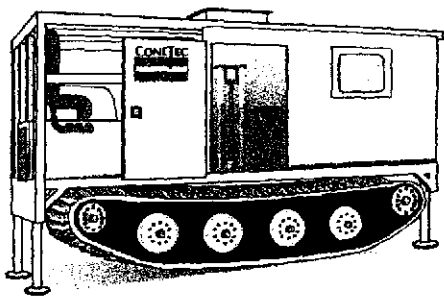


US EPA ARCHIVE DOCUMENT

Appendix F2 Geotechnical Tests - Field



Geotechnical and Environmental In Situ Testing Contractors

ConeTec Field Report

Presentation of
CPTU Test Results for:

**Peterson/Puritan OU2 Superfund Site
Cumberland, Rhode Island**

Presented to: Shield Environmental

Date: September 18, 2003

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

PRESENTATION OF IN SITU TESTING PROGRAM RESULTS

**Peterson/Puritan OU2 Superfund Site
Cumberland, RI**

September 9 and 10, 2003

Prepared for:

**Shield Environmental Associates Inc.
Charlotte, NC**

Prepared by:

**ConeTec Inc.
West Berlin, NJ**

September 18, 2003

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1.0 INTRODUCTION

This report presents the results of a cone penetrometer testing (CPT) program carried out at the Peterson/Puritan OU2 Superfund Site located in Cumberland, RI. The work was performed for Shield Environmental Associates, Inc. The CPT program took place during a single day on September 10th, 2003, (site orientation and preparatory work were completed on September 9th) when a total of 11 soundings were completed at nine different sounding locations. The CPT testing was performed in areas near the base of the landfill as well as through the top central portion of the waste.

CPT sounding locations were selected and numbered under the direction and supervision of Shield Environmental Associates personnel (Mr. John Long). Final survey data of the CPT sounding locations were provided by Shield Environmental.

2.0 FIELD EQUIPMENT AND PROCEDURES

2.1 CONE PENETRATION TESTING

The cone penetrometer tests were carried out using an integrated electronic piezo cone manufactured by ConeTec in Vancouver, Canada. The piezo cone used was a compression model cone penetrometer with a 15 cm² tip and a 225 cm² friction sleeve. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85. The piezo cone dimensions and the operating procedure were in accordance with ASTM Standard D-3441. 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 glycerin as the saturating fluid. The pore pressure element was six millimeters thick and was located immediately behind the tip (the U₂ location) for all soundings.

The cone was advanced using a 25 ton, unitized, truck-mounted cone penetration rig. 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 (Qc)
- Sleeve Friction (Fs)
- Dynamic Pore Pressure (Ut)

The field data recorded is included on the attached diskette (appendix D).

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.

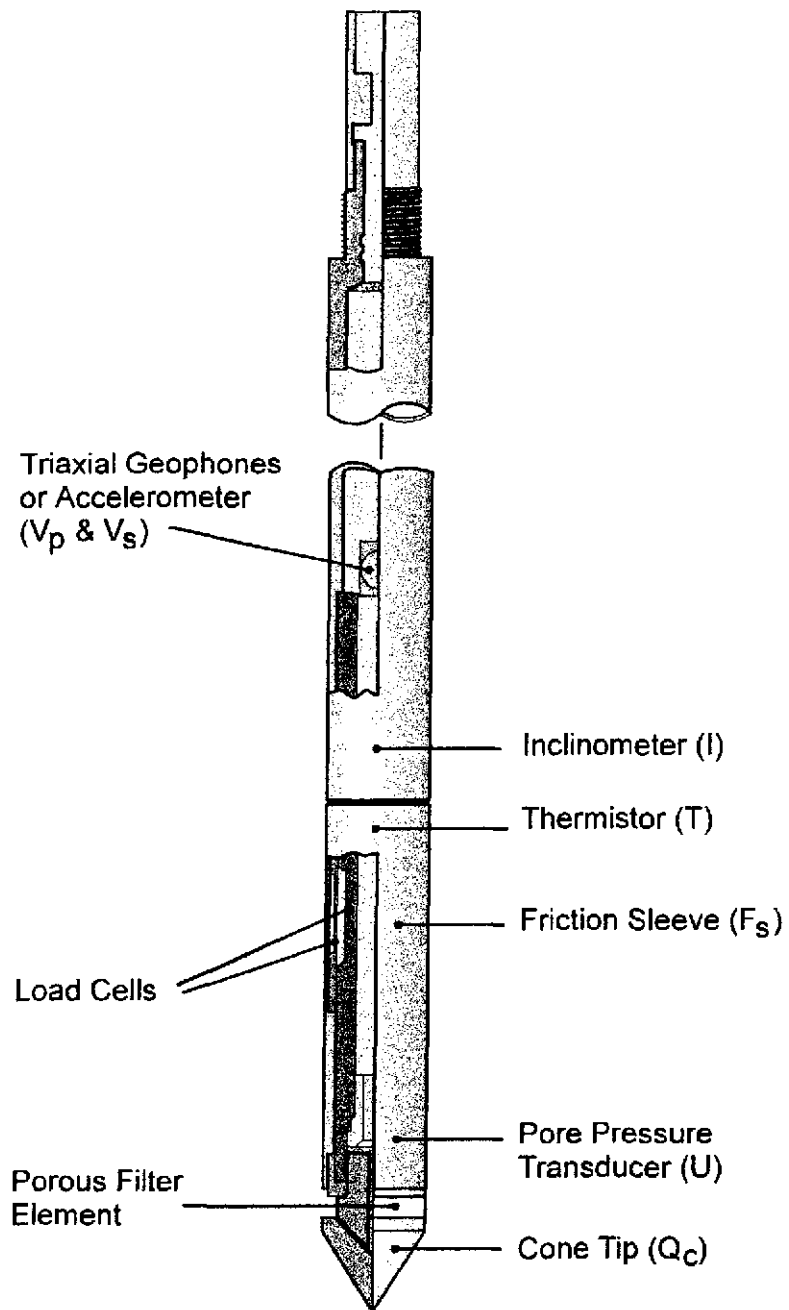


FIGURE 1 - TYPICAL CONE PENETROMETER

2.2 PORE PRESSURE DISSIPATION TESTS

When cone penetration is stopped, the piezo cone 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 dissipation curve consisting of pore water pressure (U) verses time (t). The shapes of dissipation curves are very useful in evaluating soil type, drainage and in situ static water level.

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

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 permeability.

Figure 3 shows some idealized shapes of various pore water pressure dissipation curves. The reader is referred Robertson et. al., 1990 to reference dissipation test data analytical techniques.

Estimation of Ground Water Table from CPT Dissipation Tests

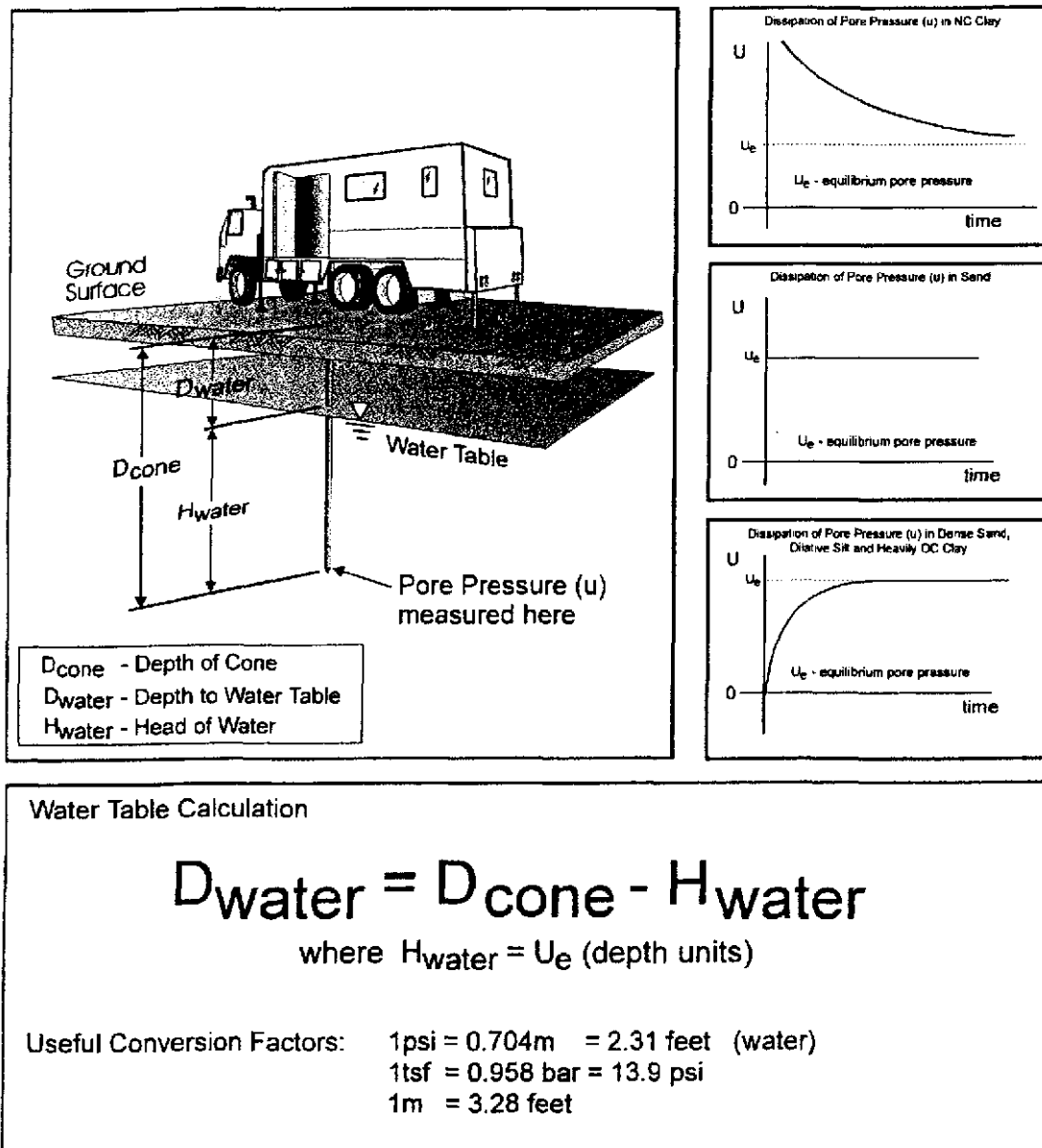


FIGURE 3 - TYPICAL DISSIPATION TESTS

3.0 CONE PENETRATION TEST DATA AND INTERPRETATION

3.1 ANALYSIS OF PIEZOCONE DATA - GENERAL

A total of 11 CPT soundings, involving approximately 355 feet of testing, were completed at nine locations.

The interpretation of cone data is based on the relationship between cone bearing, Q_c , sleeve friction, F_s , and penetration pore water pressure, U . The friction ratio, R_f , (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., 1986. It should be noted that it is not always possible to clearly identify a soil type based on Q_c , F_s and U_t . 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 cone hole is presented in Appendix B.

Each of the parameters measured in the sounding is discussed briefly below. A detailed explanation of CPTU testing and interpretation of the results can be found in "Guidelines for Geotechnical Design Using CPT and CPTU" by P. K. Robertson and R. G. Campanella, listed in the references.

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 (0.85 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, .ifi (importable) and .ifp (printable) files). Static pore water pressure is measured when cone penetration is stopped (static pore water pressure data can be found in the .ppd 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.

3.2 CONE PLOTS

The data from each sounding was plotted using the computer program ScreenZ. The plots are included in Appendix A. ScreenZ 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 chart 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 data is recorded at five second intervals. Dynamic and static pore pressure dissipation data for each CPT is included on the data disk. A total of eight dissipation tests, involving a total of 0.5 hours of testing, were completed during this project. These tests were performed to confirm water table depths at certain locations. The water depths were used in the data interpretations.

3.4 DATA PROCESSING

The electronic data files were processed using the program ScreenZ. ScreenZ is a program developed by ConeTec to calculate common engineering parameters from CPT data. The processed data files are attached in Appendix B. The files are also included on the data disk. For this project, the depth to ground water was determined from data provided by the dissipation test results. The exact depth used (Table 1) is noted in the header of each file.

3.5 DATA DISK

One data disk is included in Appendix C. The disk includes all of the CPT (.cor files, includes dynamic pore water pressure data), static pore water pressure (.ppd files) and tabular data (.tbl files).

5.0 REFERENCES

Robertson, P.K. and Campananella, R.G., 1989, "Guidelines for Geotechnical Design using CPT and CPTU", Soil Mechanics Series No. 120, The University of British Columbia.

Robertson, P.K., Sully, J., Woeller, D.G., Lunne, T., Powell, J.M., and Gillespie, D.J., 1990, "Guidelines for Interpretation of CPTU Test Data for determination of consolidation and permeability Parameters for Soils, Report prepared by ConeTec Investigations Ltd. for Energy Mines and Resources, Contract No. 23420-9-m644/01-OSC (copies available from ConeTec, Inc.).

APPENDIX A

TABLE 1 - SUMMARY OF CPT SOUNDINGS

ConeTec Inc.

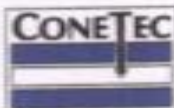
Job No.: 03-760

Location: Peterson/Puritan OU2 Superfund Site, Cumberland, RI

Client: Sheild Environmental Associates, Inc.

Date: September 9th and 10th, 2003

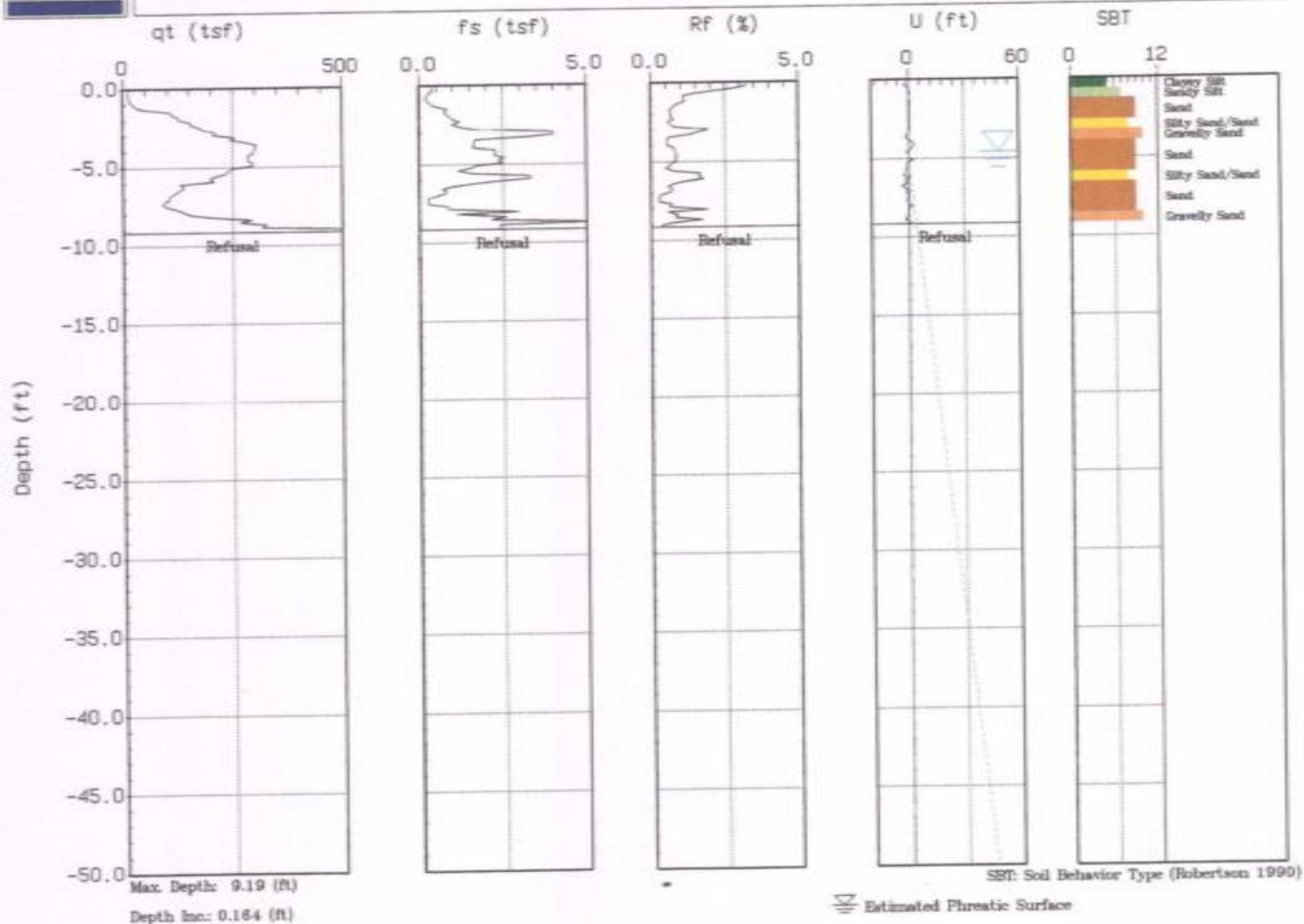
Date	CPTU Sounding	File Name	Sounding Depth (ft)	Dissipation Tests (sec)	Est. Water Table Depth (ft)	Dissipation Test Depth (ft)	Comments
10-Sep-03	CPT-1	760CP001	9.19	440	4.6	9.19	Refusal
10-Sep-03	CPT-1A	760CP01A	40.03	145	4.7	40.03	
10-Sep-03	CPT-2	760CP002	37.07	80	5.0	37.07	Refusal
10-Sep-03	CPT-3	760CP003	49.70				Refusal
10-Sep-03	CPT-4	760CP004	45.44				Refusal
10-Sep-03	CPT-5	760CP005	1.64				Refusal
10-Sep-03	CPT-5A	760CP05A	13.62				Refusal
10-Sep-03	CPT-6	760CP006	45.11	155	23.4	27.89	
10-Sep-03	CPT-7	760CP007	39.86	360	14.1	32.48	Refusal
				80	15.3	39.86	
10-Sep-03	CPT-8	760CP008	40.03	110	3.5	12.96	
10-Sep-03	CPT-9	760CP009	33.30	420	29.0	33.30	Refusal
	11		354.99	1,790			
				0.50	Hours		

