

APPENDIX C
Exploration Logs (ENGEO)





LOG OF BORING 7-B001

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 2/6/2015
HOLE DEPTH: Approx. 56½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD 88): 20.5 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: V&W Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0	Hand Augered	SANDY LEAN CLAY (CL), brown, moist, low plasticity, fine-grained sand [FILL]; top 5' hand augered	Blue diagonal lines			28	17	11	50 65	11.3		
1	1	Hand Augered								56			
5	5	Native	SILTY SAND (SM), dark brown, dense, moist, fine-grained sand, weak cementation [NATIVE]	Green dots		46				66			
2	2	Native	(medium dense, no cementation)			21	NP	NP	NP	40			
10	10	Native	(loose)			7				31			
4	4	Native	LEAN CLAY (CL), gray, very stiff, moist, low plasticity	Blue diagonal lines									
15	15	Native				29	34	23	11	97	22.9		
5	5	Native											
20	20	Native	(brown, very stiff to hard, medium plasticity)			19	41	19	22			2.5*	
7	7	Native										4.5*	
25	25												

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							Liquid Limit	Plastic Limit	Plasticity Index				
8			(stiff to very stiff, high plasticity, pocket of very soft soil at 26 feet)			12	49	17	32				3.0*
30	9		SANDY CLEAN CLAY (CL), gray, stiff, wet, low plasticity			18	29	18	11	65	24.9		
35	10		LEAN CLAY (CL), brown with black, stiff, wet, medium plasticity										
35	11		LEAN CLAY (CL), brown with black, stiff, wet, medium plasticity			14	19	18	1		31	32.1	1.5*
40	12		LEAN CLAY WITH SAND (CL), gray with brown, low plasticity, high silt content, fine grained sand			13	38	21	17	75	30.5		1.75*
45	13		FAT CLAY (CH), gray, medium stiff, high plasticity										
45	14		FAT CLAY (CH), gray, medium stiff, high plasticity			19	75	28	47		41.7		
50	15		LEAN CLAY (CL), gray, medium stiff, wet, low plasticity, high silt content										

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							Liquid Limit	Plastic Limit	Plasticity Index				
16			LEAN CLAY (CL), gray, medium stiff, wet, low plasticity, high silt content (Torvane=0.22 tsf at 51 feet)			9					32.5	89.6	0.5*
55			FAT CLAY (CH), gray, hard, wet, high plasticity			37							>4.5*
17			Bottom of boring at 56 1/2 feet. Groundwater not encountered during drilling.										



LOG OF BORING 7-B002

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 2/6/2015
HOLE DEPTH: Approx. 56½ ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (NAVD 88): 20.2 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: V&W Drilling
DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY CLAYEY SAND (SC-SM), brown, loose to medium dense, moist, fine-grained sand, poorly graded, low plasticity clay pieces mixed in [FILL]										
1	1						21	17	4	44			
5	5		SANDY SILTY (ML), dark brown, very stiff, moist, fine-grained sand [FILL]										
2	2					26	21	18	3	53	11.5		
3	3		SILTY SAND (SM), dark brown, medium dense, moist, fine-grained sand, 35-45% non-plastic fines [NATIVE]										
10	10					23							
3	3		(gray, dense)			32	NP	NP	NP	30	10.6		
37	37												
4	4		SILT (ML), gray with brown, very stiff, moist, non plastic plasticity, fine-grained sand										
15	15					34				83			
5	5		(grades to less <5% fine grained sand, low plasticity)			24	33	25	8	96	27.8		
20	20		LEAN CLAY (CL), dark brown, very stiff, moist, medium plasticity, fine-grained sand										
23	23					23	46	16	30	90	23.2	2.5* >4.5	
7	7												
25	25												

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DRILLING METHOD: Hollow Stem Auger
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			LEAN CLAY (CL), dark brown, very stiff, moist, medium plasticity, fine-grained sand			22							
30	9		SILTY SAND (SM), brown, dense, wet, fine- to medium-grained sand		▽	43	NP	NP	NP	20	27.2		
35	10		SANDY LEAN CLAY (CL), brownish gray, very stiff, medium plasticity							10			
35	11		SILTY SAND (SM), brown with dark gray, dense, moist, fine- to medium-grained sand			62	42 NP	15 NP	27 NP	58 18	21.6 25		
40	12		POORLY GRADED SAND (SP), gray, medium dense			19	NP	NP	NP	4			
45	13		Poorly graded SAND w/ silt										
45	14					15				8			
50	15		SANDY LEAN CLAY (CL), dark bluish gray, very stiff, moist, medium plasticity, high silt content, fine-grained sand										

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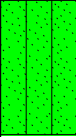


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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY LEAN CLAY (CL), dark bluish gray, very stiff, moist, medium plasticity, high silt content, fine-grained sand			17				63 51	26.7		2.5*
			SILTY SAND (SM), dark bluish gray, medium dense, fine-grained sand, 2" seam of fine gravel and coarse sand			28	NP	NP	NP				
			Bottom of boring at 56 1/2 feet. Groundwater encountered at 30 feet depth during drilling.										



LOG OF BORING 7-B003

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/7/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 20.9 ft.

LOGGED / REVIEWED BY: N. Brossard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			Asphaltic Concrete, approximately 2.5" thick										
			AGGREGATE BASE (AB), approximately 5" thick										
			SANDY SILT (ML), brown mottled with gray, stiff to very stiff, moist, slow dilatancy, non plastic, fine-grained sand [FILL]			15				68	14.9	94.6	3.75*
1			(low plasticity, rapid dilatancy, fine-grained sand)			5				71	30.7		
5													
2													
			SANDY FAT CLAY (CH), dark brown, medium stiff to very stiff, moist, no dilatancy, fine- to medium-grained sand [FILL] (Torvane=0.35 tsf at 6 feet)			6	51	15	36	58	20.9	101.2	2.5*
						3				23.8	99.9		
10						25				20.3	107.3	3.5*	
3													
			SANDY SILT (ML), brown, hard, moist, slow dilatancy, fine-grained sand [NATIVE]			36	31	28	3	61	29.9		>4.5*
4													
15													
5			SILT WITH SAND (ML), gray with brown, hard, moist, fine-grained sand			32	28	24	4	77			
20													
6			SILT (ML), light brown, very stiff, moist, slow dilatancy, fine to medium-grained sand			23	37	25	12	95	30.8	91.7	3.5*
7													
25													
			LEAN CLAY (CL), light brown, stiff to very stiff, moist, no dilatancy, contains fine to medium-grained sand										

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SURF ELEV (NAVD 88): 20.9 ft.

LOGGED / REVIEWED BY: N. Brossard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			LEAN CLAY (CL), light brown, stiff to very stiff, moist, no dilatancy, contains fine to medium-grained sand (Torvane=0.85 tsf at 26 feet)			15	43	16	27		25.1	101.4	2.5*
30	9		CLAYEY SAND (SC), brown, medium dense, wet, low plasticity, fine- to coarse-grained sand, poorly graded			28				34	14.7		
10			SANDY FAT CLAY (CH), greenish gray, stiff, wet, fine- to medium-grained sand, poorly graded, slight odor			41	66	20	46	61			4*
35	11		SANDY SILT (ML), greenish gray, hard, wet, fine-grained sand, non plastic, slight odor										
40	12		CLAYEY SAND (SC), greenish gray, medium dense, wet, low plasticity, medium-grained sand			21							3.75*
40	12		FAT CLAY (CH), gray, very stiff, moist, high plasticity, no dilatancy										
13			(hard)			46					23.6	102.2	>4.5*
45	14		(medium to high plasticity)			32					22	106.4	>4.5*
50	15												

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LOGGED / REVIEWED BY: N. Broussard / MMG
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DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			FAT CLAY (CH), gray, very stiff, moist, high plasticity, no dilatancy										
			LEAN CLAY (CL), dark gray, stiff, wet										
	16		(Torvane=0.2 tsf at 54 feet)			11	45	24	21	30.9	87.1	1.75*	
55	17												
	18		(contains approximately 20-30% fine-grained sand, poorly graded) (Torvane=0.45 tsf at 61 feet)			27				67	26	101.2	2*
60	19		(hard, moist)										
	20					38				24.3	103.1	4*	
65			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B004

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/7/2014
HOLE DEPTH: Approx. 61½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 22 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB), approximately 5" thick										
			SANDY LEAN CLAY (CL), brown, stiff to very stiff, moist, fine-grained sand, poorly graded [FILL]			24			65	15.7			
1			SANDY LEAN CLAY (CL), brown, medium stiff to very stiff, moist, slow dilatancy, fine-grained sand, less sandy with depth [FILL]			5	36	16	20	59			
5						6						2.5-3.5*	
2										19.5	99.8		
			LEAN CLAY (CL), black with brown, hard, moist, no dilatancy, medium dry strength [FILL]										
10			(brown, more silty with depth)			14	44	17	27	18.4	100.7	4*	
										37.6	86		
4			SANDY LEAN CLAY (CL), reddish brown, very stiff, moist, no dilatancy, fine-grained sand [NATIVE]										
15						13	42	15	27	69	18.5	104.7	2.5*
5													
20			SANDY LEAN CLAY (CL), brown, stiff, wet, fine-grained sand										
6						6	27	17	10	58	18.2	111.4	1.5*
7													
25													

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LOG OF BORING 7-B004

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DATE DRILLED: 10/7/2014
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HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 22 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			LEAN CLAY (CL), brown with black, very stiff, moist			12	38	19	19		31.8	91	2.5*
30	9		(less black, some white nodules)			23					24.5	100	3*
35	10		SANDY LEAN CLAY (CL), dark gray, very stiff, moist, slow dilatancy, medium dry strength, fine-grained sand			24	35	14	21	53	12	117.4	3*
40	11		SILTY SAND (SM), dark gray, dense, wet, fine- to medium-grained sand			38				18			
45	12		(small seam of silt)										
45	13		POORLY GRADED SAND WITH SILT (SP-SM) (grades to less than 10% fines, non plastic)			61							
50	14		FAT CLAY (CH), greenish gray, very stiff, moist, no dilatancy, high dry strength										

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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			FAT CLAY (CH), greenish gray, very stiff, moist, no dilatancy, high dry strength			24	77	21	56		12.1	107.8	2.75*
			SANDY SILT (ML), dark gray, hard, moist, non plastic plasticity, fine-grained sand			48				64	22.9	103.5	4*
			POORLY GRADED SAND WITH SILT (SP-SM), dark gray, medium dense, wet, fine- to medium-grained sand			29				8			
			Bottom of boring at 61 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B005

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/8/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 23.6 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB) (approximately 8 inches thick at surface)										
			SANDY CLAY (CL), reddish brown to very dark brown, hard, moist, fine-grained sand with some clay pockets [FILL] (contains some gravel)			47	33	18	15	13.9	113.5	>4.5*	
1						26							
	5		LEAN CLAY (CL), light olive brown with brown, medium stiff to stiff, moist, fine-grained sand [FILL]			17						2.75*	
2			SANDY LEAN CLAY (CL), reddish brown, stiff, moist, fine-grained sand [FILL] (Torvane=0.425 tsf at 6 feet)			8				68			
	10					9	42	27	15	85		0.75*	
3			SILT WITH SAND (ML), dark gray with reddish brown, stiff, moist, fine-grained sand [FILL] (Torvane=0.25 tsf at 11 feet)			4							
	15					5	44	27	17	33.1	85.7	1.0*	
4			SILT WITH SAND (ML), olive brown mottled with reddish brown, moist, very soft [FILL] (contains organics) (Torvane=0.125 tsf at 16 feet)			2							
	20					9	86	43	43			1.25-1.5*	
5			SANDY ELASTIC SILT (MH), grayish black mottled with reddish brown, stiff, moist, contains organics [NATIVE] (Torvane=0.75 tsf at 21 feet)			3				51			
	25		SANDY LEAN CLAY (CL), gray mottled with olive gray, soft, moist, contains roots, fine-grained sand										
			CLAYEY SAND (SC), dark gray mottled with olive gray, very loose, wet, fine-grained sand										

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HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 23.6 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			CLAYEY SAND (SC), dark gray mottled with olive gray, very loose, wet, fine-grained sand			3				48			
						3							
30	9		FAT CLAY (CH), olive gray mottled with brown, medium stiff, moist, fine-grained sand, contains organics (Torvane=0.375-0.44 tsf at 30.5 feet) (blue gray mottled with olive brown and reddish brown oxidation staining)			24	67	26	41	93		3.0*	
35			CLAYEY SAND (SC), olive brown, loose, wet, fine-grained sand, reddish brown and black oxidation staining										
						13						2.0-3.5*	
	11		LEAN CLAY (CL), olive brown mottled with reddish brown, very stiff, contains black oxidation staining CLAYEY SAND (SC), olive mottled with yellowish brown, medium dense, fine-grained sand										
40	12		LEAN CLAY WITH SAND (CL), olive brown mottled with light gray, stiff to very stiff, fine-grained sand, vesicles with gray coating (Torvane=0.75 tsf at 40.5 feet) (olive brown mottled with reddish brown, contains more sand)			31	32	21	11	90	22	105.9	3.0* >4.5*
45													
	14		(Torvane=0.6 tsf at 45.5 feet) CLAYEY SAND (SC), olive brown mottled with reddish brown, dense, fine-grained sand			37							3.0-3.5*
50	15		POORLY GRADED SAND (SP), reddish brown mottled with olive brown, medium dense, fine- to medium-grained sand, with silt										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B005

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/8/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 23.6 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			POORLY GRADED SAND (SP), reddish brown mottled with olive brown, medium dense, fine- to medium-grained sand, with silt (interbedded with fine-grained material)			23							
55			POORLY GRADED SAND (SP), gray, dense, fine- to medium-grained sand										
17			LEAN CLAY (CL), olive brown mottled with reddish brown, stiff, fine-grained sand, grades to blue gray mottled with dark olive gray (Torvane=0.8 tsf at 56.5 feet)			28			95	37.8	82.7	1.5*	
60			(Torvane=3.0 tsf at 60.5 feet) (dark olive gray)			30			74	22	104.1	2.5* 4.0*	
65			POORLY GRADED SAND (SP), olive gray, dense, fine- to medium-grained sand			61			4	25.2	97.8		
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B006

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/8/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 23 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB) approximately 6 inches thick										
			LEAN CLAY WITH SAND (CL), dark brown mottled with very dark brown, hard, moist, contains sand and gravel [FILL]			36	33	17	16	12.1	118	>4.5*	
1						16							
5			SANDY LEAN CLAY (CL), dark brown mottled with very dark brown, soft, moist, contains sand and gravel [FILL]			5				50			
2			SILT WITH SAND (ML), brown mottled with olive brown, soft to medium stiff, fine- to medium-grained sand [FILL]			4				83			
10			SILTY SAND (SM), brown mottled with olive brown, loose, moist, fine- to medium-grained sand [FILL]			9				16			
4			(contains lenses of silt within sand)			6							
15			ELASTIC SILT (MH), very dark brown mottled with reddish brown, stiff to very stiff, contains organics [NATIVE] (Torvane=0.575 tsf at 15.5 feet)			6	50	30	20	95		2.25*	
5			SILT (ML), olive brown mottled with reddish brown, soft to medium stiff, contains fine-grained sand (Torvane=0.3 tsf at 16.5 feet)			0	38	28	10			0.25-0.75*	
20			FAT CLAY (CH), very dark brown mottled with dark olive brown, stiff, moist, contains fine-grained sand, contains organics (Torvane=0.55 tsf at 21 feet)			7	60	30	30			1.0-1.25*	
7			SANDY SILTY CLAY (CL-ML), dark gray, very soft, wet, fine-grained sand, organics, light brown clay filled fracture			1	27	20	7	54			
25													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B006

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/8/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 23 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			POORLY GRADED SAND WITH SILT (SP-SM), olive gray, loose, fine-grained sand, contains silt			10				9			
			SILT (ML), olive brown, very soft, fine-grained sand			1							
30	9		FAT CLAY (CH), blue gray mottled with very light yellow, stiff to very stiff, yellow less bright with depth (Torvane=1.75 tsf at 31 feet)			27	71	31	40		19.7	94.6	3* 2.25*
35			SILTY SAND (SM), olive brown mottled with reddish brown, medium dense, fine-grained sand			21				1			
			POORLY GRADED SAND (SP), reddish brown to dark brown, medium dense, fine- to medium-grained			15							
40	12		LEAN CLAY (CL), light yellowish brown mottled with light olive brown, medium stiff to hard (contains fine-grained sand) (Torvane=2.25 tsf at 41 feet)			39	34	14	20		20.2	112.3	>4.5*
45			(color changes to mostly olive brown with red brown to black oxidation staining)			46							
50	15												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B006

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/8/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 23 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			(additional oxidization staining, contains carbonate veins and nodules) (Torvane=2.25 tsf at 51 feet) (Torvane=2.75 tsf at 51.5 feet)			32				75	24	99.3	2.5*
16													3.5*
55			(abundant oxidization staining)			52				68			>4.5*
17													
18													
60			POORLY GRADED SAND (SP), gray, medium dense, fine- to medium-grained sand			37							4.25*
19			LEAN CLAY (CL), olive brown mottled with reddish brown, very stiff to hard, fine-grained sand; oxidization staining (Torvane=2.0 tsf at 61.5 feet)										
65			POORLY GRADED SAND WITH SILT (SP-SM), olive brown mottled with reddish brown, dense, fine to medium-grained sand			58				6	18.6	109.9	
20			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B007

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/7/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 24 ft.

LOGGED / REVIEWED BY: N. Brossard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB) approximately 4" thick										
			LEAN CLAY WITH SAND (CL), brown, hard, moist, fine-grained sand [FILL]			56	37	20	17	82	18.8	106.6	>4.5*
1						31							>4.5*
5			LEAN CLAY (CL), gray mottled with brown, hard, moist [FILL]			28	40	23	17	85			>4.5*
2						14				55			
			SANDY LEAN CLAY (CL), dark brown, stiff, moist, fine- to medium-grained sand [FILL]										
10			(becomes fine-grained sand with pockets of clayey sand)			8							
			SANDY SILT (ML), brown, medium stiff, moist, non-plastic [FILL]			5				51			
4													
15			FAT CLAY (CH), gray with brown, stiff, slow to no dilatancy [NATIVE]			9	50	27	23	98	26.6	89.1	2.0*
5			(Torvane=0.5 tsf at 16 feet)			4							
			(becomes more silty)								35.7	86.3	1.5*
			(medium stiff)										1.5*
20			(Torvane=0.3 tsf at 19.5 feet)			7							
			LEAN CLAY WITH SAND (CL), very dark gray, medium stiff, moist, no dilatancy										
			(Torvane=0.2 tsf at 21 feet)			2	32	16	16	62			
			SANDY LEAN CLAY (CL), gray with brown, soft to medium stiff, moist										
7													
25													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B007

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/7/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 24 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SILTY CLAY WITH SAND (CL-ML), grayish brown, soft, wet, fine- to medium-grained sand, trace fine gravel			2	24	19	5	63			
			FAT CLAY (CH), grayish brown, soft, wet				55	25	30	97			
			SILTY SAND (SM), grayish brown, very loose, wet				15	NP	NP	38			
9			SANDY LEAN CLAY (CL), grayish brown mottled with black, very stiff, moist, fine-grained sand, no dilatancy									2.75*	
30			(becomes gray with brown oxidation, hard)			35	41	17	24	83		4.25*	
						26							
35			(trace fine-grained sand)										
11						20	35	18	17				
			SANDY LEAN CLAY (CL), gray, stiff, moist, medium- to coarse-grained sand, brown oxidation and white veins										
40			(becomes more sandy)			24	38	13	25	63			
45			POORLY GRADED SAND WITH CLAY (SP-SC), gray, medium dense, moist, fine- to medium-grained sand, trace coarse gravel										
14						24				8			
			SANDY SILT (ML), gray, very moist, low plasticity, fine-grained sand										
15													
50													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B007

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/7/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 24 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY SILT (ML), gray, very moist, low plasticity, fine-grained sand			27				62			
			SILTY SAND (SM), brown, medium dense to dense, wet, trace pockets of clay							23			
	16		LEAN CLAY (CL), gray, very stiff, moist, medium plasticity, no dilatancy, small black nodules										
55			(very stiff to hard)			27							3.25*
	17												
	18												
60						13							
	19												
	20		SILTY SAND (SM), dark greenish gray, dense, wet, fine- to coarse-grained sand			41							
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B008

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/7/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 25.9 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY LEAN CLAY (CL), light brown, stiff, moist, fine-grained sand [FILL]			29	28	17	11	51			
1			LEAN CLAY WITH SAND (CL), dark brown, very stiff, moist, fine-grained sand, no dilatency [FILL]			17	42	19	23	74		>4.5*	
5			SILTY SAND (SM), light brown, loose, moist, fine- to medium-grained sand [FILL]			16				27			
2			SANDY SILT (ML), light brown, stiff, moist, non plastic [FILL]			10				61			
			LEAN CLAY (CL), dark brown, medium stiff, moist, medium plasticity [FILL]										
10			FAT CLAY (CH), dark brown, very stiff to hard, moist, medium plasticity [FILL]			13	71	26	45	27.8	89.4	4.0*	
			SILTY SAND (SM), light brown, loose, moist, fine-grained sand, 15-25% fines [FILL]										
4			SANDY LEAN CLAY (CL), light brown, very stiff, moist, fine-grained sand [NATIVE]			11	33	23	10	70			
15			LEAN CLAY WITH SAND (CL), light brown, very stiff, moist, becomes more sandy			17	39	23	16	81		4.0*	
			(low plasticity)			10				77			
			LEAN CLAY (CL), light brown, hard, moist, <15% fine-grained sand			21				26	93.9	>4.5*	
20			SANDY LEAN CLAY (CL), very dark gray, moist, no dilatency			11	35	15	20	50	27.1		
			SILTY SAND (SM), brown, medium dense, wet, fine- to medium-grained sand			17				34	18.2	110.1	
7			(very loose, 20-30% fines)			3							
25			SANDY LEAN CLAY (CL), brown, stiff, moist, low plasticity										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B008

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/7/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 25.9 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SANDY LEAN CLAY (CL), brown, stiff, moist, low plasticity			6				52	26.9		
9			SANDY SILT (ML), gray, very stiff, moist, low plasticity, rootlets										
10			SILTY SAND (SM), dark gray, dense, moist, fine-grained sand, oxidation staining			42				44 40			2.5*
11			SANDY SILTY CLAY (CL-ML), dark gray, very stiff, moist			18	26	20	6	50	25	101.2	2.0* 3.5*
12			SANDY SILTY CLAY (CL-ML) SANDY LEAN CLAY (CL), brownish gray, very stiff, moist, medium- to coarse-grained sand										
13			LEAN CLAY (CL), brownish gray, very stiff, moist, medium- to coarse-grained sand			27				86			>4.5* 2.5*
14			LEAN CLAY WITH SAND (CL), olive yellow mottled with black, hard, moist			46	39	20	19	88	21.9	103.9	4.5*
15													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B008

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/7/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 25.9 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			LEAN CLAY WITH SAND (CL), olive yellow mottled with black, hard, moist			49	38	23	15	76	27.9	96.2	4.0*
55			SANDY SILT (ML), dark gray, stiff, wet, fine- to medium-grained sand			33	NP	NP	NP	58			
	17		SILTY SAND (SM), dark gray, dense, wet, fine-grained sand							32			
	18		(medium dense)			26				14			
	19		LEAN CLAY gray, stiff, moist, medium plasticity, no dilatency, rootlets										
65	20		POORLY GRADED SAND (SP), dark gray, dense, wet, fine- to medium-grained sand, trace coarse sand and fine gravel Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.			25							



LOG OF BORING 7-B009

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/6/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 26 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			LEAN CLAY WITH SAND (CL), grayish brown, hard, moist, low plasticity, 20-30% fine- to medium-grained sand [FILL]			73				12	122.2	>4.5*	
1			SILTY SAND (SM), reddish brown, very dense, fine- to coarse-grained sand, 20-30% fines [FILL]			84	NP	NP	NP				
5						52/6"				10	120.5		
2						65							
10						59				11.3	120.4		
4			POORLY GRADED SAND WITH SILT (SP-SM), light grayish brown, moist to wet, fine- to medium-grained sand [FILL]			17				6			
15			POORLY GRADED SAND (SP), light grayish brown, moist to wet, fine- to medium-grained sand [FILL]			10				4			
20			LEAN CLAY (CL), very dark brown, medium stiff, wet, medium plasticity, <5% fine- to medium-grained sand, pockets of black, fibrous organics [NATIVE]			5							
7			SILTY SAND (SM), reddish brown, loose to medium dense, wet, fine- to medium-grained sand										
25													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B009

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/6/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 26 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SILTY SAND (SM), reddish brown, loose to medium dense, wet, fine- to medium-grained sand				19	NP	NP	49		0.75*	
30	9		LEAN CLAY (CL), dark brown, stiff, wet, <15% fine-grained sand			11	42	23	19			2.0*	
35	11		SANDY LEAN CLAY (CL), dark brown, very stiff, wet, low plasticity, 35-45% fine- to medium-grained sand			18				28.3		3.0*	
45	14		LEAN CLAY (CL), light olive brown, very soft, wet, <15% fine-grained sand			1	48	16	32			0.25*	
50	15												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B009

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/6/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 26 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			POORLY GRADED SAND WITH SILT (SP-SM), light brown, medium dense to dense, wet, fine- to medium-grained sand, 5-12% fines			26				30			
17													
18													
60													
19													
65													
20						33							
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B010

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/6/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 27 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SILTY SAND (SM), reddish brown, dense, moist, fine- to medium-grained sand, 20-30% fines [FILL]										
			SANDY LEAN CLAY (CL), dark brown, hard, moist, low plasticity, 35-45% fine- to medium-grained sand [FILL]			67				13.4	121.6	>4.5*	
1			SANDY SILT (ML), reddish brown, hard, moist, fine- to medium-grained sand [FILL]			49			54				
5			SILTY SAND (SM), reddish brown, loose to medium dense, moist, 15-25% fines [FILL]			43				7.8	110		
2						10							
10			(10-20% fines)			10				6.4	87.7		
4						5							
15			SILT WITH SAND (ML), reddish brown, medium stiff, 15-30% fine- to medium-grained sand [NATIVE]			6	NP	NP	NP				
5													
20			LEAN CLAY (CL), dark reddish brown, very soft, low plasticity, 5-15% fine-grained sand, trace pockets of black organics			1							
7													
25			SILT WITH SAND (ML), grayish brown, medium stiff, low plasticity, 15-25% fine-grained sand										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B010

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/6/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 27 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SILT WITH SAND (ML), grayish brown, medium stiff, low plasticity, 15-25% fine-grained sand										
			(Torvane=0.15 tsf at 28 feet)										
30	9		SILTY SAND (SM), grayish brown, loose, fine- to medium-grained sand, 15-25% fines			8				32.5			0.75*
35	10		SANDY SILT (ML), grayish brown, medium stiff, wet, 35-45% fine-grained sand										
35	11		SANDY SILT (ML), grayish brown, medium stiff, wet, 35-45% fine-grained sand			6	NP	NP	NP				
40	12		POORLY GRADED SAND (SP), gray, medium dense, wet, medium- to coarse-grained sand, <5% fines			20				22.7			
45	13		POORLY GRADED SAND (SP), gray, medium dense, wet, medium- to coarse-grained sand, <5% fines										
45	14		LEAN CLAY WITH SAND (CL), gray, very stiff, wet, 20-30% fine- to coarse-grained sand			20	29	17	12				
50	15		LEAN CLAY (CL), grayish brown, stiff, wet, <15% fine-grained sand										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B010

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/6/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 27 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			LEAN CLAY (CL), grayish brown, stiff, wet, <15% fine-grained sand			12	35	20	15				1.75*
17						10							
18			FAT CLAY (CH), grayish brown, stiff, wet, <15% fine-grained sand			10	54	18	36				2.0*
19													
20						17							
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B010A

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/8/2015
HOLE DEPTH: Approx. 40½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 27 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB) approximately 4" thick										
			SILTY SAND (SM), dark brown, dense, moist, pockets of low plasticity clay [FILL]			57				40		>4.5*	
1			SANDY LEAN CLAY (CL), olive brown, hard, moist, fine-grained sand [FILL]			38	27	18	9	63			
5			SILTY SAND (SM), dark brown to brown, medium dense to dense, moist, fine-grained sand, non plastic fines [FILL]			51	NP	NP	NP	16			
2						27				18			
10			(loose)			11				22			
4						7							
15			SILTY SAND TO SANDY SILT (SM/ML), gray with brown, medium dense to stiff, moist, fine-grained sand, non-plastic [NATIVE]			14				51		2.75*	
5			SILTY SAND (SM)			18				47		1.0*	
			Silty SAND										
20			SANDY SILT (ML), gray with brown, medium stiff, wet, fine-grained sand, dilative			7	33	25	8	57			
6							29	NP	NP	63	34.6	87.1	
			(brown, soft, low plasticity) (Torvane=0.15 tsf at 21 feet)				32	29	3				
7			(dark gray, moist)								35.9	83.2	
25						7				55	33.3	0.5*	

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B010A

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/8/2015
HOLE DEPTH: Approx. 40½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 27 ft.

