water. How this is done depends on where the instruments were zeroed (i.e. on deck or at mud line).

Details regarding the interpretation methods for all of the interpreted parameters are provided in Table 1. The appropriate references cited in Table 1 are listed in Table 2. Where methods are based on charts or techniques that are too complex to describe in this summary the user should refer to the cited material.

The estimated Soil Behavior Types (normalized and non-normalized) are based on the charts developed by Robertson and Campanella shown in Figures 1 and 2. Alternate classification charts, such as the Bq SBTcharts, are shown in Figure 3.

Where the results of a calculation/interpretation are declared *'invalid'* the value will be represented by the text strings "-9999" or "-9999.0". In some cases the value 0 will be used. Invalid results will occur because of (and not limited to) one or a combination of:

1. Invalid or undefined CPT data (e.g. drilled out section or data gap).

2. Where the interpretation method is inappropriate, for example, drained parameters in an undrained material (and vice versa).

3. Where interpretation input values are beyond the range of the referenced charts or specified limitations of the interpretation method.

4. Where pre-requisite or intermediate interpretation calculations are invalid.

The parameters selected for output from the program are often specific to a particular project. As such, not all of the interpreted parameters listed in Table 1 may be included in the output files delivered with this report.

The output files are provided in Microsoft Excel XLS format. The ConeTec software has several options for output depending on the number or types of interpreted parameters desired. Each output file will be named using the original COR file basename followed by a three or four letter indicator of the interpretation set selected (e.g. BSC, TBL, NLI or IFI) and possibly followed by an operator selected suffix identifying the characteristics of the particular interpretation run.

Table 1
CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	Mid Layer Depth *(where interpretations are done at each point then Mid Layer Depth = Recorded Depth)*	*Depth (Layer Top) + Depth (Layer Bottom) / 2.0*	
Elevation	Elevation of Mid Layer based on sounding collar elevation supplied by client	Elevation = Collar Elevation - Depth	
Avgqc	Averaged recorded tip value (q_c)	$Avgqc = \frac{1}{n}\sum_{i=1}^{n} q_c$ *n=1 when interpretations are done at each point*	
Avgqt	Averaged corrected tip (q_t) where: $q_t = q_c + (1-a) \bullet u$	$Avgqt = \frac{1}{n}\sum_{i=1}^{n} q_t$ *n=1 when interpretations are done at each point*	
Avgfs	Averaged sleeve friction (f_s)	$Avgfs = \frac{1}{n}\sum_{i=1}^{n} fs$ *n=1 when interpretations are done at each point*	
AvgRf	Averaged friction ratio (Rf) where friction ratio is defined as: $Rf = 100\% \bullet \frac{fs}{qt}$	$AvgRf = 100\% \cdot \frac{Avgfs}{Avgqt}$ *n=1 when interpretations are done at each point*	
Avgu	Averaged dynamic pore pressure *(u)*	$Avgu = \frac{1}{n}\sum_{i=1}^{n} u_i$ *n=1 when interpretations are done at each point*	
AvgRes	Averaged Resistivity (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} RESISTIVITY_i$ *n=1 when interpretations are done at each point*	
AvgUVIF	Averaged UVIF ultra-violet induced fluorescence (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} UVIF_i$ *n=1 when interpretations are done at each point*	
AvgTemp	Averaged Temperature (this data is not always available since it is a specialized test)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} TEMPERATURE_i$ *n=1 when interpretations are done at each point*	
AvgGamma	Averaged Gamma Counts (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} GAMMA_i$ *n=1 when interpretations are done at each point*	
SBT	Soil Behavior Type as defined by Robertson and Campanella	See Figure 1	2, 5

Interpreted Parameter	Description	Equation	Ref
U.Wt.	Unit Weight of soil determined from one of the following user selectable options: 1) uniform value 2) value assigned to each SBT zone 3) user supplied unit weight profile	See references	5
T. Stress σ_v	Total vertical overburden stress at Mid Layer Depth. *A layer is defined as the averaging interval specified by the user. For data interpreted at each point the Mid Layer Depth is the same as the recorded depth.*	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ *where* γ_i is layer unit weight h_i is layer thickness	
E. Stress σ_v'	Effective vertical overburden stress at Mid Layer Depth	$Estress = Tstress - u_{eq}$	
Ueq	Equilibrium pore pressure determined from one of the following user selectable options: 1) hydrostatic from water table depth 2) user supplied profile	For hydrostatic option: $u_{eq} = \gamma_w \cdot (D - D_{wt})$ where u_{eq} is equilibrium pore pressure γ_w is unit weight of water D is the current depth D_{wt} is the depth to the water table	
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' *is in tsf* $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from qt/N ratios assigned to each SBT zone. This method has abrupt N value changes at zone boundaries.	*See Figure 1*	4, 5
$(N_1)_{60}$	SPT N_{60} value corrected for overburden pressure	$(N_1)_{60} = Cn \cdot N_{60}$	4
$N_{60}I_c$	SPT N_{60} values based on the Ic parameter	$(qt/pa)/ N_{60} = 8.5 (1 – Ic/4.6)$	5
$(N_1)_{60}Ic$	SPT N_{60} value corrected for overburden pressure (using N_{60} I_c). User has 2 options.	1) $(N_1)_{60}Ic= Cn \cdot (N_{60}\, Ic)$ 2) $q_{c1n}/ (N_1)_{60}Ic = 8.5 (1 – Ic/4.6)$	4 5
$(N_1)_{60cs}Ic$	Clean sand equivalent SPT $(N_1)_{60}Ic$. User has 3 options.	1) $(N_1)_{60cs}Ic = \alpha + \beta((N_1)_{60}Ic)$ 2) $(N_1)_{60cs}Ic = K_{SPT} * ((N_1)_{60}Ic)$ 3) $q_{c1ncs})/ (N_1)_{60cs}Ic = 8.5 (1 – Ic/4.6)$ FC ≤ 5%: $\alpha = 0$, $\beta=1.0$ FC ≥ 35% $\alpha = 5.0$, $\beta=1.2$ 5% < FC < 35% $\alpha = \exp[1.76 – (190/FC^2)]$ $\beta = [0.99 + (FC^{1.5}/1000)]$	10 10 5
Su	Undrained shear strength based on q_t Su factor N_{kt} is user selectable	$Su = \frac{qt - \sigma_v}{N_{kt}}$	1, 5
Su	Undrained shear strength based on pore pressure Su factor $N_{\Delta u}$ is user selectable	$Su = \frac{u_2 - u_{eq}}{N_{\Delta u}}$	1, 5
k	Coefficient of permeability (assigned to each SBT zone)		5
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{qt - \sigma_v}$ *where:* $\Delta u = u - u_{eq}$ *and* u = *dynamic pore pressure* u_{eq} = *equilibrium pore pressure*	1, 5

Interpreted Parameter	Description	Equation	Ref
Q_t	Normalized q_t for Soil Behavior Type classification as defined by Robertson, 1990	$Qt = \frac{qt - \sigma_v}{\sigma'_v}$	2, 5
F_r	Normalized Friction Ratio for Soil Behavior Type classification as defined by Robertson, 1990	$Fr = 100\% \cdot \frac{fs}{qt - \sigma_v}$	2, 5
Net qt	Net tip resistance	$qt - \sigma_v$	
qe	Effective tip resistance	$qt - u_2$	
qeNorm	Normalized effective tip resistance	$\frac{qt - u_2}{\sigma'_v}$	
SBTn	Normalized Soil Behavior Type as defined by Robertson and Campanella	See Figure 2	2, 5
SBT-BQ	Non-normalized Soil Behavior type based on the Bq parameter	See Figure 3	2, 5
SBT-BQn	Normalized Soil Behavior based on the Bq parameter	See Figure 3	2, 5
SBT-JandD	Soil Behaviour Type as defined by Jeffries and Davies	See Figure 3	7
SBT-BQn	Normalized Soil Behavior base on the Bq parameter	See Figure 3	2, 5
I_c	Soil index for estimating grain characteristics	$Ic = [(3.47 - \log_{10}Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$ *Where:* $Q = \left(\frac{qt - \sigma_v}{P_{a2}}\right)\left(\frac{P_a}{\sigma'_v}\right)^n$ *And* *Fr is in percent* *P_a = atmospheric pressure* *P_{a2} = atmospheric pressure* *n varies from 0.5 to 1.0 and is selected in an iterative manner based on the resulting I_c*	3, 8
FC	Apparent fines content (%)	*$FC=1.75(Ic^{3.25}) - 3.7$* *FC=100 for Ic > 3.5* *FC=0 for Ic < 1.26* *FC = 5% if 1.64 < Ic < 2.6 AND F_r<0.5*	3
Ic Zone	This parameter is the Soil Behavior Type zone based on the Ic parameter (valid for zones 2 through 7 on SBTn chart)	Ic < 1.31 Zone = 7 1.31 < Ic < 2.05 Zone = 6 2.05 < Ic < 2.60 Zone = 5 2.60 < Ic < 2.95 Zone = 4 2.95 < Ic < 3.60 Zone = 3 Ic > 3.60 Zone = 2	3
PHI ϕ	Friction Angle determined from one of the following user selectable options: a) Campanella and Robertson b) Durgunoglu and Mitchel c) Janbu d) Kulhawy and Mayne	See reference	5 5 5 11
Dr	Relative Density determined from one of the following user selectable options: a) Ticino Sand b) Hokksund Sand c) Schmertmann 1976 d) Jamiolkowski - All Sands	See reference	5

Interpreted Parameter	Description	Equation	Ref
OCR	Over Consolidation Ratio	a) Based on Schmertmann's method involving a plot of S_u/σ_v' /($S_u/\sigma_v')_{NC}$ and OCR where the Su/p' ratio for NC clay is user selectable	9
State Parameter	The state parameter is used to describe whether a soil is contractive (SP is positive) or dilative (SP is negative) at large strains based on the work by Been and Jefferies	See reference	8, 6, 5
Es/qt	Intermediate parameter for calculating Young's Modulus, E, in sands. It is the Y axis of the reference chart.	Based on Figure 5.59 in the reference	5
Young's Modulus E	Young's Modulus based on the work done in Italy. There are three types of sands considered in this technique. The user selects the appropriate type for the site from: a) OC Sands b) Aged NC Sands c) Recent NC Sands Each sand type has a family of curves that depend on mean normal stress. The program calculates mean normal stress and linearly interpolates between the two extremes provided in the Es/qt chart.	Mean normal stress is evaluated from: $\sigma'_m = \frac{1}{3}\left(\sigma'_v + \sigma'_h + \sigma'_h\right)^3$ where σ_v'= vertical effective stress σ_h'= horizontal effective stress and $\sigma_h = K_o \cdot \sigma_v'$ with Ko assumed to be 0.5	5
q_{c1}	q_t normalized for overburden stress used for seismic analysis	$q_{c1} = q_t \cdot (Pa/\sigma_v')^{0.5}$ where: Pa = atm. Pressure q_t is in MPa	3
q_{c1n}	q_{c1} in dimensionless form used for seismic analysis	$q_{c1n} = (q_{c1} / Pa)(Pa/\sigma_v')^n$ where: Pa = atm. Pressure and n ranges from 0.5 to 0.75 based on Ic.	3
K_{SPT}	Equivalent clean sand factor for $(N_1)60$	$K_{SPT} = 1 + ((0.75/30) \cdot (FC - 5))$	10
K_{CPT}	Equivalent clean sand correction for q_{c1N}	$K_{cpt} = 1.0$ for $I_c \leq 1.64$ $K_{cpt} = f(I_c)$ for $I_c > 1.64$ (see reference)	10
q_{c1ncs}	Clean sand equivalent q_{c1n}	$q_{c1ncs} = q_{c1n} \cdot K_{cpt}$	3
CRR	Cyclic Resistance Ratio (for Magnitude 7.5)	$q_{c1ncs} < 50$: $CRR_{7.5} = 0.833\ [(q_{c1ncs}/1000] + 0.05$ $50 \leq q_{c1ncs} < 160$: $CRR_{7.5} = 93\ [(q_{c1ncs}/1000]^3 + 0.08$	10
CSR	Cyclic Stress Ratio	$CSR = (\tau_{av}/\sigma_v') = 0.65\ (a_{max} / g)\ (\sigma_v/ \sigma_v')\ r_d$ $r_d = 1.0 - 0.00765\ z$ $z \leq 9.15$m $r_d = 1.174 - 0.0267\ z$ $9.15 < z \leq 23$m $r_d = 0.744 - 0.008\ z$ $23 < z \leq 30$m $r_d = 0.50$ $z > 30$m	10

Interpreted Parameter	Description	Equation	Ref
MSF	Magnitude Scaling Factor	See Reference	10
FofS	Factor of Safety against Liquefaction	FS = ($CRR_{7.5}$ / CSR) MSF	10
Liquefaction Status	Statement indicating possible liquefaction	Takes into account FofS and limitations based on I_c and q_{c1ncs}.	10
Cont/Dilat Tip	Contractive / Dilative qc1 Boundary based on $(N_1)_{60}$	$(\sigma_v')_{boundary} = 9.58 \times 10^{-4} [(N_1)_{60}]^{-4.79}$ qc1 is calculated from specified qt(MPa)/N ratio	11
Su(Liq)/s'v	Liquefied Shear Strength Ratio	$\frac{Su(Liq)}{\sigma_v'} = 0.03 + 0.0143(q_{c1})$	12

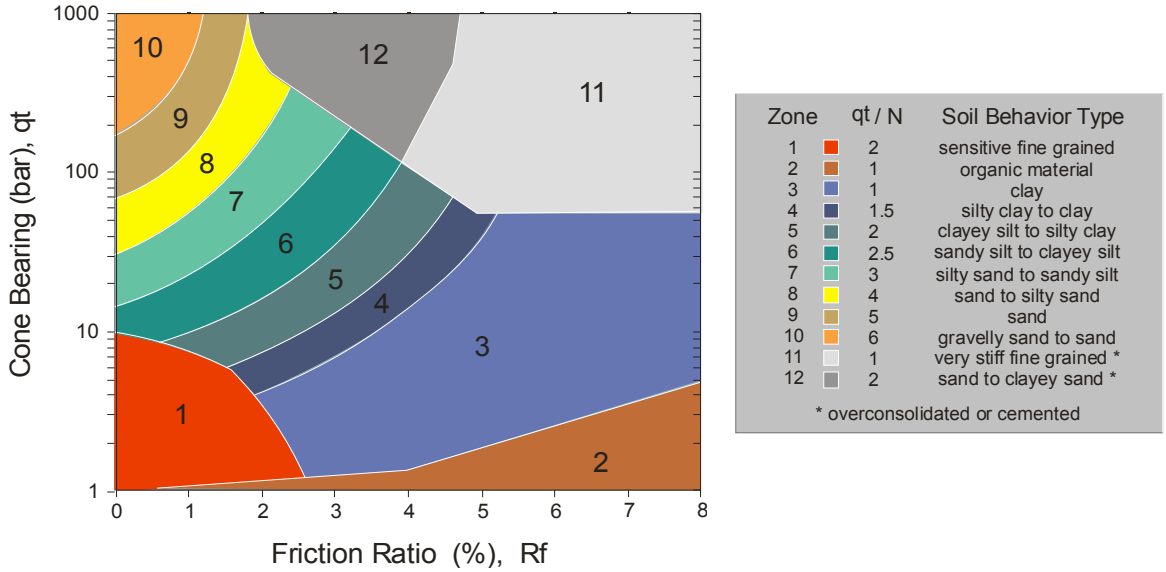


Figure 1 Non-Normalized Behavior Type Classification Chart

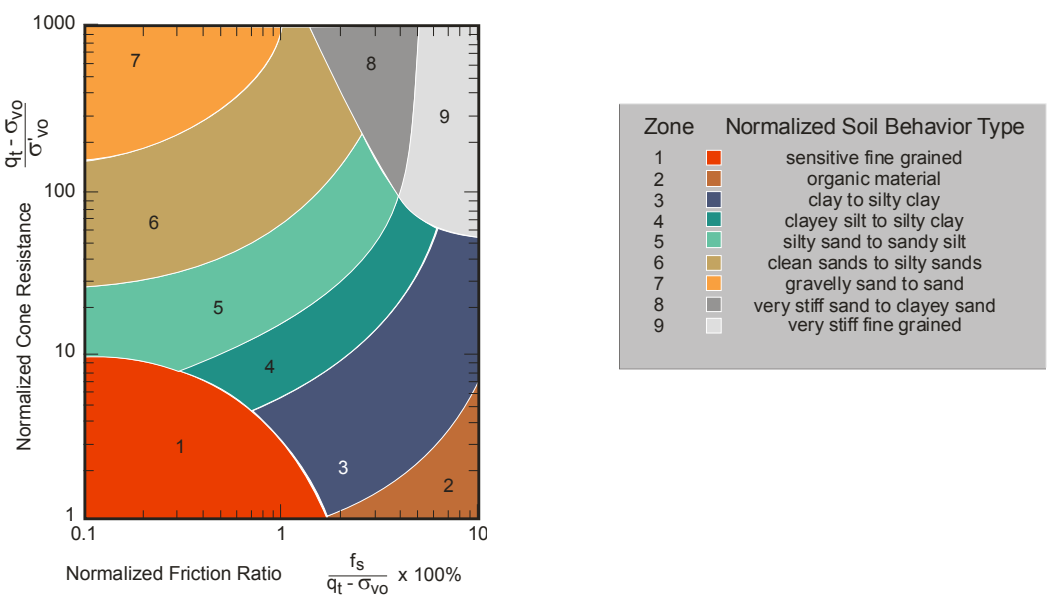


Figure 2 Normalized Behavior Type Classification Chart

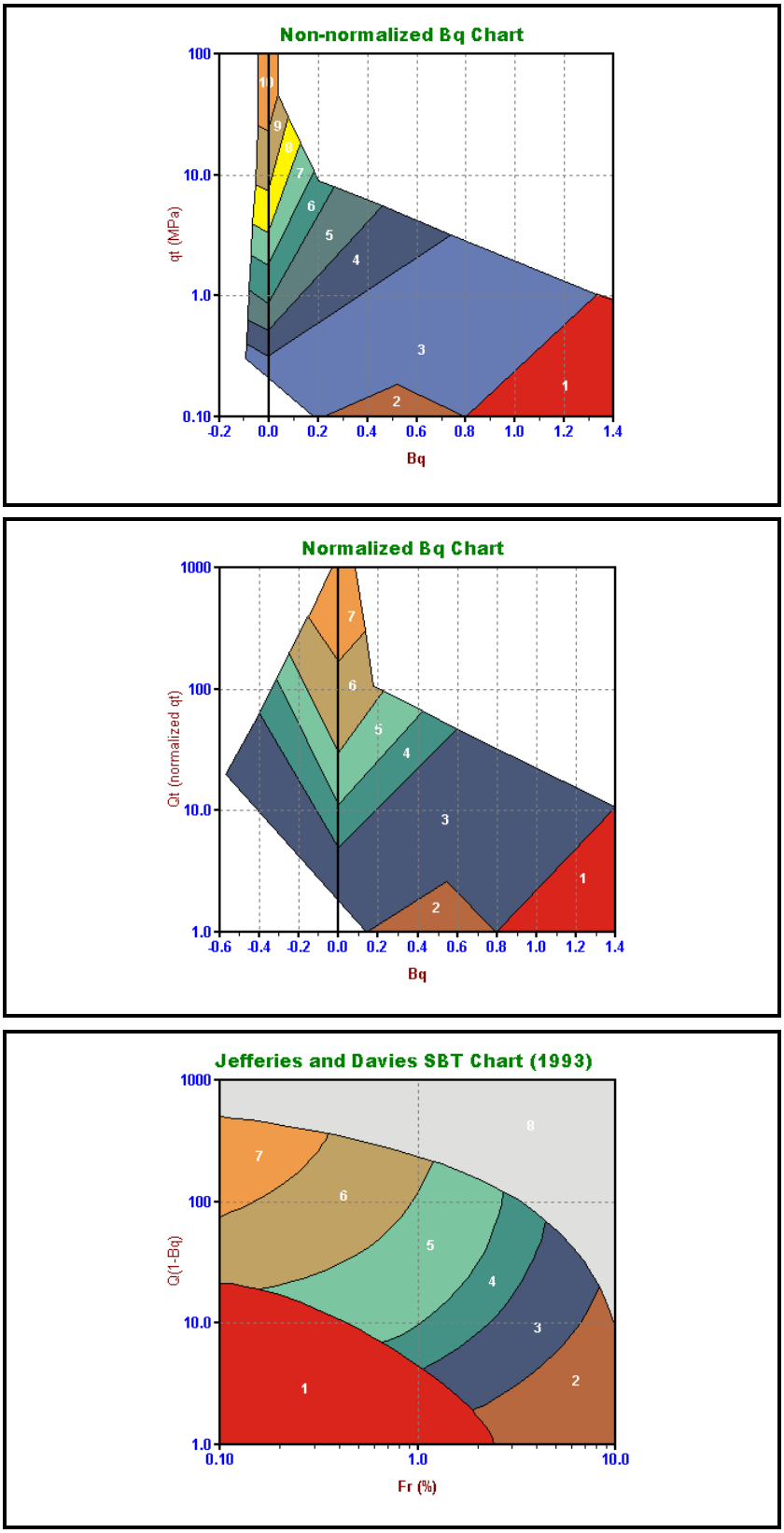


Figure 3 – Alternate Soil Behaviour Type Charts

Table 2 References

No.	References
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3	Robertson, P.K. and Fear, C.E., 1998, "Evaluating cyclic liquefaction potential using the cone penetration test", Canadian Geotechnical Journal, 35: 442-459.
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10	Proceedings of theNCEER Workshop on Evaluation of Liquefaction Resistance of Soils, Salt LakeCity, 1996. Chaired by Leslie Youd. 11
11	Kulhawy, F.H. and Mayne, P.W. ,1990, "Manual on Estimating Soil Properties for Foundation Design, *Report No. EL-6800"*, Electric Power Research Institute, Palo Alto, CA, August 1990, 306 p.
12	Oslon, Scott M. and Stark, Timothy D., 2003, "Yield Strength Ratio and Liquefaction Analysis of Slopes and Embankments", Journal of Geotechnical and Geoenvironmental Engineering, ASCE, August 2003.

Appendix C

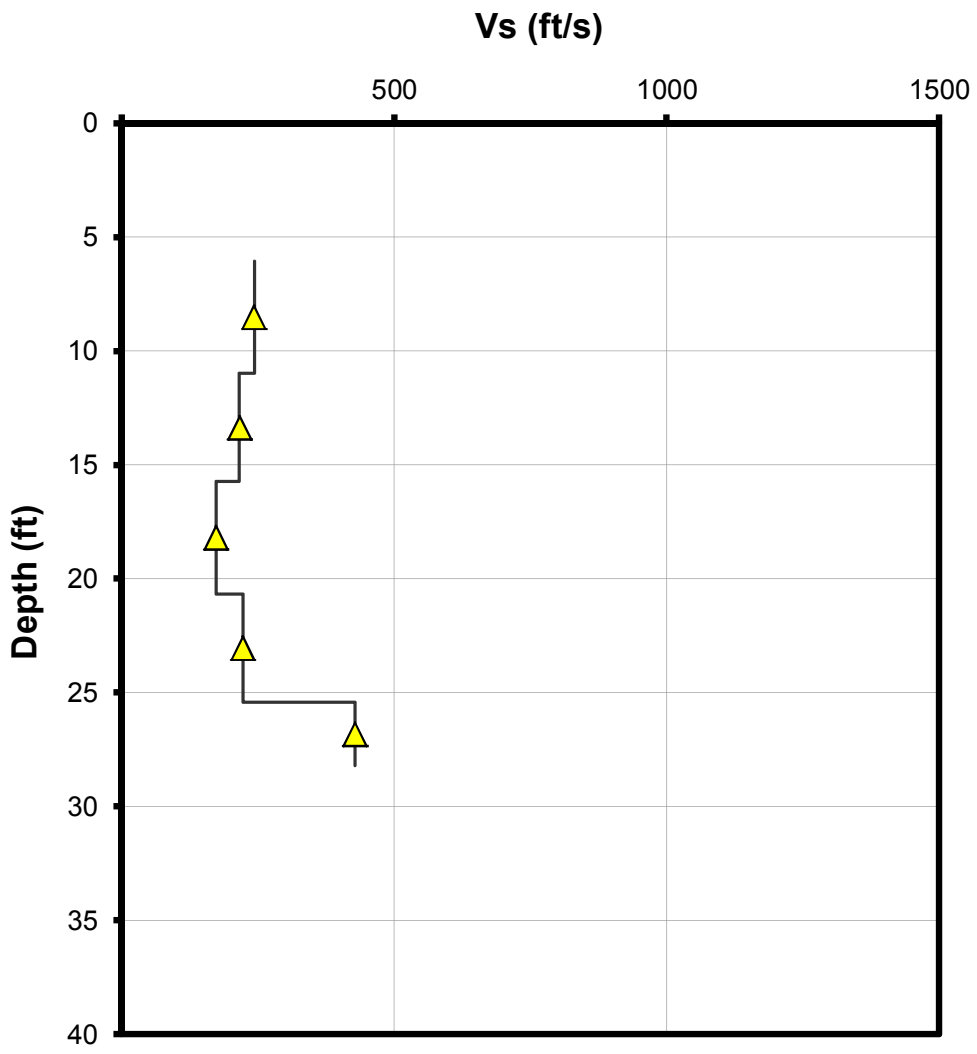
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-01
Site	Carteret, New Jersey
Date	7/12/2012

Seismic Source:	Beam	
Source Offset:	4.50	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
6.73	6.07	7.56				
11.65	10.99	11.88	4.32	17.77	8.53	243
16.40	15.74	16.37	4.50	20.81	13.37	216
21.33	20.67	21.16	4.78	27.58	18.21	173
26.08	25.42	25.82	4.66	20.98	23.05	222
28.87	28.21	28.57	2.75	6.43	26.82	428

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-01
Date: July 12, 2012



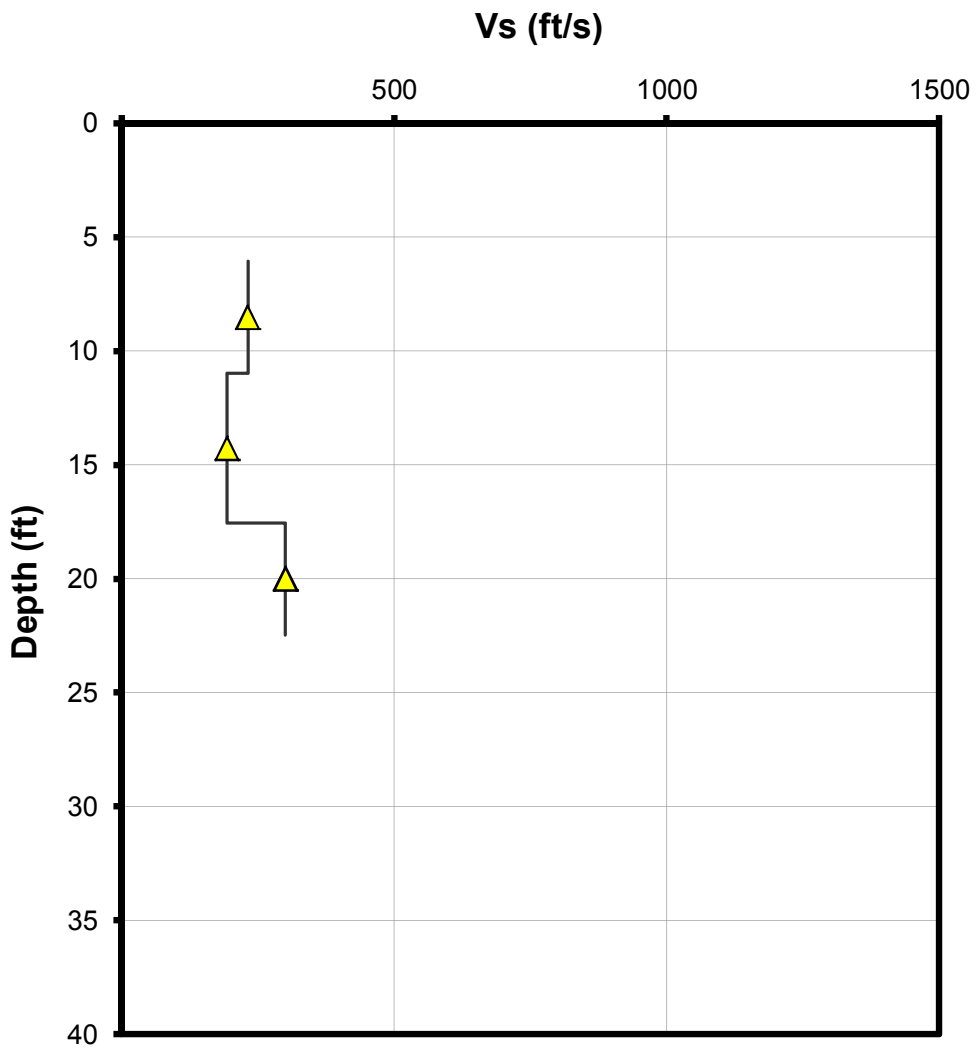
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-02
Site	Carteret, New Jersey
Date	7/13/2012

Seismic Source:	Beam	
Source Offset:	4.50	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
6.73	6.07	7.56				
11.65	10.99	11.88	4.32	18.65	8.53	232
18.21	17.55	18.12	6.24	32.31	14.27	193
23.13	22.47	22.92	4.80	15.97	20.01	300

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-02
Date: July 13, 2012



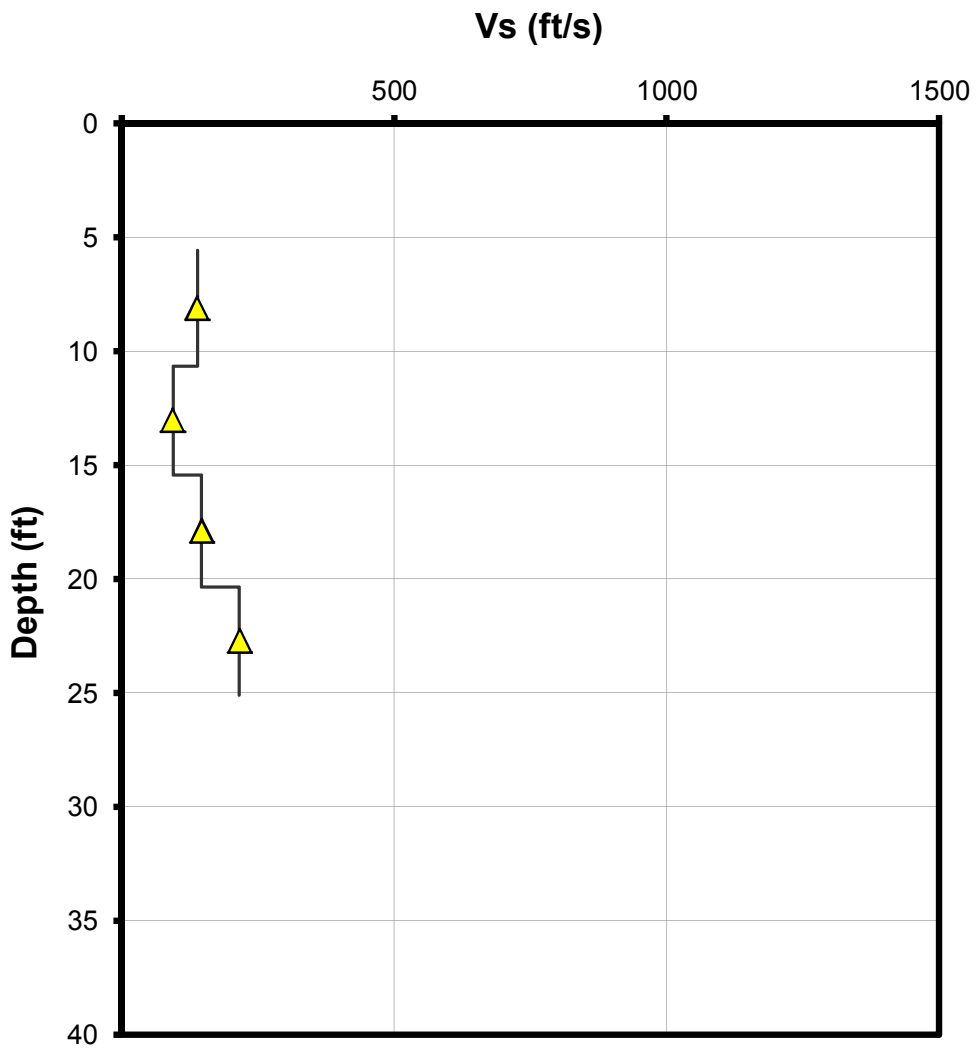
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-04
Site	Carteret, New Jersey
Date	7/10/2012

Seismic Source:	Beam	
Source Offset:	4.50	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
6.23	5.57	7.16				
11.32	10.66	11.57	4.41	31.73	8.12	139
16.08	15.42	16.07	4.49	47.80	13.04	94
21.00	20.34	20.84	4.77	32.57	17.88	146
25.75	25.09	25.49	4.66	21.57	22.72	216

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-04
Date: July 10, 2012



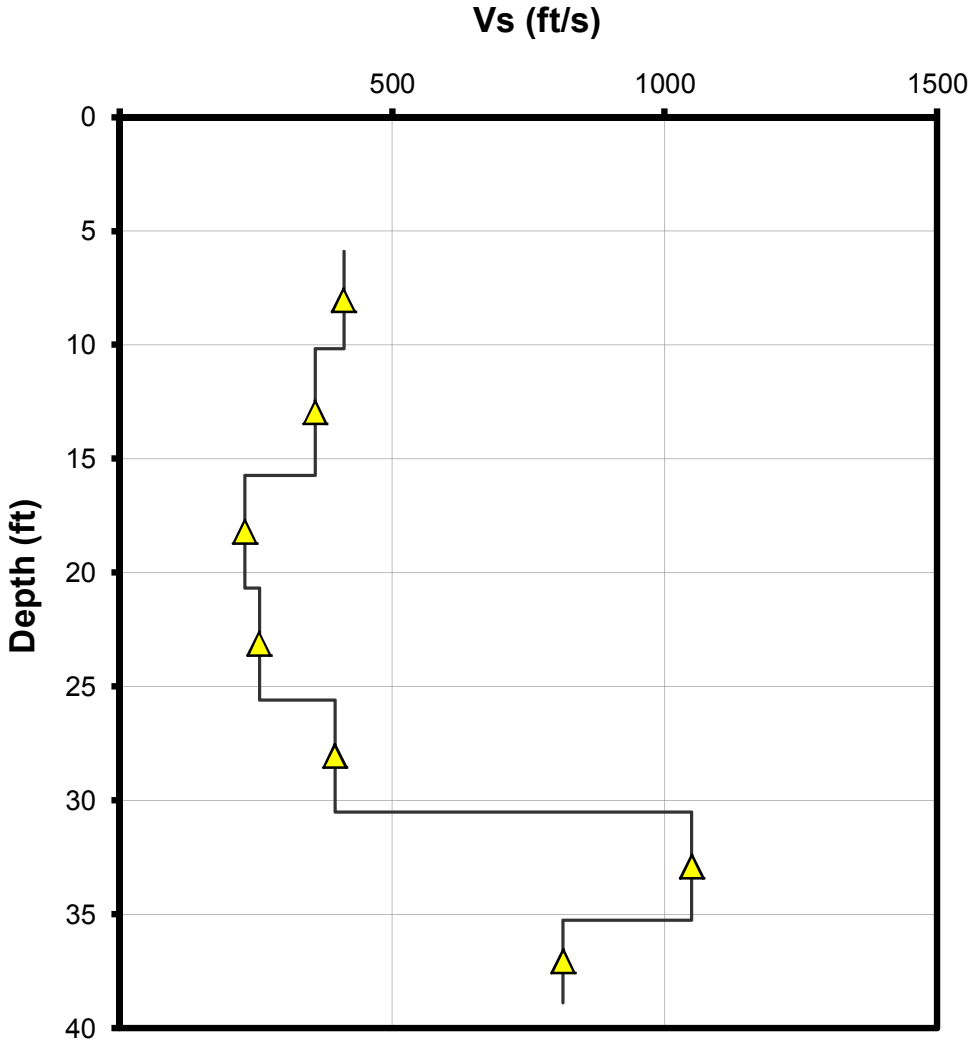
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-05
Site	Carteret, New Jersey
Date	7/10/2012

Seismic Source:	Beam	
Source Offset:	4.75	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
6.56	5.90	7.58				
10.83	10.17	11.23	3.65	8.88	8.04	411
16.40	15.74	16.44	5.22	14.55	12.96	359
21.33	20.67	21.21	4.77	20.77	18.21	230
26.25	25.59	26.03	4.82	18.82	23.13	256
31.17	30.51	30.88	4.85	12.27	28.05	395
35.92	35.26	35.58	4.70	4.48	32.89	1049
39.53	38.87	39.16	3.58	4.40	37.07	814

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-05
Date: July 10, 2012



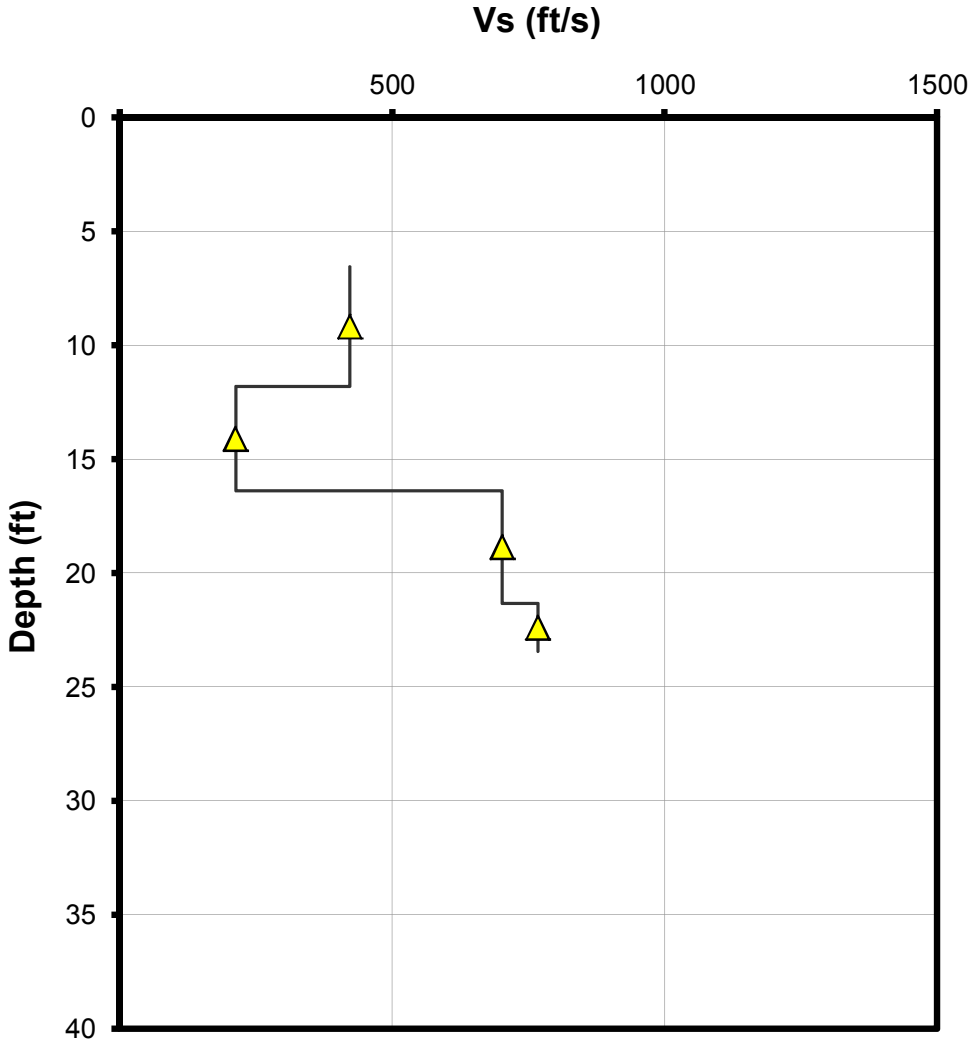
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-08
Site	Carteret, New Jersey
Date	7/10/2012

Seismic Source:	Beam	
Source Offset:	5.00	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
7.22	6.56	8.25				
12.47	11.81	12.83	4.58	10.83	9.19	423
17.06	16.40	17.15	4.32	20.30	14.11	213
21.98	21.32	21.90	4.75	6.77	18.86	702
24.11	23.45	23.98	2.08	2.71	22.39	767

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-08
Date: July 10, 2012



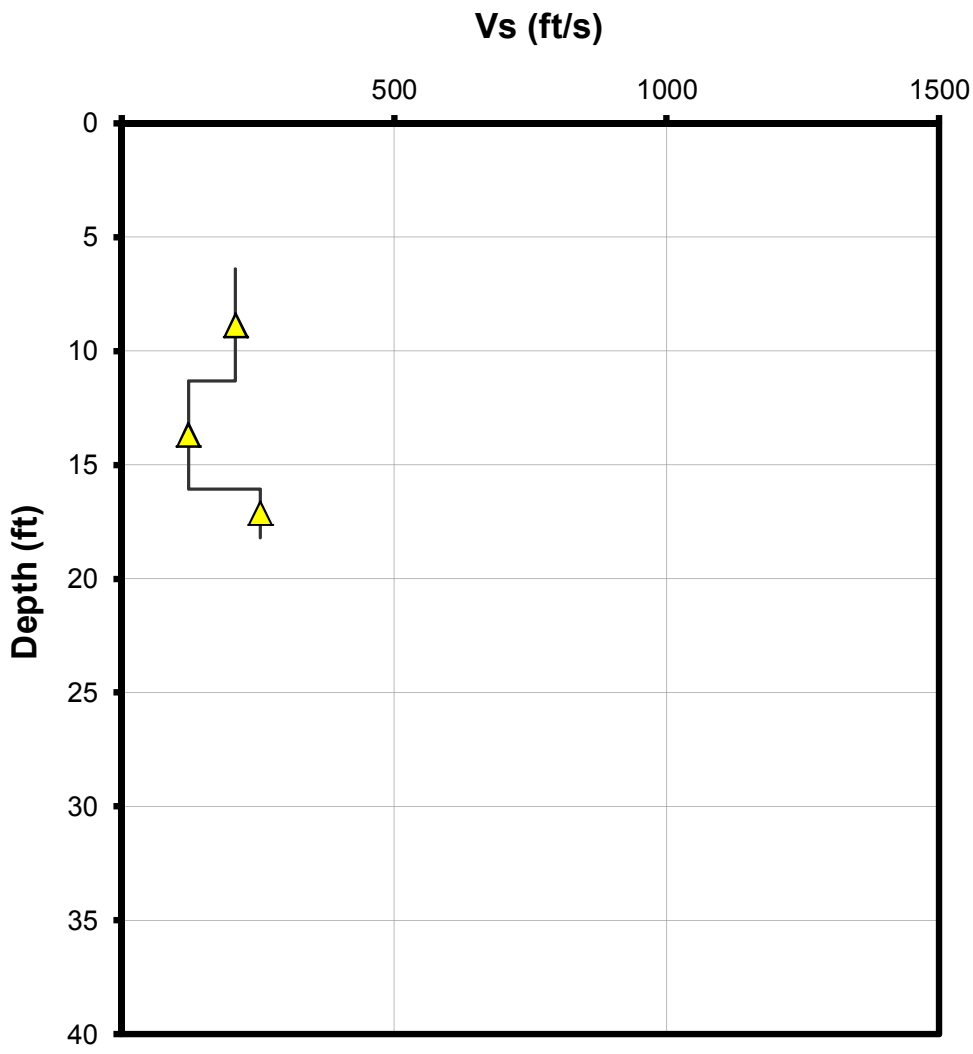
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-09D
Site	Carteret, New Jersey
Date	7/13/2012

Seismic Source:	Beam	
Source Offset:	4.75	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
7.05	6.39	7.97				
11.98	11.32	12.28	4.31	20.66	8.86	209
16.73	16.07	16.76	4.48	36.39	13.70	123
18.86	18.20	18.81	2.05	8.07	17.14	254

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-09D
Date: July 13, 2012



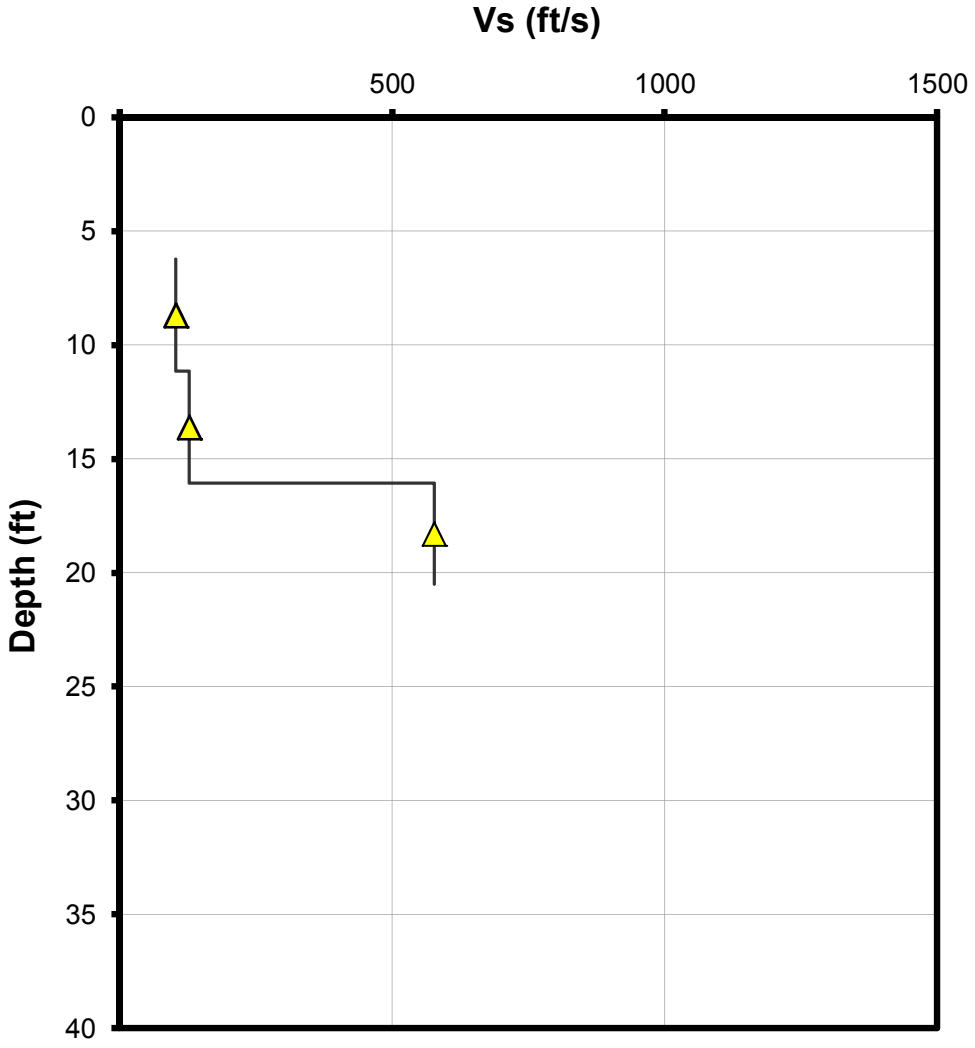
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-11A
Site	Carteret, New Jersey
Date	7/12/2012

Seismic Source:	Beam	
Source Offset:	4.50	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
6.89	6.23	7.69				
11.81	11.15	12.03	4.34	42.09	8.69	103
16.73	16.07	16.69	4.66	36.51	13.61	128
21.16	20.50	20.99	4.30	7.45	18.29	577

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-11A
Date: July 12, 2012



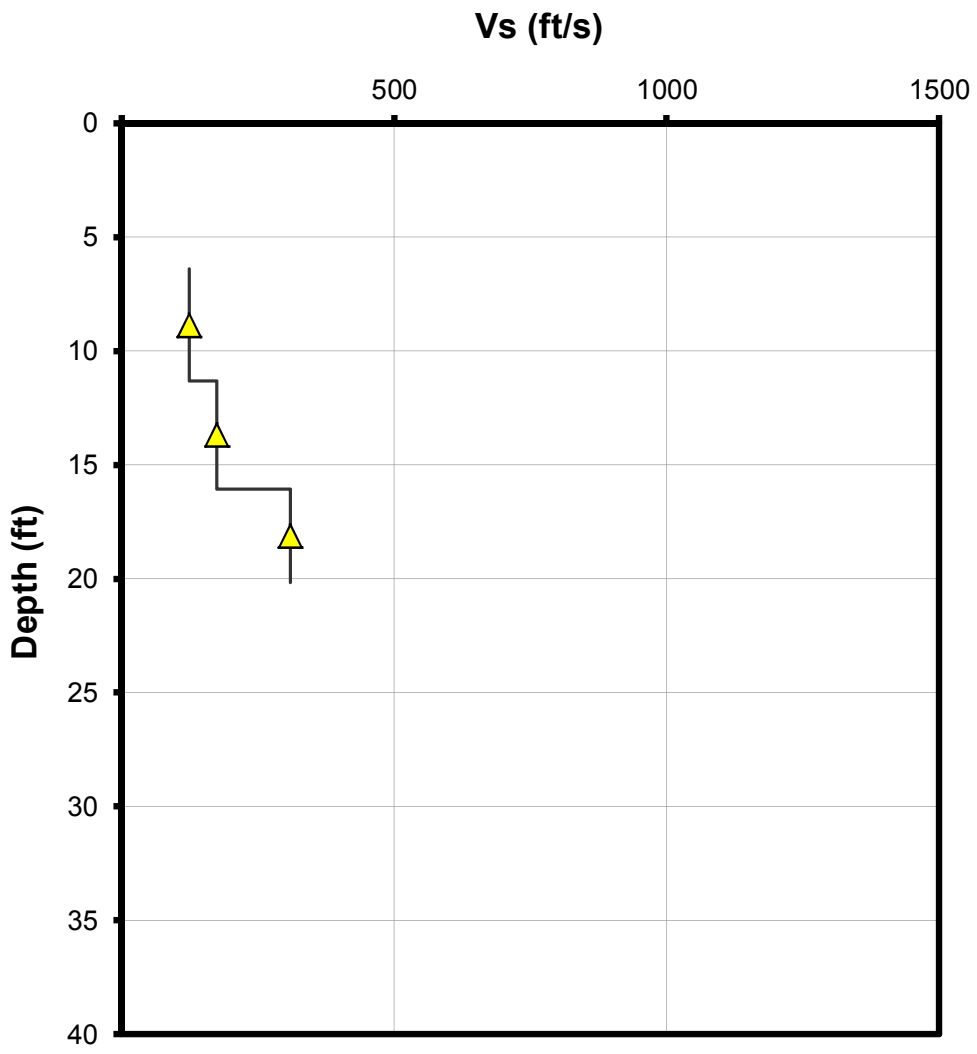
Job No	12-741
Client	Michael Baker Jr.
Project Title	Rahway Arch
Hole	CPT-12
Site	Carteret, New Jersey
Date	7/16/2012