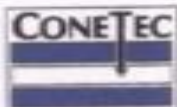


Shield Environmental

Site: CPT-1
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09:10:03 09:32

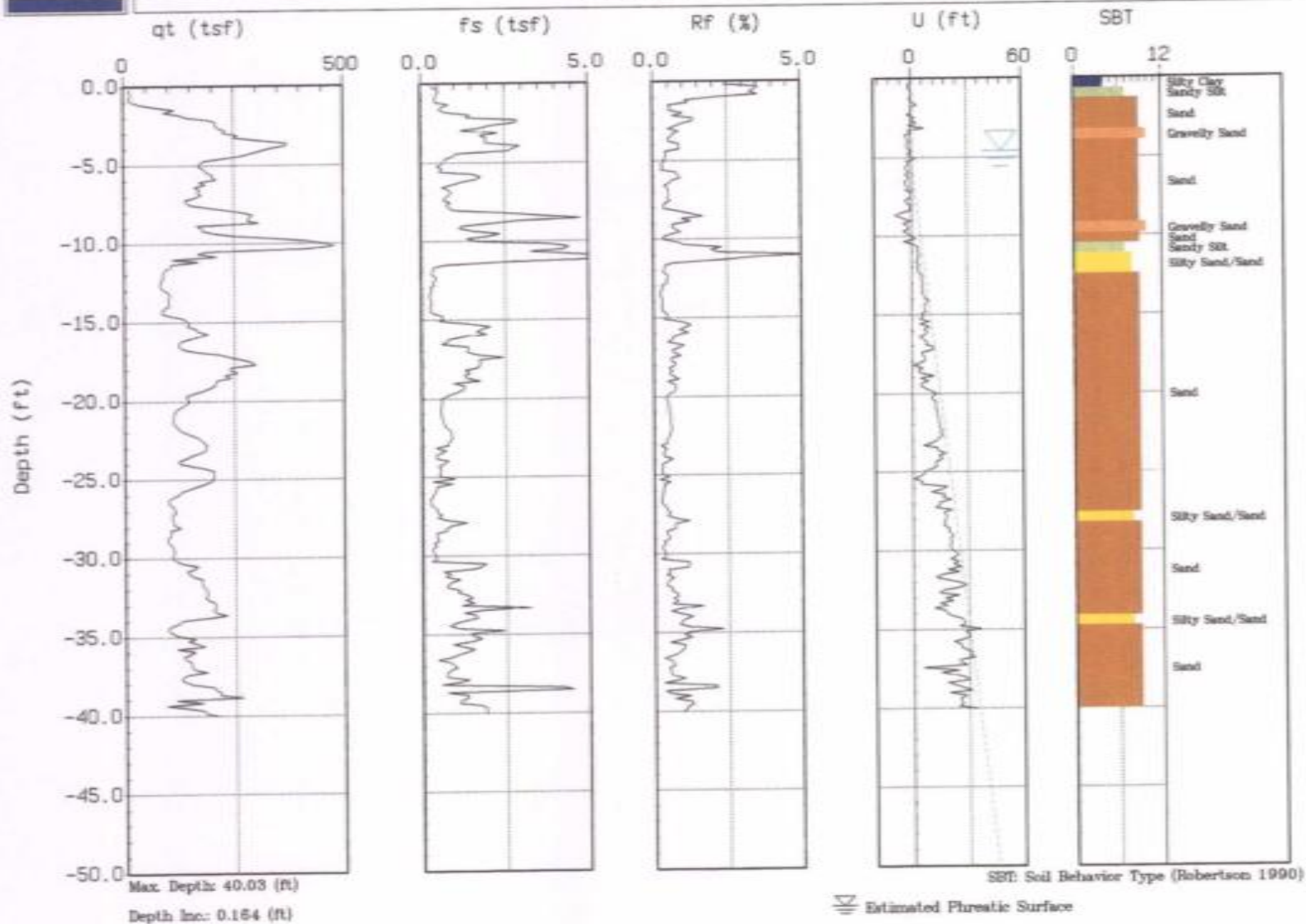


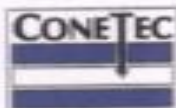


Shield Environmental

Site: CPT-1A
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09:10:03 09:57

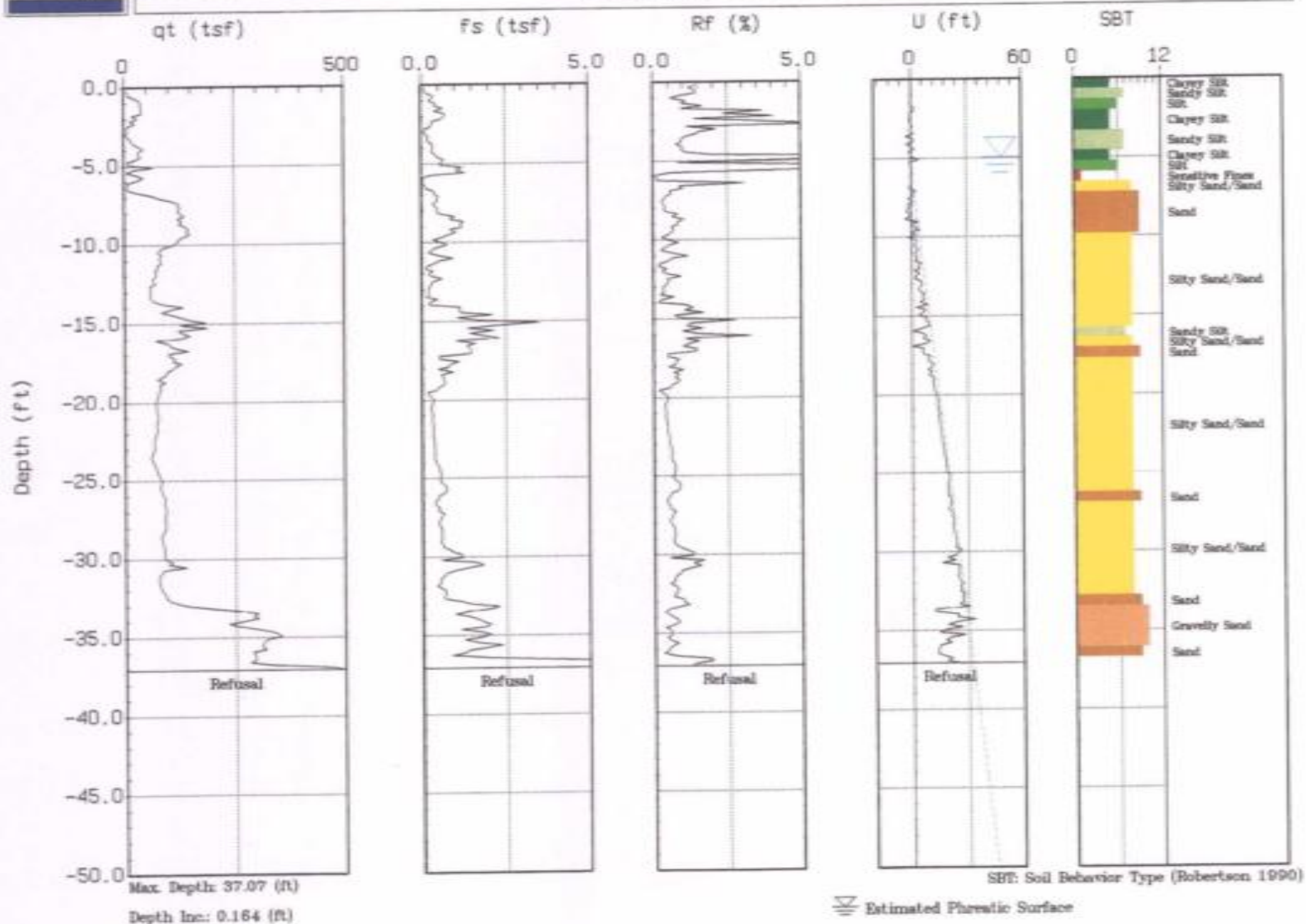


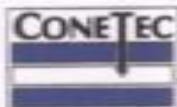


Shield Environmental

Site: CPT-2
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09:10:03 10:50

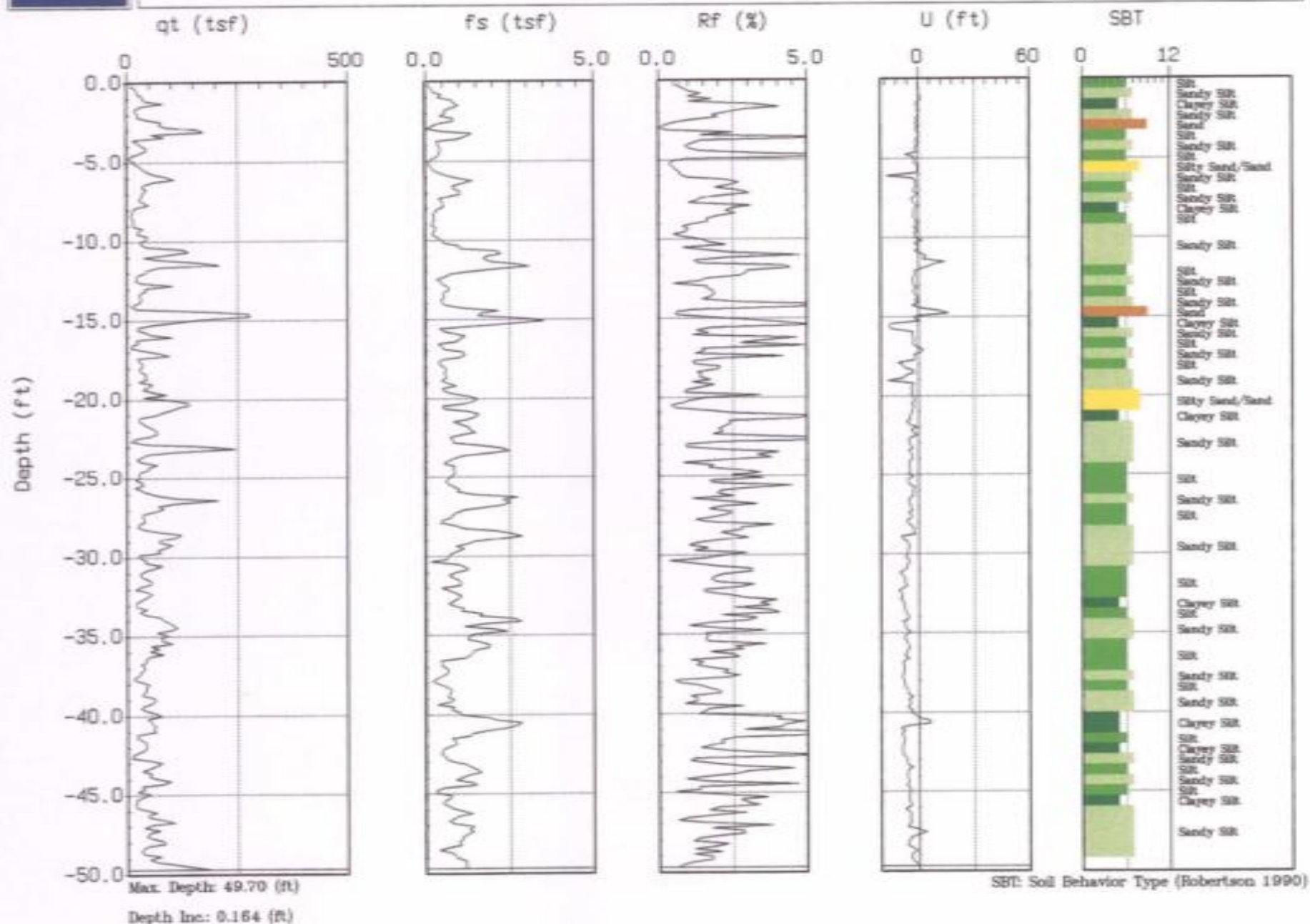


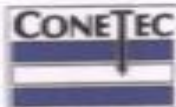


Shield Environmental

Site: CPT-3
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09:10:03 11:48

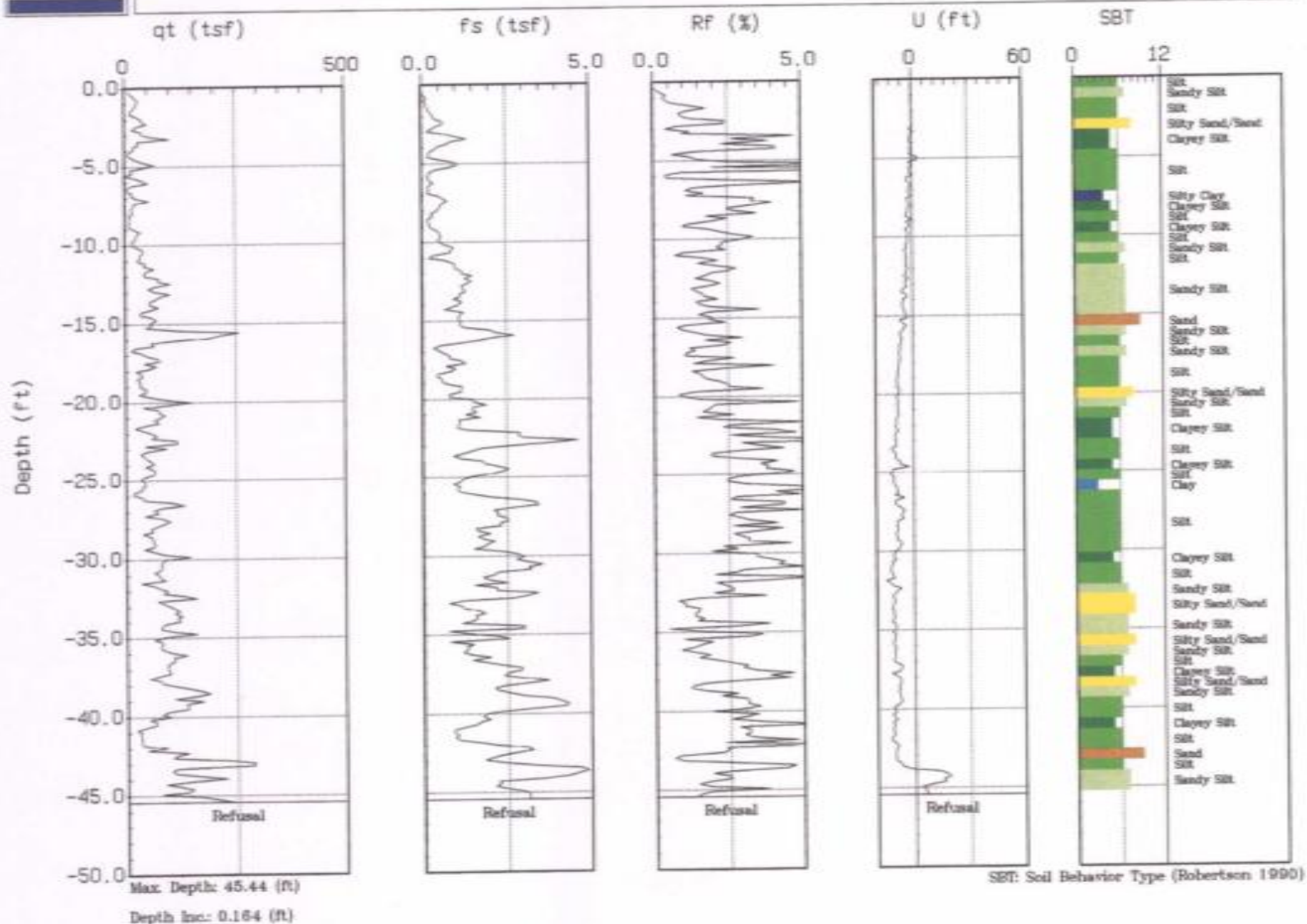


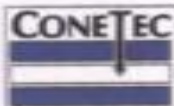


Shield Environmental

Site: CPT-4
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09:10:03 12:39

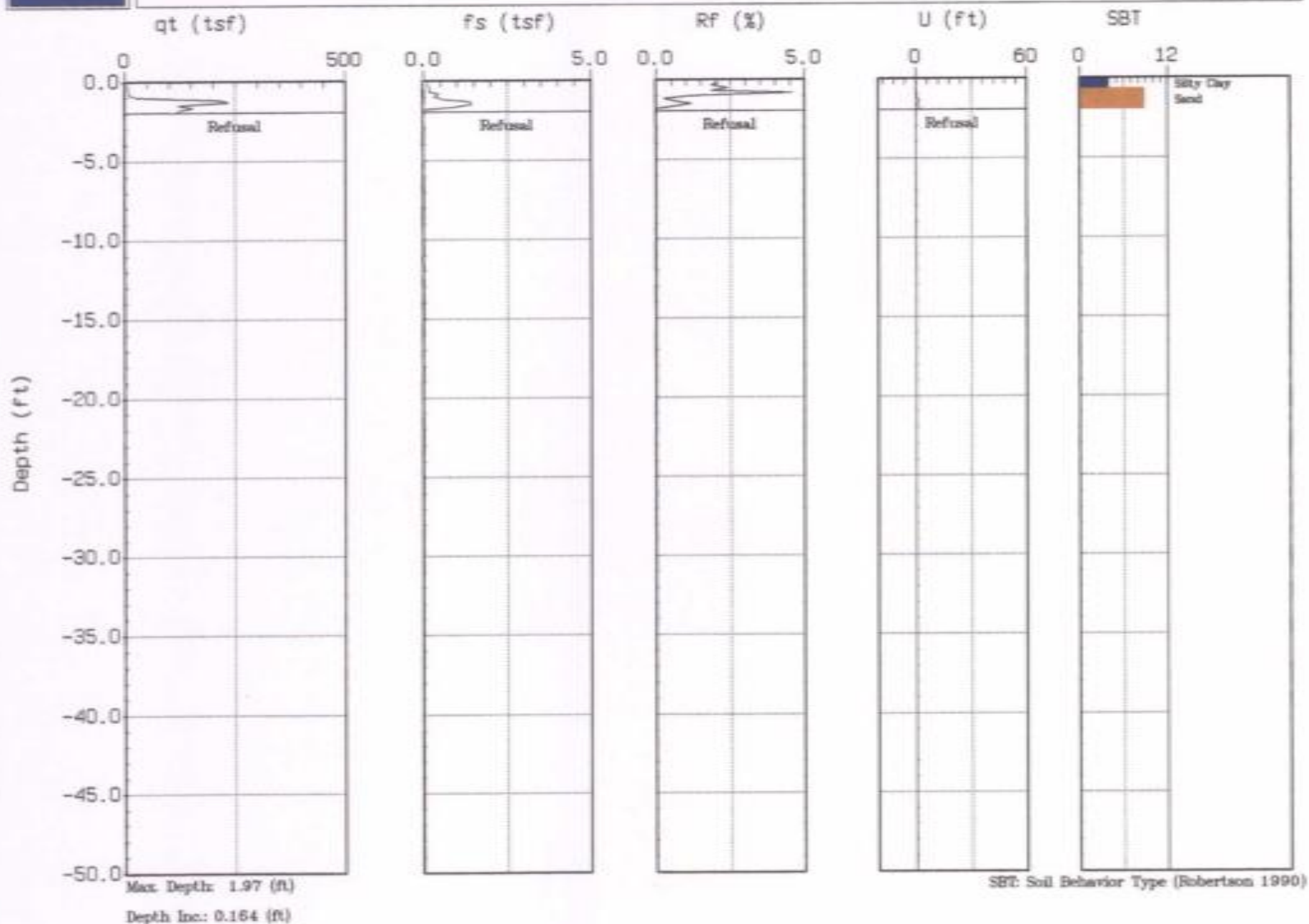


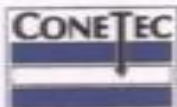


Shield Environmental

Site: CPT-5
Location: Peterson/Puritan

Cone: 20 TON A D139
Date: 09:10:03 13:35

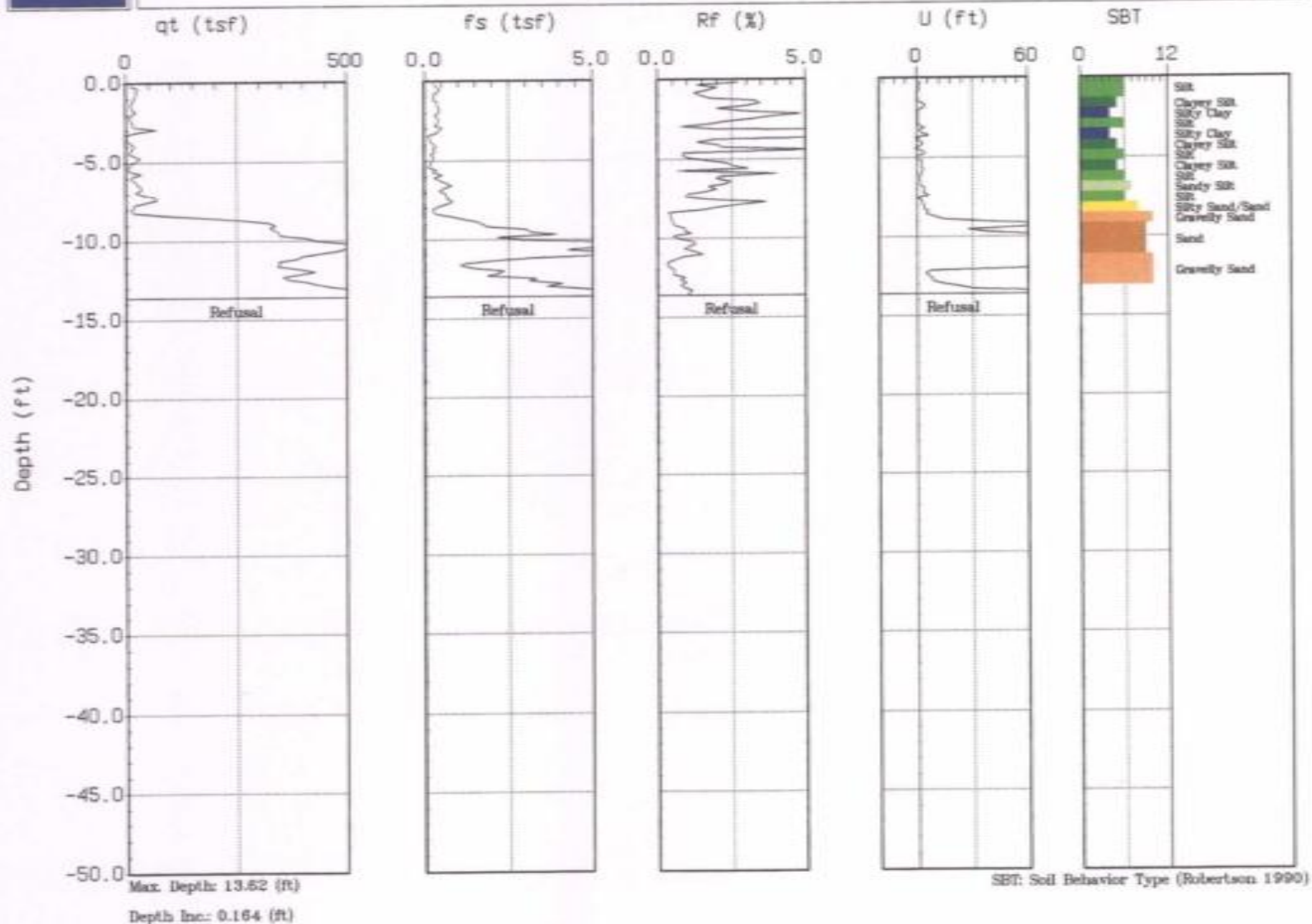


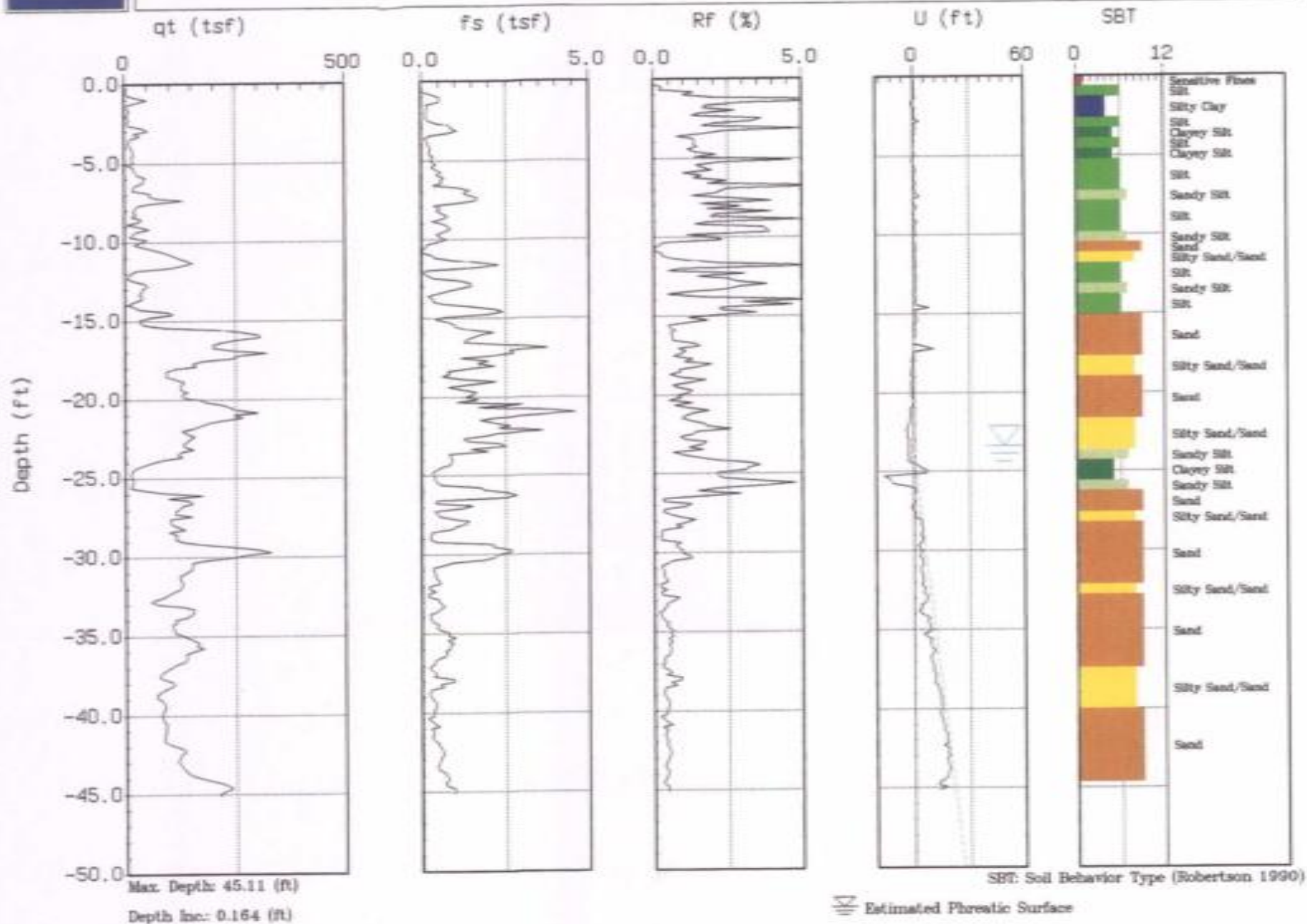
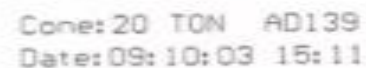