LOGGED / REVIEWED BY: N. Broussard / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			LEAN CLAY WITH SAND (CL), very dark gray, very soft to soft, moist, fine-grained sand (Torvane=0.1 tsf at 25 feet)				36	21	15	76			
			SILT (ML), very dark gray, very soft to soft, moist				26	NP	NP	92	31.3	95.5	
			POORLY GRADED SAND (SP), dark gray, loose to medium dense, moist, fine-grained sand			16				5	29.5		
			LEAN CLAY (CL), very dark gray, soft, moist, medium plasticity (Torvane=0.25 tsf at 27.5 feet)										
30			SILTY SAND (SM), dark gray, loose, wet, fine- to medium-grained sand			6				13	35.7		
35			SANDY LEAN CLAY (CL), dark gray, soft to medium stiff, moist, increasing plasticity with depth (Torvane=0.35 tsf at 35.5 feet) (Torvane=0.15 tsf at 36 feet)			3							
40			SILTY SAND (SM), dark gray, loose, wet, fine-grained sand			9				18	33.7		
			Bottom of boring at 40 1/2 feet. Groundwater not encountered due to drilling method.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B011

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/9/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 29 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB), approximately 6 inches thick										
			CLAYEY SAND (SC), brown mottled with reddish brown, dense to very dense, moist, fine- to medium-grained sand, contains organics [FILL]			73				32	8.8	122.3	
1			(dark brown)			40							
5						68				15			
2			(contains gravel, olive brown)			35							
			CLAYEY SAND (SC), yellowish brown, loose to medium dense, moist, fine-grained sand, contains clay inclusions [FILL]			36				23	9	98.5	
10						9							
4						13							
15			SANDY LEAN CLAY (CL), olive brown, medium stiff to stiff, moist, fine-grained sand [NATIVE]			8	31	21	10	59			
5						14	47	24	23		22.8	107.2	
20			SANDY LEAN CLAY (CL), very dark grayish brown, stiff, wet, fine-grained sand			4	28	23	5	44		2.0*	
6			SILTY SAND (SM), dark yellowish brown, loose, wet, fine-grained sand									1.5-1.75*	
7													
25													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B011

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/9/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 29 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SANDY SILT (ML), olive brown mottled with reddish brown, soft to medium stiff, wet, fine-grained sand, contains carbonates			14	NP	NP	NP	70		0.5*	
						12	NP	NP	NP				
30	9		LEAN CLAY (CL), olive gray, hard, wet, fine-grained sand (Torvane=2.0 tsf at 30.5 feet)			33	41	19	22	86		>4.5*	
						48						>4.5*	
35	11		(Torvane=2.0 tsf at 35.5 feet) SILTY SAND (SM), olive gray mottled with reddish brown, medium dense to dense, wet, fine-grained sand										
40	12		LEAN CLAY WITH SAND (CL), olive gray mottled with reddish brown, hard, wet, fine-grained sand, contains silt (Torvane=1.0 tsf at 41 feet)			47				82		4.0*	
	13		(sand)										
45	14		SILT WITH SAND (ML), olive brown mottled with reddish brown, very stiff to hard, wet, fine-grained sand (Torvane=0.875 tsf at 46 feet)			34	34	26	8	77		2.5* >4.5*	
	15												
50													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B011

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/9/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 29 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			SILTY SAND (SM), olive brown mottled with reddish brown, medium dense, wet, fine-grained sand (Torvane=0.4 tsf at 50.5 feet)			33	NP	NP	NP	43			
55	17		POORLY GRADED SAND WITH SILT (SP-SM), gray, medium dense to dense, wet, fine- to medium-grained sand			28				11			
60	19					51				6			
65	20		SANDY LEAN CLAY (CL), blue gray, soft to medium stiff, wet, fine-grained sand (Torvane=0.25 tsf at 66 feet)			21				53		0.25*	
			LEAN CLAY (CL), blue gray, very stiff, wet, fine-grained sand									2.5*	
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B012

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/9/2011
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 32.5 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), dark brown, medium dense, moist, fine- to medium-grained sand			39				48	12.2	109.6	
1	1					18							
5	5					16							
2	2					16				38	13.8	106.3	
10	10					32	NP	NP	NP	29 22	12.6	115.7	
4	4		LEAN CLAY WITH SAND (CL), dark grayish brown, stiff, moist, low plasticity, 15-25% fine- to medium-grained sand			11							
15	15		POORLY GRADED SAND (SP), light grayish brown, loose, moist, medium- to course-grained sand			16					17.3	100.8	
5	5		SILT (ML), grayish brown, stiff, moist, fine- to medium-grained sand			11	NP	NP	NP	92			>4.5*
20	20		SILTY CLAY (CL-ML), grayish brown, stiff to very stiff, moist, fine- to medium-grained sand			16	39	25	14	96	24.7 10.4	85.3 93.1	
7	7		(Torvane=0.15 tsf at 21.5 feet)			17							
25	25												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B012

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/9/2011
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 32.5 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			POORLY GRADED SAND (SP), dark grayish brown, medium dense, wet, medium- to coarse-grained sand			14				1	24.2		
9	30		POORLY GRADED SAND WITH SILT (SP-SM), gray, medium dense, wet, fine- to medium-grained sand			11				7	30.4		
			(silt in cuttings)										
11	35		POORLY GRADED SAND (SP), gray, medium dense, medium- to coarse-grained sand			19					25.5	91.7	
12	40		SANDY LEAN CLAY (CL), dark gray, soft, wet, low plasticity, fine grained sand			10							
13			POORLY GRADED SAND (SP), gray, medium dense, wet, medium- to coarse-grained sand										
14	45					20				2	25.7		
15	50												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B012

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/9/2011
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 32.5 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			(dense)			37				2	20.8		
			CLAY WITH SAND (CL), gray, medium stiff, wet, low plasticity, fine- to medium-grained sand			24							
			POORLY GRADED SAND WITH SILT (SP-SM), gray, dense, medium- to coarse-grained sand										
			POORLY GRADED SAND (SP), light gray, very dense, wet, medium- to coarse-grained sand			52					10.6		
						63					21.4		
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B013

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/10/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: Z. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB) approximately 12 inches at surface										
			SILTY SAND (SM), grayish brown, medium dense, moist, fine- to medium-grained sand (grades to fine-grained sand)			30			30	8.6	121.4		
1						18							
5			SILTY SAND (SM), light brown, medium dense, moist, fine-grained sand (20-25% fines)			19			14	11.5	108.9		
2						7							
10			POORLY GRADED SAND WITH SILT (SP-SM), light brown, loose, moist, fine- to medium-grained sand (fine to medium-grained sand)			6			9	6.1	101.3		
4						4							
15			SILTY SAND (SM), brown, loose to medium dense, moist, fine- to medium-grained sand			14			27				
5						22				19.6	93		
20			POORLY GRADED SAND WITH SILT (SP-SM), brown, medium dense, moist to wet, fine-grained sand			11			8	6.5			
6													
7													
25													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B013

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/10/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: Z. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			POORLY GRADED SAND (SP), gray to dark gray, loose to medium dense, wet, fine- to medium-grained sand			13				2	27.4		
9													
10			POORLY GRADED SAND WITH SILT (SP-SM), gray to dark gray, loose to medium dense, wet, fine to medium-grained sand			18				1	22.8 24.7	95.7 92.7	
11						8				6			
12			POORLY GRADED SAND (SP), gray to dark gray, loose to medium dense, wet, fine- to medium-grained sand			11							
13													
14						13				0	30.3		
15													
						12				1	31.6		

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B013

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/10/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: Z. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			POORLY GRADED SAND WITH SILT (SP-SM), grayish brown, medium dense, wet, fine- to coarse-grained sand			11				9	30.8		
17						14					16.7		
19			POORLY GRADED SAND WITH SILT (SP-SM), gray, dense to very dense, wet, fine- to medium-grained sand										
20			SILTY SAND (SM), dark gray, very dense, wet, fine-grained sand, 20-30% fines Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.			54					20.3		

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B014

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/10/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: Z. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB), approximately 6" at surface										
			CLAYEY SAND (SC), dark brown, dense, moist, fine-grained sand, 20-30% fines			60				8.8	127.9		
1			SILT WITH SAND (ML), olive gray, very stiff, moist, 15-20% fine-grained sand			20							
5			SILTY SAND (SM), light grayish brown, loose to medium dense, fine-grained sand			22	NP	NP	NP	39	13.2	109.5	>4.5*
2						12							
10			SANDY SILT (ML), olive gray, stiff to very stiff, moist, 30-40% fine-grained sand (Torvane=0.3 tsf at 10 feet)			14	NP	NP	NP		11.7	113	1.75* 3.0*
4						4				67			
15						20	NP	NP	NP		14.7	112.9	3.75* 3.5*
5						12							
20			SILT (ML), brownish gray, hard, moist, fine-grained sand, 5-10% fines			26	NP	NP	NP		15	110.9	>4.5* 4.5*
7			SILTY SAND (SM), grayish brown, medium dense, moist to wet, fine- to medium-grained sand, 15-20% fines			12							
25			SILTY SAND (SM), olive brown, medium dense, wet, fine-grained sand										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B014

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/10/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: Z. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SILTY SAND (SM), olive brown, medium dense, wet, fine-grained sand			17				35			
9			POORLY GRADED SAND (SP), brownish gray, dense, wet, fine-to medium-grained sand										
30			(med. dense)			26				0	19.7		
35			(dense)			32				1	20		
40			(grayish brown, dense)			37				0			
45			(dense)			48				1	22.1		
50													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B014

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 10/10/2014
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: Z. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			(dense) (thin 2-3" sandy silt layer)			31				3	25.5		
55			(gray, very dense, fine to coarse-grained sand)			46				0	21.8		
60			(fine to medium-grained sand)			48				2	19.3		
65			SANDY SILT (ML), dark bluish gray, stiff, wet, fine-grained sand			15	NP	NP	NP	57	28.5		
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B015

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 36 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), light brown, medium dense, dry to moist, fine- to medium-grained sand [FILL]			35				18			
1	1		(brown, very loose to loose, moist)			4				15			
2	2		(35-45% fines)			13							
3	3		CLAYEY SAND (SC), olive brown, loose, wet [NATIVE]			8	NP	NP	NP	49			
4	4		(medium dense)			19				44	10.2	114.1	
5	5		SANDY LEAN CLAY (CL), olive brown mottled with orange, hard, wet, medium plasticity			13							
6	6		(very stiff, 35-45% fine-grained sand, low plasticity)			55/6"					24.8	102.4	>4.5*
7	7		POORLY GRADED SAND (SP), light brown, loose to medium dense, wet, fine- to medium-grained sand			22	NP	NP	NP	63			
25	25												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B015

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 36 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			POORLY GRADED SAND (SP), light brown, loose to medium dense, wet, fine- to medium-grained sand			19				3	21.8	100.7	
9			(grayish brown)			20							
30			LEAN CLAY (CL), olive brown, very stiff, wet, medium plasticity, with fine-grained sand			36							3.75*
10						18	44	22	22	89			
35			SANDY SILT (ML), olive brown mottled with orange, stiff, wet, low plasticity, interbedded layers of silt and sand			46				51	28.8	98.1	0.5*
11			POORLY GRADED SAND (SP), brown, dense, wet, fine- to medium-grained sand, <5% fines			32					22.3		
40			(dilative)			39							
45			POORLY GRADED SAND WITH SILT (SP-SM), grayish brown, dense, wet, fine-grained sand			43				8	26.5 22.3	106.7	
14													
15			POORLY GRADED SAND (SP), light brown, dense, wet, fine- to medium-grained sand, <5% fines										
50													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B015

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 36 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			POORLY GRADED SAND (SP), light brown, dense, wet, fine- to medium-grained sand, <5% fines			45							
16			(very dense)			51			4	23.8			
55			(fine- to coarse-grained sand)			51							
60			SILTY SAND (SM), light brown, dense, wet, fine- to medium-grained sand			37			13	30.4			
19			LEAN CLAY (CL), greenish gray, very stiff, wet, low plasticity, with fine-grained sand			54	43	20	23	89		3.25*	
65													
20													
21													
70													
22													
75													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B015

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 36 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
23			LEAN CLAY (CL), greenish gray, very stiff, wet, low plasticity, with fine-grained sand			24	45	19	26	89			
			Bottom of boring at 76 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B016

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 91½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), dark brown, medium dense, fine- to medium-grained sand, moist [FILL]			29				30			
1	0.3												
5	1.5		(loose)			20				22			
2	0.6					7							
10	3.0		(brown, med. dense)			12				22			
4	1.2		(loose)			9							
15	4.5		POORLY GRADED SAND WITH SILTS (SP-SM), light olive brown, loose to medium dense, fine- to medium-grained sand, moist [NATIVE]			20				27	14	101.4	
5	1.5					13							
20	6.0					21							
7	2.1		POORLY GRADED SAND WITH SILT (SP-SM)			10				8	37.6		
25	7.6												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B016

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 91½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SILTY SAND (SM), light grayish brown, loose to medium dense, moist, fine- to coarse-grained sand			27				17	26.8	93.3	
18						18							
30	9		FAT CLAY (CH), olive brown mottled with orange, very stiff, wet, high plasticity			37	61	25	36	96	35.4	112.5	2.5*
35	10		SILTY SAND (SM), olive brown, dense, wet, fine- to medium-grained sand, 20-30% fines			26							
40	11		POORLY GRADED SAND (SP), olive brown, medium dense, wet, fine- to coarse-grained sand			40				2	25.1	94	
43	12					22							
45	13					43				5	27.4		
50	14					36							

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B016

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 91½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			POORLY GRADED SAND (SP), light olive brown, medium dense, wet, fine- to coarse-grained sand			39				4	21.5		
17													
18													
19						54				5	19.8		
20													
21			SANDY LEAN CLAY (CL), gray, very stiff, wet, medium plasticity, fine-grained sand										
22						20	31	21	10	65			
25			POORLY GRADED SAND WITH SILT (SP-SM), dark gray, dense, wet, fine- to medium-grained sand										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B016

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/6/2015
HOLE DEPTH: Approx. 91½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
23			POORLY GRADED SAND WITH SILT (SP-SM), dark gray, dense, wet, fine- to medium-grained sand			45				12	27.6		
24			LEAN CLAY (CL), dark brown, stiff, wet, medium plasticity, with fine-grained sand										
26						14	38	19	19	74	26.5		
27						23	30	16	14				
			Bottom of boring at 91 1/2 feet. Groundwater not encountered due to drilling method.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B017

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), dark brown, medium dense, moist, fine- to coarse-grained sand, 15-25% fines [FILL]			28							
1	1												
5	5		POORLY GRADED SAND WITH SILT (SP-SM), dark brown, medium dense, moist, fine- to coarse-grained sand [FILL]			56			10				
2	2					23							
10	10		(loose)			13			12				
4	4					10							
15	15		POORLY GRADED SAND WITH SILT (SP-SM), light brown, medium dense, wet, fine- to medium-grained sand [NATIVE]			21			12	10.5	116.7		
5	5					14							
20	20		POORLY GRADED SAND (SP), brown, medium dense, wet, medium- to coarse-grained sand			26			3				
7	7					16							
25	25												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B017

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			POORLY GRADED SAND (SP), brown, medium dense, wet, medium- to coarse-grained sand			26	NP	NP	NP	1			
			SANDY SILT (ML), olive brown, medium stiff, wet, fine-grained sand, non plastic							54			1.0*
			POORLY GRADED SAND (SP), light brown, medium dense, wet, fine- to coarse-grained sand			21							
30						58				2	15.9		
						25							
35			SILTY SAND (SM), light olive brown, dense, wet										
						33				17	26.6		
			SANDY SILT (ML), olive brown mottled with orange, hard, wet, fine-grained sand, non plastic										
40						40	NP	NP	NP	51			
45			POORLY GRADED SAND WITH SILT (SP-SM), grayish brown, very dense, wet, fine- to coarse-grained sand, lenses of oxidation discoloration										
						42				6	26.2		
50			POORLY GRADED SAND (SP), gray, dense, wet, fine- to medium-grained sand <5% fines										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B017

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			POORLY GRADED SAND (SP), gray, dense, wet, fine- to medium-grained sand <5% fines			47							
17			(very dense)			61			4	20.5			
18			SANDY LEAN CLAY (CL), olive brown, stiff, wet, low plasticity, fine-grained sand			26	30	22	8	63	26.5	96.2	1.75*
19						31							
20			LEAN CLAY (CL), dark grayish brown, hard, high plasticity			46	49	49	NP	97			4.5*
21			FAT CLAY (CH), gray mottled with orange, very stiff, wet, high plasticity, <15% fine-grained sand, fissured			25	57	22	35				
22													
75													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15




LOG OF BORING 7-B017

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 76½ ft.
HOLE DIAMETER: 4.8 in.
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LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
	23		FAT CLAY (CH), gray mottled with orange, very stiff, wet, high plasticity, <15% fine-grained sand, fissured			22							
			Bottom of boring at 76 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B018

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), dark brown, loose, moist, fine- to coarse-grained sand, 25-35% fines [FILL]			18							
1	0.3		(medium dense)			58			32				
2	0.6		(loose)			24							
3	0.9		(very dark brown)			19			40	9.7	115.4		
4	1.2		POORLY GRADED SAND WITH SILT (SP-SM), olive brown, loose, moist, medium- to coarse-grained sand [FILL]			14							
5	1.5		SILTY SAND (SM), olive brown, dense, moist, fine- to medium-grained sand			17			19				
6	1.8		SANDY SILT (ML), gray, hard, wet, fine- to medium-grained sand, non plastic			32	NP	NP	NP	67			
7	2.1		POORLY GRADED SAND (SP), light brown, medium dense, wet, medium- to coarse-grained sand			39							
8	2.4					17			4	23.3			
25	7.6												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B018

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

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DRILLING CONTRACTOR: So Cal Drilling
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			FAT CLAY (CH), olive brown, very stiff, wet, fine- to medium-grained sand				57	23	34	99		3.0*	
30	9		CLAYEY SAND (SC), olive brown, dense, wet, fine- to coarse-grained sand			53	40	25	15	95		3.25*	
35	11		SILTY SAND (SM), light brown, loose, wet, fine- to medium-grained sand			22				28	23.8	96.5	
40	12		(brown, dense, fine- to coarse-grained sand, cemented)			66				33	28.7		
45	14		SANDY LEAN CLAY (CL), olive brown, stiff to very stiff, wet, fine- to coarse-grained sand			24	44	18	26	56		1.5*	
50	15		POORLY GRADED SAND (SP), reddish brown, dense, wet, medium- to coarse-grained sand										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B018

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/5/2015
HOLE DEPTH: Approx. 66½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: C. Crawford / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
16			POORLY GRADED SAND (SP), reddish brown, dense, wet, medium- to coarse-grained sand			37				5			
55	17		(grayish brown)			46							
60	19		LEAN CLAY WITH SAND (CL), light olive brown, stiff, wet, fine-grained sand			20	44	20	24	77			
65	20		FAT CLAY (CH), light olive brown, stiff, wet, some fine-grained sand			20	75	29	46	92			
			Bottom of boring at 66 1/2 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-B019

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 53 ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 7 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			LEAN CLAY WITH SAND (CL), grayish brown, very stiff to hard, moist, fine-grained sand [NATIVE]			17	38	21	17	75	21	103.7	4.25* 3.75*
	1		LEAN CLAY (CL), dark gray, stiff, moist			5	41	26	15	97			
	5		SILTY SAND (SM), dark gray, loose, moist, fine to medium grained sand			8	22	18	4	36	20.2		
	2		SILTY CLAY WITH SAND (CL-ML), gray, soft to medium stiff, moist				29	22	7	85			
	10		SANDY SILT (ML), gray, soft to medium stiff, moist, fine-grained sand, non plastic			4	24	23	1	55 60	32		
	4		LEAN CLAY (CL), gray with brown, very stiff, moist			47	36	23	13	94	26.6	96.3	4.50*
	5		SANDY LEAN CLAY (CL), gray with brown, very stiff, moist, fine lamina, peels apart in layers approximately 1/16" thick			27				54			
	20		LEAN CLAY WITH SAND (CL), gray with brown, very stiff, moist			25	32	21	11	71	28.5	94.1	
	7					14				78	25.7		
	25		SANDY LEAN CLAY (CL), olive brown and yellowish brown, stiff to very stiff, moist, contains zones of carbonate and fine grained sand										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B019

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 53 ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 7 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SANDY LEAN CLAY (CL), olive brown and yellowish brown, stiff to very stiff, moist, contains zones of carbonate and fine grained sand (some blue gray mottling at bottom of sample)			10							
						12							
30	9		CLAYEY SAND (SC), brown, medium dense, moist, fine to medium grained			41			33				
						12							
35	11		(gray, dense, contains 4 to 6 inch thick silt lense at 36 1/2 feet)			23			32	23.8	96.5		
						31							
40	12		(medium dense)			22							0.50*
						12	42	19	23	87	28.7		
45	14		LEAN CLAY (CL), blue and gray, medium stiff to stiff, moist, contains red-brown oxidation staining and fine grained sand (very stiff, contains vesicles with blue gray clay)			41			89	22.3	106.7		4.25*
						21							
50	15												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B019

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 53 ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 7 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			CLAYEY SAND (SC), gray, dense, fine to medium grained			39				14	24.5	101.3	
	16		Bottom of boring at 53 feet. Groundwater not encountered due to drilling method.			35							



LOG OF BORING 7-B020

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 116½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			AGGREGATE BASE (AB) approximately 4" thick										
			SANDY LEAN CLAY (CL), brown, stiff, fine-grained sand			20							
1			(reddish brown oxidation staining)			5	25	16	9	64			
2			SANDY SILT (ML), brown, medium stiff			7	NP	NP	NP	52			
3			Olive brown, stiff to very stiff, sandy (at bottom of sample, zones of clayey material, fine-grained sand) (Torvane=0.5 tsf at 15 feet)			12	NP	NP	NP	58	15.9	108.4	3.25*
4			(contains carbonates and organics)			15							
5			(some reddish brown oxidation staining)			16					28	88.1	3.0*
6			SILTY SAND (SM), yellowish brown, medium dense, fine-grained sand, some reddish brown oxidation staining			10							
7			(grayish brown, medium dense, fine- to medium-grained sand, some reddish brown oxidation staining)			20				33.1	86.6		
						11							
						19				17	17.4		
25													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B020

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 116½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
8			SILTY SAND (SM), yellowish brown, medium dense, fine-grained sand, some reddish brown oxidation staining			24							
9			POORLY GRADED SAND (SP), gray, medium dense, fine- to medium-grained sand										
30			(dense)			49			2	17.7			
10			(yellowish brown, medium- to coarse-grained sand)			34							
35			(gray mottled with yellowish brown, very dense, some clay inclusions)			44							
11			(thin layer of fine-grained sand)			35							
40						63			4	15.9			
13						60							
45						55/6"							
14						36							
15													
50													

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B020

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 116½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx	
							Liquid Limit	Plastic Limit	Plasticity Index					
15.5			POORLY GRADED SAND (SP), gray mottled with yellowish brown, very dense	[Yellow dotted pattern]		82				2	21.9			
16.5							58							
17.5														
55			SANDY SILT (ML), dark bluish gray, stiff, fine-grained sand	[Cyan vertical stripes]		57								
18.5														
60														
19.5														
65			SANDY SILT (ML), dark bluish gray, stiff, fine-grained sand	[Cyan vertical stripes]		12	NP	NP	NP	54	35.2			
20														
21														
70														
22														
75														

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B020

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 116½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
23			POORLY GRADED SAND WITH SILT (SP-SM), dark gray, very dense			57				8	26		
26			(gray, fine- to medium-grained sand)			57				6			
29			(fine-grained sand)			50				9			

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-B020

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 1/9/2015
HOLE DEPTH: Approx. 116½ ft.
HOLE DIAMETER: 4.8 in.
SURF ELEV (NAVD 88): 34 ft.

LOGGED / REVIEWED BY: J. Botelho / MMG
DRILLING CONTRACTOR: So Cal Drilling
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
31			POORLY GRADED SAND WITH SILT (SP-SM), dark gray, very dense										
105	32		SANDY SILT (ML), dark bluish gray, very stiff, non plastic plasticity, fine-grained sand			33	NP	NP	NP	65			
110	33												
115	34		LEAN CLAY WITH SAND (CL), dark bluish gray, very stiff, fine-grained sand										
	35					35	30	20	10	71			
			Bottom of boring at 116.5 feet. Groundwater not encountered due to drilling method.										



LOG OF BORING 7-HA001

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 7/7/2015
HOLE DEPTH: Approx. 11 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 14.5 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			LEAN CLAY (CL), brown, moist, low plasticity, contains fine- to medium-grained sand										
			SANDY LEAN CLAY (CL), very dark brown, moist, low plasticity, fine-grained sand				33	21	12	89			
2.5	1		SANDY LEAN CLAY (CL), very dark brown, moist, low plasticity, fine-grained sand				38	24	14	65			
5.0	2		SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, silt fines							37			
			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, silt fines							25			
			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, silt fines							21			
7.5			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, silt fines							12			
			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, silt fines							20			
			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, silt fines							19			
10.0	3		SANDY SILT (ML), yellowish brown, moist to wet, fine-grained sand							15			
			SANDY SILT (ML), yellowish brown, moist to wet, fine-grained sand							54			
			Bottom of boring at approximately 11 feet. Groundwater encountered at 10 1/2 feet during drilling.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-HA002

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 9½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 11.5 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0.0	0.0		SANDY CLAY (CL), dark yellowish brown, moist, low plasticity, fine- to medium-grained sand										
2.5	0.76	1	LEAN CLAY (CL), dark brown, moist, medium plasticity, <15% fine-grained sand				35	20	15	64			
5.0	1.52		LEAN CLAY WITH SAND (CL), brown, moist, medium plasticity, fine-grained sand							79			
7.5	2.28	2	SILTY SAND (SM), yellowish brown with iron oxidation, moist, medium-grained sand, 20-30% fines										
			LEAN CLAY WITH SAND (CL), grayish brown with iron oxidation, moist to wet, low plasticity, fine- to medium-grained sand, silt fines		▽								
			POORLY GRADED SAND (SP), yellowish brown, wet, fine- to medium-grained sand							3			
			Bottom of boring at approximately 9 1/2 feet. Groundwater encountered at 8 1/2 feet during drilling.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-HA003

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 15 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 17.3 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SANDY LEAN CLAY (CL), dark brown, stiff, moist, medium plasticity, fine-grained sand										
1	1		(dark yellowish brown)				40	18	22	69			
2	2		SANDY LEAN CLAY (CL), very dark grayish brown, moist, medium plasticity, fine- to coarse-grained sand							59			
3	3		SILTY SAND (SM), dark yellowish brown, moist							26			
4	4		SANDY LEAN CLAY (CL), dark yellowish brown, moist, low plasticity, 30-40% fine- to medium-grained sand							22			
5	5		SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand							7			
6	6		POORLY GRADED SAND WITH SILT (SP-SM), yellowish brown, wet, fine- to medium-grained sand, 5-12% fines		▽								
15	15		Bottom of boring at approximately 15 feet. Groundwater encountered at 14 1/2 feet during drilling.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-HA004

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 9 3/4 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 9 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx		
							Liquid Limit	Plastic Limit	Plasticity Index						
2.5	1	X	LEAN CLAY (CL), dark yellowish brown, moist, medium plasticity, <15% fine-grained sand												
			(dark grayish brown)												
			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, 25-35% fines										NP	NP	NP
			LEAN CLAY (CL), very dark grayish brown, moist, medium plasticity (contains iron oxidation)										48	22	26
5.0	2	X	SILTY SAND (SM), moist, olive brown with iron oxidation								41				
7.5		X													
		X	Bottom of boring at approximately 9 3/4 feet. Groundwater encountered at 9 feet during drilling.												