Seismic Source:	Beam	
Source Offset:	4.50	(ft)
Source Depth:	0.00	(ft)
Geophone Offset:	0.66	(ft)

SEISMIC TEST RESULTS - Vs

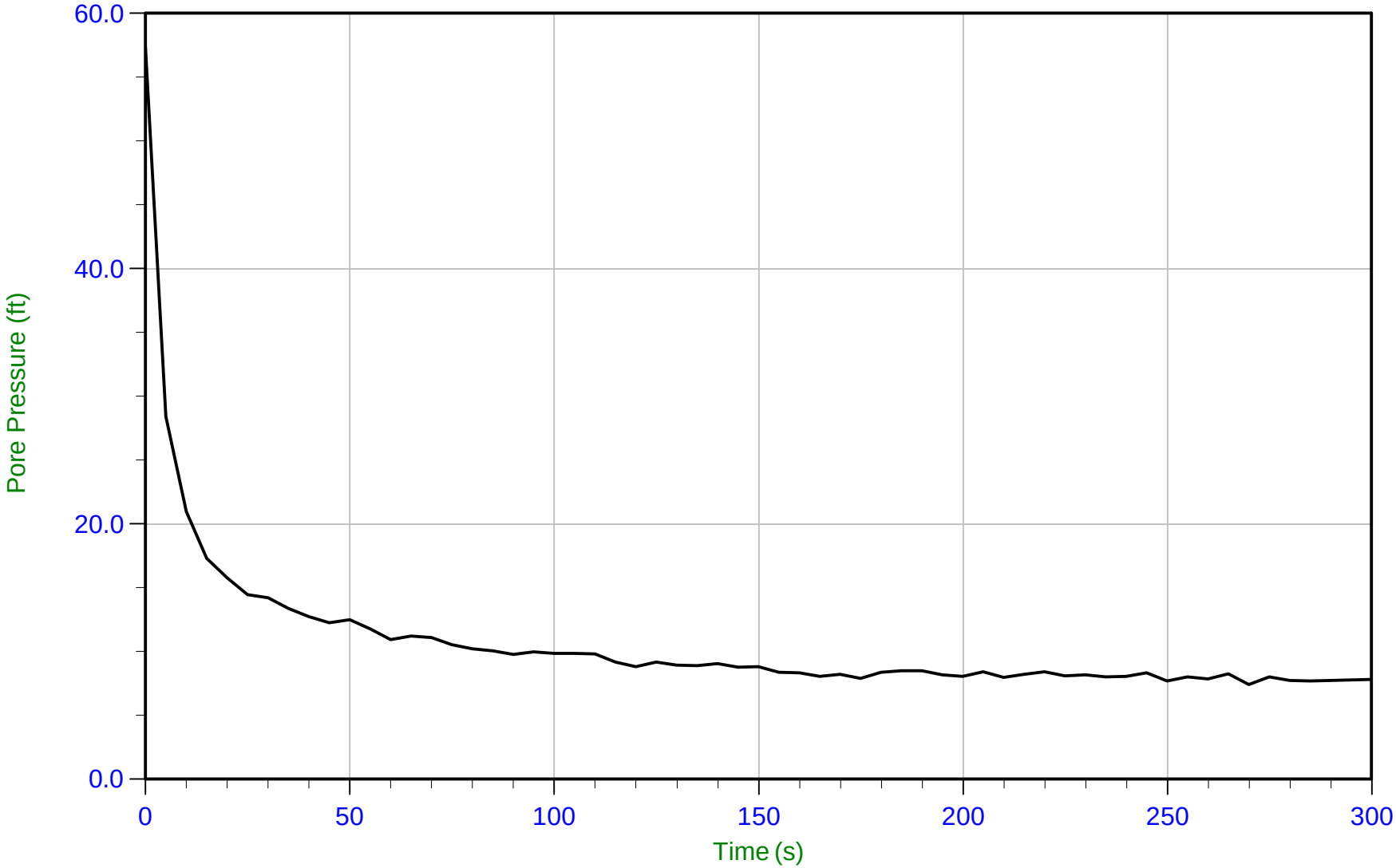
Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Depth Interval (ft)	Time Interval (ms)	Mid-layer Depth (ft)	Vs Interval Velocity (ft/s)
7.05	6.39	7.82				
11.98	11.32	12.19	4.37	35.28	8.86	124
16.73	16.07	16.69	4.51	25.80	13.70	175
20.83	20.17	20.67	3.98	12.86	18.12	309

Job No: 12-741
Client: Michael Baker Jr.
Project: Rahway Arch
Sounding: CPT-12
Date: July 16, 2012



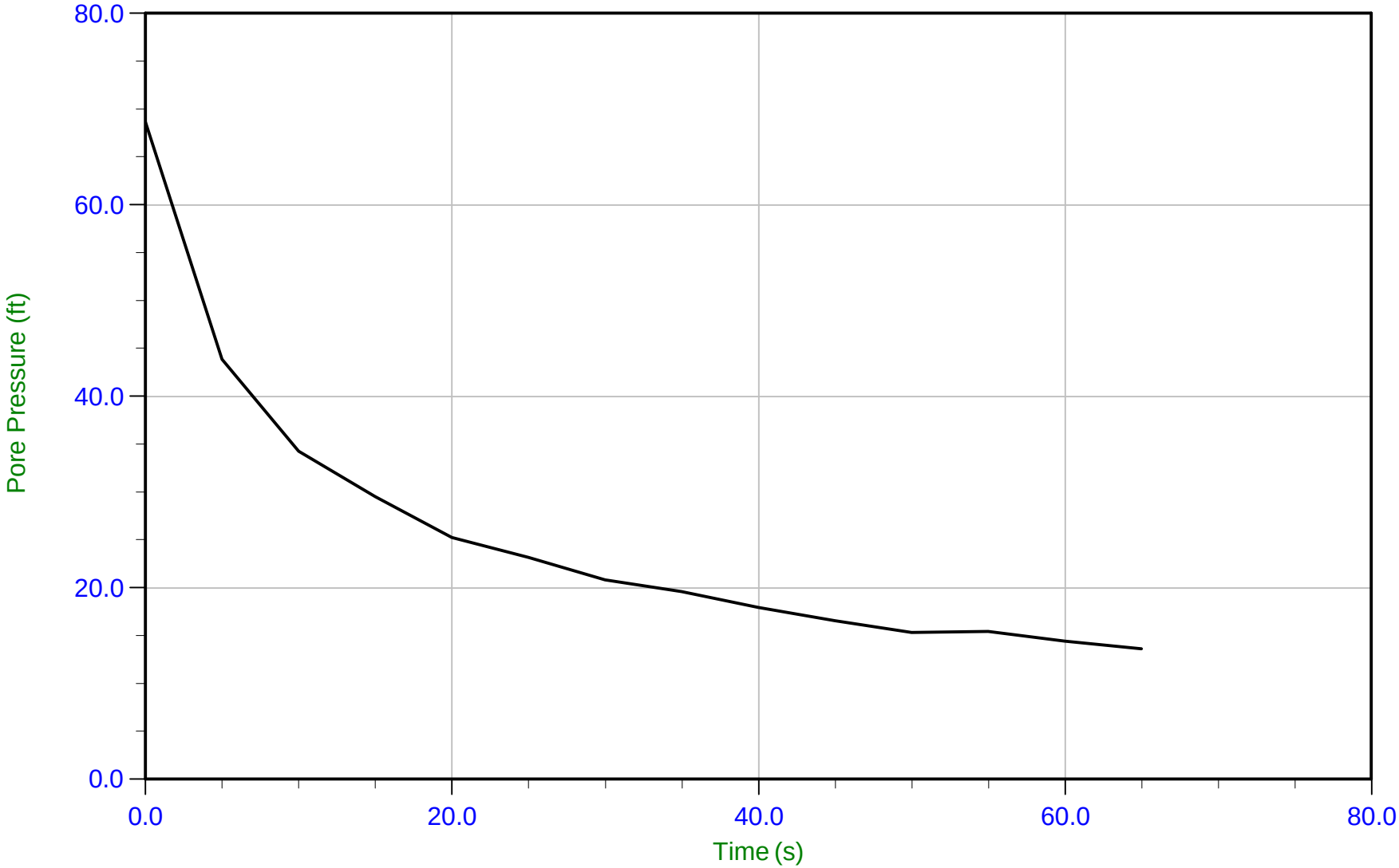
Appendix D

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/12/2012 07:18 Site: Rahway Arch	Sounding: CPT-01 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



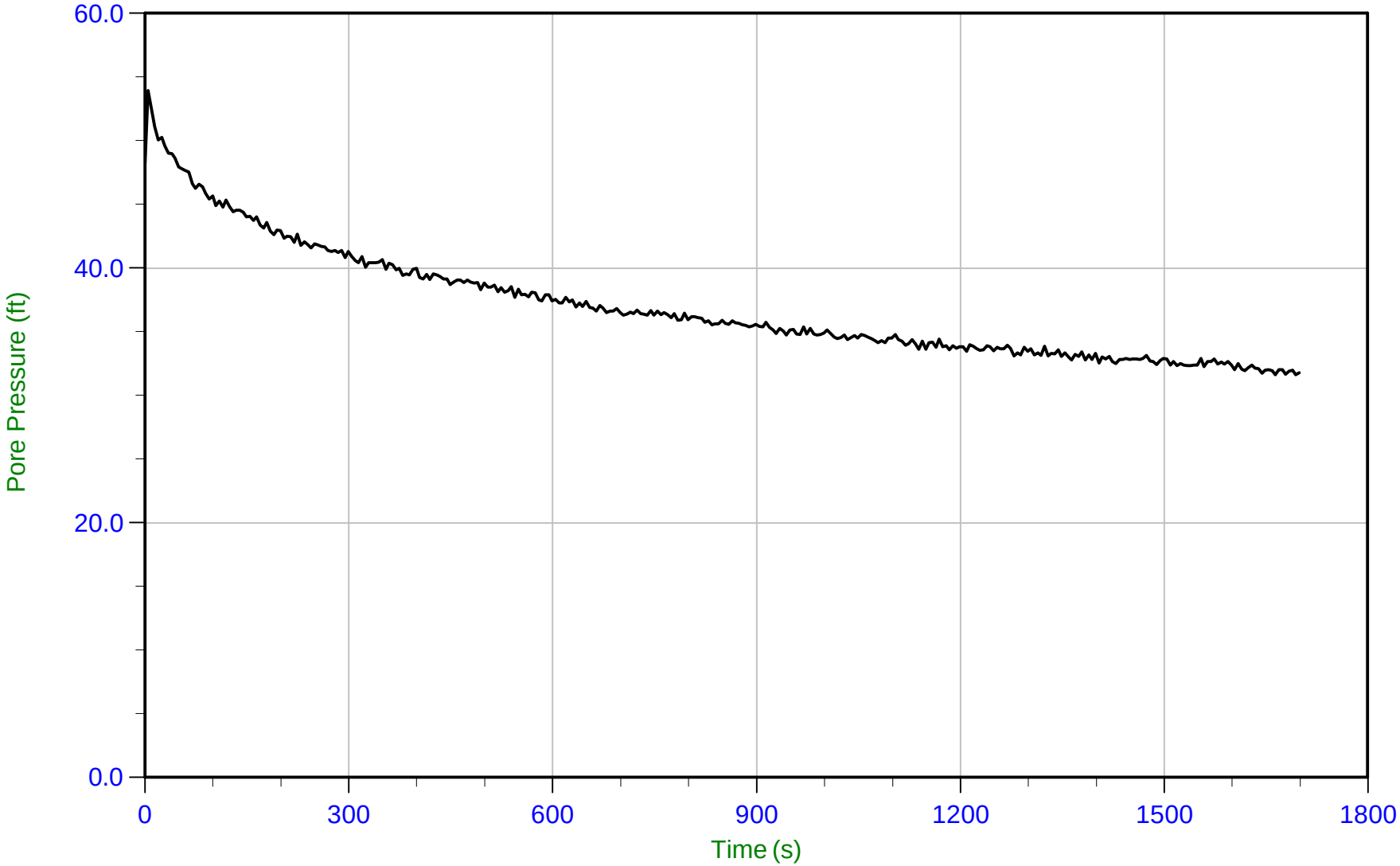
Trace Summary:				
	Filename: 741CP01.PPD	U Min: 7.4 ft	WT: 0.122 m / 0.400 ft	T(50): 4.3 s
	Depth: 2.450 m / 8.038 ft	U Max: 57.4 ft	Ueq: 7.6 ft	Ir: 100
	Duration: 300.0 s		U(50): 32.52 ft	Ch: 163.5 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/12/2012 07:18 Site: Rahway Arch	Sounding: CPT-01 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



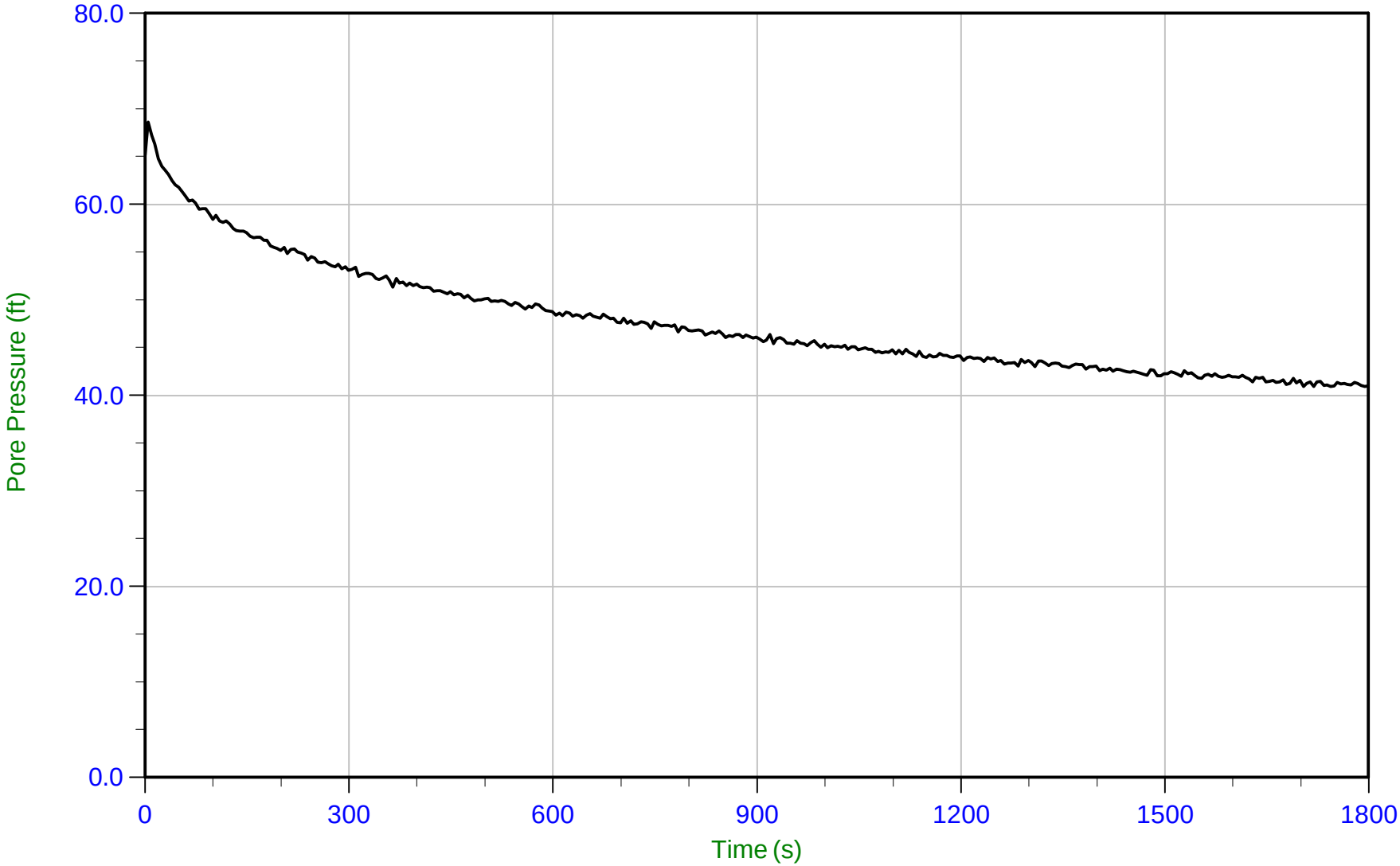
Trace Summary:				
	Filename: 741CP01.PPD	U Min: 13.6 ft	WT: 0.122 m / 0.400 ft	T(50): 7.5 s
	Depth: 3.050 m / 10.006 ft	U Max: 68.7 ft	Ueq: 9.6 ft	Ir: 100
	Duration: 65.0 s		U(50): 39.15 ft	Ch: 94.1 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/12/2012 07:18 Site: Rahway Arch	Sounding: CPT-01 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



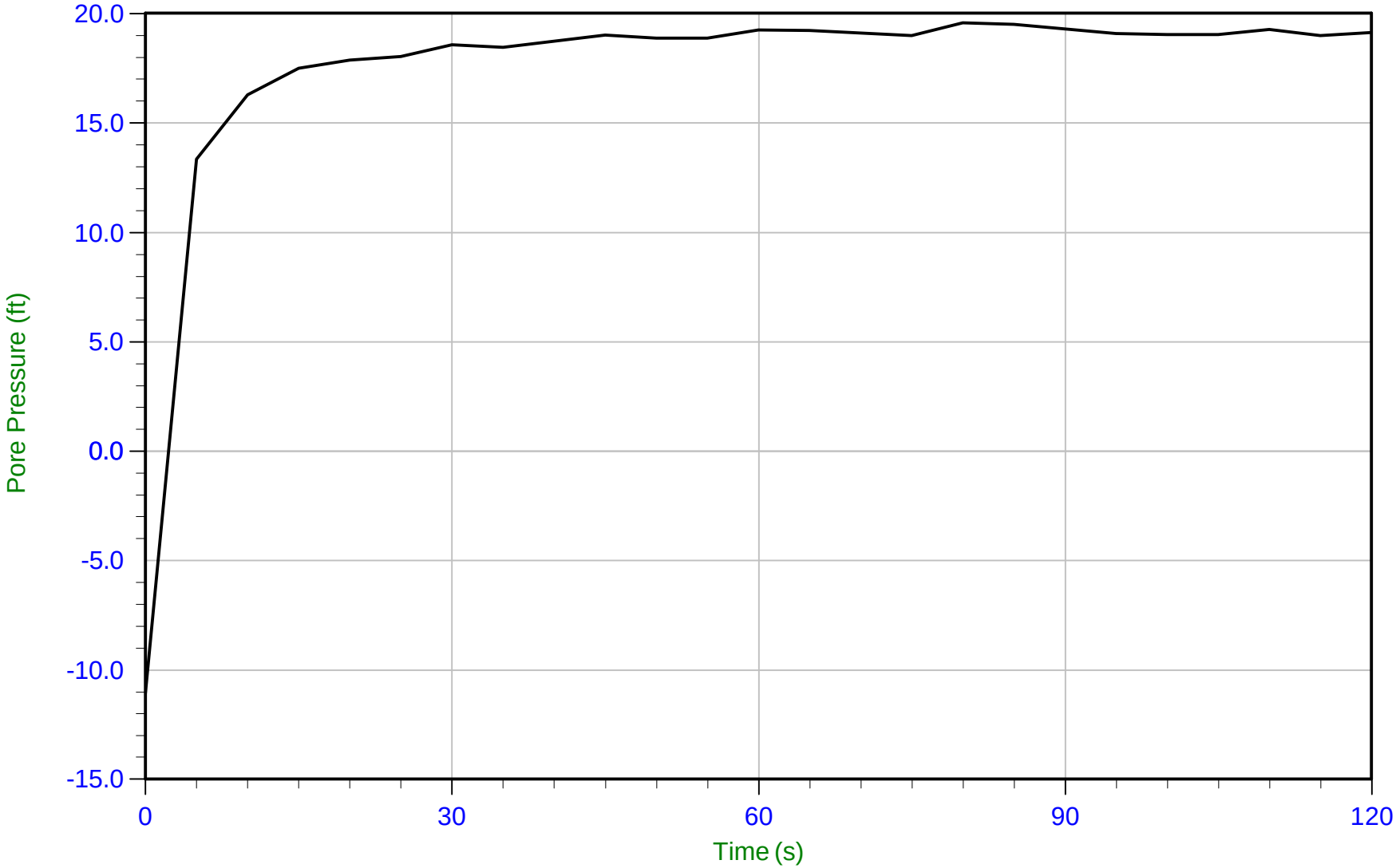
Trace Summary:				
	Filename: 741CP01.PPD	U Min: 31.6 ft	WT: 0.123 m / 0.404 ft	T(50): 923.0 s
	Depth: 5.000 m / 16.404 ft	U Max: 53.9 ft	Ueq: 16.0 ft	Ir: 100
	Duration: 1700.0 s		U(50): 34.97 ft	Ch: 0.8 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/12/2012 07:18 Site: Rahway Arch	Sounding: CPT-01 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



Trace Summary:				
	Filename: 741CP01.PPD	U Min: 40.9 ft	WT: 0.123 m / 0.404 ft	T(50): 1065.9 s
	Depth: 6.500 m / 21.325 ft	U Max: 68.6 ft	Ueq: 20.9 ft	Ir: 100
	Duration: 1800.0 s		U(50): 44.77 ft	Ch: 0.7 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/13/2012 13:02 Site: Rahway Arch	Sounding: CPT-03 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



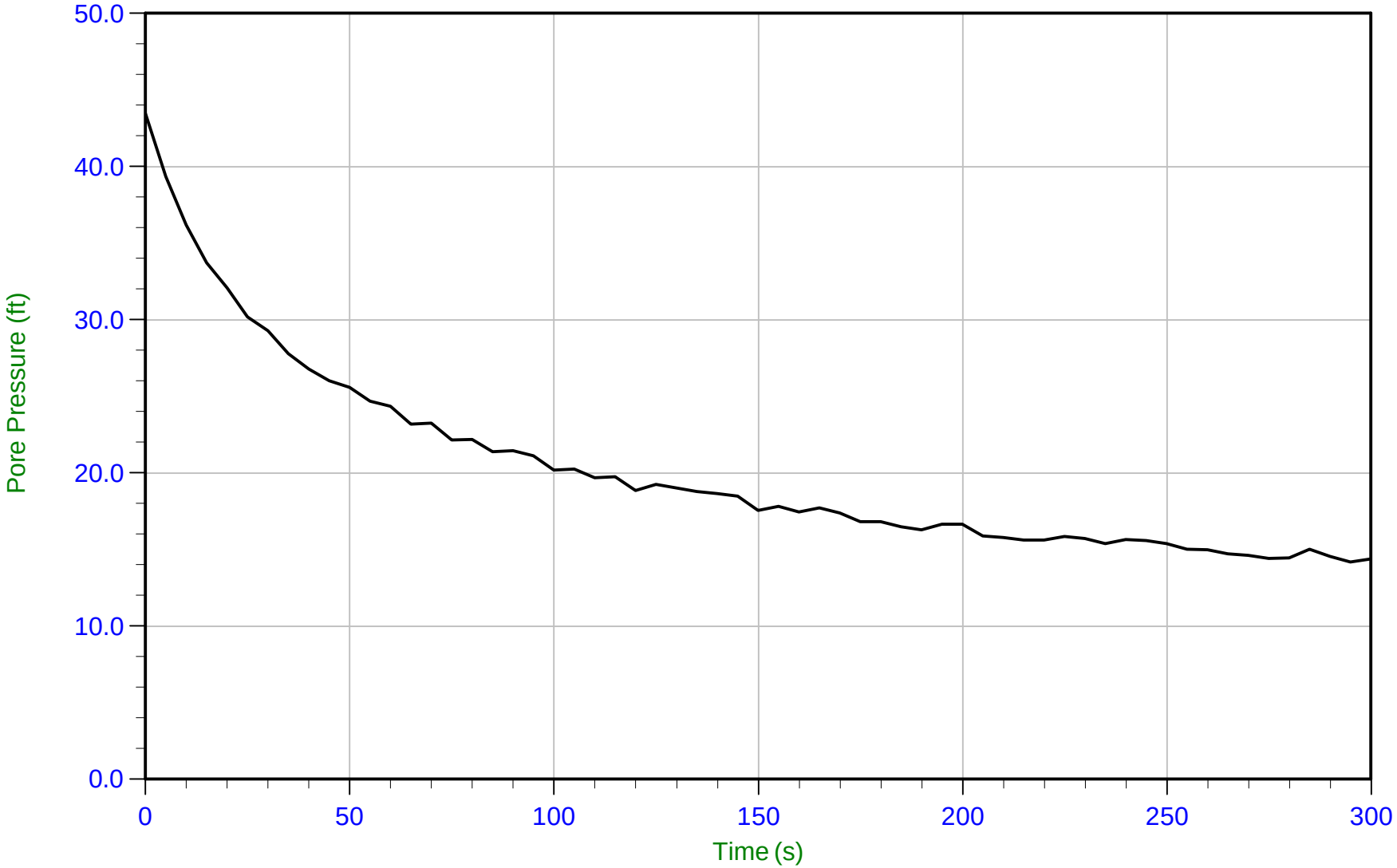
Trace Summary:

Filename: 741CP03.PPD
Depth: 6.050 m / 19.849 ft
Duration: 120.0 s

U Min: -11.1 ft
U Max: 19.6 ft

WT: 0.242 m / 0.794 ft
Ueq: 19.1 ft

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 12:07 Site: Rahway Arch	Sounding: CPT-04 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



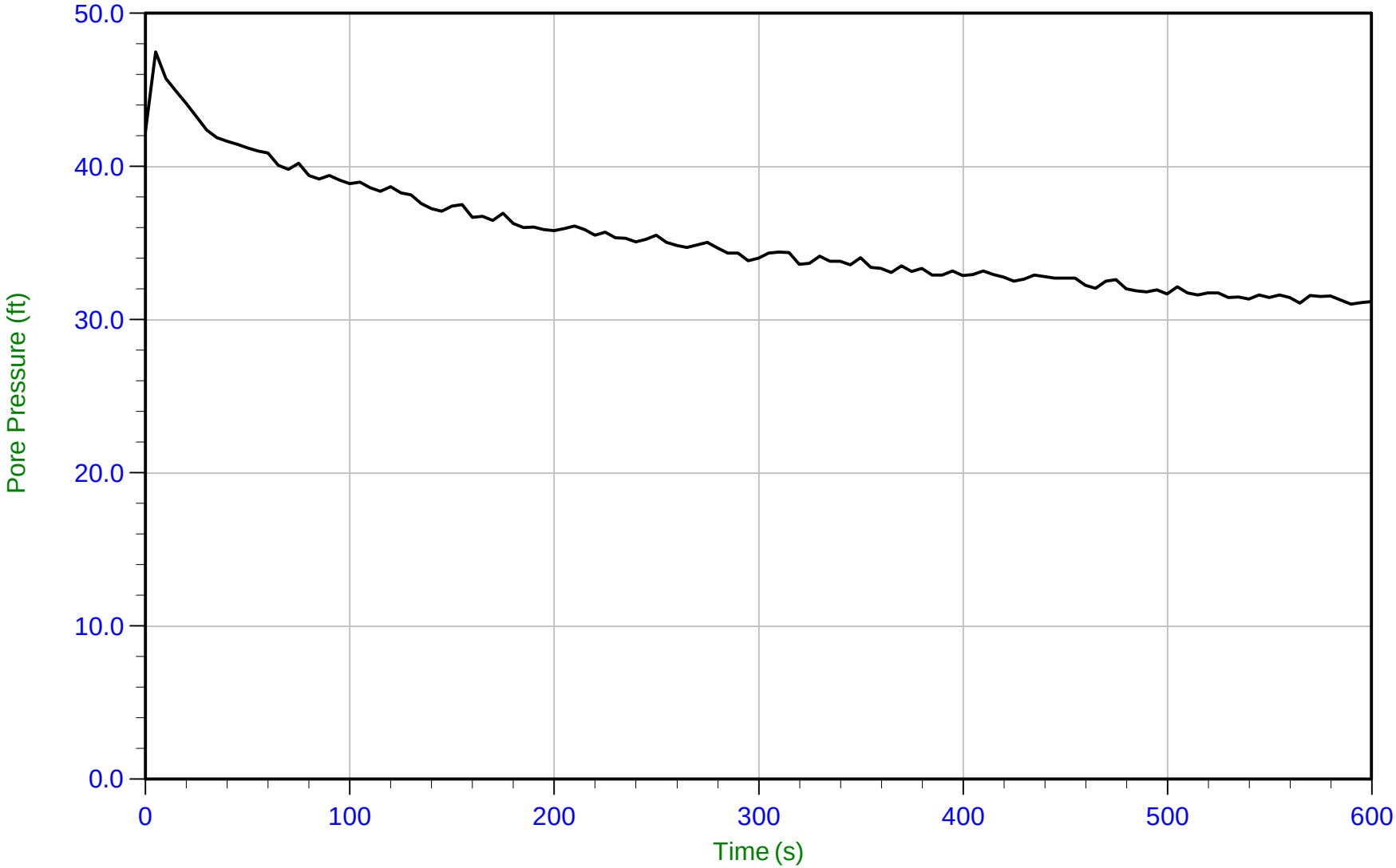
Trace Summary:				
	Filename: 741CP04.PPD	U Min: 14.2 ft	WT: 1.464 m / 4.803 ft	T(50): 53.3 s
	Depth: 3.450 m / 11.319 ft	U Max: 43.5 ft	Ueq: 6.5 ft	Ir: 100
	Duration: 300.0 s		U(50): 24.99 ft	Ch: 13.2 sq cm/min

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07/10/2012 12:07
Site: Rahway Arch

Sounding: CPT-04
Cone: 302:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

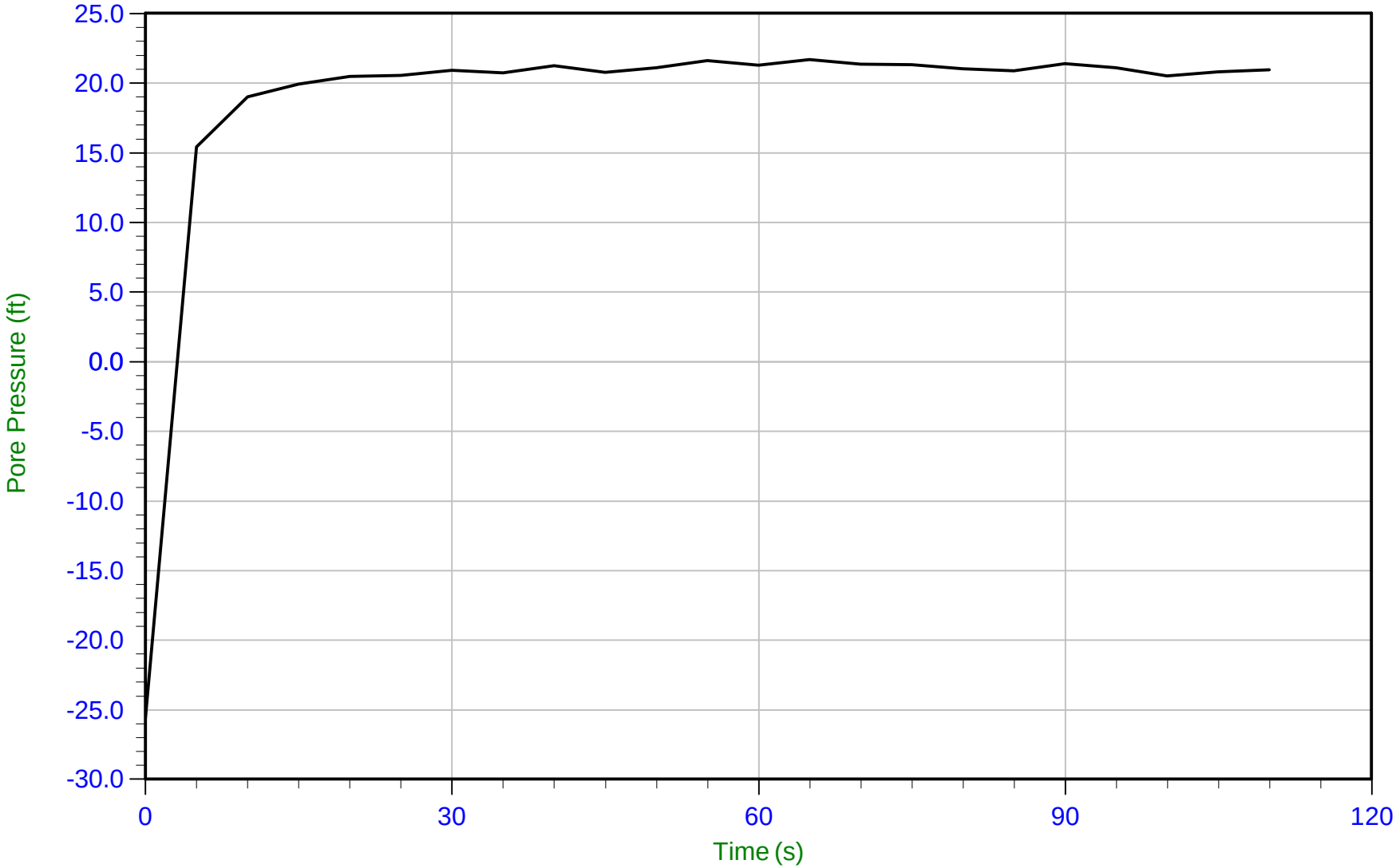
Filename: 741CP04.PPD
Depth: 5.900 m / 19.357 ft
Duration: 600.0 s

U Min: 31.0 ft
U Max: 47.5 ft

WT: 1.464 m / 4.803 ft
Ueq: 14.6 ft
U(50): 31.01 ft

T(50): 585.0 s
Ir: 100
Ch: 1.2 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 12:07 Site: Rahway Arch	Sounding: CPT-04 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



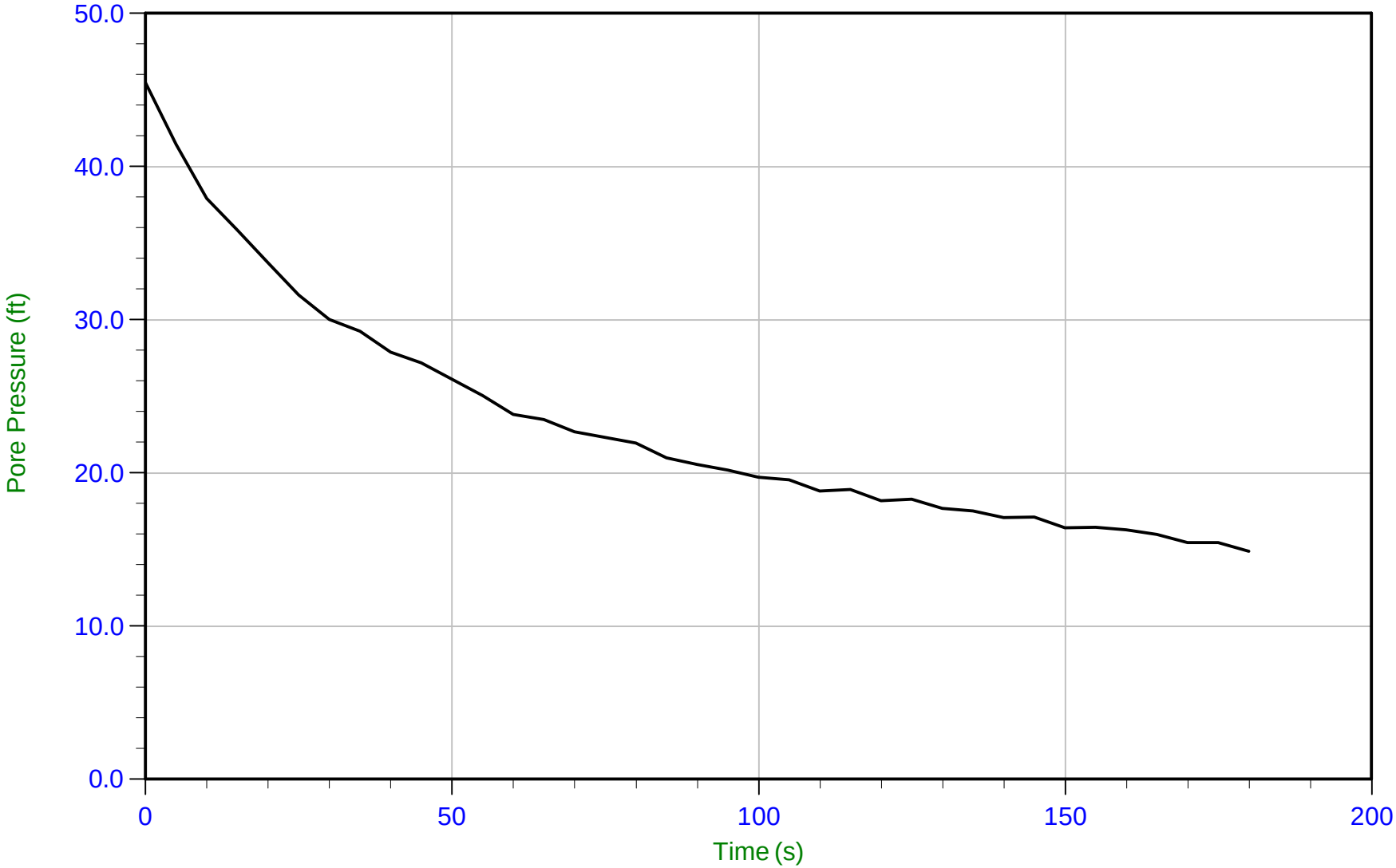
Trace Summary:

Filename: 741CP04.PPD
Depth: 8.100 m / 26.574 ft
Duration: 110.0 s

U Min: -25.6 ft
U Max: 21.7 ft

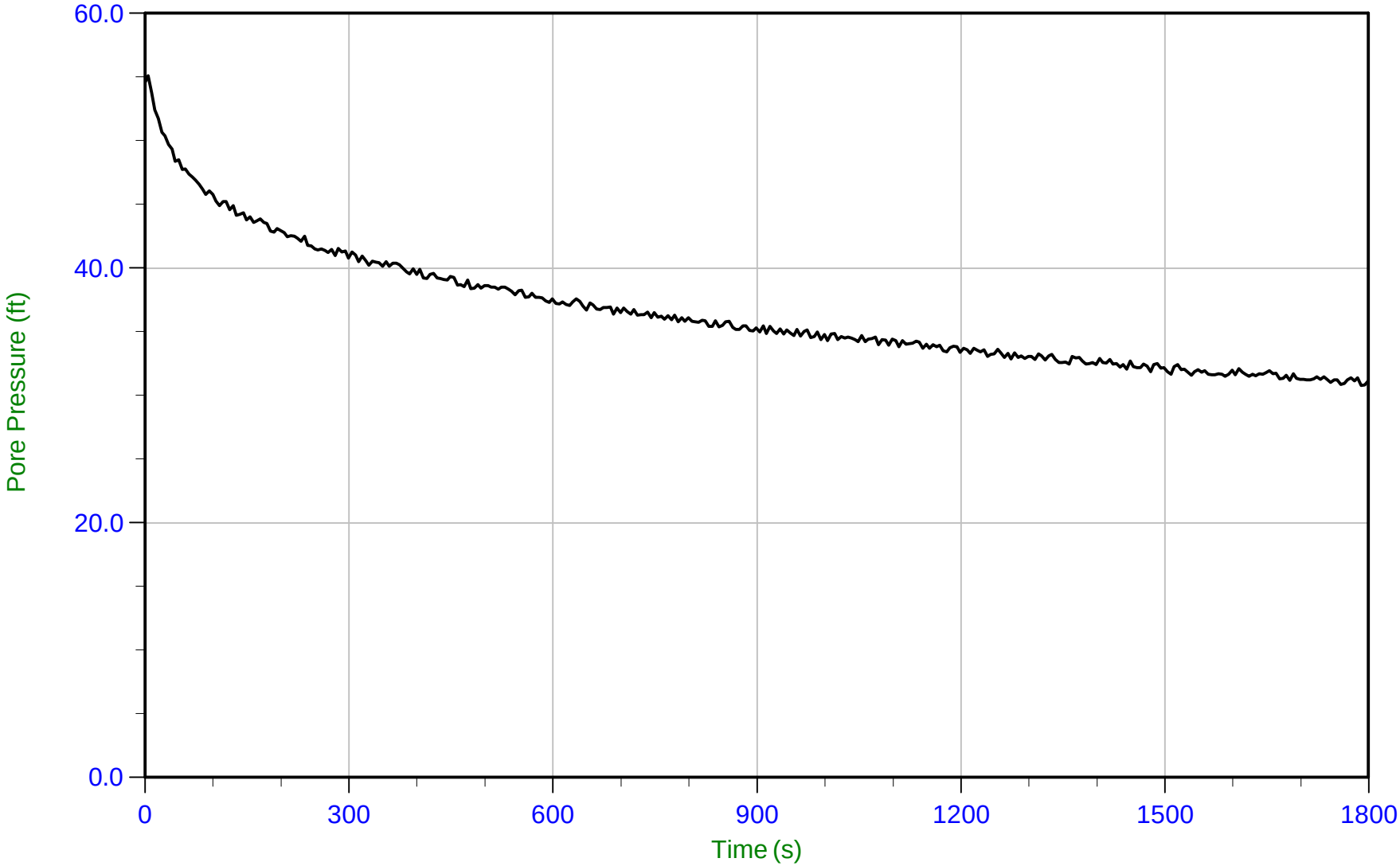
WT: 1.464 m / 4.803 ft
Ueq: 21.8 ft

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 13:34 Site: Rahway Arch	Sounding: CPT-05 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



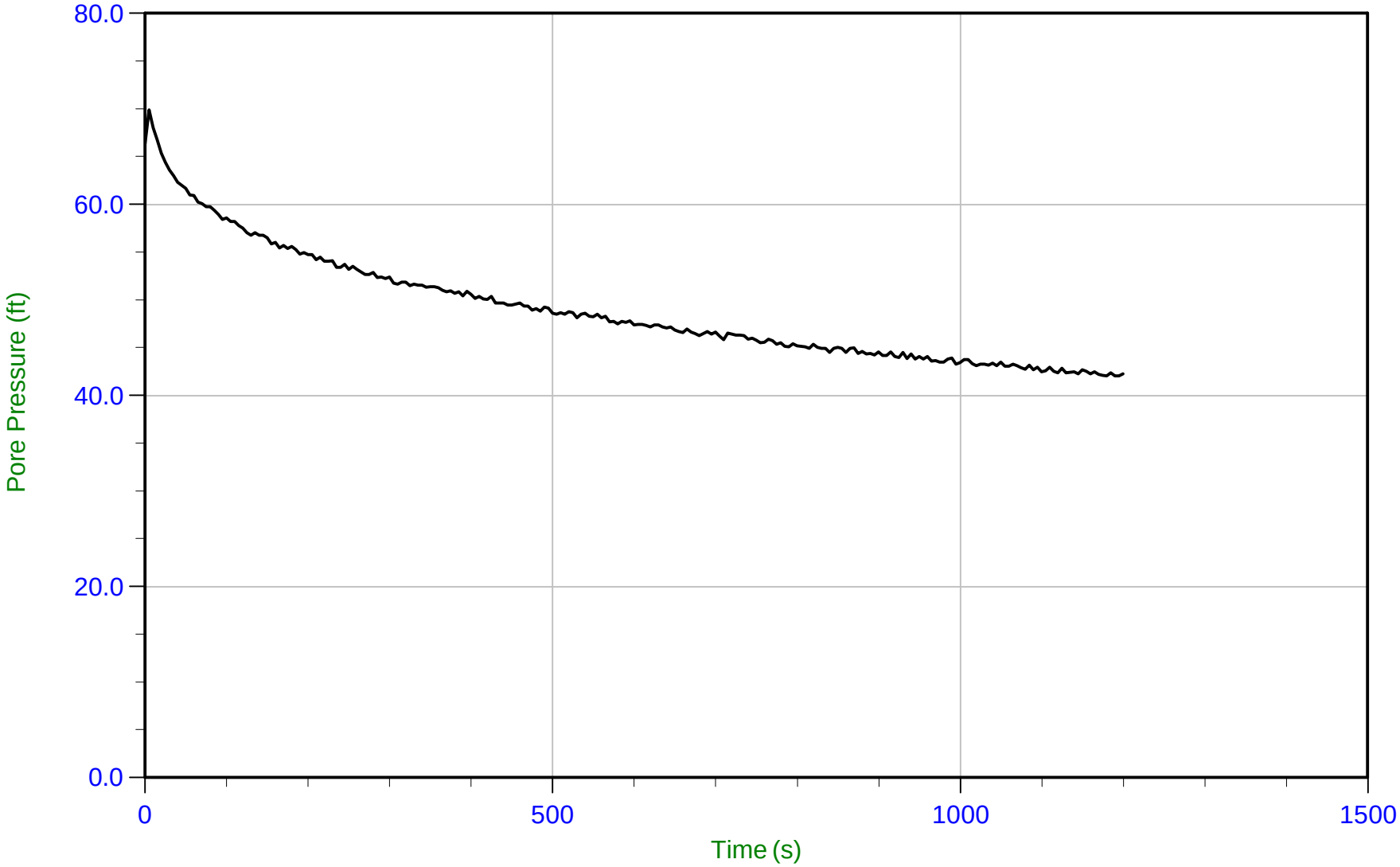
Trace Summary:				
	Filename: 741CP05.PPD	U Min: 14.9 ft	WT: 0.610 m / 2.001 ft	T(50): 45.2 s
	Depth: 3.300 m / 10.827 ft	U Max: 45.5 ft	Ueq: 8.8 ft	Ir: 100
	Duration: 180.0 s		U(50): 27.15 ft	Ch: 15.5 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 13:34 Site: Rahway Arch	Sounding: CPT-05 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



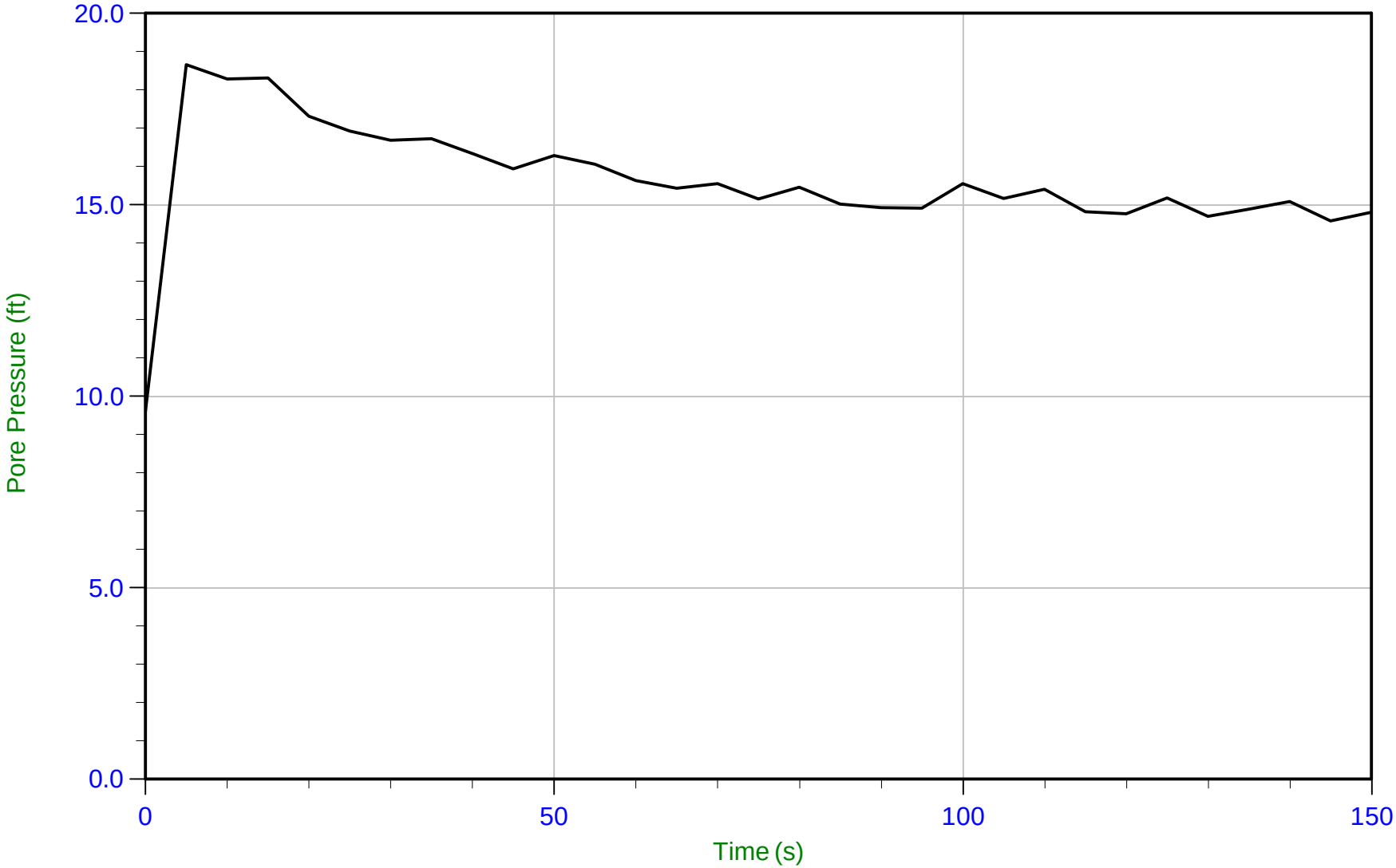
Trace Summary:				
	Filename: 741CP05.PPD	U Min: 30.8 ft	WT: 0.610 m / 2.001 ft	T(50): 948.6 s
	Depth: 5.000 m / 16.404 ft	U Max: 55.1 ft	Ueq: 14.4 ft	Ir: 100
	Duration: 1800.0 s		U(50): 34.74 ft	Ch: 0.7 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 13:34 Site: Rahway Arch	Sounding: CPT-05 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