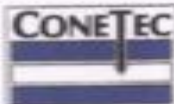
Shield Environmental

Site: CPT-5A
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09/10/03 13:43



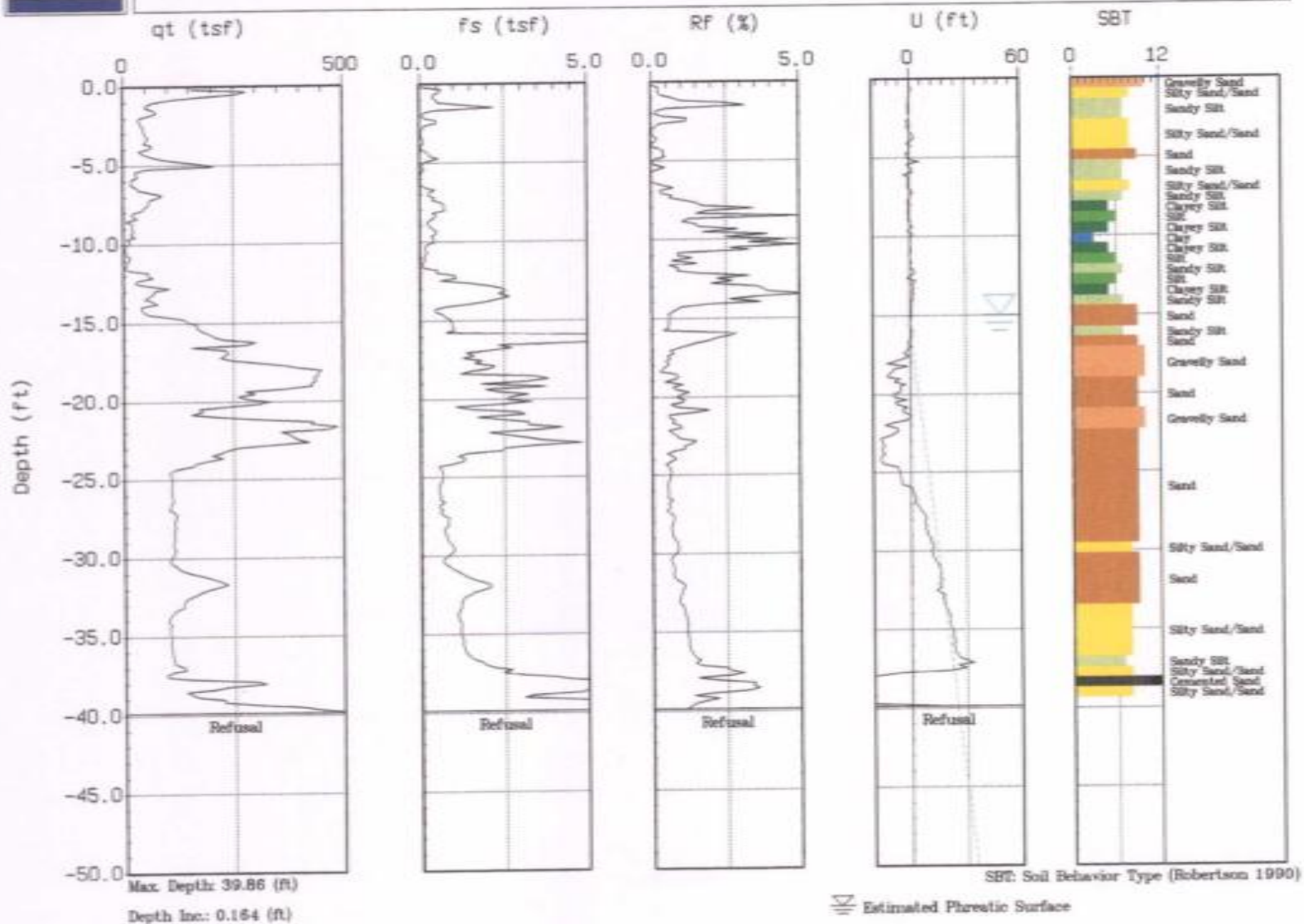


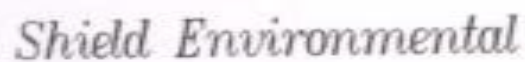


Shield Environmental

Site: CPT-7
Location: Peterson/Puritan

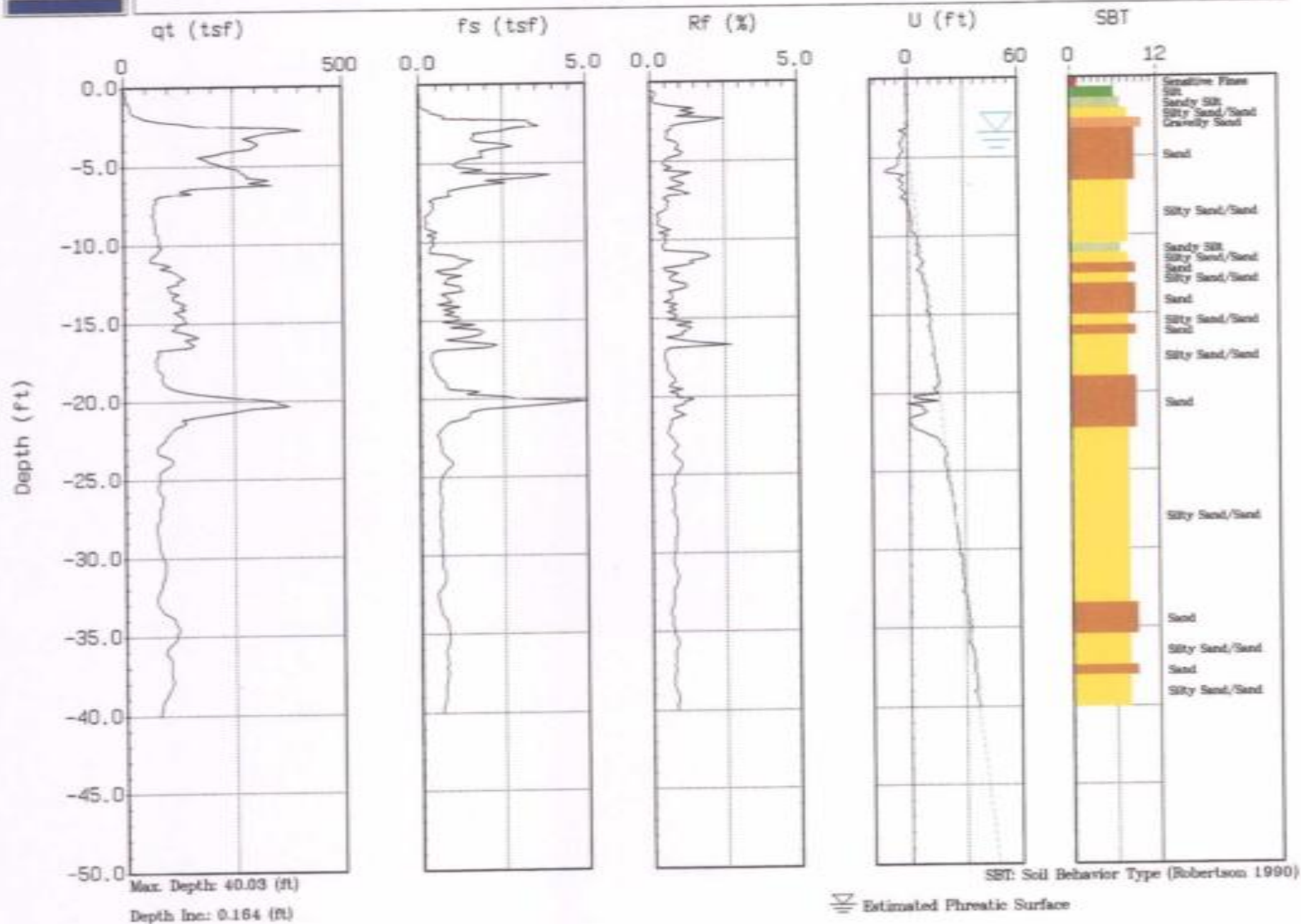
Cone: 20 TON AD139
Date: 09:10:03 16:26

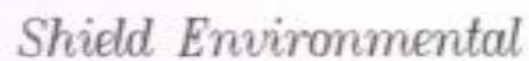




Site: CPT-8
Location: Peterson/Puritan

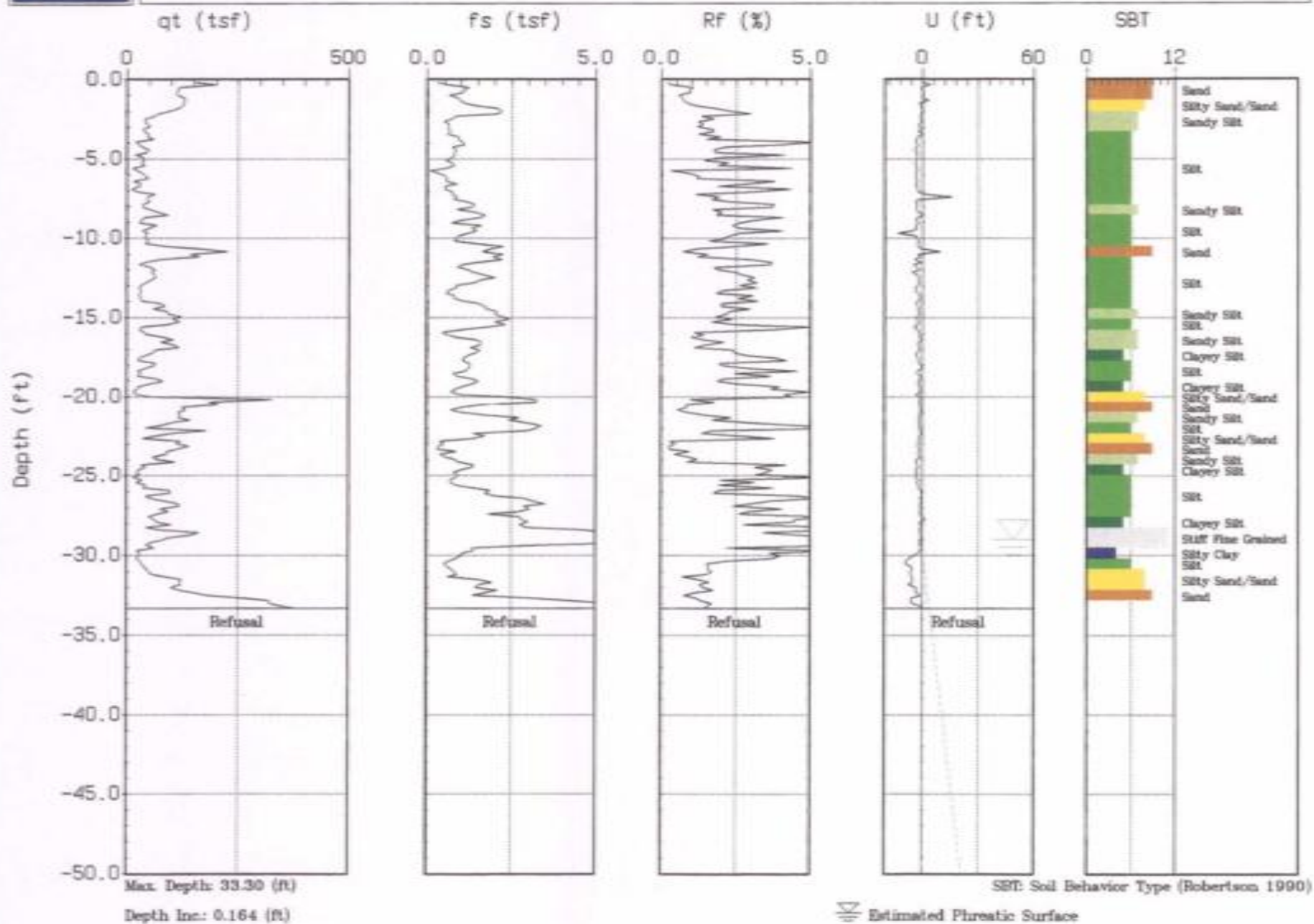
Cone: 20 TON AD139
Date: 09:10:03 17:24





Site: CPT-9
Location: Peterson/Puritan

Cone: 20 TON AD139
Date: 09:10:03 18:14



APPENDIX B

ConeTec Investigations Ltd. - CPT Interpretation

Client: Shield Environmental

Site: CPT-1

Location: Peterson/Puritan

: 20 TON AD139

Date: 09:10:03 09:32

Water Table (m): 1.42 (ft): 4.65 Unit Weight of Water (Default): 62.44 pcf

Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	EStress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qcn
1	0.10	0.33	12.41	0.30	2.44	5	18.85	1.89	1.89	0.00	2.00	6.0	11.9	95.13	5.0E-06	8	630.74
2	0.30	0.98	29.16	0.30	1.04	7	18.85	5.66	5.66	0.00	2.00	9.3	18.7	0.00	5.0E-04	6	493.90
3	0.50	1.64	117.21	0.80	0.69	9	18.85	9.43	9.43	0.00	2.00	22.5	45.0	0.00	5.0E-02	0	1192.6
4	0.70	2.30	166.15	1.10	0.66	9	18.85	13.20	13.20	0.00	2.00	31.9	63.8	0.00	5.0E-02	0	1207.6
5	0.90	2.95	228.00	3.23	1.42	8	18.85	16.97	16.97	0.00	2.00	54.7	109.4	0.00	5.0E-03	0	1288.9
6	1.10	3.61	296.52	1.63	0.55	10	18.85	20.74	20.74	0.00	2.00	47.4	94.9	0.00	5.0E+00	0	1371.6
7	1.30	4.27	287.49	2.33	0.81	9	18.85	24.51	24.51	0.00	1.98	55.2	109.1	0.00	5.0E-02	0	1125.0
8	1.50	4.92	269.32	2.02	0.75	9	18.85	28.28	27.47	0.81	1.87	51.7	96.6	0.00	5.0E-02	7	940.23
9	1.70	5.58	211.70	2.34	1.10	9	18.85	32.05	29.28	2.77	1.81	40.6	73.5	0.00	5.0E-02	6	693.05
10	1.90	6.23	130.87	1.39	1.06	8	18.85	35.82	31.09	4.73	1.76	31.4	55.1	0.00	5.0E-03	6	403.02
11	2.10	6.89	104.08	0.53	0.51	9	18.85	39.59	32.89	6.70	1.71	20.0	34.1	0.00	5.0E-02	6	302.53
12	2.30	7.55	112.65	0.55	0.49	9	18.85	43.36	34.70	8.66	1.66	21.6	35.9	0.00	5.0E-02	6	310.38
13	2.50	8.20	227.39	2.20	0.97	9	18.85	47.13	36.51	10.62	1.62	43.7	70.7	0.00	5.0E-02	6	596.59
14	2.70	8.86	507.76	3.21	0.63	10	18.85	50.90	38.32	12.58	1.58	81.2	128.4	0.00	5.0E+00	0	1270.7

ConeTec Investigations Ltd. - CPT Interpretation
Client: Shield Environmental
Site: CPT-1A
Location: Peterson/Puritan
Cone: 20 TON AD139
a: 09:10:03 09:57