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-HA005

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 17 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 17.7 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0			SILTY SAND (SM), dark yellowish brown, moist, fine- to medium-grained sand, 30-40% fines										
1			SILTY SAND (SM), yellowish brown, moist, fine- to medium-grained sand, 20-30% fines										
5			SANDY LEAN CLAY (CL), yellowish brown, moist, fine- to medium-grained sand				30	15	15	65			
2			LEAN CLAY WITH SAND (CL), olive brown, moist, medium plasticity							75			
			(dark olive brown)										
10			LEAN CLAY (CL), moist, very dark grayish brown with iron oxidation, medium plasticity, fine-grained sand							86			
			(olive brown, low plasticity)										
4			FAT CLAY (CH), very dark grayish brown, stiff, moist, medium to high plasticity							94			
15			LEAN CLAY (CL), light olive brown, stiff, wet, medium plasticity. <15% fine-grained sand		▽								
5			Bottom of boring at approximately 17 feet. Groundwater encountered at 17 feet during drilling.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-HA006

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 11 1/4 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 11.5 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			LEAN CLAY (CL), dark olive brown, moist, low to medium plasticity, fine- to medium-grained sand										
2.5	1		LEAN CLAY WITH SAND (CL), dark yellowish brown, moist, low to medium plasticity, fine- to medium-grained sand						76				
5.0			LEAN CLAY WITH SAND (CL), dark brown, contains iron oxidation, medium plasticity, 15-25% fine- to medium-grained sand										
7.5	2		LEAN CLAY WITH SAND (CL), very dark gray, moist, fine-grained sand				48	21	27	76			
10.0	3		LEAN CLAY (CL), olive brown, moist, low to medium plasticity, contains fine- to medium-grained sand										
			(dark brown, wet)		▽					87			
			Bottom of boring at approximately 11 1/4 feet. Groundwater encountered at 10 1/2 feet during drilling.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15



LOG OF BORING 7-HA007

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 9½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 8.9 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			LEAN CLAY (CL), dark olive brown, moist, low plasticity, <15% fine- to medium-grained sand										
2.5	1		LEAN CLAY WITH SAND (CL), brown, moist, low plasticity, fine- to medium-grained sand						81				
5.0			LEAN CLAY WITH SAND (CL), very dark grayish brown, moist, medium to high plasticity										
	2		SANDY LEAN CLAY (CL), moist, dark yellowish brown with iron oxidation, medium plasticity, fine-grained sand						67				
7.5			(wet)		▽				62				
			Bottom of boring at approximately 9 1/2 feet. Groundwater encountered at 8 3/4 feet during drilling.										



LOG OF BORING 7-HA008

Geotechnical Exploration
RD-17 Levee Evaluation
San Joaquin County, California
5747.005.000

DATE DRILLED: 9/15/2015
HOLE DEPTH: Approx. 13 1/4 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (NAVD 88): 14.9 ft.

LOGGED / REVIEWED BY: C. Crawford / ZAC
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

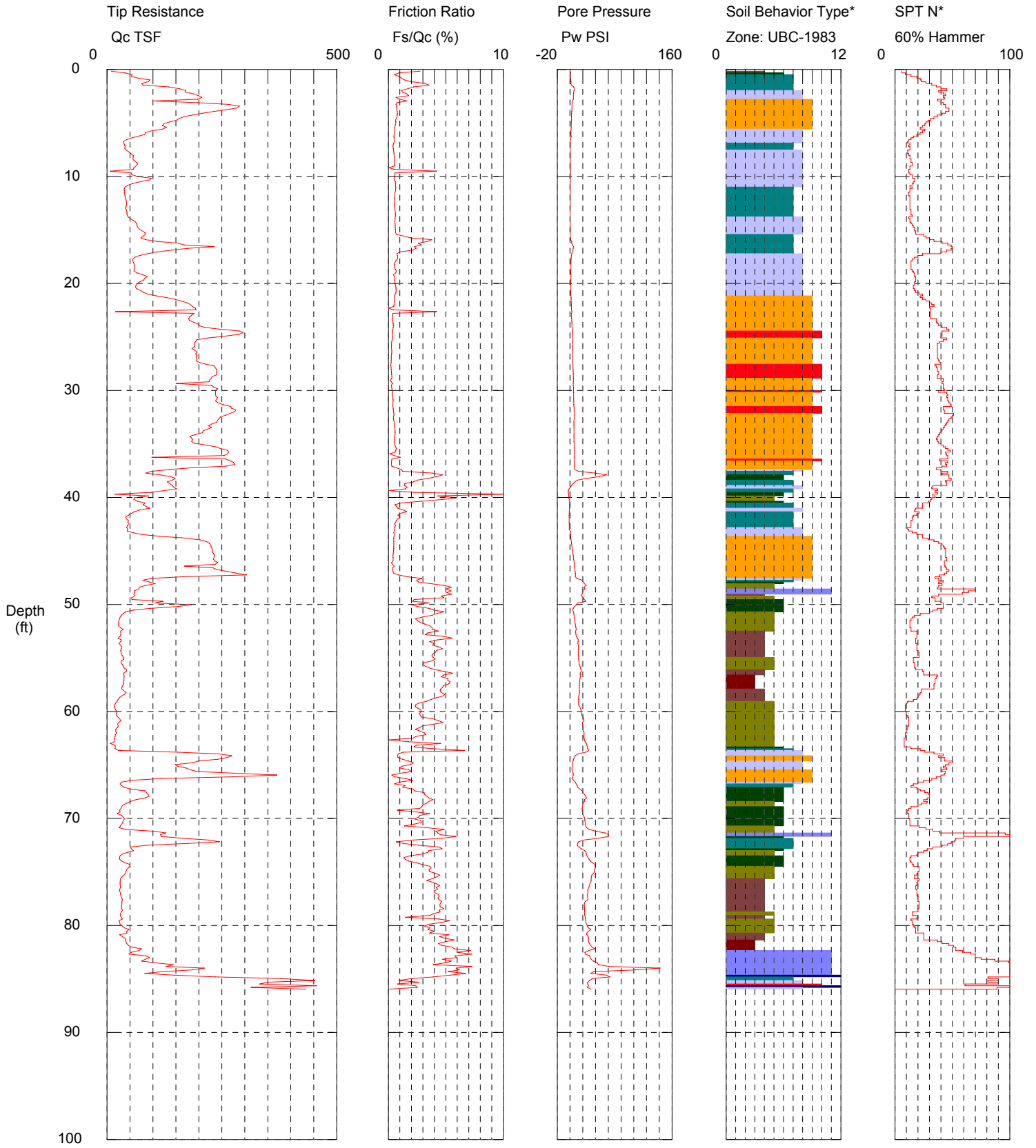
Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY LEAN CLAY (CL), yellowish brown, moist, low plasticity, 30-40% fine- to medium-grained sand										
2.5	1		SANDY LEAN CLAY (CL), dark olive brown, moist, low plasticity, fine- to medium-grained sand						63				
			SILTY SAND (SM), light olive brown, moist, fine- to medium-grained sand				NP	NP	NP	32			
5.0			SANDY LEAN CLAY (CL), dark yellowish brown, moist, low plasticity, fine- to medium-grained sand						70				
	2		LEAN CLAY (CL), dark grayish brown, moist, medium plasticity, <15% fine- to medium-grained sand										
7.5			(very dark grayish brown)										
			SANDY LEAN CLAY (CL), brown, moist, medium plasticity, fine- to medium-grained sand										
10.0	3								57				
12.5	4				▽								
			Bottom of boring at approximately 13 1/4 feet. Groundwater encountered at 13 feet during drilling.										

LOG - GEOTECHNICAL W/METERS 5747005000 - RD17 ULDC.GPJ ENGEO INC.GDT 10/23/15

ENGEO

Operator: Brittsan
 Sounding: 7-CPT001
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 7:29:35 AM
 Location: Manteca Levee
 Job Number: ENG-502



Maximum Depth = 85.96 feet

Depth Increment = 0.164 feet

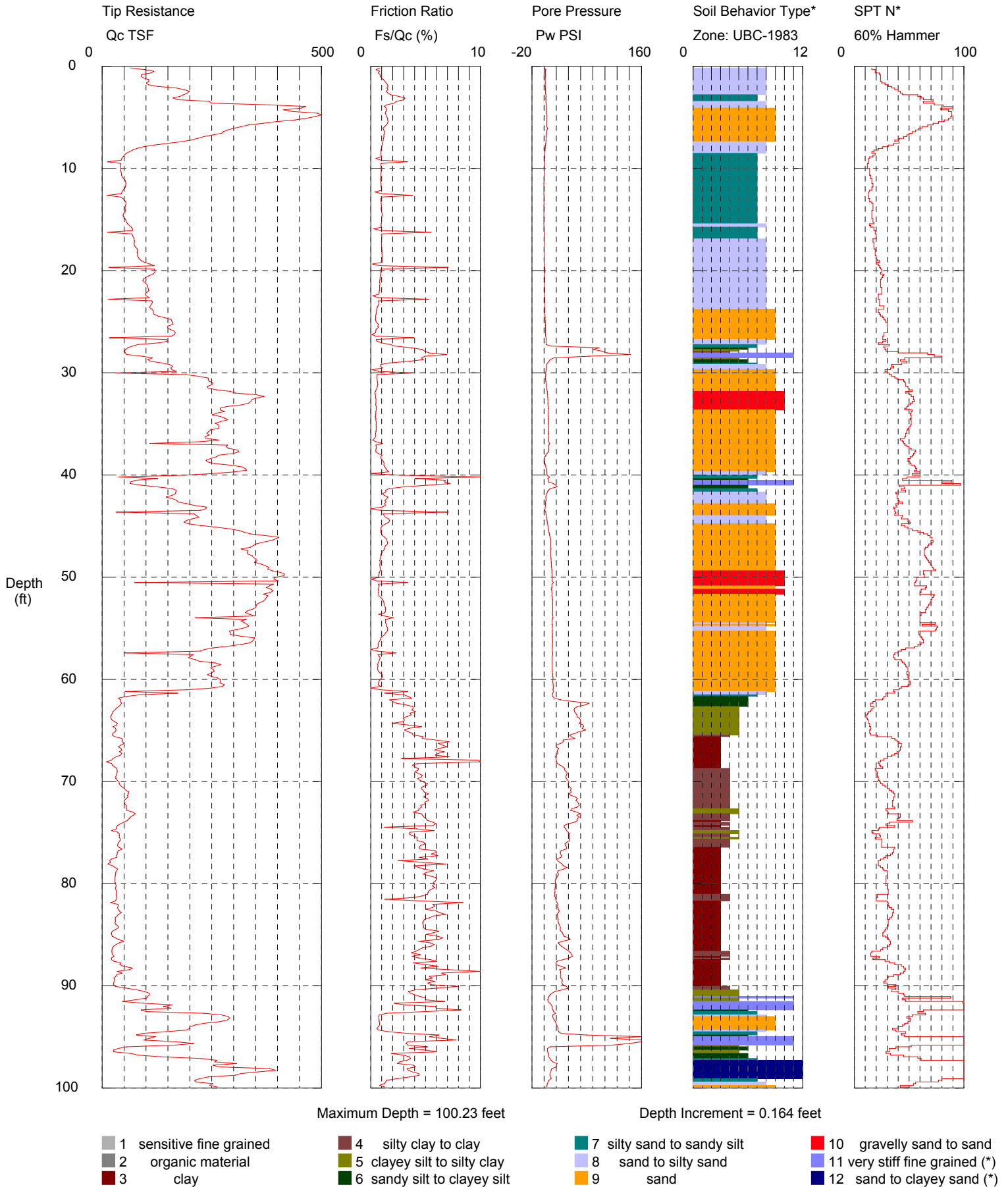
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT002
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 8:37:03 AM
 Location: Manteca Levee
 Job Number: ENG-502



Maximum Depth = 100.23 feet

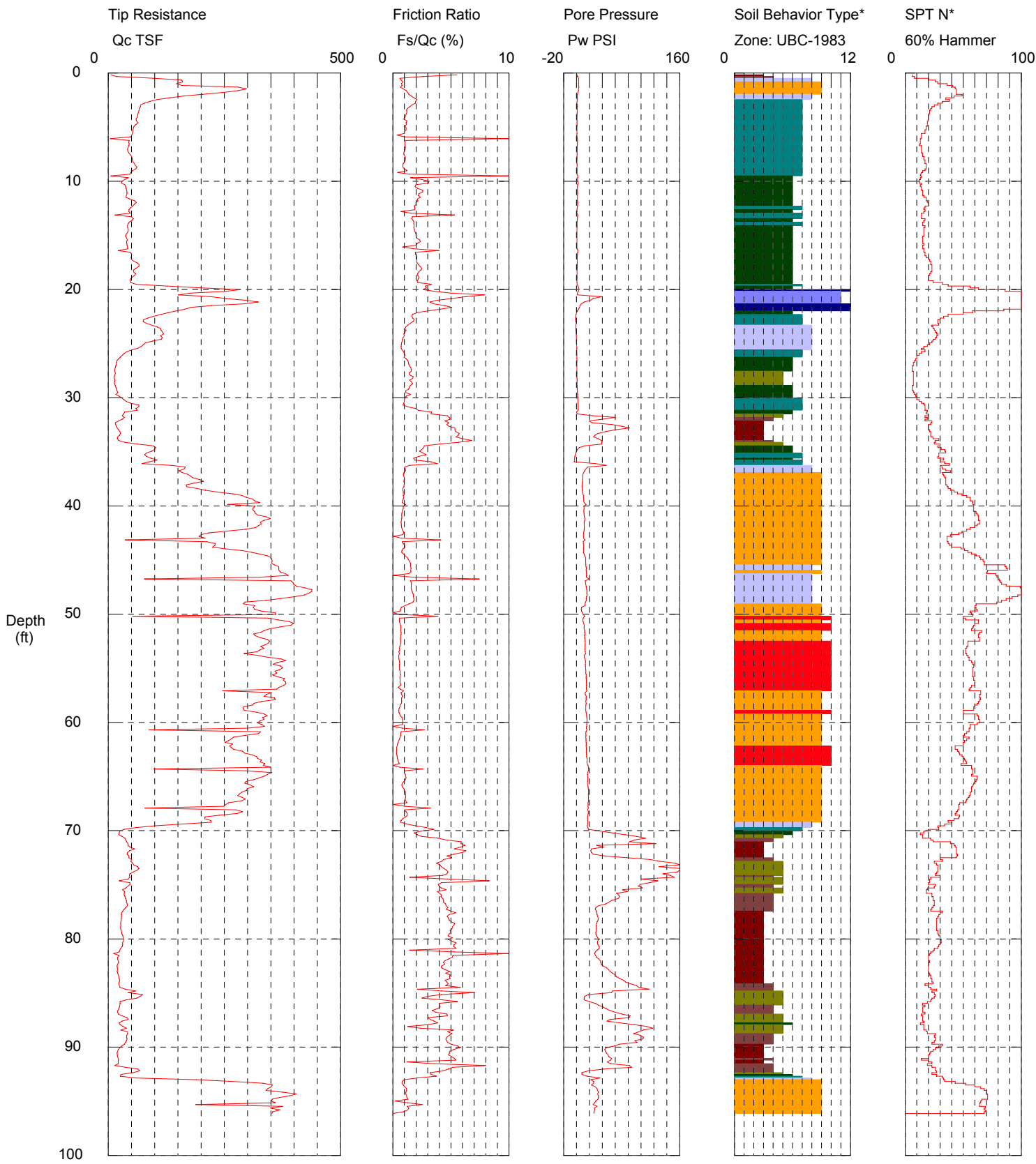
Depth Increment = 0.164 feet

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT003
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 9:37:43 AM
 Location: Manteca Levee
 Job Number: ENG-502



Maximum Depth = 96.13 feet

Depth Increment = 0.164 feet

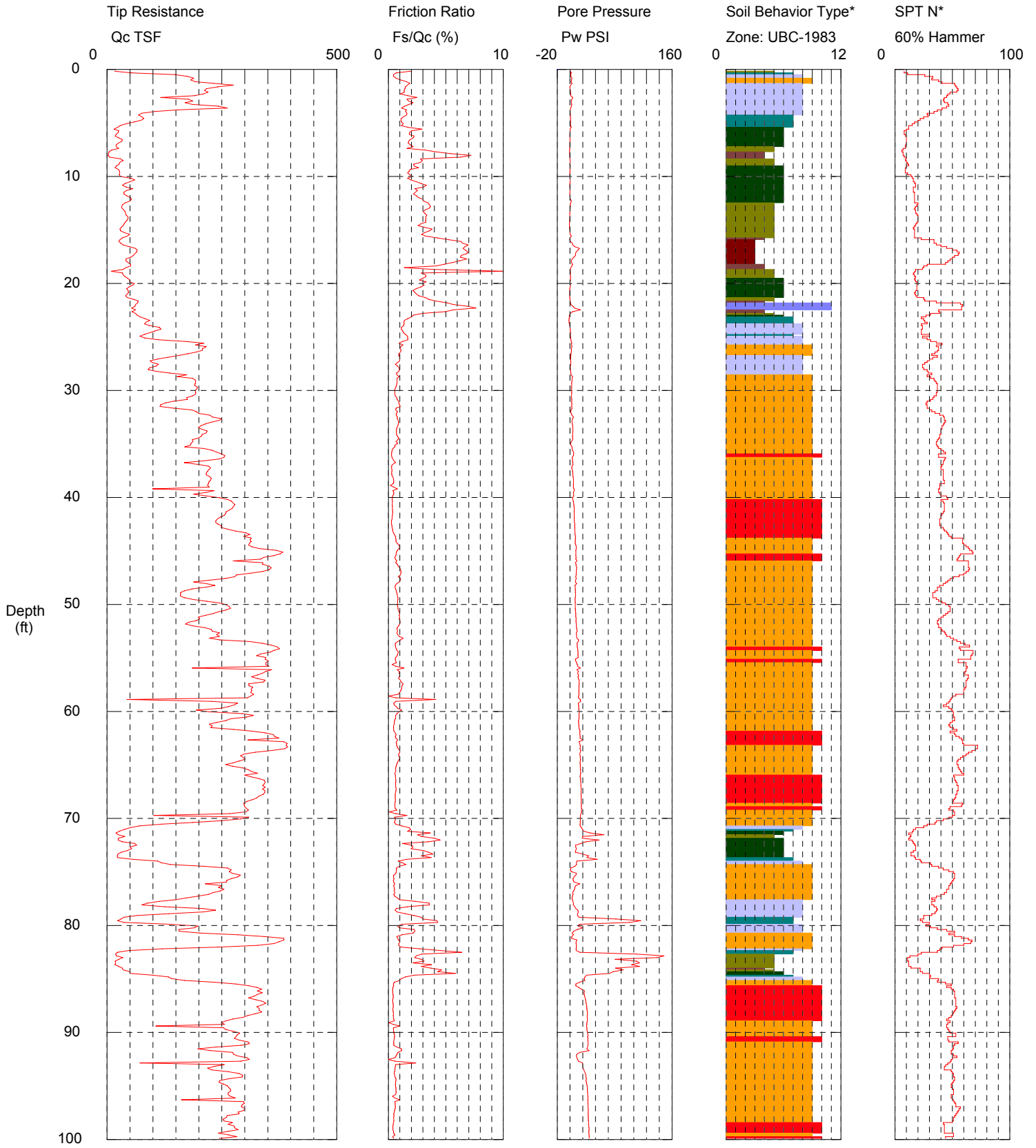
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT004
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 10:33:35 AM
 Location: Manteca Levee
 Job Number: ENG-502



Maximum Depth = 100.39 feet

Depth Increment = 0.164 feet

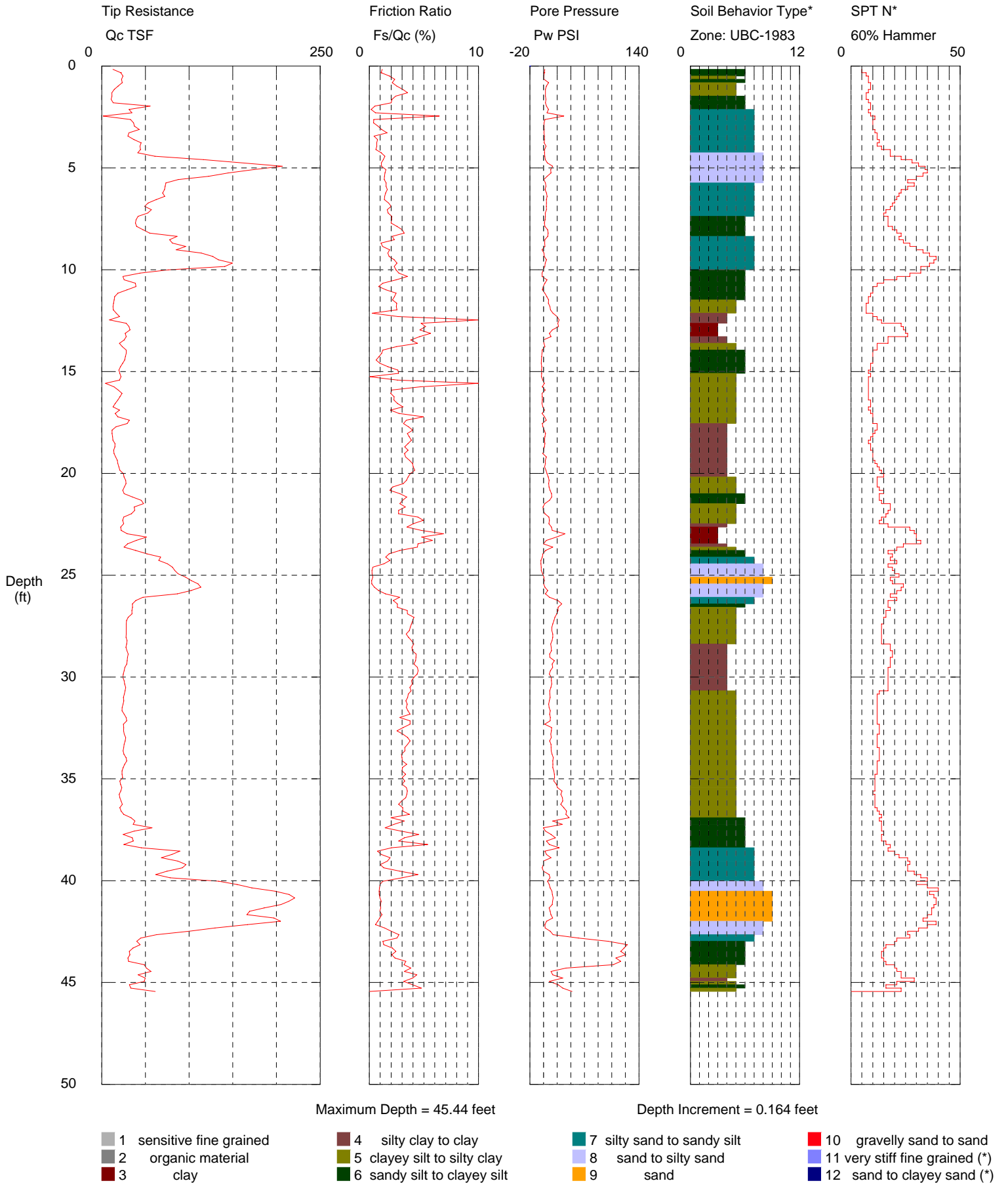
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT005
 Cone Used: DSG1111

CPT Date/Time: 1/3/2015 8:03:05 AM
 Location: Levee
 Job Number: ENG-502

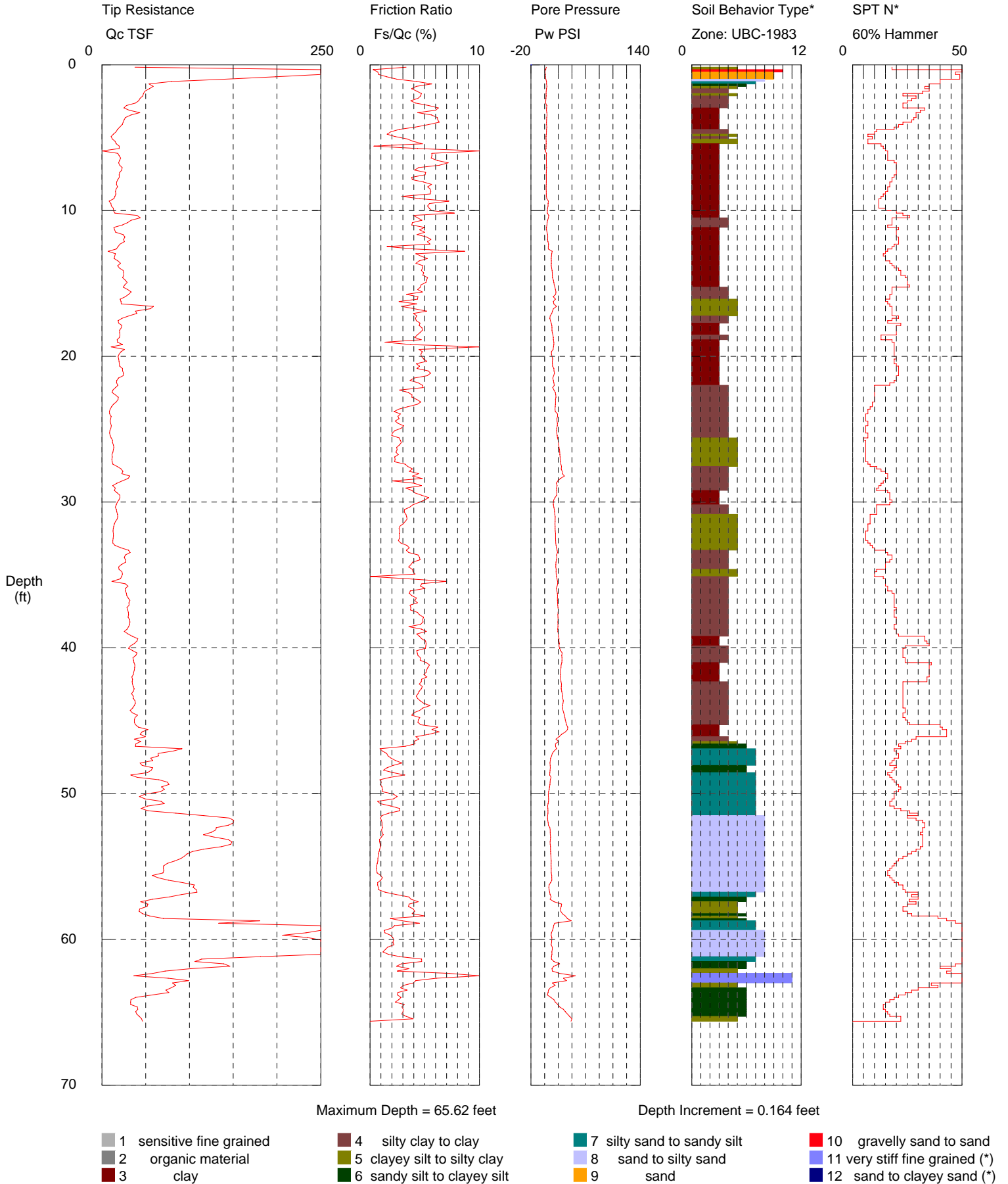


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT006
 Cone Used: DSG1111

CPT Date/Time: 1/3/2015 10:32:42 AM
 Location: Levee
 Job Number: ENG-502

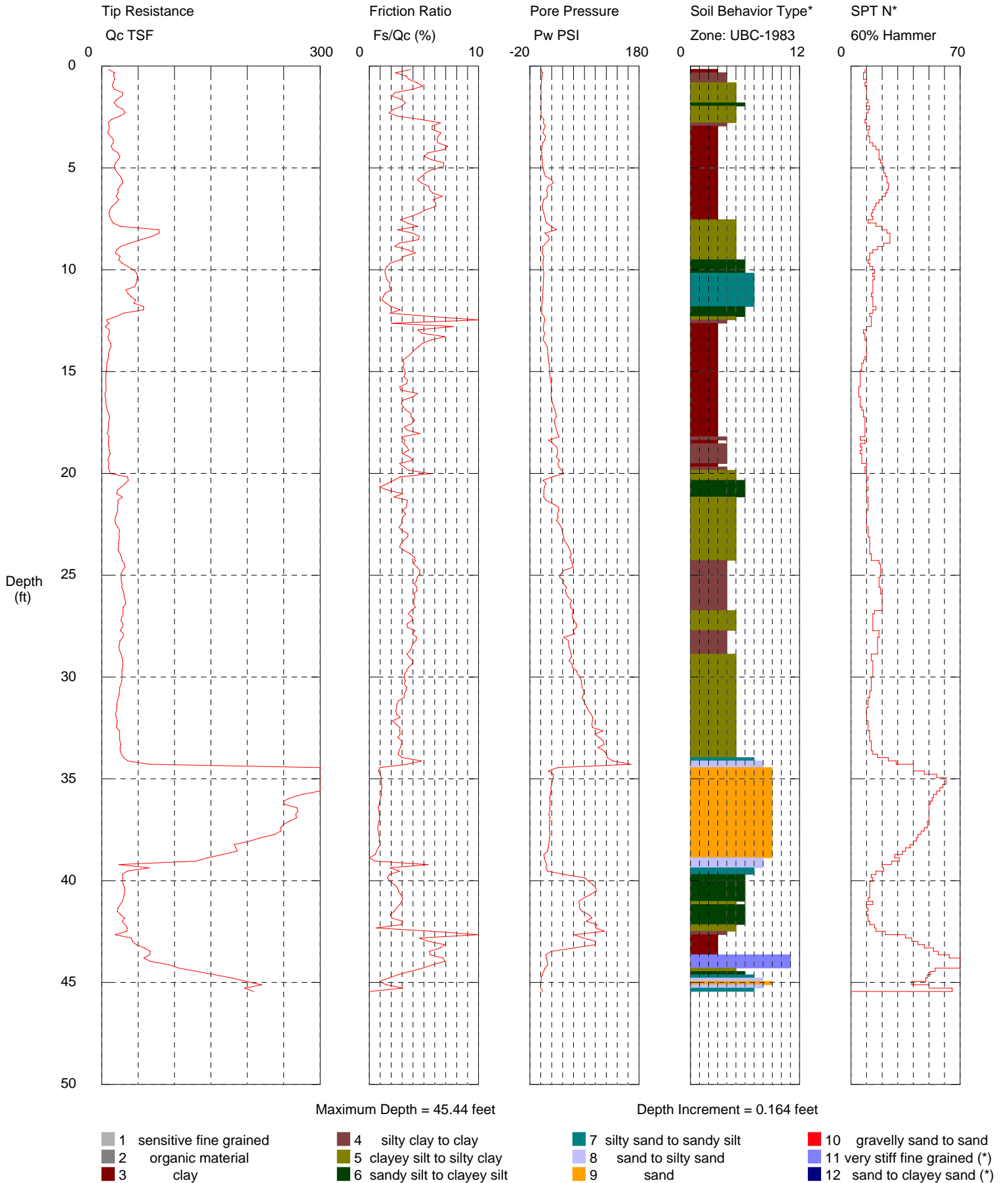


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT007
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 10:54:31 AM
 Location: Levee
 Job Number: ENG-502