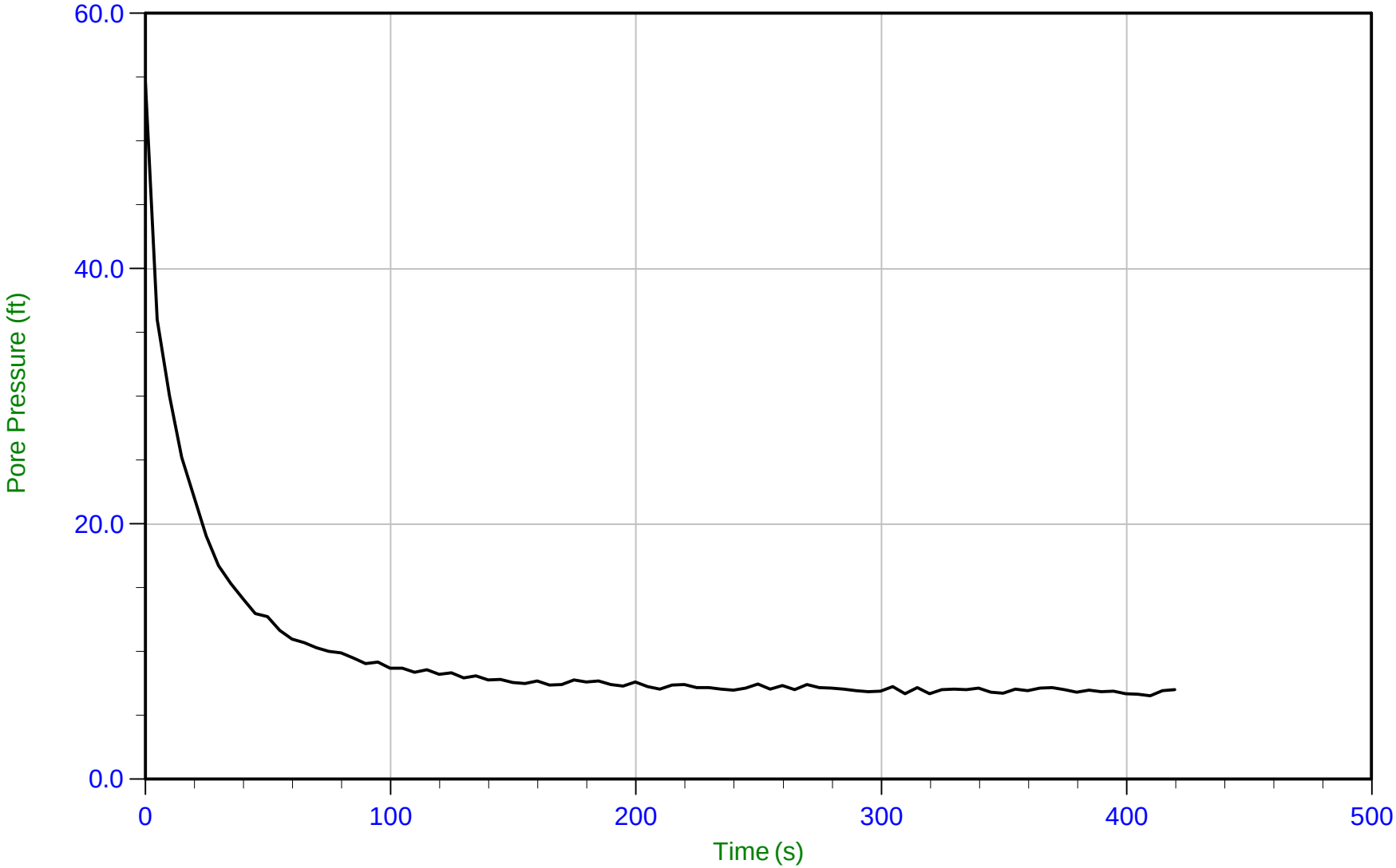
Trace Summary:	Filename: 741CP05.PPD Depth: 6.500 m / 21.325 ft Duration: 1200.0 s	U Min: 42.1 ft U Max: 69.9 ft	WT: 0.610 m / 2.001 ft Ueq: 19.3 ft

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/12/2012 13:47 Site: Rahway Arch	Sounding: CPT-06A Cone: 302:T1500F15U500 Cone Area: 15 sq cm



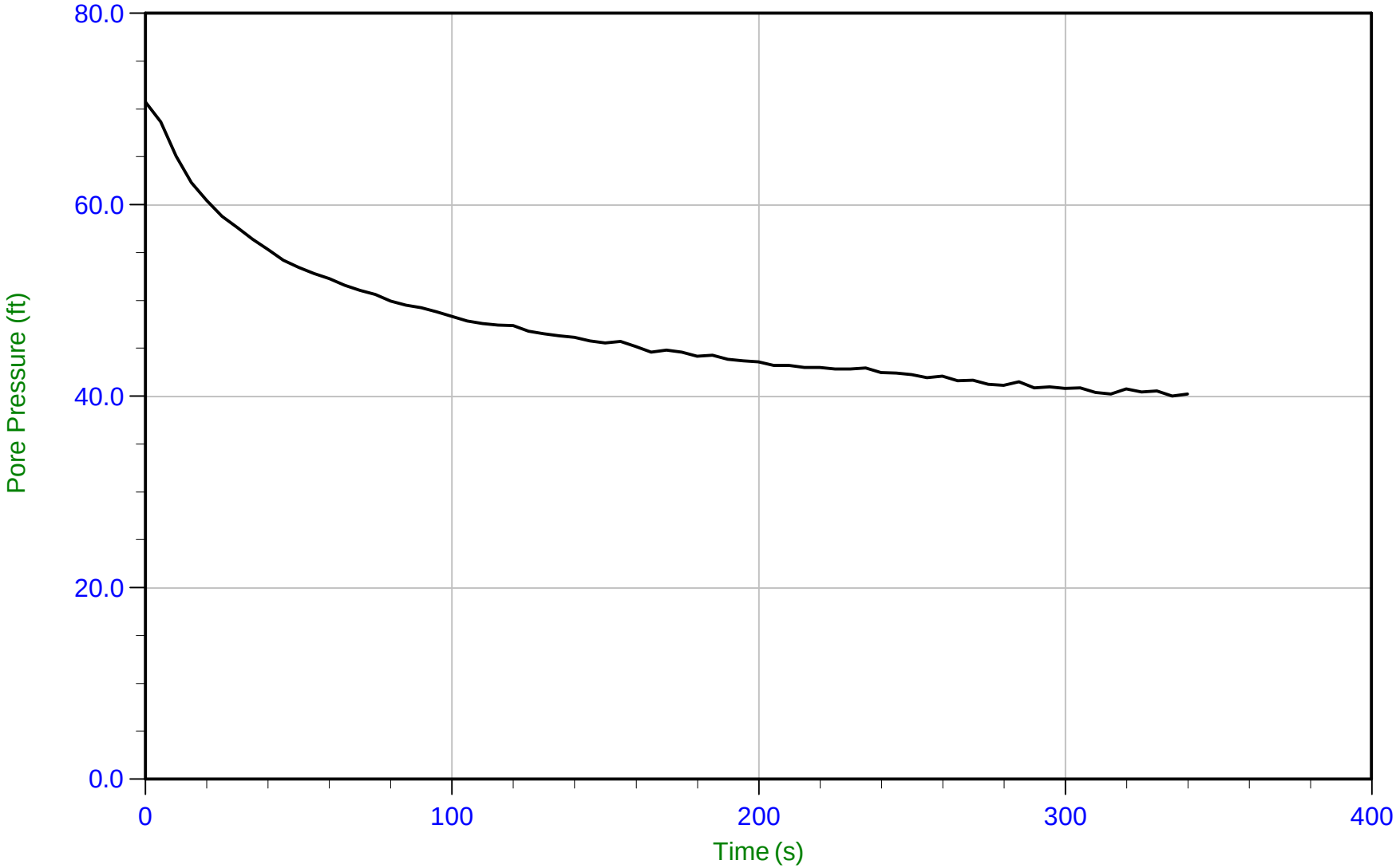
Trace Summary:	Filename: 741CP06A.PPD Depth: 8.200 m / 26.903 ft Duration: 150.0 s	U Min: 9.6 ft U Max: 18.7 ft	WT: 3.749 m / 12.300 ft Ueq: 14.6 ft U(50): 16.63 ft	T(50): 31.3 s Ir: 100 Ch: 22.4 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 09:49 Site: Rahway Arch	Sounding: CPT-08 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



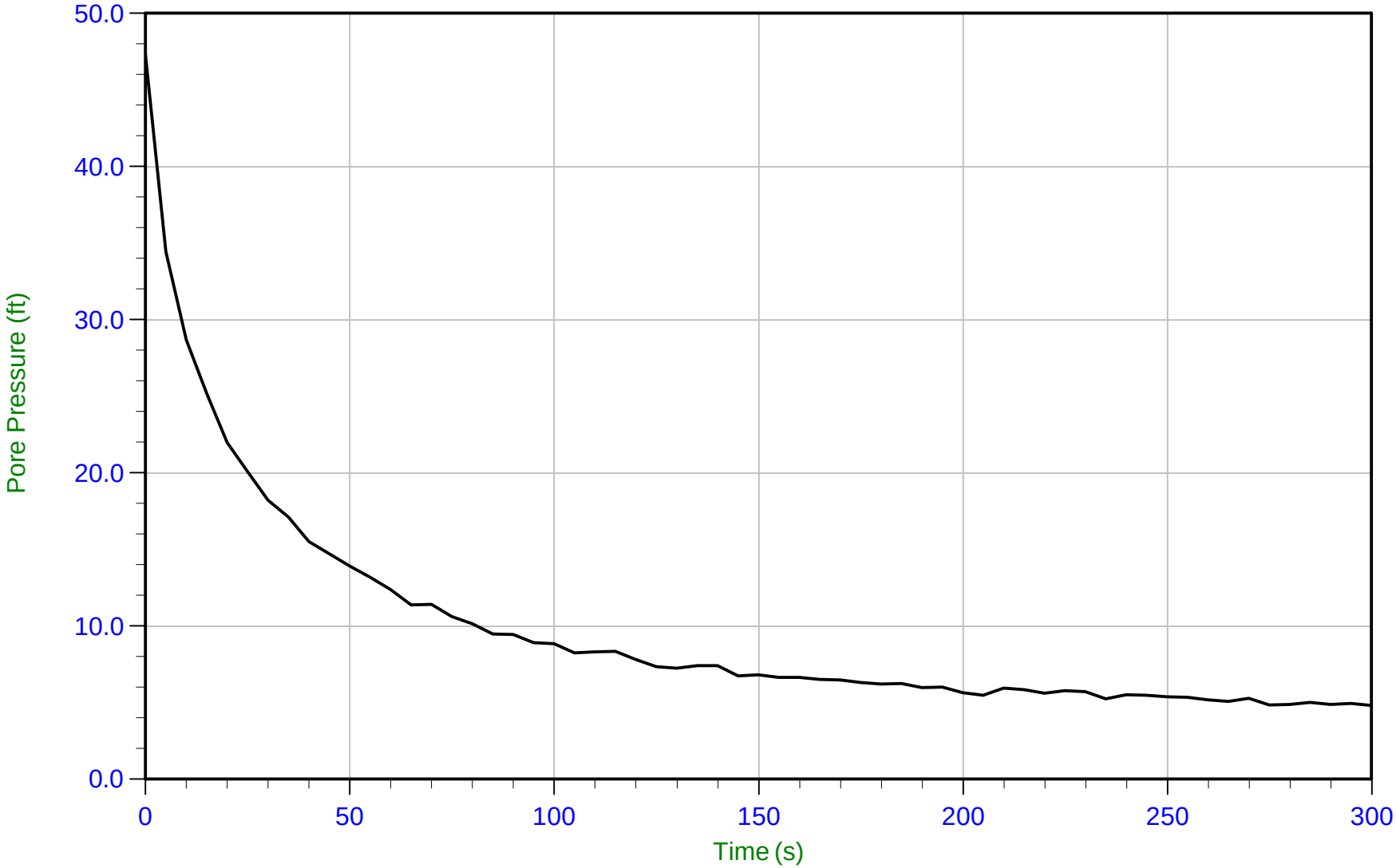
Trace Summary:				
	Filename: 741CP08.PPD	U Min: 6.5 ft	WT: 1.205 m / 3.953 ft	T(50): 9.6 s
	Depth: 3.200 m / 10.499 ft	U Max: 54.6 ft	Ueq: 6.5 ft	Ir: 100
	Duration: 420.0 s		U(50): 30.56 ft	Ch: 73.3 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/10/2012 09:49 Site: Rahway Arch	Sounding: CPT-08 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



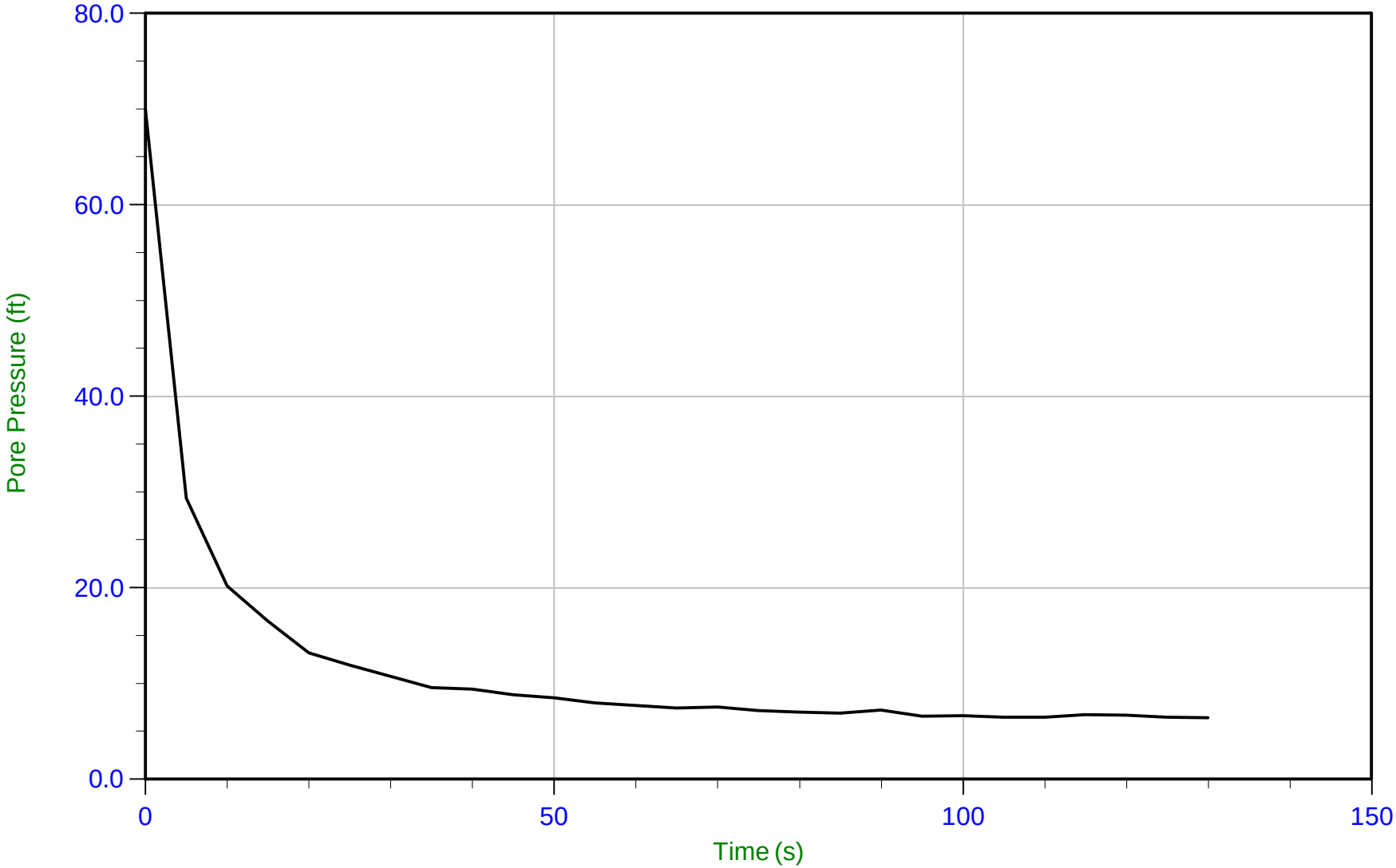
Trace Summary:				
	Filename: 741CP08.PPD	U Min: 40.0 ft	WT: 1.204 m / 3.950 ft	T(50): 239.7 s
	Depth: 5.550 m / 18.208 ft	U Max: 70.7 ft	Ueq: 14.3 ft	Ir: 100
	Duration: 340.0 s		U(50): 42.49 ft	Ch: 2.9 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/13/2012 08:40 Site: Rahway Arch	Sounding: CPT-09D Cone: 302:T1500F15U500 Cone Area: 15 sq cm



Trace Summary:				
	Filename: 741CP09D.PPD	U Min: 4.8 ft	WT: 0.889 m / 2.917 ft	T(50): 14.2 s
	Depth: 2.150 m / 7.054 ft	U Max: 47.3 ft	Ueq: 4.1 ft	Ir: 100
	Duration: 300.0 s		U(50): 25.73 ft	Ch: 49.3 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/12/2012 12:10 Site: Rahway Arch	Sounding: CPT-11A Cone: 302:T1500F15U500 Cone Area: 15 sq cm



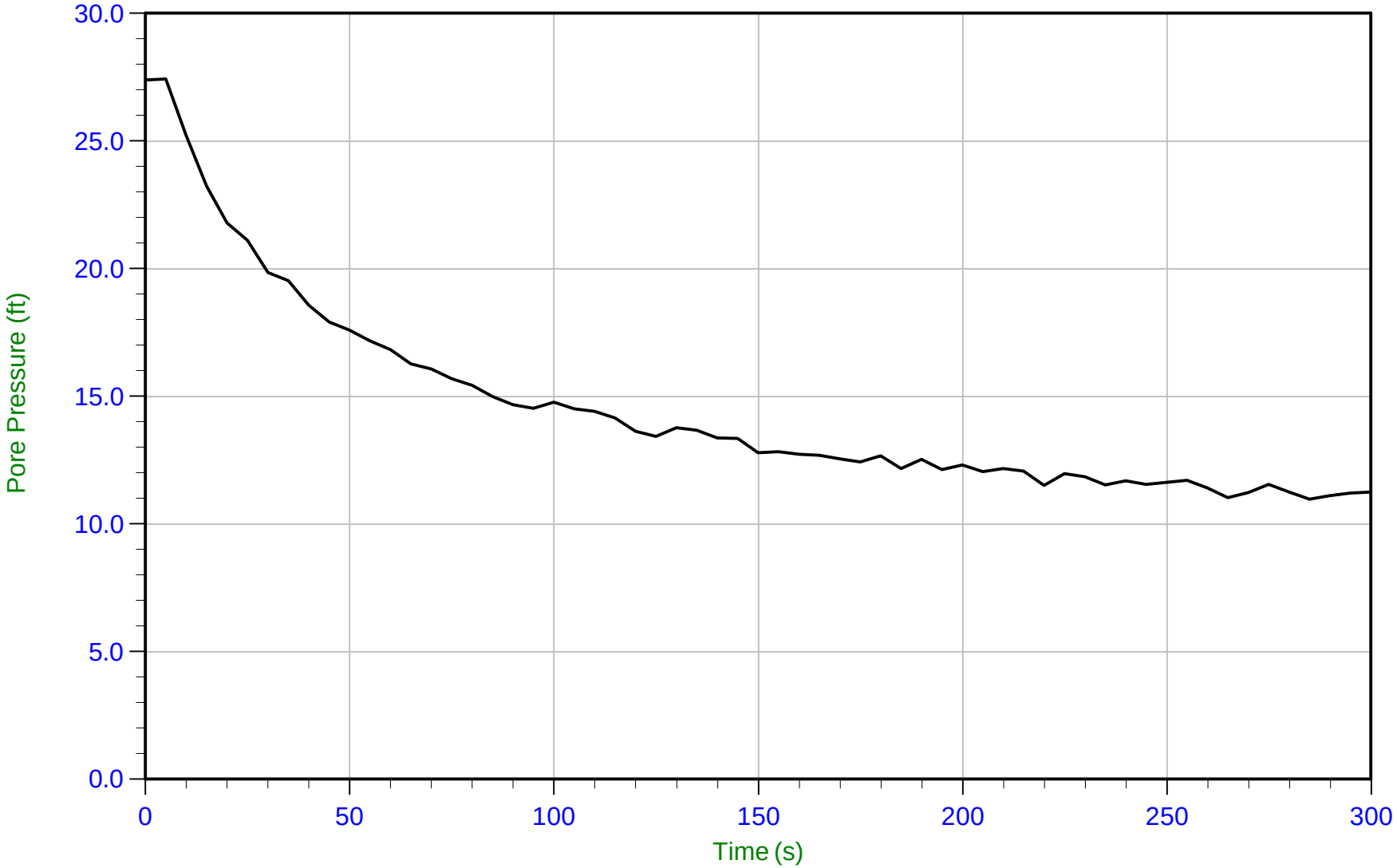
Trace Summary:

Filename: 741CP11A.PPD
Depth: 2.100 m / 6.890 ft
Duration: 130.0 s

U Min: 6.4 ft
U Max: 69.9 ft

WT: 0.149 m / 0.489 ft
Ueq: 6.4 ft

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/16/2012 06:56 Site: Rahway Arch	Sounding: CPT-12 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



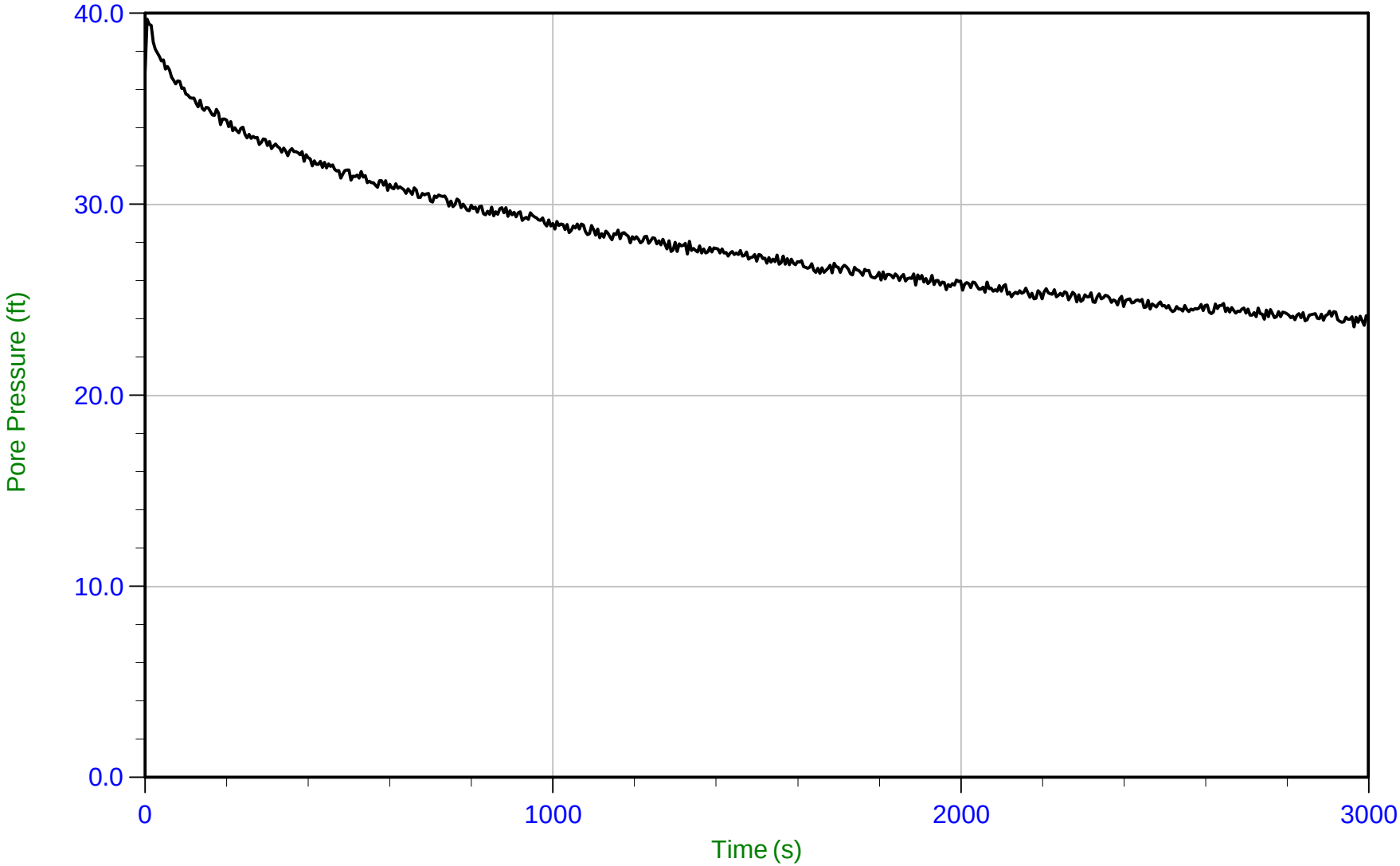
Trace Summary:				
	Filename: 741CP12.PPD	U Min: 11.0 ft	WT: 0.956 m / 3.136 ft	T(50): 70.4 s
	Depth: 2.150 m / 7.054 ft	U Max: 27.4 ft	Ueq: 3.9 ft	Ir: 100
	Duration: 300.0 s		U(50): 15.68 ft	Ch: 10.0 sq cm/min

CONETEC

Michael Baker Jr.

Job No: 12-741
Date: 07/16/2012 06:56
Site: Rahway Arch

Sounding: CPT-12
Cone: 302:T1500F15U500
Cone Area: 15 sq cm



Trace Summary:

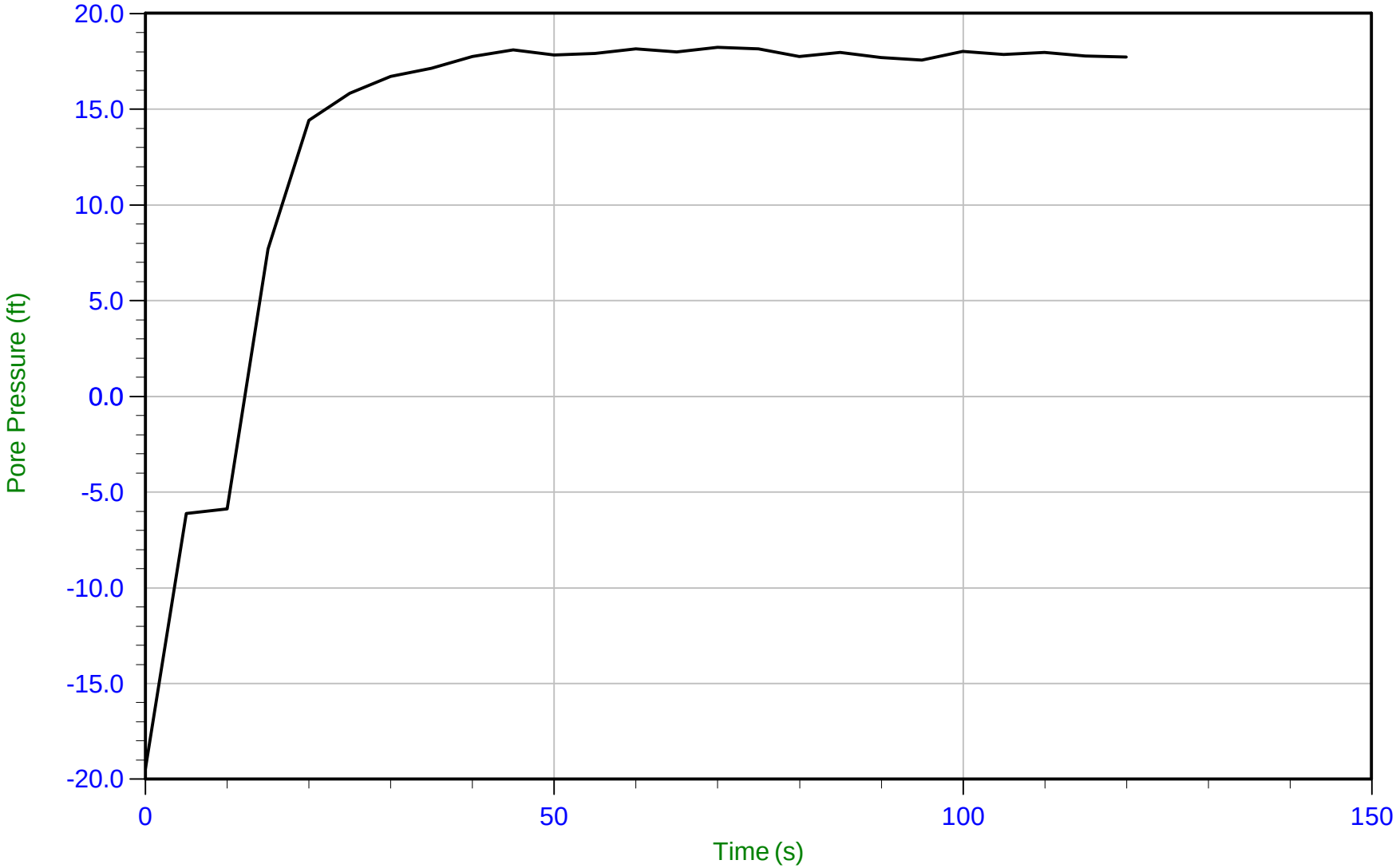
Filename: 741CP12.PPD
Depth: 4.300 m / 14.107 ft
Duration: 3000.0 s

U Min: 23.6 ft
U Max: 39.7 ft

WT: 0.956 m / 3.136 ft
Ueq: 11.0 ft
U(50): 25.33 ft

T(50): 2109.5 s
Ir: 100
Ch: 0.3 sq cm/min

CONETEC	*Michael Baker Jr.*	Job No: 12-741 Date: 07/16/2012 06:56 Site: Rahway Arch	Sounding: CPT-12 Cone: 302:T1500F15U500 Cone Area: 15 sq cm



Trace Summary:

Filename: 741CP12.PPD
Depth: 6.350 m / 20.833 ft
Duration: 120.0 s

U Min: -19.5 ft
U Max: 18.2 ft

WT: 0.956 m / 3.136 ft
Ueq: 17.7 ft

Appendix E

Electronic Data Files

The released data contains the following folders:

1. CPT Data - .cor files in ASCII format, and or .xls files.
2. Pore Pressure Dissipation Data - .ppd files in Excel format
3. CPT Plots - .pdf files
4. Data Interpretation - .xls files contain common engineering values
5. Shear Wave Velocity Data - .pdf files of tabular and graphical seismic data.

ConeTec Digital File Formats

CPT Data Files (COR Extension)

ConeTec data files are stored in ASCII text files that are readable by almost any text editor. ConeTec CPT data files are named such that the first 3 characters contain the job number, the next two characters are CP followed by two characters indicating the sounding number. The last 8th character position is reserved for the letters a, b, c, d etc to uniquely identify multiple soundings at the same location. The CPT sounding file has the extension COR, and pore pressure dissipation files have the extension PPD or PPF. As an example, for job number 06-127 the first sounding will have file names 127CP01.COR and 127CP01.PPD.

The sounding (COR) file consists of the following components:

1. Two lines of header information
2. Data records
3. End of data marker
4. Units information

Header Lines

Line 1: Columns 1-6 may be blank or may indicate the version number of the recording software
Columns 7-21 contain the sounding Date and Time
Columns 22-36 contain the sounding Operator

Line 2: Columns 1-16 contain the Job Location
Columns 17-31 contain the Cone ID
Columns 32-47 contain the sounding number

Data Records

The data records contain 4 or more columns of data in floating point format. A comma (and spaces) separates each data item:

Column 1:	Sounding Depth (meters)
Column 2:	Tip (q_c) data uncorrected for pore pressure effects. Recorded in units selected by the operator.
Column 3:	Sleeve (f_s) data. Recorded in units selected by the operator
Column 4:	Dynamic pore pressure readings. Recorded in units selected by the operator
Column 5:	Empty, Resistivity, UVIF or Gamma data

End of Data Marker

After the last line of data there will be a line containing ASCII 26 (CTL-Z) and a newline (carriage return/ line feed) character. This is used to mark the end of data.

Units Information

The last section of the file contains information about the units that were selected for the sounding. A separator bar makes up the first line. The second line contains the type of units used for depth, q_c, f_s and u. The third line contains the conversion values required for ConeTec's software to convert the recorded data to an internal set of base units (bar for q_c, bar for f_s and meters for u).

CPT Dissipation Files (PPx Extension)

CPT Dissipation files have the same naming convention as the CPT sounding files and have the extension PPD, PPF or PPM. PPF (PPM and PPD) files consist of the following components:

1. Two lines of header information
2. Data records

Header Lines (same as COR file):

Line 1: Columns 1-6 may be blank or may indicate the version number of the recording software
Columns 7-21 contain the sounding Date and Time
Columns 22-36 contain the sounding Operator

Line 2: Columns 1-16 contain the Job Location
Columns 17-31 contain the Cone ID
Columns 32-47 contain the sounding number

Data Records

The data records immediately follow the header lines. Each data record can occupy several lines in the file and is a complete record of a dissipation test at a particular depth. Each data record starts with a line containing two values separated by spaces; the first value being an index number (not currently used by the Software) and the second being the dissipation test depth in meters. Following this line are the dissipation pore pressure values stored at 5 second intervals with a maximum of 12 entries per line. The last line of the dissipation record may not contain a full 12 entries. The data record is terminated with an ASCII 30 character (appears as a triangle in some editors).

This sequence is repeated for every dissipation test in the sounding. No marker is used to indicate end of file. Units information is not stored in this file. Users need to check the CPT file for the units that were used.

CPT Basic Interpretations (TBL Extension)

ConeTec's basic CPT interpretation output files are generally delivered in text files with a TBL extension. The root file name is the same as the COR files. A number of calculated geotechnical parameters are presented in these files. The files are stored as ASCII text files that can be viewed using any text editor such as Notepad or Wordpad. The files do not contain any page formatting. These files are not distributed if the enhanced interpretation files are provided.

CPT Enhanced Interpretations (IFI, IFP, XLS Extension)

ConeTec's enhanced CPT interpretation output files are delivered in several formats, each file type containing the exact same information but formatted slightly differently. The files typically have any of the following file extensions:

1. IFI — an importable TAB delimited ASCII text file containing approximately 47 data columns of geotechnical interpretations. The file is designed for easy import to Excel. A companion document describes the techniques used for the interpretations (usually reproduced at the beginning of the Interpretation Appendix). Text editors can be used to view the file contents, however, they may remove the tabs or replace the tabs with spaces upon saving the file destroying the feature that makes them easy to import into Excel.

   Because Excel imports the data as text and the sheet is protected two steps may be necessary to modify the data or use the values in certain Excel functions:

   a) Under Tools (Excel 2000) Select the Protection Option and then Unprotect the sheet
   b) Select the entire sheet, copy and then use Paste Special to paste as values to a second sheet.

   Future versions of our interpretation routine will address these inconveniences.

2. IFP — a printable ASCII text file containing the same 47 columns of geotechnical interpretations as the IFI file. This file type has been formatted as a multi-page document with up to 132 characters per line and up to 68 lines per page. Each page has been separated into multiple sections to accommodate all the data fields. Each physical page has a header section and a page/section number. The file is designed for direct printing to laser printers set into compressed font mode. This output is typically provided in the Interpretation Appendix.

   An abbreviated set of interpretations (containing 36 columns of output) may be generated instead. These files usually have the extensions NLI and NLP. XLS files can be generated from these as well.

3. XLS — an Excel format file that has been generated directly from the corresponding IFI file. IFI and IFP files are not distributed if the XLS files are generated. The XLS files may have been generated from abbreviated NLI interpretation files.

In each case root file name is the same as the COR files.

CPT Interpretations (Excel Format)

ConeTec's latest software (September 2007) outputs CPT interpretations directly to Excel format (XLS extension) without creating intermediate ASCII files. Because of the desires of various clients, there are several different configurations of output parameters in ConeTec's interpretation files. Since the Excel format file must have the XLS extension a suffix is used after the basename of the source CPT data file (COR) to identify the format of the file. The configurations still follow the formats described above and use the same extensions but now as suffixes. To allow for various runs (e.g. using a different water table, or user supplied equilibrium profile, or different methods for a particular parameter) of the same data an additional suffix may be specified by the engineer post processing the data to identify each particular run. This suffix will follow the one used to identify the format of the file.

For example:

If the selected format is ConeTec's TBL configuration and each run is identified by a run number. The resultant files generated for 278CP01.COR would be:

78CP01-TBL-RUN01.XLS
78CP01-TBL-RUN02.XLS
78CP01-TBL-RUN03.XLS

CPT Data in Excel Format

ConeTec can now provide the equivalent of the ASCII COR files in Excel Format. These files will have the same basename as the COR files and an XLS extension.

Pore Pressure Dissipation Data in Excel Format

ConeTec can now provide the equivalent of the ASCII PPD format files in Excel format. These files will contain each dissipation trace that exceeds a minimum duration (selected by the engineer during post-processing) in a particular Excel spreadsheet column. The first column (Column A) will contain the time in seconds and the second column (Column B) will contain the time in minutes. Subsequent columns will contain dissipation trace data. The time columns will extend to the longest trace of the data set.

Detailed header information is provided at the top of the spreadsheet. The test depth in meters and feet, the number of points in the trace and the particular units are identified at the top of each trace column.

The Excel format file names will have the same basename as the original PPD format file followed by the suffix -PPD and then followed by a second suffix that the engineer doing the post processing can specify. Because the engineer can select various types of units for the dissipation data output (which can be different from the units used in the original recording) the secondary suffix is often used to identify the units in the XLS file, however, the original recorded units and the output units are clearly identified within the XLS spreadsheet file.

LABORATORY TEST RESULTS

APPENDIX C

Project: Michael Baker Jr., Inc.: Rahway Arch
Project No.: 19998709

URS

SUMMARY OF LABORATORY TEST RESULTS

Boring and Sample Number	Depth (feet)	Classification	USCS and AASHTO Symbols	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits		Specific Gravity	Organic Content (%)	Grain Size		Compaction	Consolidation	Analytical Results (ppm)		Triaxial Compression		Unconfined Compression		pH
						Liquid Limit	Plastic Limit			<#200 (%)	<2μ (%)			Chloride	Sulfate	UU	CIU	Stress (psi)	Strain (%)	
BD-01R T-1	24.0-26.0	Gray ELASTIC SILT with SAND	MH A-7-5(133)	72.9		291	173	2.36	14.76	79	16									6.9
BD-01R T-1	—			66.3	58.2											*				
BD-03 T-1	23.0-25.0	Gray SANDY ELASTIC SILT	MH A-7-5(42)	65.1		105	45	2.53		66	18									
BD-03 T-1	—			80.9	51.4												*			
BD-03 T-1	—			75.4	53.9												*			
BD-03 T-1	—			59.0	51.4												*			
BD-03 S-12	25.0-27.0	Gray SANDY FAT CLAY	CH A-7-5(28)	73.8		89	35			57	14									
BD-04R T-1	21.0-23.0	Gray FAT CLAY	CH A-7-5(65)	75.0		98	41			93	18									
BD-04R T-1	—			81.9	51.2								*							
BD-04R T-1	—			77.1	52.6											*				
BD-05 S-5	14.0-16.0	Gray FAT CLAY with SAND	CH A-7-5(41)	70.9		78	34		5.7	82	16									6.6
BS-01 S-9	16.0-18.0	Brown SANDY LEAN CLAY	CL A-4(3)	20.4		25	17			65	17									
BS-02 T-1	7.0-9.0	Dark Gray SANDY ELASTIC SILT	MH A-7-5(158)	375.7		467	256	2.14	19.3	62	21									6.7
BS-02 T-1	—			384.1	13.6								*							
BS-02 T-1	—			384.0	13.6											*				
BS-04 T-1	23.0-25.0	Brown FAT CLAY	CH A-7-5(57)	71.9		93	38			87	21									
BS-04 T-1	—			110.5	45.6											*				
BS-04 S-12	25.0-27.0	Brown SILTY SAND	SM A-2-4(0)	45.0						32										
BS-08 T-1	15.0-17.0	Brown SILT with SAND	ML A-4(0)	20.1		20	18			71	7									

The soil classification and USCS symbols are based partially on visual classification unless both Atterberg limits and grain size analysis tests are performed.

* Refer to Laboratory Test Curves

Project: Michael Baker Jr., Inc.: Rahway Arch
Project No.: 19998709

URS

SUMMARY OF LABORATORY TEST RESULTS

Boring and Sample Number	Depth (feet)	Classification	USCS and AASHTO Symbols	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits		Specific Gravity	Organic Content (%)	Grain Size		Compaction	Consolidation	Analytical Results (ppm)		Triaxial Compression		Unconfined Compression		pH
						Liquid Limit	Plastic Limit			<#200 (%)	<2μ (%)			Chloride	Sulfate	UU	CIU	Stress (psi)	Strain (%)	
BS-08 T-1	—			19.4	109.9											*				6.5
BS-08 S-10	21.0-23.0	Brown SILT with SAND	ML A-4(0)	16.0						80										
BS-09 T-1	12.0-14.0	Gray SILTY SAND	SM A-7-5(43)	58.6		241	113	2.52	2.9	43	8									
BS-09 T-1	—			170.9	28.4												*			
BS-09 T-1	—			154.2	24.3												*			
BS-09 T-1	—			59.0	92.6												*			
BS-09 T-1	—			48.6	69.0								*							
ID-06 U-2	14.0-16.0	Dark Gray FAT CLAY	CH A-7-5(99)	120.9		130	43	2.58		94	32									
ID-06 U-2	--			96.4	46.5								*							
IS-02 U-1	19.0-21.0	Dark Gray SANDY LEAN CLAY	CL A-6(6)	99.3		33	22	2.63		69	14									
IS-02 U-1	—			223.1	22.7								*							
IS-02 U-1	—			37.5	86.2											*				
W-05 T-1	15.0-17.0	Brown SANDY LEAN CLAY	CL A-4(2)	26.1		25	15			53	15									
W-05 T-1	—			27.0	97.3											*				
W-08 U-1	14.0-16.0	Gray LEAN CLAY	CL A-6(17)			36	16			87	33									
W-08 U-1	—			30.4	91.9											*				

The soil classification and USCS symbols are based partially on visual classification unless both Atterberg limits and grain size analysis tests are performed.

* Refer to Laboratory Test Curves

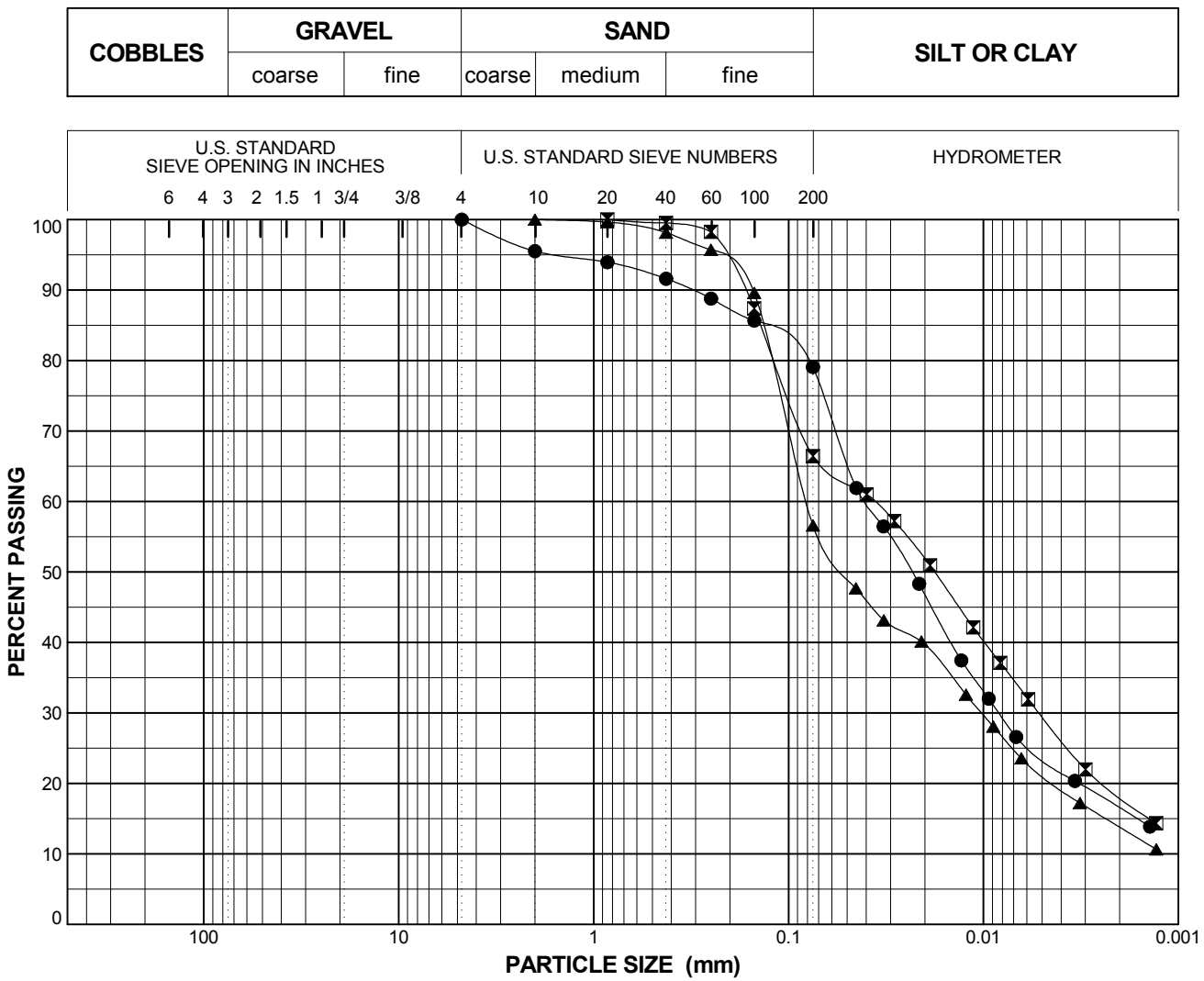
URS Corporation #19998709
Rahway Arch Site Carteret, New Jersey
LABORATORY TESTING DATA SUMMARY

BORING	SAMPLE	DEPTH	IDENTIFICATION TESTS										PERMEABILITY	STRENGTH			CONSOLIDATION		REMARKS
																	INITIAL CONDITIONS		
NO.	NO.	(ft)	WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDRO. % MINUS 2 μm (%)	TOTAL UNIT WEIGHT (pcf)	DRY UNIT WEIGHT (pcf)	SPECIFIC GRAVITY (-)	(cm/sec)	TEST TYPE	PEAK SHEAR STRESS (ksf)	AXIAL STRAIN @ PEAK STRESS (%)	VOID RATIO* (-)	SATUR-ATION* (%)	/Test ID
BS-03R	T-1	8-10								91.3									
BS-03R	T-1A	8.35	90.9				MH			96.4	50.5			CIU@0.2	1.1	17.5			T3303
BS-03R	T-1	8.65	120.0																
BS-03R	T-1B	8.9	108.1				MH			91.7	44.0			CIU@2	1.3	3.0			T3304
BS-03R	T-1	9.2	116.4																
BS-03R	T-1C	9.45	106.7				MH			94.1	45.5			CIU@5	3.3	2.5			T3305
BS-03R	T-1	9.75	87.3																
BS-03R	T-1D	10.0	124.3				MH	93.0	18	91.3	40.7	3.173					3.866	102	C12129
BS-06	U-1	2-4								85.3									
BS-06	U-1	2.75	77.4																
BS-06	U-1	3.3	73.6																
BS-06	U-1C	3.55	84.9				MH	96.0	21	94.4	51.1	3.100					2.790	94	C12128
ID-01	S-3	4-6	134.3	59	49	10	MH	96.6	5										
ID03R	T-1	0-2								79.3									
ID03R	T-1	0.45	114.5																
ID03R	T-1	1.0	170.1																
ID03R	T-1C	1.25	157.1				MH	86.7	26	83.6	32.5	2.756					4.289	101	C12127
ID-04	T-1	8-10								72.6									
ID-04	T-1	8.6	269.9				PT											Disturbed, no test	
ID-06	U-1	0-2								76.5								Disturbed, no test	
ID-06	S-2	2-4	109.2	62	61	1	MH												

URS Corporation #19998709
Rahway Arch Site Carteret, New Jersey
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS: WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDRO. % MINUS 2 μm (%)	TOTAL UNIT WEIGHT (pcf)	DRY UNIT WEIGHT (pcf)	SPECIFIC GRAVITY (-)	PERMEABILITY (cm/sec)	STRENGTH: TEST TYPE	PEAK SHEAR STRESS (ksf)	AXIAL STRAIN @ PEAK STRESS (%)	CONSOLIDATION INITIAL CONDITIONS: VOID RATIO* (-)	SATUR-ATION* (%)	REMARKS /Test ID
Sludge Composite (2)				NP	64		MH												
Sludge Composite (2)			115.8				MH			93.2	43.2			UU@1	0.0	1.4			
Sludge Composite (2)			112.3				MH			92.9	43.8						3.704	100	C12146
Sludge Composite (2)			94.5				MH			91.1	46.8		6.4E-6						P9528
Sludge Composite (2)			100.8				MH			91.5	45.6			CIU@0.2	0.3	18.9			T3315
Sludge Composite (2)			97.9				MH			92.5	46.7			CIU@ 2	2.1	20.0			T3316
Sludge Composite (2)			94.3				MH			94.3	47.5			CIU@ 5	5.1	20.7			T3317

Note: (1) USCS symbol based on visual observation and Sieve reported.
(2) Composite from sludge materials in BS-03R T-1, BS-06 U-1, and ID03R T-1
* Saturation and Void Ratio based on measured specific gravities



SYMBOL	●	⧗	▲
Boring	BD-01R	BD-03	BD-03
Sample	T-1	T-1	S-12
Spec			
Depth (ft)	24.0-26.0	23.0-25.0	25.0-27.0
% +3"	0.0	0.0	0.0
% Gravel	0.0	0.0	0.0
% Sand	20.9	33.5	43.4
% Fines	79.1	66.5	56.6
% -2μ	16.5	18.3	13.8
Cc			
Cu			
LL	291	105	89
PL	173	45	35
PI	118	60	54
USCS	MH	MH	CH
w (%)	72.9	65.1	73.8

Particle Size (Sieve #)	PERCENT FINER ●	⧗	▲
4"			
3"			
1-1/2"			
3/4"			
3/8"			
4	100.0		
10	95.5		100.0
20	94.0	100.0	99.6
40	91.6	99.5	98.1
60	88.8	98.3	95.7
100	85.7	87.4	89.6
200	79.1	66.5	56.6

SYMBOL	DESCRIPTION AND REMARKS
●	Gray ELASTIC SILT with SAND (MH)
⧗	Gray SANDY ELASTIC SILT (MH)
▲	Gray SANDY FAT CLAY (CH)