Water Table (m): 1.42 (ft): 4.65 Unit Weight of Water (Default): 62.44 pcf
Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	EStress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	14.00	0.44	3.18	4	18.85	1.89	1.89	0.00	2.00	9.0	17.9	107.39	5.0E-07	8	712.00
2	0.30	0.98	34.97	0.52	1.48	7	18.85	5.66	5.66	0.00	2.00	11.2	22.4	0.00	5.0E-04	6	592.55
3	0.50	1.64	119.25	0.83	0.69	9	18.85	9.43	9.43	0.00	2.00	22.9	45.8	0.00	5.0E-02	0	1213.4
4	0.70	2.30	207.97	2.28	1.10	9	18.85	13.20	13.20	0.00	2.00	39.9	79.9	0.00	5.0E-02	0	1511.8
5	0.90	2.95	241.51	1.76	0.73	9	18.85	16.97	16.97	0.00	2.00	46.4	92.7	0.00	5.0E-02	0	1365.4
6	1.10	3.61	346.25	2.19	0.63	10	18.85	20.74	20.74	0.00	2.00	55.4	110.8	0.00	5.0E+00	0	1601.8
7	1.30	4.27	271.39	1.84	0.68	9	18.85	24.51	24.51	0.00	1.98	52.1	103.0	0.00	5.0E-02	0	1062.0
8	1.50	4.92	176.46	0.62	0.35	9	18.85	28.28	27.47	0.81	1.87	33.9	63.3	0.00	5.0E-02	7	615.67
9	1.70	5.58	199.06	1.12	0.57	9	18.85	32.05	29.28	2.77	1.81	38.2	69.1	0.00	5.0E-02	7	651.61
10	1.90	6.23	172.32	1.09	0.63	9	18.85	35.82	31.09	4.73	1.76	33.1	58.1	0.00	5.0E-02	7	531.01
11	2.10	6.89	160.35	0.81	0.50	9	18.85	39.59	32.89	6.70	1.71	30.8	52.5	0.00	5.0E-02	7	466.75
12	2.30	7.55	178.11	0.77	0.43	9	18.85	43.36	34.70	8.66	1.66	34.2	56.8	0.00	5.0E-02	7	491.46
13	2.50	8.20	283.00	2.91	1.03	9	18.85	47.13	36.51	10.62	1.62	54.3	88.0	0.00	5.0E-02	6	742.80
14	2.70	8.86	207.23	1.84	0.89	9	18.85	50.90	38.32	12.58	1.58	39.8	62.9	0.00	5.0E-02	6	517.83
15	2.90	9.51	306.54	1.82	0.59	10	18.85	54.67	40.13	14.54	1.54	49.0	75.8	0.00	5.0E+00	7	731.98
16	3.10	10.17	386.99	3.54	0.91	9	18.85	58.44	41.94	16.51	1.51	74.3	112.3	0.00	5.0E-02	7	884.48
17	3.30	10.83	163.73	4.90	2.99	7	18.85	62.22	43.75	18.47	1.48	52.4	77.5	0.00	5.0E-04	8	357.88
18	3.50	11.48	99.11	0.98	0.98	8	18.85	66.99	45.55	20.43	1.45	23.8	34.5	0.00	5.0E-03	6	207.41
19	3.70	12.14	85.68	0.35	0.41	8	18.85	69.76	47.36	22.39	1.42	20.6	29.2	0.00	5.0E-03	6	172.19
20	3.90	12.80	88.22	0.31	0.35	9	18.85	73.53	49.17	24.35	1.40	16.9	23.6	0.00	5.0E-02	6	170.74
21	4.10	13.45	100.89	0.25	0.25	9	18.85	77.30	50.98	26.32	1.37	19.4	26.6	0.00	5.0E-02	6	188.47
22	4.30	14.11	90.55	0.26	0.28	9	18.85	81.07	52.79	28.28	1.35	17.4	23.4	0.00	5.0E-02	6	163.13
23	4.50	14.76	131.50	0.52	0.40	9	18.85	84.84	54.60	30.24	1.32	25.2	33.4	0.00	5.0E-02	6	22
24	4.70	15.42	165.00	1.71	1.04	9	18.85	88.61	56.41	32.20	1.30	31.7	41.3	0.00	5.0E-02	6	27
25	4.90	16.08	140.77	1.18	0.84	9	18.85	92.38	58.22	34.16	1.28	27.0	34.7	0.00	5.0E-02	6	230.55
26	5.10	16.73	159.26	1.17	0.73	9	18.85	96.15	60.02	36.13	1.26	30.6	38.6	0.00	5.0E-02	6	253.11
27	5.30	17.39	273.14	1.88	0.69	9	18.85	99.92	61.83	38.09	1.24	52.4	65.3	0.00	5.0E-02	6	422.45
28	5.50	18.04	241.43	1.52	0.63	9	18.85	103.69	63.64	40.05	1.23	46.4	56.9	0.00	5.0E-02	6	362.56
29	5.70	18.70	215.33	1.32	0.61	9	18.85	107.46	65.45	42.01	1.21	41.3	50.0	0.00	5.0E-02	6	314.20
30	5.90	19.36	165.08	1.15	0.70	9	18.85	111.23	67.26	43.97	1.19	31.7	37.8	0.00	5.0E-02	6	233.97
31	6.10	20.01	139.32	0.62	0.44	9	18.85	115.00	69.07	45.94	1.18	26.8	31.5	0.00	5.0E-02	6	191.99
32	6.30	20.67	113.92	0.56	0.49	9	18.85	118.77	70.88	47.90	1.16	21.9	25.4	0.00	5.0E-02	6	152.63
33	6.50	21.33	111.81	0.62	0.55	9	18.85	122.55	72.68	49.86	1.15	21.5	24.6	0.00	5.0E-02	6	145.99
34	6.70	21.98	143.15	0.81	0.56	9	18.85	126.32	74.49	51.82	1.13	27.5	31.2	0.00	5.0E-02	6	182.79
35	6.90	22.64	179.78	0.82	0.46	9	18.85	130.09	76.30	53.78	1.12	34.5	38.7	0.00	5.0E-02	6	224.48
36	7.10	23.29	160.55	0.51	0.32	9	18.85	133.86	78.11	55.75	1.11	30.8	34.1	0.00	5.0E-02	6	195.60
37	7.30	23.95	144.72	0.57	0.39	9	18.85	137.63	79.92	57.71	1.09	27.8	30.4	0.00	5.0E-02	6	172.11
38	7.50	24.61	201.10	0.53	0.26	9	18.85	141.40	81.73	59.67	1.08	38.6	41.8	0.00	5.0E-02	7	234.49
39	7.70	25.26	171.95	0.65	0.38	9	18.85	145.17	83.54	61.63	1.07	33.0	35.4	0.00	5.0E-02	6	195.87
40	7.90	25.92	114.88	0.34	0.30	9	18.85	148.94	85.34	63.59	1.06	22.1	23.4	0.00	5.0E-02	6	127.47
41	8.10	26.57	104.54	0.26	0.25	9	18.85	152.71	87.15	65.56	1.05	20.1	21.0	0.00	5.0E-02	6	113.40
42	8.30	27.23	108.33	0.48	0.44	9	18.85	156.48	88.96	67.52	1.04	20.8	21.6	0.00	5.0E-02	6	115.14
43	8.50	27.89	111.60	0.91	0.81	8	18.85	160.25	90.77	69.48	1.03	26.8	27.5	0.00	5.0E-03	6	116.27
44	8.70	28.54	98.59	0.49	0.50	9	18.85	164.02	92.58	71.44	1.02	18.9	19.3	0.00	5.0E-02	6	100.46
45	8.90	29.20	105.44	0.37	0.35	9	18.85	167.79	94.39	73.40	1.01	20.2	20.4	0.00	5.0E-02	6	105.46
46	9.10	29.86	109.91	0.35	0.32	9	18.85	171.56	96.20	75.37	1.00	21.1	21.1	0.00	5.0E-02	6	107.91
47	9.30	30.51	146.32	1.36	0.93	9	18.85	175.33	98.00	77.33	0.99	28.1	27.8	0.00	5.0E-02	6	141.54
48	9.50	31.17	161.47	0.80	0.49	9	18.85	179.10	99.81	79.29	0.98	31.0	30.4	0.00	5.0E-02	6	153.50
49	9.70	31.82	180.00	0.85	0.47	9	18.85	182.88	101.62	81.25	0.97	34.6	33.6	0.00	5.0E-02	6	168.24
50	9.90	32.48	189.50	1.26	0.67	9	18.85	186.65	103.43	83.21	0.96	36.4	35.0	0.00	5.0E-02	6	174.08
51	10.10	33.14	202.59	1.91	0.95	9	18.85	190.42	105.24	85.18	0.95	38.9	37.1	0.00	5.0E-02	6	182.99
52	10.30	33.79	167.38	1.41	0.84	9	18.85	194.19	107.05	87.14	0.95	32.1	30.4	0.00	5.0E-02	6	148.29
53	10.50	34.45	100.83	1.31	1.29	8	18.85	197.96	108.86	89.10	0.94	24.2	22.7	0.00	5.0E-03	6	87.10
54	10.70	35.10	144.50	1.53	1.06	9	18.85	201.73	110.67	91.06	0.93	27.7	25.8	0.00	5.0E-02	6	123.53
55	10.90	35.76	148.58	1.21	0.82	9	18.85	205.50	112.47	93.02	0.92	28.5	26.3	0.00	5.0E-02	6	124
56	11.10	36.42	140.53	0.78	0.55	9	18.85	209.27	114.28	94.99	0.92	27.0	24.7	0.00	5.0E-02	6	116
57	11.30	37.07	156.74	0.85	0.54	9	18.85	213.04	116.09	96.95	0.91	30.1	27.3	0.00	5.0E-02	6	127.78
58	11.50	37.73	134.89	0.96	0.71	9	18.85	216.81	117.90	98.91	0.90	25.9	23.3	0.00	5.0E-02	6	107.99
59	11.70	38.39	207.88	2.48	1.19	9	18.85	220.58	119.71	100.87	0.89	39.9	35.7	0.00	5.0E-02	6	164.86

60	11.90	39.04	161.25	1.22	0.76	9	18.85	224.35	121.52	102.83	0.89	31.0	27.5	0.00	5.0E-02	6	125.55
61	12.10	39.70	176.33	1.85	1.05	9	18.85	228.12	123.33	104.80	0.88	33.9	29.8	0.00	5.0E-02	6	135.41

ConeTec Investigations Ltd. - CPT Interpretation
Client: Shield Environmental
Site: CPT-2
Location: Peterson/Puritan
Cone: 20 TON AD139
e: 09:10:03 10:50

Water Table (m): 1.52 (ft): 5.00 Unit Weight of Water (Default): 62.44 pcf
Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	EStress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	10.99	0.15	1.39	5	18.85	1.89	1.89	0.00	2.00	5.3	10.6	84.28	5.0E-06	6	558.80
2	0.30	0.98	37.20	0.33	0.89	7	18.85	5.66	5.66	0.00	2.00	11.9	23.8	0.00	5.0E-04	6	630.46
3	0.50	1.64	31.55	0.60	1.89	6	18.85	9.43	9.43	0.00	2.00	12.1	24.2	241.54	5.0E-05	6	320.29
4	0.70	2.30	12.73	0.37	2.93	5	18.85	13.20	13.20	0.00	2.00	6.1	12.2	96.70	5.0E-06	5	91.59
5	0.90	2.95	7.81	0.11	1.47	5	18.85	16.97	16.97	0.00	2.00	3.7	7.5	58.59	5.0E-06	5	43.16
6	1.10	3.61	28.98	0.27	0.91	7	18.85	20.74	20.74	0.00	2.00	9.3	18.5	0.00	5.0E-04	6	133.16
7	1.30	4.27	31.03	0.37	1.20	7	18.85	24.51	24.51	0.00	1.98	9.9	19.6	0.00	5.0E-04	6	120.56
8	1.50	4.92	25.67	0.75	2.92	5	18.85	28.28	28.28	0.00	1.84	12.3	22.7	194.89	5.0E-06	5	86.14
9	1.70	5.58	27.04	0.65	2.39	6	18.85	32.05	30.32	1.73	1.78	10.4	18.5	205.07	5.0E-05	5	84.53
10	1.90	6.23	8.00	0.06	0.72	1	18.85	35.82	32.13	3.69	1.73	3.8	6.6	58.56	1.0E-07	5	22.78
11	2.10	6.89	72.25	0.41	0.57	8	18.85	39.59	33.94	5.65	1.68	17.3	29.1	0.00	5.0E-03	6	203.19
12	2.30	7.55	122.86	0.41	0.33	9	18.85	43.36	35.75	7.61	1.64	23.6	38.6	0.00	5.0E-02	7	328.72
13	2.50	8.20	127.89	0.70	0.55	9	18.85	47.13	37.56	9.57	1.60	24.6	39.2	0.00	5.0E-02	6	325.64
14	2.70	8.86	137.25	1.11	0.81	9	18.85	50.90	39.37	11.54	1.56	26.4	41.1	0.00	5.0E-02	6	333.41
15	2.90	9.51	130.70	0.68	0.52	9	18.85	54.67	41.18	13.50	1.53	25.1	38.3	0.00	5.0E-02	6	303.38
16	3.10	10.17	88.44	0.50	0.57	8	18.85	58.44	42.98	15.46	1.49	21.2	31.7	0.00	5.0E-03	6	196.17
17	3.30	10.83	81.54	0.54	0.66	8	18.85	62.22	44.79	17.42	1.46	19.6	28.6	0.00	5.0E-03	6	173.36
18	3.50	11.48	72.38	0.23	0.32	8	18.85	65.99	46.60	19.38	1.43	17.4	24.9	0.00	5.0E-03	6	147.69
19	3.70	12.14	67.11	0.35	0.52	8	18.85	69.76	48.41	21.35	1.41	16.1	22.7	0.00	5.0E-03	6	131.63
20	3.90	12.80	58.51	0.23	0.39	8	18.85	73.53	50.22	23.31	1.38	14.0	19.4	0.00	5.0E-03	6	110.38
21	4.10	13.45	69.15	0.25	0.37	8	18.85	77.30	52.03	25.27	1.36	16.6	22.5	0.00	5.0E-03	6	126.11
22	4.30	14.11	107.46	0.90	0.84	8	18.85	81.07	53.84	27.23	1.33	25.8	34.4	0.00	5.0E-03	6	190.11
23	4.50	14.76	145.61	2.08	1.43	8	18.85	84.84	55.64	29.19	1.31	34.9	45.9	0.00	5.0E-03	6	249
	4.70	15.42	146.58	1.80	1.22	8	18.85	88.61	57.45	31.16	1.29	35.2	45.4	0.00	5.0E-03	6	241
25	4.90	16.08	99.55	1.70	1.71	7	18.85	92.38	59.26	33.12	1.27	31.9	40.5	0.00	5.0E-04	6	159.70
26	5.10	16.73	114.31	1.42	1.24	8	18.85	96.15	61.07	35.08	1.25	27.4	34.4	0.00	5.0E-03	6	178.11
27	5.30	17.39	116.51	0.74	0.64	9	18.85	99.92	62.88	37.04	1.23	22.4	27.6	0.00	5.0E-02	6	176.30
28	5.50	18.04	95.02	0.69	0.72	8	18.85	103.69	64.69	39.00	1.22	22.8	27.7	0.00	5.0E-03	6	139.41
29	5.70	18.70	81.16	0.64	0.79	8	18.85	107.46	66.50	40.97	1.20	19.5	23.4	0.00	5.0E-03	6	115.55
30	5.90	19.36	76.37	0.31	0.41	8	18.85	111.23	68.30	42.93	1.18	18.3	21.7	0.00	5.0E-03	6	105.70
31	6.10	20.01	70.43	0.30	0.43	8	18.85	115.00	70.11	44.89	1.17	16.9	19.8	0.00	5.0E-03	6	94.79
32	6.30	20.67	73.37	0.27	0.37	8	18.85	118.77	71.92	46.85	1.15	17.6	20.3	0.00	5.0E-03	6	96.28
33	6.50	21.33	72.46	0.30	0.41	8	18.85	122.55	73.73	48.81	1.14	17.4	19.8	0.00	5.0E-03	6	92.68
34	6.70	21.98	70.14	0.31	0.45	8	18.85	126.32	75.54	50.78	1.13	16.8	19.0	0.00	5.0E-03	6	87.46
35	6.90	22.64	66.29	0.34	0.51	8	18.85	130.09	77.35	52.74	1.11	15.9	17.7	0.00	5.0E-03	6	80.59
36	7.10	23.29	60.76	0.35	0.58	8	18.85	133.86	79.16	54.70	1.10	14.6	16.0	0.00	5.0E-03	6	72.00
37	7.30	23.95	67.10	0.42	0.63	8	18.85	137.63	80.97	56.66	1.09	16.1	17.5	0.00	5.0E-03	6	77.87
38	7.50	24.61	77.15	0.52	0.68	8	18.85	141.40	82.77	58.62	1.08	18.5	19.9	0.00	5.0E-03	6	87.77
39	7.70	25.26	80.47	0.61	0.75	8	18.85	145.17	84.58	60.59	1.06	19.3	20.6	0.00	5.0E-03	6	89.61
40	7.90	25.92	86.85	0.58	0.67	8	18.85	148.94	86.39	62.55	1.05	20.8	21.9	0.00	5.0E-03	6	94.79
41	8.10	26.57	90.09	0.41	0.46	9	18.85	152.71	88.20	64.51	1.04	17.3	18.0	0.00	5.0E-02	6	96.33
42	8.30	27.23	90.21	0.56	0.62	8	18.85	156.48	90.01	66.47	1.03	21.6	22.3	0.00	5.0E-03	6	94.47
43	8.50	27.89	90.32	0.50	0.56	8	18.85	160.25	91.82	68.43	1.02	21.7	22.1	0.00	5.0E-03	6	92.69
44	8.70	28.54	82.63	0.56	0.68	8	18.85	164.02	93.63	70.40	1.01	19.8	20.1	0.00	5.0E-03	6	82.97
45	8.90	29.20	86.65	0.61	0.71	8	18.85	167.79	95.43	72.36	1.00	20.8	20.8	0.00	5.0E-03	6	85.41
46	9.10	29.86	93.41	0.96	1.03	8	18.85	171.56	97.24	74.32	0.99	22.4	22.2	0.00	5.0E-03	6	90.45
47	9.30	30.51	101.03	1.43	1.42	8	18.85	175.33	99.05	76.28	0.98	24.2	23.8	0.00	5.0E-03	6	96.14
48	9.50	31.17	75.52	0.60	0.79	8	18.85	179.10	100.86	78.24	0.97	18.1	17.7	0.00	5.0E-03	6	70.11
49	9.70	31.82	81.39	0.54	0.66	8	18.85	182.88	102.67	80.21	0.97	19.5	18.9	0.00	5.0E-03	6	74.32
50	9.90	32.48	100.00	0.76	0.76	8	18.85	186.65	104.48	82.17	0.96	24.0	23.0	0.00	5.0E-03	6	90.10
51	10.10	33.14	224.49	1.76	0.78	9	18.85	190.42	106.29	84.13	0.95	43.1	40.9	0.00	5.0E-02	6	200.98
52	10.30	33.79	274.09	1.42	0.52	10	18.85	194.19	108.09	86.09	0.94	43.9	41.3	0.00	5.0E+00	6	241.63
53	10.50	34.45	304.37	1.67	0.55	10	18.85	197.96	109.90	88.05	0.93	48.7	45.5	0.00	5.0E+00	6	264.06
	10.70	35.10	325.54	1.64	0.50	10	18.85	201.73	111.71	90.02	0.93	52.1	48.2	0.00	5.0E+00	6	277.95
	10.90	35.76	302.81	1.72	0.57	10	18.85	205.50	113.52	91.98	0.92	48.4	44.5	0.00	5.0E+00	6	254
56	11.10	36.42	300.35	3.66	1.22	9	18.85	209.27	115.33	93.94	0.91	57.7	52.6	0.00	5.0E-02	6	241

ConeTec Investigations Ltd. - CPT Interpretation
Client: Shield Environmental
Site: CPT-3
Location: Peterson/Puritan
Cone: 20 TON AD139
a: 09:10:03 11:48

Water Table (m): 16.76 (ft): 55.00 Unit Weight of Water (Default): 62.44 pcf
Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Ps (tsf)	Rf (%)	SET	U Wt (kN/m ³)	TStress (kPa)	ESTress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	17.80	0.15	0.81	6	18.85	1.89	1.89	0.00	2.00	6.8	13.7	136.53	5.0E-05	7	905.22
2	0.30	0.98	48.18	0.60	1.24	7	18.85	5.66	5.66	0.00	2.00	15.4	30.8	0.00	5.0E-04	6	816.79
3	0.50	1.64	23.47	0.71	3.05	5	18.85	9.43	9.43	0.00	2.00	11.3	22.5	179.46	5.0E-06	8	237.97
4	0.70	2.30	53.77	0.60	1.11	7	18.85	13.20	13.20	0.00	2.00	17.2	34.4	0.00	5.0E-04	6	390.13
5	0.90	2.95	119.07	0.50	0.42	9	18.85	16.97	16.97	0.00	2.00	22.9	45.7	0.00	5.0E-02	7	672.66
6	1.10	3.61	37.73	0.70	1.87	6	18.85	20.74	20.74	0.00	2.00	14.5	29.0	288.07	5.0E-05	6	173.63
7	1.30	4.27	31.86	0.40	1.26	7	18.85	24.51	24.51	0.00	1.98	10.2	20.2	0.00	5.0E-04	6	123.78
8	1.50	4.92	16.17	0.15	0.94	6	18.85	28.28	28.28	0.00	1.84	6.2	11.4	121.94	5.0E-05	5	53.90
9	1.70	5.58	55.93	0.36	0.64	8	18.85	32.05	32.05	0.00	1.73	13.4	23.2	0.00	5.0E-03	6	166.53
10	1.90	6.23	60.10	1.06	1.76	7	18.85	35.82	35.82	0.00	1.64	19.2	31.4	0.00	5.0E-04	6	160.07
11	2.10	6.89	36.32	0.88	2.43	6	18.85	39.59	39.59	0.00	1.56	13.9	21.7	275.74	5.0E-05	5	87.06
12	2.30	7.55	33.16	0.48	1.45	7	18.85	43.36	43.36	0.00	1.49	10.6	15.8	0.00	5.0E-04	5	72.40
13	2.50	8.20	11.61	0.26	2.28	5	18.85	47.13	47.13	0.00	1.43	5.6	7.9	85.37	5.0E-06	4	22.64
14	2.70	8.86	19.60	0.23	1.17	6	18.85	50.90	50.90	0.00	1.37	7.5	10.3	146.48	5.0E-05	5	35.97
15	2.90	9.51	34.72	0.27	0.77	7	18.85	54.67	54.67	0.00	1.32	11.1	14.7	0.00	5.0E-04	6	59.97
16	3.10	10.17	58.77	0.75	1.27	7	18.85	58.44	58.44	0.00	1.28	18.8	24.1	0.00	5.0E-04	6	95.54
17	3.30	10.83	85.77	1.95	2.28	7	18.85	62.22	62.22	0.00	1.24	27.4	34.1	0.00	5.0E-04	5	131.34
18	3.50	11.48	122.61	2.45	2.00	7	18.85	65.99	65.99	0.00	1.20	39.2	47.3	0.00	5.0E-04	6	177.38
19	3.70	12.14	27.17	0.72	2.65	6	18.85	69.76	69.76	0.00	1.17	10.4	12.2	203.11	5.0E-05	4	36.40
20	3.90	12.80	53.89	0.57	1.06	7	18.85	73.53	73.53	0.00	1.14	17.2	19.7	0.00	5.0E-04	6	69.36
21	4.10	13.45	30.13	0.52	1.73	6	18.85	77.30	77.30	0.00	1.11	11.6	12.9	225.25	5.0E-05	5	36.43
22	4.30	14.11	60.17	1.08	1.79	7	18.85	81.07	81.07	0.00	1.09	19.3	20.9	0.00	5.0E-04	5	70.25
23	4.50	14.76	208.54	2.41	1.16	9	18.85	84.84	84.84	0.00	1.06	40.0	42.5	0.00	5.0E-02	6	234.98
	4.70	15.42	37.66	1.21	3.21	5	18.85	88.61	88.61	0.00	1.04	18.1	18.8	282.15	5.0E-06	4	39.80
25	4.90	16.08	50.89	1.00	1.96	7	18.85	92.38	92.38	0.00	1.02	16.3	16.6	0.00	5.0E-04	5	51.88
26	5.10	16.73	32.90	0.62	1.88	6	18.85	96.15	96.15	0.00	1.00	12.6	12.6	244.95	5.0E-05	5	31.84
27	5.30	17.39	44.54	0.76	1.71	7	18.85	99.92	99.92	0.00	0.98	14.3	14.0	0.00	5.0E-04	5	41.79
28	5.50	18.04	33.74	0.53	1.57	6	18.85	103.69	103.69	0.00	0.96	13.0	12.5	250.84	5.0E-05	5	30.24
29	5.70	18.70	42.13	0.57	1.35	7	18.85	107.46	107.46	0.00	0.94	13.5	12.7	0.00	5.0E-04	5	36.64
30	5.90	19.36	57.34	0.67	1.17	7	18.85	111.23	111.23	0.00	0.93	18.3	17.0	0.00	5.0E-04	5	48.49
31	6.10	20.01	102.43	1.34	1.30	8	18.85	115.00	115.00	0.00	0.91	24.6	22.4	0.00	5.0E-03	5	84.50
32	6.30	20.67	89.50	0.97	1.09	8	18.85	118.77	118.77	0.00	0.90	21.5	19.3	0.00	5.0E-03	6	71.34
33	6.50	21.33	32.97	1.13	3.44	5	18.85	122.55	122.55	0.00	0.88	15.8	14.0	243.43	5.0E-06	4	24.83
34	6.70	21.98	60.97	1.26	2.06	7	18.85	126.32	126.32	0.00	0.87	19.5	17.0	0.00	5.0E-04	5	45.34
35	6.90	22.64	59.87	0.98	1.63	7	18.85	130.09	130.09	0.00	0.86	19.2	16.4	0.00	5.0E-04	5	43.18
36	7.10	23.29	108.95	1.93	1.77	7	18.85	133.86	133.86	0.00	0.85	34.9	29.5	0.00	5.0E-04	5	77.14
37	7.30	23.95	41.74	0.73	1.74	7	18.85	137.63	137.63	0.00	0.83	13.4	11.1	0.00	5.0E-04	5	28.12
38	7.50	24.61	33.23	0.81	2.44	6	18.85	141.40	141.40	0.00	0.82	12.8	10.5	243.88	5.0E-05	4	21.56
39	7.70	25.26	27.03	0.68	2.52	6	18.85	145.17	145.17	0.00	0.81	10.4	8.4	195.97	5.0E-05	4	16.87
40	7.90	25.92	64.16	1.50	2.34	6	18.85	148.94	148.94	0.00	0.80	24.6	19.8	480.84	5.0E-05	5	40.36
41	8.10	26.57	118.50	2.21	1.87	7	18.85	152.71	152.71	0.00	0.79	37.9	30.0	0.00	5.0E-04	5	73.49
42	8.30	27.23	43.83	0.88	2.02	6	18.85	156.48	156.48	0.00	0.78	16.8	13.2	324.07	5.0E-05	4	25.89
43	8.50	27.89	32.29	0.73	2.27	6	18.85	160.25	160.25	0.00	0.77	12.4	9.6	235.15	5.0E-05	4	18.34
44	8.70	28.54	95.75	2.43	2.54	7	18.85	164.02	164.02	0.00	0.76	30.6	23.4	0.00	5.0E-04	5	55.04
45	8.90	29.20	82.56	1.18	1.43	7	18.85	167.79	167.79	0.00	0.76	26.4	20.0	0.00	5.0E-04	5	46.24
46	9.10	29.86	43.13	0.73	1.68	7	18.85	171.56	171.56	0.00	0.75	13.8	10.3	0.00	5.0E-04	4	23.14
47	9.30	30.51	55.35	0.88	1.59	7	18.85	175.33	175.33	0.00	0.74	17.7	13.1	0.00	5.0E-04	5	29.31
48	9.50	31.17	39.01	0.83	2.13	6	18.85	179.10	179.10	0.00	0.73	15.0	11.0	285.28	5.0E-05	4	19.91
49	9.70	31.82	36.96	0.80	2.16	6	18.85	182.88	182.88	0.00	0.72	14.2	10.3	269.24	5.0E-05	4	18.40
50	9.90	32.48	38.46	0.92	2.39	6	18.85	186.65	186.65	0.00	0.72	14.8	10.6	280.45	5.0E-05	4	18.78
51	10.10	33.14	28.59	0.92	3.23	5	18.85	190.42	190.42	0.00	0.71	13.7	9.7	204.37	5.0E-06	3	13.42
52	10.30	33.79	72.83	2.18	2.99	6	18.85	194.19	194.19	0.00	0.70	28.0	19.6	543.78	5.0E-05	4	35.00
53	10.50	34.45	94.62	1.83	1.93	7	18.85	197.96	197.96	0.00	0.70	30.3	21.1	0.00	5.0E-04	5	44.88
	10.70	35.10	86.94	1.38	1.59	7	18.85	201.73	201.73	0.00	0.69	27.8	19.2	0.00	5.0E-04	5	40.37
	10.90	35.76	63.84	1.64	2.57	6	18.85	205.50	205.50	0.00	0.68	24.5	16.7	473.89	5.0E-05	4	28.83
56	11.10	36.42	41.71	0.83	2.00	6	18.85	209.27	209.27	0.00	0.68	16.0	10.8	303.58	5.0E-05	4	18.13
57	11.30	37.07	33.17	0.60	1.80	6	18.85	213.04	213.04	0.00	0.67	12.7	8.5	237.67	5.0E-05	4	13.95
58	11.50	37.73	28.83	0.32	1.12	7	18.85	216.81	216.81	0.00	0.66	9.2	6.1	0.00	5.0E-04	4	11.76
59	11.70	38.39	38.67	0.67	1.74	6	18.85	220.58	220.58	0.00	0.66	14.8	9.8	279.31	5.0E-05	4	15.83