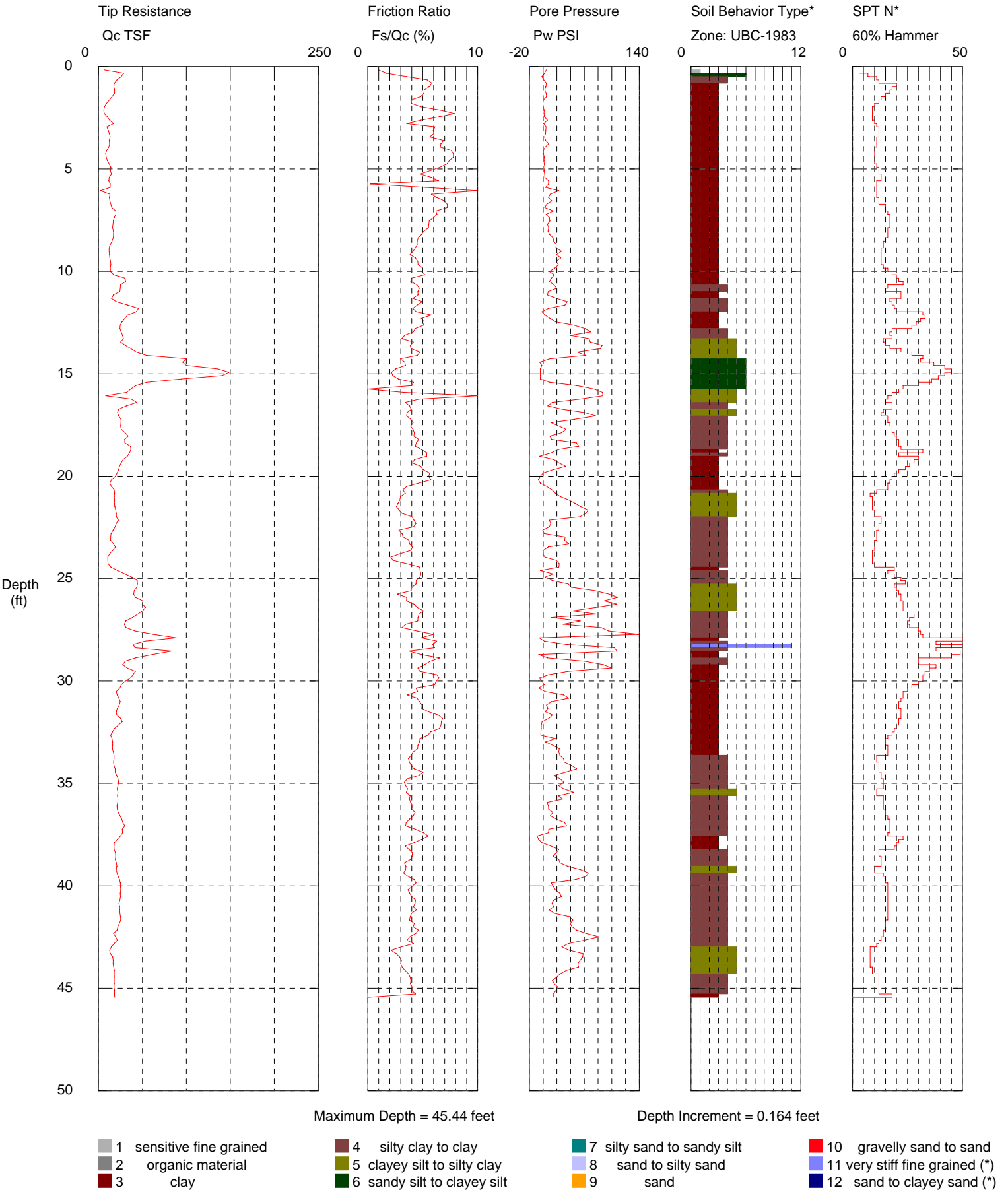


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT008
 Cone Used: DSG1111

CPT Date/Time: 1/3/2015 9:00:22 AM
 Location: Levee
 Job Number: ENG-502

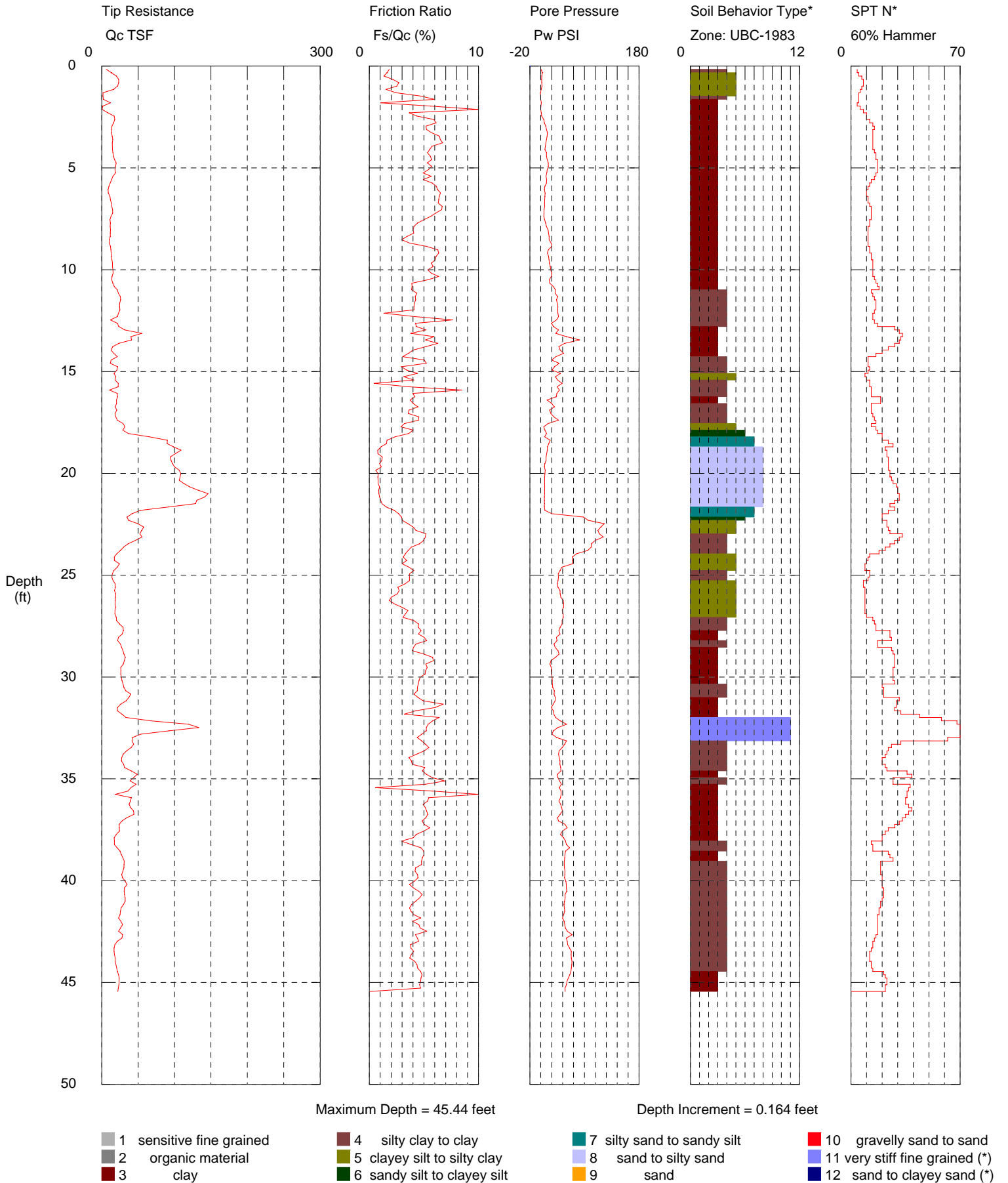


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT009
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 11:43:23 AM
 Location: Levee
 Job Number: ENG-502

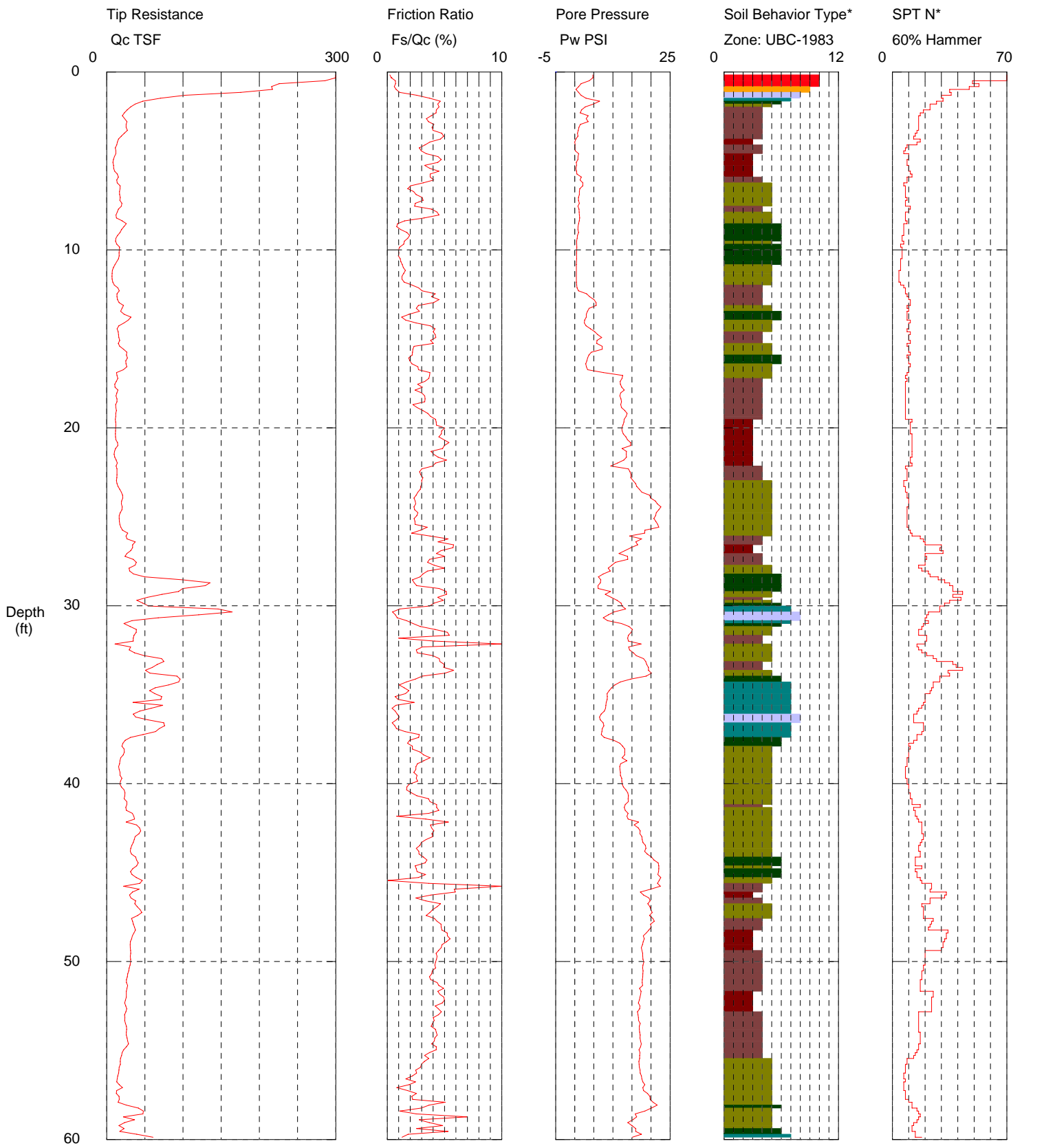


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT010
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 1:45:08 PM
 Location: RD 17 Levee
 Job Number: ENG-502



Maximum Depth = 60.53 feet

Depth Increment = 0.164 feet

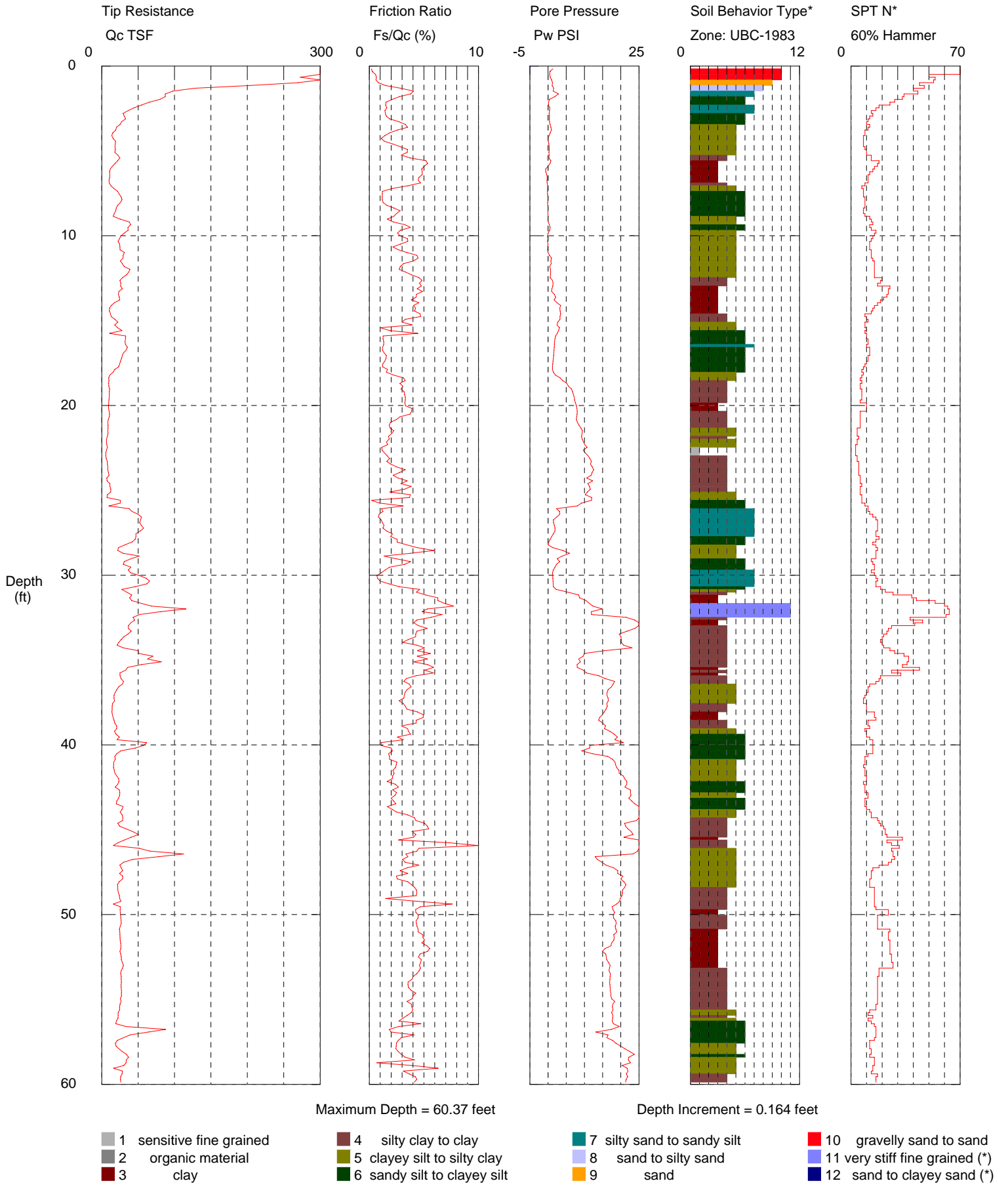
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT011
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 12:56:53 PM
 Location: RD 17 Levee
 Job Number: ENG-502

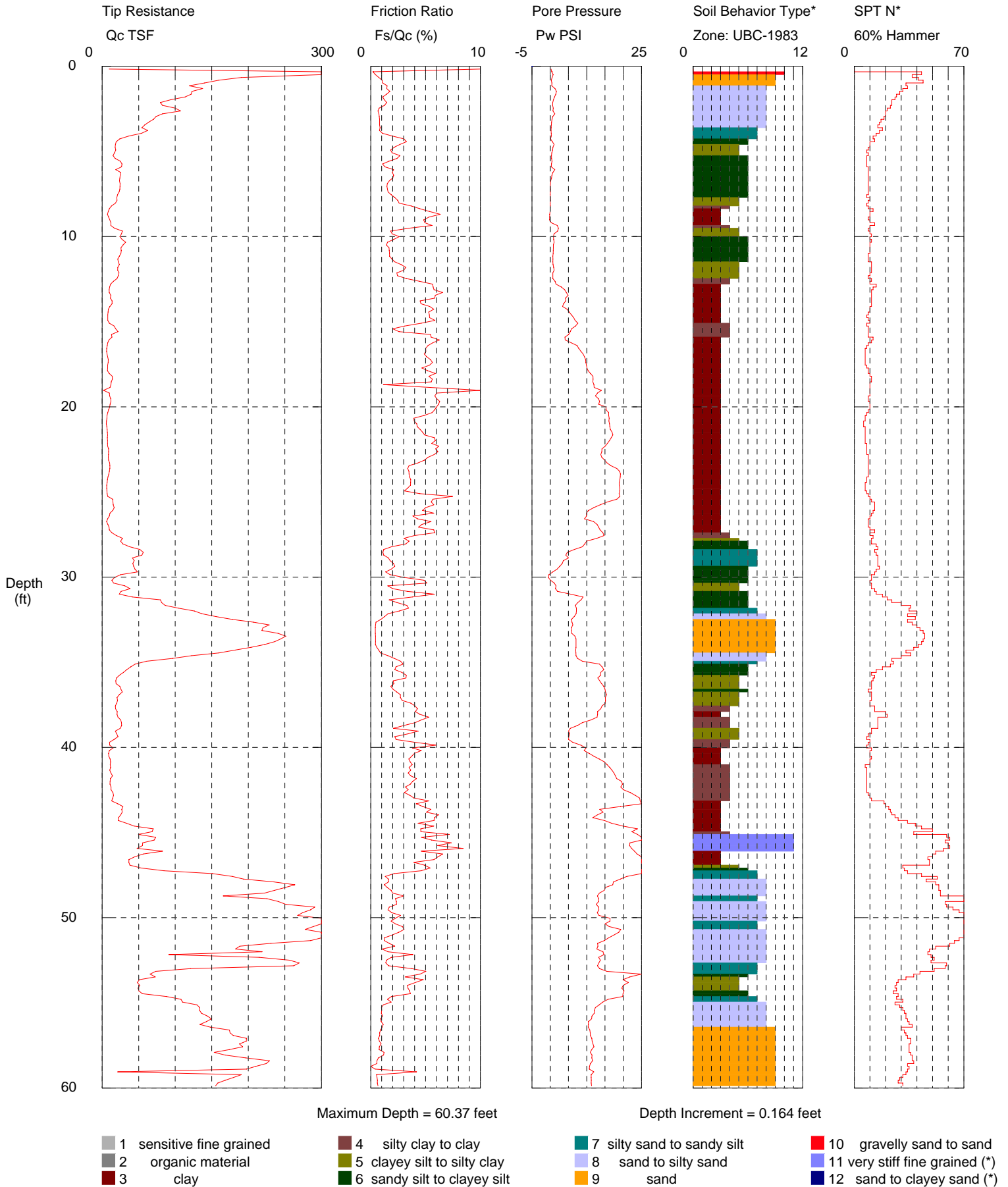


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT012
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 2:28:03 PM
 Location: RD 17 Levee
 Job Number: ENG-502

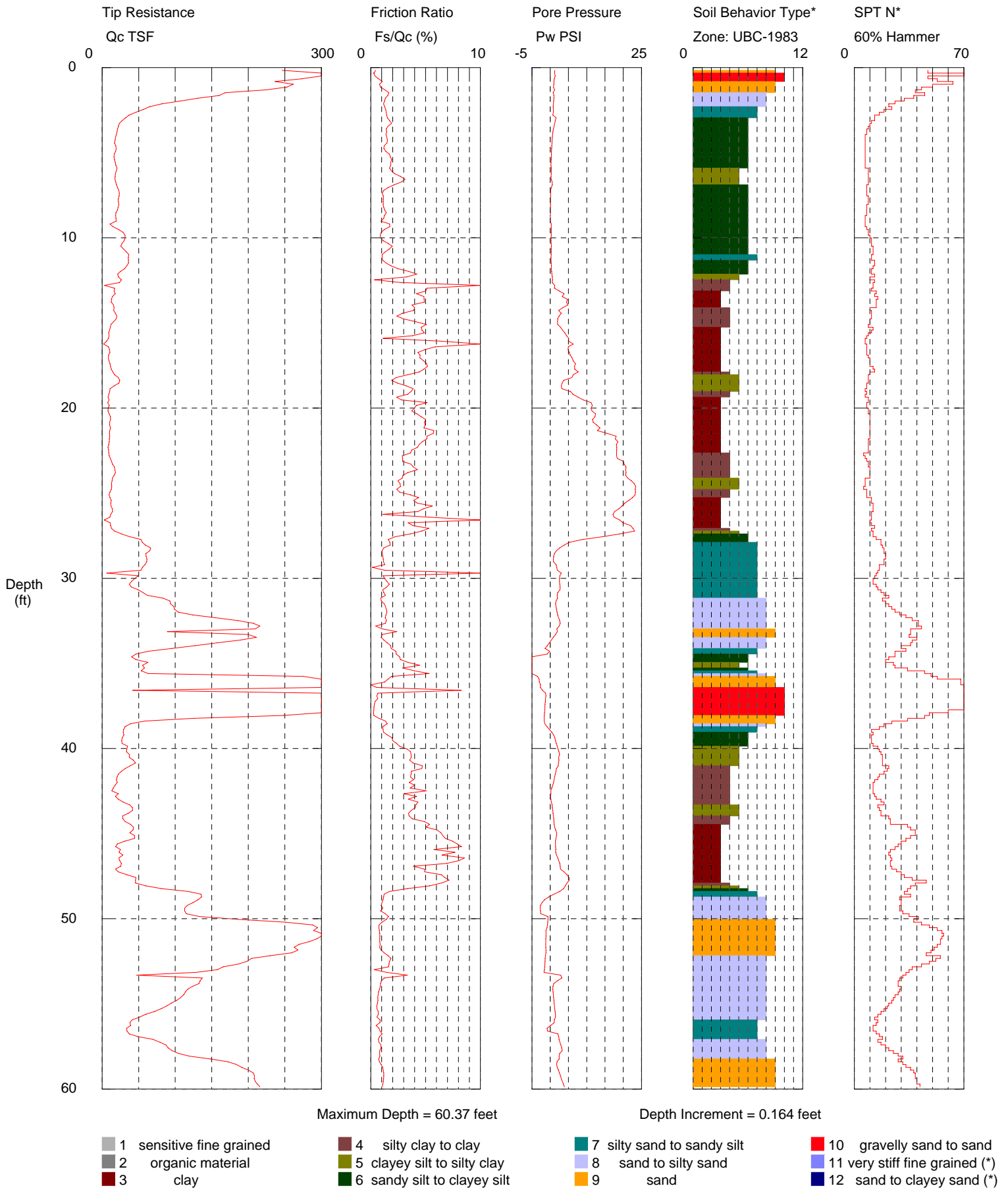


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT013
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 3:08:01 PM
 Location: RD 17 Levee
 Job Number: ENG-502

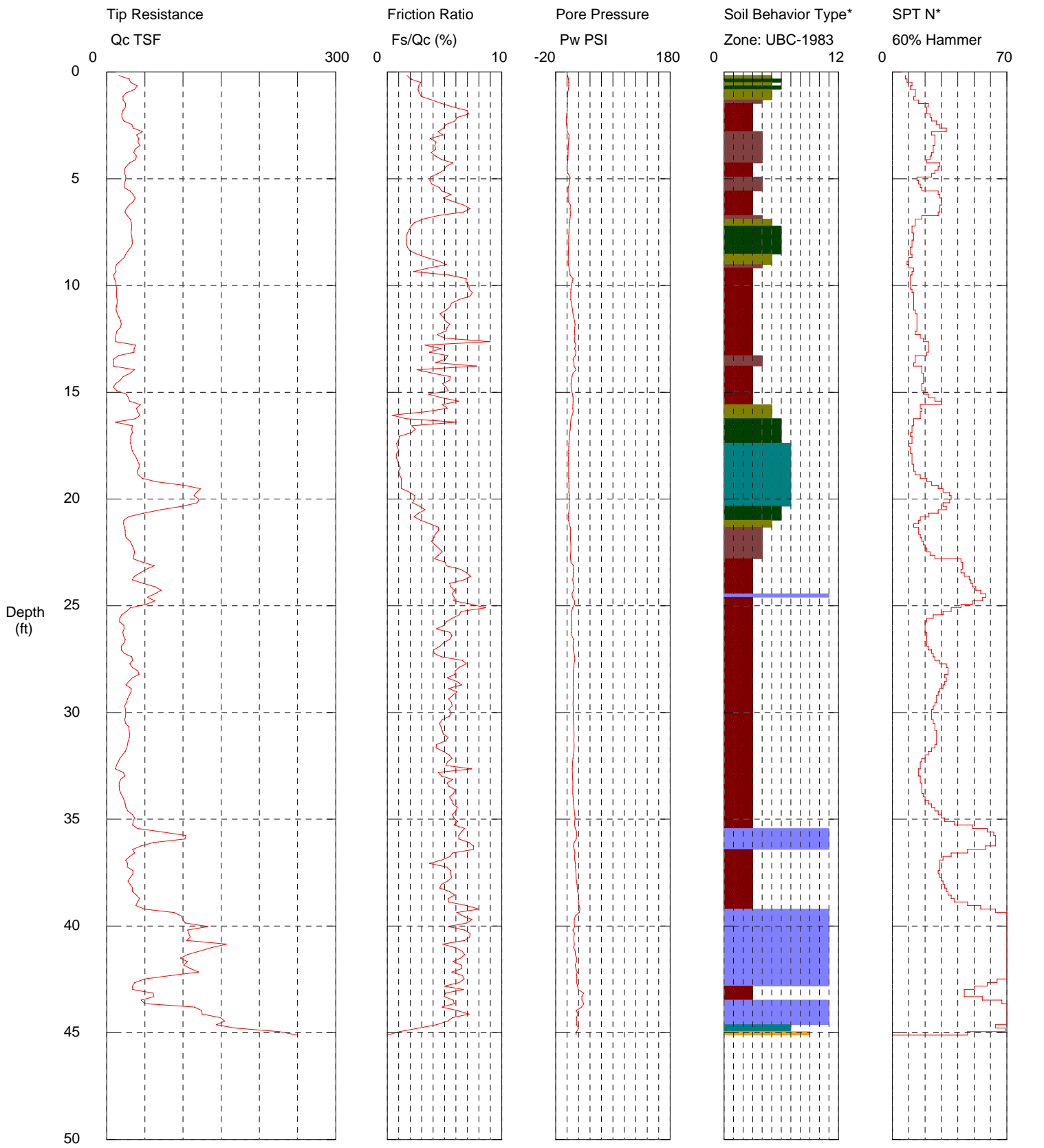


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT014
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 12:25:38 PM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 45.11 feet