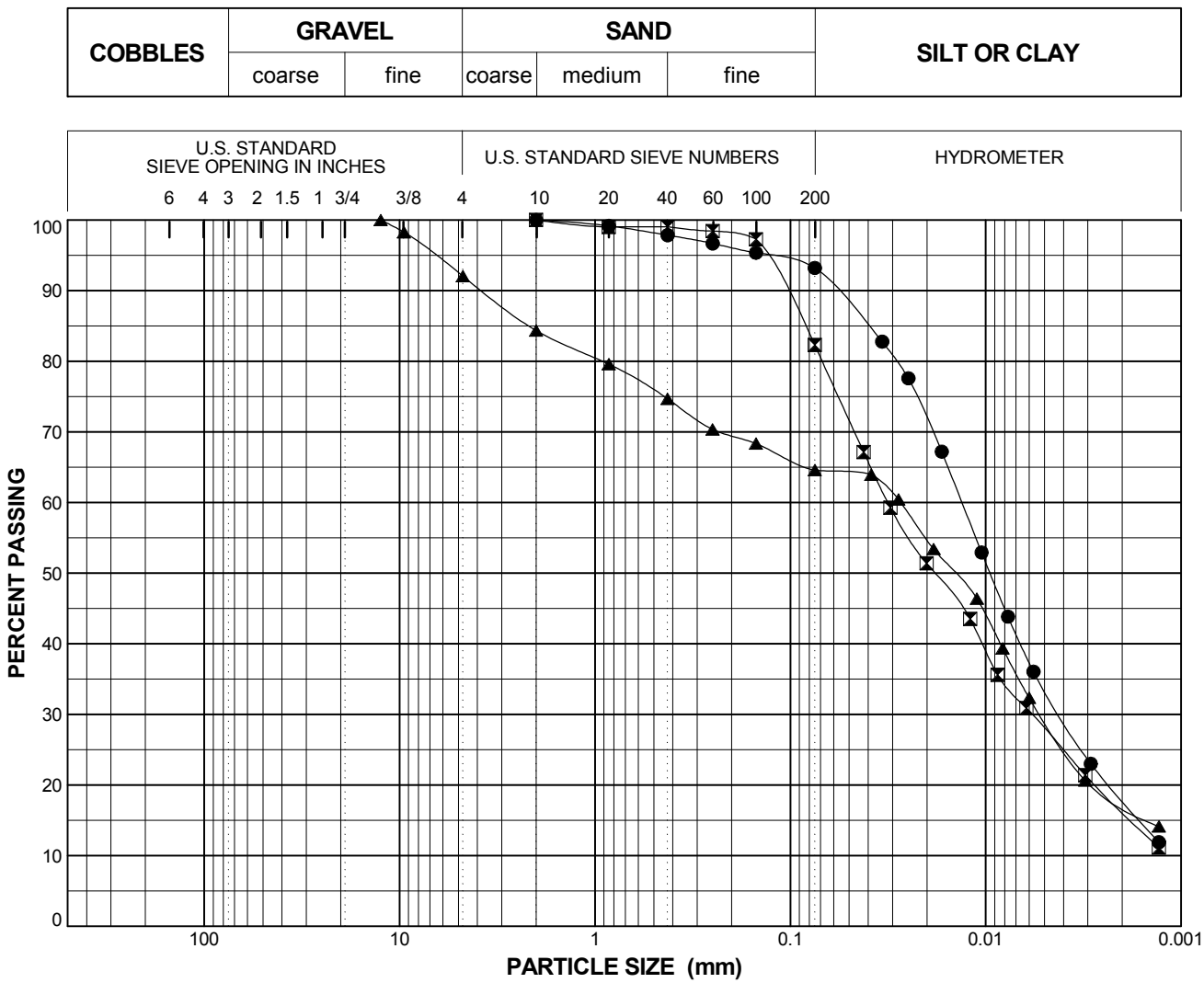
PARTICLE SIZE DISTRIBUTION

Michael Baker Jr., Inc.: Rahway Arch

Project Number 19998709	September 2012	Figure 1

URS

SIEVE_BLUEBELL 19998709 RAHWAY ARCH.GPJ URS_BLUE.GDT 10/1/12



SYMBOL	●	⧗	▲
Boring	BD-04R	BD-05	BS-01
Sample	T-1	S-5	S-9
Spec			
Depth (ft)	21.0-23.0	14.0-16.0	16.0-18.0
% +3"	0.0	0.0	0.0
% Gravel	0.0	0.0	7.9
% Sand	6.8	17.7	27.5
% Fines	93.2	82.3	64.6
% -2μ	17.9	16.2	17.4
Cc			
Cu			
LL	98	78	25
PL	41	34	17
PI	57	44	8
USCS	CH	CH	CL
w (%)	75.0	70.9	20.4

Particle Size (Sieve #)	PERCENT FINER ●	⧗	▲
4"			
3"			
1-1/2"			
3/4"			
3/8"			98.3
4			92.1
10	100.0	100.0	84.3
20	99.2	99.0	79.6
40	97.8	99.0	74.7
60	96.7	98.4	70.4
100	95.4	97.3	68.3
200	93.2	82.3	64.6

SYMBOL	DESCRIPTION AND REMARKS
●	Gray FAT CLAY (CH)
⧗	Gray FAT CLAY with SAND (CH)
▲	Brown SANDY LEAN CLAY (CL)

PARTICLE SIZE DISTRIBUTION

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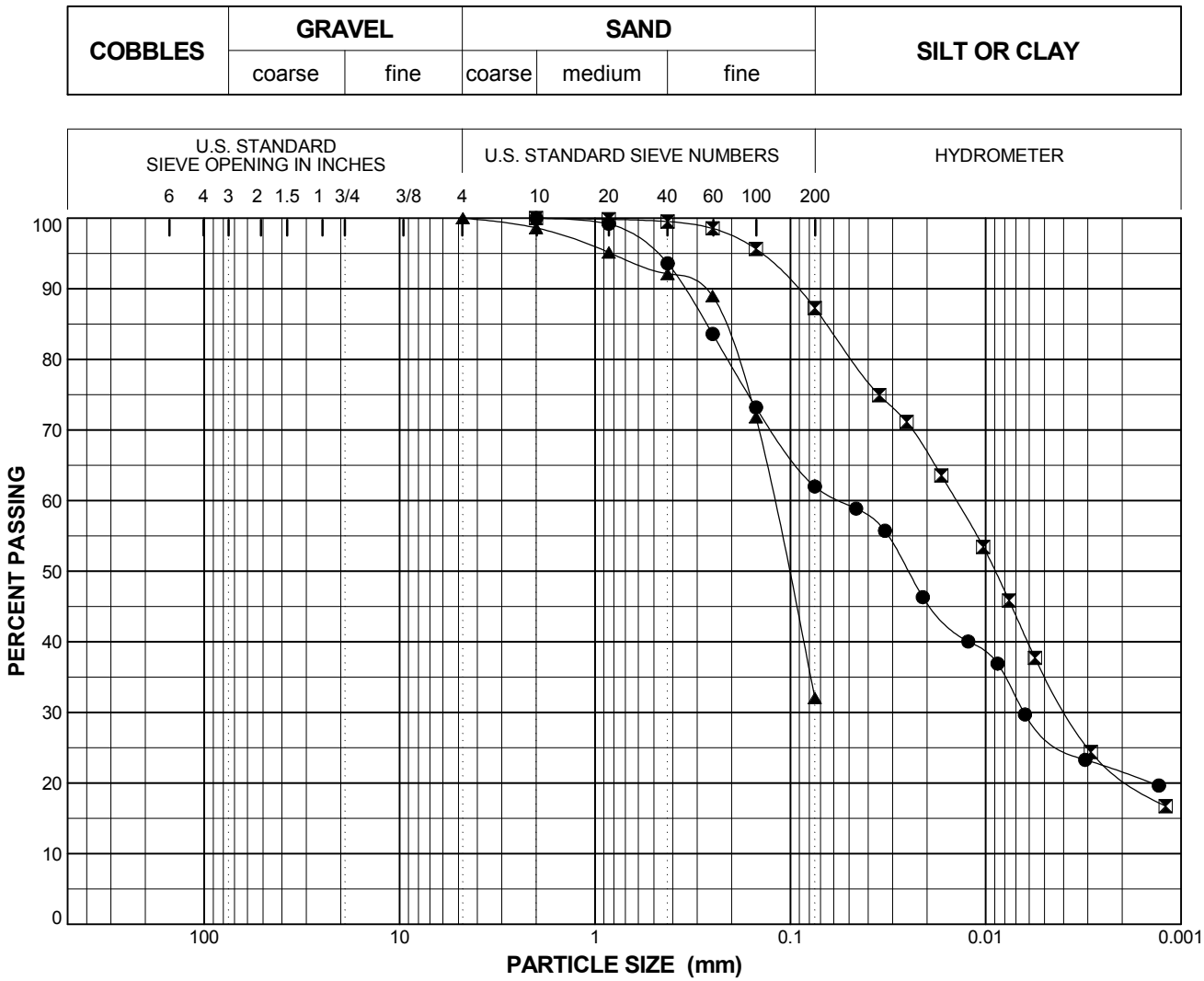
Project Number 19998709	September 2012	Figure 2

URS

SIEVE_BLUEBELL 19998709 RAHWAY ARCH.GPJ URS_BLUE.GDT 10/1/12



SYMBOL	●	⧗	▲
Boring	BS-02	BS-04	BS-04
Sample	T-1	T-1	S-12
Spec			
Depth (ft)	7.0-9.0	23.0-25.0	25.0-27.0
% +3"	0.0	0.0	0.0
% Gravel	0.0	0.0	0.0
% Sand	38.0	12.7	68.0
% Fines	62.0	87.3	32.0
% -2μ	21.5	21.2	
Cc			
Cu			
LL	467	93	
PL	256	38	
PI	211	55	
USCS	MH	CH	SM
w (%)	375.7	71.9	45.0

Particle Size (Sieve #)	PERCENT FINER ●	⧗	▲
4"			
3"			
1-1/2"			
3/4"			
3/8"			
4			100.0
10	100.0	100.0	98.6
20	99.2	99.8	95.1
40	93.6	99.5	92.1
60	83.6	98.5	89.0
100	73.2	95.6	71.8
200	62.0	87.3	32.0

SYMBOL	DESCRIPTION AND REMARKS
●	Dark Gray SANDY ELASTIC SILT (MH)
⧗	Brown FAT CLAY (CH)
▲	Brown SILTY SAND (SM)

PARTICLE SIZE DISTRIBUTION

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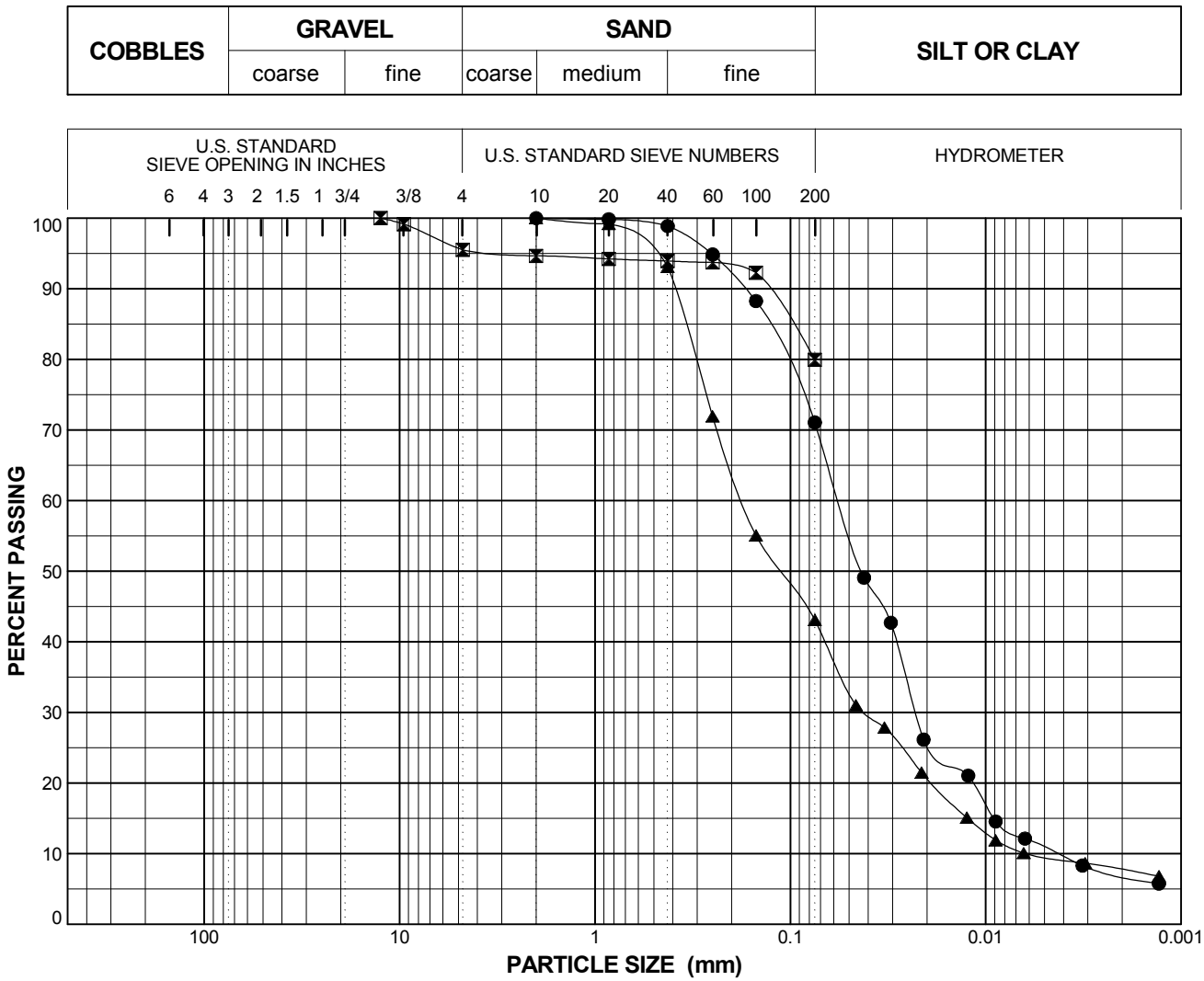
Project Number 19998709	September 2012	Figure 3

URS

SIEVE_BLUEBELL 19998709 RAHWAY ARCH.GPJ URS_BLUE.GDT 10/1/12



SYMBOL	●	⧗	▲
Boring	BS-08	BS-08	BS-09
Sample	T-1	S-10	T-1
Spec			
Depth (ft)	15.0-17.0	21.0-23.0	12.0-14.0
% +3"	0.0	0.0	0.0
% Gravel	0.0	4.5	0.0
% Sand	28.9	15.6	56.9
% Fines	71.1	80.0	43.1
% -2μ	7.0		7.7
Cc	2.14		1.61
Cu	12.98		28.37
LL	20		241
PL	18		113
PI	2		128
USCS	ML	ML	SM
w (%)	20.1	16.0	58.6

Particle Size (Sieve #)	PERCENT FINER ●	⧗	▲
4"			
3"			
1-1/2"			
3/4"			
3/8"		99.1	
4		95.5	
10	100.0	94.7	100.0
20	99.8	94.2	99.2
40	98.9	93.9	93.1
60	94.9	93.7	72.0
100	88.3	92.3	55.1
200	71.1	80.0	43.1

SYMBOL	DESCRIPTION AND REMARKS
●	Brown SILT with SAND (ML)
⧗	Brown SILT with SAND (ML)
▲	Gray SILTY SAND (SM)

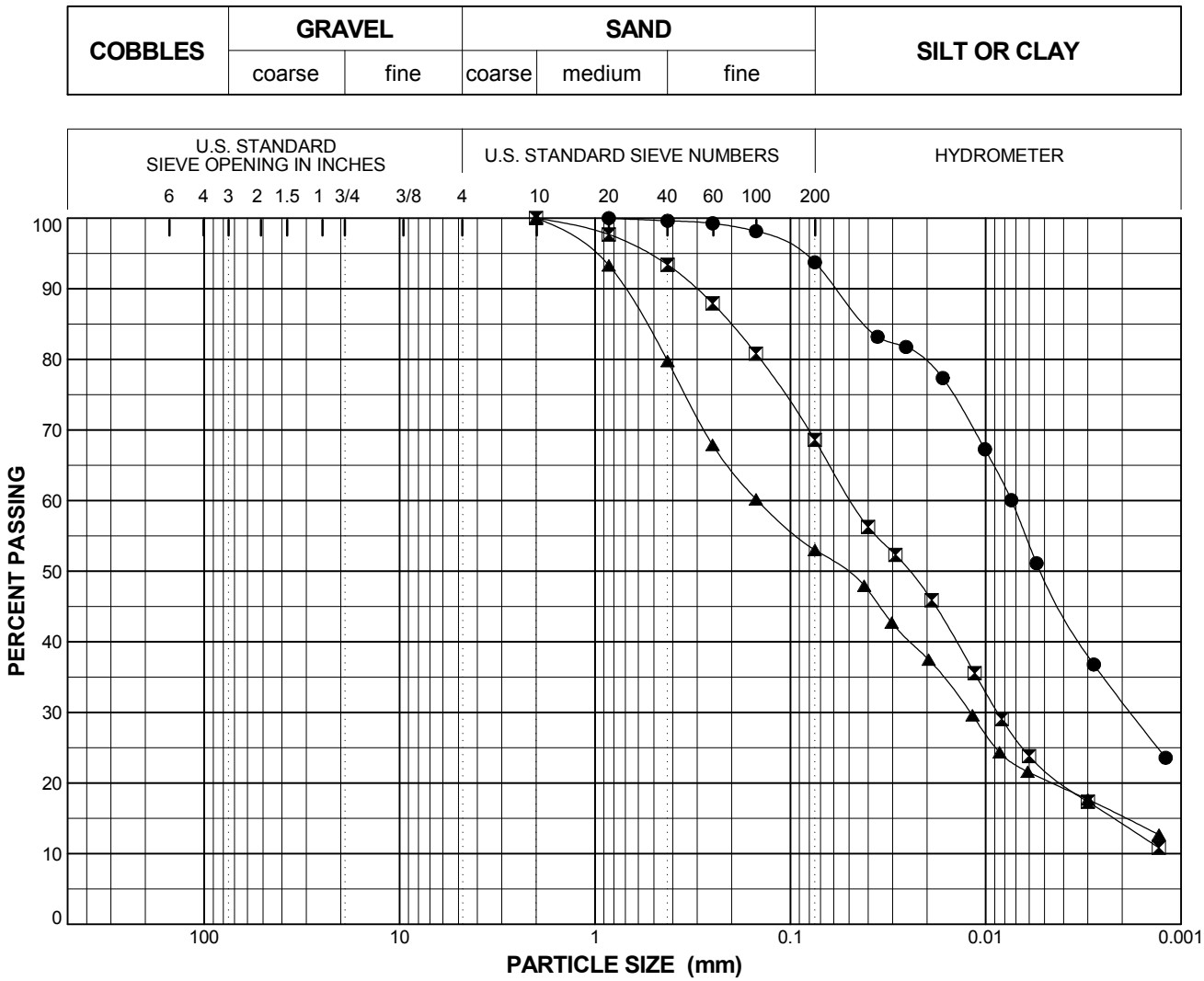
PARTICLE SIZE DISTRIBUTION

Michael Baker Jr., Inc.: Rahway Arch

Project Number 19998709	September 2012	Figure 4

URS

SIEVE_BLUEBELL 19998709 RAHWAY ARCH.GPJ URS_BLUE.GDT 10/1/12



SYMBOL	●	⧗	▲
Boring	ID-06	IS-02	W-05
Sample	U-2	U-1	T-1
Spec			
Depth (ft)	14.0-16.0	19.0-21.0	15.0-17.0
% +3"	0.0	0.0	0.0
% Gravel	0.0	0.0	0.0
% Sand	6.3	31.4	47.0
% Fines	93.8	68.6	53.0
% -2μ	31.5	14.2	15.3
Cc			
Cu			
LL	130	33	25
PL	43	22	15
PI	87	11	10
USCS	CH	CL	CL
w (%)	120.9	99.3	26.1

Particle Size (Sieve #)	PERCENT FINER ●	⧗	▲
4"			
3"			
1-1/2"			
3/4"			
3/8"			
4			
10		100.0	100.0
20	100.0	97.7	93.3
40	99.6	93.4	79.8
60	99.3	87.9	67.9
100	98.2	80.8	60.2
200	93.8	68.6	53.0

SYMBOL	DESCRIPTION AND REMARKS
●	Dark Gray FAT CLAY (CH)
⧗	Dark Gray SANDY LEAN CLAY (CL)
▲	Brown SANDY LEAN CLAY (CL)

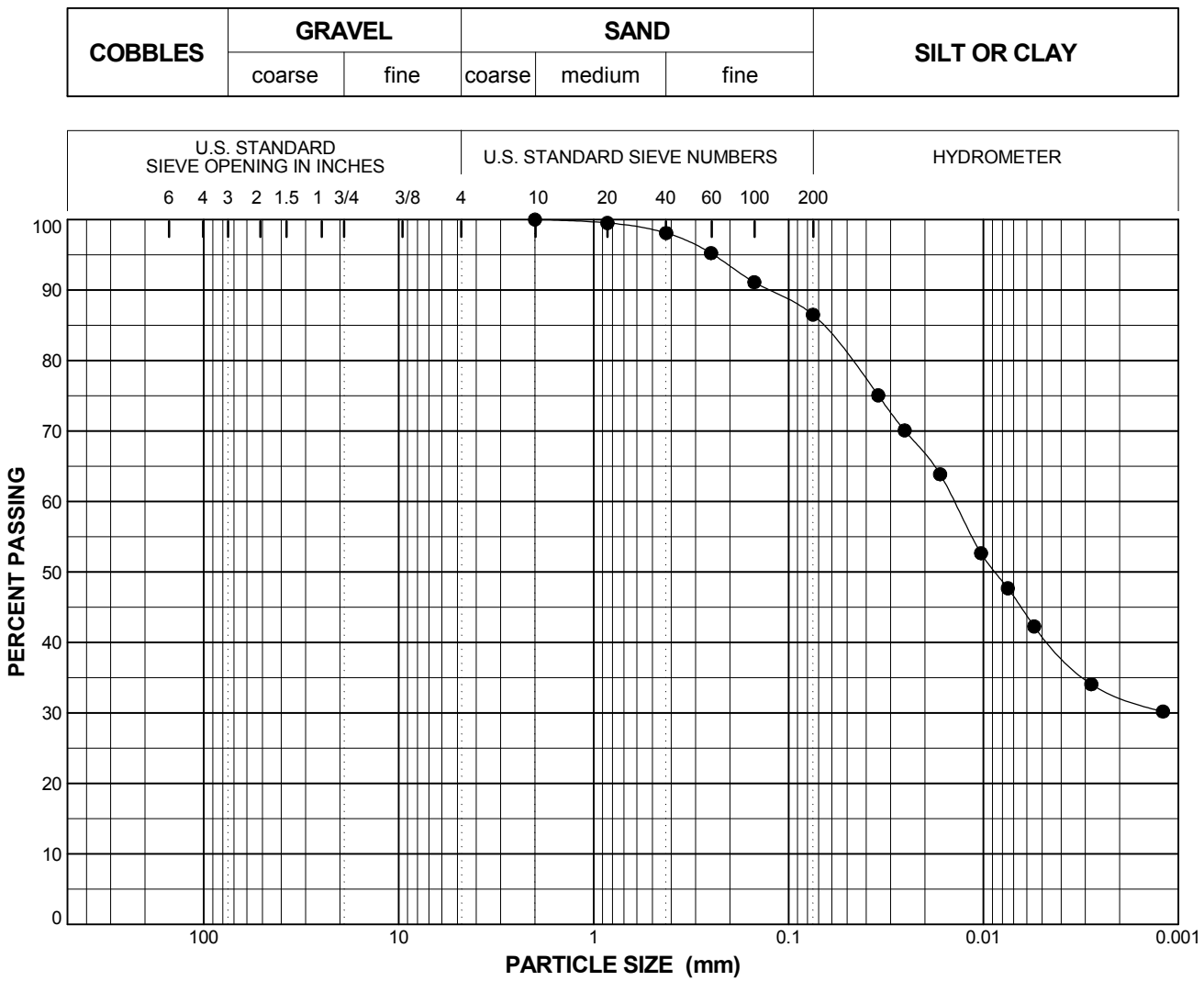
PARTICLE SIZE DISTRIBUTION

Michael Baker Jr., Inc.: Rahway Arch

Project Number 19998709	September 2012	Figure 5

URS

SIEVE_BLUEBELL 19998709 RAHWAY ARCH.GPJ URS_BLUE.GDT 10/1/12



SYMBOL	●		
Boring	W-08		
Sample	U-1		
Spec			
Depth (ft)	14.0-16.0		
% +3"	0.0		
% Gravel	0.0		
% Sand	13.5		
% Fines	86.5		
% -2μ	32.5		
Cc			
Cu			
LL	36		
PL	16		
PI	20		
USCS	CL		
w (%)			

Particle Size (Sieve #)	PERCENT FINER ●		
4"			
3"			
1-1/2"			
3/4"			
3/8"			
4			
10	100.0		
20	99.5		
40	98.1		
60	95.2		
100	91.1		
200	86.5		

SYMBOL	DESCRIPTION AND REMARKS
●	Gray LEAN CLAY (CL)

PARTICLE SIZE DISTRIBUTION

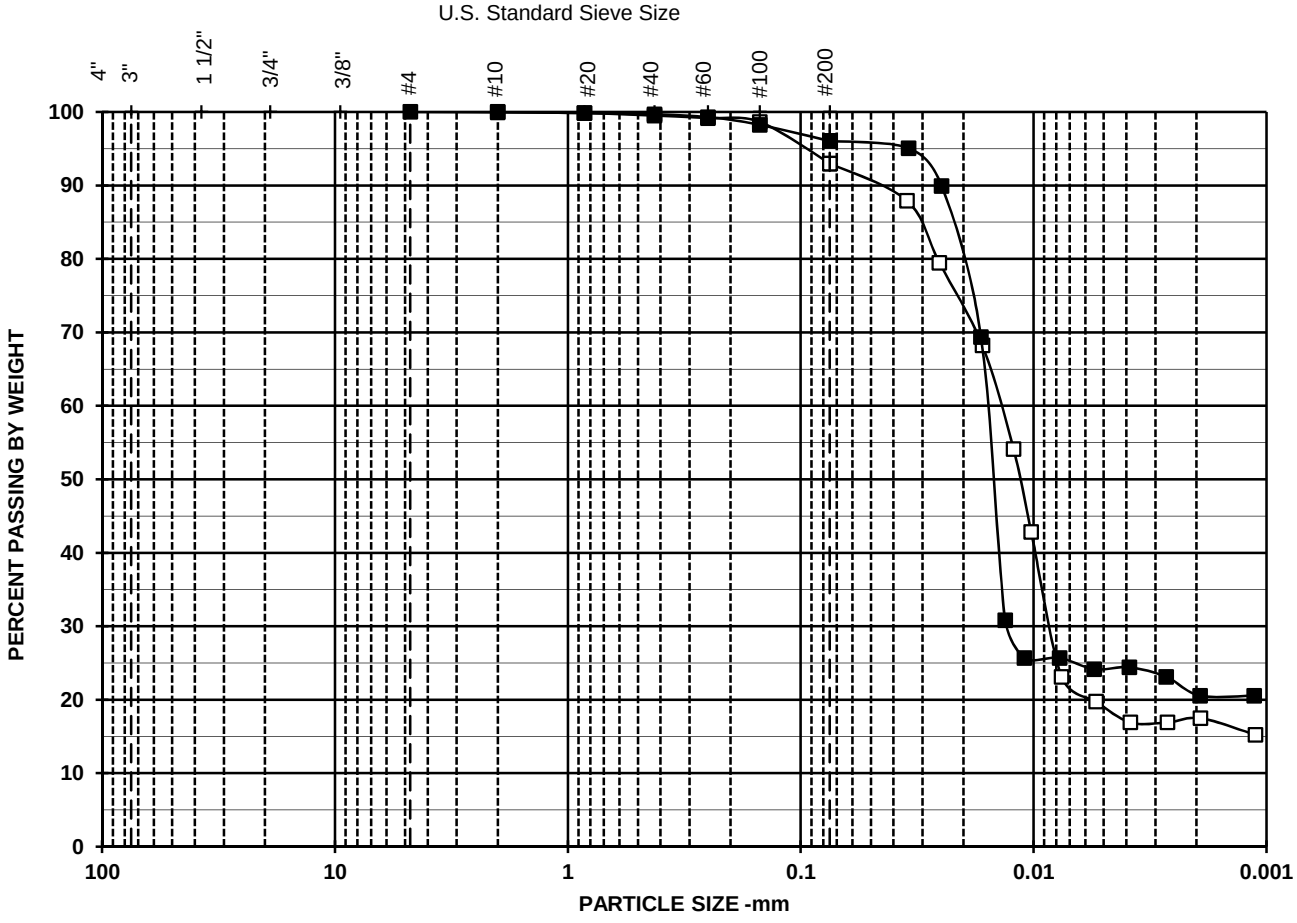
Michael Baker Jr., Inc.: Rahway Arch

Project Number 19998709	September 2012	Figure 6

URS

SIEVE_BLUEBELL 19998709 RAHWAY ARCH.GPJ URS_BLUE.GDT 10/1/12

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



Symbol	□	■	○
Boring	BS-03R	BS-06	
Sample	T-1D	U-1C	
Depth	10	3.55	
% +3"	0.0	0.0	
% Gravel	0.0	0.0	
% SAND	7.0	4.0	
%C SAND	0.0	0.1	
%M SAND	0.5	0.3	
%F SAND	6.5	3.6	
% FINES	93.0	96.0	
% -2μ	18	21	
D_{100} (mm)	2.00	4.75	
D_{60} (mm)	0.01	0.02	
D_{30} (mm)	0.01	0.01	
D_{10} (mm)			
Cc			
Cu			

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"			
3/8"			
4		100.0	
10	100.0	99.9	
20	99.8	99.9	
40	99.5	99.7	
60	99.2	99.3	
100	98.6	98.2	
200	93.0	96.0	

SYMBOL	w (%)	LL	PL	PI	USCS	DESCRIPTION AND REMARKS	Date Tested
□					MH	Gray, Elastic silt	8/13/2012
■					MH	Gray, Elastic silt	8/13/2012
○							

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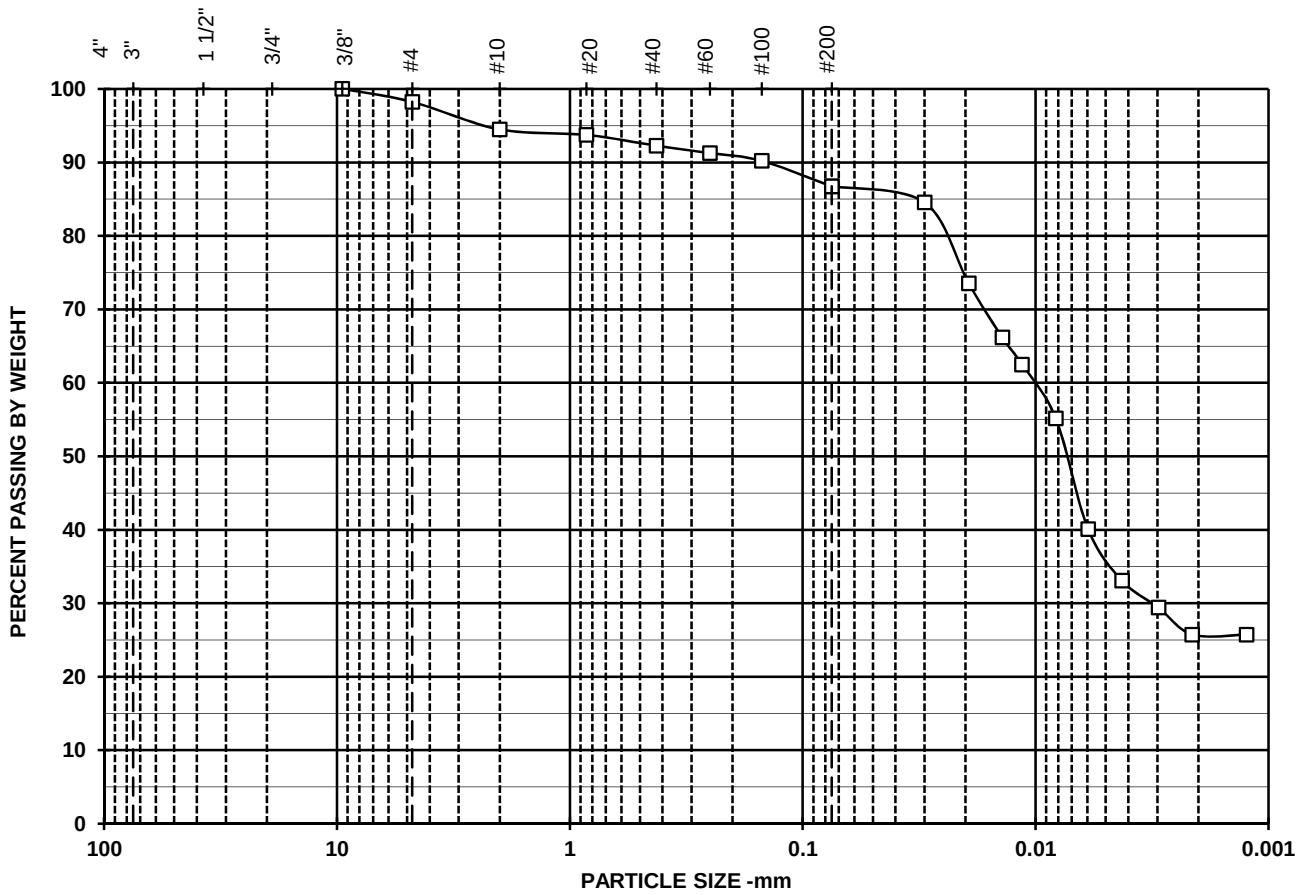
Rahway Arch Site, Carteret, New Jersey

Analysis File: 3SV-MasterRev3

siev1a.xlsx 9/11/2012

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



SYMBOL	w (%)	LL	PL	PI	USCS	DESCRIPTION AND REMARKS	Date Tested
□					MH	Gray, Elastic silt	8/13/2012
■							
○							

Symbol	□	■	○
Boring	ID-03R		
Sample	T-1C		
Depth	1.25		
% +3"	0.0		
% Gravel	1.8		
% SAND	11.5		
%C SAND	3.7		
%M SAND	2.2		
%F SAND	5.6		
% FINES	86.7		
% -2μ	26		
D_{100} (mm)	9.50		
D_{60} (mm)	0.01		
D_{30} (mm)	0.00		
D_{10} (mm)			
Cc			
Cu			

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"			
3/8"	100.0		
4	98.2		
10	94.5		
20	93.7		
40	92.3		
60	91.3		
100	90.2		
200	86.7		

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PARTICLE SIZE DISTRIBUTION

Rahway Arch Site, Carteret, New Jersey

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE
ASTM D 5084 - Method F

Project No.: T19998709 | BORING: | Test No.: p9528

Project Name: Rahway Arch Site | SAMPLE: Sludge Composite | DEPTH (ft):

Specimen - Apparatus set-up - Test Information | Cell No. H-6 | Apparatus No. 1 | Stage No.: 3

Preliminary Length/Area Calculations

Lo =	4.117	in	Lo=	10.456	cm
dLc=	0.059	in	Ao =	19.31	cm^2
Lc=	4.058	in	Vo =	201.87	cm^3
			Lc=	10.306	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	8.68	cm^3
			Vc =	193.19	cm^3
Sc =	0.550	cm^{-1}	Ac=	18.746	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
	x	with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove air			x	No		Yes
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
or		Demineralized		0.005 N calcium sulfate (CaSO4)		Permeability

Equations Used

Kt = - 0.0000757 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 ºC = RT * Kt TubeC= 1.3127

Consol Stage- Trial No.	Temp. º C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	22.0	10/9/12	10	13	00	105.0	100.0	49.00	40.84	0.98	5.48E-06
final	22.0	10/9/12	10	18	00			46.00	41.80		6.41E-06
1	RT = 0.956	dT =	5.00 min			σ'_c =	0.7 ksf	0.225	0.230	io= 10.0	0%
initial	22.0	10/9/12	10	20	00	105.0	100.0	49.00	40.84	0.96	5.52E-06
final	22.2	10/9/12	10	32	00			44.05	42.45		6.44E-06
2	RT = 0.953	dT =	12.00 min			σ'_c =	0.7 ksf	0.371	0.386	io= 10.0	0%
initial	22.2	10/9/12	10	33	00	105.0	100.0	49.00	40.84	0.96	5.52E-06
final	22.3	10/9/12	10	40	00			45.24	42.07		6.41E-06
3	RT = 0.949	dT =	7.00 min			σ'_c =	0.7 ksf	0.282	0.295	io= 10.0	0%
initial	22.3	10/9/12	10	41	00	105.0	100.0	49.00	40.84	0.96	5.55E-06
final	22.3	10/9/12	10	54	00			43.88	42.50		6.45E-06
4	RT = 0.948	dT =	13.00 min			σ'_c =	0.7 ksf	0.384	0.398	io= 10.0	0%
initial											
final											
5											
initial											
final											
6											

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	10.306	cm	ε_{axial} =	1.4%
Ac =	15.308	cm^2		
Vc=	157.77	cm^3	ε_{vol} =	21.8%
Sc =	0.673	cm^{-1}	Sc = Lc / Ac , final	

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	94.54	91.1	46.8	93.6
PreTest	71.89	103.0	59.9	100.0

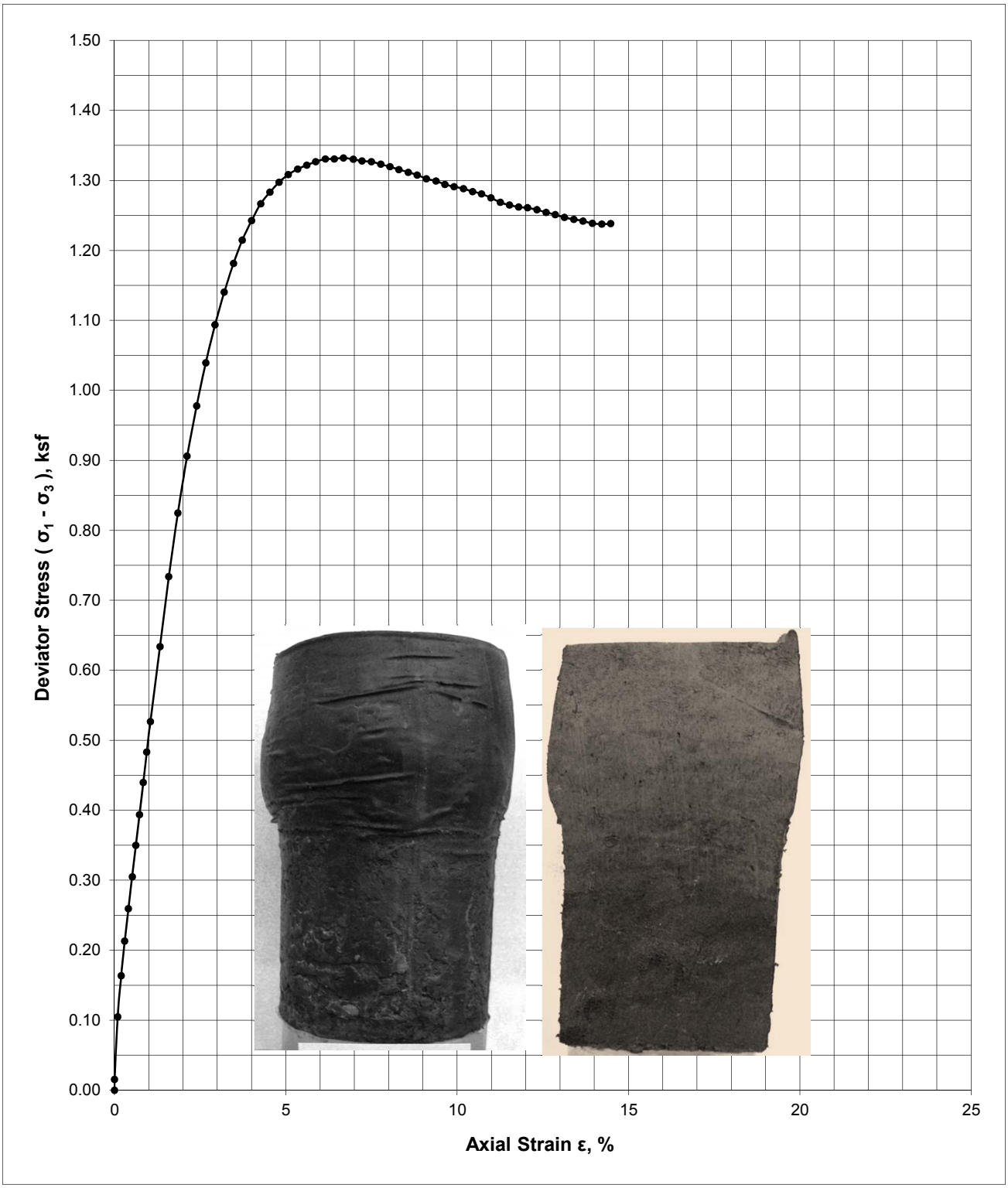
HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **6.43E-06** cm/sec

(i_o)ave = 10.0

Tested By: DT Reviewed By: G. Thomas

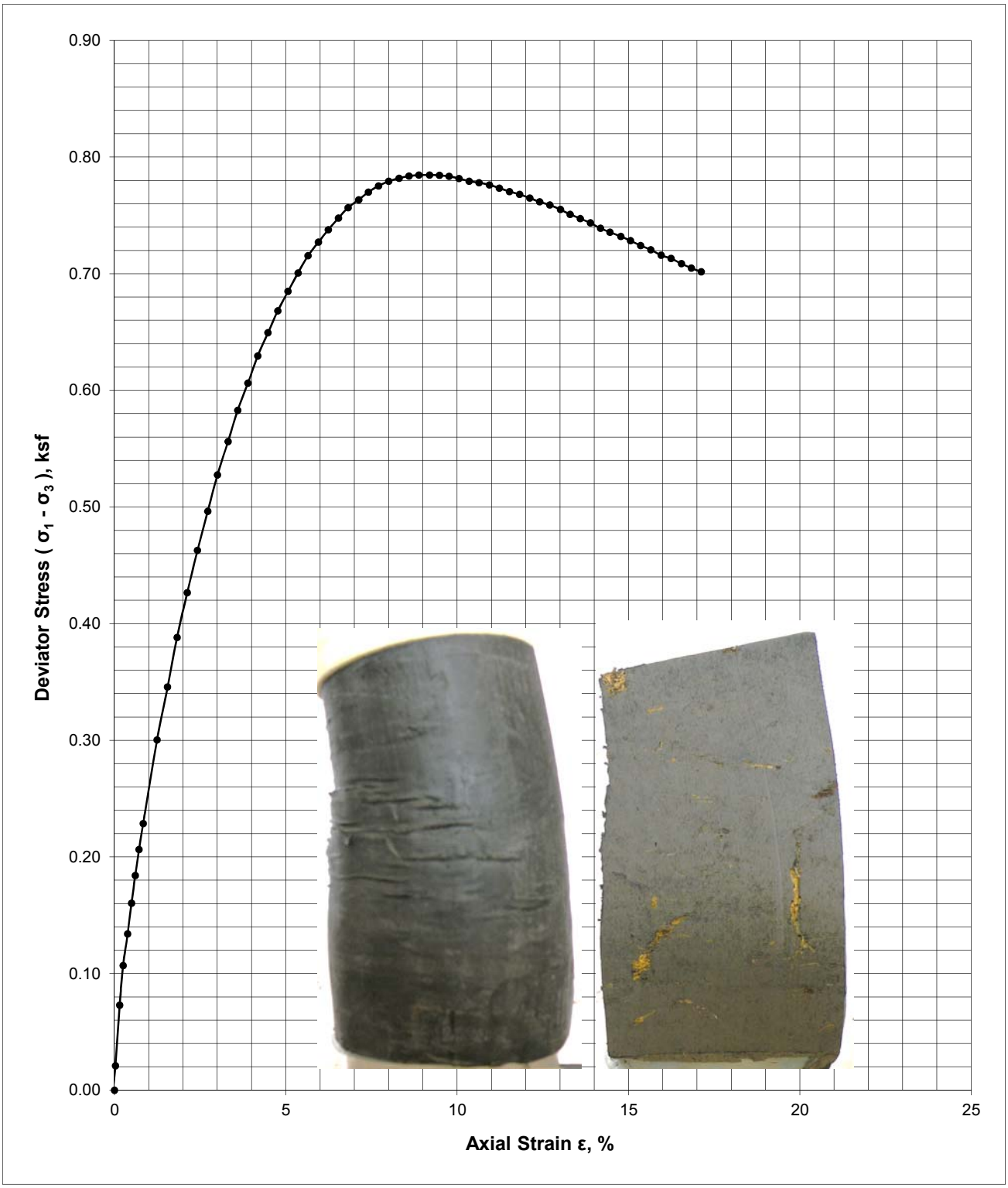


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
66.3	96.8	58.2	291	173	5.59	2.87	2.0	1.33	6.7	1.0
Description:	Gray Elastic SILT						Tested by: RM		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: BD-01R	Sample No.: T-1	Sample Depth (ft): 24.0-26.0	Date: 9/6/2012

URS

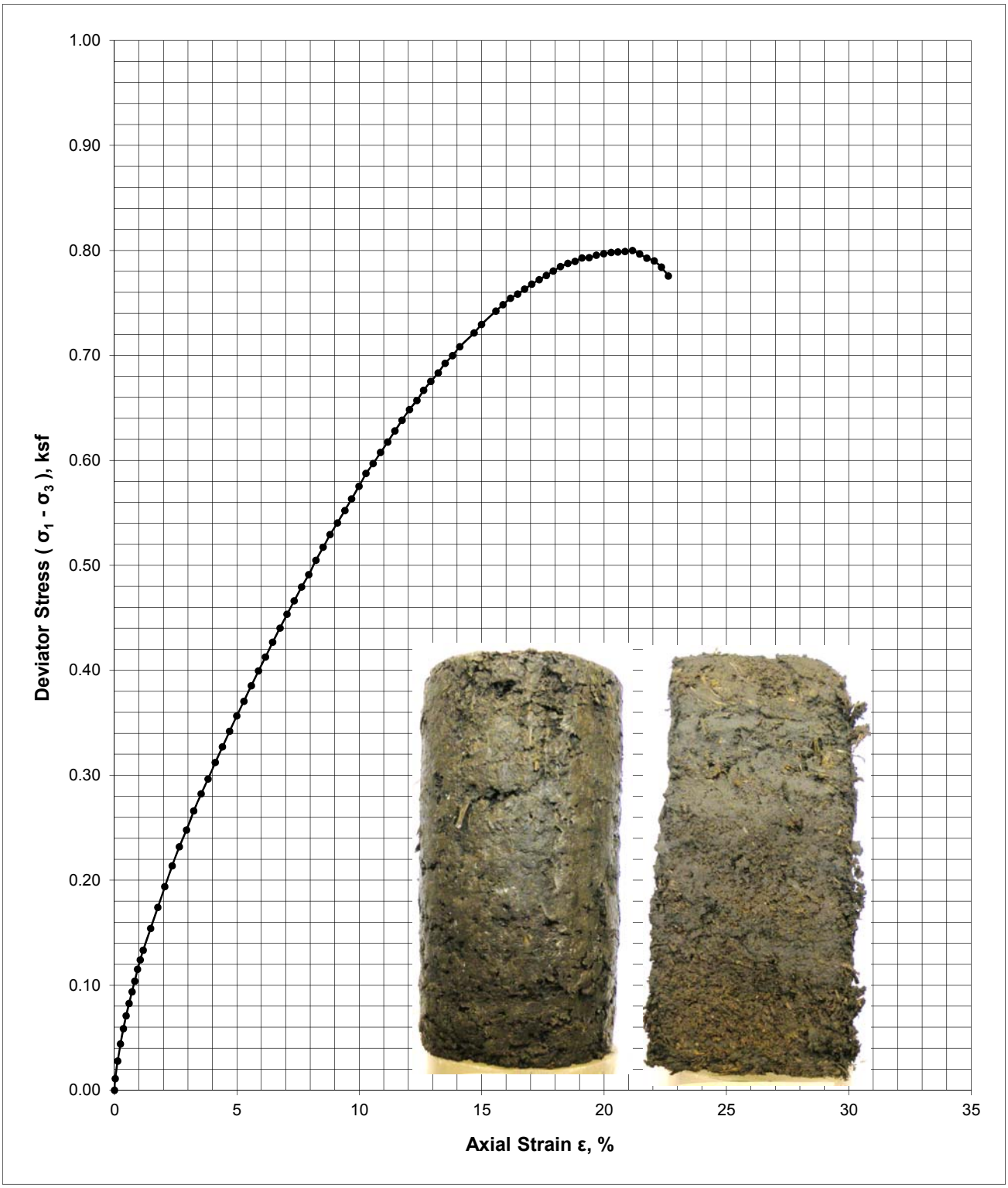


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
77.1	93.1	52.6	291	173	5.59	2.88	2.5	0.78	9.2	1.0
Description:	Dark Gray Fat CLAY						Tested by: TV		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: BD-04R	Sample No.: T-1	Sample Depth (ft): 21.0-23.0	Date: 8/20/2012

URS

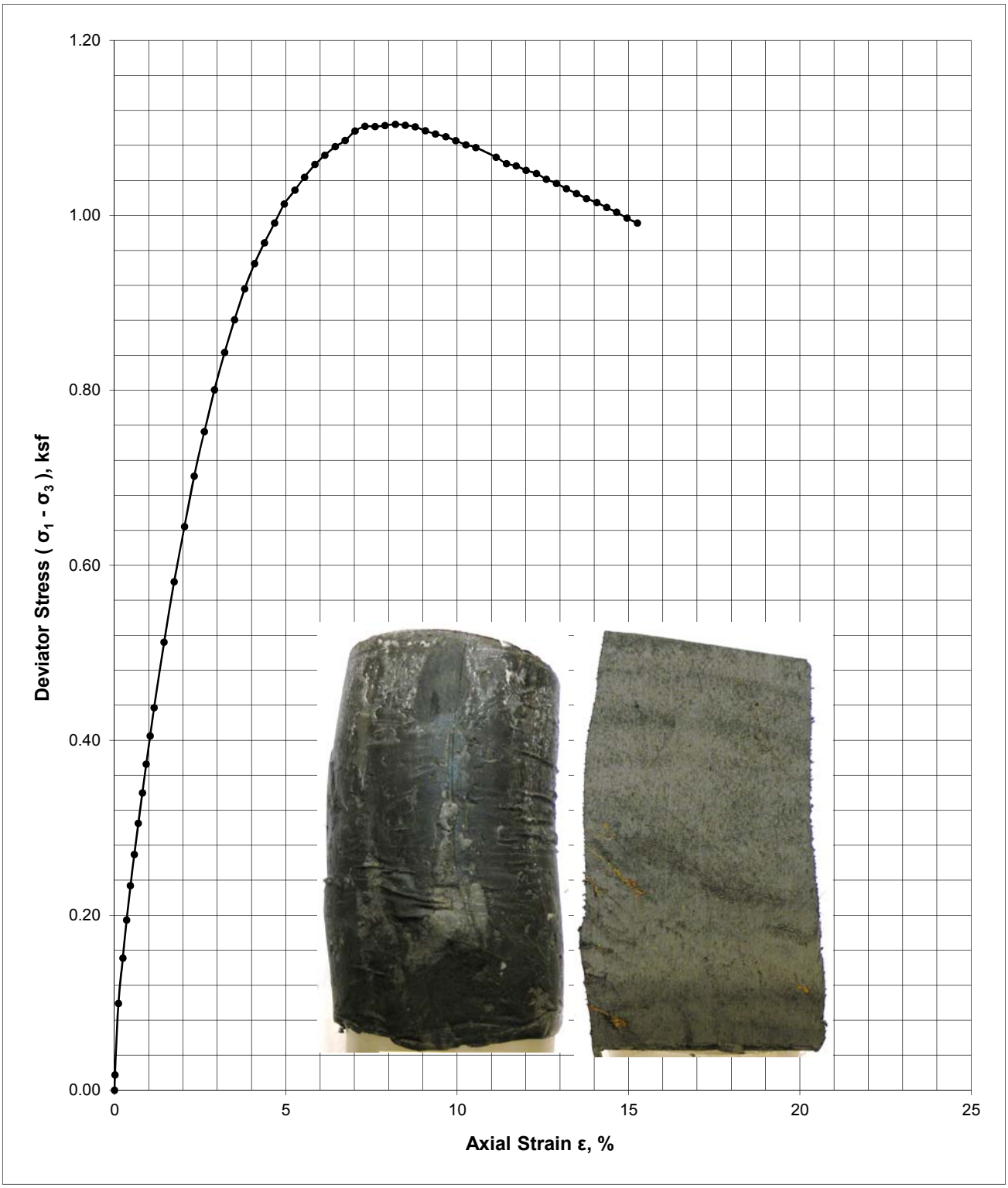


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
384.1	65.9	13.6	467	256	5.59	2.87	0.9	0.72	15.0	1.0
Description:	Dark Gray Sandy Elastic SILT						Tested by: TV		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: BS-02	Sample No.: T-1	Sample Depth (ft): 7.0-9.0	Date: 8/20/2012