60	11.90	39.04	54.32	0.62	1.14	7	18.85	224.35	224.35	0.00	0.65	17.4	11.4	0.00	5.0E-04	5	22.24
61	12.10	39.70	53.89	0.90	1.67	7	18.85	228.12	228.12	0.00	0.65	17.2	11.2	0.00	5.0E-04	4	21.68
62	12.30	40.35	54.72	2.37	4.33	5	18.85	231.89	231.89	0.00	0.64	26.3	16.9	401.72	5.0E-06	3	21.65
63	12.50	41.01	40.77	1.71	4.21	5	18.85	235.66	235.66	0.00	0.64	19.6	12.5	294.22	5.0E-06	3	1'
64	12.70	41.67	38.64	0.82	2.12	6	18.85	239.43	239.43	0.00	0.63	14.8	9.4	277.64	5.0E-05	4	15.98
	12.90	42.32	20.23	0.50	2.48	5	18.85	243.20	243.20	0.00	0.63	9.7	6.1	135.87	5.0E-06	3	6.98
65	13.10	42.98	60.54	0.98	1.61	7	18.85	246.98	246.98	0.00	0.62	19.4	12.1	0.00	5.0E-04	4	22.53
67	13.30	43.63	49.91	1.36	2.72	6	18.85	250.75	250.75	0.00	0.62	19.2	11.8	363.24	5.0E-05	4	18.11
68	13.50	44.29	61.95	1.07	1.73	7	18.85	254.52	254.52	0.00	0.61	19.8	12.2	0.00	5.0E-04	4	22.37
69	13.70	44.95	31.94	0.51	1.60	6	18.85	258.29	258.29	0.00	0.61	12.3	7.5	224.60	5.0E-05	4	10.87
70	13.90	45.60	23.83	0.62	2.60	5	18.85	262.06	262.06	0.00	0.60	11.4	6.9	162.04	5.0E-06	3	7.73
71	14.10	46.26	60.31	1.07	1.77	7	18.85	265.83	265.83	0.00	0.60	19.3	11.6	0.00	5.0E-04	4	20.78
72	14.30	46.92	66.91	1.04	1.55	7	18.85	269.60	269.60	0.00	0.60	21.4	12.8	0.00	5.0E-04	4	22.82
73	14.50	47.57	56.29	1.18	2.10	7	18.85	273.37	273.37	0.00	0.59	18.0	10.7	0.00	5.0E-04	4	18.77
74	14.70	48.23	48.73	0.76	1.56	7	18.85	277.14	277.14	0.00	0.59	15.6	9.2	0.00	5.0E-04	4	15.88
75	14.90	48.88	56.40	0.92	1.63	7	18.85	280.91	280.91	0.00	0.58	18.0	10.5	0.00	5.0E-04	4	16.27

ConeTec Investigations Ltd. - CPT Interpretation

Client: Shield Environmental

Site: CPT-4

Location: Peterson/Puritan

Cone: 20 TON AD139

e: 09:10:03 12:39

Water Table (m): 16.76 (ft): 55.00 Unit Weight of Water (Default): 62.44 pcf

Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	EStress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	15.31	0.02	0.13	6	18.85	1.89	1.89	0.00	2.00	5.9	11.8	117.43	5.0E-05	7	778.60
2	0.30	0.98	25.52	0.11	0.44	7	18.85	5.66	5.66	0.00	2.00	8.2	16.3	0.00	5.0E-04	7	432.20
3	0.50	1.64	21.92	0.25	1.14	6	18.85	9.43	9.43	0.00	2.00	8.4	16.8	167.61	5.0E-05	6	222.26
4	0.70	2.30	33.04	0.50	1.52	6	18.85	13.20	13.20	0.00	2.00	12.7	25.4	252.70	5.0E-05	6	239.35
5	0.90	2.95	58.63	0.54	0.91	8	18.85	16.97	16.97	0.00	2.00	14.1	28.1	0.00	5.0E-03	6	330.72
6	1.10	3.61	24.77	0.84	3.40	5	18.85	20.74	20.74	0.00	2.00	11.9	23.8	188.57	5.0E-06	5	113.66
7	1.30	4.27	13.92	0.24	1.74	5	18.85	24.51	24.51	0.00	1.98	6.7	13.2	104.97	5.0E-06	5	53.54
8	1.50	4.92	39.74	0.83	2.09	6	18.85	28.28	28.28	0.00	1.84	15.3	28.1	302.91	5.0E-05	5	133.89
9	1.70	5.58	20.00	0.23	1.15	6	18.85	32.05	32.05	0.00	1.73	7.7	13.3	151.06	5.0E-05	5	58.92
10	1.90	6.23	18.79	0.23	1.25	6	18.85	35.82	35.82	0.00	1.64	7.2	11.8	141.46	5.0E-05	5	49.36
11	2.10	6.89	28.05	0.36	1.28	6	18.85	39.59	39.59	0.00	1.55	10.8	16.8	212.27	5.0E-05	5	67.02
12	2.30	7.55	17.36	0.50	3.44	4	18.85	43.36	43.36	0.00	1.49	11.1	16.5	129.85	5.0E-07	4	37.43
13	2.50	8.20	11.13	0.28	2.56	5	18.85	47.13	47.13	0.00	1.43	5.3	7.6	81.67	5.0E-06	4	21.66
14	2.70	8.86	17.99	0.24	1.31	6	18.85	50.90	50.90	0.00	1.37	6.9	9.5	134.12	5.0E-05	5	32.93
15	2.90	9.51	21.56	0.51	2.39	5	18.85	54.67	54.67	0.00	1.32	10.3	13.7	161.20	5.0E-06	4	36.85
16	3.10	10.17	31.66	0.74	2.35	6	18.85	58.44	58.44	0.00	1.28	12.2	15.6	238.47	5.0E-05	5	51.00
17	3.30	10.83	34.71	0.51	1.46	7	18.85	62.22	62.22	0.00	1.24	11.1	13.8	0.00	5.0E-04	5	52.56
18	3.50	11.48	49.56	1.01	2.03	6	18.85	65.99	65.99	0.00	1.20	19.0	22.9	375.37	5.0E-05	5	71.11
19	3.70	12.14	73.91	1.33	1.80	7	18.85	69.76	69.76	0.00	1.17	23.7	27.7	0.00	5.0E-04	5	100.71
20	3.90	12.80	71.97	1.24	1.73	7	18.85	73.53	73.53	0.00	1.14	23.0	26.3	0.00	5.0E-04	5	92.96
21	4.10	13.45	63.50	1.08	1.69	7	18.85	77.30	77.30	0.00	1.11	20.3	22.6	0.00	5.0E-04	5	77.86
22	4.30	14.11	50.45	0.96	1.90	7	18.85	81.07	81.07	0.00	1.09	16.1	17.5	0.00	5.0E-04	5	58.74
23	4.50	14.76	61.50	1.10	1.78	7	18.85	84.84	84.84	0.00	1.06	19.7	20.9	0.00	5.0E-04	5	68.59
24	4.70	15.42	160.14	1.63	1.02	9	18.85	88.61	88.61	0.00	1.04	30.7	32.0	0.00	5.0E-02	6	172.49
25	4.90	16.08	107.62	1.92	1.76	7	18.85	92.38	92.38	0.00	1.02	34.4	35.1	0.00	5.0E-04	5	110.84
26	5.10	16.73	30.05	0.50	1.65	6	18.85	96.15	96.15	0.00	1.00	11.5	11.5	223.07	5.0E-05	5	29.00
27	5.30	17.39	65.37	1.00	1.53	7	18.85	99.92	99.92	0.00	0.98	20.9	20.5	0.00	5.0E-04	5	61.80
28	5.50	18.04	37.28	0.75	2.00	6	18.85	103.69	103.69	0.00	0.96	14.3	13.8	278.00	5.0E-05	5	33.51
29	5.70	18.70	31.65	0.56	1.79	6	18.85	107.46	107.46	0.00	0.94	12.2	11.5	234.47	5.0E-05	5	27.27
30	5.90	19.36	45.27	1.05	2.33	6	18.85	111.23	111.23	0.00	0.93	17.4	16.1	338.79	5.0E-05	5	38.07
31	6.10	20.01	94.12	1.42	1.51	8	18.85	115.00	115.00	0.00	0.91	22.6	20.6	0.00	5.0E-03	5	77.56
32	6.30	20.67	78.55	1.46	1.86	7	18.85	118.77	118.77	0.00	0.90	25.1	22.6	0.00	5.0E-04	5	62.49
33	6.50	21.33	51.72	1.22	2.36	6	18.85	122.55	122.55	0.00	0.88	19.9	17.6	387.41	5.0E-05	5	39.52
34	6.70	21.98	56.42	2.01	3.57	5	18.85	126.32	126.32	0.00	0.87	27.1	23.6	423.21	5.0E-06	4	41.88
35	6.90	22.64	91.78	3.53	3.85	5	18.85	130.09	130.09	0.00	0.86	44.1	37.8	694.49	5.0E-06	4	66.73
36	7.10	23.29	42.22	1.33	3.14	6	18.85	133.86	133.86	0.00	0.85	16.2	13.7	313.52	5.0E-05	4	29.28
37	7.30	23.95	57.23	1.74	3.04	6	18.85	137.63	137.63	0.00	0.83	22.0	18.3	428.55	5.0E-05	4	38.92
38	7.50	24.61	51.33	2.09	4.08	5	18.85	141.40	141.40	0.00	0.82	24.6	20.3	382.87	5.0E-06	4	33.85
39	7.70	25.26	39.67	1.08	2.71	6	18.85	145.17	145.17	0.00	0.81	15.2	12.4	293.02	5.0E-05	4	25.23
40	7.90	25.92	28.56	1.42	4.96	3	18.85	148.94	148.94	0.00	0.80	27.4	22.0	207.40	5.0E-08	3	17.41
41	8.10	26.57	94.08	3.11	3.30	6	18.85	152.71	152.71	0.00	0.79	36.1	28.6	710.34	5.0E-05	4	58.14
42	8.30	27.23	73.15	2.24	3.07	6	18.85	156.48	156.48	0.00	0.78	28.1	22.0	549.25	5.0E-05	4	43.88
43	8.50	27.89	68.28	2.18	3.19	6	18.85	160.25	160.25	0.00	0.77	26.2	20.3	511.58	5.0E-05	4	39.90
44	8.70	28.54	53.43	1.74	3.26	6	18.85	164.02	164.02	0.00	0.76	20.5	15.7	397.19	5.0E-05	4	30.27
45	8.90	29.20	58.19	1.84	3.16	6	18.85	167.79	167.79	0.00	0.76	22.3	16.9	433.51	5.0E-05	4	32.29
46	9.10	29.86	99.12	2.72	2.74	6	18.85	171.56	171.56	0.00	0.75	38.1	28.4	747.50	5.0E-05	5	54.46
47	9.30	30.51	74.48	3.24	4.35	5	18.85	175.33	175.33	0.00	0.74	35.8	26.4	557.98	5.0E-06	4	39.78
48	9.50	31.17	67.76	2.00	2.95	6	18.85	179.10	179.10	0.00	0.73	26.0	19.0	506.10	5.0E-05	4	35.32
49	9.70	31.82	78.13	2.09	2.67	6	18.85	182.88	182.88	0.00	0.72	30.0	21.7	585.43	5.0E-05	4	40.02
50	9.90	32.48	110.16	2.59	2.35	7	18.85	186.65	186.65	0.00	0.72	35.2	25.3	0.00	5.0E-04	5	55.66
51	10.10	33.14	108.83	1.16	1.07	8	18.85	190.42	190.42	0.00	0.71	26.1	18.5	0.00	5.0E-03	5	53.87
52	10.30	33.79	111.49	1.59	1.43	8	18.85	194.19	194.19	0.00	0.70	26.8	18.8	0.00	5.0E-03	5	54.12
53	10.50	34.45	105.80	1.96	1.85	7	18.85	197.96	197.96	0.00	0.70	33.9	23.6	0.00	5.0E-04	5	50.31
	10.70	35.10	77.20	1.73	2.24	7	18.85	201.73	201.73	0.00	0.69	24.7	17.0	0.00	5.0E-04	5	35.74
	10.90	35.76	98.04	1.31	1.33	8	18.85	205.50	205.50	0.00	0.68	23.5	16.1	0.00	5.0E-03	5	44.80
56	11.10	36.42	100.74	1.66	1.65	7	18.85	209.27	209.27	0.00	0.68	32.2	21.8	0.00	5.0E-04	5	45.21
57	11.30	37.07	89.32	2.66	2.98	6	18.85	213.04	213.04	0.00	0.67	34.3	23.0	668.93	5.0E-05	4	39.25
58	11.50	37.73	78.29	3.06	3.91	5	18.85	216.81	216.81	0.00	0.66	37.6	25.0	583.93	5.0E-06	4	33.67
59	11.70	38.39	163.22	2.33	1.43	8	18.85	220.58	220.58	0.00	0.66	39.2	25.8	0.00	5.0E-03	5	70.03

60	11.90	39.04	138.30	3.80	2.75	7	18.85	224.35	224.35	0.00	0.65	44.3	28.9	0.00	5.0E-04	5	58.18
61	12.10	39.70	101.17	2.89	2.86	6	18.85	228.12	228.12	0.00	0.65	38.9	25.2	758.76	5.0E-05	4	41.58
62	12.30	40.35	55.89	1.72	3.08	6	18.85	231.89	231.89	0.00	0.64	21.5	13.8	410.67	5.0E-05	4	22.14
63	12.50	41.01	27.75	0.99	3.55	5	18.85	235.66	235.66	0.00	0.64	13.3	8.5	194.26	5.0E-06	3	10
64	12.70	41.67	46.81	1.44	3.07	6	18.85	239.43	239.43	0.00	0.63	18.0	11.4	340.36	5.0E-05	4	17
	12.90	42.32	99.57	2.85	2.86	6	18.85	243.20	243.20	0.00	0.63	38.2	24.0	745.27	5.0E-05	4	38.30
	13.10	42.98	232.57	2.40	1.03	9	18.85	246.98	246.98	0.00	0.62	44.7	27.8	0.00	5.0E-02	6	89.40
67	13.30	43.63	151.39	4.62	3.05	6	18.85	250.75	250.75	0.00	0.62	58.1	35.9	1142.64	5.0E-05	5	56.9
68	13.50	44.29	125.33	2.55	2.03	7	18.85	254.52	254.52	0.00	0.61	40.1	24.6	0.00	5.0E-04	5	46.27
69	13.70	44.95	150.50	2.94	1.96	7	18.85	258.29	258.29	0.00	0.61	48.2	29.3	0.00	5.0E-04	5	54.94

ConeTec Investigations Ltd. - CPT Interpretation

Client: Shield Environmental

Site: CPT-5

Location: Peterson/Puritan

Cone: 20 TON A D139

e: 09:10:03 13:35

Water Table (m): 16.76 (ft): 55.00 Unit Weight of Water (Default): 62.44 pcf

Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	ESTress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	6.63	0.13	2.04	4	18.85	1.89	1.89	0.00	2.00	4.2	8.5	50.76	5.0E-07	8	336.54
2	0.30	0.98	122.21	0.67	0.55	9	18.85	5.66	5.66	0.00	2.00	23.5	46.9	0.00	5.0E-02	0	2073.3
3	0.50	1.64	128.78	0.58	0.45	9	18.85	9.43	9.43	0.00	2.00	24.7	49.5	0.00	5.0E-02	0	1310.5

ConeTec Investigations Ltd. - CPT Interpretation
 Client: Shield Environmental
 Site: CPT-5A
 Location: Peterson/Puritan
 Cone: 20 TON AD139
 z: 09:10:03 13:43

Water Table (m): 16.76 (ft): 55.00 Unit Weight of Water (Default): 62.44 pcf
 Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	EStress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	20.10	0.36	1.78	6	18.85	1.89	1.89	0.00	2.00	7.7	15.4	154.19	5.0E-05	0	1022.2
2	0.30	0.98	16.34	0.29	1.76	6	18.85	5.66	5.66	0.00	2.00	6.3	12.5	125.00	5.0E-05	6	276.27
3	0.50	1.64	15.04	0.40	2.68	5	18.85	9.43	9.43	0.00	2.00	7.2	14.4	114.74	5.0E-06	5	152.15
4	0.70	2.30	11.20	0.36	3.21	4	18.85	13.20	13.20	0.00	2.00	7.2	14.3	84.98	5.0E-07	5	80.50
5	0.90	2.95	26.98	0.39	1.45	6	18.85	16.97	16.97	0.00	2.00	10.4	20.7	205.86	5.0E-05	6	151.65
6	1.10	3.61	6.95	0.15	2.20	4	18.85	20.74	20.74	0.00	2.00	4.4	8.9	51.70	5.0E-07	4	31.16
7	1.30	4.27	12.98	0.26	2.00	5	18.85	24.51	24.51	0.00	1.98	6.2	12.3	97.71	5.0E-06	5	49.83
8	1.50	4.92	18.00	0.21	1.17	6	18.85	28.28	28.28	0.00	1.84	6.9	12.7	135.96	5.0E-05	5	60.10
9	1.70	5.58	15.58	0.30	1.91	5	18.85	32.05	32.05	0.00	1.73	7.5	12.9	117.08	5.0E-06	5	45.66
10	1.90	6.23	23.41	0.52	2.23	6	18.85	35.82	35.82	0.00	1.64	9.0	14.7	176.93	5.0E-05	5	61.74
11	2.10	6.89	39.42	0.56	1.43	7	18.85	39.59	39.59	0.00	1.56	12.6	19.6	0.00	5.0E-04	5	94.57
12	2.30	7.55	37.55	0.66	1.75	6	18.85	43.36	43.36	0.00	1.49	14.4	21.4	284.91	5.0E-05	5	82.13
13	2.50	8.20	77.59	0.41	0.53	8	18.85	47.13	47.13	0.00	1.43	18.6	26.5	0.00	5.0E-03	6	157.04
14	2.70	8.86	312.45	1.57	0.50	10	18.85	50.90	50.90	0.00	1.37	50.0	68.6	0.00	5.0E+00	7	588.26
15	2.90	9.51	360.71	3.07	0.85	9	18.85	54.67	54.67	0.00	1.32	69.3	91.7	0.00	5.0E-02	6	632.36
16	3.10	10.17	484.28	5.13	1.06	9	18.85	58.44	58.44	0.00	1.28	93.0	119.0	0.00	5.0E-02	6	794.47
17	3.30	10.83	425.31	4.74	1.11	9	18.85	62.22	62.22	0.00	1.24	81.7	101.3	0.00	5.0E-02	6	655.27
18	3.50	11.48	357.18	1.42	0.40	10	18.85	65.99	65.99	0.00	1.20	57.1	68.9	0.00	5.0E+00	7	518.65
19	3.70	12.14	385.56	2.44	0.63	10	18.85	69.76	69.76	0.00	1.17	61.9	72.5	0.00	5.0E+00	7	531.00
20	3.90	12.80	459.71	3.88	0.84	10	18.85	73.53	73.53	0.00	1.14	73.6	84.0	0.00	5.0E+00	6	599.22