Depth Increment = 0.164 feet

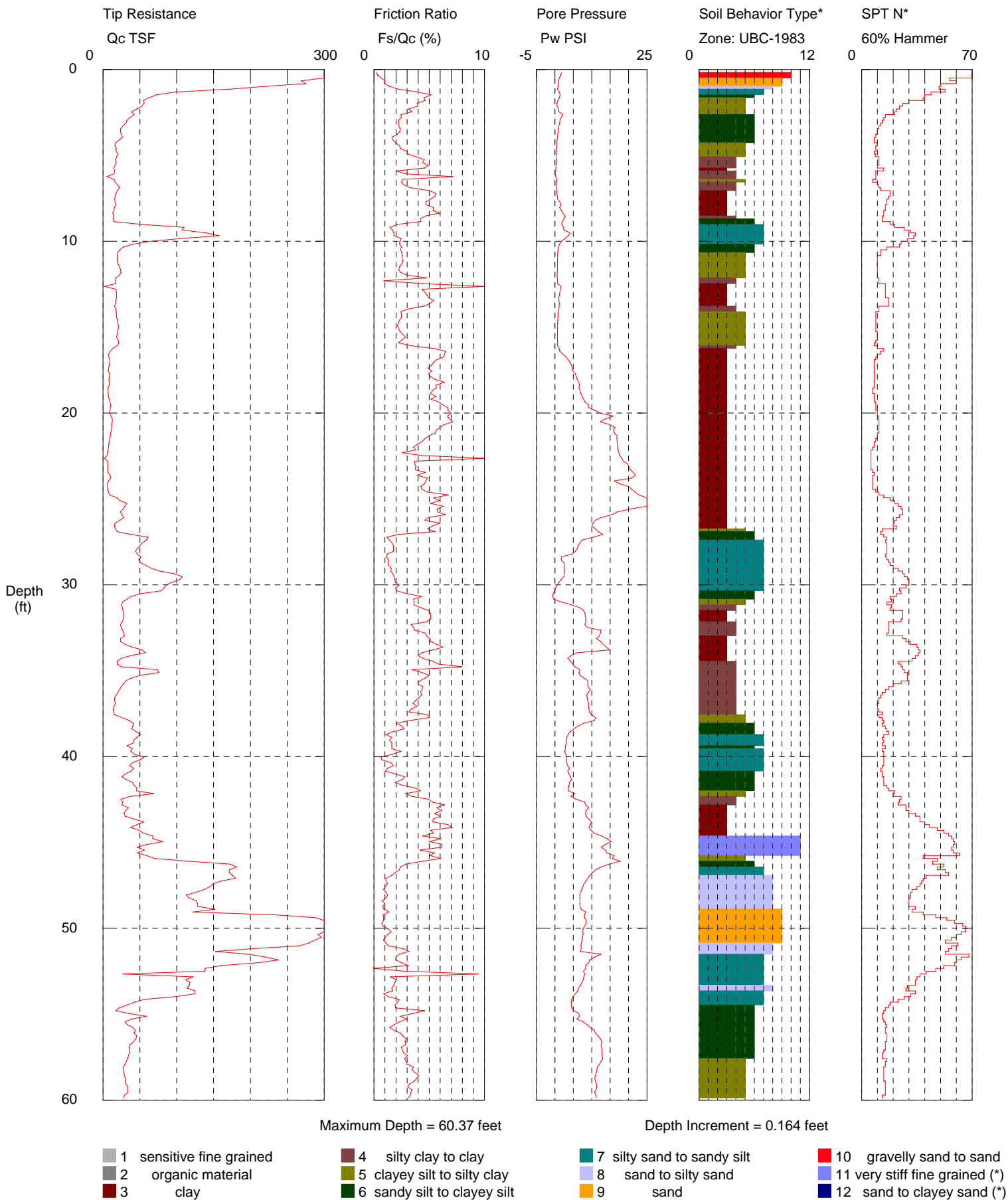
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Brittsan
 Sounding: 7-CPT015
 Cone Used: DSG1111

CPT Date/Time: 12/21/2014 3:50:11 PM
 Location: RD 17 Levee
 Job Number: ENG-502

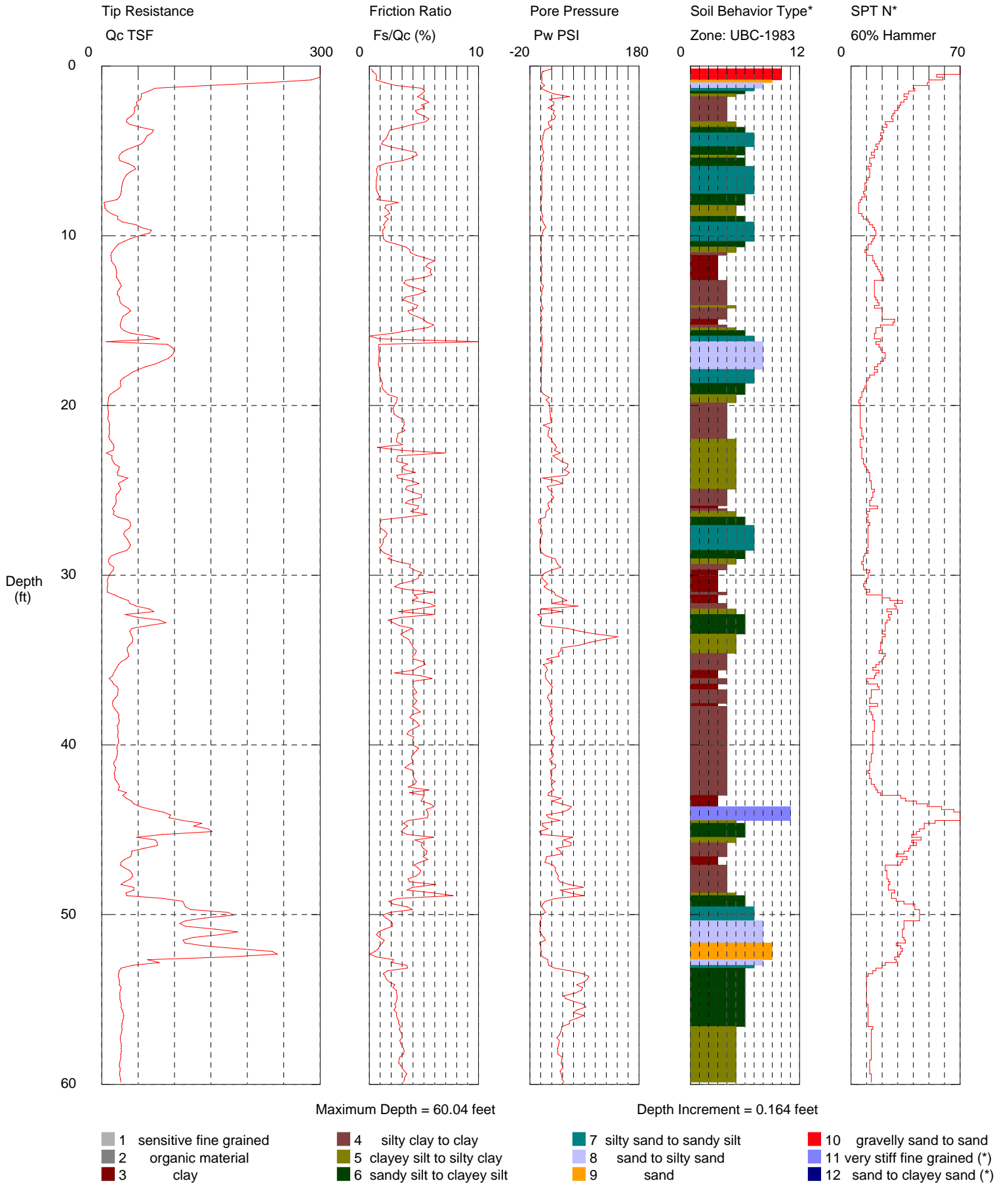


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT016
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 2:54:24 PM
 Location: Levee
 Job Number: ENG-502

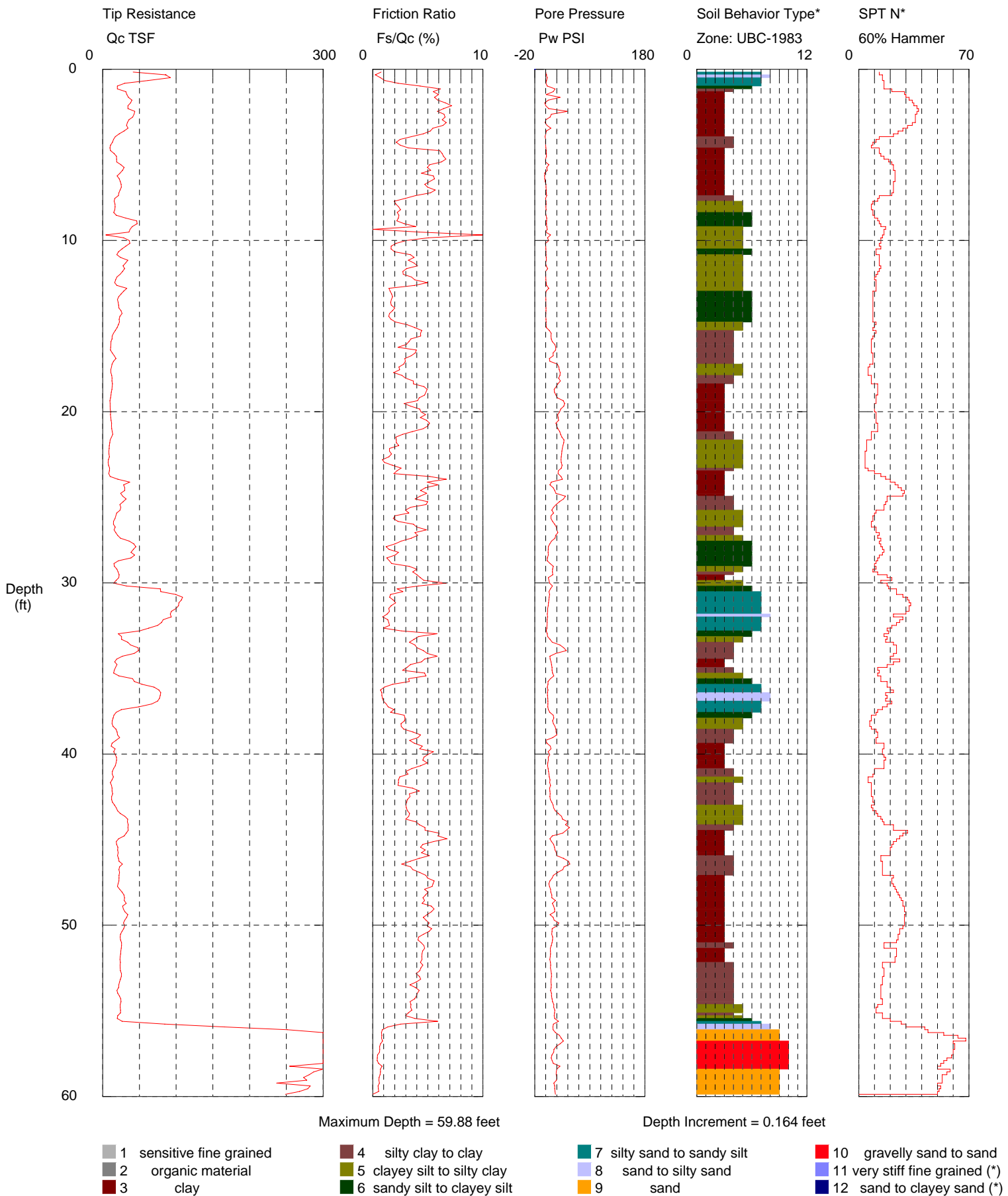


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT017
 Cone Used: DSG1111

CPT Date/Time: 12/26/2014 12:11:50 PM
 Location: Levee
 Job Number: ENG-502

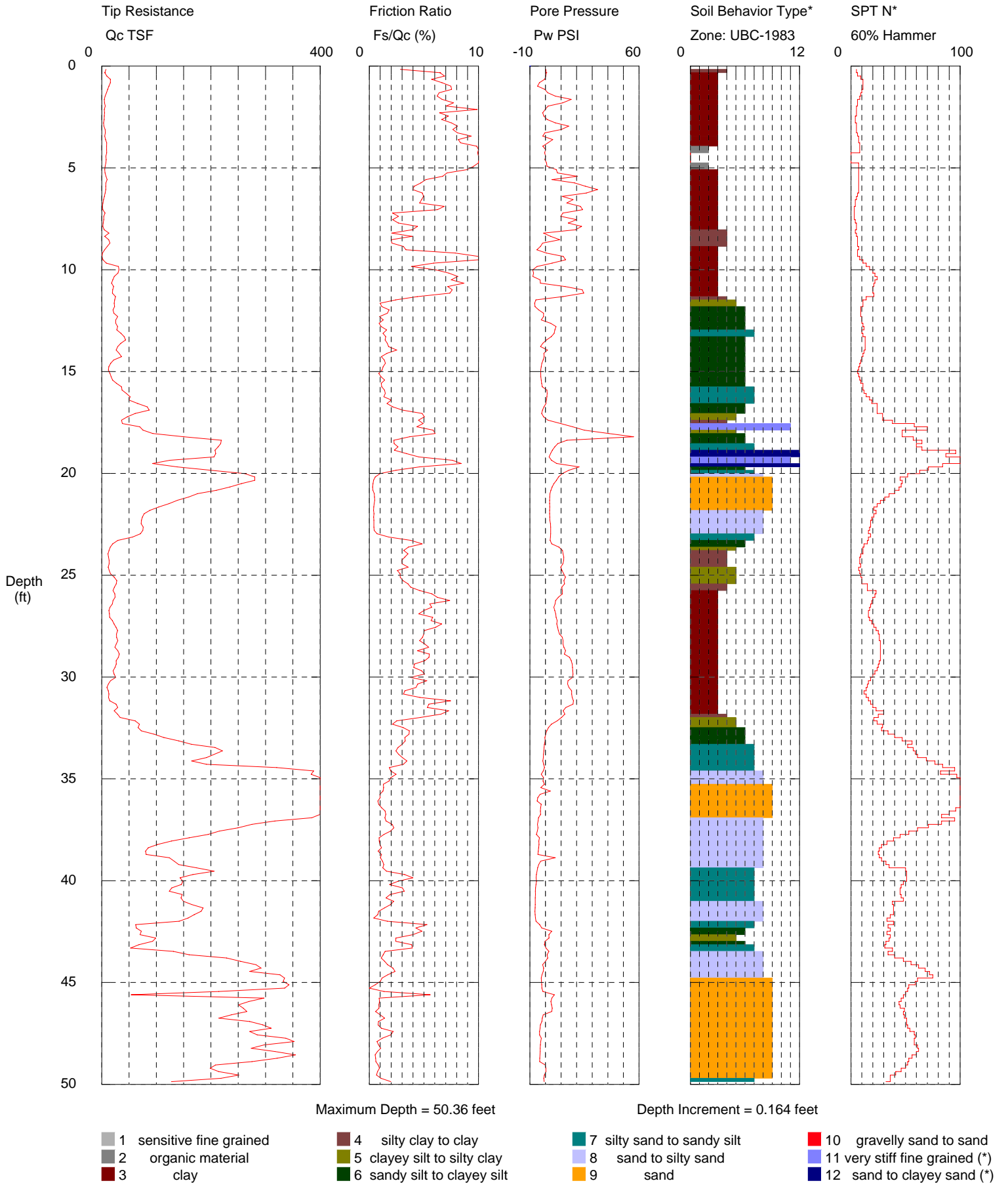


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT018
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 8:38:52 AM
 Location: LEVEE
 Job Number: ENG-502

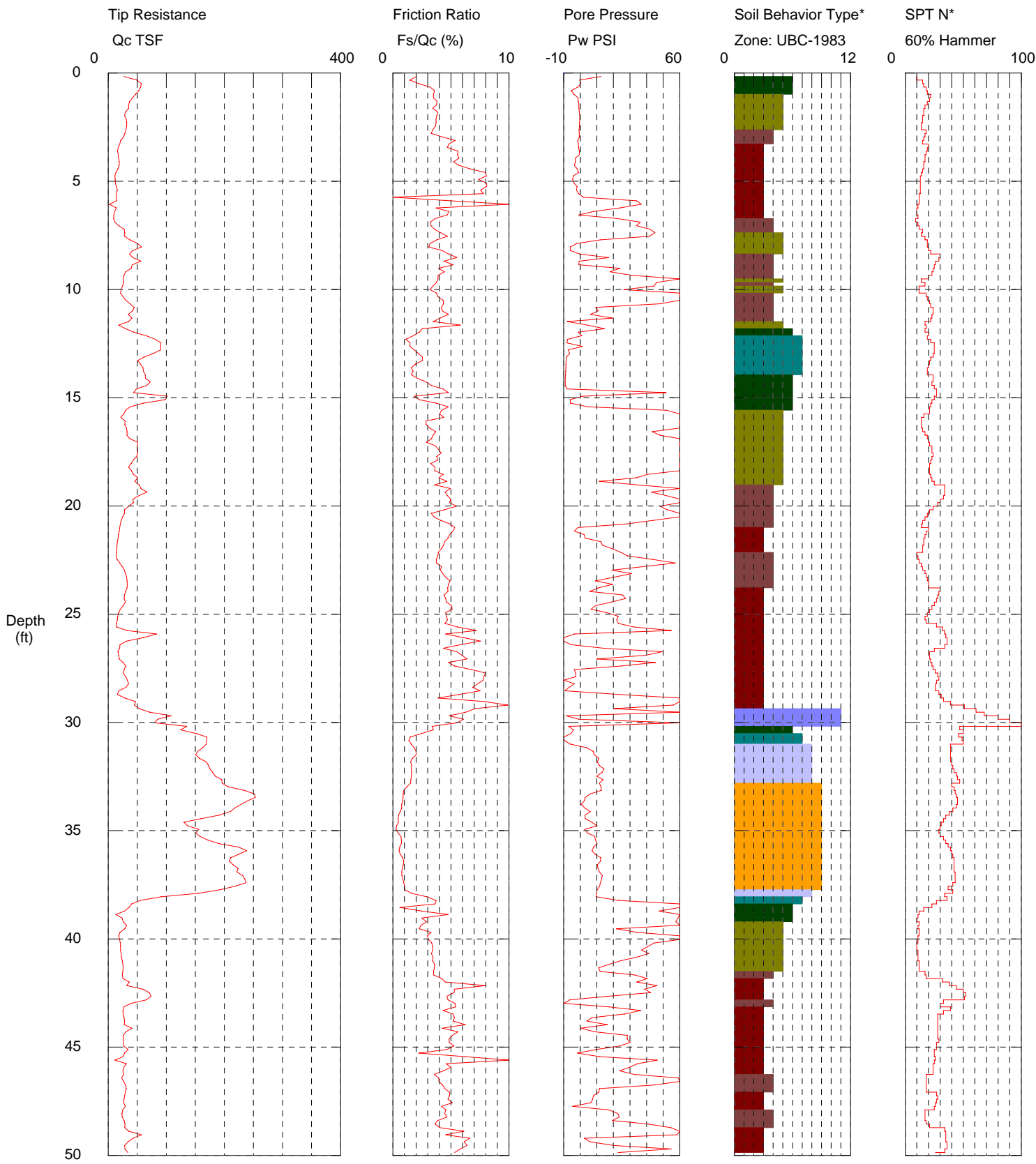


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT019
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 9:24:54 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.52 feet

Depth Increment = 0.164 feet

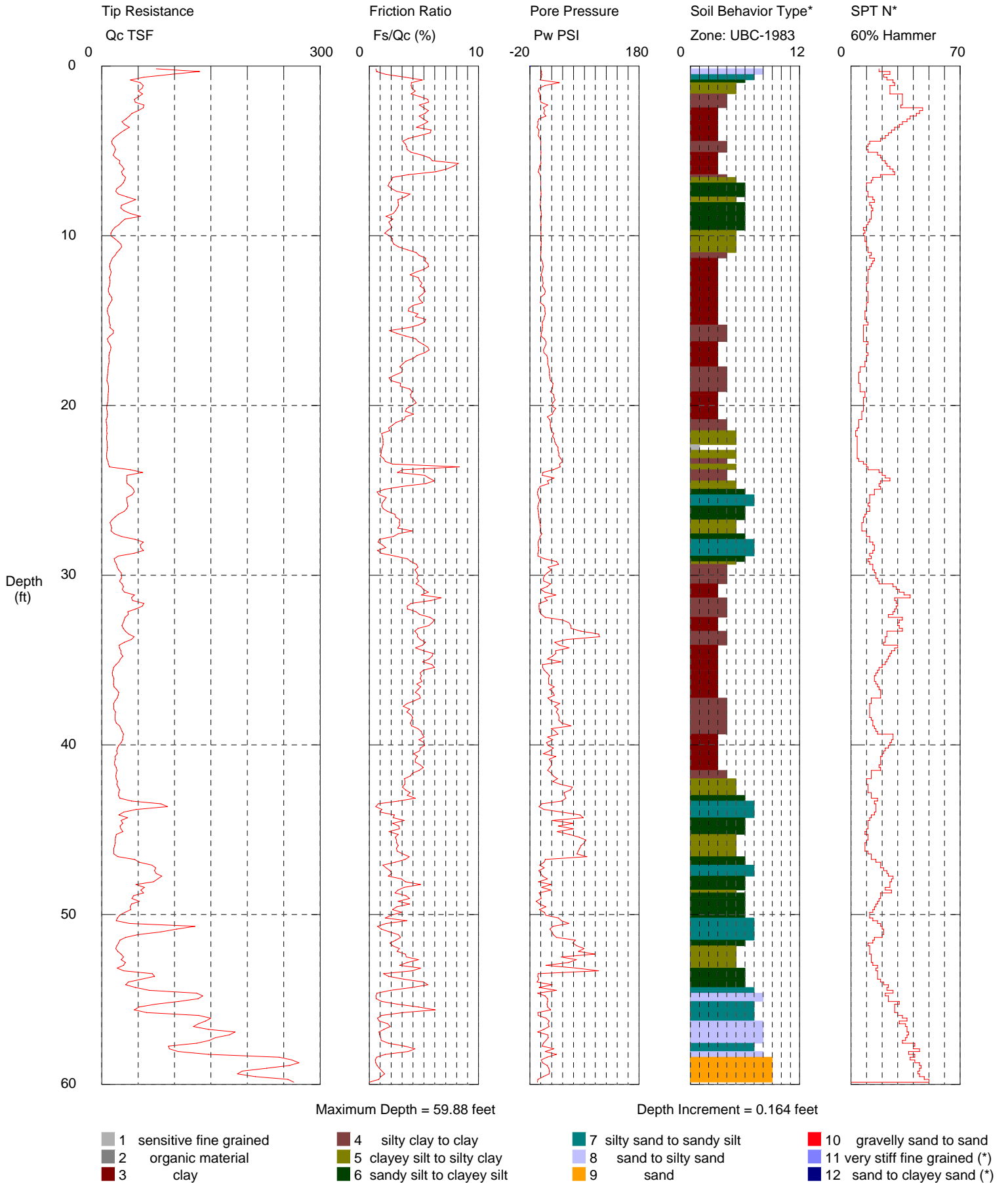
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT020
 Cone Used: DSG1111

CPT Date/Time: 12/26/2014 12:49:21 PM
 Location: Levee
 Job Number: ENG-502

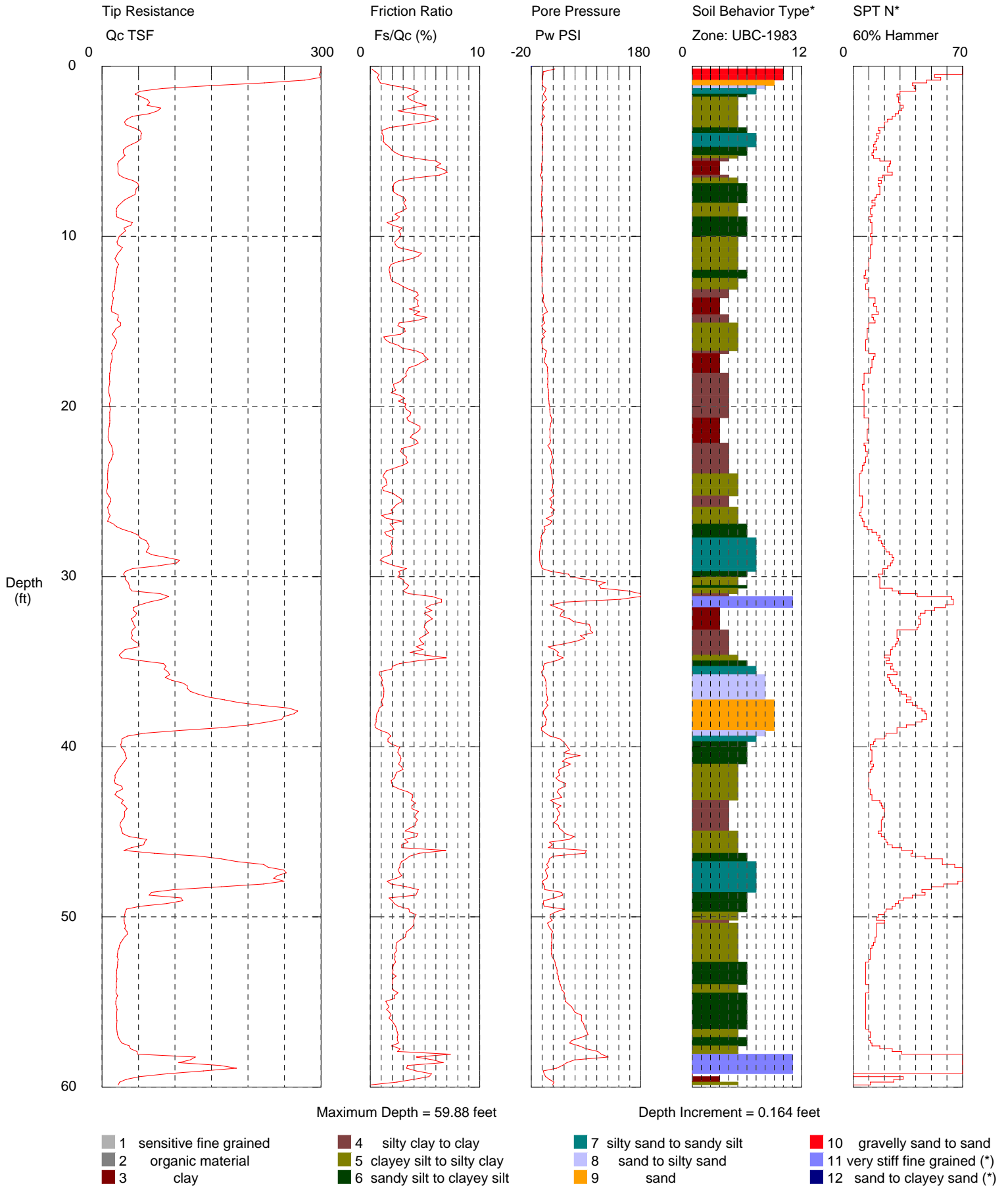


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT021
 Cone Used: DSG1111

CPT Date/Time: 12/26/2014 2:01:07 PM
 Location: Levee
 Job Number: ENG-502

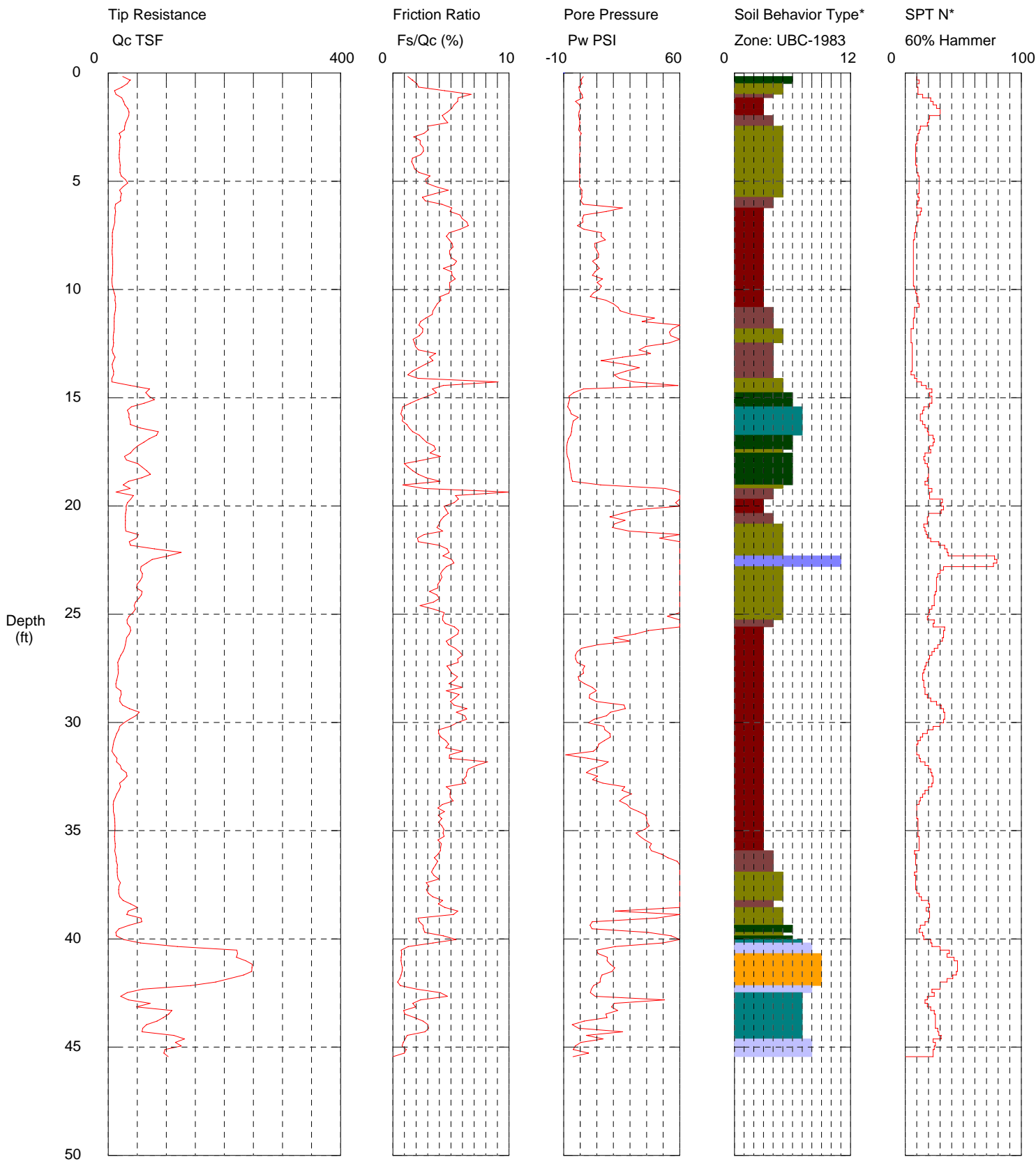


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT022
 Cone Used: DDG1316

CPT Date/Time: 2/4/2015 3:34:33 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