URS

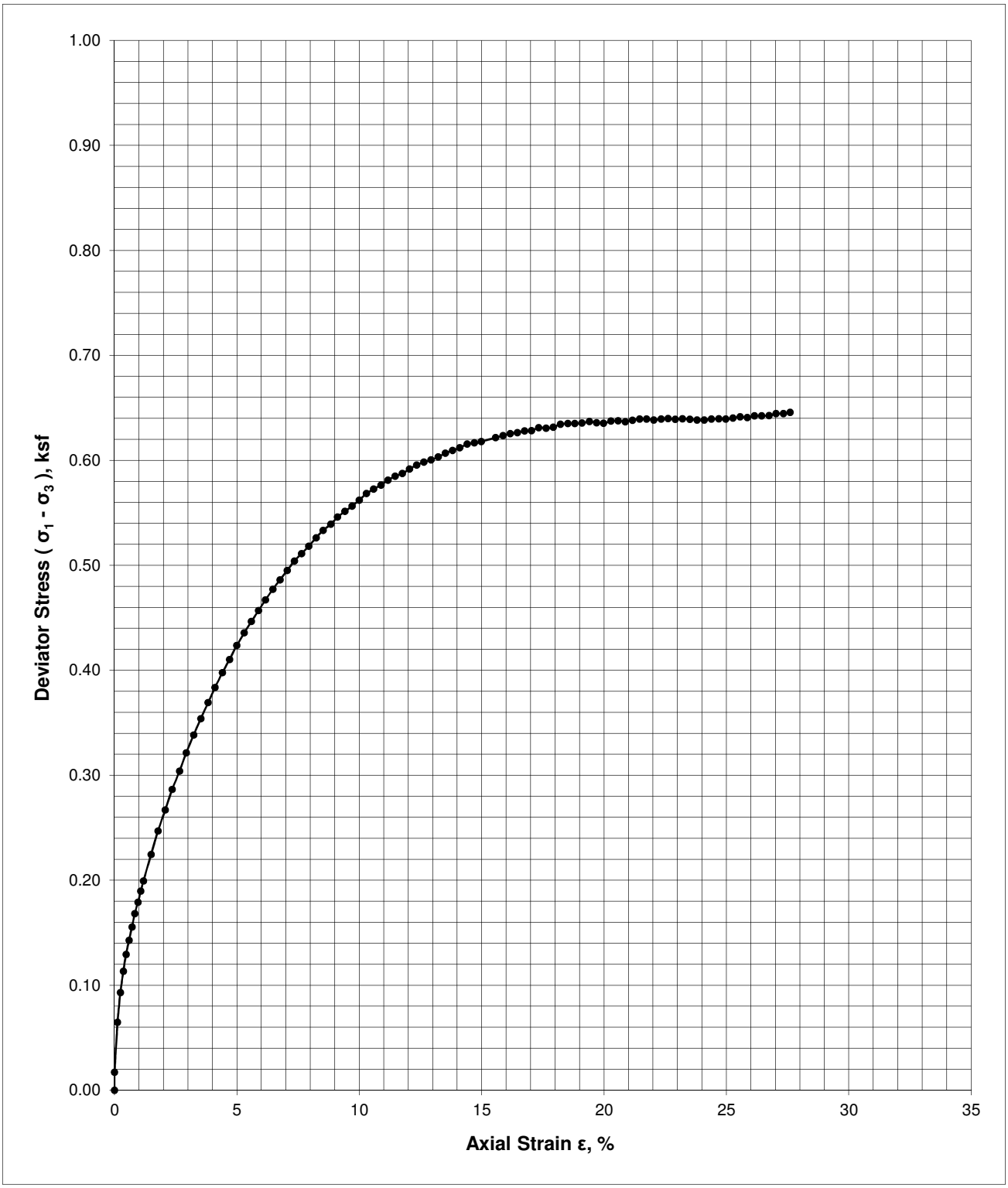


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
110.5	95.9	45.6	93	38	5.59	2.88	2.8	1.10	8.2	1.0
Description:	Brown Fat CLAY						Tested by: TV		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: BS-04	Sample No.: T-1	Sample Depth (ft): 23.0-25.0	Date: 8/20/2012

URS

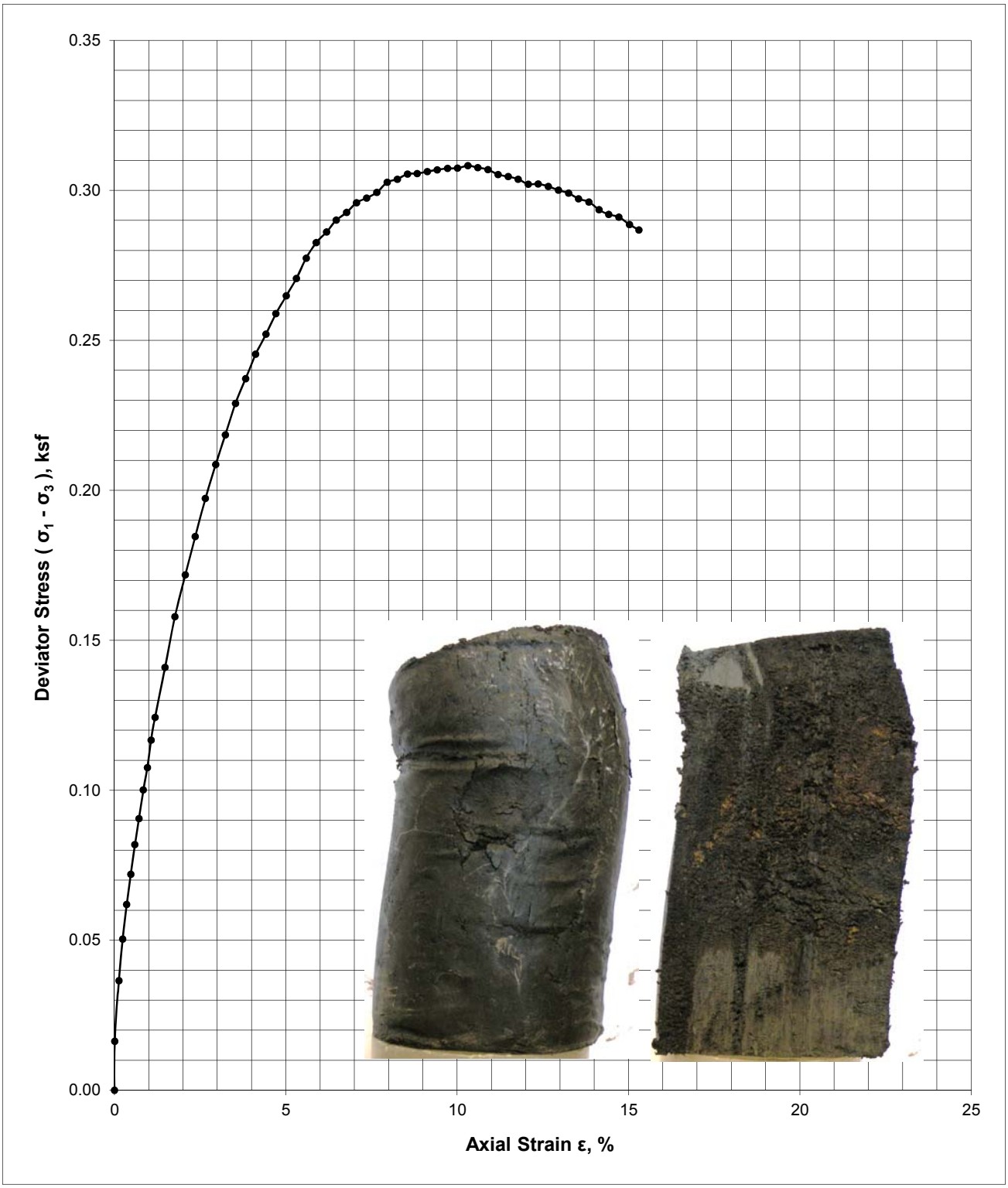


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
19.4	131.2	109.9	20	18	5.59	2.87	1.7	0.61	15.0	1.0
Description:	0						Tested by: TV		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: BS-08	Sample No.: T-1	Sample Depth (ft): 14.0-16.0	Date: 8/15/2012

URS

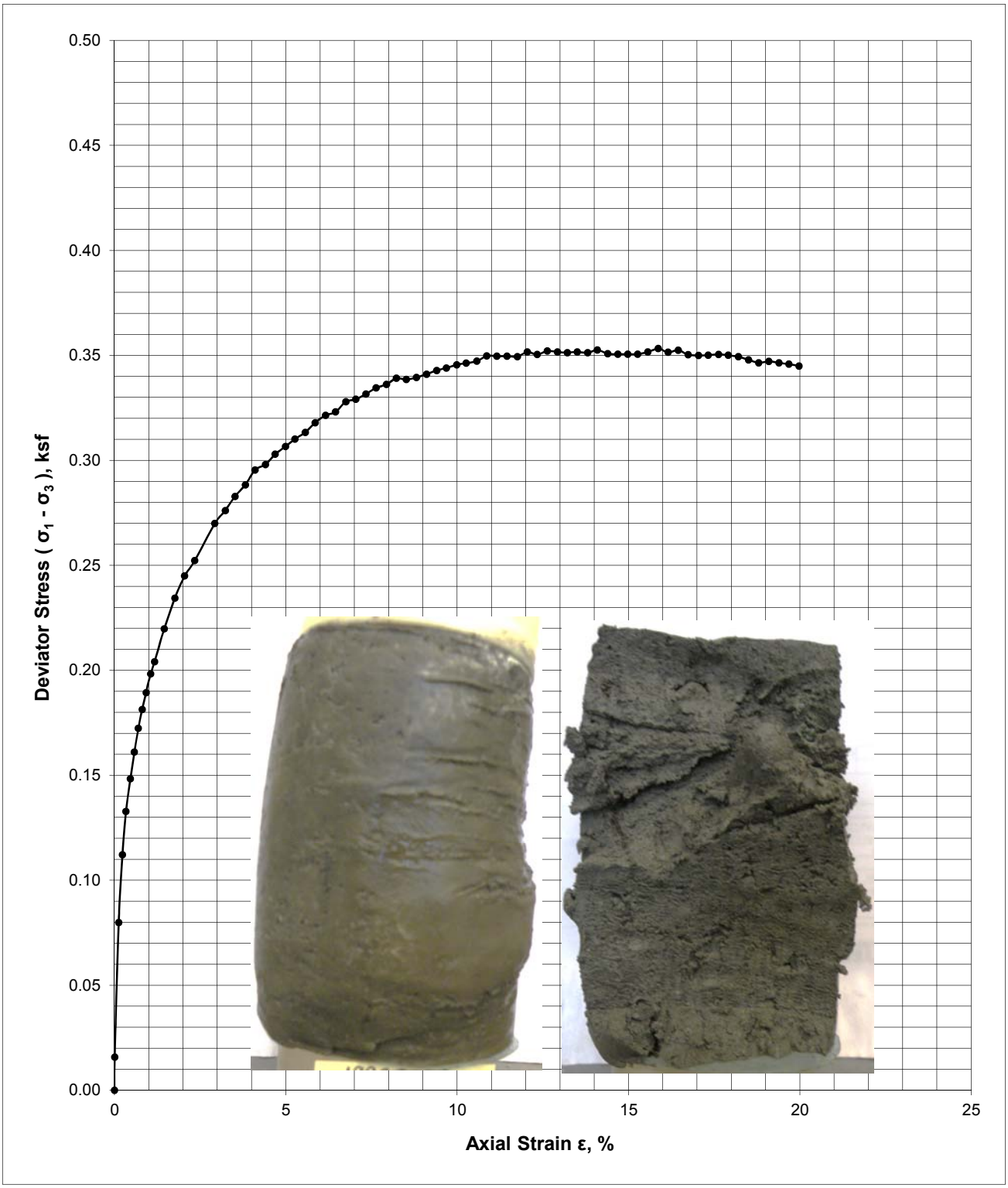


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
223.1	73.2	22.7	33	22	5.59	2.88	2.3	0.31	10.3	1.0
Description:	Dark Gray Sandy Lean CLAY						Tested by: TV		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: IS-02	Sample No.: U-1	Sample Depth (ft): 19.0-21.0	Date: 8/20/2012

URS

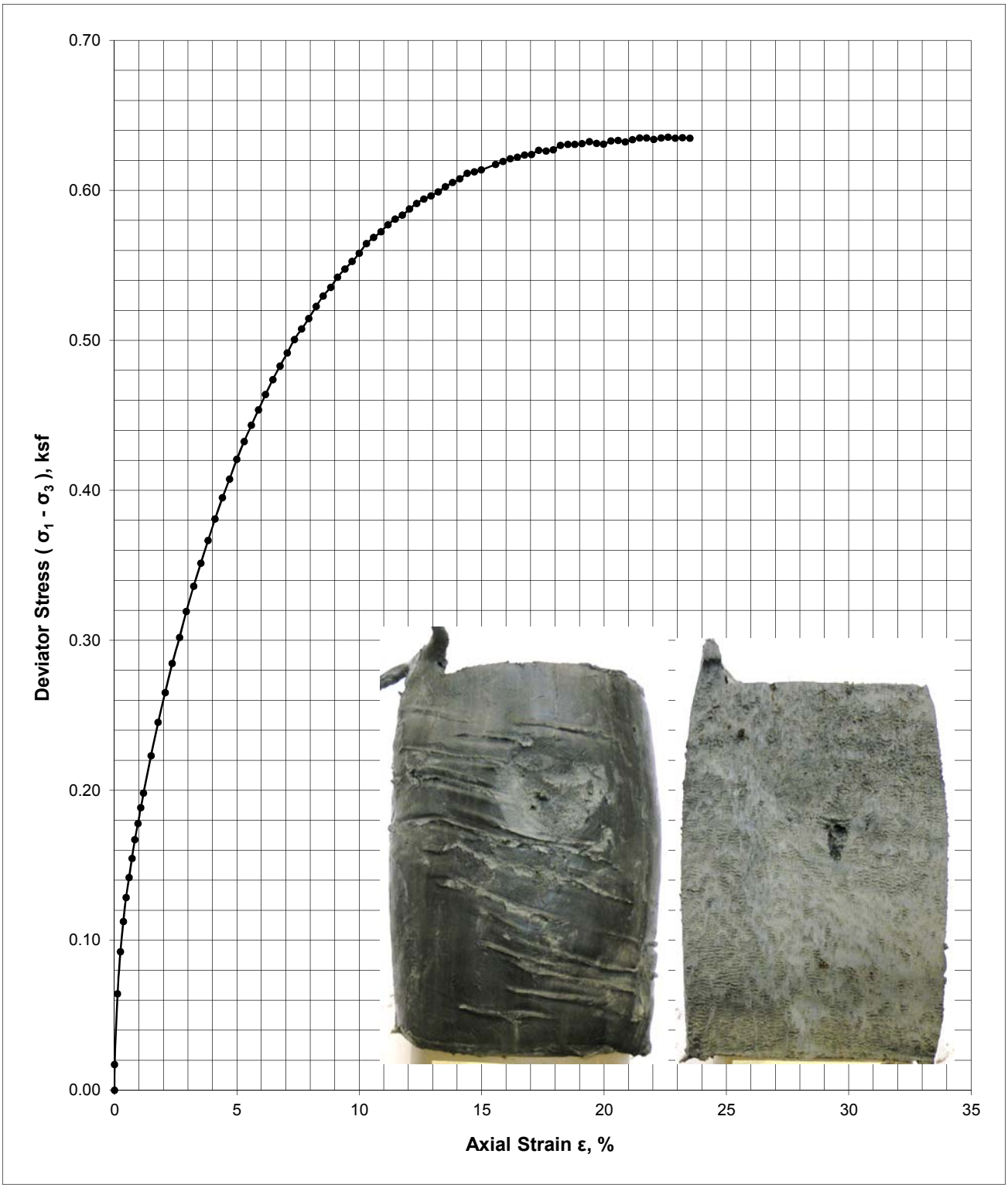


Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
27.0	123.5	97.3	25	15	5.59	2.87	1.6	0.35	15.0	1.0
Description:	Brown Sandy Lean CLAY						Tested by: TV		Reviewed by: EM	

Project No.:	Project Name:	Unconsolidated-Undrained Triaxial Compression (UU) Test
19998709	**Rahway Arch**	**ASTM D 2850**

Boring No.: W-05	Sample No.: T-1	Sample Depth (ft): 15.0-17.0	Date: 9/6/2012

URS



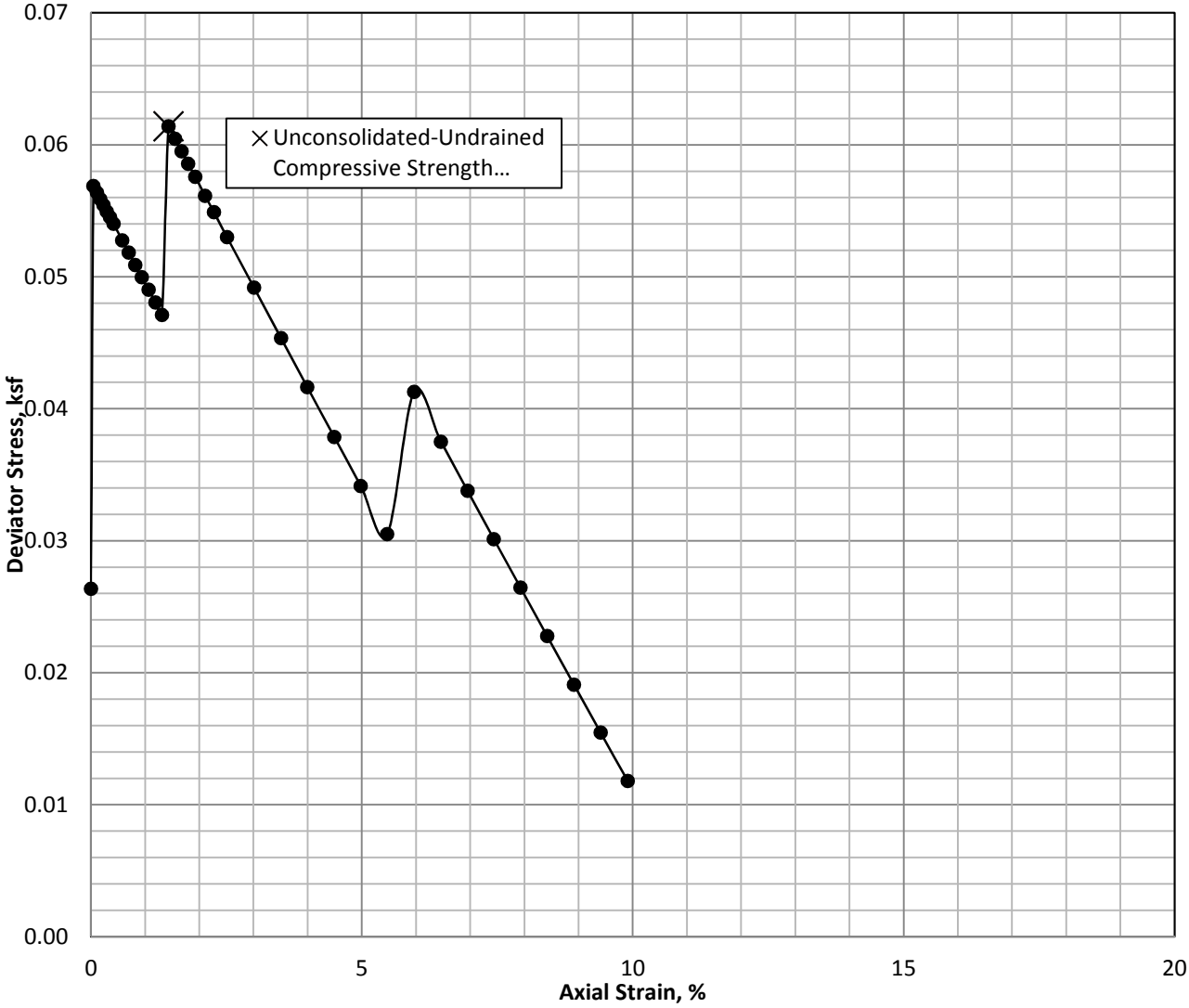
Specimen Information							Test Summary			
Water Content (%)	Wet Unit Weight (pcf)	Dry Unit Weight (pcf)	Atterberg Limits LL	Atterberg Limits PL	Initial Length (in)	Initial Dia. (in)	σ_3 (ksf)	$(\sigma_1 - \sigma_3)_{max}$ (ksf)	ε_f %	Strain Rate (%/min)
30.4	119.9	91.9	36	16	5.59	2.88	1.7	0.61	15.0	1.0
Description:	Gray Lean CLAY						Tested by: TV		Reviewed by: EM	

Project No.: 19998709	Project Name: **Rahway Arch**	**Unconsolidated-Undrained Triaxial Compression (UU) Test ASTM D 2850**

Boring No.: W-08	Sample No.: U-1	Sample Depth (ft): 14.0-16.0	Date: 8/20/2012

URS

UNCONSOLIDATED-UNDRAINED COMPRESSIVE STRENGTH TEST, ASTM METHOD D2850



Specimen and Material Property Information

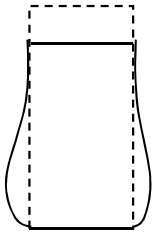
Sample Type: Intact

Description and/or Classification: MH, dark gray SILT

Cell Pressure (ksf)	Water (1) Content (%)	Wet Unit Weight (pcf)	Dry Unit (1) Weight (pcf)	Void Ratio (-)	Saturation(2) (%)	Length (inch)	Diameter (inch)	L/D (-)	LL/ PL (-)	PI (-)	Specific (2) Gravity (-)
0 (Initial)	115.8	93.2	43.2	3.77	101.4	4.000	1.953	2.0	NP		3.30
1.0	115.8	93.2	43.2	3.77	101.4	4.000	1.953	2.0	64		

Failure Summary

U-U Compressive Strength (ksf)	U-U Shear Strength, s_u (ksf)	Strain to to Peak (%)	Strain Rate (%/min)
0.06	0.03	1.4	0.74



FAILURE SKETCH

Remarks and Notes:

(1) Water Content determined after shear from partial specimen.

(2) Assumed specific gravity

Tested by: DT Reviewed by: GET

Test Date: 9/21/2012 Review Date: 10/9/2012

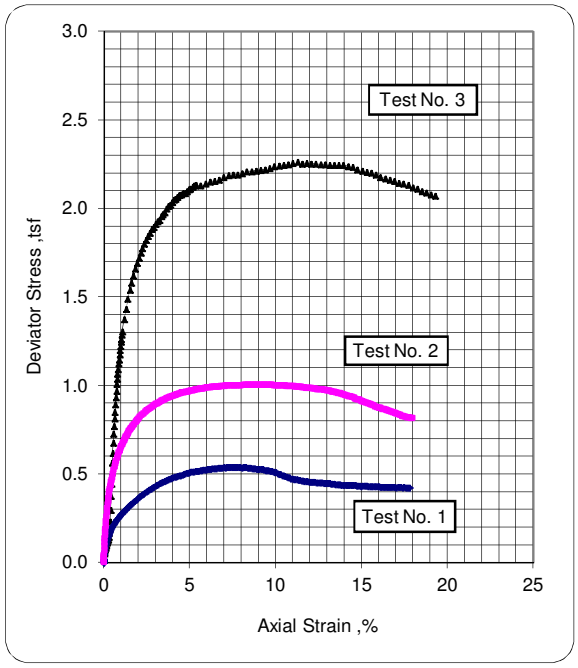
URS Corporation **Project # 19998709**	**Rahway Arch Site** **Carteret, New Jersey**	**UNCONSOLIDATED-UNDRAINED COMPRESSION TEST**
TerraSense, LLC **Project # T19998709**		**Sample: Composite**

URS

ASTMD 4767 Isotropically Consolidated Undrained Triaxial Test Series(With Pore Pressure Measurements)

Project No.: 19998709 **File No.:** 19998709 CIU-1

Project Name: Rahway Arch **Date:** August 22, 2012

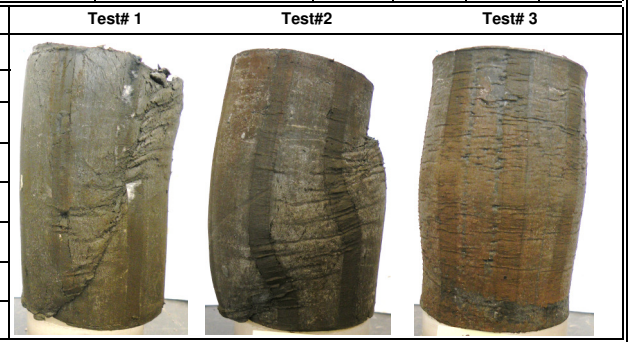


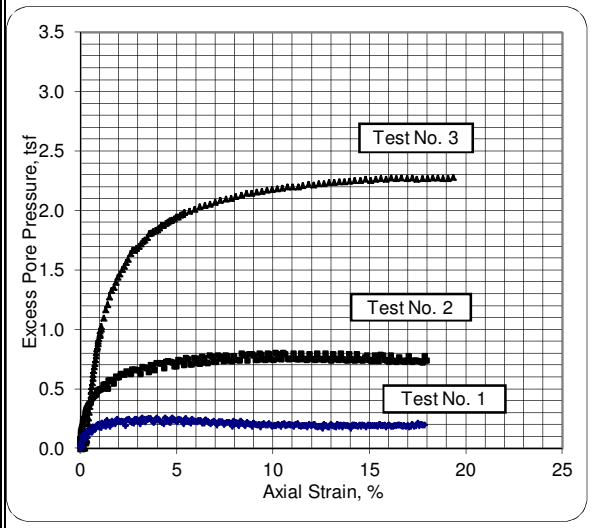
Test Sample Summary

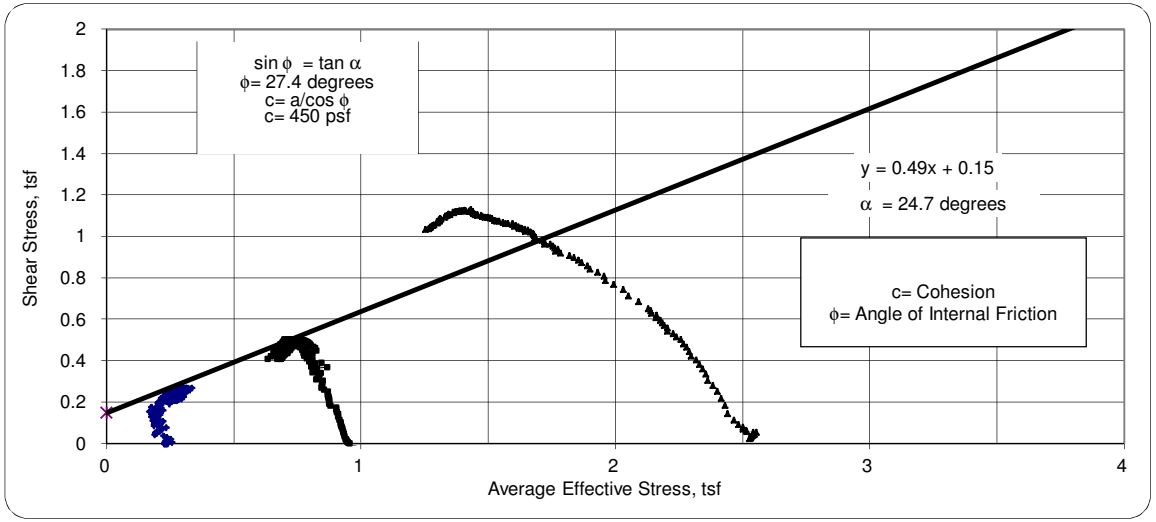
Test No.	Boring No.	Sample No./Depth	Water Content, % Initial	Water Content, % Final	Dry Density, pcf Initial	Dry Density, pcf Final	Degree of Saturation, % Initial	Degree of Saturation, % Final	B Factor,%	Void Ratio Initial	Void Ratio Final	$\bar{\sigma}_c$ tsf
1	BD-03	T-1/23-25	80.9	80.2	51.4	52.2	98.7	100.2	100.0	2.075	2.026	0.25
2	BD-03	T-1/23-25	75.4	67.7	53.9	58.3	98.9	100.3	100.0	1.928	1.708	1.00
3	BD-03	T-1/23-25	59.0	57.7	51.4	64.6	97.3	101.0	100.0	2.072	1.446	2.50
Specific Gravity=			2.53	Measured			Liquid Limit, %		105			
Stain Rate, %/hr.			1.0				Plastic Limit, %		45			
Note: Atterberg Limits were conducted on Test No.1 only.							Liquidity Index		0.60	0.51	0.23	

Test Series Summary

Test No.	Max. Deviator Stress, tsf	Value at Maximum Shear Stress: Axial Strain, %	Obliquity	A- Factor
1	0.54	7.3	23.602	0.420
2	1.00	8.9	5.801	0.787
3	2.26	11.3	8.577	0.973
4				
5				
6				





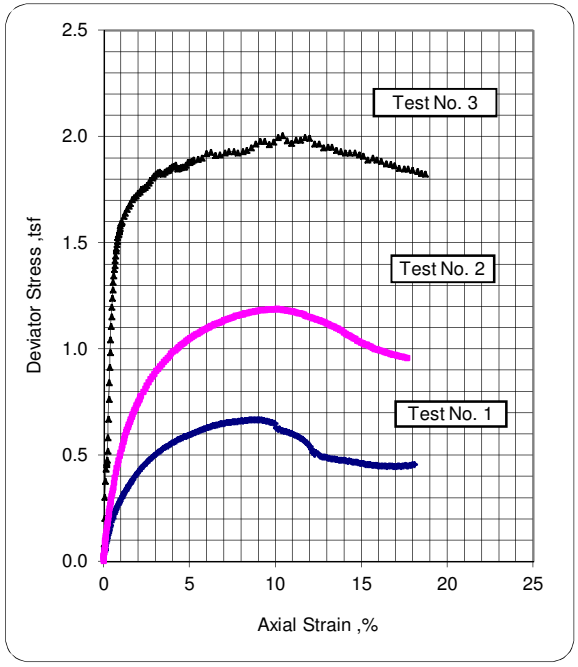


URS

ASTMD 4767 Isotropically Consolidated Undrained Triaxial Test Series(With Pore Pressure Measurements)

Project No.: 19998709 **File No.:** 19998709 CIU-2

Project Name: Rahway Arch **Date:** August 23, 2012



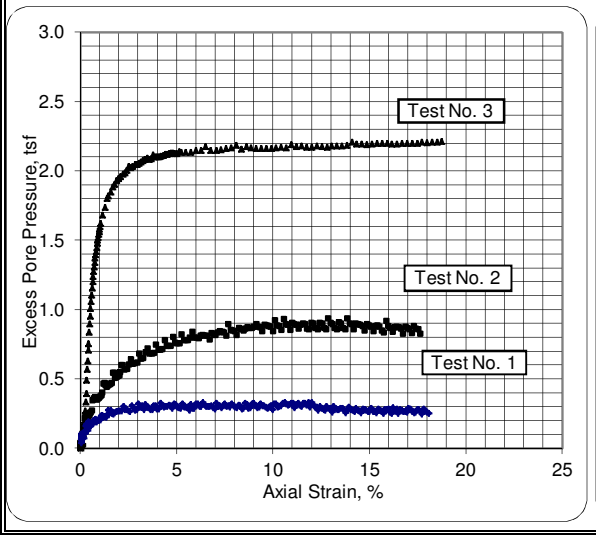
Test Sample Summary

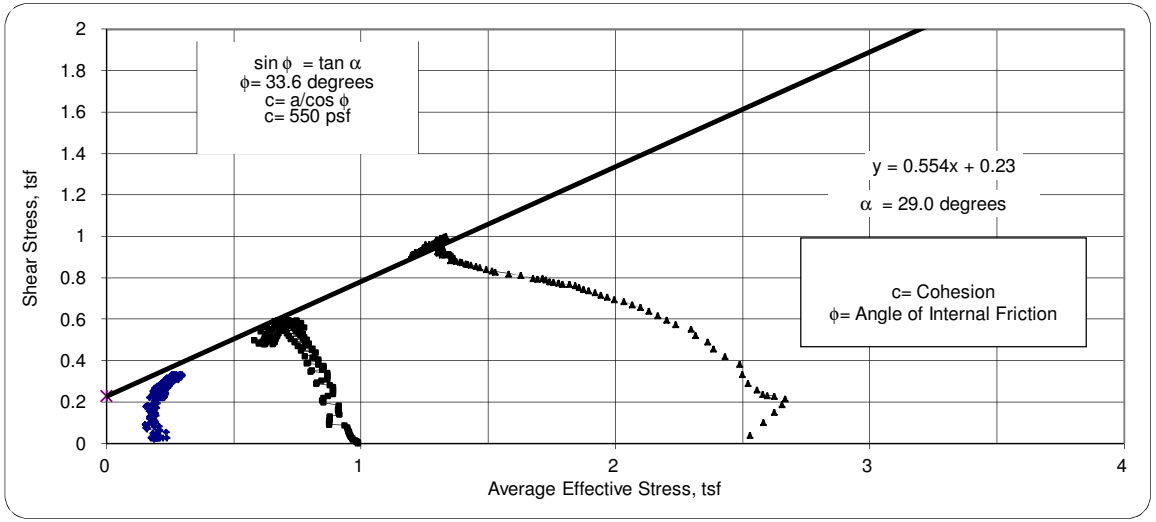
Test No.	Boring No.	Sample No./Depth	Water Content, % Initial	Water Content, % Final	Dry Density, pcf Initial	Dry Density, pcf Final	Degree of Saturation, % Initial	Degree of Saturation, % Final	B Factor,%	Void Ratio Initial	Void Ratio Final	$\bar{\sigma}_c$ tsf
1	BS-09	T-1/12-14	170.9	166.8	28.4	30.4	95.1	100.7	100.0	4.530	4.175	0.25
2	BS-09	T-1/12-14	201.2	154.2	24.3	33.2	92.4	103.8	100.0	5.484	3.743	1.00
3	BS-09	T-1/12-14	59.0	20.8	92.6	105.2	100.2	106.0	100.0	0.698	0.495	2.50
Specific Gravity=			2.52	Measured			Liquid Limit, %		241			
Stain Rate, %/hr.			1.0				Plastic Limit, %		113			
Note: Atterberg Limits were conducted on Test No.1 only.							Liquidity Index		0.45	0.69	-0.42	

Test Series Summary

Test No.	Max. Deviator Stress, tsf	Value at Maximum Shear Stress: Axial Strain, %	Obliquity	A- Factor
1	0.67	8.6	-8.672	0.477
2	1.19	10.1	16.194	0.776
3	2.01	10.4	7.126	1.083
4				
5				
6				

Test# 1 Test#2 Test# 3





SUMMARY FOR STATIC CIU' TRIAXIAL TESTS SPECIMENS

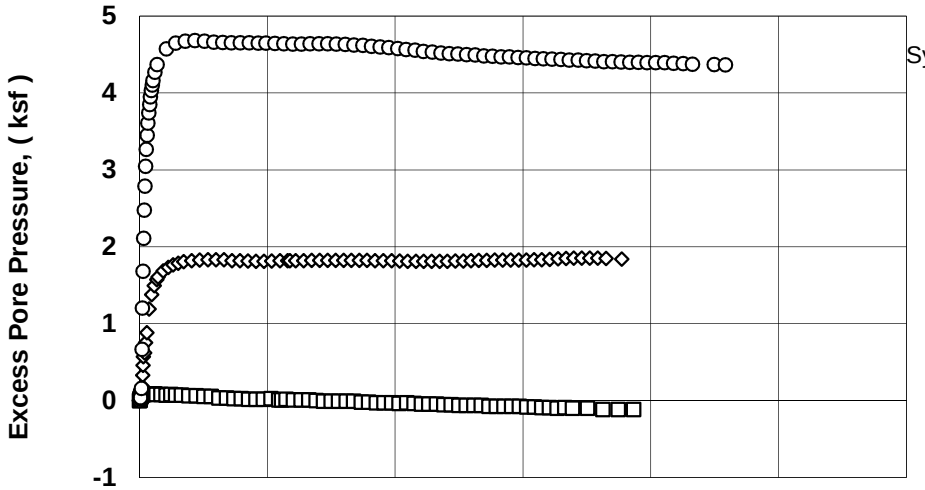
Test No	Boring No	Sample Section No	Depth Elev (ft)	USCS Group Symbol Gs	w_o w_c (%)	$\gamma_{t,o}$ $\gamma_{t,c}$ (pcf)	$\gamma_{d,o}$ $\gamma_{d,c}$ (pcf)	$\sigma'_{c,max}$ OCR (ksf)	$\sigma'_{v,c}$ $K_c = \frac{\sigma'_{v,c}}{\sigma'_{h,c}}$ (ksf)	$\varepsilon_{a,c}$ $\varepsilon_{v,c}$ (%)	B factor (%) ε_{rate} (%/hr)	at Peak Deviator Stress: ε_a (%)	at Peak Obliquity: $\frac{\sigma_1 - \sigma_3}{2}$ (ksf)	$\frac{\sigma'_1 + \sigma'_3}{2}$ (ksf)	σ'_1 / σ'_3	A factor	ϕ' for c'=0
T3303	BS-03R	T-1A	8.35	MH	90.9	96.4	50.5	0.20	0.20	1.1		17.5	1.07	1.37	8.13	-0.046	51.3
				(3.17)	88.5	98.1	52.0	1.0	1.00	3.0	1.5	10.4	0.98	1.21	9.55	-0.014	54.1
T3304	BS-03R	T-1B	8.9	MH	108.1	91.7	44.0	2.00	2.00	5.4	99.2	3.0	1.32	1.49	16.60	0.695	62.4
				(3.17)	94.7	96.3	49.5	1.0	1.00	11.0	1.6	3.0	1.32	1.49	16.60	0.695	62.4
T3305	BS-03R	T-1C	9.45	MH	106.7	94.1	45.5	5.00	5.00	14.5	98.1	2.5	3.34	3.66	21.63	0.700	65.7
				(3.17)	79.4	101.0	56.3	1.0	1.00	19.1	1.0	2.2	3.34	3.65	22.19	0.701	66.0

Test No	Description of Material Tested and Remarks
T3303	MH, gray silt
T3304	MH, gray silt
T3305	MH, gray silt

Strength Envelope Summary						
Test Series	Failure Criteria	ϕ' (deg)	c' (ksf)	α' (deg)	a' (ksf)	Correlation Coefficient
1	1	63.4	0.000	41.8	0.000	--
	2	64.3	0.000	42.0	0.000	--

Failure Criteria: 1 - Peak Deviator Stress
2 - Peak Obliquity

Project No. T19998709	URS Corporation #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements BS-03R T-1 SUMMARY	September 2012
	TerraSense, LLC		

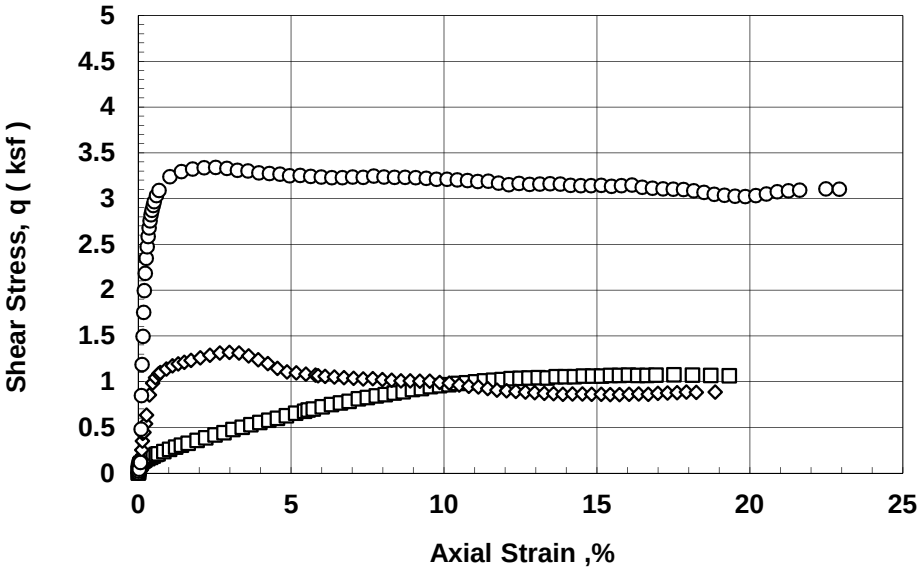


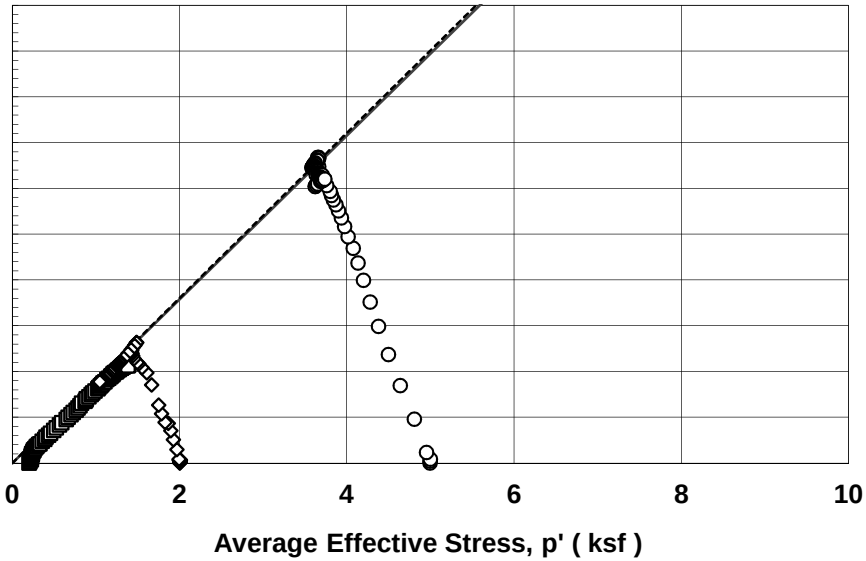
LEGEND AND SUMMARY INFORMATION

Symbol	Test	Boring	Sample	Depth (ft)	w_o (%)	γ_{to} (pcf)	σ'_c (ksf)
□	T3303	BS-03R	T-1A	8.4	90.9	96.4	0.20
◊	T3304	BS-03R	T-1B	8.9	108.1	91.7	2.00
○	T3305	BS-03R	T-1C	9.5	106.7	94.1	5.00

SERIES SUMMARY

Notation	Failure Criteria	c' (ksf)	Φ' (degrees)
———	Peak Deviator Stress	0.00	63.4
·····	Peak Obliquity	0.00	64.3

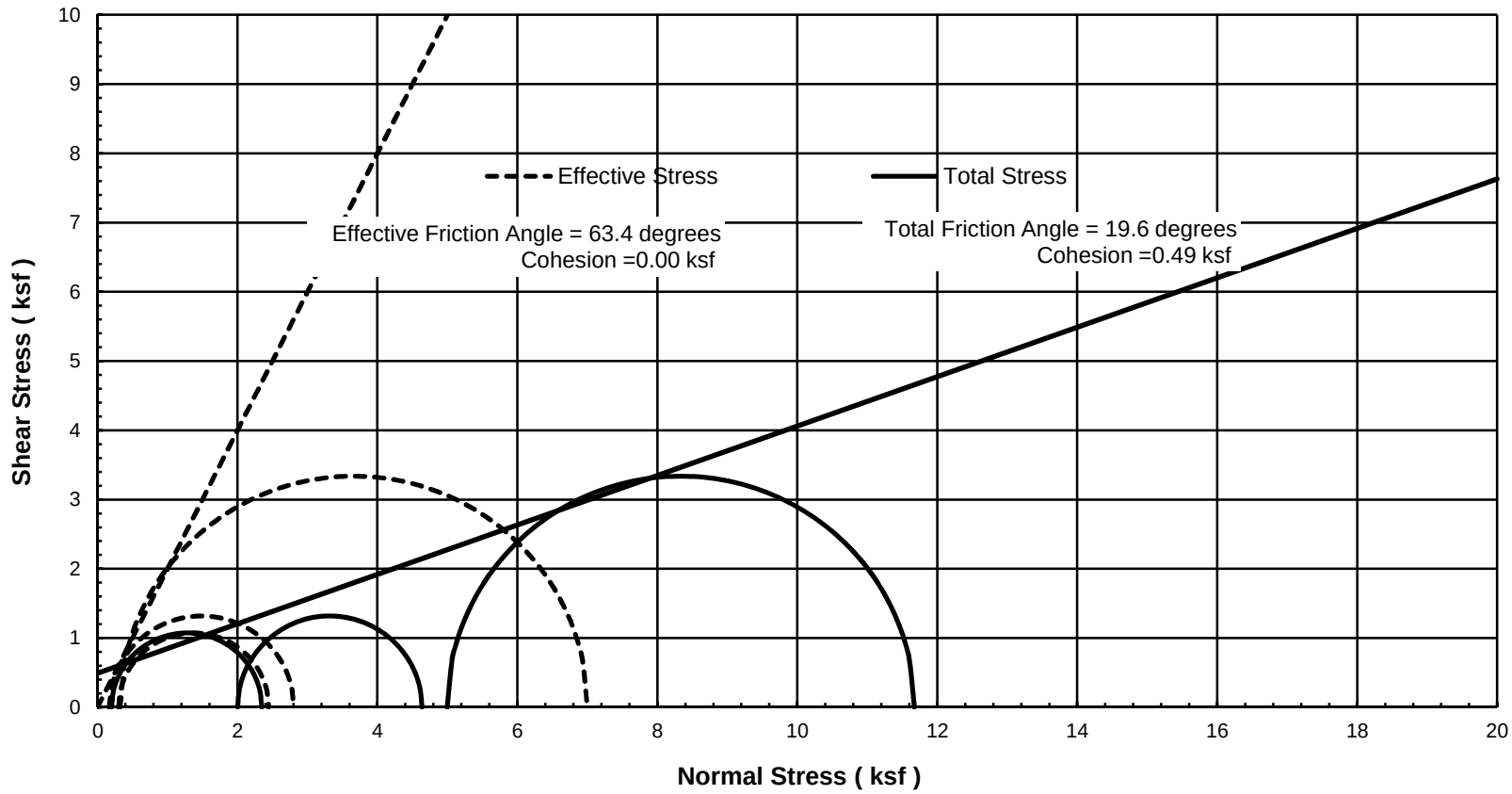




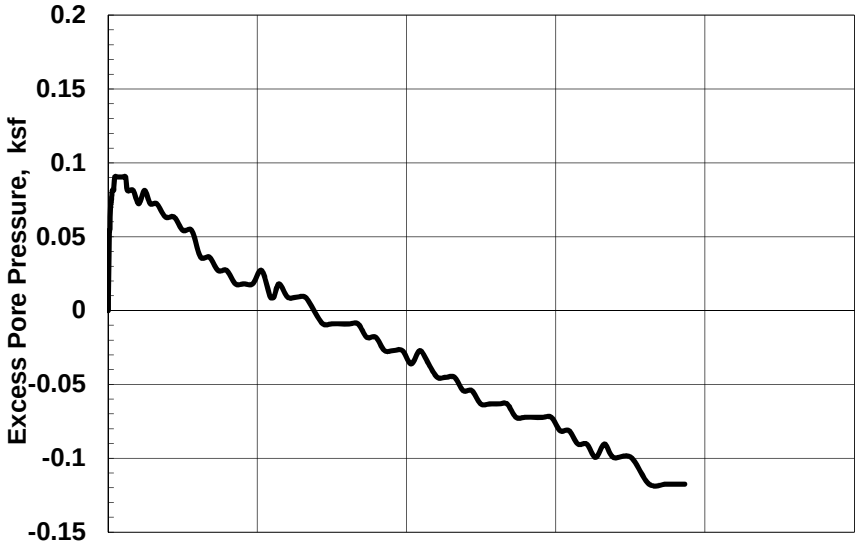
Project No. T19998709	**URS Corporation #19998709 Rahway Arch Site**	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements BS-03R T-1 SUMMARY	Figure 1
Prepared by: CMJ Checked by: G. Thomas	**TerraSense, LLC**		September 2012

Analysis File: Cu'sum3v4

10/9/2012 Test: Ciusum1.xlsx



Project No. T19998709	URS Corporation #19998709 Rahway Arch Site	Mohr Circles of Total and Effective Stresses at Peak CIU' Triaxial Test	Figure 2
TerraSense, LLC		BS-03R T-1 SUMMARY	September 2012



SAMPLE INFORMATION

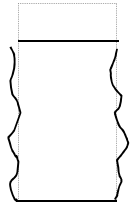
Boring: BS-03R Sample: T-1A Depth: 8.35ft
Type: Intact tube sample
Description: MH, gray silt

SPECIMEN INFORMATION (Initial)

Height: 5.98 inch Diameter: 2.81 inch Area: 6.22 in²
Water Content: 90.9 % Total Unit Weight: 96.4 pcf