ConeTec Investigations Ltd. - CPT Interpretation
 Client: Shield Environmental
 Site: CFT-6
 Location: Peterson/Puritan
 Cone: 20 TON AD139
 #: 09:10:03 15:11

Water Table (m): 7.13 (ft): 23.40 Unit Weight of Water (Default): 62.44 pcf
 Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	ESTress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	4.98	0.00	0.10	1	18.85	1.89	1.89	0.00	2.00	2.4	4.8	38.06	1.0E-07	7	252.35
2	0.30	0.98	25.53	0.45	1.76	6	18.85	5.66	5.66	0.00	2.00	9.8	19.6	195.60	5.0E-05	6	432.28
3	0.50	1.64	6.96	0.14	2.08	4	18.85	9.43	9.43	0.00	2.00	4.5	8.9	52.72	5.0E-07	5	69.90
4	0.70	2.30	8.66	0.21	2.43	4	18.85	13.20	13.20	0.00	2.00	5.5	11.1	65.42	5.0E-07	5	61.97
5	0.90	2.95	37.05	0.88	2.38	6	18.85	16.97	16.97	0.00	2.00	14.2	28.5	283.17	5.0E-05	5	208.61
6	1.10	3.61	11.60	0.16	1.34	5	18.85	20.74	20.74	0.00	2.00	5.6	11.1	87.43	5.0E-06	5	52.70
7	1.30	4.27	17.56	0.24	1.34	6	18.85	24.51	24.51	0.00	1.98	6.7	13.3	132.87	5.0E-05	5	67.77
8	1.50	4.92	15.25	0.34	2.20	5	18.85	28.28	28.28	0.00	1.84	7.3	13.5	114.85	5.0E-06	5	50.76
9	1.70	5.58	30.02	0.43	1.44	6	18.85	32.05	32.05	0.00	1.73	11.5	19.9	227.98	5.0E-05	5	88.91
10	1.90	6.23	31.23	0.54	1.72	6	18.85	35.82	35.82	0.00	1.64	12.0	19.6	236.95	5.0E-05	5	82.68
11	2.10	6.89	48.88	1.28	2.62	6	18.85	39.59	39.59	0.00	1.56	18.8	29.2	372.25	5.0E-05	5	117.53
12	2.30	7.55	59.97	1.20	2.00	7	18.85	43.36	43.36	0.00	1.49	19.2	28.5	0.00	5.0E-04	5	131.78
13	2.50	8.20	23.89	0.59	2.46	6	18.85	47.13	47.13	0.00	1.43	9.2	13.1	179.68	5.0E-05	5	47.65
14	2.70	8.86	32.39	0.59	1.82	6	18.85	50.90	50.90	0.00	1.37	12.4	17.1	244.72	5.0E-05	5	60.09
15	2.90	9.51	25.26	0.63	2.48	6	18.85	54.67	54.67	0.00	1.32	9.7	12.8	189.60	5.0E-05	5	43.35
16	3.10	10.17	42.62	0.36	0.84	7	18.85	58.44	58.44	0.00	1.28	13.6	17.5	0.00	5.0E-04	6	69.01
17	3.30	10.83	113.77	0.17	0.15	9	18.85	62.22	62.22	0.00	1.24	21.8	27.1	0.00	5.0E-02	7	174.55
18	3.50	11.48	103.15	1.63	1.58	8	18.85	65.99	65.99	0.00	1.20	24.8	29.8	0.00	5.0E-03	6	149.07
19	3.70	12.14	12.61	0.17	1.33	6	18.85	69.76	69.76	0.00	1.17	4.8	5.7	91.25	5.0E-05	4	16.35
20	3.90	12.80	43.45	1.29	2.97	6	18.85	73.53	73.53	0.00	1.14	16.7	19.0	327.82	5.0E-05	5	55.73
21	4.10	13.45	32.15	0.42	1.31	7	18.85	77.30	77.30	0.00	1.11	10.3	11.5	0.00	5.0E-04	5	38.93
22	4.30	14.11	38.86	1.15	2.97	6	18.85	81.07	81.07	0.00	1.09	14.9	16.2	291.98	5.0E-05	4	45.02
23	4.50	14.76	57.88	1.37	2.36	6	18.85	84.84	84.84	0.00	1.06	22.2	23.6	437.70	5.0E-05	5	64.49
24	4.70	15.42	153.97	1.04	0.68	9	18.85	88.61	88.61	0.00	1.04	29.6	30.7	0.00	5.0E-02	6	165.81
25	4.90	16.08	267.96	1.68	0.63	9	18.85	92.38	92.38	0.00	1.02	51.4	52.4	0.00	5.0E-02	6	277.46
26	5.10	16.73	241.13	2.59	1.07	9	18.85	96.15	96.15	0.00	1.00	46.3	46.2	0.00	5.0E-02	6	239.75
27	5.30	17.39	206.85	1.98	0.95	9	18.85	99.92	99.92	0.00	0.98	39.7	38.9	0.00	5.0E-02	6	197.73
28	5.50	18.04	114.00	1.49	1.30	8	18.85	103.69	103.69	0.00	0.96	27.4	26.3	0.00	5.0E-03	6	104.55
29	5.70	18.70	117.09	1.21	1.03	8	18.85	107.46	107.46	0.00	0.94	28.1	26.5	0.00	5.0E-03	6	103.60
30	5.90	19.36	129.56	1.25	0.96	9	18.85	111.23	111.23	0.00	0.93	24.9	23.1	0.00	5.0E-02	6	110.82
31	6.10	20.01	177.08	1.38	0.78	9	18.85	115.00	115.00	0.00	0.91	34.0	31.0	0.00	5.0E-02	6	146.82
32	6.30	20.67	259.19	3.25	1.25	9	18.85	118.77	118.77	0.00	0.90	49.8	44.7	0.00	5.0E-02	6	208.49
33	6.50	21.33	210.86	2.39	1.14	9	18.85	122.55	122.55	0.00	0.88	40.5	35.8	0.00	5.0E-02	6	164.19
34	6.70	21.98	144.20	2.69	1.86	8	18.85	126.32	126.32	0.00	0.87	34.6	30.1	0.00	5.0E-03	5	108.59
35	6.90	22.64	137.65	1.71	1.24	8	18.85	130.09	130.09	0.00	0.86	33.0	28.3	0.00	5.0E-03	6	100.58
36	7.10	23.29	131.86	1.68	1.27	8	18.85	133.86	133.86	0.00	0.85	31.6	26.8	0.00	5.0E-03	6	93.56
37	7.30	23.95	53.55	0.87	1.62	7	18.85	137.63	135.98	1.64	0.84	17.1	14.4	0.00	5.0E-04	5	36.79
38	7.50	24.61	14.21	0.43	3.03	5	18.85	141.40	137.79	3.61	0.83	6.8	5.7	97.81	5.0E-06	3	8.87
39	7.70	25.26	14.71	0.44	2.97	5	18.85	145.17	139.60	5.57	0.83	7.1	5.8	101.38	5.0E-06	3	9.08
40	7.90	25.92	101.47	2.25	2.22	7	18.85	148.94	141.41	7.53	0.82	32.5	26.7	0.00	5.0E-04	5	67.83
41	8.10	26.57	136.42	1.19	0.88	9	18.85	152.71	143.22	9.49	0.82	26.2	21.4	0.00	5.0E-02	6	90.38
42	8.30	27.23	119.07	0.62	0.52	9	18.85	156.48	145.03	11.45	0.81	22.9	18.6	0.00	5.0E-02	6	77.74
43	8.50	27.89	114.74	1.14	0.99	8	18.85	160.25	146.84	13.42	0.81	27.5	22.2	0.00	5.0E-03	6	73.92
44	8.70	28.54	110.52	0.43	0.39	9	18.85	164.02	148.64	15.38	0.80	21.2	17.0	0.00	5.0E-02	6	70.28
45	8.90	29.20	212.93	1.21	0.57	9	18.85	167.79	150.45	17.34	0.80	40.9	32.6	0.00	5.0E-02	6	134.75
46	9.10	29.86	259.40	2.43	0.93	9	18.85	171.56	152.26	19.30	0.79	49.8	39.5	0.00	5.0E-02	6	162.42
47	9.30	30.51	149.33	0.93	0.62	9	18.85	175.33	154.07	21.26	0.79	28.7	22.6	0.00	5.0E-02	6	91.91
48	9.50	31.17	125.72	0.37	0.30	9	18.85	179.10	155.88	23.23	0.78	24.1	18.9	0.00	5.0E-02	6	76.28
49	9.70	31.82	121.71	0.36	0.30	9	18.85	182.88	157.69	25.19	0.78	23.4	18.2	0.00	5.0E-02	6	72.94
50	9.90	32.48	76.95	0.30	0.39	8	18.85	186.65	159.50	27.15	0.77	18.5	14.3	0.00	5.0E-03	6	45.14
51	10.10	33.14	127.97	0.55	0.43	9	18.85	190.42	161.30	29.11	0.77	24.6	18.9	0.00	5.0E-02	6	74.98
52	10.30	33.79	127.97	0.28	0.22	9	18.85	194.19	163.11	31.07	0.77	24.6	18.8	0.00	5.0E-02	6	74.12
53	10.50	34.45	107.16	0.43	0.40	9	18.85	197.96	164.92	33.04	0.76	20.6	15.7	0.00	5.0E-02	6	61.18
54	10.70	35.10	147.99	0.81	0.55	9	18.85	201.73	166.73	35.00	0.76	28.4	21.5	0.00	5.0E-02	6	84.00
55	10.90	35.76	155.76	0.81	0.52	9	18.85	205.50	168.54	36.96	0.75	29.9	22.5	0.00	5.0E-02	6	87.50
56	11.10	36.42	130.27	0.55	0.42	9	18.85	209.27	170.35	38.92	0.75	25.0	18.8	0.00	5.0E-02	6	72.19
57	11.30	37.07	89.46	0.29	0.32	9	18.85	213.04	172.16	40.88	0.75	17.2	12.8	0.00	5.0E-02	6	48.65
58	11.50	37.73	93.81	0.66	0.70	8	18.85	216.81	173.96	42.85	0.74	22.5	16.7	0.00	5.0E-03	6	50.52
59	11.70	38.39	82.55	0.41	0.50	8	18.85	220.58	175.77	44.81	0.74	19.8	14.6	0.00	5.0E-03	6	43.83

60	11.90	39.04	80.44	0.30	0.37	8	18.85	224.35	177.58	46.77	0.73	19.3	14.2	0.00	5.0E-03	6	42.22
61	12.10	39.70	83.12	0.36	0.44	8	18.85	228.12	179.39	48.73	0.73	19.9	14.6	0.00	5.0E-03	6	43.21
62	12.30	40.35	86.77	0.27	0.31	9	18.85	231.89	181.20	50.69	0.73	16.7	12.1	0.00	5.0E-02	6	44.69
63	12.50	41.01	87.49	0.35	0.39	9	18.85	235.66	183.01	52.66	0.72	16.8	12.2	0.00	5.0E-02	6	4
64	12.70	41.67	94.55	0.36	0.38	9	18.85	239.43	184.82	54.62	0.72	18.2	13.1	0.00	5.0E-02	6	4
	12.90	42.32	126.55	0.57	0.45	9	18.85	243.20	186.62	56.58	0.72	24.3	17.4	0.00	5.0E-02	6	63.79
	13.10	42.98	121.19	0.51	0.42	9	18.85	246.98	188.43	58.54	0.71	23.3	16.6	0.00	5.0E-02	6	60.43
67	13.30	43.63	146.13	0.56	0.39	9	18.85	250.75	190.24	60.50	0.71	28.1	19.9	0.00	5.0E-02	6	72.42
68	13.50	44.29	218.58	0.72	0.33	9	18.85	254.52	192.05	62.47	0.71	42.0	29.6	0.00	5.0E-02	6	107.93

ConeTec Investigations Ltd. - CPT Interpretation

Client: Shield Environmental

Site: CPT-7

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 16:26

Water Table (m): 4.57 (ft): 15.00 Unit Weight of Water (Default): 62.44 pcf

Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	EStress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	215.15	0.41	0.19	10	18.85	1.89	1.89	0.00	2.00	34.4	68.8	0.00	5.0E+00	0	10954.
2	0.30	0.98	70.64	0.66	0.93	8	18.85	5.66	5.66	0.00	2.00	17.0	33.9	0.00	5.0E-03	0	1198.0
3	0.50	1.64	61.21	0.68	1.12	7	18.85	9.43	9.43	0.00	2.00	19.6	39.2	0.00	5.0E-04	6	622.35
4	0.70	2.30	40.05	0.29	0.74	7	18.85	13.20	13.20	0.00	2.00	12.8	25.6	0.00	5.0E-04	6	290.32
5	0.90	2.95	50.12	0.03	0.06	8	18.85	16.97	16.97	0.00	2.00	12.0	24.1	0.00	5.0E-03	0	282.56
6	1.10	3.61	56.48	0.06	0.10	8	18.85	20.74	20.74	0.00	2.00	13.6	27.1	0.00	5.0E-03	7	260.47
7	1.30	4.27	55.22	0.17	0.31	8	18.85	24.51	24.51	0.00	1.98	13.3	26.2	0.00	5.0E-03	6	215.28
8	1.50	4.92	135.69	0.20	0.15	9	18.85	28.28	28.28	0.00	1.84	26.1	47.9	0.00	5.0E-02	7	459.63
9	1.70	5.58	26.22	0.04	0.16	7	18.85	32.05	32.05	0.00	1.73	8.4	14.5	0.00	5.0E-04	6	77.55
10	1.90	6.23	24.39	0.04	0.16	7	18.85	35.82	35.82	0.00	1.64	7.8	12.8	0.00	5.0E-04	6	64.36
11	2.10	6.89	71.60	0.34	0.47	8	18.85	39.59	39.59	0.00	1.56	17.2	26.7	0.00	5.0E-03	6	172.61
12	2.30	7.55	51.00	0.61	1.19	7	18.85	43.36	43.36	0.00	1.49	16.3	24.3	0.00	5.0E-04	6	111.90
13	2.50	8.20	19.39	0.48	2.48	5	18.85	47.13	47.13	0.00	1.43	9.3	13.3	145.13	5.0E-06	4	38.49
14	2.70	8.86	20.73	0.28	1.34	6	18.85	50.90	50.90	0.00	1.37	8.0	10.9	155.13	5.0E-05	5	38.09
15	2.90	9.51	16.67	0.41	2.47	5	18.85	54.67	54.67	0.00	1.32	8.0	10.6	123.65	5.0E-06	4	28.27
16	3.10	10.17	5.79	0.22	3.85	3	18.85	58.44	58.44	0.00	1.28	5.6	7.1	39.77	5.0E-08	3	8.50
17	3.30	10.83	11.07	0.14	1.31	5	18.85	62.22	62.22	0.00	1.24	5.3	6.6	80.05	5.0E-06	4	16.08
18	3.50	11.48	19.39	0.17	0.86	6	18.85	65.99	65.99	0.00	1.20	7.4	9.0	143.63	5.0E-05	5	27.21
19	3.70	12.14	45.67	0.79	1.72	7	18.85	69.76	69.76	0.00	1.17	14.6	17.1	0.00	5.0E-04	5	61.85
20	3.90	12.80	73.42	2.13	2.90	6	18.85	73.53	73.53	0.00	1.14	28.2	32.2	557.99	5.0E-05	5	94.86
21	4.10	13.45	62.46	2.35	3.76	5	18.85	77.30	77.30	0.00	1.11	30.0	33.4	473.51	5.0E-06	4	76.57
22	4.30	14.11	45.33	0.79	1.74	7	18.85	81.07	81.07	0.00	1.09	14.5	15.8	0.00	5.0E-04	5	52.68
23	4.50	14.76	137.15	0.80	0.58	9	18.85	84.84	84.84	0.00	1.06	26.3	28.0	0.00	5.0E-02	6	254.19
24	4.70	15.42	180.15	0.92	0.51	9	18.85	88.61	87.35	1.26	1.05	34.6	36.2	0.00	5.0E-02	6	196.97
25	4.90	16.08	252.87	5.97	2.36	7	18.85	92.38	89.16	3.22	1.04	80.9	83.9	0.00	5.0E-04	8	271.23
26	5.10	16.73	213.74	2.11	0.99	9	18.85	96.15	90.97	5.18	1.03	41.0	42.1	0.00	5.0E-02	6	224.49
27	5.30	17.39	283.61	1.58	0.56	10	18.85	99.92	92.78	7.14	1.02	45.4	46.1	0.00	5.0E+00	6	292.37
28	5.50	18.04	433.40	1.75	0.40	10	18.85	103.69	94.59	9.10	1.01	69.3	69.8	0.00	5.0E+00	7	438.77
29	5.70	18.70	432.01	3.02	0.70	10	18.85	107.46	96.40	11.07	1.00	69.1	68.9	0.00	5.0E+00	6	429.11
30	5.90	19.36	302.38	2.80	0.93	9	18.85	111.23	98.21	13.03	0.99	58.1	57.3	0.00	5.0E-02	6	294.45
31	6.10	20.01	287.59	2.73	0.95	9	18.85	115.00	100.01	14.99	0.98	55.2	54.0	0.00	5.0E-02	6	274.89
32	6.30	20.67	178.62	2.15	1.21	9	18.85	118.77	101.82	16.95	0.97	34.3	33.3	0.00	5.0E-02	6	167.24
33	6.50	21.33	412.00	2.65	0.64	10	18.85	122.55	103.63	18.91	0.96	65.9	63.4	0.00	5.0E+00	6	360.48
34	6.70	21.98	396.58	3.10	0.78	10	18.85	126.32	105.44	20.88	0.95	63.5	60.5	0.00	5.0E+00	6	359.87
35	6.90	22.64	352.36	3.81	1.08	9	18.85	130.09	107.25	22.84	0.95	67.7	63.9	0.00	5.0E-02	6	314.19
36	7.10	23.29	219.57	1.87	0.85	9	18.85	133.86	109.06	24.80	0.94	42.2	39.5	0.00	5.0E-02	6	192.05
37	7.30	23.95	157.68	1.01	0.64	9	18.85	137.63	110.87	26.76	0.93	30.3	28.1	0.00	5.0E-02	6	135.30
38	7.50	24.61	106.19	0.62	0.58	9	18.85	141.40	112.68	28.72	0.92	20.4	18.8	0.00	5.0E-02	6	89.22
39	7.70	25.26	106.59	0.58	0.55	9	18.85	145.17	114.48	30.69	0.91	20.5	18.7	0.00	5.0E-02	6	88.11
40	7.90	25.92	107.56	0.55	0.51	9	18.85	148.94	116.29	32.65	0.91	20.7	18.7	0.00	5.0E-02	6	87.51
41	8.10	26.57	104.81	0.58	0.56	9	18.85	152.71	118.10	34.61	0.90	20.1	18.1	0.00	5.0E-02	6	83.90
42	8.30	27.23	116.01	0.66	0.57	9	18.85	156.48	119.91	36.57	0.89	22.3	19.9	0.00	5.0E-02	6	91.57
43	8.50	27.89	113.68	0.76	0.67	9	18.85	160.25	121.72	38.53	0.89	21.8	19.4	0.00	5.0E-02	6	88.34
44	8.70	28.54	112.44	0.72	0.64	9	18.85	164.02	123.53	40.50	0.88	21.6	19.0	0.00	5.0E-02	6	86.05
45	8.90	29.20	112.46	0.89	0.79	9	18.85	167.79	125.34	42.46	0.87	21.6	18.9	0.00	5.0E-02	6	84.80
46	9.10	29.86	106.68	0.81	0.76	8	18.85	171.56	127.14	44.42	0.87	25.6	22.2	0.00	5.0E-03	6	79.20
47	9.30	30.51	120.03	0.77	0.64	9	18.85	175.33	128.95	46.38	0.86	23.0	19.9	0.00	5.0E-02	6	88.00
48	9.50	31.17	189.74	1.31	0.69	9	18.85	179.10	130.76	48.34	0.86	36.4	31.2	0.00	5.0E-02	6	137.93
49	9.70	31.82	204.57	1.94	0.95	9	18.85	182.88	132.57	50.31	0.85	39.3	33.4	0.00	5.0E-02	6	146.76
50	9.90	32.48	146.56	1.37	0.93	9	18.85	186.65	134.38	52.27	0.84	28.1	23.8	0.00	5.0E-02	6	103.32
51	10.10	33.14	124.79	1.16	0.93	9	18.85	190.42	136.19	54.23	0.84	24.0	20.1	0.00	5.0E-02	6	86.57
52	10.30	33.79	100.87	1.08	1.07	8	18.85	194.19	138.00	56.19	0.83	24.2	20.2	0.00	5.0E-03	5	68.77
53	10.50	34.45	101.73	1.15	1.14	8	18.85	197.96	139.80	58.15	0.83	24.4	20.2	0.00	5.0E-03	5	68.44
54	10.70	35.10	103.34	1.19	1.15	8	18.85	201.73	141.61	60.12	0.82	24.8	20.4	0.00	5.0E-03	5	68.63
55	10.90	35.76	104.91	1.25	1.19	8	18.85	205.50	143.42	62.08	0.82	25.2	20.6	0.00	5.0E-03	5	68.79
56	11.10	36.42	109.95	1.54	1.40	8	18.85	209.27	145.23	64.04	0.81	26.4	21.4	0.00	5.0E-03	5	71.23
57	11.30	37.07	117.79	2.29	1.94	7	18.85	213.04	147.04	66.00	0.81	37.7	30.4	0.00	5.0E-04	5	75.46
58	11.50	37.73	217.98	4.56	2.09	8	18.85	216.81	148.85	67.96	0.80	52.3	42.0	0.00	5.0E-03	5	139.13
59	11.70	38.39	181.79	6.17	3.39	12	18.85	220.58	150.66	69.93	0.80	87.3	69.6	0.00	0.0E+00	8	114.37