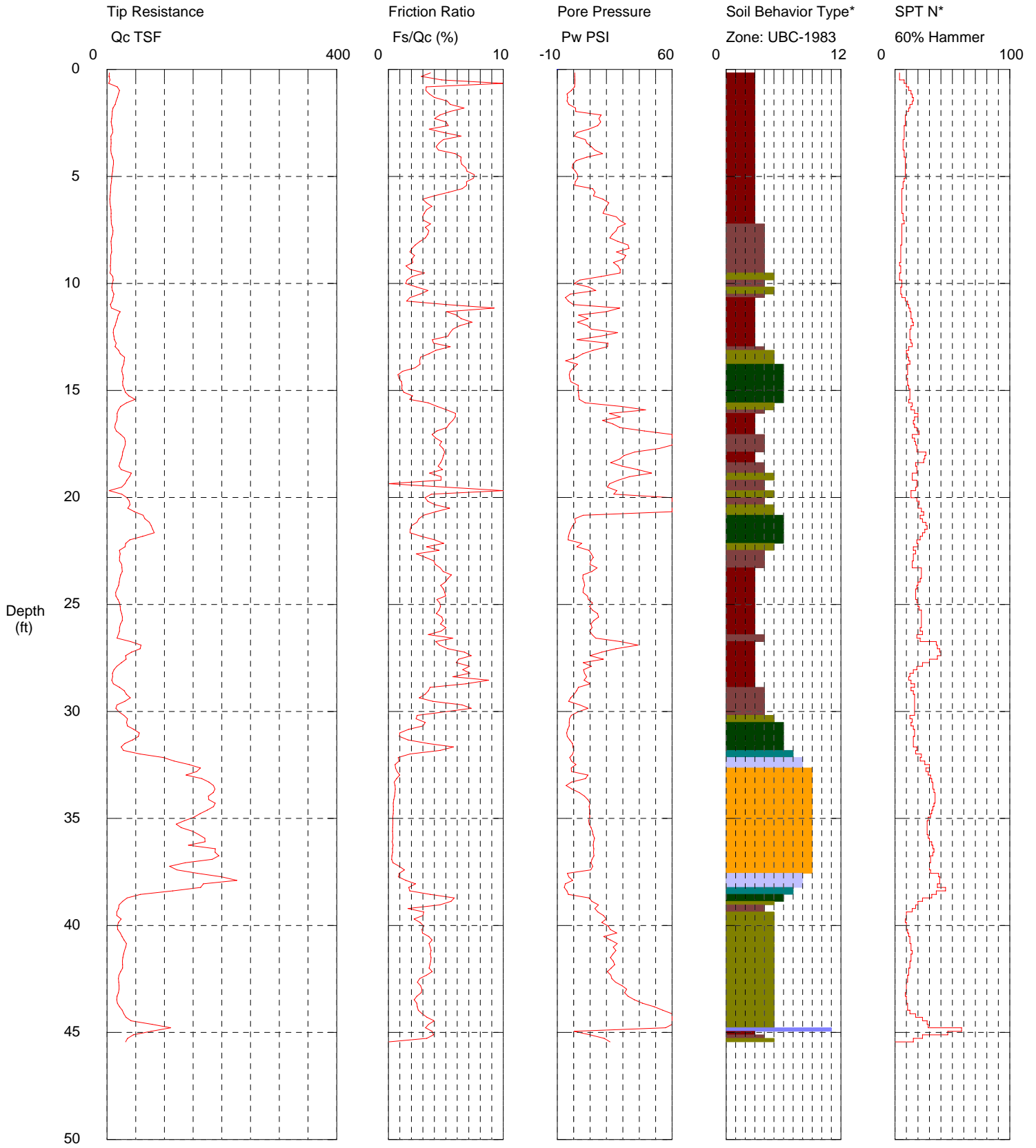
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT023
 Cone Used: DDG1316

CPT Date/Time: 2/4/2015 3:00:17 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

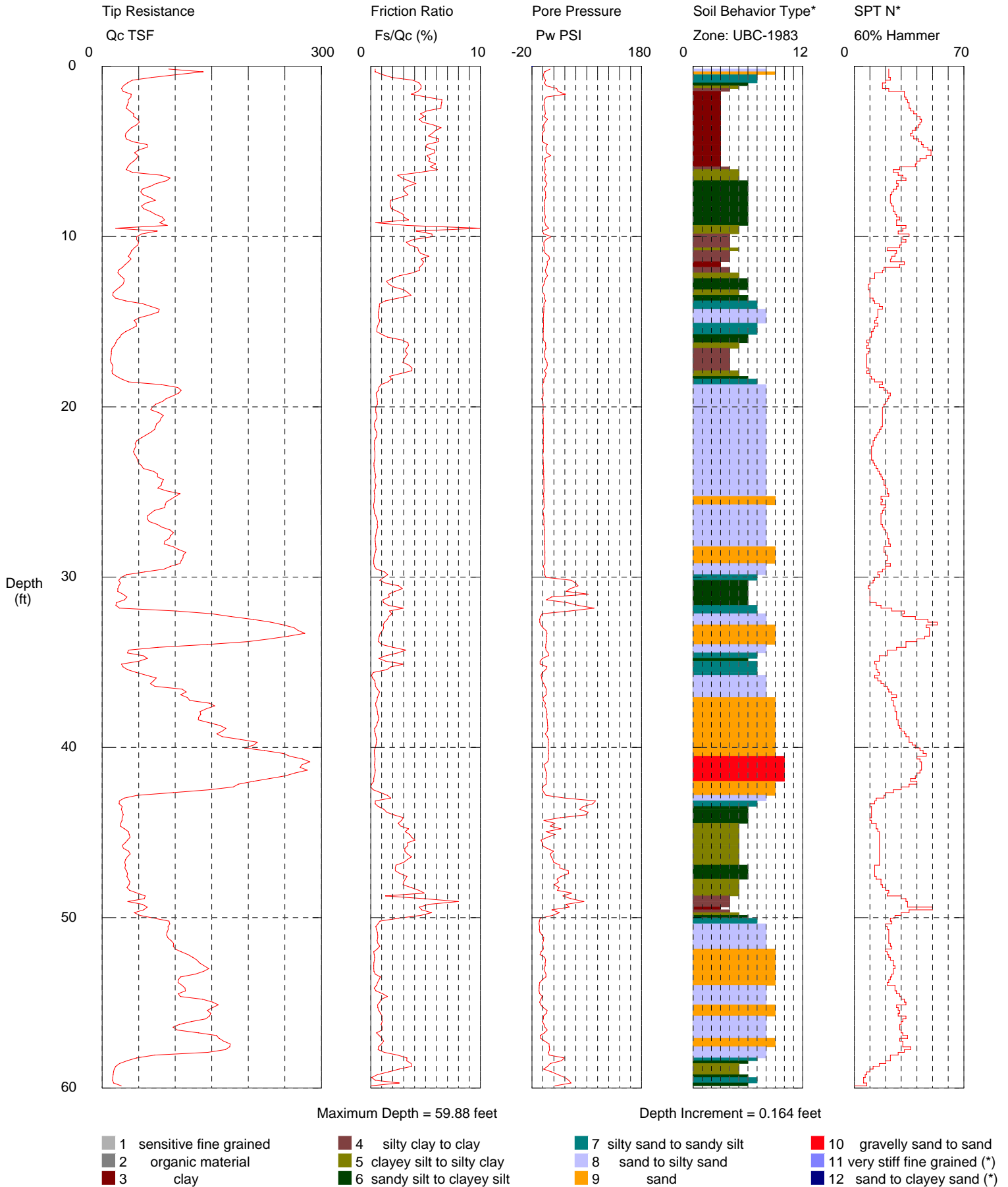
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT024
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 6:49:16 AM
 Location: Levee
 Job Number: ENG-502

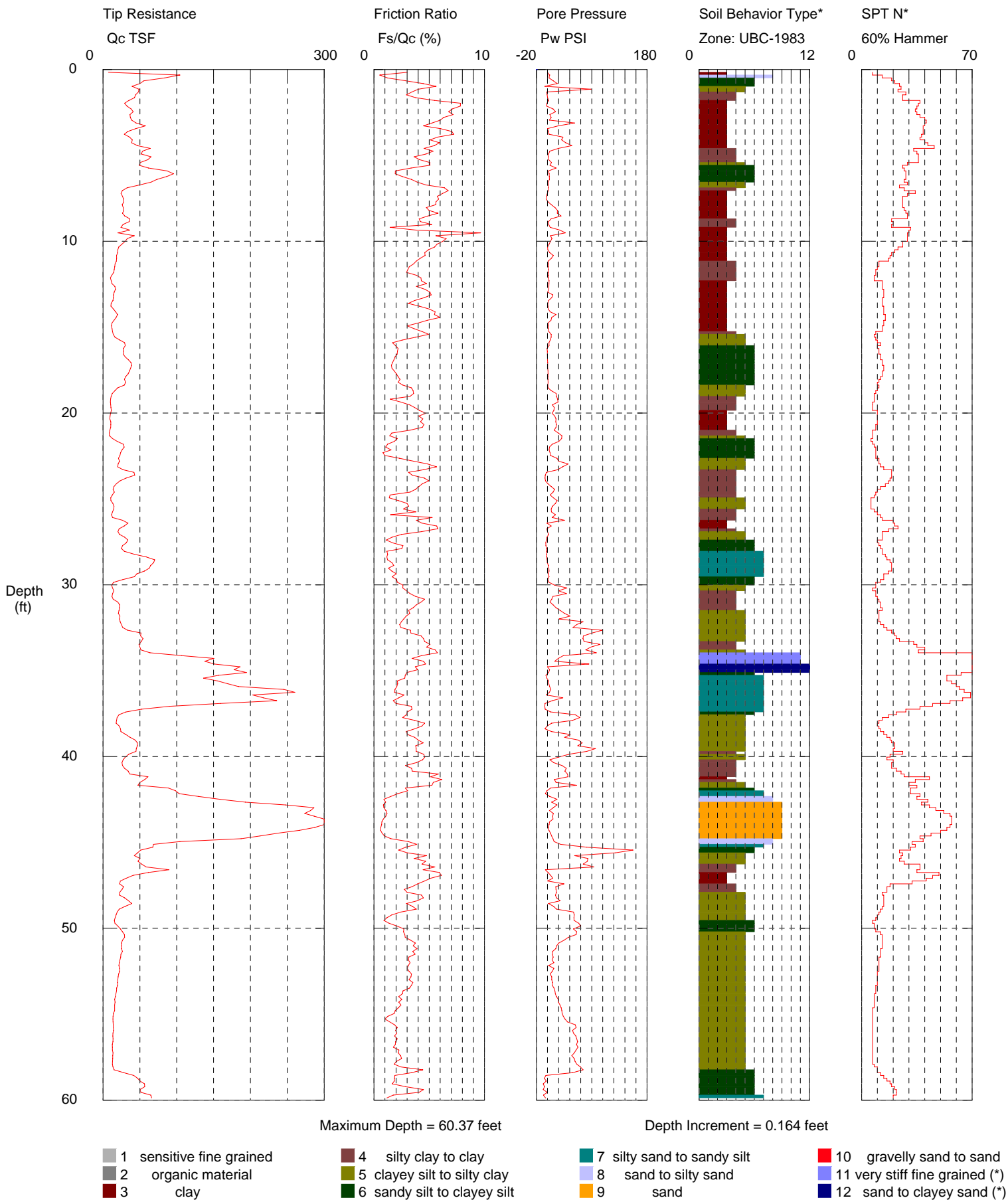


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT025
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 7:41:54 AM
 Location: Levee
 Job Number: ENG-502

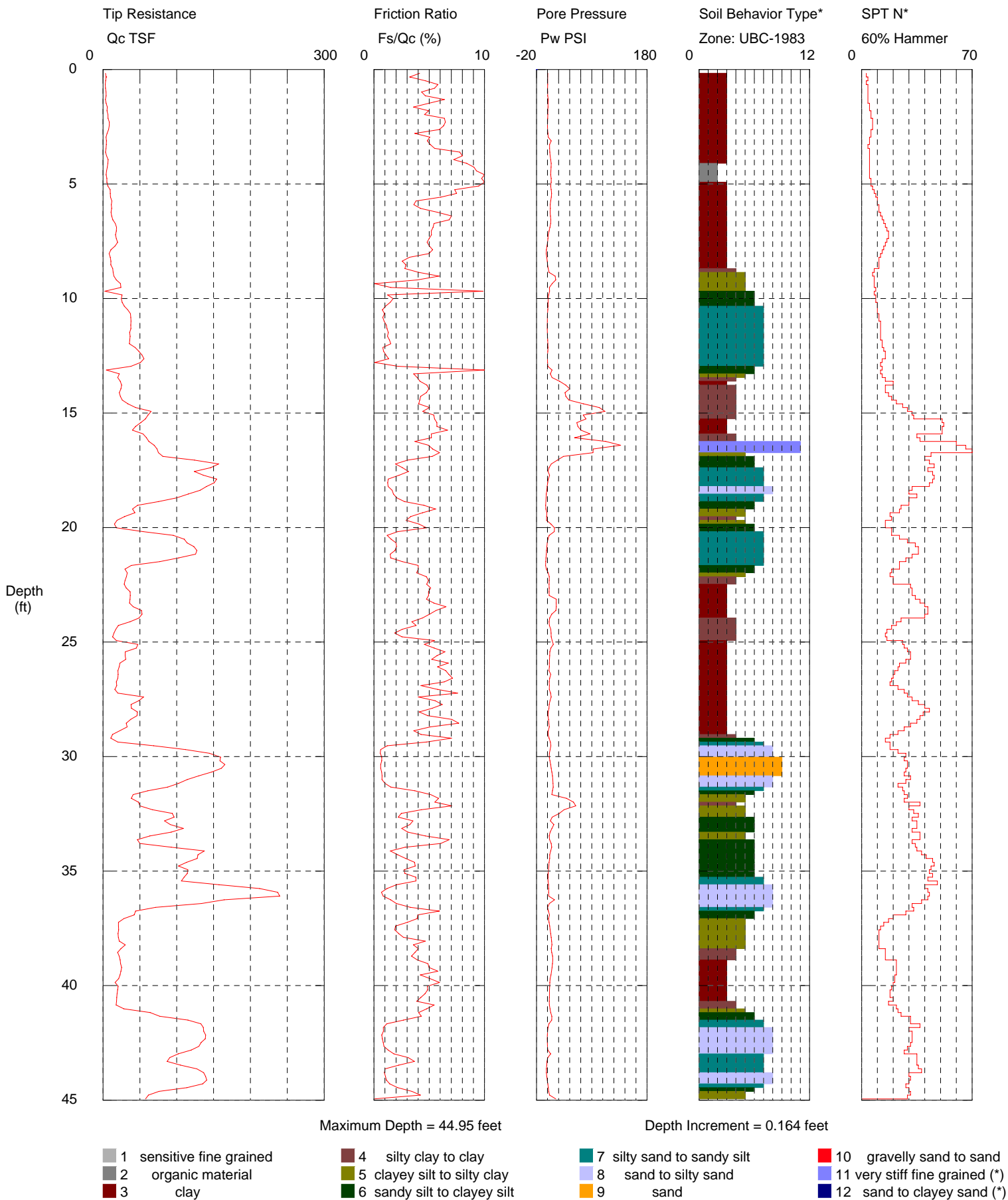


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT026
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 2:03:39 PM
 Location: Levee
 Job Number: ENG-502

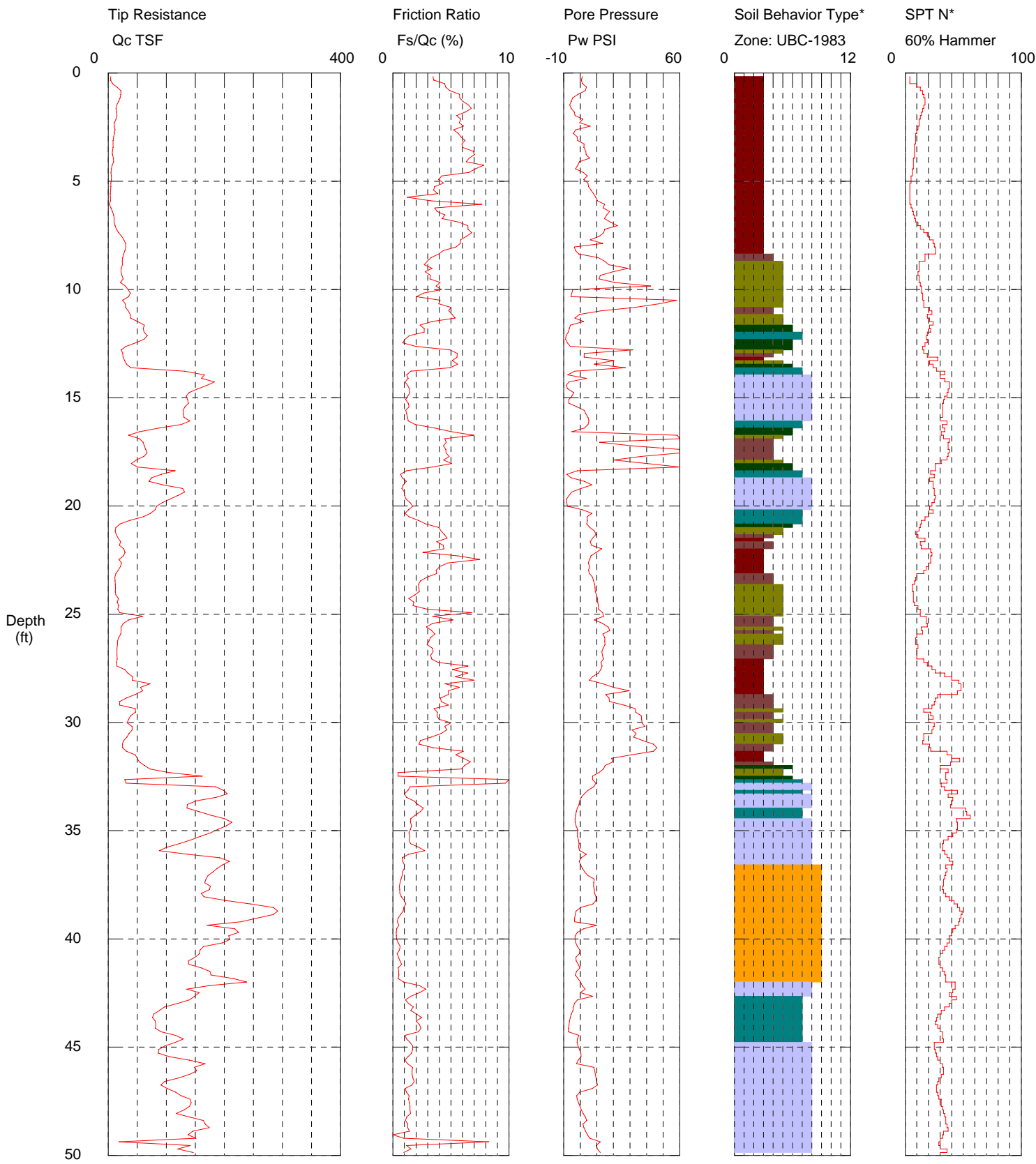


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT027
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 10:26:12 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.36 feet

Depth Increment = 0.164 feet

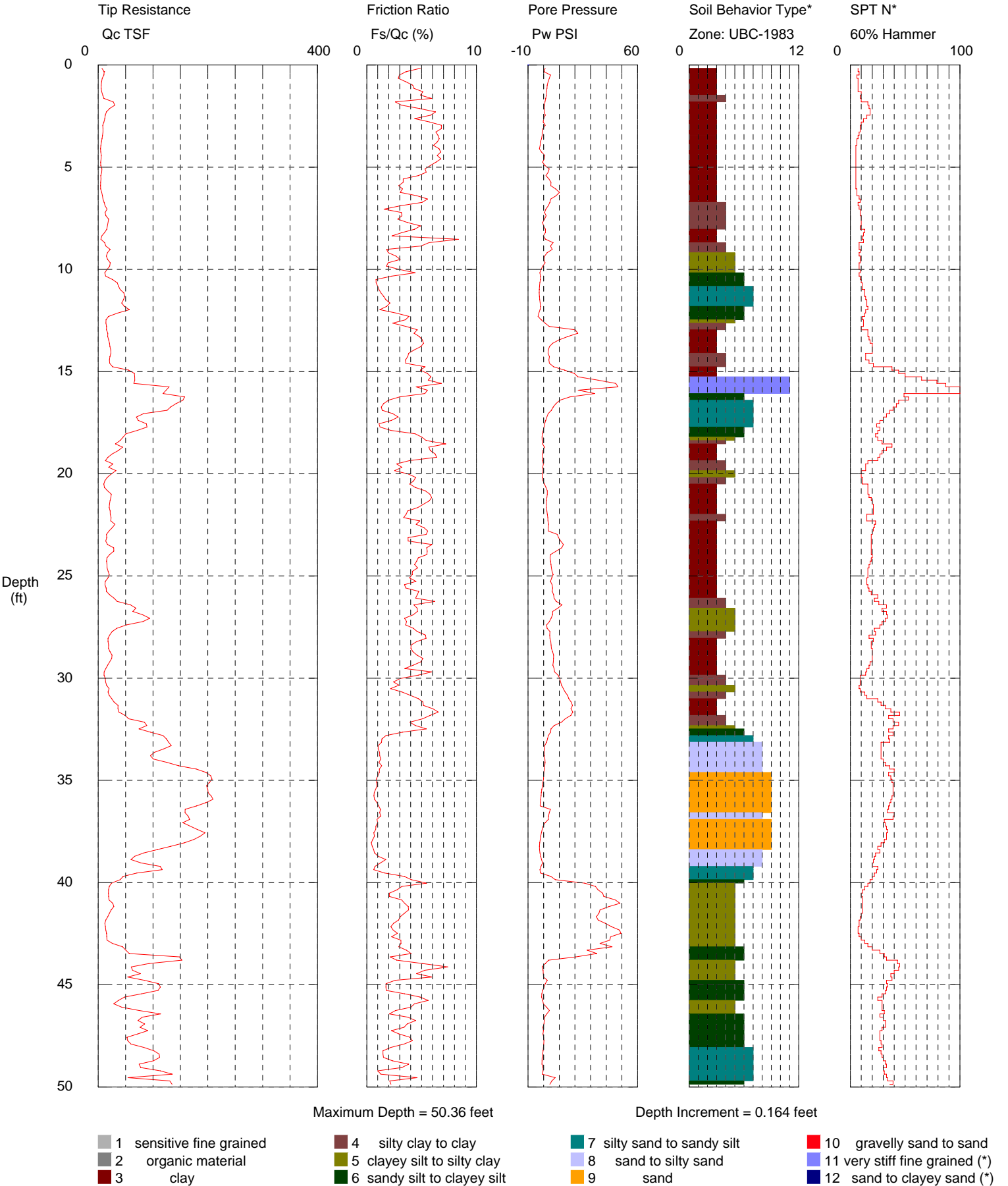
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT028
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 11:07:11 AM
 Location: LEVEE
 Job Number: ENG-502

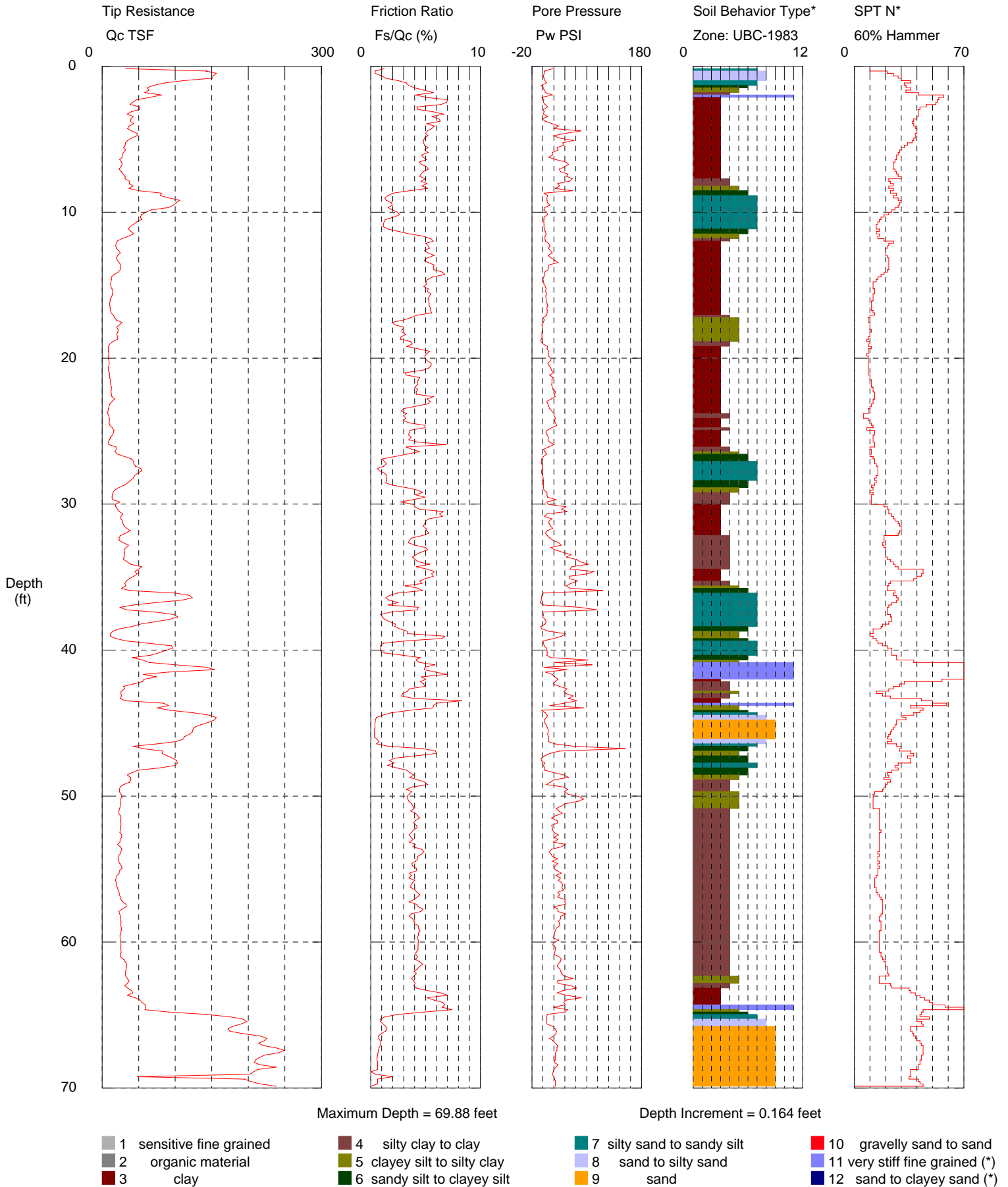


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT029
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 8:29:41 AM
 Location: Levee
 Job Number: ENG-502