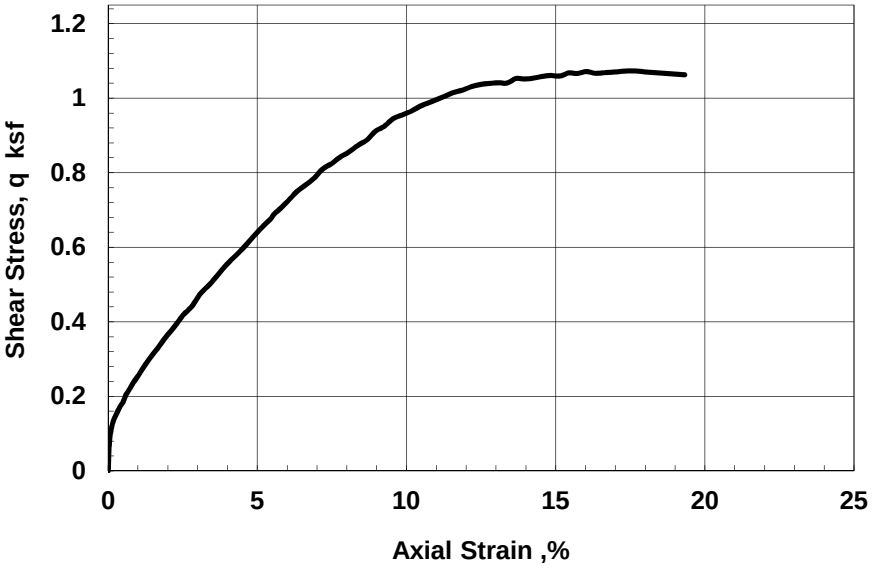
TEST SUMMARY

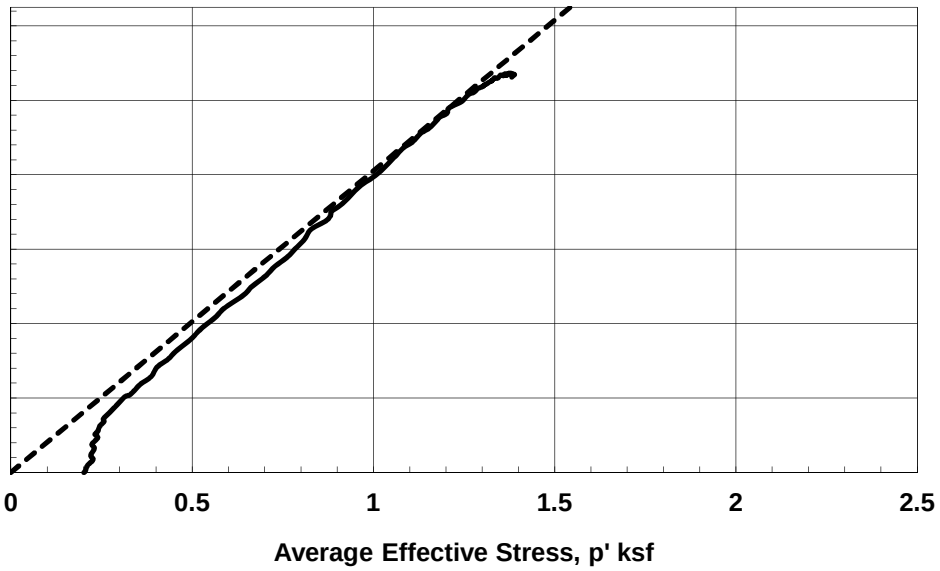
Consolidation Stresses: 0.20 ksf vertical, 0.20 ksf lateral
Water Content: 88.5 % Total Unit Weight: 98.1 pcf
B Coefficient: Strain Rate: 0.024 %/min
Peak Shear Strength: 1.07 ksf @ 17.5 % Strain
Peak Effective Friction Angle: 54.1°



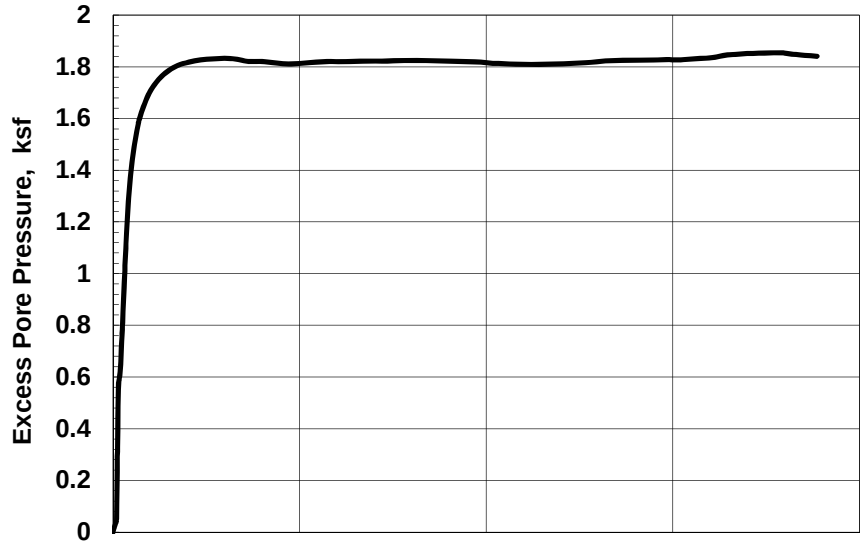
Failure Sketch

REMARKS:





Test by: DT	Project No. T19998709	URS #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements
Checked by: GET	**TerraSense, LLC**		Boring: BS-03R Sample: T-1A
			October-12



SAMPLE INFORMATION

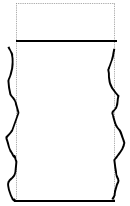
Boring: BS-03R Sample: T-1B Depth: 8.9ft
Type: Intact tube sample
Description: MH, gray silt

SPECIMEN INFORMATION (Initial)

Height: 5.95 inch Diameter: 2.83 inch Area: 6.28 in²
Water Content: 108.1 % Total Unit Weight: 91.7 pcf

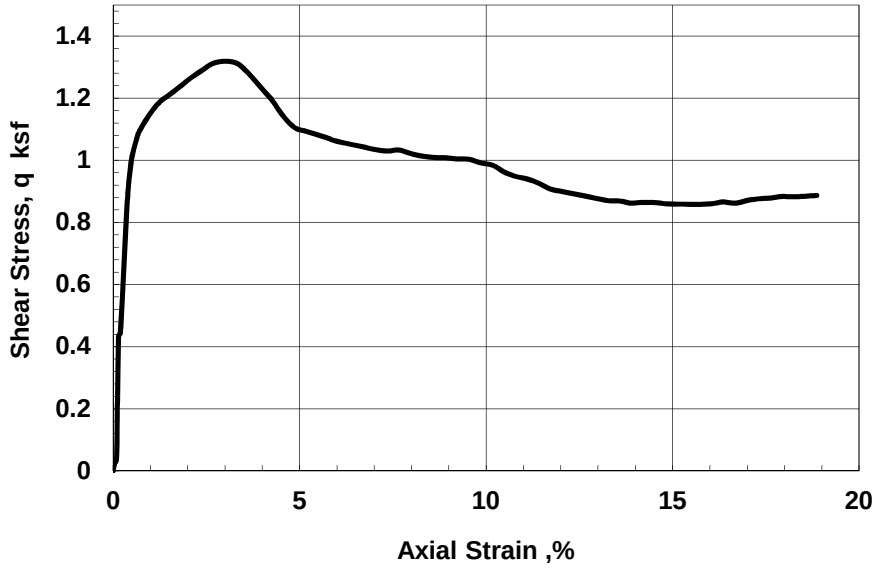
TEST SUMMARY

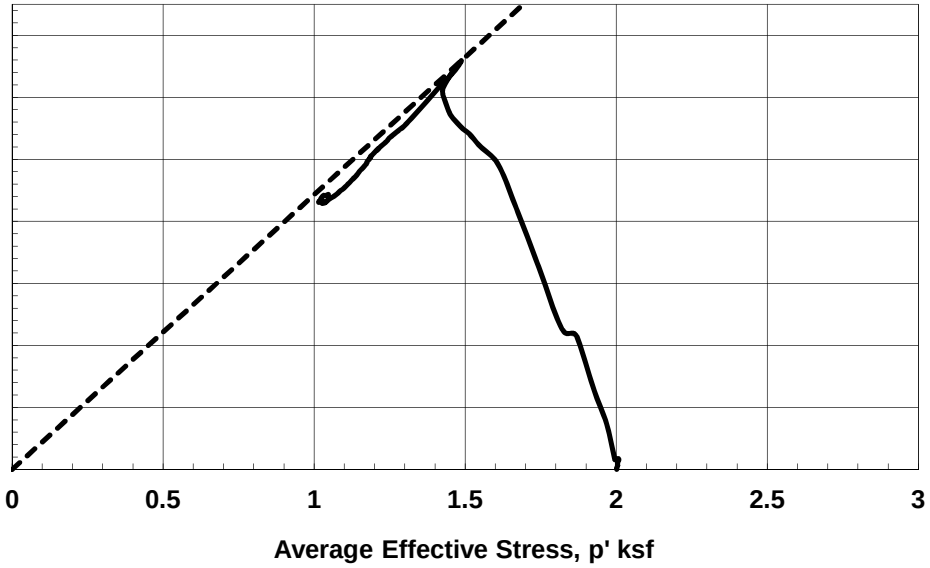
Consolidation Stresses: 2.00 ksf vertical, 2.00 ksf lateral
Water Content: 94.7 % Total Unit Weight: 96.3 pcf
B Coefficient: 99.2 Strain Rate: 0.026 %/min
Peak Shear Strength: 1.32 ksf @ 3.0 % Strain
Peak Effective Friction Angle: 62.4°



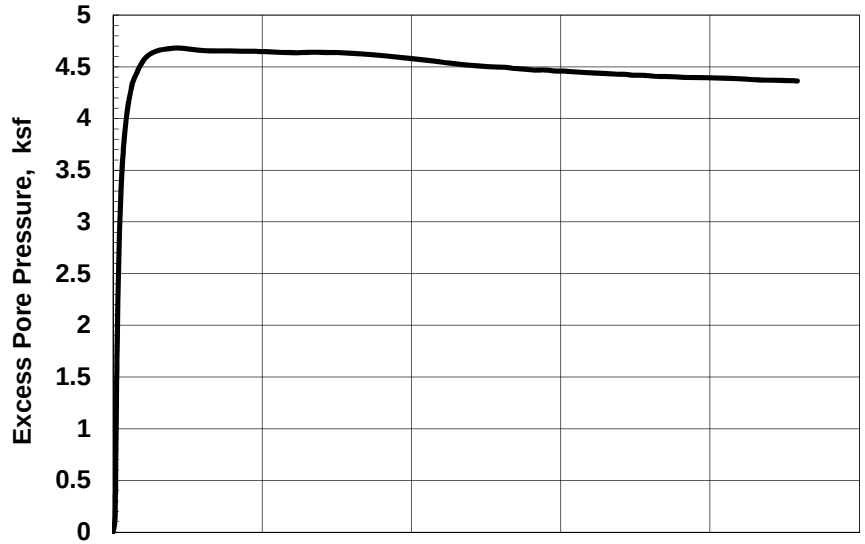
Failure Sketch

REMARKS:





Test by: DT	Project No. T19998709	URS #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements
Checked by: GET	**TerraSense, LLC**		Boring: BS-03R Sample: T-1B
			October-12



SAMPLE INFORMATION

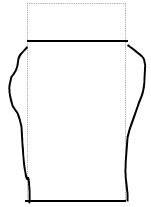
Boring: BS-03R Sample: T-1C Depth: 9.45ft
Type: Intact tube sample
Description: MH, gray silt

SPECIMEN INFORMATION (Initial)

Height: 5.99 inch Diameter: 2.84 inch Area: 6.32 in²
Water Content: 106.7 % Total Unit Weight: 94.1 pcf

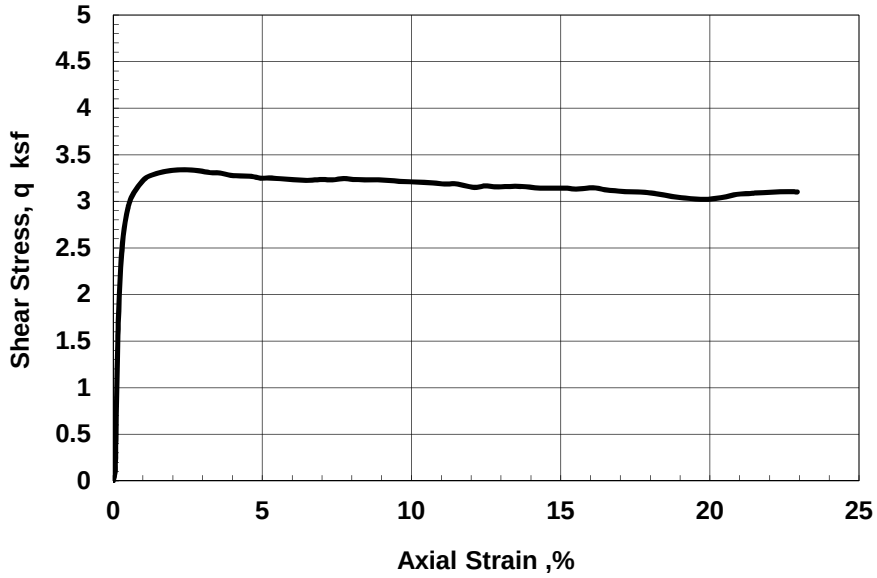
TEST SUMMARY

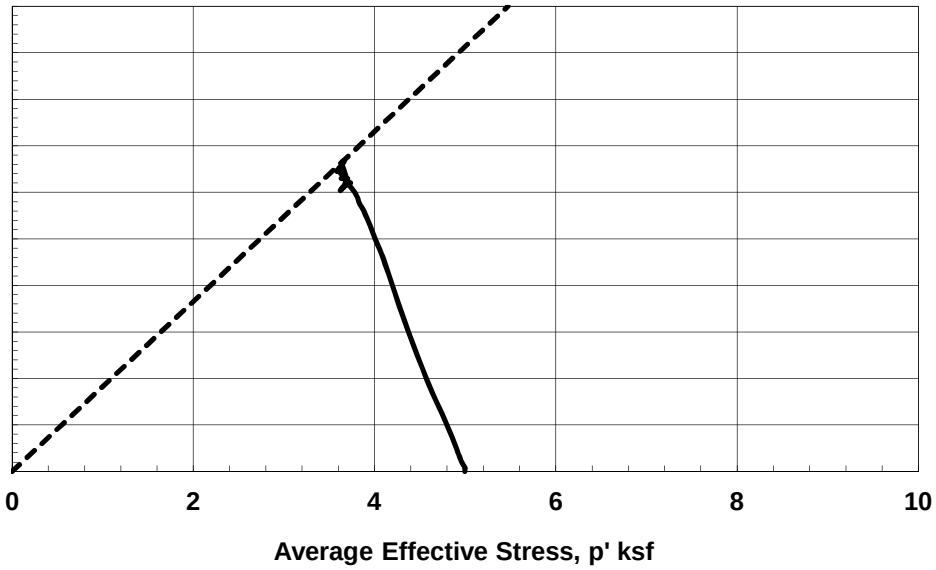
Consolidation Stresses: 5.00 ksf vertical, 5.00 ksf lateral
Water Content: 79.4 % Total Unit Weight: 101.0 pcf
B Coefficient: 98.1 Strain Rate: 0.017 %/min
Peak Shear Strength: 3.34 ksf @ 2.5 % Strain
Peak Effective Friction Angle: 66.0°



Failure Sketch

REMARKS:





Test by: DT	Project No. T19998709	URS #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements
Checked by: GET	**TerraSense, LLC**		Boring: BS-03R Sample: T-1C
			October-12

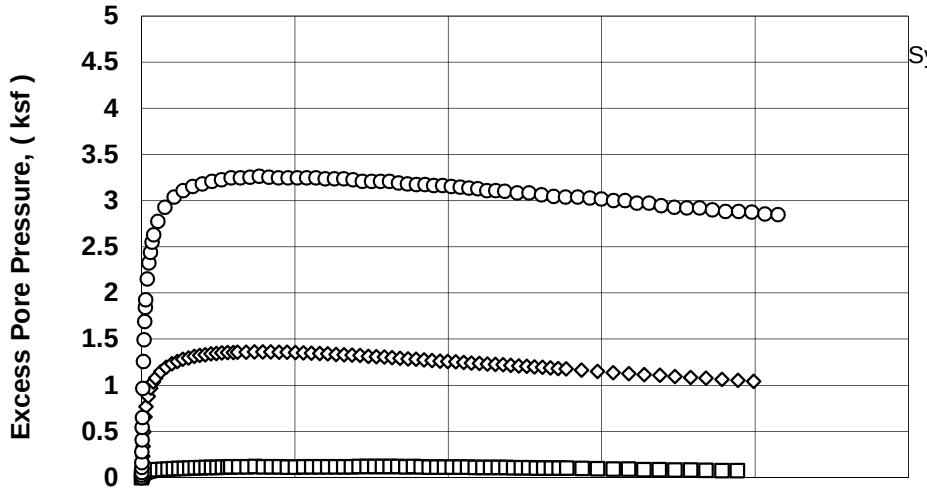
SUMMARY FOR STATIC CIU' TRIAXIAL TESTS SPECIMENS

Test No	Boring No	Sample Section No	USCS Group Symbol	w_o	$\gamma_{t,o}$	$\gamma_{d,o}$	$\sigma'_{c,max}$ (ksf)	$\sigma'_{v,c}$ (ksf)	$\varepsilon_{a,c}$	B factor (%)	at Peak Deviator Stress					
											at Peak Obliquity					
			Gs	w_c (%)	$\gamma_{t,c}$ (pcf)	$\gamma_{d,c}$ (pcf)	OCR	$K_c = \frac{\sigma'_{v,c}}{\sigma'_{h,c}}$	$\varepsilon_{v,c}$ (%)	ε_{rate} (%/hr)	ε_a (%)	$\frac{\sigma_1 - \sigma_3}{2}$ (ksf)	$\frac{\sigma'_1 + \sigma'_3}{2}$ (ksf)	σ'_1 / σ'_3	A factor	ϕ' for c'=0
T3315	Sludge Composite		MH	100.8	91.5	45.6	0.20	0.20	0.2	99.3	18.9	0.30	0.42	5.87	0.126	45.1
			(3.10)	72.9	102.7	59.4	1.0	1.00	23.2	1.3	18.4	0.30	0.42	5.96	0.131	45.5
T3316	Sludge Composite		MH	97.9	92.5	46.7	2.00	2.00	2.4	99.4	20.0	2.12	3.08	5.41	0.246	43.5
			(3.10)	63.1	106.8	65.5	1.0	1.00	28.6	1.3	20.0	2.12	3.08	5.41	0.246	43.5
T3317	Sludge Composite		MH	94.3	92.3	47.5	5.00	5.00	4.9	97.9	20.7	5.06	7.21	5.71	0.281	44.6
			(3.10)	55.4	110.7	71.2	1.0	1.00	33.3	1.0	20.7	5.06	7.21	5.71	0.281	44.6

Test No	
T3315	MH, gray silt; sludge
T3316	MH, gray silt; sludge
T3317	MH, gray silt; sludge

Strength Envelope Summary						
Test Series	Failure Criteria	ϕ' (deg)	c' (ksf)	α' (deg)	a' (ksf)	Correlation Coefficient
1	1	44.4	0.000	35.0	0.000	--
	2	44.4	0.000	35.0	0.000	--
Failure Criteria:	1 - Peak Deviator Stress 2 - Peak Obliquity					

Project No. T19998709	**URS Corporation #19998709** **Rahway Arch Site**	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements Sludge Composite SUMMARY	October 2012
TerraSense, LLC			

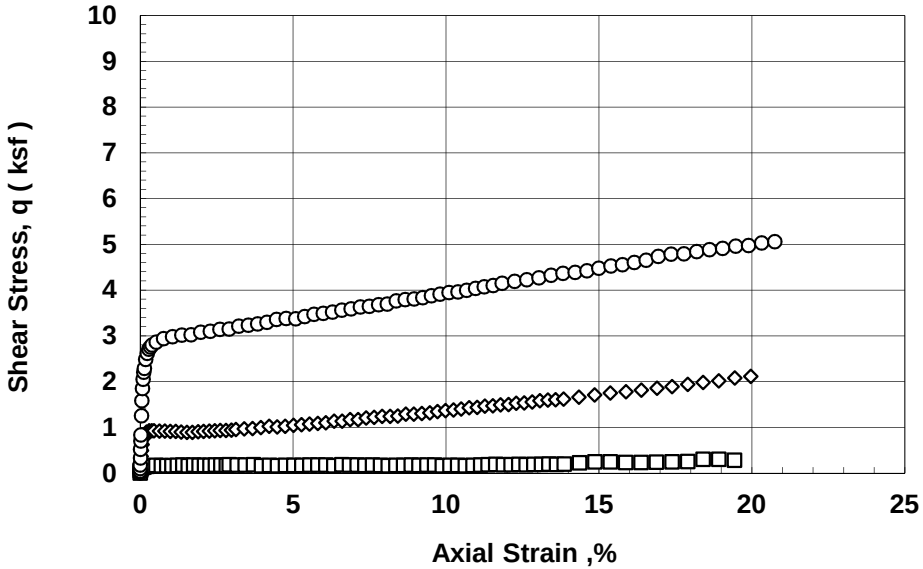


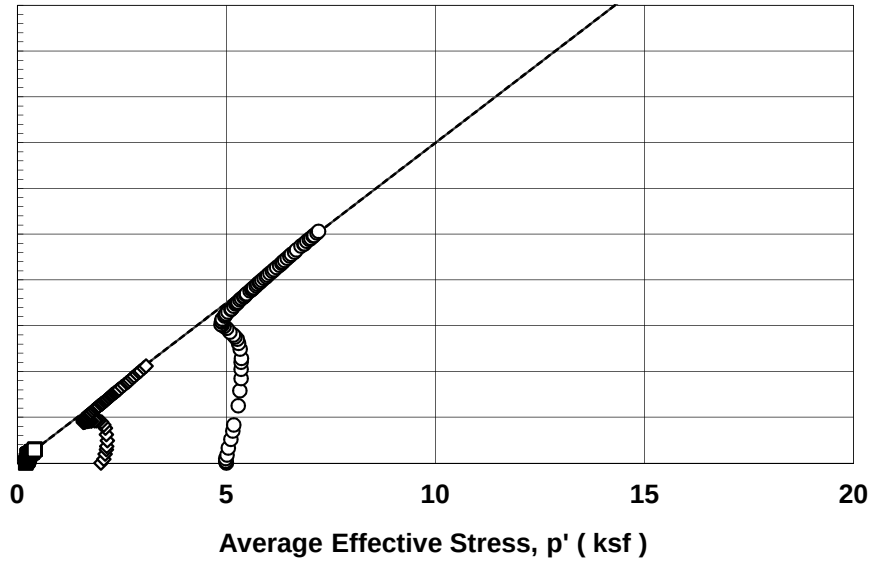
LEGEND AND SUMMARY INFORMATION

Symbol	Test	Boring	Sample	Depth (ft)	w_o (%)	γ_{to} (pcf)	σ'_c (ksf)
□	T3315	Sludge Composite			100.8	91.5	0.20
◊	T3316	Sludge Composite			97.9	92.5	2.00
○	T3317	Sludge Composite			94.3	92.3	5.00

SERIES SUMMARY

Notation	Failure Criteria	c' (ksf)	Φ' (degrees)
———	Peak Deviator Stress	0.00	44.4
·····	Peak Obliquity	0.00	44.4

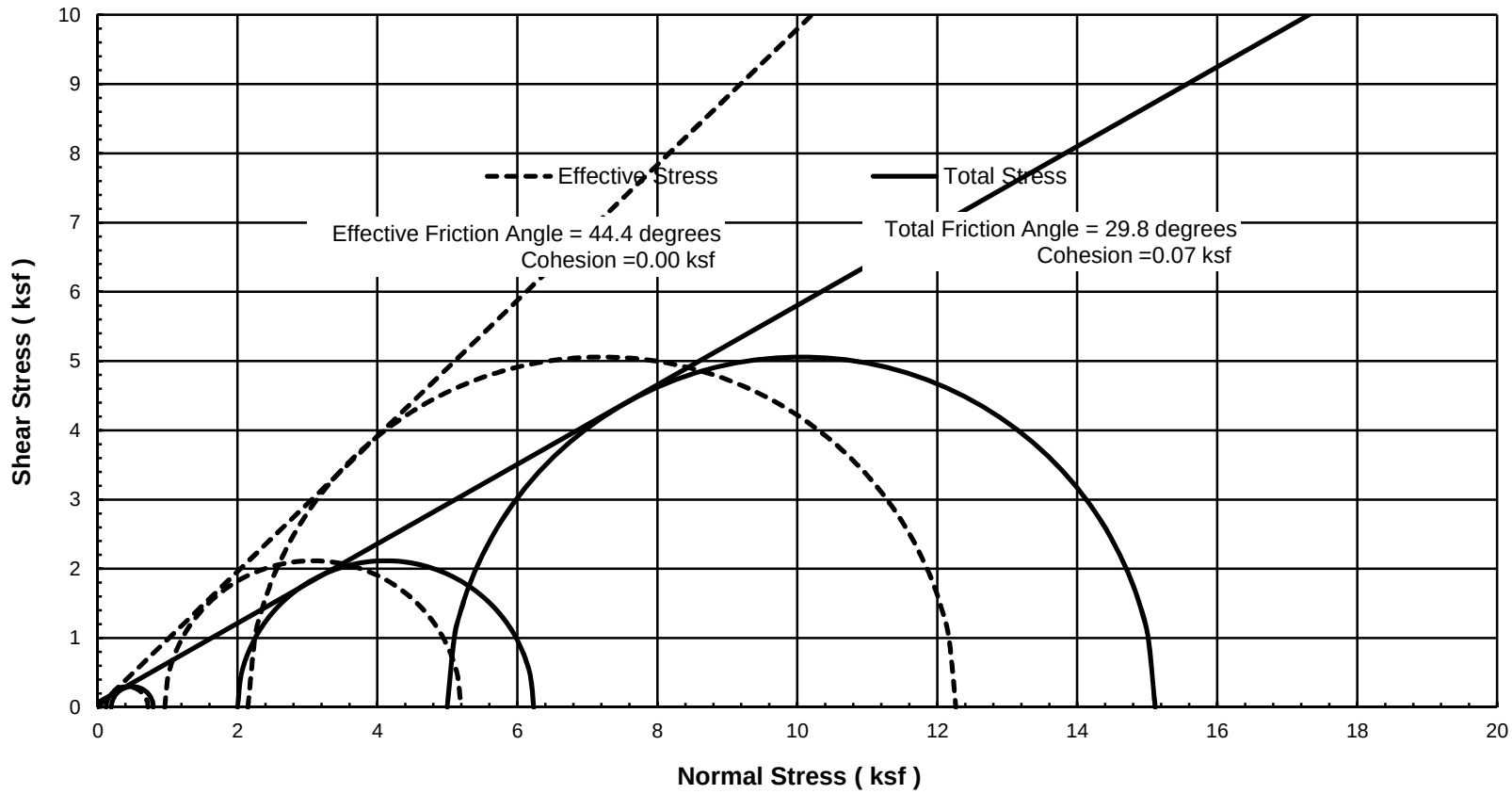




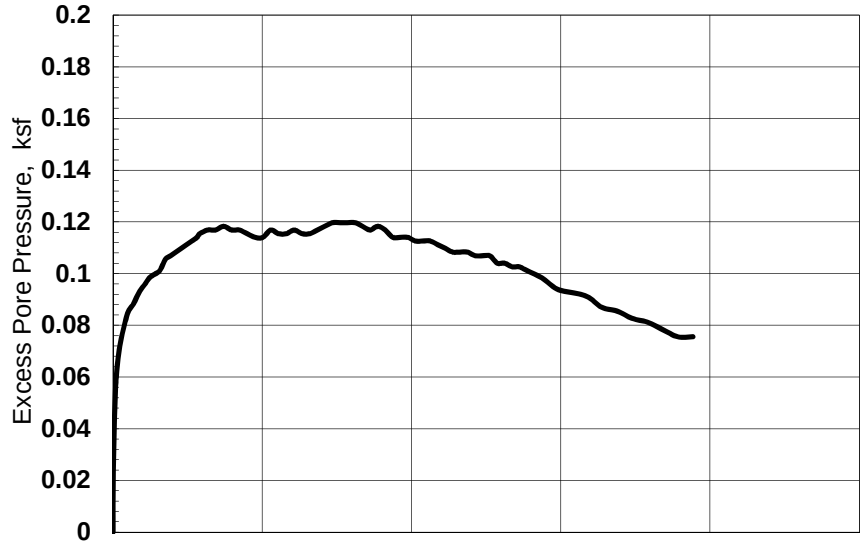
Project No. T19998709	**URS Corporation #19998709 Rahway Arch Site**	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements Sludge Composite SUMMARY	Figure 1
Prepared by: CMJ Checked by: G. Thomas	**TerraSense, LLC**		October 2012

Analysis File: Cu'sum3v4

10/10/2012 Test: Ciusum1b.xlsx



Project No. **T19998709**	**URS Corporation #19998709** **Rahway Arch Site**	**Mohr Circles of Total and Effective Stresses at Peak** **CIU' Triaxial Test**	**Figure** **2**
TerraSense, LLC		**Sludge Composite SUMMARY**	**October 2012**



SAMPLE INFORMATION

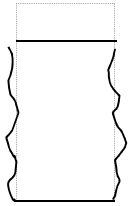
Sample: Sludge Composite
Type: Reconstituted
Description: MH, gray silt; sludge

SPECIMEN INFORMATION (Initial)

Height: 4.01 inch Diameter: 1.96 inch Area: 3.01 in²
Water Content: 100.8 % Total Unit Weight: 91.5 pcf

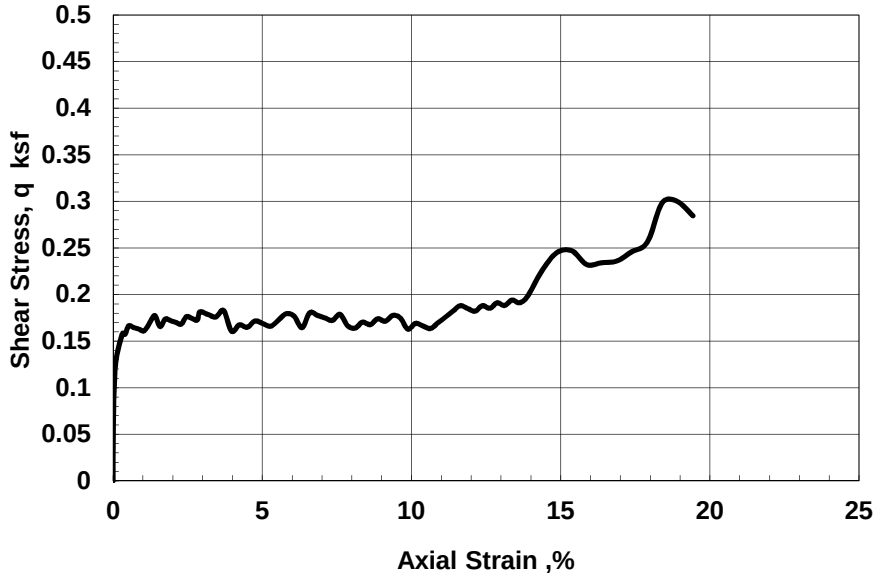
TEST SUMMARY

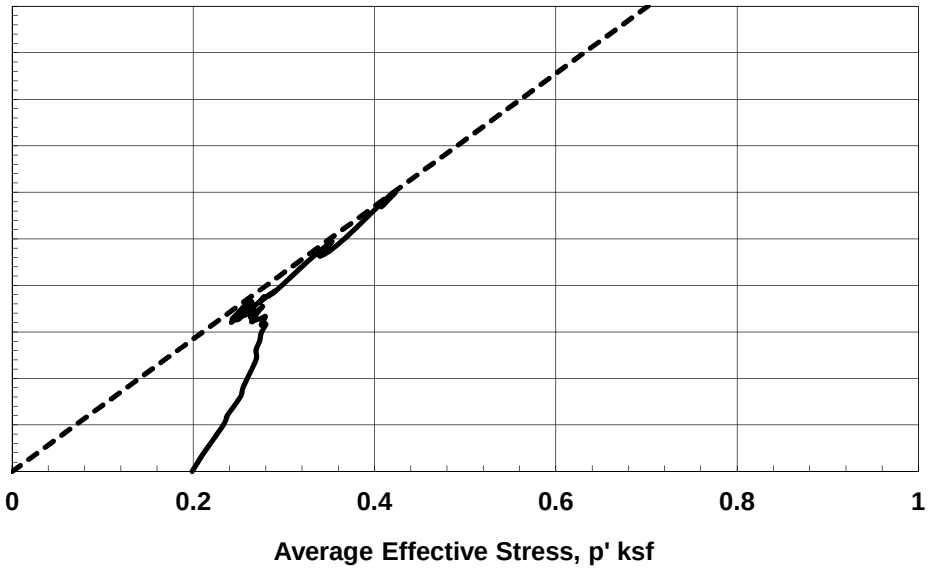
Consolidation Stresses: 0.20 ksf vertical, 0.20 ksf lateral
Water Content: 72.9 % Total Unit Weight: 102.7 pcf
B Coefficient: 99.3 Strain Rate: 0.021 %/min
Peak Shear Strength: 0.30 ksf @ 18.9 % Strain
Peak Effective Friction Angle: 45.5°



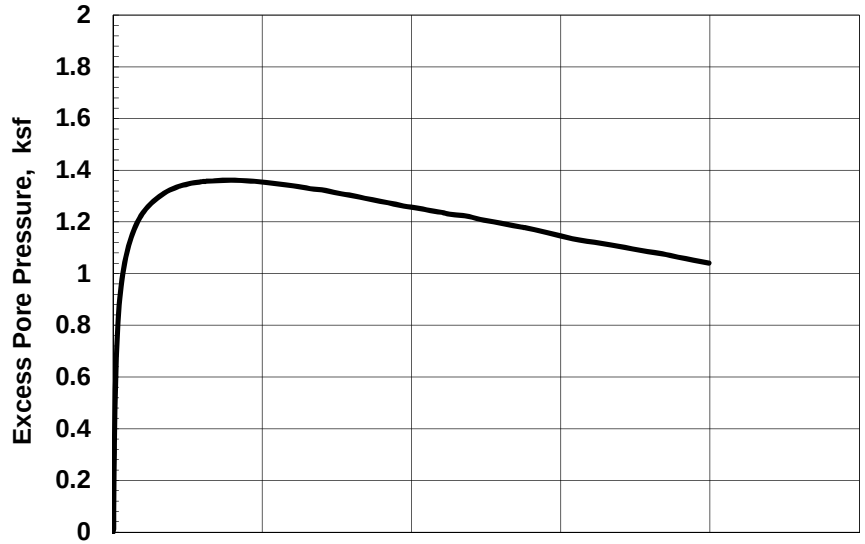
Failure Sketch

REMARKS:





Test by: DT	Project No. T19998709	URS #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements
Checked by: GET	**TerraSense, LLC**		Sample: Sludge Composite
			October-12



SAMPLE INFORMATION

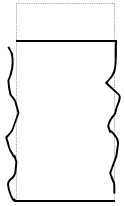
Sample: Sludge Composite
Type: Reconstituted
Description: MH, gray silt; sludge

SPECIMEN INFORMATION (Initial)

Height: 4.00 inch Diameter: 1.95 inch Area: 2.99 in²
Water Content: 97.9 % Total Unit Weight: 92.5 pcf

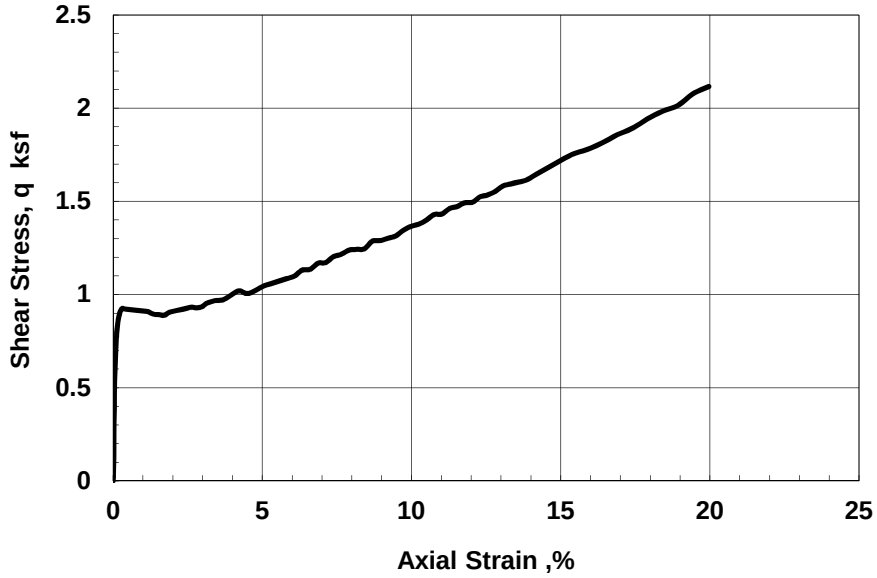
TEST SUMMARY

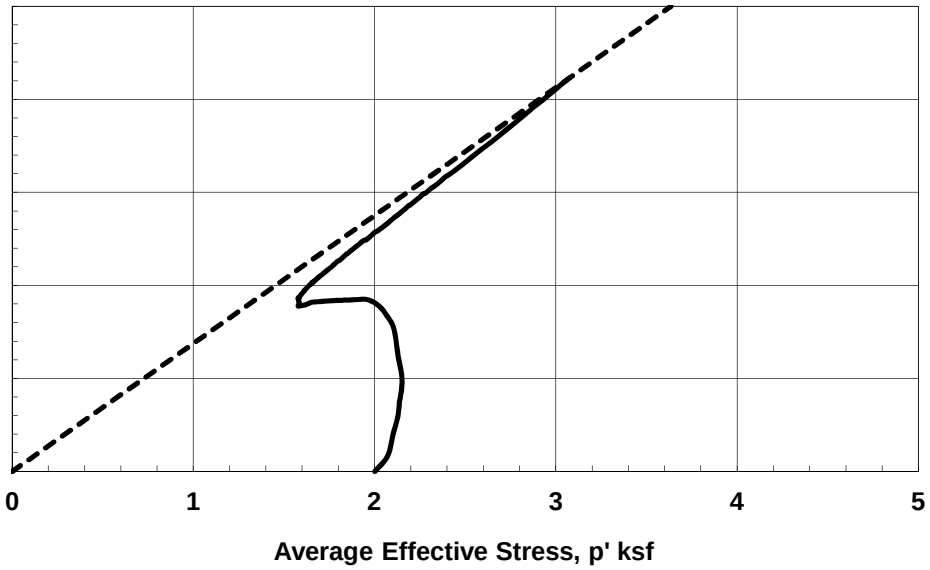
Consolidation Stresses: 2.00 ksf vertical, 2.00 ksf lateral
Water Content: 63.1 % Total Unit Weight: 106.8 pcf
B Coefficient: 99.4 Strain Rate: 0.022 %/min
Peak Shear Strength: 2.12 ksf @ 20.0 % Strain
Peak Effective Friction Angle: 43.5°



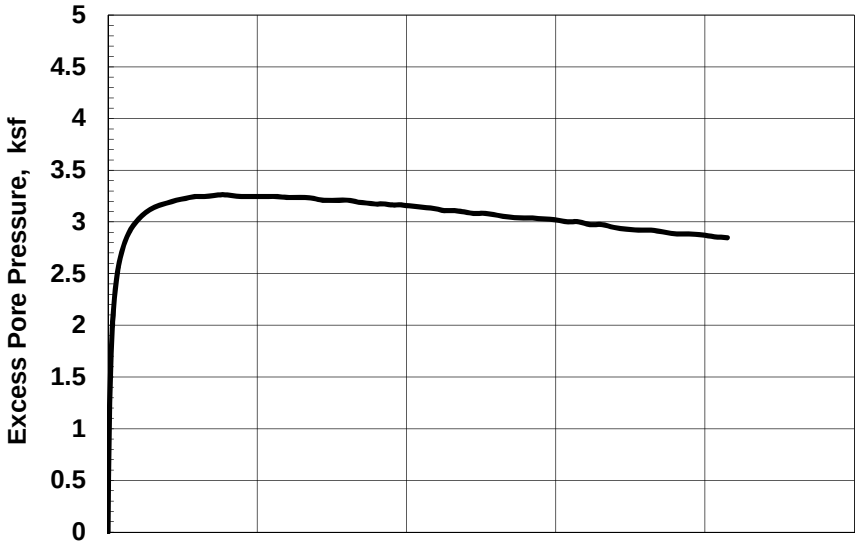
Failure Sketch

REMARKS:





Test by: DT	Project No. T19998709	URS #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements
Checked by: GET	**TerraSense, LLC**		Sample: Sludge Composite
			October-12



SAMPLE INFORMATION

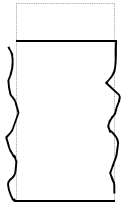
Sample: Sludge Composite
Type: Reconstituted
Description: MH, gray silt; sludge
LL = NP PL = 64 PI = NP

SPECIMEN INFORMATION (Initial)

Height: 4.00 inch Diameter: 1.95 inch Area: 3.00 in²
Water Content: 94.3 % Total Unit Weight: 92.3 pcf

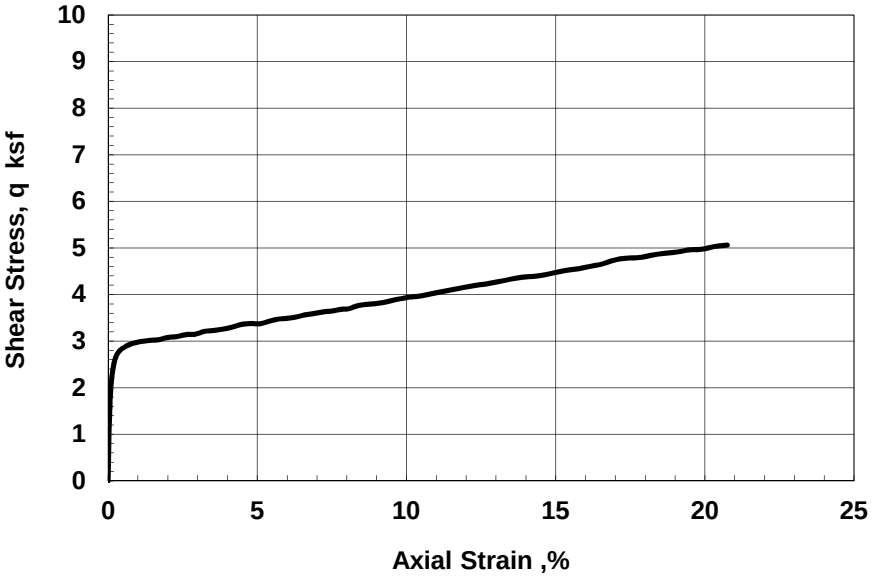
TEST SUMMARY

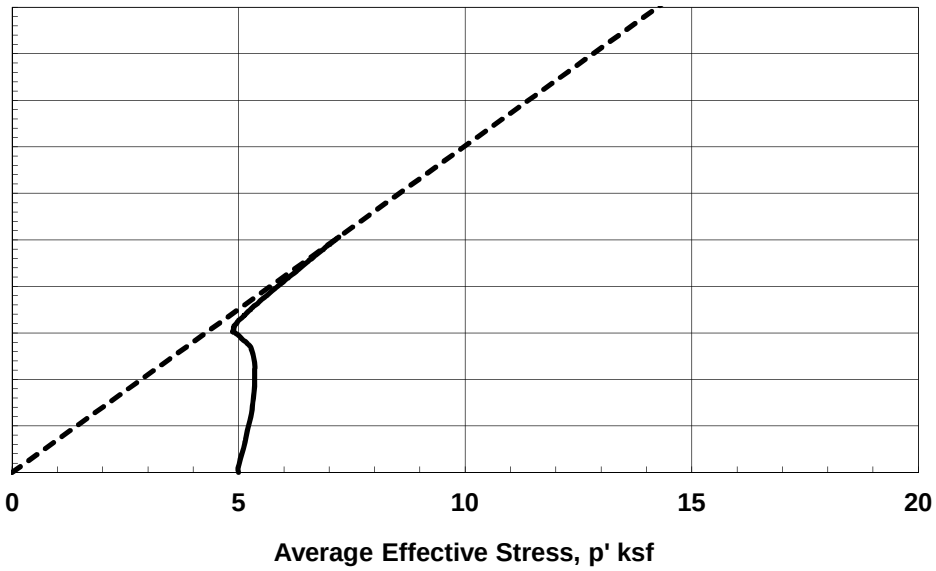
Consolidation Stresses: 5.00 ksf vertical, 5.00 ksf lateral
Water Content: 55.4 % Total Unit Weight: 110.7 pcf
B Coefficient: 97.9 Strain Rate: 0.017 %/min
Peak Shear Strength: 5.06 ksf @ 20.7 % Strain
Peak Effective Friction Angle: 44.6°



Failure Sketch

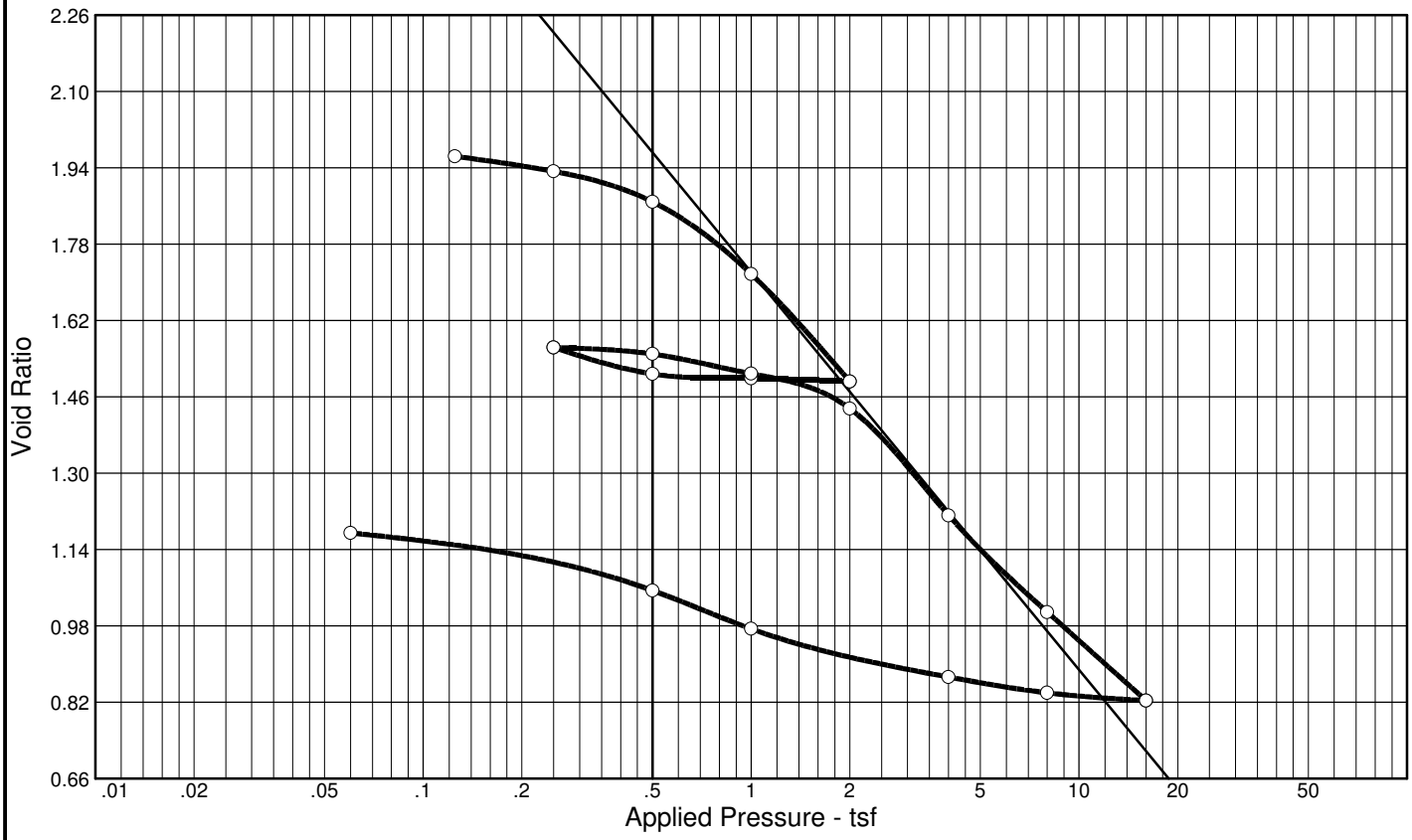
REMARKS:





Test by: DT	Project No. T19998709	URS #19998709 Rahway Arch Site	CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION with Pore Pressure Measurements
Checked by: GET	**TerraSense, LLC**		Sample: Sludge Composite
			October-12

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation											
No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α
2	0.25	0.08	0.002								
3	0.50	0.10	0.005								
4	1.00	0.04	0.013								
5	2.00	0.03	0.007								
9	0.50	0.20	0.000								
10	1.00	0.10	0.003								
11	2.00	0.07	0.004								
12	4.00	0.03	0.021								
13	8.00	0.02	0.014								
14	16.00	0.03	0.023								

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
101.6 %	81.9 %	51.6	98	57	2.48		0.72	0.83	0.13	2.000

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Gray Fat CLAY	CH	

Project No. 19998709 **Client:** Michael Baker Jr., Inc.