60 11.90 39.04 230.99 4.14 1.79 8 18.85 224.35 152.46 71.89 0.79 55.4 43.9 0.00 5.0E-03 6 143.98

ConeTec Investigations Ltd. - CPT Interpretation

Client: Shield Environmental

Site: CPT-8

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 17:24

Water Table (m): 1.07 (ft): 3.50 Unit Weight of Water (Default): 62.44 pcf

Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	ESTress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	4.52	0.00	0.06	1	18.85	1.89	1.89	0.00	2.00	2.2	4.3	34.59	1.0E-07	0	229.34
2	0.30	0.98	12.31	0.01	0.10	6	18.85	5.66	5.66	0.00	2.00	4.7	9.5	94.12	5.0E-05	7	208.01
3	0.50	1.64	29.70	0.37	1.25	7	18.85	9.43	9.43	0.00	2.00	9.5	19.0	0.00	5.0E-04	6	301.44
4	0.70	2.30	167.05	2.71	1.45	8	18.85	13.20	13.20	0.00	2.00	44.9	89.8	0.00	5.0E-03	0	1359.6
5	0.90	2.95	326.48	2.12	0.65	10	18.85	16.97	16.97	0.00	2.00	52.2	104.5	0.00	5.0E+00	0	1846.1
6	1.10	3.61	297.58	2.14	0.72	9	18.85	20.74	20.41	0.33	2.00	57.1	114.3	0.00	5.0E-02	0	1398.4
7	1.30	4.27	200.71	1.92	0.96	9	18.85	24.51	22.22	2.29	2.00	38.5	77.1	0.00	5.0E-02	6	865.99
8	1.50	4.92	229.83	1.17	0.51	9	18.85	28.28	24.03	4.25	2.00	44.1	88.1	0.00	5.0E-02	7	916.97
9	1.70	5.58	289.56	2.60	0.90	9	18.85	32.05	25.84	6.21	1.93	55.6	107.0	0.00	5.0E-02	0	1074.6
10	1.90	6.23	226.63	1.88	0.83	9	18.85	35.82	27.65	8.17	1.86	43.5	81.0	0.00	5.0E-02	7	785.62
11	2.10	6.89	95.45	0.78	0.81	8	18.85	39.59	29.46	10.14	1.80	22.9	41.3	0.00	5.0E-03	6	309.74
12	2.30	7.55	68.75	0.37	0.54	8	18.85	43.36	31.26	12.10	1.75	16.5	28.9	0.00	5.0E-03	6	209.72
13	2.50	8.20	67.51	0.22	0.33	8	18.85	47.13	33.07	14.06	1.70	16.2	27.6	0.00	5.0E-03	6	194.52
14	2.70	8.86	70.43	0.20	0.28	8	18.85	50.90	34.88	16.02	1.66	16.9	28.0	0.00	5.0E-03	6	192.37
15	2.90	9.51	78.90	0.39	0.49	8	18.85	54.67	36.69	17.98	1.62	18.9	30.6	0.00	5.0E-03	6	204.96
16	3.10	10.17	78.26	0.35	0.45	8	18.85	58.44	38.50	19.95	1.58	18.8	29.6	0.00	5.0E-03	6	193.63
17	3.30	10.83	66.80	1.02	1.52	7	18.85	62.22	40.31	21.91	1.54	21.4	33.0	0.00	5.0E-04	6	157.54
18	3.50	11.48	103.27	1.05	1.01	8	18.85	65.99	42.12	23.87	1.51	24.8	37.4	0.00	5.0E-03	6	233.82
19	3.70	12.14	127.47	0.87	0.69	9	18.85	69.76	43.92	25.83	1.48	24.5	36.1	0.00	5.0E-02	6	277.00
20	3.90	12.80	107.00	1.10	1.03	8	18.85	73.53	45.73	27.79	1.45	25.7	37.2	0.00	5.0E-03	6	223.01
21	4.10	13.45	119.72	0.80	0.67	9	18.85	77.30	47.54	29.76	1.42	23.0	32.6	0.00	5.0E-02	6	240.13
22	4.30	14.11	125.65	0.85	0.68	9	18.85	81.07	49.35	31.72	1.39	24.1	33.6	0.00	5.0E-02	6	242.79
23	4.50	14.76	132.36	0.93	0.70	9	18.85	84.84	51.16	33.68	1.37	25.4	34.8	0.00	5.0E-02	6	246.71
24	4.70	15.42	126.44	1.54	1.22	8	18.85	88.61	52.97	35.64	1.34	30.3	40.8	0.00	5.0E-03	6	227.49
25	4.90	16.08	153.21	1.39	0.91	9	18.85	92.38	54.78	37.60	1.32	29.4	38.9	0.00	5.0E-02	6	266.82
26	5.10	16.73	94.54	1.31	1.38	8	18.85	96.15	56.59	39.57	1.30	22.7	29.5	0.00	5.0E-03	6	158.69
27	5.30	17.39	71.95	0.33	0.45	8	18.85	99.92	58.39	41.53	1.28	17.3	22.1	0.00	5.0E-03	6	116.57
28	5.50	18.04	80.62	0.43	0.54	8	18.85	103.69	60.20	43.49	1.26	19.3	24.4	0.00	5.0E-03	6	126.84
29	5.70	18.70	89.09	0.65	0.73	8	18.85	107.46	62.01	45.45	1.24	21.4	26.6	0.00	5.0E-03	6	136.18
30	5.90	19.36	160.15	1.18	0.74	9	18.85	111.23	63.82	47.41	1.23	30.7	37.7	0.00	5.0E-02	6	239.16
31	6.10	20.01	339.50	3.63	1.07	9	18.85	115.00	65.63	49.38	1.21	65.2	78.7	0.00	5.0E-02	6	494.86
32	6.30	20.67	226.80	1.98	0.88	9	18.85	118.77	67.44	51.34	1.19	43.5	51.9	0.00	5.0E-02	6	321.11
33	6.50	21.33	128.46	1.06	0.82	9	18.85	122.55	69.25	53.30	1.18	24.7	29.0	0.00	5.0E-02	6	176.33
34	6.70	21.98	99.74	0.57	0.57	9	18.85	126.32	71.05	55.26	1.16	19.2	22.2	0.00	5.0E-02	6	132.98
35	6.90	22.64	79.86	0.57	0.71	8	18.85	130.09	72.86	57.22	1.15	19.2	22.0	0.00	5.0E-03	6	103.43
36	7.10	23.29	85.41	0.65	0.76	8	18.85	133.86	74.67	59.19	1.13	20.5	23.2	0.00	5.0E-03	6	108.02
37	7.30	23.95	100.24	0.90	0.90	8	18.85	137.63	76.48	61.15	1.12	24.1	26.9	0.00	5.0E-03	6	124.03
38	7.50	24.61	77.95	0.71	0.91	8	18.85	141.40	78.29	63.11	1.11	18.7	20.7	0.00	5.0E-03	6	93.78
39	7.70	25.26	74.99	0.57	0.76	8	18.85	145.17	80.10	65.07	1.09	18.0	19.7	0.00	5.0E-03	6	88.07
40	7.90	25.92	81.37	0.55	0.68	8	18.85	148.94	81.91	67.03	1.08	19.5	21.1	0.00	5.0E-03	6	93.55
41	8.10	26.57	81.04	0.59	0.72	8	18.85	152.71	83.71	69.00	1.07	19.5	20.8	0.00	5.0E-03	6	91.11
42	8.30	27.23	77.76	0.56	0.72	8	18.85	156.48	85.52	70.96	1.06	18.7	19.8	0.00	5.0E-03	6	85.46
43	8.50	27.89	70.64	0.57	0.81	8	18.85	160.25	87.33	72.92	1.05	17.0	17.8	0.00	5.0E-03	6	75.82
44	8.70	28.54	72.86	0.60	0.82	8	18.85	164.02	89.14	74.88	1.04	17.5	18.1	0.00	5.0E-03	6	76.63
45	8.90	29.20	76.28	0.58	0.76	8	18.85	167.79	90.95	76.84	1.03	18.3	18.8	0.00	5.0E-03	6	78.67
46	9.10	29.86	83.94	0.62	0.74	8	18.85	171.56	92.76	78.81	1.02	20.1	20.5	0.00	5.0E-03	6	85.02
47	9.30	30.51	69.71	0.62	0.70	8	18.85	175.33	94.57	80.77	1.01	21.5	21.7	0.00	5.0E-03	6	89.22
48	9.50	31.17	86.40	0.70	0.82	8	18.85	179.10	96.37	82.73	1.00	20.7	20.7	0.00	5.0E-03	6	84.21
49	9.70	31.82	78.82	0.63	0.80	8	18.85	182.88	98.18	84.69	0.99	18.9	18.7	0.00	5.0E-03	6	75.21
50	9.90	32.48	70.25	0.49	0.70	8	18.85	186.65	99.99	86.65	0.98	16.9	16.5	0.00	5.0E-03	6	65.58
51	10.10	33.14	78.60	0.53	0.67	8	18.85	190.42	101.80	88.62	0.97	18.9	18.3	0.00	5.0E-03	6	72.26
52	10.30	33.79	105.98	0.65	0.62	9	18.85	194.19	103.61	90.58	0.96	20.3	19.6	0.00	5.0E-02	6	96.32
53	10.50	34.45	117.66	0.78	0.66	9	18.85	197.96	105.42	92.54	0.95	22.6	21.5	0.00	5.0E-02	6	105.27
54	10.70	35.10	111.59	0.81	0.73	9	18.85	201.73	107.23	94.50	0.95	21.4	20.3	0.00	5.0E-02	6	98.03
55	10.90	35.76	92.16	0.75	0.82	8	18.85	205.50	109.04	96.46	0.94	22.1	20.7	0.00	5.0E-03	6	79.25
56	11.10	36.42	99.81	0.74	0.74	8	18.85	209.27	110.84	98.43	0.93	24.0	22.3	0.00	5.0E-03	6	84.55
57	11.30	37.07	101.77	0.75	0.74	8	18.85	213.04	112.65	100.39	0.92	24.4	22.5	0.00	5.0E-03	6	84.84
58	11.50	37.73	104.72	0.75	0.72	9	18.85	216.81	114.46	102.35	0.91	20.1	18.4	0.00	5.0E-02	6	85.94
59	11.70	38.39	96.52	0.70	0.72	8	18.85	220.58	116.27	104.31	0.91	23.2	21.0	0.00	5.0E-03	6	77.80

60	11.90	39.04	81.52	0.69	0.82	8	18.85	224.35	118.08	106.27	0.90	20.0	18.1	0.00	5.0E-03	6	66.00
61	12.10	39.70	77.20	0.62	0.80	8	18.85	228.12	119.89	108.24	0.89	18.5	16.6	0.00	5.0E-03	6	59.92

ConeTec Investigations Ltd. - CPT Interpretation

Client: Shield Environmental

Site: CPT-9

Location: Peterson/Puritan

Cone: 20 TON AD139

z: 09:10:03 18:14

Water Table (m): 8.84 (ft): 29.00 Unit Weight of Water (Default): 62.44 pcf

Su Nkt used: 12.50

Layer	Depth (m)	Depth (ft)	Qt (tsf)	Fs (tsf)	Rf (%)	SBT	U Wt (kN/m ³)	TStress (kPa)	ESTress (kPa)	HPres (kPa)	Cn	N60 (blows/ft)	N160	Su (kPa)	k (cm/s)	SBTn	Qtn
1	0.10	0.33	145.67	0.77	0.53	9	18.85	1.89	1.89	0.00	2.00	28.0	55.9	0.00	5.0E-02	0	7416.4
2	0.30	0.98	121.39	0.88	0.73	9	18.85	5.66	5.66	0.00	2.00	23.3	46.6	0.00	5.0E-02	0	2059.3
3	0.50	1.64	116.55	1.70	1.46	8	18.85	9.43	9.43	0.00	2.00	28.0	55.9	0.00	5.0E-03	0	1185.9
4	0.70	2.30	53.32	1.03	1.93	7	18.85	13.20	13.20	0.00	2.00	17.1	34.1	0.00	5.0E-04	8	386.87
5	0.90	2.95	42.75	0.63	1.47	7	18.85	16.97	16.97	0.00	2.00	13.7	27.4	0.00	5.0E-04	6	240.89
6	1.10	3.61	43.42	0.86	1.99	6	18.85	20.74	20.74	0.00	2.00	16.7	33.3	331.79	5.0E-05	6	199.98
7	1.30	4.27	38.54	0.87	2.24	6	18.85	24.51	24.51	0.00	1.98	14.8	29.3	294.03	5.0E-05	5	149.96
8	1.50	4.92	31.56	0.69	2.17	6	18.85	28.28	28.28	0.00	1.84	12.1	22.3	240.14	5.0E-05	5	106.15
9	1.70	5.58	27.98	0.43	1.55	6	18.85	32.05	32.05	0.00	1.73	10.7	18.6	212.29	5.0E-05	5	82.80
10	1.90	6.23	33.38	0.62	1.86	6	18.85	35.82	35.82	0.00	1.64	12.8	21.0	253.46	5.0E-05	5	88.45
11	2.10	6.89	31.38	0.62	1.96	6	18.85	39.59	39.59	0.00	1.56	12.0	18.7	237.83	5.0E-05	5	75.09
12	2.30	7.55	44.63	1.04	2.33	6	18.85	43.36	43.36	0.00	1.49	17.1	25.5	339.31	5.0E-05	5	97.81
13	2.50	8.20	62.27	1.33	2.13	7	18.85	47.13	47.13	0.00	1.43	19.9	28.4	0.00	5.0E-04	5	125.82
14	2.70	8.86	41.18	1.22	2.95	6	18.85	50.90	50.90	0.00	1.37	15.8	21.7	312.23	5.0E-05	5	76.67
15	2.90	9.51	43.19	1.21	2.81	6	18.85	54.67	54.67	0.00	1.32	16.6	22.0	327.36	5.0E-05	5	74.84
16	3.10	10.17	55.86	1.33	2.38	6	18.85	58.44	58.44	0.00	1.28	21.4	27.5	424.32	5.0E-05	5	90.75
17	3.30	10.83	172.53	1.91	1.11	9	18.85	62.22	62.22	0.00	1.24	33.1	41.1	0.00	5.0E-02	6	265.22
18	3.50	11.48	48.23	1.39	2.89	6	18.85	65.99	65.99	0.00	1.20	18.5	22.3	365.12	5.0E-05	5	69.17
19	3.70	12.14	60.80	1.55	2.54	6	18.85	69.76	69.76	0.00	1.17	23.3	27.4	461.34	5.0E-05	5	82.67
20	3.90	12.80	39.21	1.16	2.96	6	18.85	73.53	73.53	0.00	1.14	15.1	17.2	295.28	5.0E-05	4	50.20
21	4.10	13.45	29.46	0.69	2.35	6	18.85	77.30	77.30	0.00	1.11	11.3	12.6	220.09	5.0E-05	4	35.59
22	4.30	14.11	63.29	1.51	2.39	6	18.85	81.07	81.07	0.00	1.09	24.3	26.4	479.55	5.0E-05	5	73.94
23	4.50	14.76	101.68	2.17	2.14	7	18.85	84.84	84.84	0.00	1.06	32.5	34.6	0.00	5.0E-04	5	114.06
24	4.70	15.42	68.08	1.77	2.60	6	18.85	88.61	88.61	0.00	1.04	26.1	27.2	515.74	5.0E-05	5	72.76
25	4.90	16.08	66.37	0.82	1.24	7	18.85	92.38	92.38	0.00	1.02	21.2	21.6	0.00	5.0E-04	5	67.97
26	5.10	16.73	90.29	1.50	1.66	7	18.85	96.15	96.15	0.00	1.00	28.9	28.8	0.00	5.0E-04	5	89.15
27	5.30	17.39	38.59	1.19	3.08	5	18.85	99.92	99.92	0.00	0.98	18.5	18.1	288.38	5.0E-06	4	36.08
28	5.50	18.04	48.30	1.22	2.52	6	18.85	103.69	103.69	0.00	0.96	18.5	17.8	362.62	5.0E-05	5	43.71
29	5.70	18.70	50.57	1.13	2.23	6	18.85	107.46	107.46	0.00	0.94	19.4	18.3	379.82	5.0E-05	5	44.18
30	5.90	19.36	28.67	0.97	3.40	5	18.85	111.23	111.23	0.00	0.93	13.8	12.8	211.28	5.0E-06	4	23.74
31	6.10	20.01	146.31	2.43	1.66	8	18.85	115.00	115.00	0.00	0.91	35.1	32.0	0.00	5.0E-03	6	121.13
32	6.30	20.67	143.52	1.10	0.76	9	18.85	118.77	118.77	0.00	0.90	27.6	24.7	0.00	5.0E-02	6	115.00
33	6.50	21.33	119.37	2.45	2.05	7	18.85	122.55	122.55	0.00	0.88	38.2	33.8	0.00	5.0E-04	5	92.51
34	6.70	21.98	98.84	2.75	2.78	6	18.85	126.32	126.32	0.00	0.87	38.0	33.1	748.97	5.0E-05	5	74.12
35	6.90	22.64	84.11	0.98	1.17	8	18.85	130.09	130.09	0.00	0.86	20.2	17.3	0.00	5.0E-03	5	61.07
36	7.10	23.29	108.02	0.47	0.44	9	18.85	133.86	133.86	0.00	0.85	20.7	17.5	0.00	5.0E-02	6	76.47
37	7.30	23.95	66.87	0.91	1.37	7	18.85	137.63	137.63	0.00	0.83	21.4	17.9	0.00	5.0E-04	5	45.64
38	7.50	24.61	29.86	1.00	3.34	5	18.85	141.40	141.40	0.00	0.82	14.3	11.8	218.01	5.0E-06	4	19.27
39	7.70	25.26	28.81	0.77	2.66	6	18.85	145.17	145.17	0.00	0.81	11.1	9.0	209.66	5.0E-05	4	18.05
40	7.90	25.92	68.65	1.74	2.53	6	18.85	148.94	148.94	0.00	0.80	26.4	21.1	515.29	5.0E-05	5	43.25
41	8.10	26.57	92.99	3.08	3.32	6	18.85	152.71	152.71	0.00	0.79	35.7	28.3	701.92	5.0E-05	4	57.46
42	8.30	27.23	72.17	2.59	3.59	6	18.85	156.48	156.48	0.00	0.78	27.7	21.7	541.74	5.0E-05	4	43.28
43	8.50	27.89	68.25	2.87	4.21	5	18.85	160.25	160.25	0.00	0.77	32.8	25.3	511.34	5.0E-06	4	39.89
44	8.70	28.54	116.78	6.86	5.87	11	18.85	164.02	164.02	0.00	0.76	112.1	85.7	0.00	0.0E+00	9	67.35
45	8.90	29.20	59.15	5.86	8.00	11	18.85	167.79	167.20	0.60	0.76	56.8	43.0	0.00	0.0E+00	3	32.96
46	9.10	29.86	24.79	1.07	4.31	4	18.85	171.56	169.01	2.56	0.75	15.9	11.9	176.67	5.0E-07	3	13.07
47	9.30	30.51	36.69	0.62	1.70	6	18.85	175.33	170.81	4.52	0.75	14.1	10.6	267.76	5.0E-05	4	19.59
48	9.50	31.17	78.85	0.96	1.22	8	18.85	179.10	172.62	6.48	0.74	18.9	14.1	0.00	5.0E-03	5	42.81
49	9.70	31.82	115.33	1.75	1.52	8	18.85	182.88	174.43	8.44	0.74	27.7	20.5	0.00	5.0E-03	5	62.42
50	9.90	32.48	228.16	2.61	1.14	9	18.85	186.65	176.24	10.41	0.74	43.8	32.3	0.00	5.0E-02	6	123.22

APPENDIX C

Shield Env.