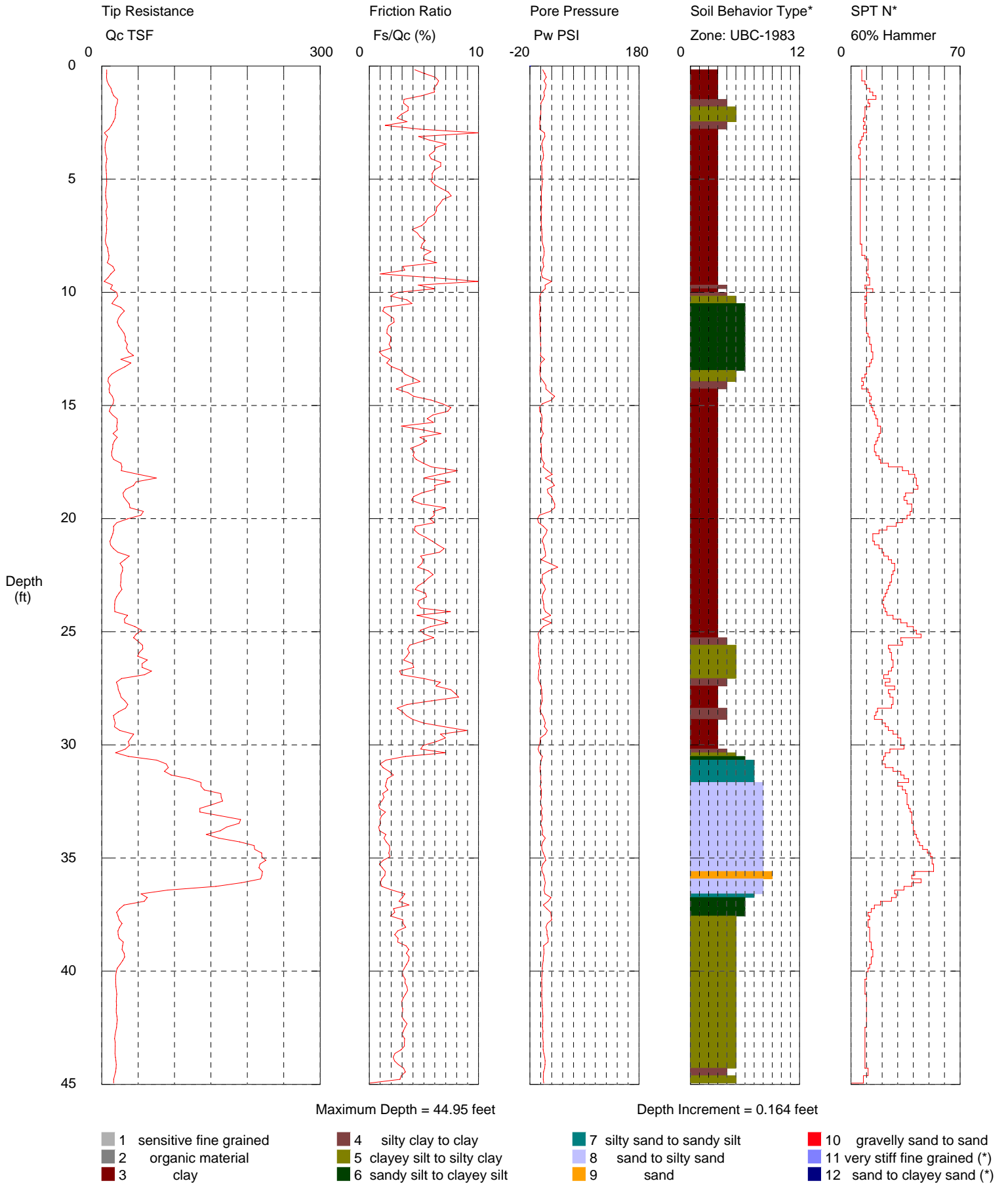


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT030
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 2:54:58 PM
 Location: Levee
 Job Number: ENG-502

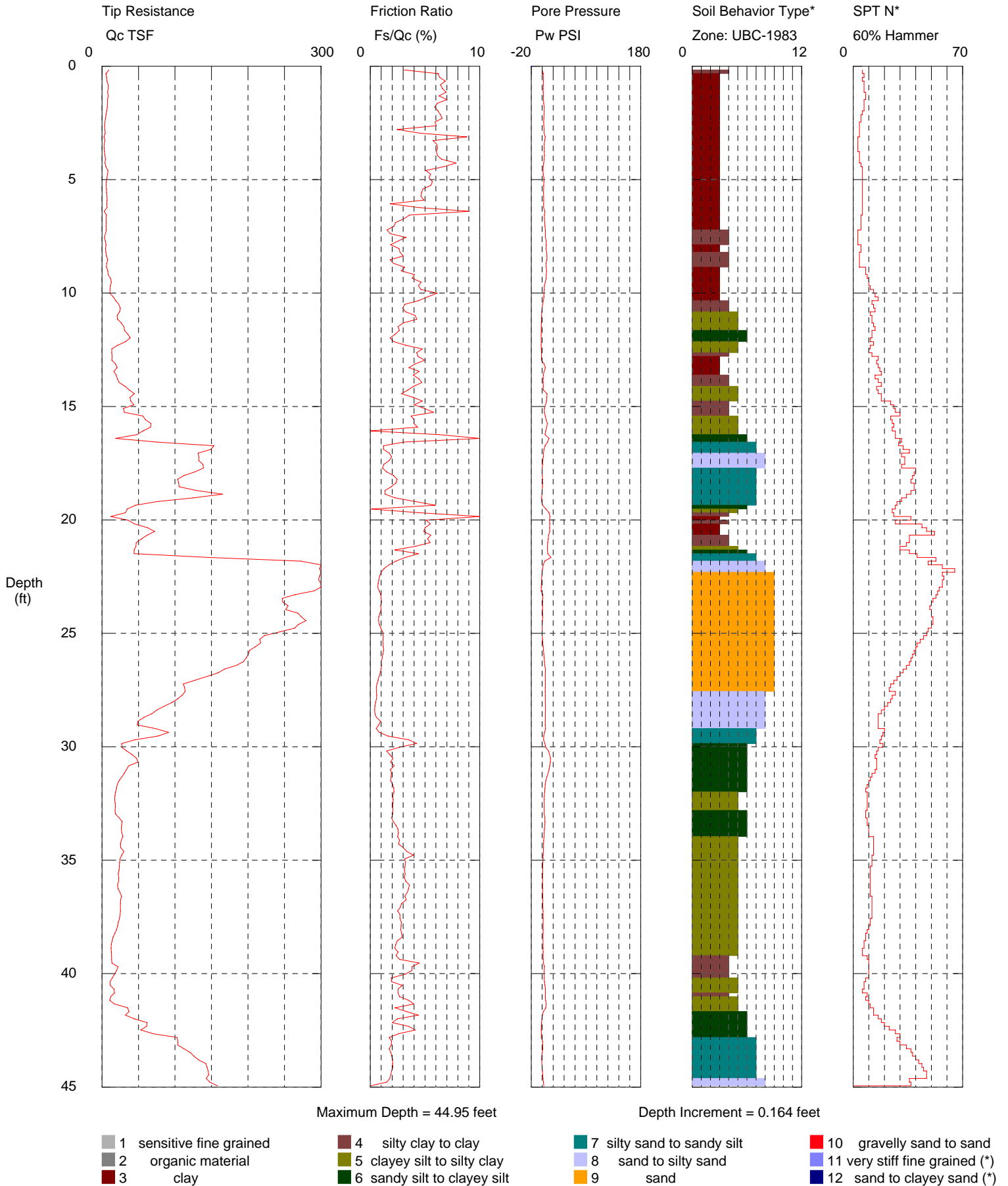


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT031
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 2:24:36 PM
 Location: Levee
 Job Number: ENG-502

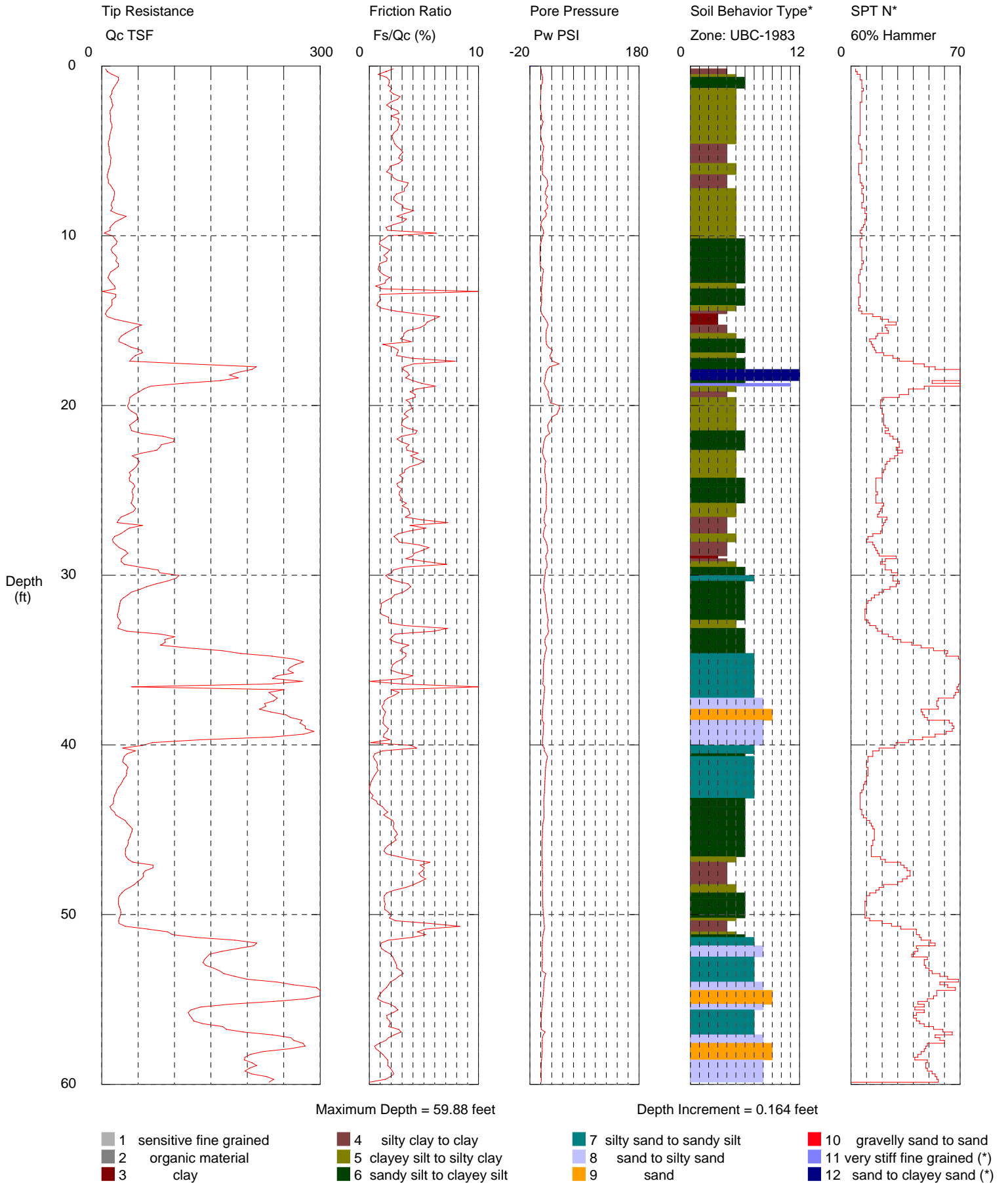


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT032
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 1:36:34 PM
 Location: Levee
 Job Number: ENG-502

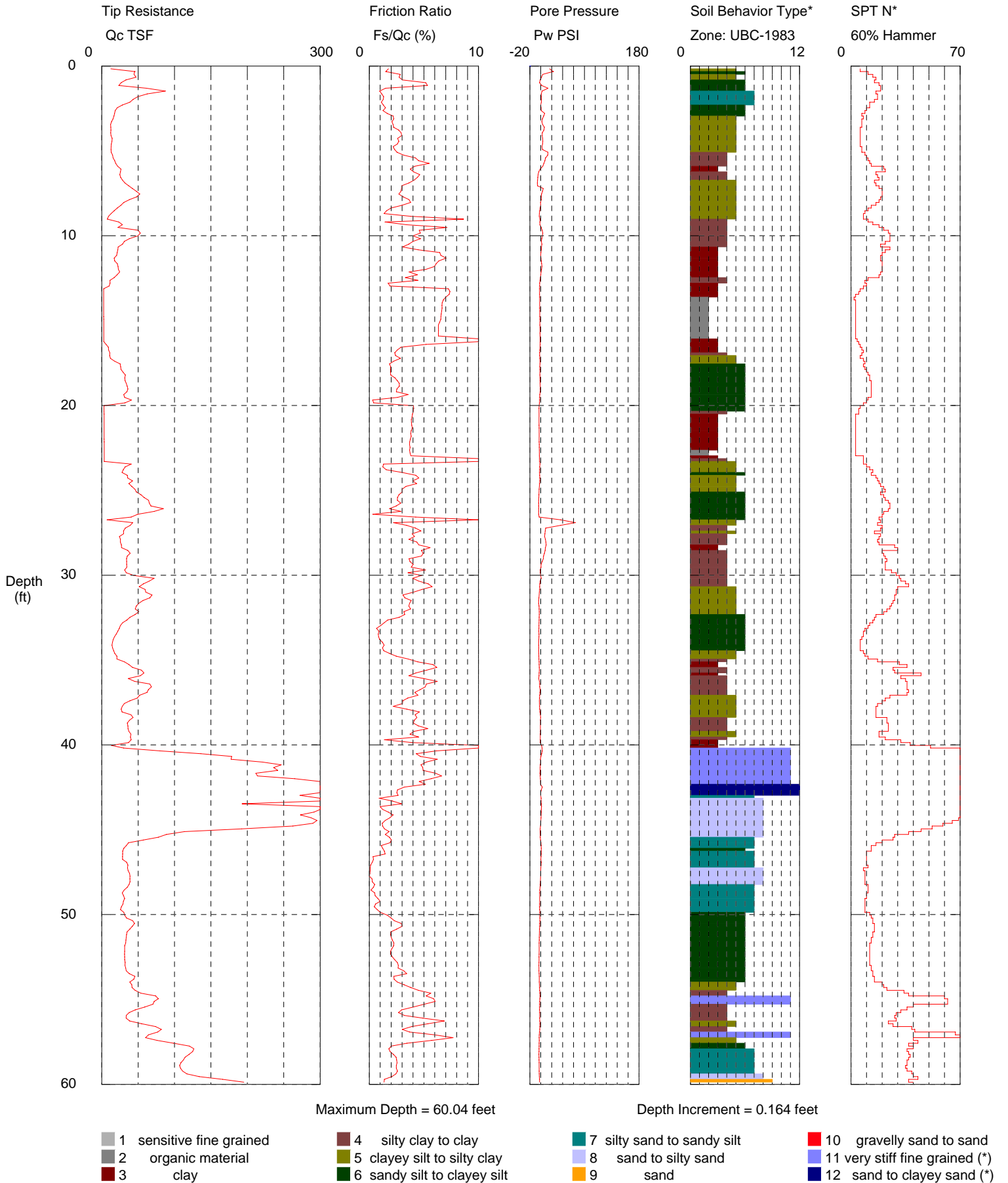


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT033
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 1:01:15 PM
 Location: Levee
 Job Number: ENG-502

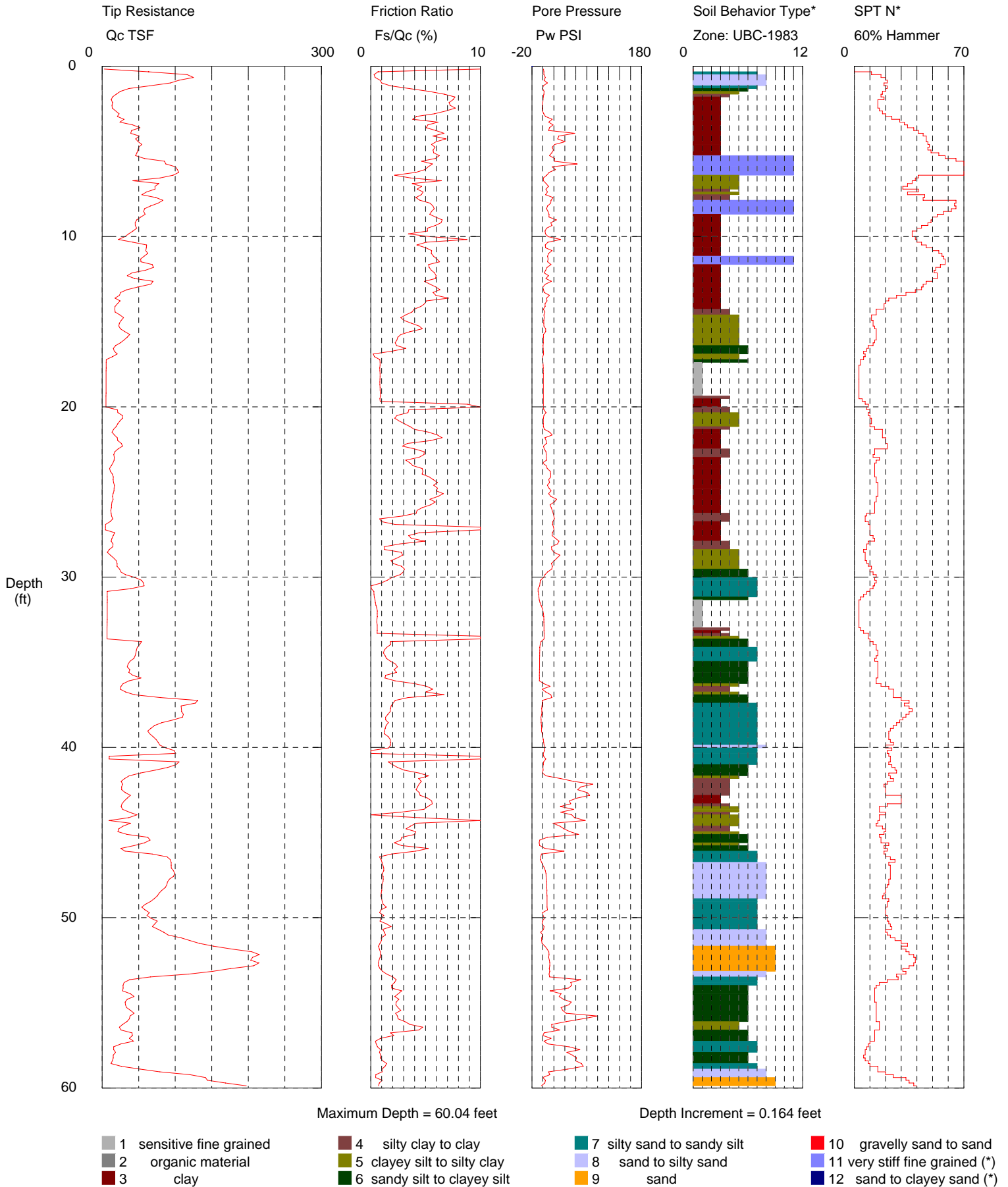


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT034
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 9:18:10 AM
 Location: Levee
 Job Number: ENG-502

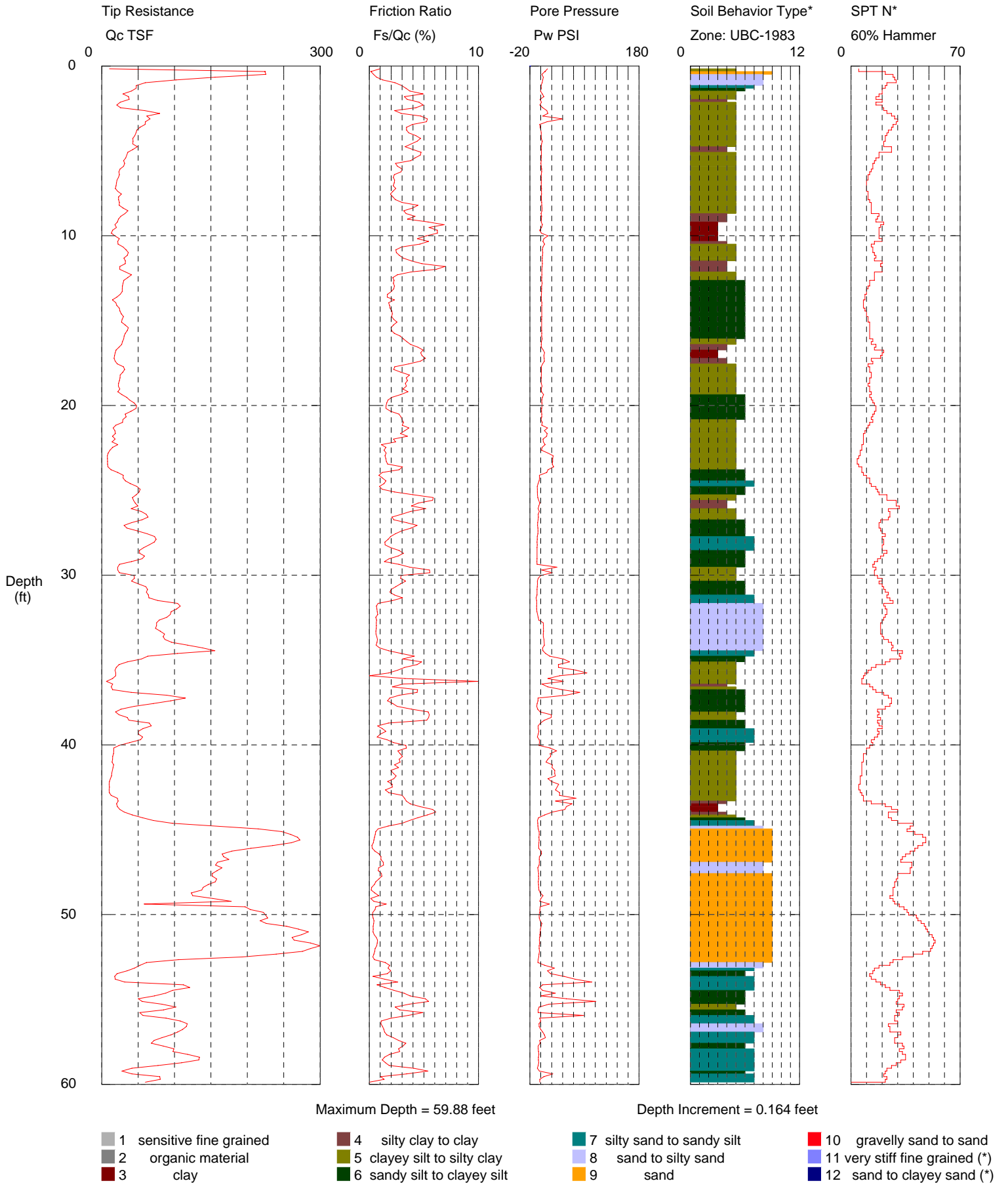


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT035
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 10:00:59 AM
 Location: Levee
 Job Number: ENG-502

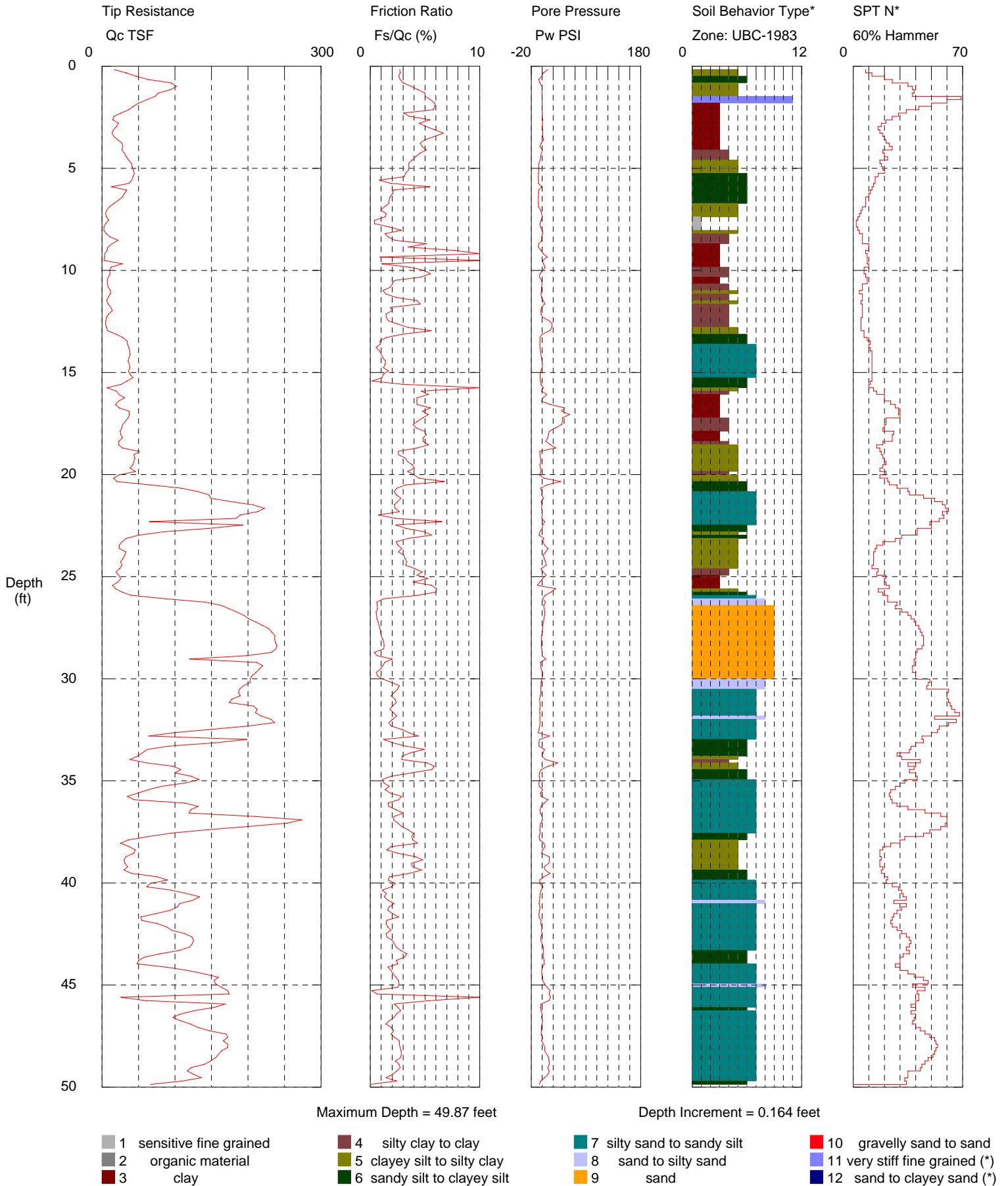


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT036
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 11:11:24 AM
 Location: Levee
 Job Number: ENG-502

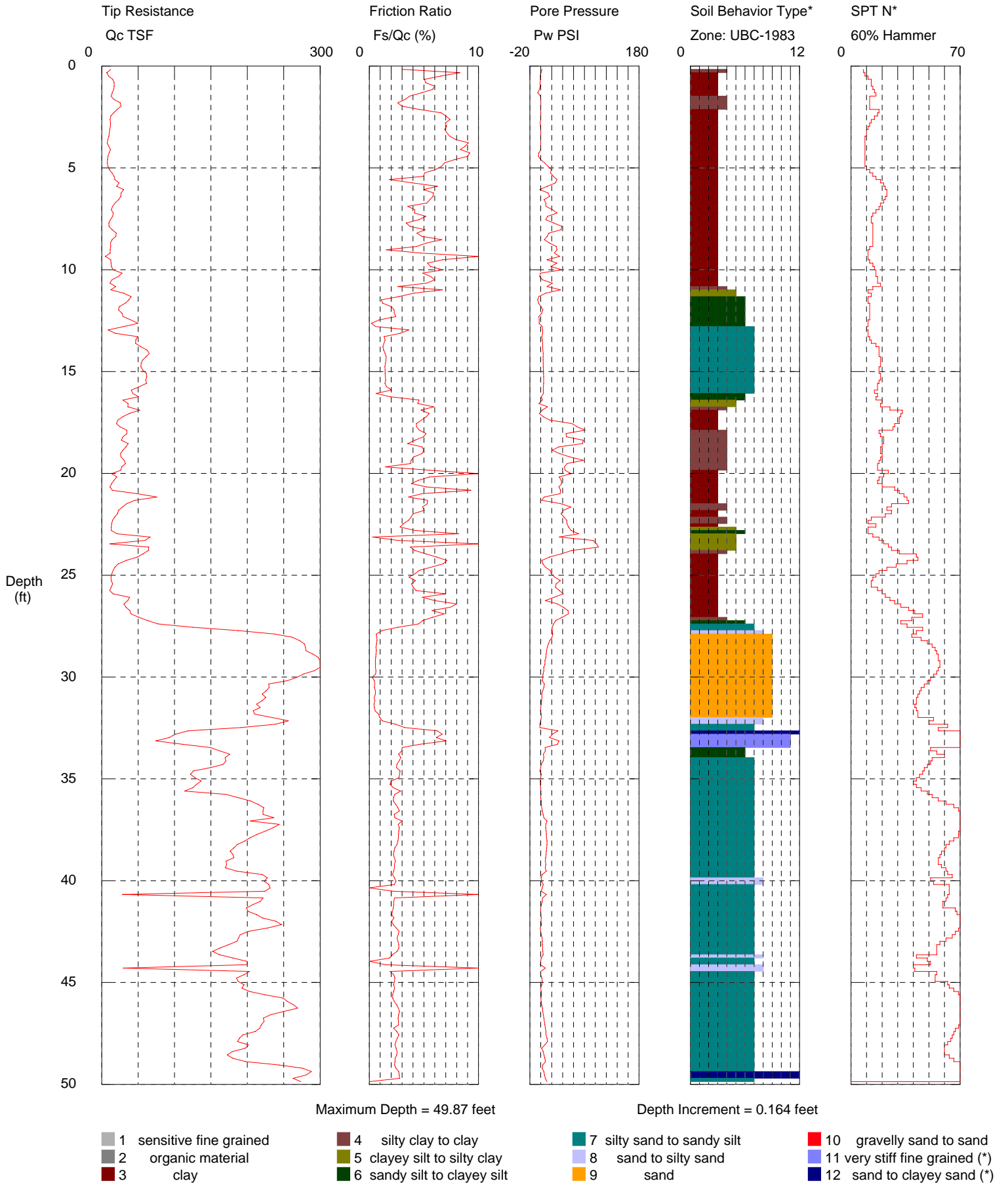


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT037
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 11:43:53 AM
 Location: Levee
 Job Number: ENG-502