Project: Rahway Arch

Source: BD-04R **Sample No.:** T-1 **Elev./Depth:** 21.0-23.0

URS CORPORATION

Fort Washington, PA

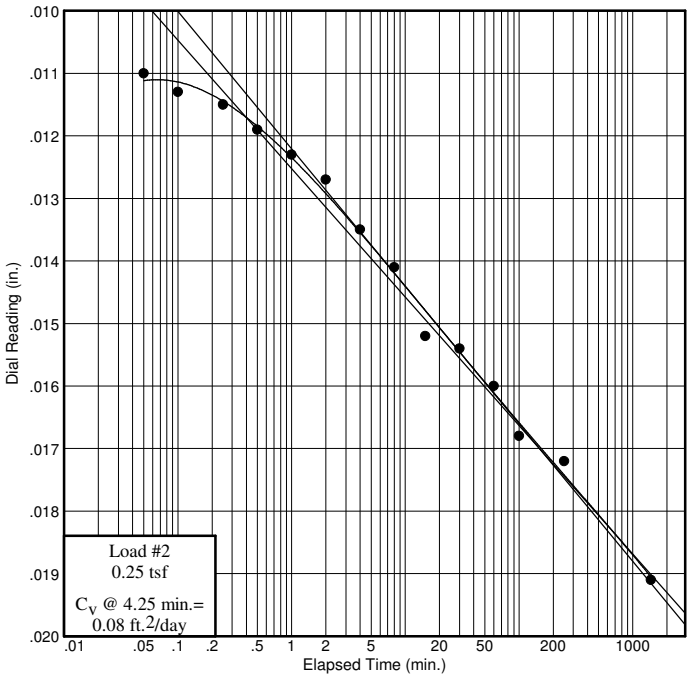
Remarks:

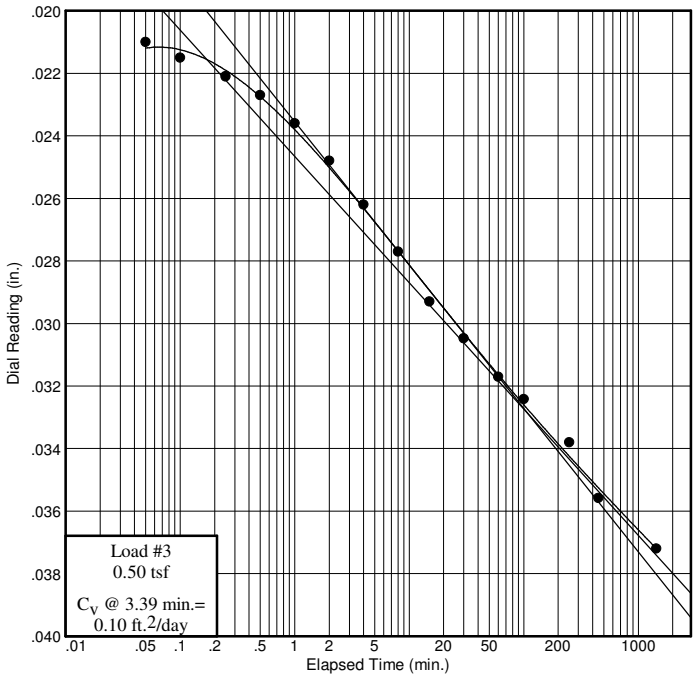
Figure

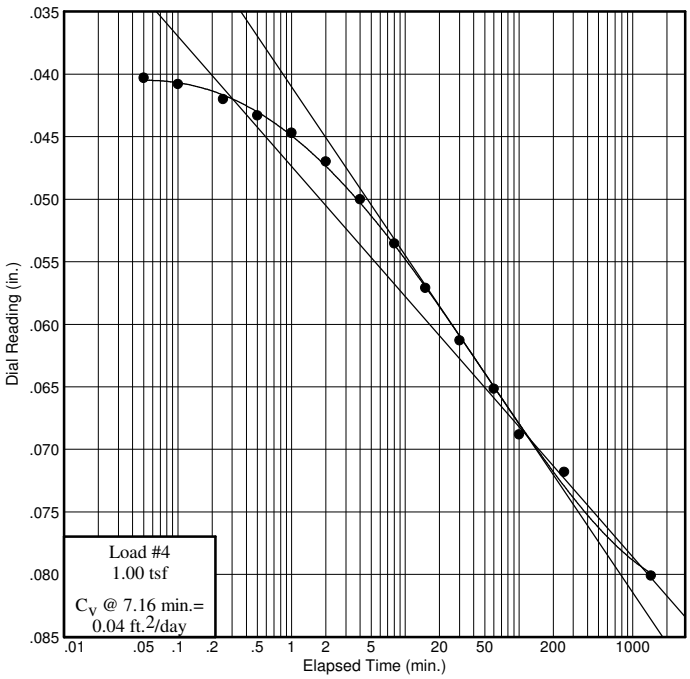
Dial Reading vs. Time

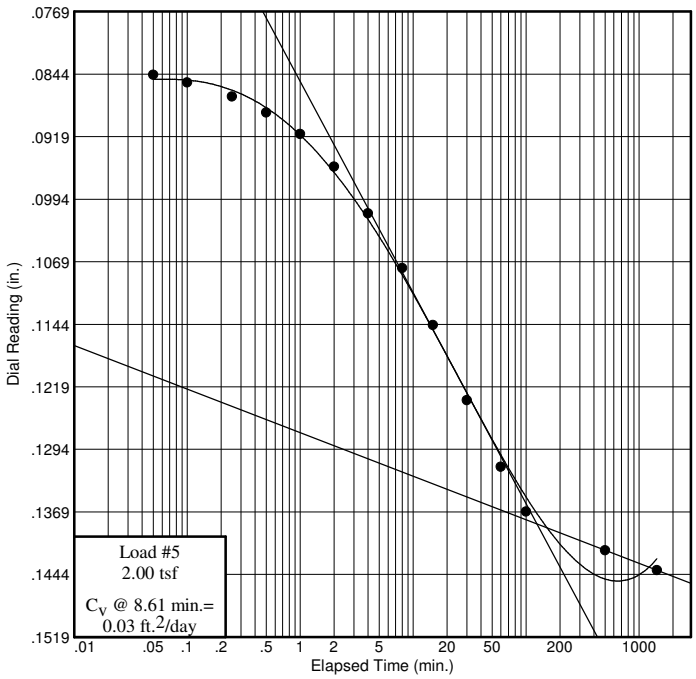
Project No.: 19998709
Project: Rahway Arch

Source: BD-04R Sample No.: T-1 Elev./Depth: 21.0-23.0









URS CORPORATION

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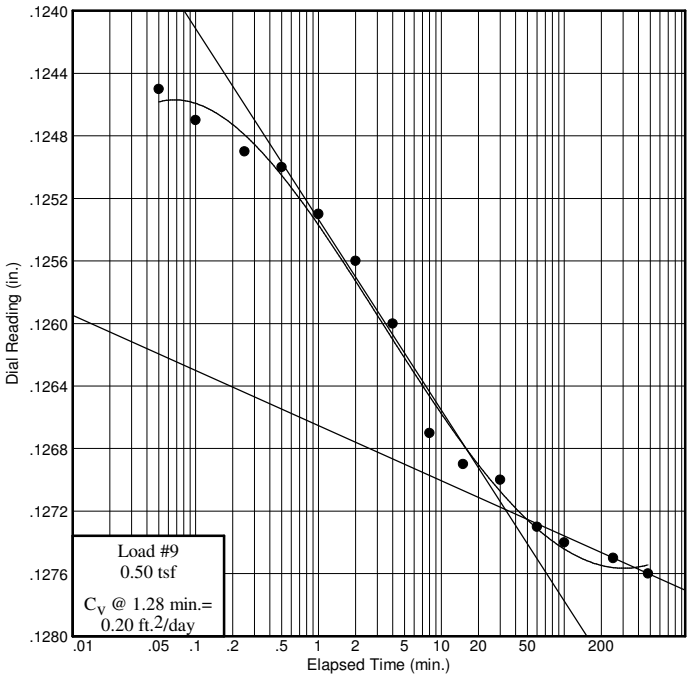
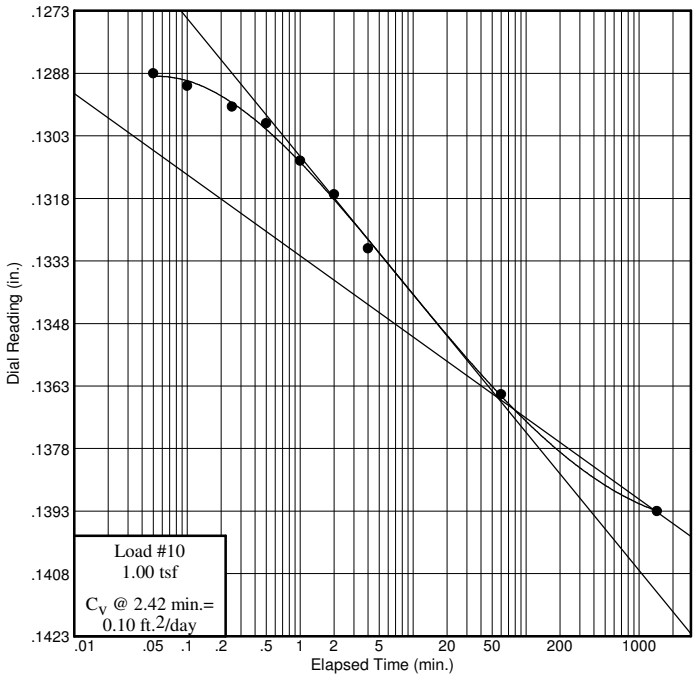
Figure

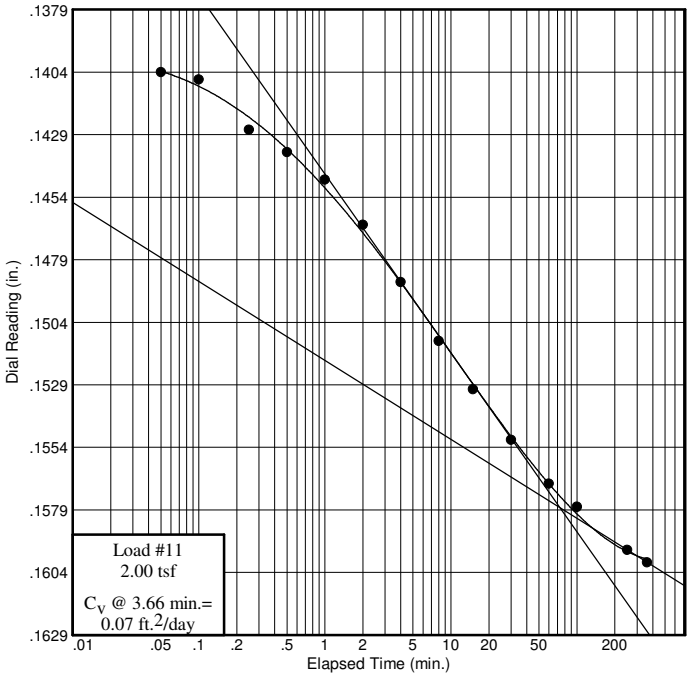
Dial Reading vs. Time

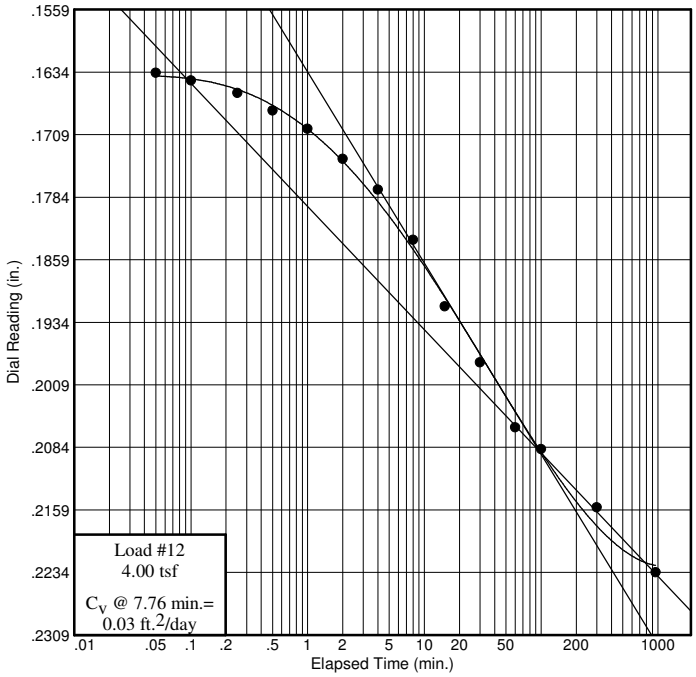
Project No.: 19998709
Project: Rahway Arch

Source: BD-04R Sample No.: T-1 Elev./Depth: 21.0-23.0









URS CORPORATION

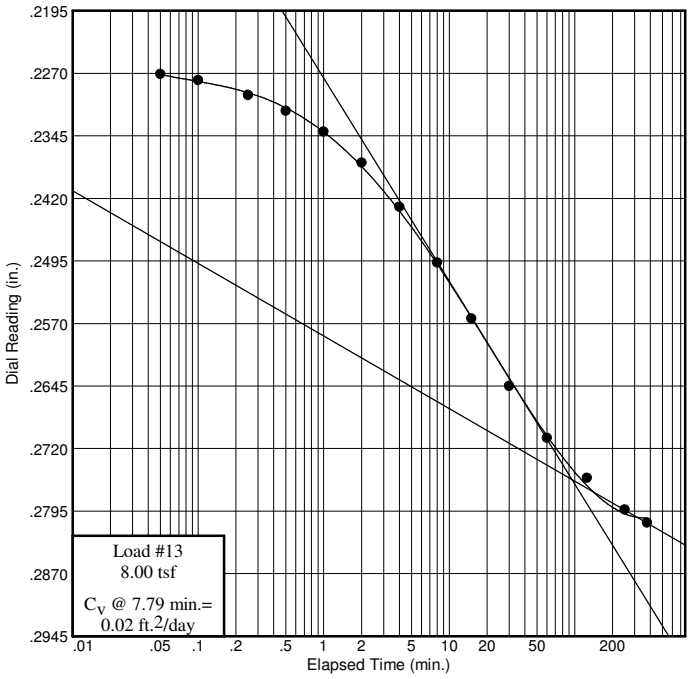
Fort Washington, PA

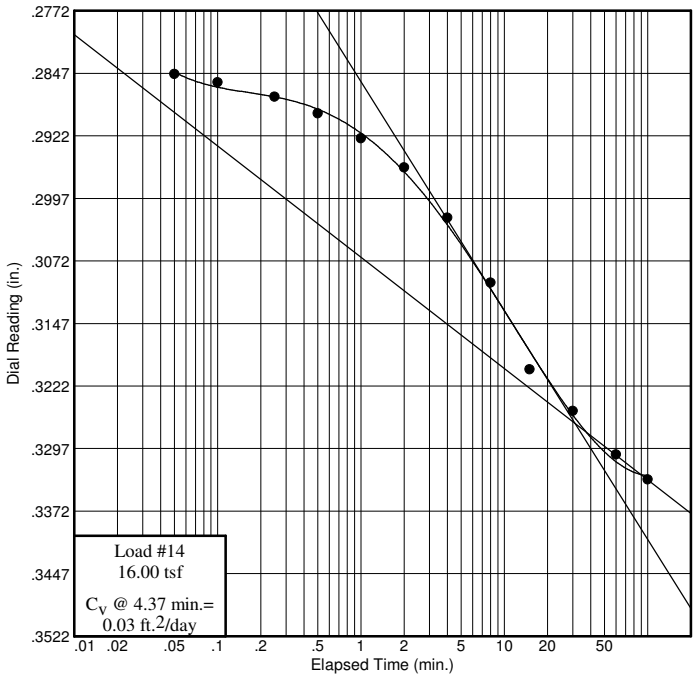
Figure

Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: BD-04R Sample No.: T-1 Elev./Depth: 21.0-23.0





URS CORPORATION

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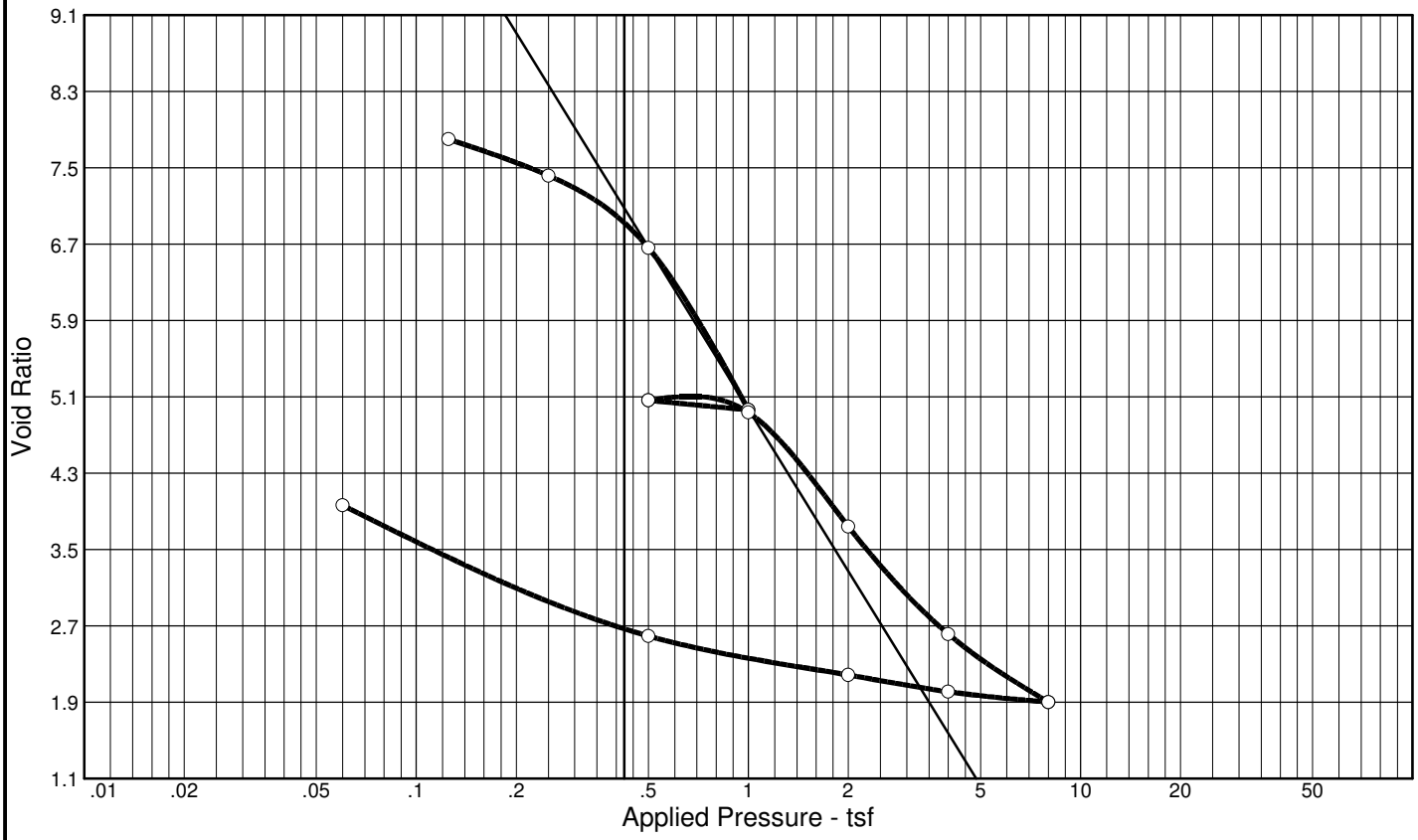
Figure

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation											
No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α
1	0.13	0.02	0.010								
2	0.25	0.11	0.012								
3	0.50	0.06	0.018								
4	1.00	0.14	0.046								
7	2.00	0.01	0.049								
8	4.00	0.01	0.045								
9	8.00	0.00	0.027								

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
99.8 %	464.9 %	11.9	467	211	1.75		0.46	5.64	0.64	8.150

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Gray Sandy Elastic Silt	MH	

Project No. 19998709 **Client:** Michael Baker Jr., Inc.

Project: Rahway Arch

Source: BS-02 **Sample No.:** T-1 **Elev./Depth:** 7.0-9.0

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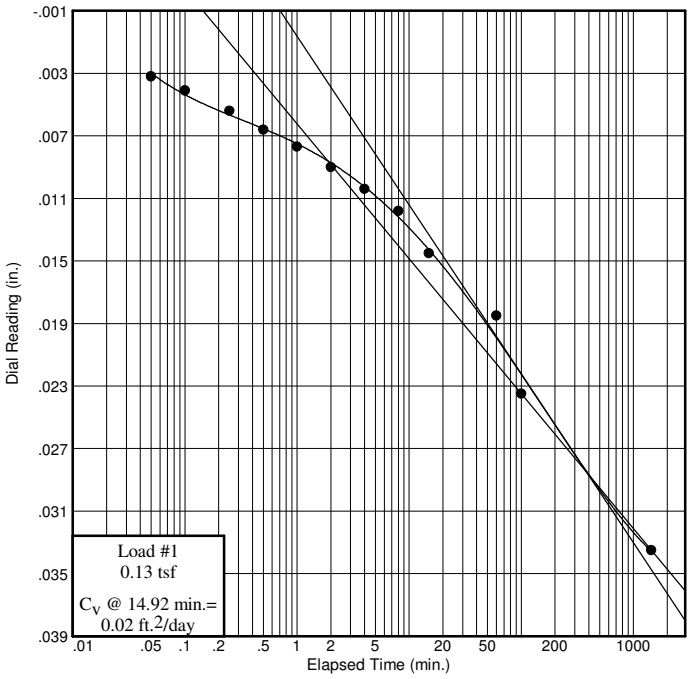
Remarks:

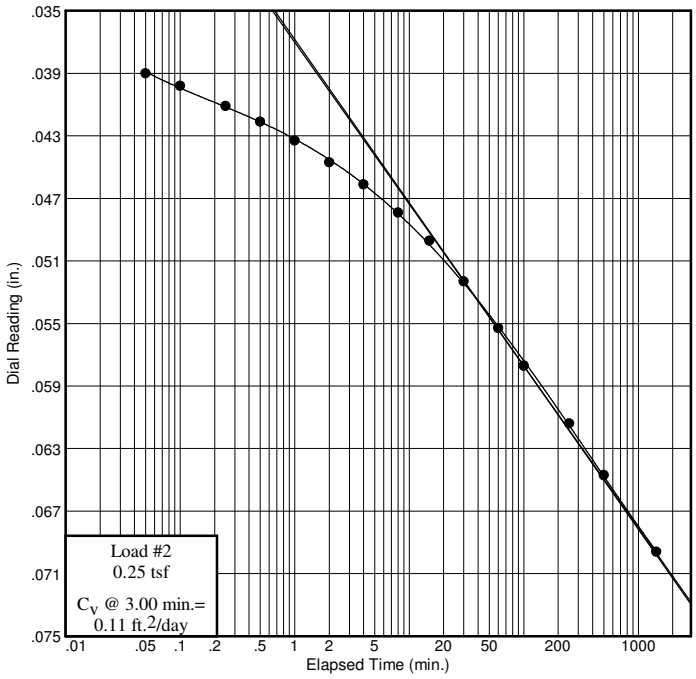
Figure

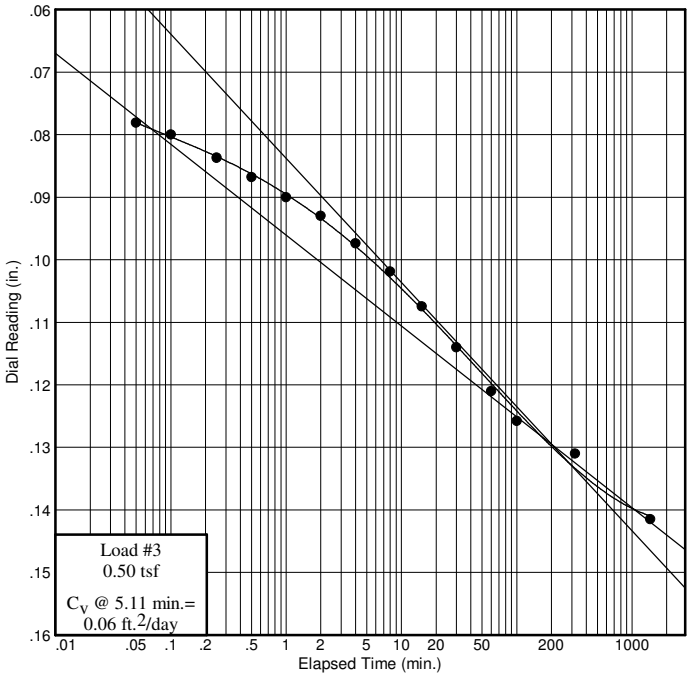
Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: BS-02 Sample No.: T-1 Elev./Depth: 7.0-9.0







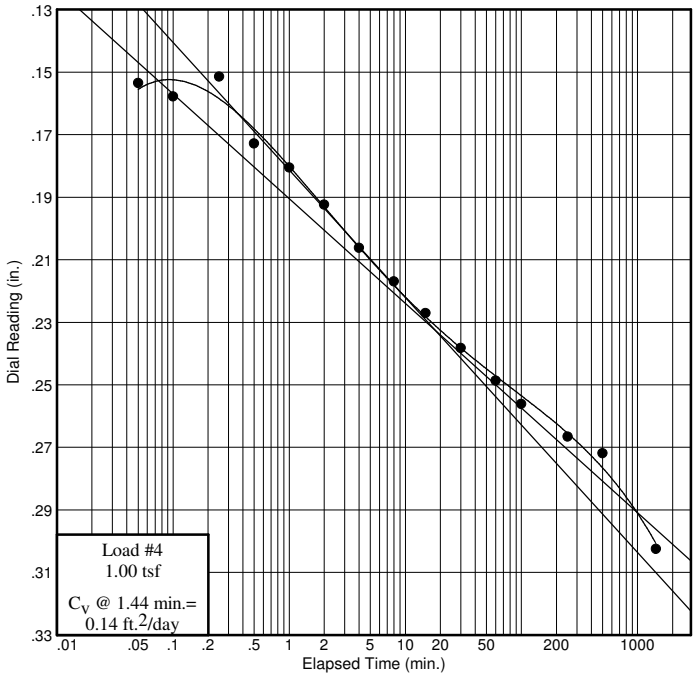


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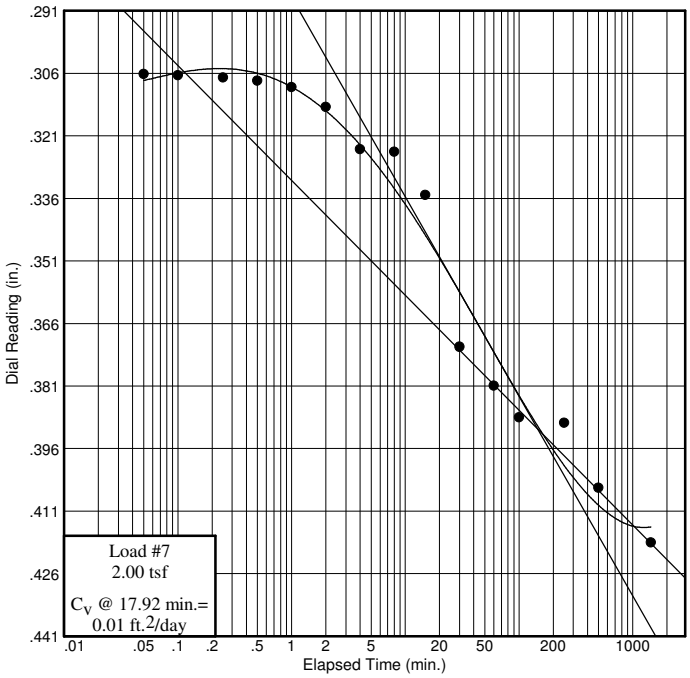
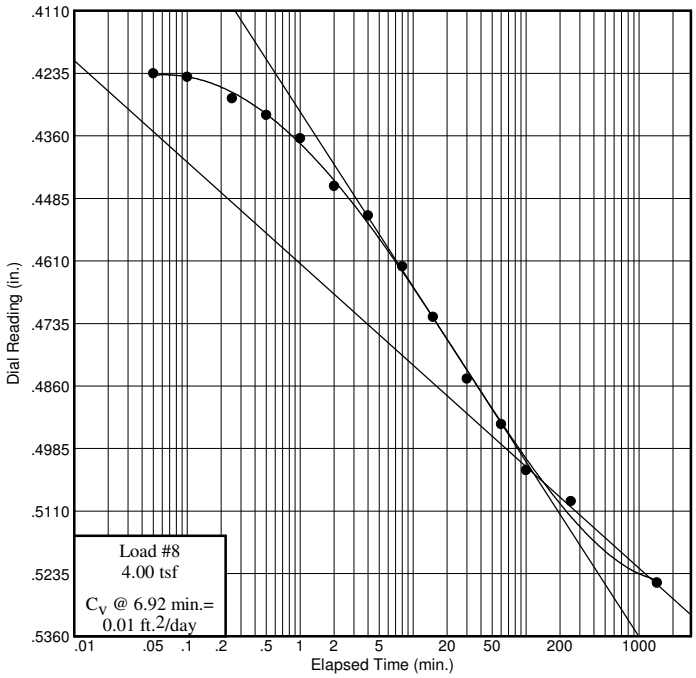
Figure

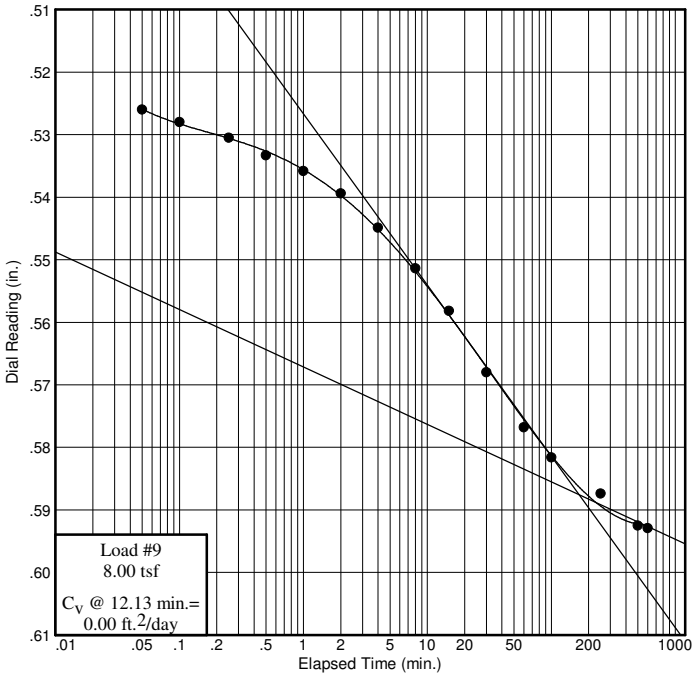
Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: BS-02 Sample No.: T-1 Elev./Depth: 7.0-9.0







URS CORPORATION

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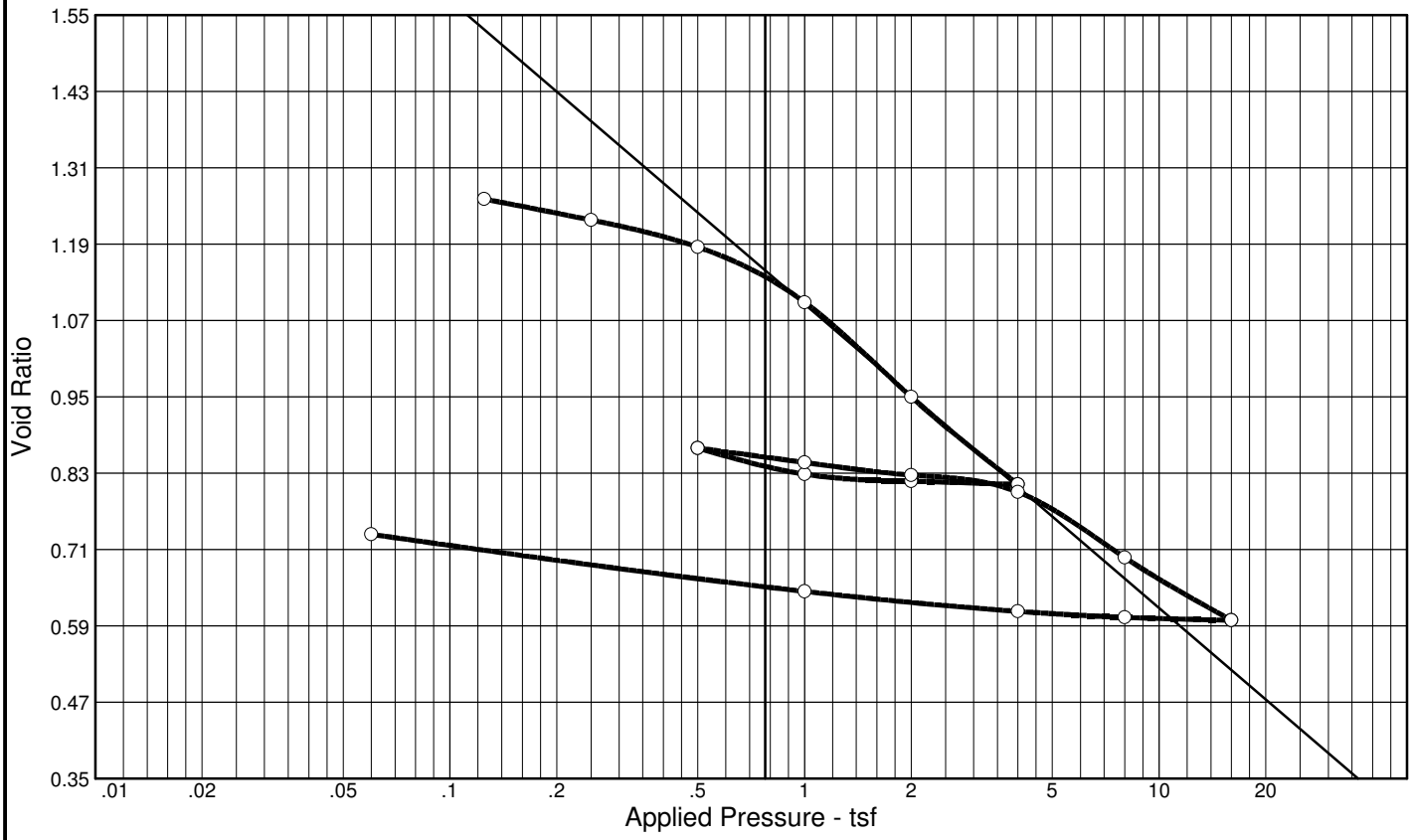
Figure

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation											
No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α
3	0.50	0.20	0.003								
4	1.00	0.12	0.002								
5	2.00	0.44	0.012								
6	4.00	0.28	0.012								
11	2.00	2.07	0.001								
12	4.00	0.61	0.003								
13	8.00	0.13	0.006								
14	16.00	0.28	0.011								

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
95.7 %	48.6 %	69.0	241	128	2.52		0.83	0.48	0.06	1.279

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Silty Sand	SM	

Project No. 19998709 **Client:** Michael Baker Jr., Inc.

Project: Rahway Arch

Source: BS-09 **Sample No.:** T-1 **Elev./Depth:** 12.0-14.0

URS CORPORATION

Fort Washington, PA

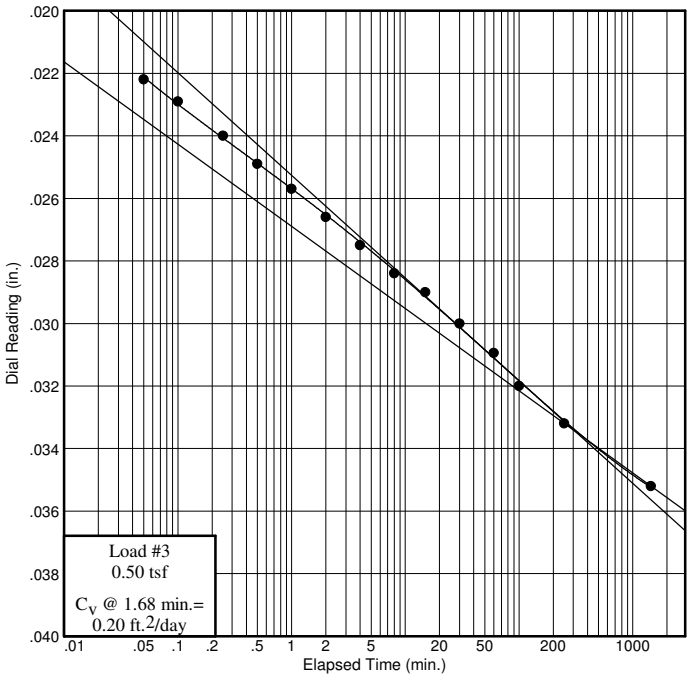
Remarks:

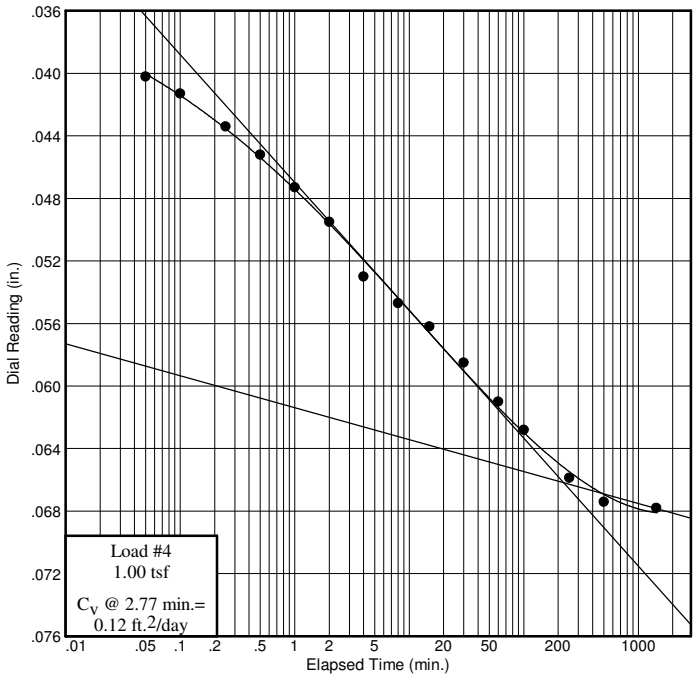
Figure

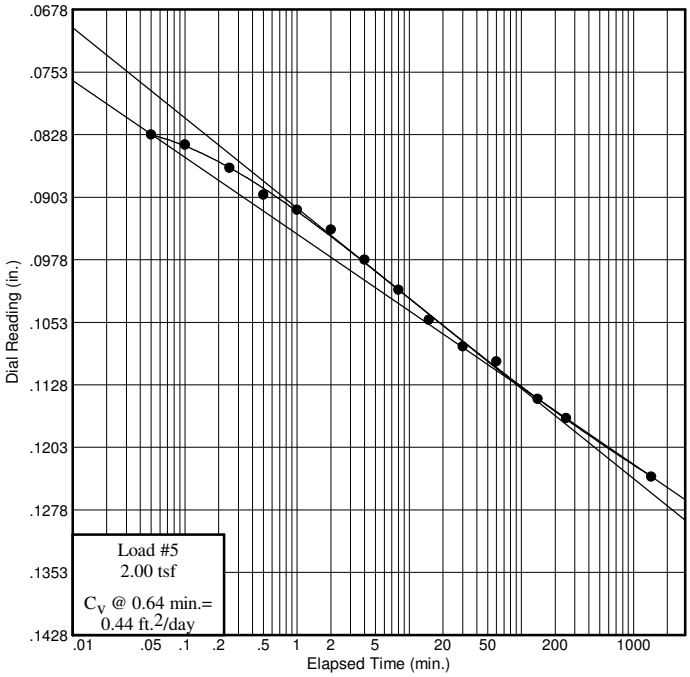
Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: BS-09 Sample No.: T-1 Elev./Depth: 12.0-14.0







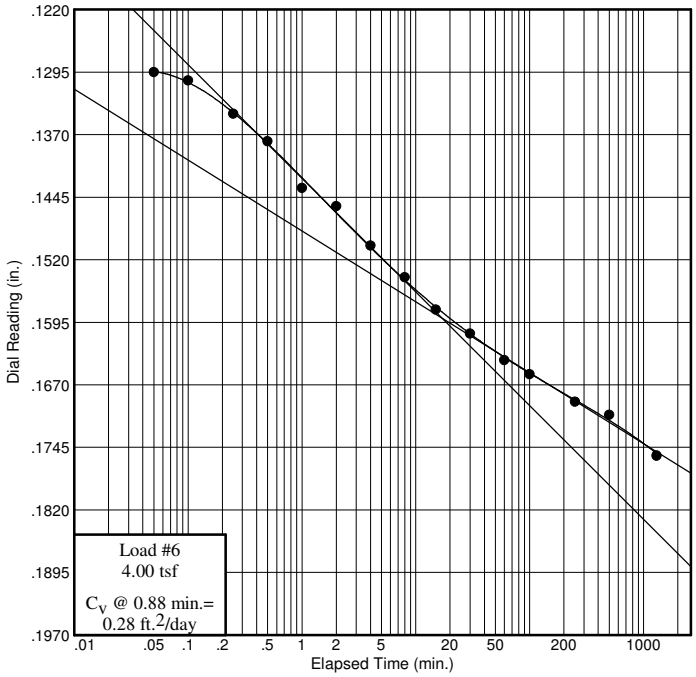


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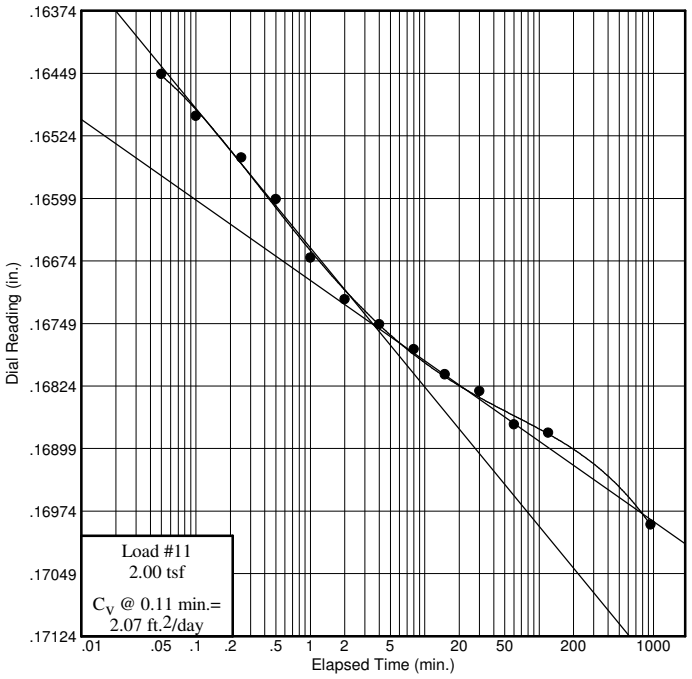
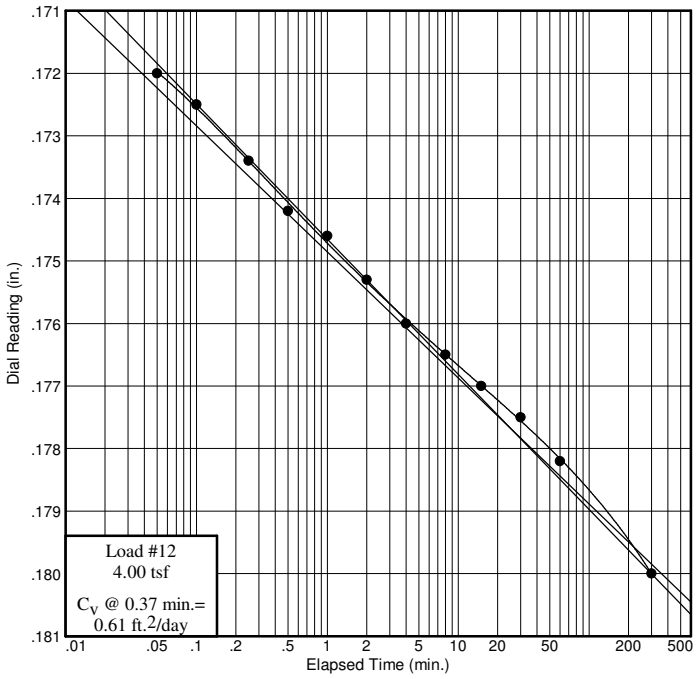
Figure

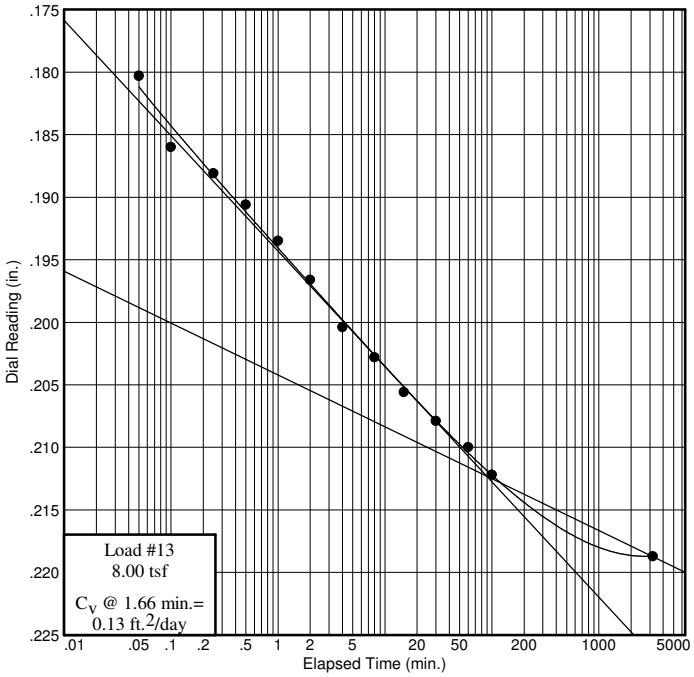
Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: BS-09 Sample No.: T-1 Elev./Depth: 12.0-14.0







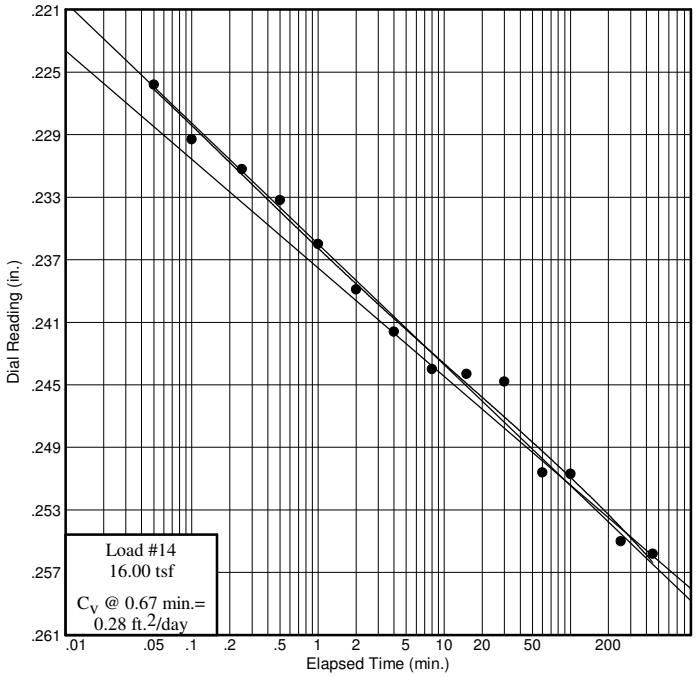


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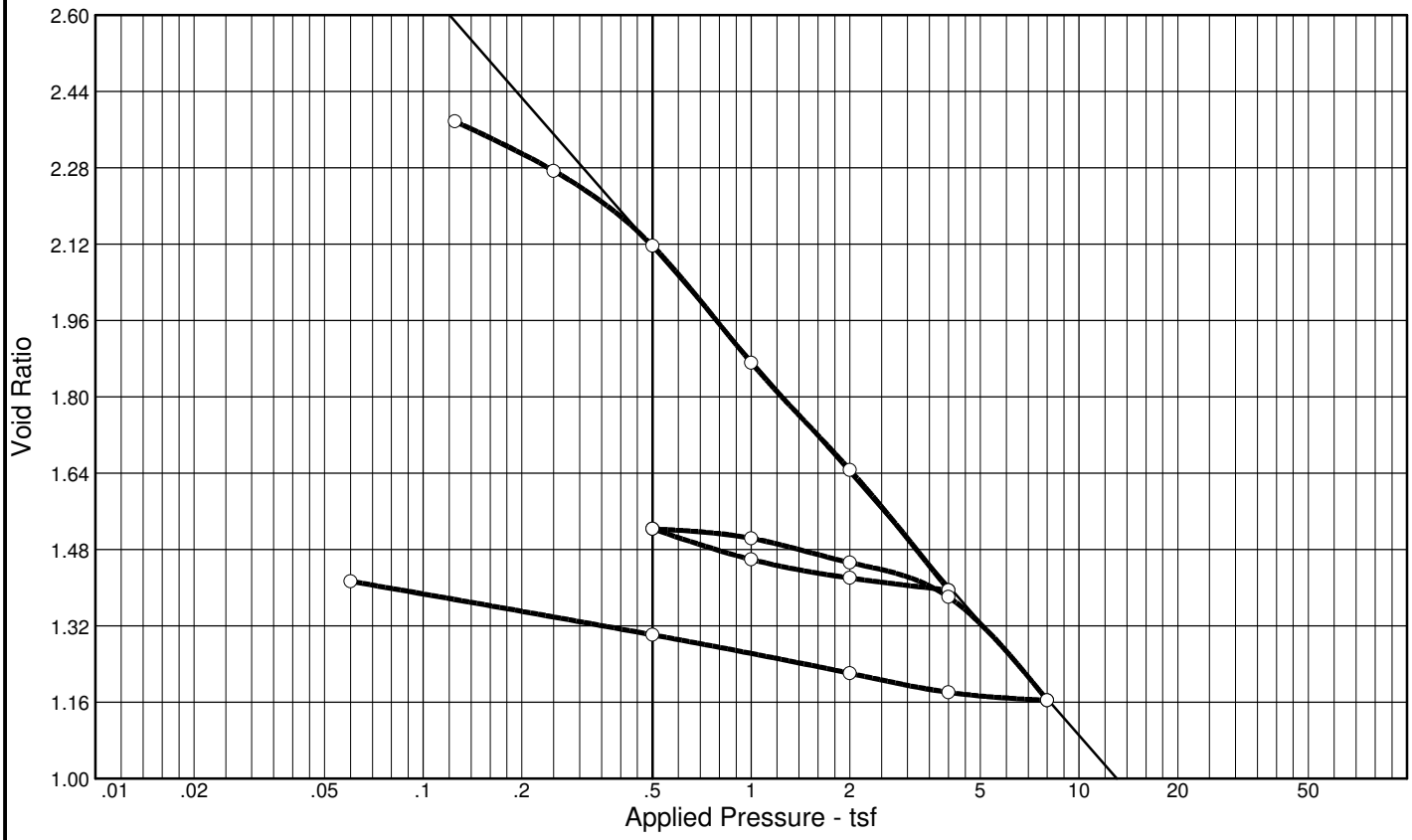
Figure

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation											
No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α
2	0.25	0.09	0.011								
3	0.50	0.02	0.014								
4	1.00	0.01	0.025								
5	2.00	0.02	0.016								
6	4.00	0.03	0.016								
11	2.00	0.11	0.002								
12	4.00	0.07	0.006								
13	8.00	0.02	0.016								

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
100.9 %	96.4 %	46.5	130	87	2.58		0.49	0.79	0.13	2.466

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Gray Fat Clay	CH	

Project No. 19998709 **Client:** Michael Baker Jr., Inc.