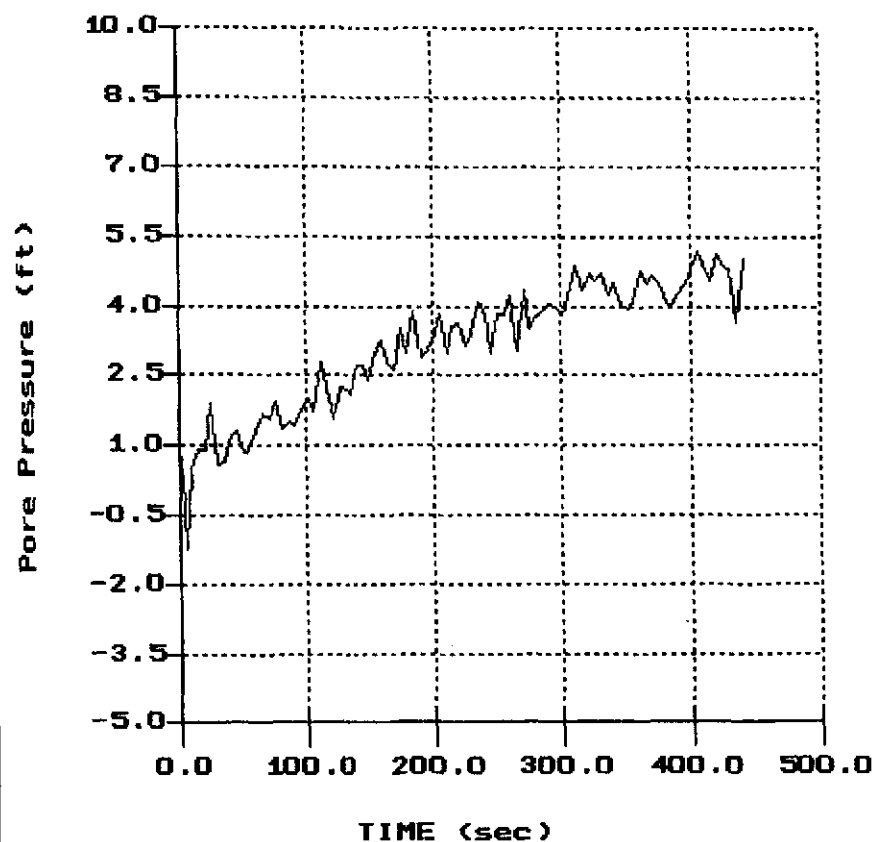
Hole: CPT-1

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 09:32

PORE PRESSURE DISSIPATION RECORD



File: 760CP001.PPD

Depth (m): 2.80

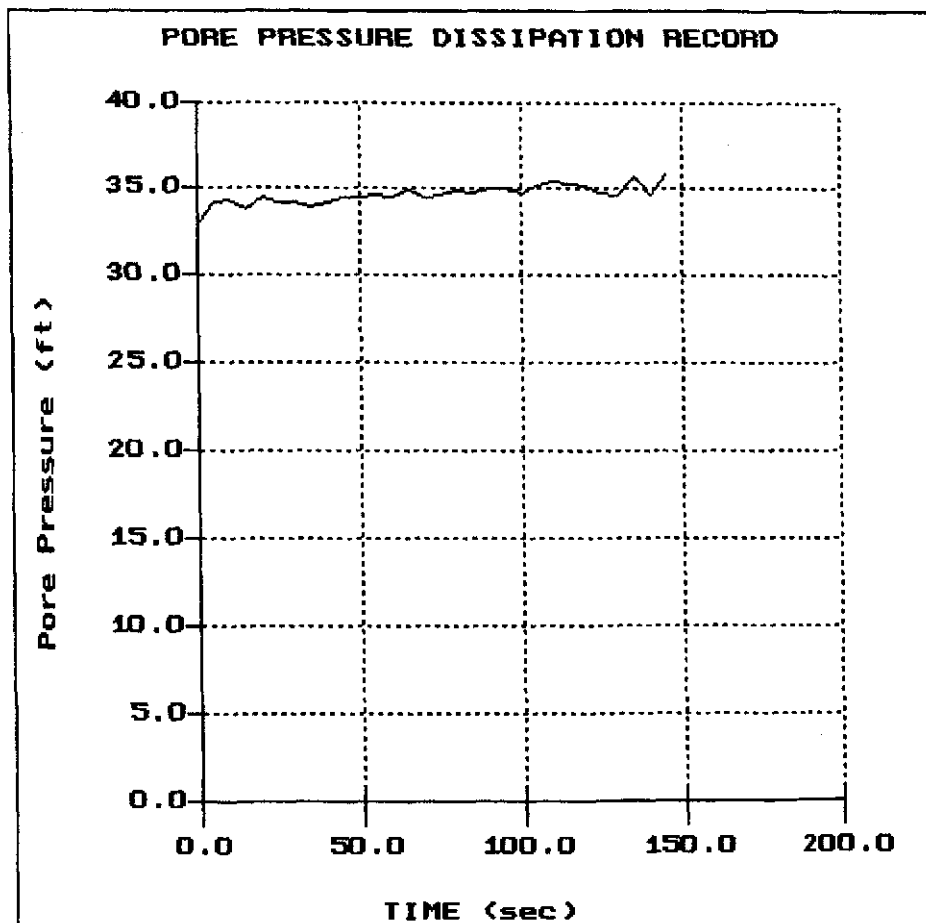
(ft): 9.19

Duration: 440.0s

U-min: -1.27 5.0s

U-max: 5.16 405.0s

Shield Env.

Hole: CPT-1A
Location: Peterson/PuritanCone: 20 TON AD139
Date: 09:10:03 09:57File: 760CP01A.PPD
Depth (m): 12.20
(ft): 40.03
Duration : 145.0s
U-min: 32.94 0.0s
U-max: 35.81 145.0s

Shield Env.

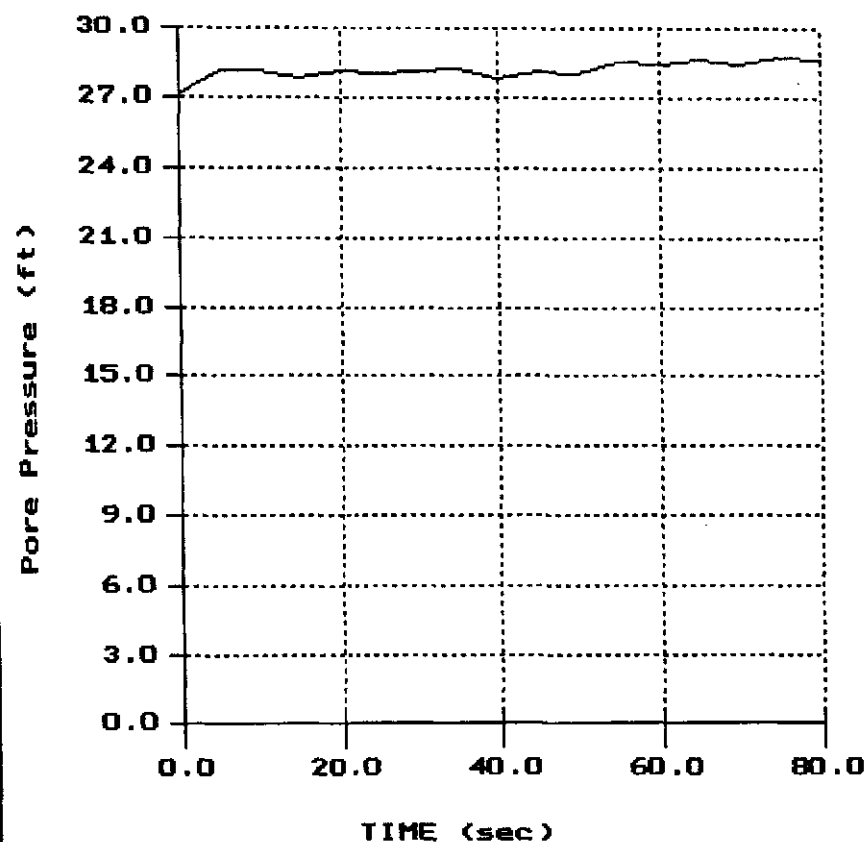
Hole: CPT-2

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 10:50

PORE PRESSURE DISSIPATION RECORD



File: 760CP002.PPD

Depth (m): 11.30

(ft): 37.07

Duration: 80.0s

U-min: 27.08 0.0s

U-max: 28.77 75.0s

Shield Env.

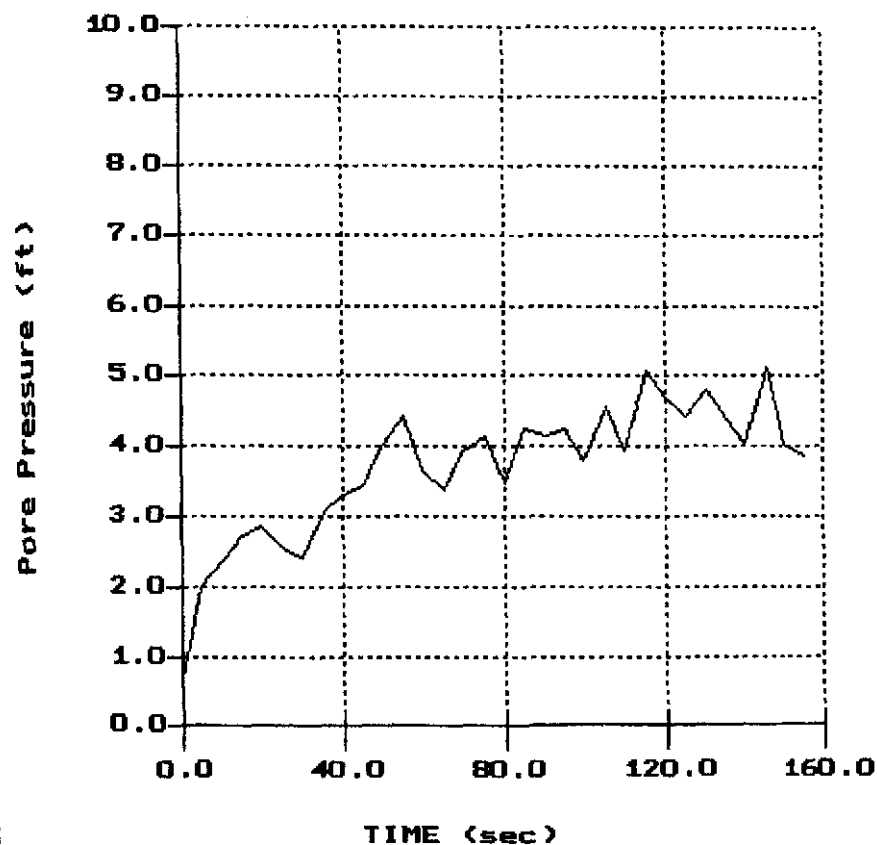
Hole: CPT-6

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 15:11

PORE PRESSURE DISSIPATION RECORD



File: 760CP006.PPD
Depth (m): 8.50
(ft): 27.89
Duration : 155.0s
U-min: 0.66 0.0s
U-max: 5.12 145.0s

Shield Env.

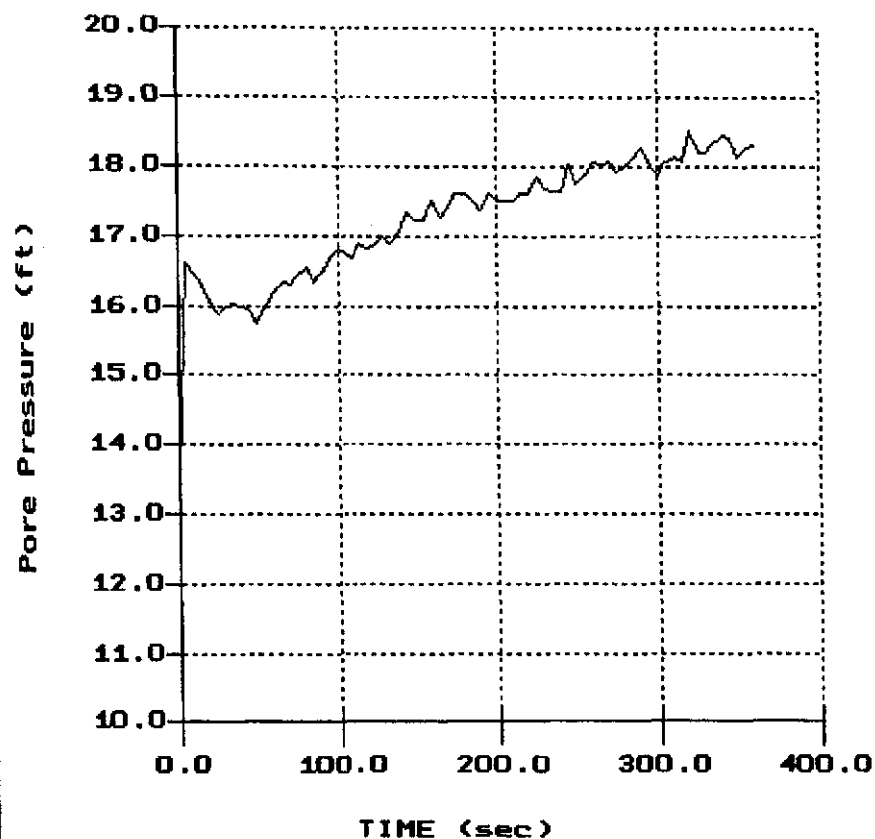
Hole: CPT-7

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 16:26

PORE PRESSURE DISSIPATION RECORD



File: 760CP007.PPD

Depth (m): 9.90

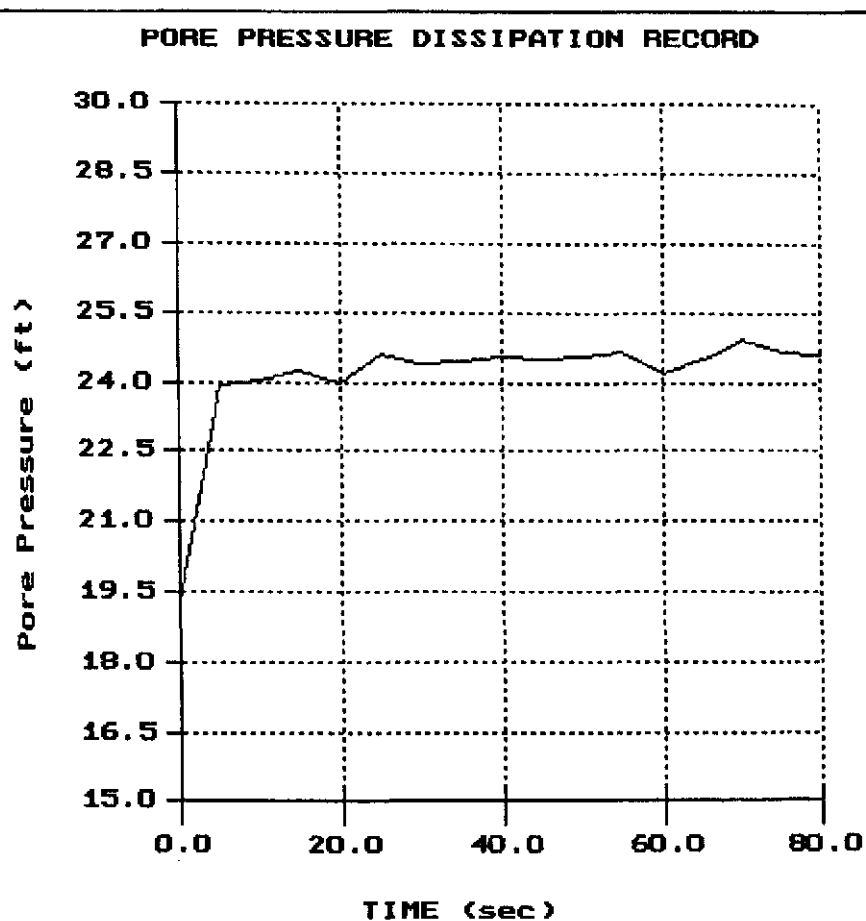
(ft): 32.48

Duration: 360.0s

U-min: 13.52 0.0s

U-max: 18.49 320.0s

Shield Env.

Hole: CPT-7
Location: Peterson/PuritanCone: 20 TON AD139
Date: 09:10:03 16:26File: 760CP007.PPD
Depth (m): 12.15
(ft): 39.86
Duration: 80.0s
U-min: 19.29 0.0s
U-max: 24.87 70.0s

Shield Env.

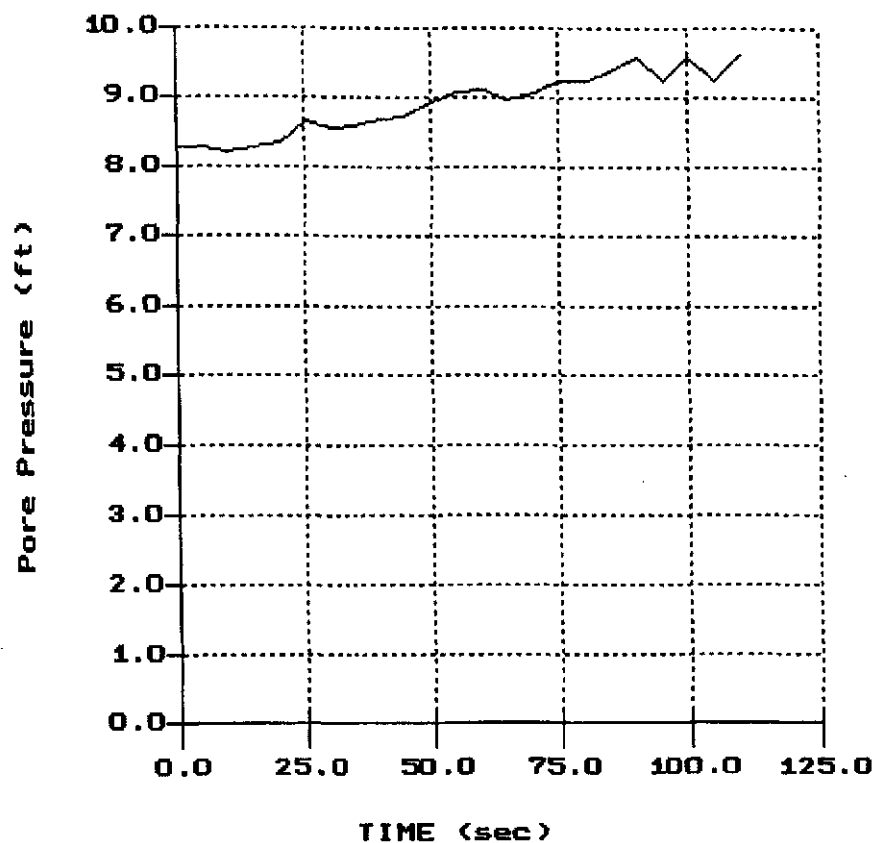
Hole: CPT-8

Location: Peterson/Puritan

Cone: 20 TON AD139

Date: 09:10:03 17:24

PORE PRESSURE DISSIPATION RECORD



File: 760CP008.PPD

Depth (m): 3.95

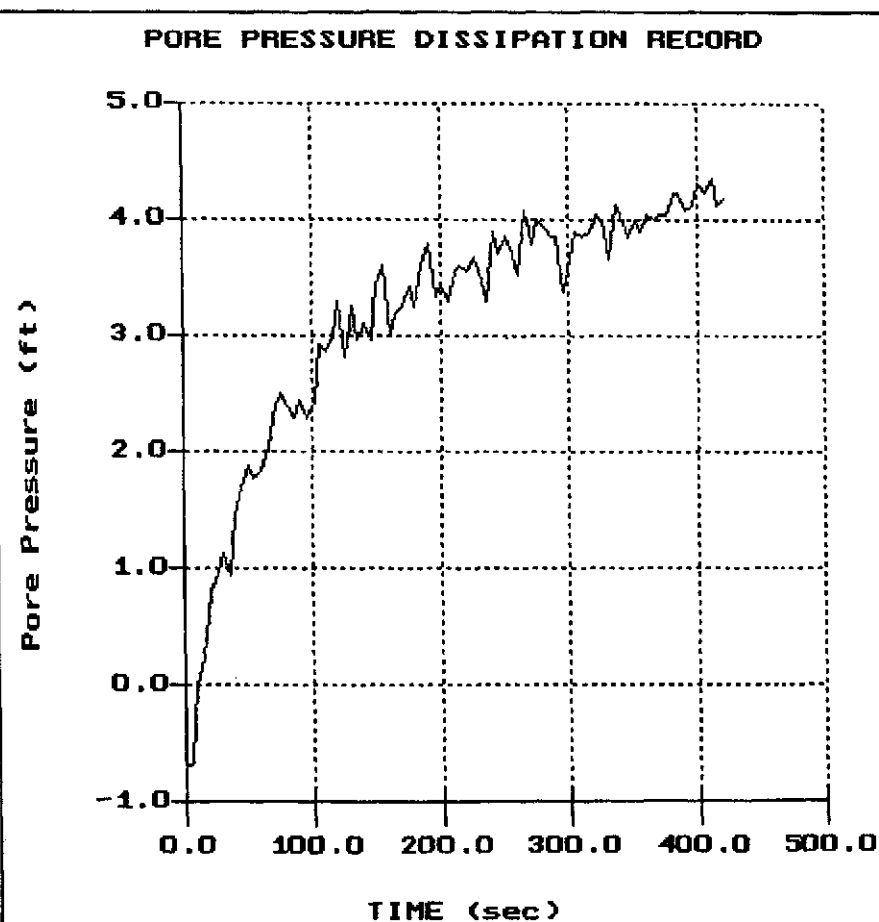
(ft): 12.96

Duration: 110.0s

U-min: 8.21 10.0s

U-max: 9.62 110.0s

Shield Env.

Hole: CPT-9
Location: Peterson/PuritanCone: 20 TON AD139
Date: 09:10:03 18:14

File: 760CP009.PPD
Depth (m): 10.15
(ft): 33.30
Duration: 420.0s
U-min: -0.70 0.0s
U-max: 4.36 410.0s