Project: Rahway Arch

Source: ID-06 **Sample No.:** U-2 **Elev./Depth:** 14.0-16.0

URS CORPORATION

Fort Washington, PA

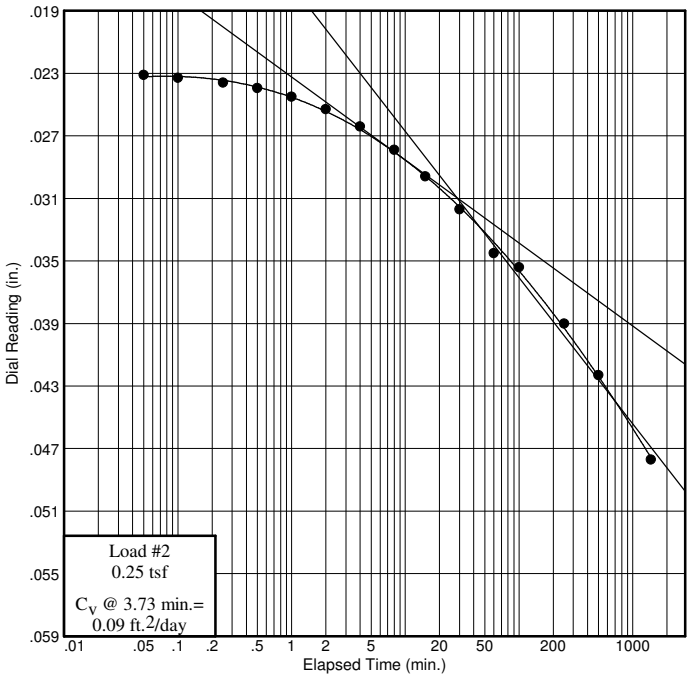
Remarks:

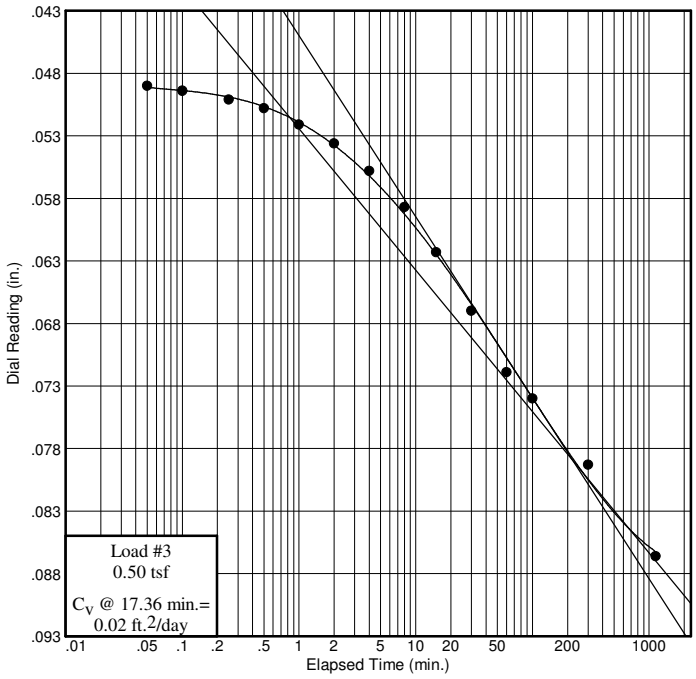
Figure

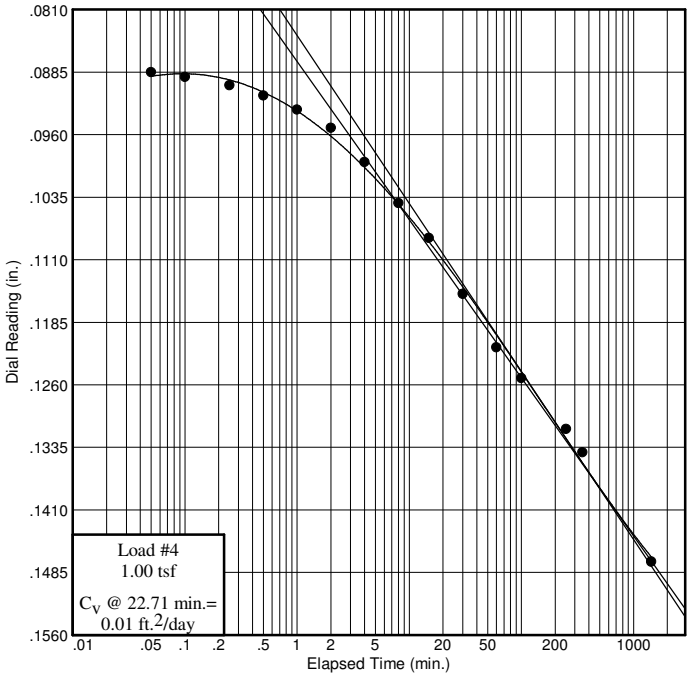
Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: ID-06 Sample No.: U-2 Elev./Depth: 14.0-16.0







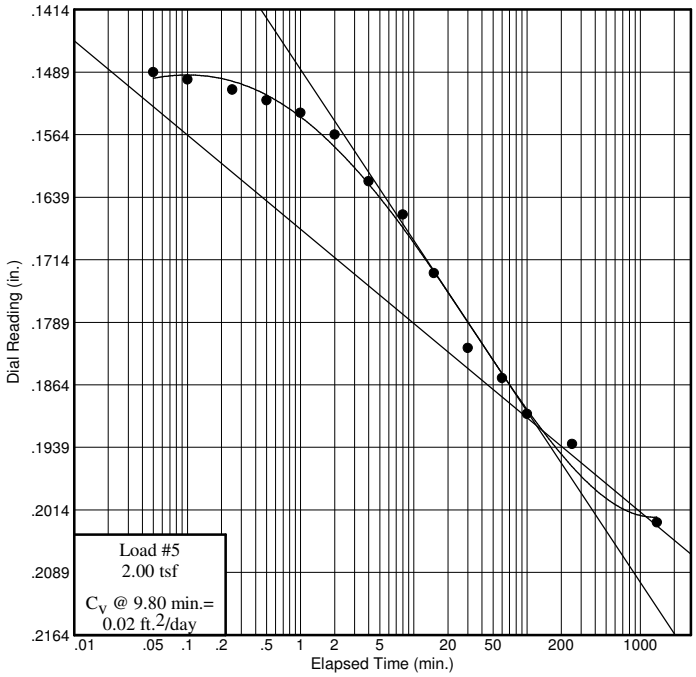


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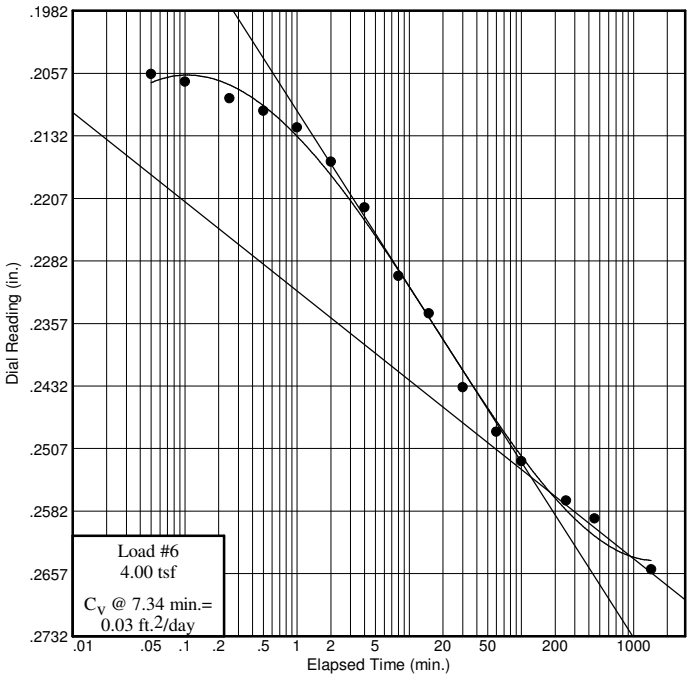
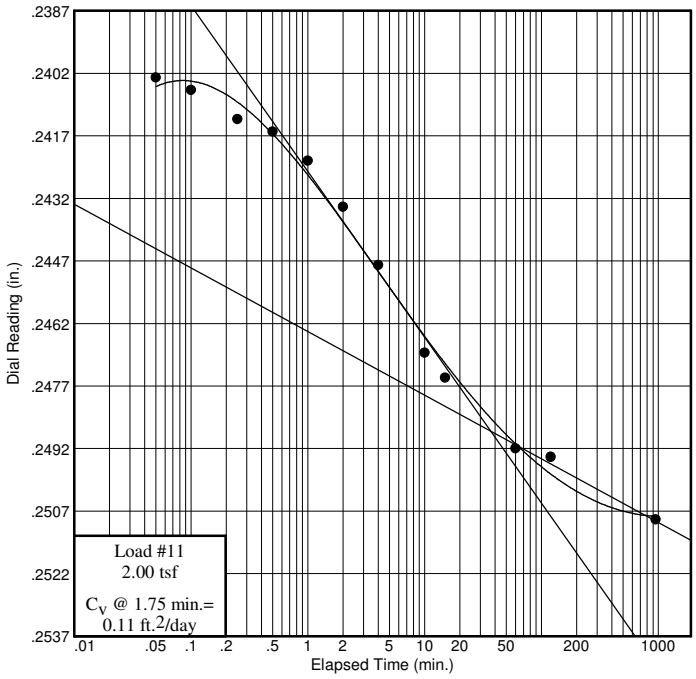
Figure

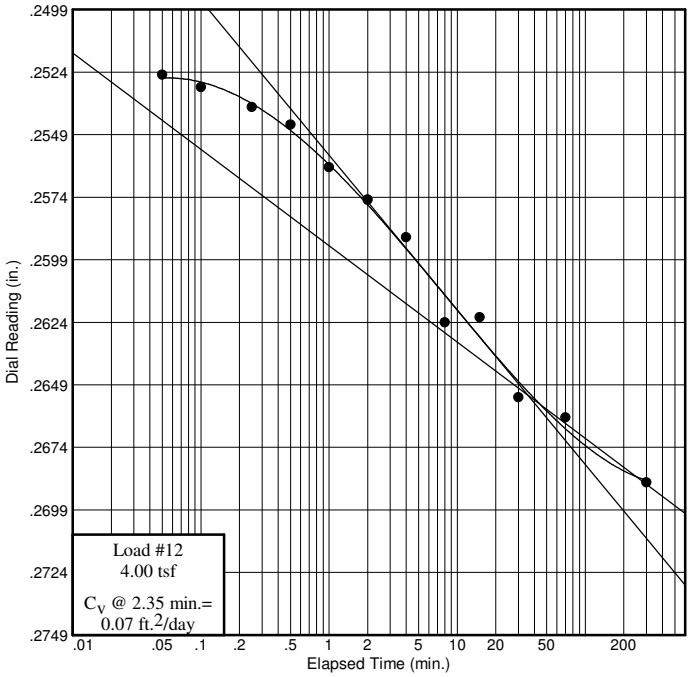
Dial Reading vs. Time

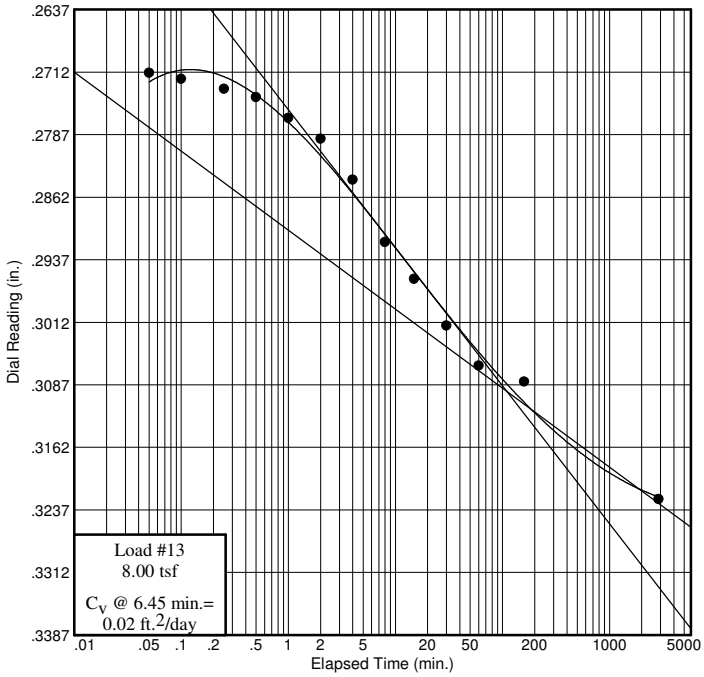
Project No.: 19998709
Project: Rahway Arch

Source: ID-06 Sample No.: U-2 Elev./Depth: 14.0-16.0









URS CORPORATION

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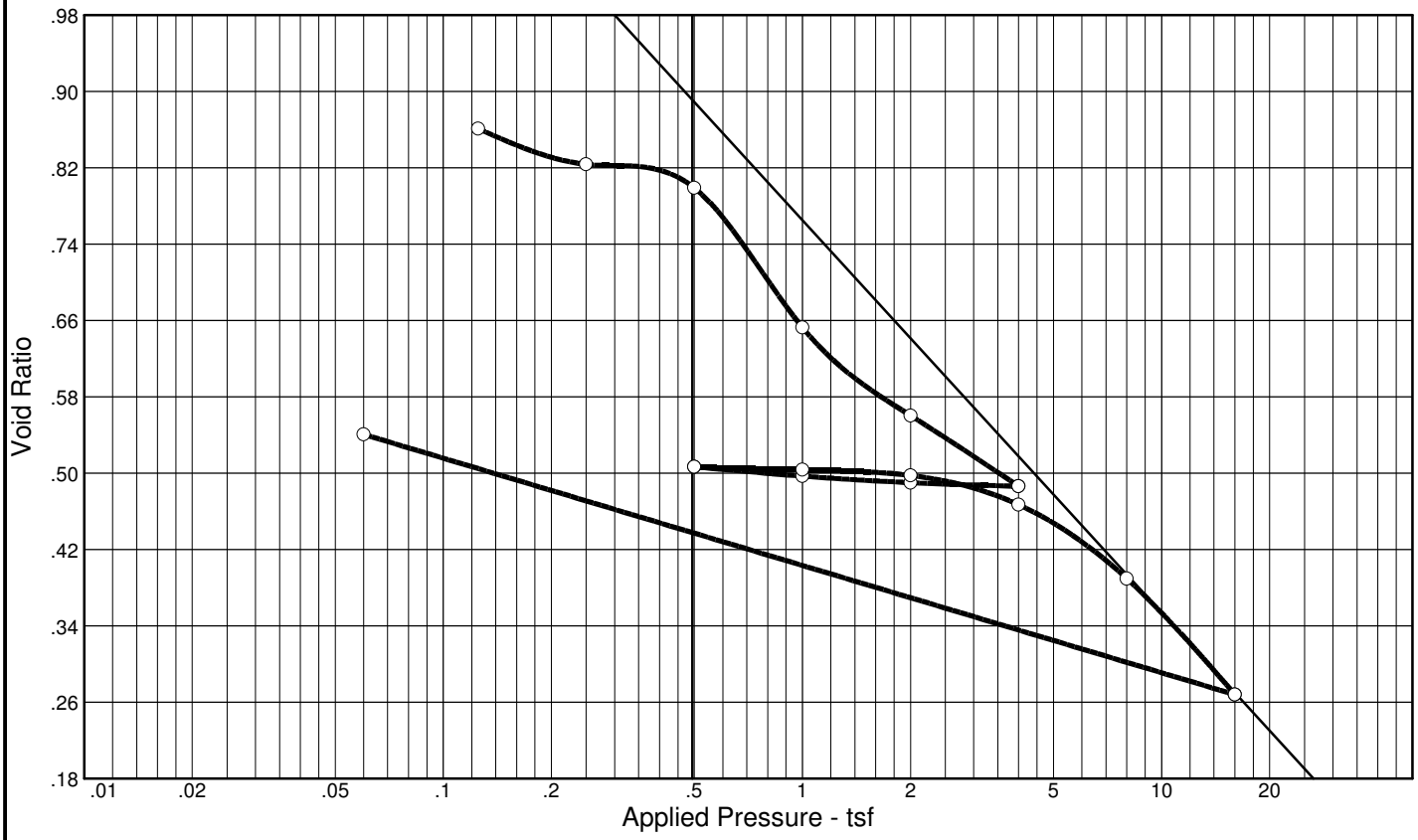
Figure

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation											
No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α	No.	Load (tsf)	C_v (ft.^{2}/day)	C_α
12	4.00	0.02	0.012								
13	8.00	0.30	0.023								

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
109.0 %	37.5 %	86.2	33	11	2.63		1.08	0.41	0.04	0.904

MATERIAL DESCRIPTION	USCS	AASHTO
Dark Gray Sandy Lean CLAY	CL	

Project No. 19998709 **Client:** Michael Baker Jr., Inc.

Project: Rahway Arch

Source: IS-02 **Sample No.:** U-1 **Elev./Depth:** 19.0-21.0

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Remarks:

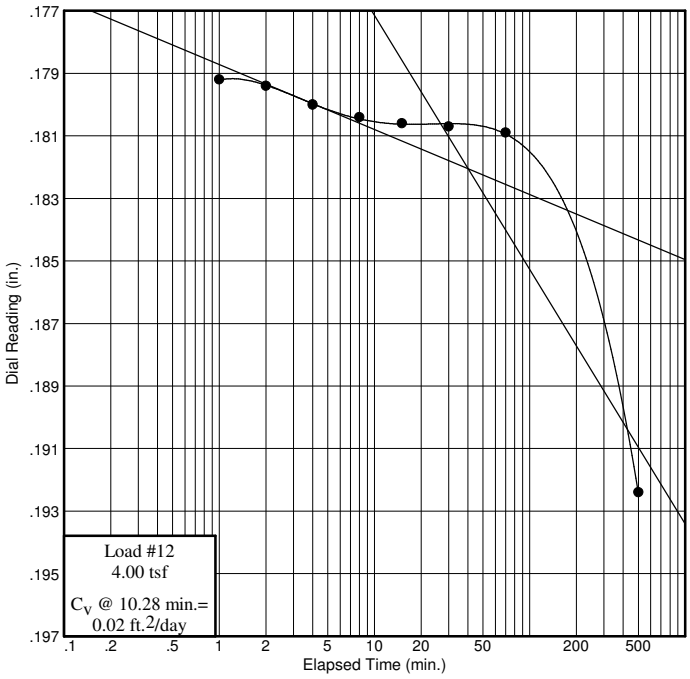
After initial 2.0 tsf, needle start sticking.Time curves are skewed. Sample maybe disturbed.

Figure

Dial Reading vs. Time

Project No.: 19998709
Project: Rahway Arch

Source: IS-02 Sample No.: U-1 Elev./Depth: 19.0-21.0



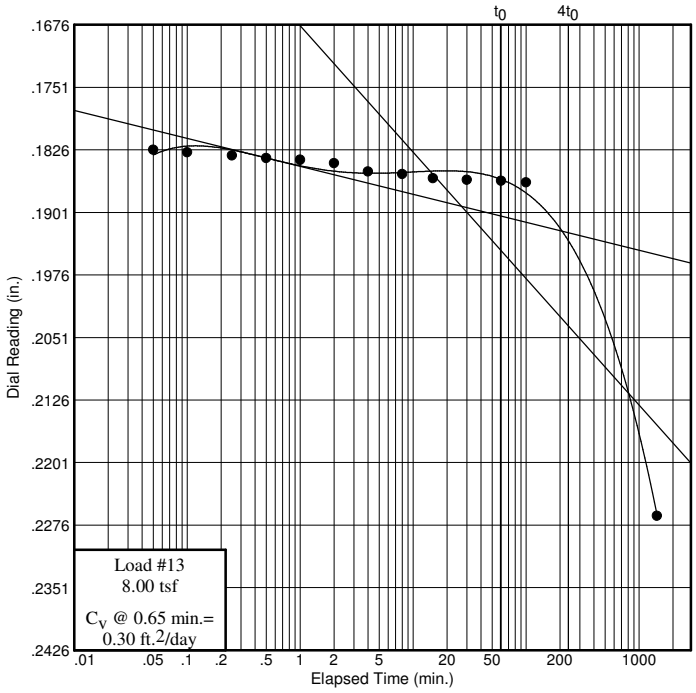


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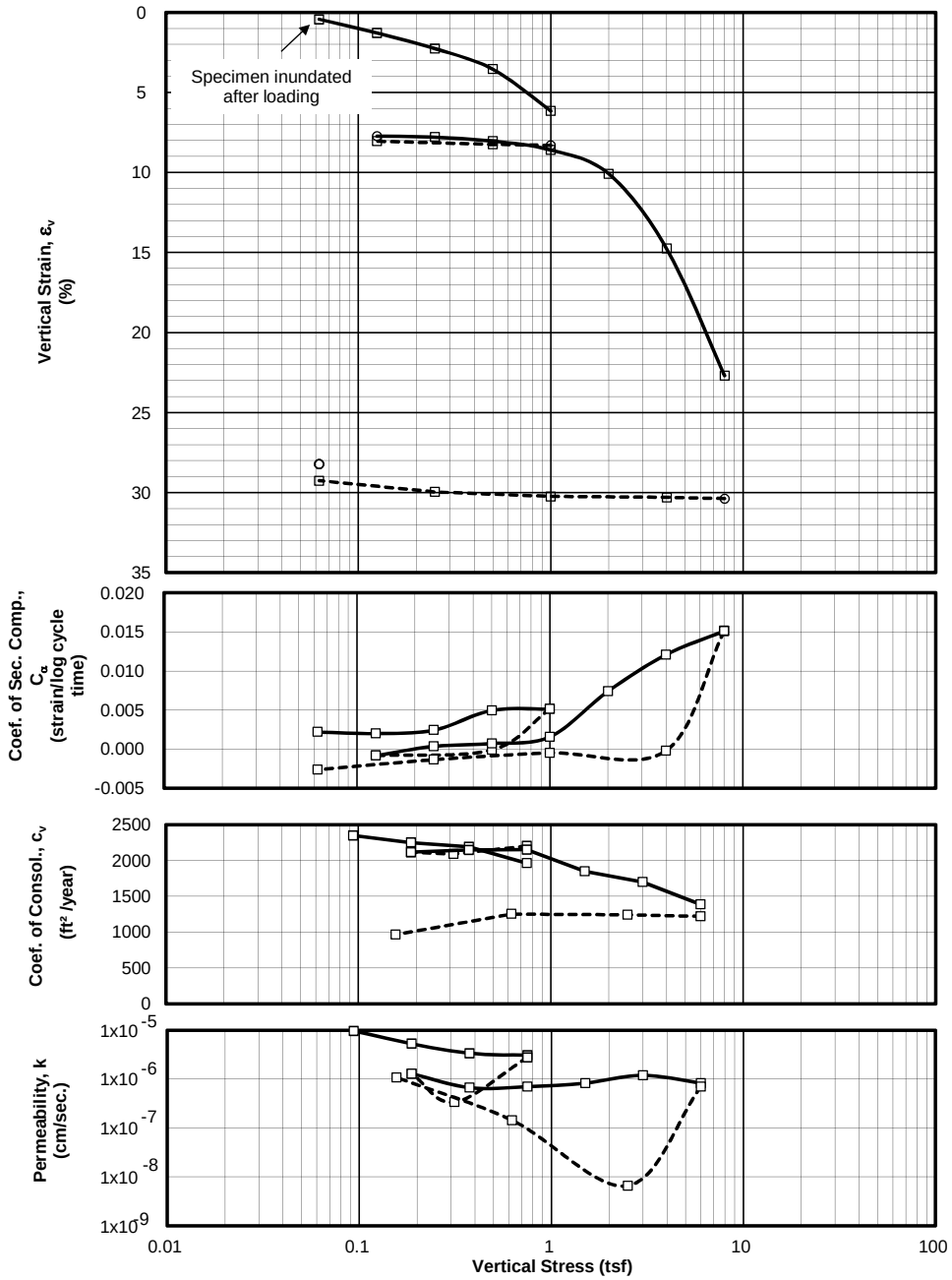
Figure



SAMPLE INFORMATION

Boring: BS-03R
Sample: T-1D
Depth: 10.00 feet
Elevation:
Type: 3-inch thin wall tube
Description: MH, gray elastic silt

Remarks: Significant creep noted in addition to primary and secondary consolidation

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height: 0.61 inch
Diameter: 2.50 inch

Initial water content:	124.3	%
Initial total unit weight:	91.3	pcf
Initial dry unit weight:	40.7	pcf
Initial void ratio:	3.866	
Initial degree of saturation:	102 *	%
Final water content:	84.1	%
Final total unit weight:	100.2	pcf
Final dry unit weight:	54.4	pcf
Final void ratio:	2.638	
Final degree of saturation:	101 *	%

(* for measured specific gravity = 3.17)

TEST SUMMARY

Construction Method:	Taylor (Square Root)
Estimated preconsolidation stress (tsf):	2.4 (Range: 2.0 to 2.6)
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.264
Compression Index (void ratio per log cycle stress):	1.285
Swell Ratio (strain per log cycle stress):	0.003
Swell Index (void ratio per log cycle stress):	0.015
Recompression Ratio (strain per log cycle stress):	0.006
Recompression Index (void ratio per log cycle stress):	0.029

LEGEND: □ End of primary o End of Stage ——— Loading - - - - - - Unloading

Test Date: 8/15/12 Tested By: TK/CMJ Checked By: GET

URS Corporation Project No. 19998709	Rahway Arch Site Carteret, New Jersey	ONE DIMENSIONAL CONSOLIDATION TEST Boring: BS-03R Depth: 10.00 feet
TerraSense, LLC	Project No. T19998709	September 2012

PROJECT:	Rahway Arch Site				
PROJECT NO.:	T19998709	Initial height:	0.609 inch	Final height:	0.455 inch
BORING:	BS-03R	Initial water content:	124.3 %	Final water content:	84.1 %
SAMPLE:	T-1D	Initial dry density:	40.7 pcf	Final dry density:	54.4 pcf
TEST:	C12129	Initial total density:	91.3 pcf	Final total density:	100.2 pcf
DEPTH, feet:	10	Initial saturation:	102 %	Final saturation:	101 %
BY:	TK/CMJ	Initial void ratio:	3.866	Final void ratio:	2.638
TEST DATE:	8/15/2012			Final strain:	25.2 %

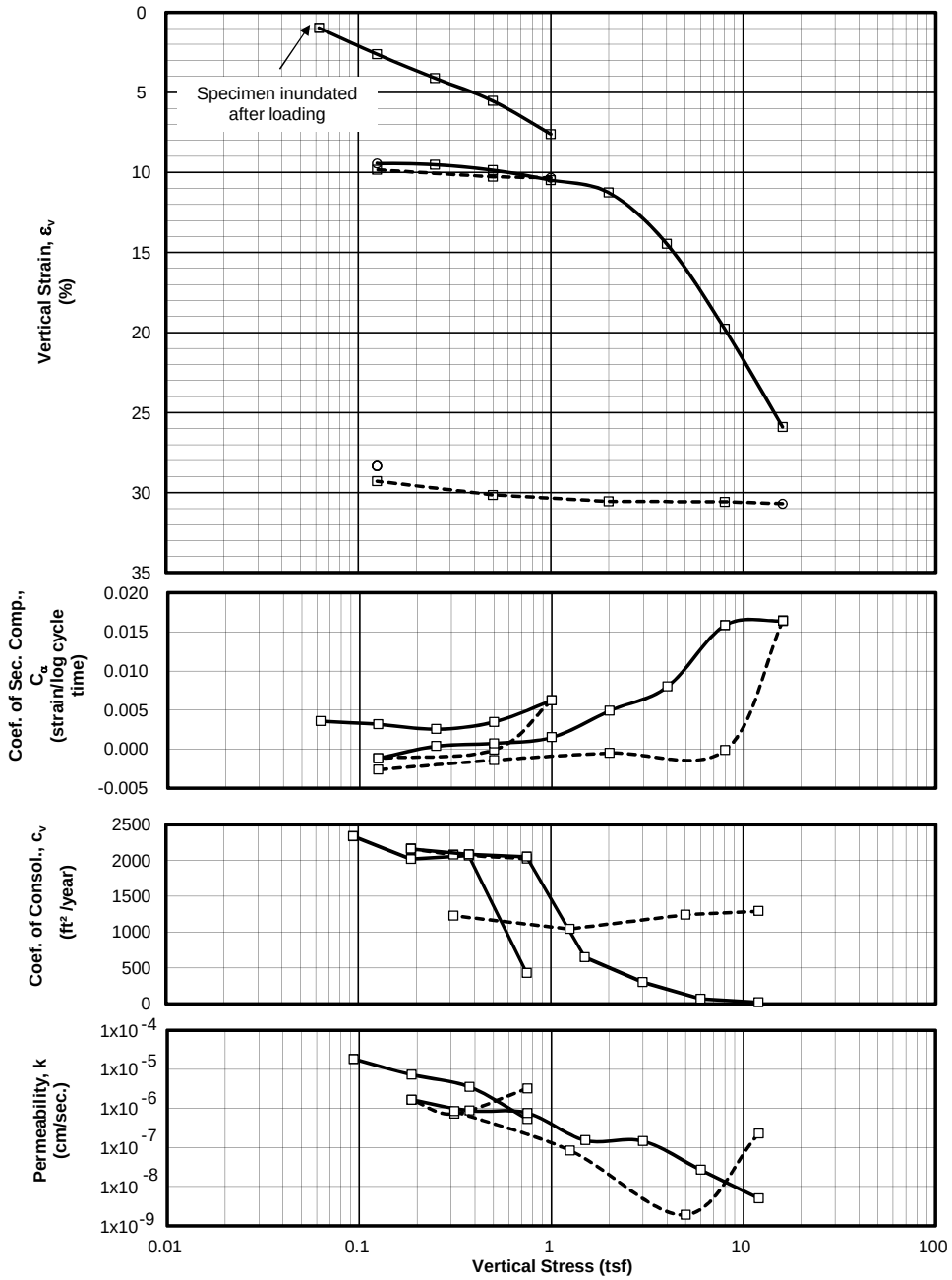
EQUIPMENT: SPECIMEN DESCRIPTION: MH, gray elastic silt

Load Frame No.: 3

Ring Diameter: 2.5 inch

G	LL	PL	PI
3.173			

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft²/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.063	0.0026	0.428	3.845	1.054	3.815	2501.75	0.0022	14.61	5.16E-06
2	0.125	0.0078	1.287	3.803	2.084	3.765	2347.77	0.0020	7.27	9.74E-06
3	0.250	0.0138	2.268	3.756	3.278	3.706	2249.69	0.0024	12.74	5.33E-06
4	0.500	0.0216	3.553	3.693	5.873	3.580	2189.02	0.0049	19.46	3.39E-06
5	1.00	0.0375	6.163	3.566	8.308	3.462	1960.48	0.0051	19.16	3.09E-06
6	0.500	0.0503	8.251	3.464	8.232	3.465	2201.08	-0.0001	23.94	2.77E-06
7	0.125	0.0490	8.051	3.474	7.734	3.490	2090.00	-0.0008	187.00	3.37E-07
8	0.250	0.0475	7.796	3.487	7.904	3.481	2114.72	0.0003	49.11	1.30E-06
9	0.500	0.0491	8.056	3.474	8.364	3.459	2147.75	0.0007	96.46	6.72E-07
10	1.00	0.0524	8.596	3.448	9.334	3.412	2151.90	0.0016	92.49	7.02E-07
11	2.00	0.0614	10.089	3.375	13.202	3.224	1847.62	0.0074	67.01	8.32E-07
12	4.00	0.0899	14.759	3.148	19.887	2.898	1696.96	0.0121	42.82	1.20E-06
13	8.00	0.1383	22.701	2.761	30.378	2.388	1386.26	0.0151	50.36	8.30E-07
14	4.00	0.1845	30.296	2.392	30.330	2.390	1217.78	-0.0002	52.67	6.98E-07
15	1.00	0.1842	30.244	2.394	30.119	2.400	1242.91	-0.0005	5702.70	6.58E-09
16	0.250	0.1824	29.958	2.408	29.432	2.434	1252.13	-0.0014	262.34	1.44E-07
17	0.063	0.1782	29.258	2.442	28.224	2.493	965.63	-0.0027	26.79	1.09E-06



SAMPLE INFORMATION

Boring: BS-06
Sample: U-1C
Depth: 3.55 feet
Elevation:
Type: 3-inch thin wall tube
Description: MH, light gray elastic silt

Remarks: Significant creep noted in addition to primary and secondary consolidation

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height: 0.61 inch
Diameter: 2.50 inch

Initial water content:	84.9	%
Initial total unit weight:	94.4	pcf
Initial dry unit weight:	51.1	pcf
Initial void ratio:	2.790	
Initial degree of saturation:	94 *	%
Final water content:	63.9	%
Final total unit weight:	106.0	pcf
Final dry unit weight:	64.7	pcf
Final void ratio:	1.993	
Final degree of saturation:	99 *	%

(* for measured specific gravity = 3.10)

TEST SUMMARY

Construction Method:	Taylor (Square Root)
Estimated preconsolidation stress (tsf):	3.2 (Range: 2.1 to 3.4)
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.203
Compression Index (void ratio per log cycle stress):	0.769
Swell Ratio (strain per log cycle stress):	0.007
Swell Index (void ratio per log cycle stress):	0.027
Recompression Ratio (strain per log cycle stress):	0.008
Recompression Index (void ratio per log cycle stress):	0.030
Remarks:	

LEGEND: □ End of primary o End of Stage ——— Loading - - - - - - Unloading

Test Date: 8/14/12 Tested By: TK/CMJ Checked By: GET

URS Corporation Project No. 19998709	Rahway Arch Site Carteret, New Jersey	ONE DIMENSIONAL CONSOLIDATION TEST Boring: BS-06 Depth: 3.55 feet
TerraSense, LLC	Project No. T19998709	September 2012

PROJECT:	Rahway Arch Site				
PROJECT NO.:	T19998709	Initial height:	0.614 inch	Final height:	0.484 inch
BORING:	BS-06	Initial water content:	84.9 %	Final water content:	63.9 %
SAMPLE:	U-1C	Initial dry density:	51.1 pcf	Final dry density:	64.7 pcf
TEST:	C12128	Initial total density:	94.4 pcf	Final total density:	106.0 pcf
DEPTH, feet:	3.55	Initial saturation:	94 %	Final saturation:	99 %
BY:	TK/CMJ	Initial void ratio:	2.790	Final void ratio:	1.993
TEST DATE:	8/14/2012			Final strain:	21.0 %

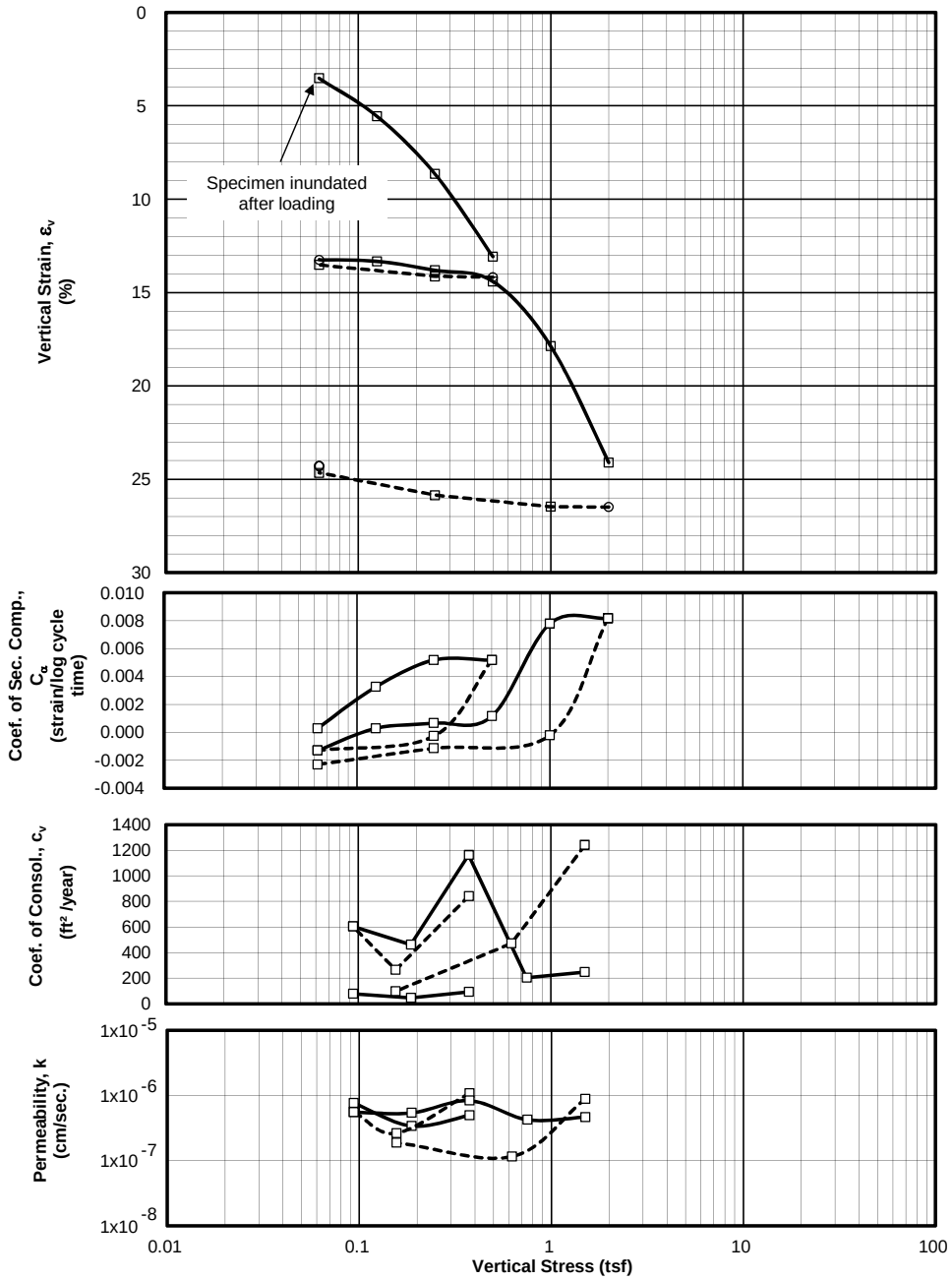
EQUIPMENT: SPECIMEN DESCRIPTION: MH, light gray elastic silt

Load Frame No.: 2

Ring Diameter: 2.5 inch

G	LL	PL	PI
3.1			

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft²/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.063	0.0060	0.973	2.753	1.993	2.715	2619.82	0.0036	6.42	1.23E-05
2	0.125	0.0160	2.615	2.691	3.850	2.644	2338.76	0.0032	3.81	1.85E-05
3	0.250	0.0252	4.110	2.635	5.292	2.590	2020.07	0.0025	8.36	7.29E-06
4	0.500	0.0340	5.536	2.580	7.095	2.521	2067.04	0.0035	17.53	3.56E-06
5	1.00	0.0467	7.607	2.502	10.325	2.399	428.94	0.0062	24.14	5.36E-07
6	0.500	0.0630	10.267	2.401	10.223	2.403	2022.34	-0.0001	18.80	3.25E-06
7	0.125	0.0603	9.831	2.418	9.436	2.433	2080.65	-0.0012	86.01	7.30E-07
8	0.250	0.0584	9.512	2.430	9.643	2.425	2161.05	0.0004	39.17	1.66E-06
9	0.500	0.0605	9.860	2.417	10.228	2.403	2085.46	0.0007	71.84	8.76E-07
10	1.00	0.0643	10.477	2.393	11.163	2.367	2051.61	0.0015	81.09	7.63E-07
11	2.00	0.0691	11.261	2.363	13.475	2.280	646.59	0.0049	127.55	1.53E-07
12	4.00	0.0887	14.450	2.243	17.195	2.139	302.90	0.0080	62.70	1.46E-07
13	8.00	0.1213	19.768	2.041	23.776	1.889	66.77	0.0158	75.23	2.68E-08
14	16.0	0.1589	25.893	1.809	30.692	1.627	21.71	0.0164	130.60	5.02E-09
15	8.00	0.1876	30.574	1.631	30.868	1.620	1292.06	-0.0001	170.91	2.28E-07
16	2.00	0.1874	30.544	1.633	30.407	1.638	1240.93	-0.0005	19693.98	1.90E-09
17	0.500	0.1850	30.143	1.648	29.509	1.672	1043.36	-0.0014	374.62	8.40E-08
18	0.125	0.1797	29.286	1.680	28.330	1.717	1229.64	-0.0026	43.72	8.49E-07



SAMPLE INFORMATION

Boring:	ID-03R
Sample:	T-1C
Depth:	1.25 feet
Elevation:	
Type:	3-inch thin wall tube
Description:	MH, gray elastic silt (crystal formations noted)

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height:	0.60	inch
Diameter:	2.50	inch

Initial water content:	157.1	%
Initial total unit weight:	83.6	pcf
Initial dry unit weight:	32.5	pcf
Initial void ratio:	4.289	
Initial degree of saturation:	101 *	%

Final water content:	114.6	%
Final total unit weight:	89.1	pcf
Final dry unit weight:	41.5	pcf
Final void ratio:	3.145	
Final degree of saturation:	100 *	%

(* for measured specific gravity = 2.76)

TEST SUMMARY

Construction Method:	Casagrande (Log)
Estimated preconsolidation stress (tsf):	0.4 (Range: 0.3 to 0.5)
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.207
Compression Index (void ratio per log cycle stress):	1.095
Swell Ratio (strain per log cycle stress):	0.010
Swell Index (void ratio per log cycle stress):	0.053
Recompression Ratio (strain per log cycle stress):	0.010
Recompression Index (void ratio per log cycle stress):	0.053
Remarks:	

LEGEND: □ End of primary o End of Stage ——— Loading - - - - - - Unloading

Test Date: 8/13/12 Tested By: TK/CMJ Checked By: GET

URS Corporation Project No. 19998709	Rahway Arch Site Carteret, New Jersey	ONE DIMENSIONAL CONSOLIDATION TEST Boring: ID-03R Depth: 1.25 feet
TerraSense, LLC	Project No. T19998709	September 2012

PROJECT:	Rahway Arch Site				
PROJECT NO.:	T19998709	Initial height:	0.602 inch	Final height:	0.472 inch
BORING:	ID-03R	Initial water content:	157.1 %	Final water content:	114.6 %
SAMPLE:	T-1C	Initial dry density:	32.5 pcf	Final dry density:	41.5 pcf
TEST:	C12127	Initial total density:	83.6 pcf	Final total density:	89.1 pcf
DEPTH, feet:	1.25	Initial saturation:	101 %	Final saturation:	100 %
BY:	TK/CMJ	Initial void ratio:	4.289	Final void ratio:	3.145
TEST DATE:	8/13/2012			Final strain:	21.6 %

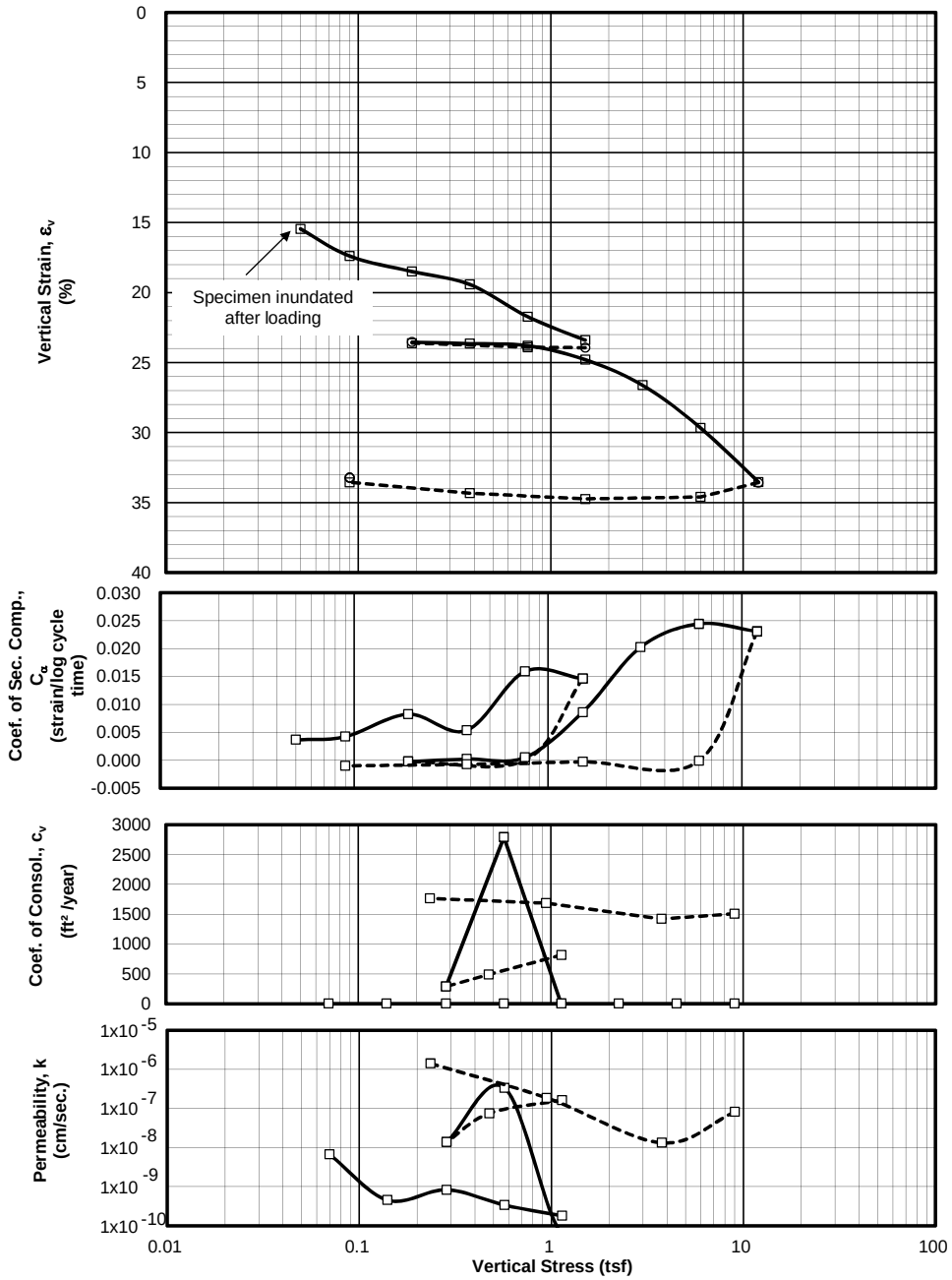
EQUIPMENT: SPECIMEN DESCRIPTION: MH, gray elastic silt (crystal formations noted)

Load Frame No.: 6

Ring Diameter: 2.5 inch

G	LL	PL	PI
2.756			

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft²/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.063	0.0212	3.527	4.102	3.599	4.098	82.34	0.0003	1.77	1.40E-06
2	0.125	0.0335	5.565	3.994	6.230	3.959	77.66	0.0033	3.07	7.64E-07
3	0.250	0.0520	8.647	3.831	9.251	3.799	45.50	0.0052	4.06	3.38E-07
4	0.500	0.0787	13.078	3.597	14.182	3.539	93.03	0.0052	5.64	4.97E-07
5	0.250	0.0851	14.138	3.541	14.054	3.545	839.61	-0.0003	23.57	1.07E-06
6	0.063	0.0814	13.518	3.574	13.245	3.588	263.93	-0.0013	30.22	2.64E-07
7	0.125	0.0802	13.328	3.584	13.391	3.580	604.11	0.0003	33.00	5.52E-07
8	0.250	0.0831	13.814	3.558	13.958	3.550	460.70	0.0007	25.76	5.40E-07
9	0.500	0.0867	14.407	3.527	14.722	3.510	1162.31	0.0012	42.16	8.32E-07
10	1.00	0.1076	17.872	3.343	19.075	3.280	203.27	0.0078	14.43	4.25E-07
11	2.00	0.1450	24.098	3.014	26.482	2.888	246.90	0.0082	16.06	4.64E-07
12	1.00	0.1593	26.463	2.889	26.358	2.895	1239.99	-0.0002	42.28	8.85E-07
13	0.250	0.1556	25.853	2.921	25.591	2.935	470.44	-0.0011	122.99	1.15E-07
14	0.063	0.1484	24.656	2.985	24.290	3.004	97.84	-0.0023	15.66	1.88E-07



SAMPLE INFORMATION

Boring:	Sludge Composite
Sample:	
Depth:	
Elevation:	
Type:	Reconstituted
Description:	MH, gray SILT
	Sample initially self-consolidated in ring

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height:	0.61	inch
Diameter:	2.50	inch

Initial water content:	112.3	%
Initial total unit weight:	92.9	pcf
Initial dry unit weight:	43.8	pcf
Initial void ratio:	3.704	
Initial degree of saturation:	100	%
Final water content:	67.1	%
Final total unit weight:	107.0	pcf
Final dry unit weight:	64.0	pcf
Final void ratio:	2.214	
Final degree of saturation:	100	% (assumed specific gravity = 3.30)

TEST SUMMARY

Construction Method:	Casagrande (Log)
Estimated preconsolidation stress (tsf):	
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.128
Compression Index (void ratio per log cycle stress):	0.602
Swell Ratio (strain per log cycle stress):	0.005
Swell Index (void ratio per log cycle stress):	0.024
Recompression Ratio (strain per log cycle stress):	0.012
Recompression Index (void ratio per log cycle stress):	0.056
Remarks:	

LEGEND: □ End of primary o End of Stage ——— Loading - - - - - - Unloading

Test Date: 9/21/12 Tested By: TK/CMJ Checked By: GET

URS Corporation Project No. 19998709	Rahway Arch Site Carteret, New Jersey	ONE DIMENSIONAL CONSOLIDATION TEST Sludge Composite
TerraSense, LLC	Project No. T19998709	October 2012

PROJECT:	Rahway Arch Site				
PROJECT NO.:	T19998709	Initial height:	0.610 inch	Final height:	0.417 inch
BORING:	Sludge Composite	Initial water content:	112.3 %	Final water content:	67.1 %
SAMPLE:		Initial dry density:	43.8 pcf	Final dry density:	64.0 pcf
TEST:	C12146	Initial total density:	92.9 pcf	Final total density:	107.0 pcf
DEPTH, feet:		Initial saturation:	100 %	Final saturation:	100 %
BY:	TK/CMJ	Initial void ratio:	3.704	Final void ratio:	2.214
TEST DATE:	9/21/2012			Final strain:	31.7 %

EQUIPMENT:
Load Frame No.: 2
Ring Diameter: 2.5 inch

SPECIMEN DESCRIPTION: MH, gray SILT
Sample initially self-consolidated in ring

G	LL	PL	PI
3.297			

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft²/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.050	0.0942	15.456	2.977	16.017	2.950	97.93	0.0036	0.32	9.13E-06
2	0.090	0.1061	17.401	2.885	17.464	2.882	0.45570	0.0042	2.06	6.68E-09
3	0.190	0.1128	18.500	2.834	18.684	2.825	0.13633	0.0082	9.09	4.52E-10
4	0.380	0.1185	19.429	2.790	19.974	2.764	0.56313	0.0053	20.46	8.30E-10
5	0.760	0.1325	21.736	2.681	21.800	2.678	0.18388	0.0159	16.47	3.37E-10
6	1.51	0.1427	23.402	2.603	23.935	2.578	0.26725	0.0146	45.01	1.79E-10
7	0.760	0.1458	23.904	2.579	23.977	2.576	814.03	0.0000	149.60	1.64E-07
8	0.190	0.1440	23.614	2.593	23.542	2.596	489.30	-0.0002	196.55	7.51E-08
9	0.380	0.1442	23.644	2.592	23.742	2.587	288.76	0.0002	629.37	1.38E-08
10	0.760	0.1451	23.796	2.584	24.076	2.571	2789.00	0.0005	249.26	3.38E-07
11	1.51	0.1512	24.799	2.537	24.920	2.532	0.14345	0.0086	74.81	5.78E-11
12	3.00	0.1623	26.618	2.452	26.842	2.441	0.13228	0.0202	81.92	4.87E-11
13	6.00	0.1809	29.670	2.308	29.911	2.297	0.16002	0.0244	98.28	4.91E-11
14	12.0	0.2044	33.523	2.127	33.572	2.125	0.15376	0.0231	155.75	2.98E-11
15	6.00	0.2110	34.597	2.076	34.833	2.065	1503.38	-0.0001	558.44	8.12E-08
16	1.51	0.2118	34.735	2.070	34.625	2.075	1419.88	-0.0003	3244.23	1.32E-08
17	0.380	0.2093	34.320	2.089	34.027	2.103	1684.73	-0.0007	272.16	1.87E-07
18	0.090	0.2046	33.547	2.126	33.210	2.142	1763.28	-0.0010	37.51	1.42E-06