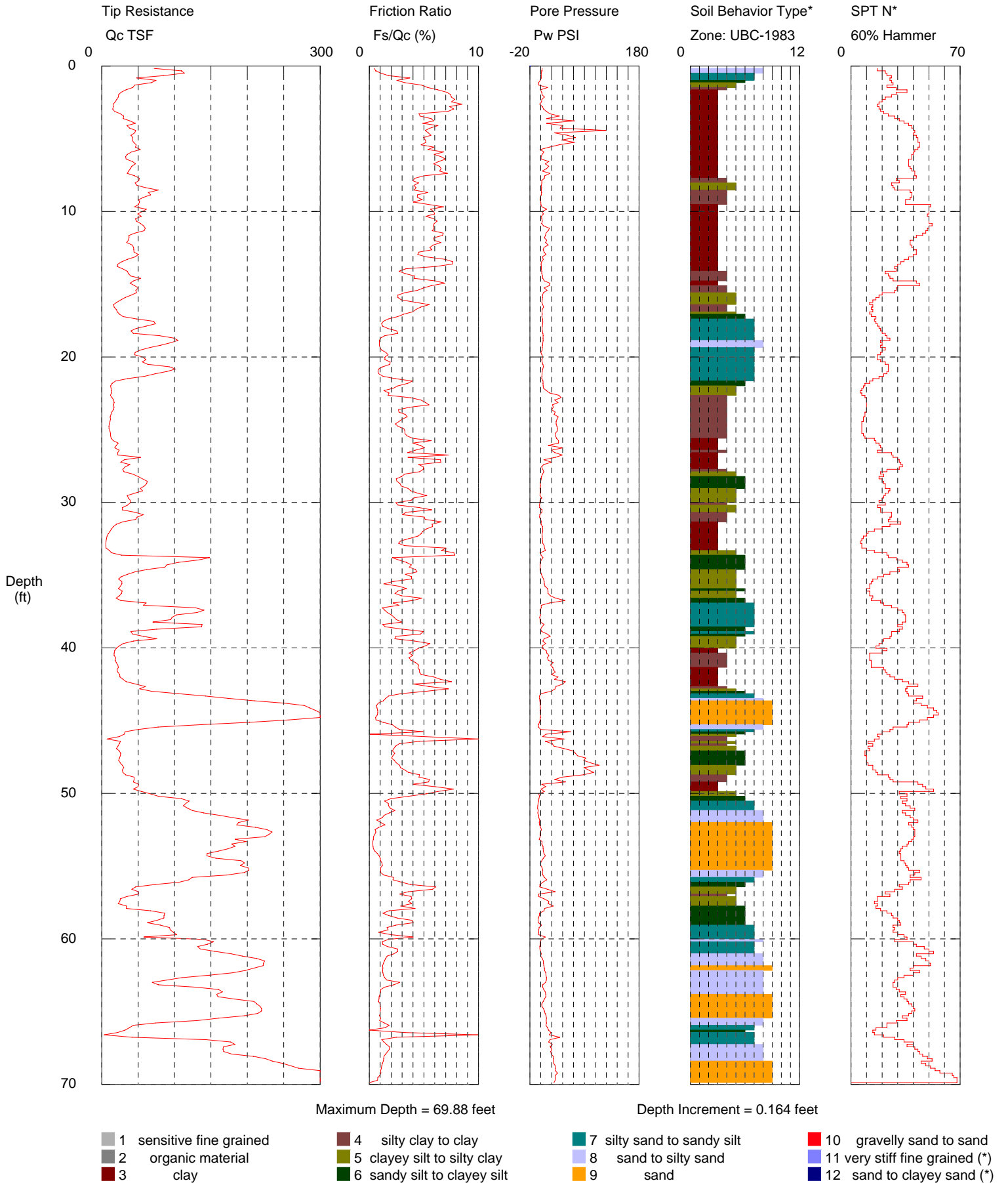


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT038
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 10:45:35 AM
 Location: Levee
 Job Number: ENG-502

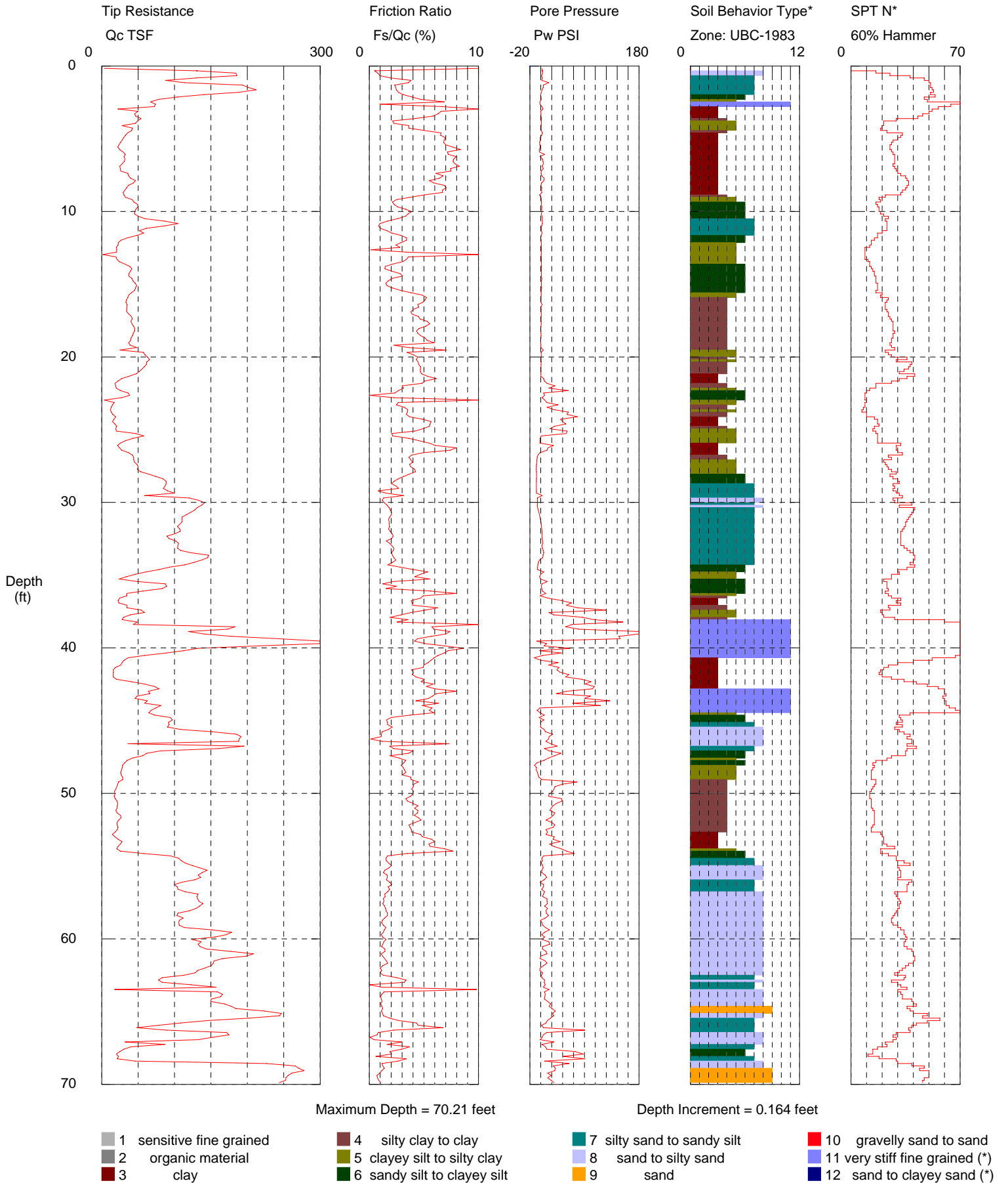


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT039
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 11:35:19 AM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 70.21 feet

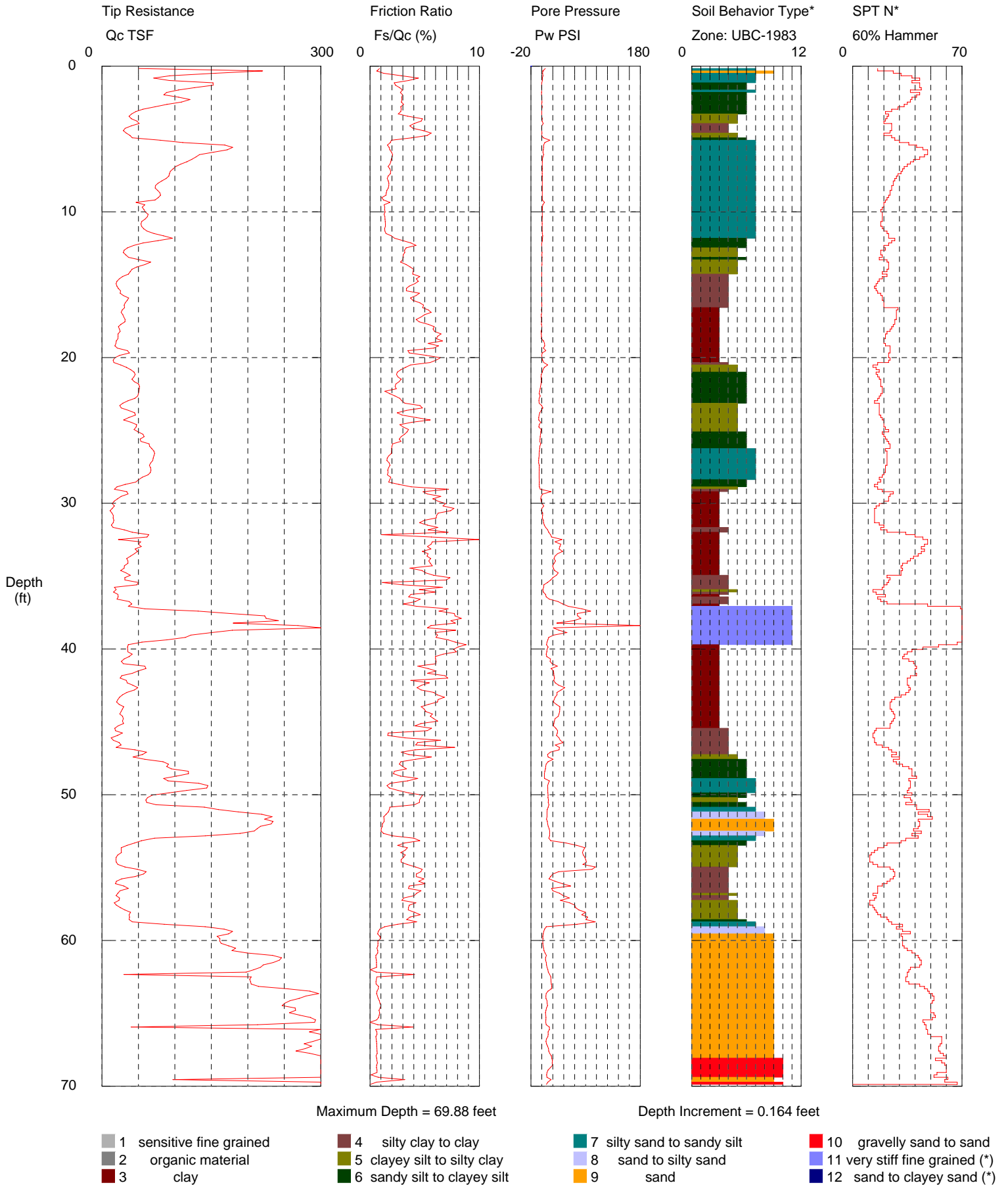
Depth Increment = 0.164 feet

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT040
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 12:30:06 PM
 Location: Levee
 Job Number: ENG-502

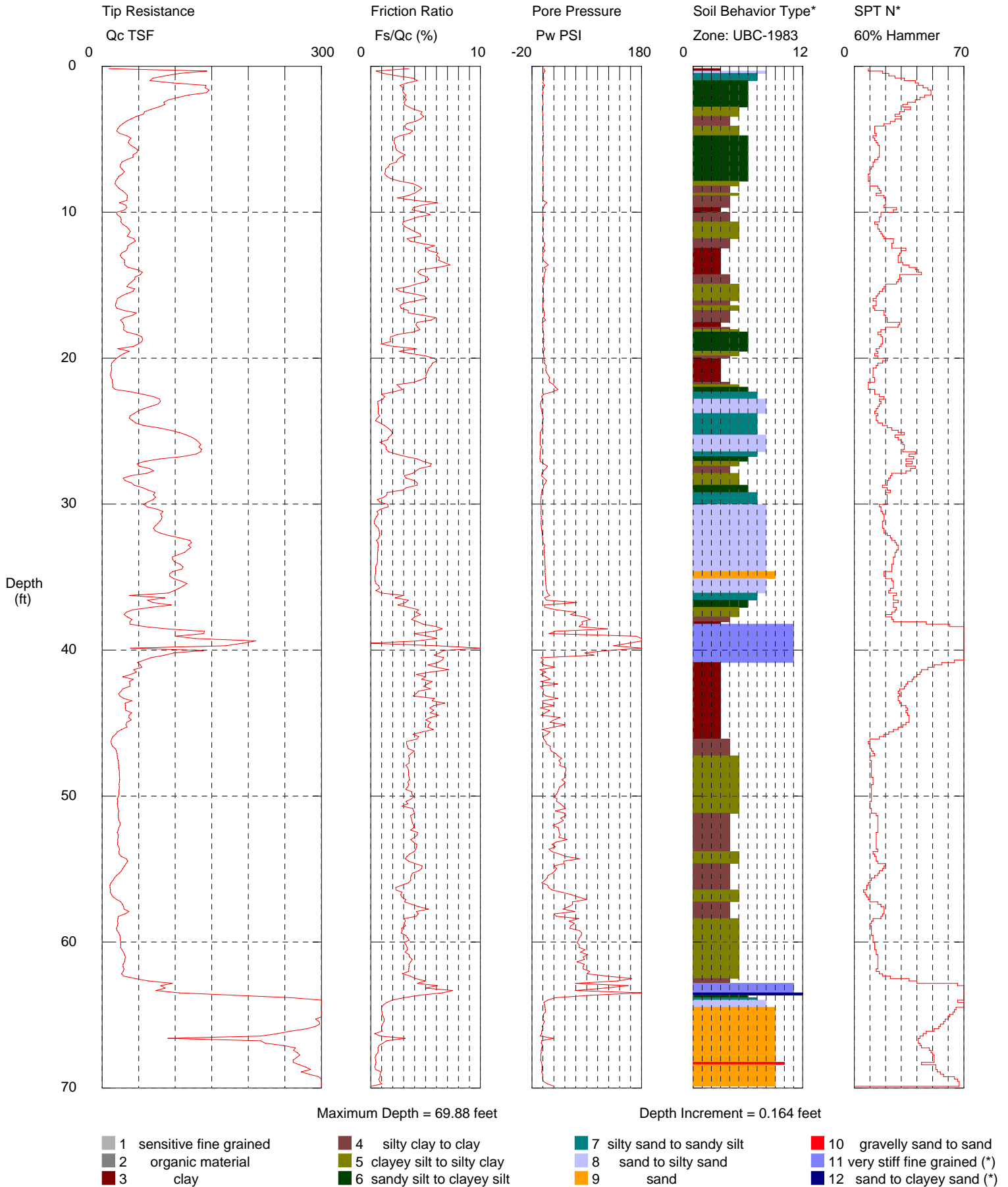


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT041
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 1:24:02 PM
 Location: Levee
 Job Number: ENG-502

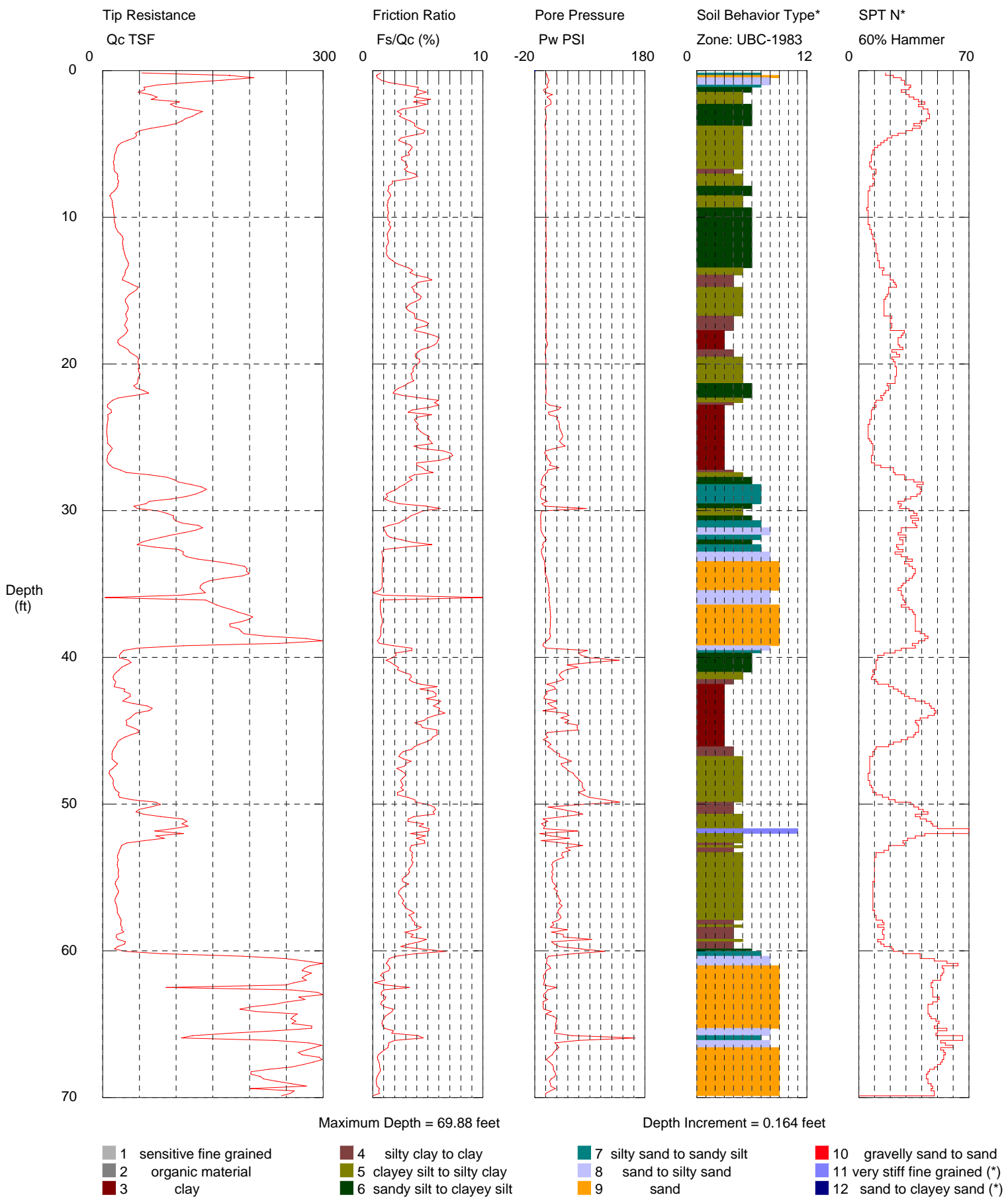


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT042
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 2:13:05 PM
 Location: Levee
 Job Number: ENG-502

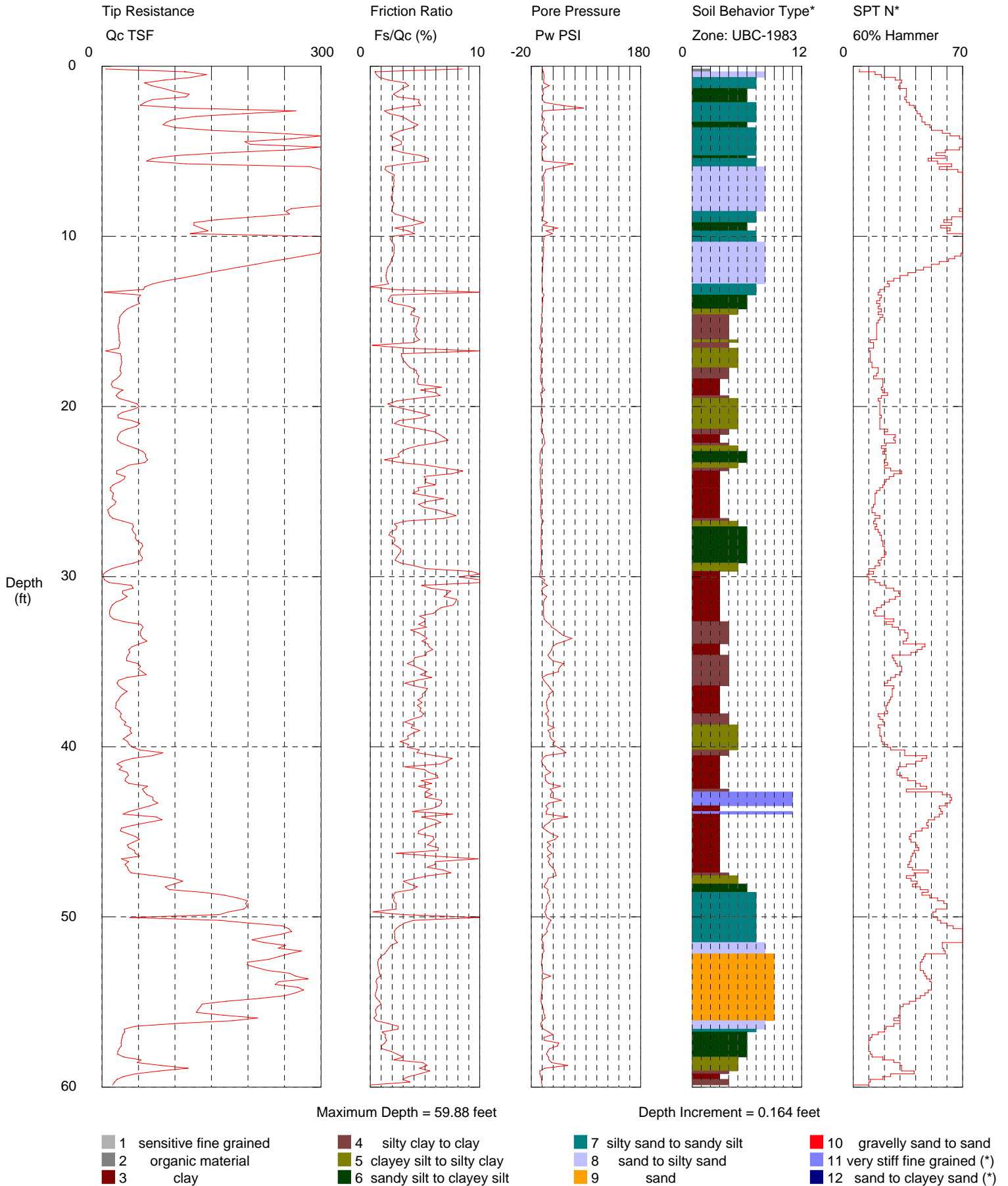


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT043
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 2:54:05 PM
 Location: Levee
 Job Number: ENG-502

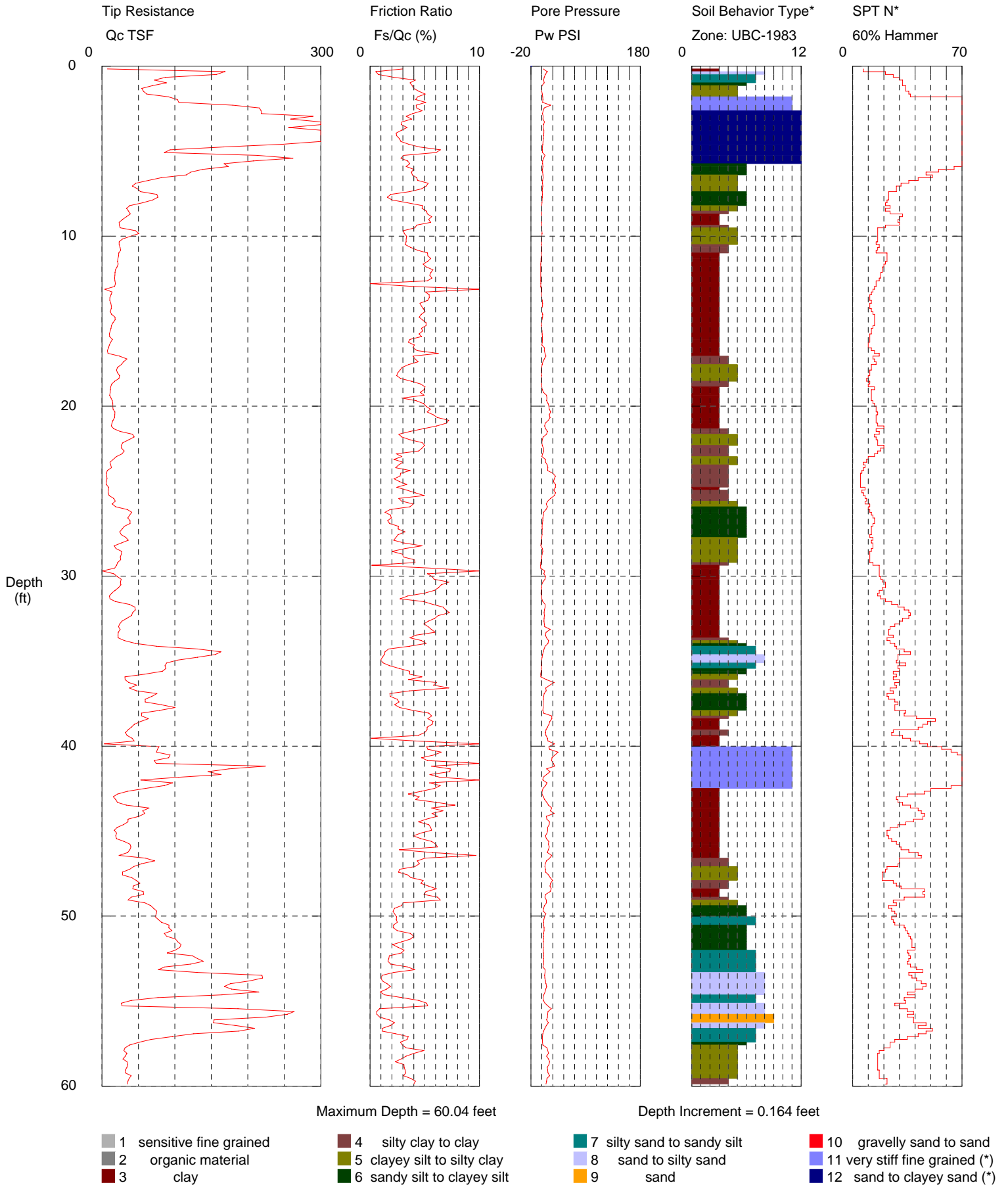


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT044
 Cone Used: DSG1111

CPT Date/Time: 12/27/2014 3:32:17 PM
 Location: Levee
 Job Number: ENG-502

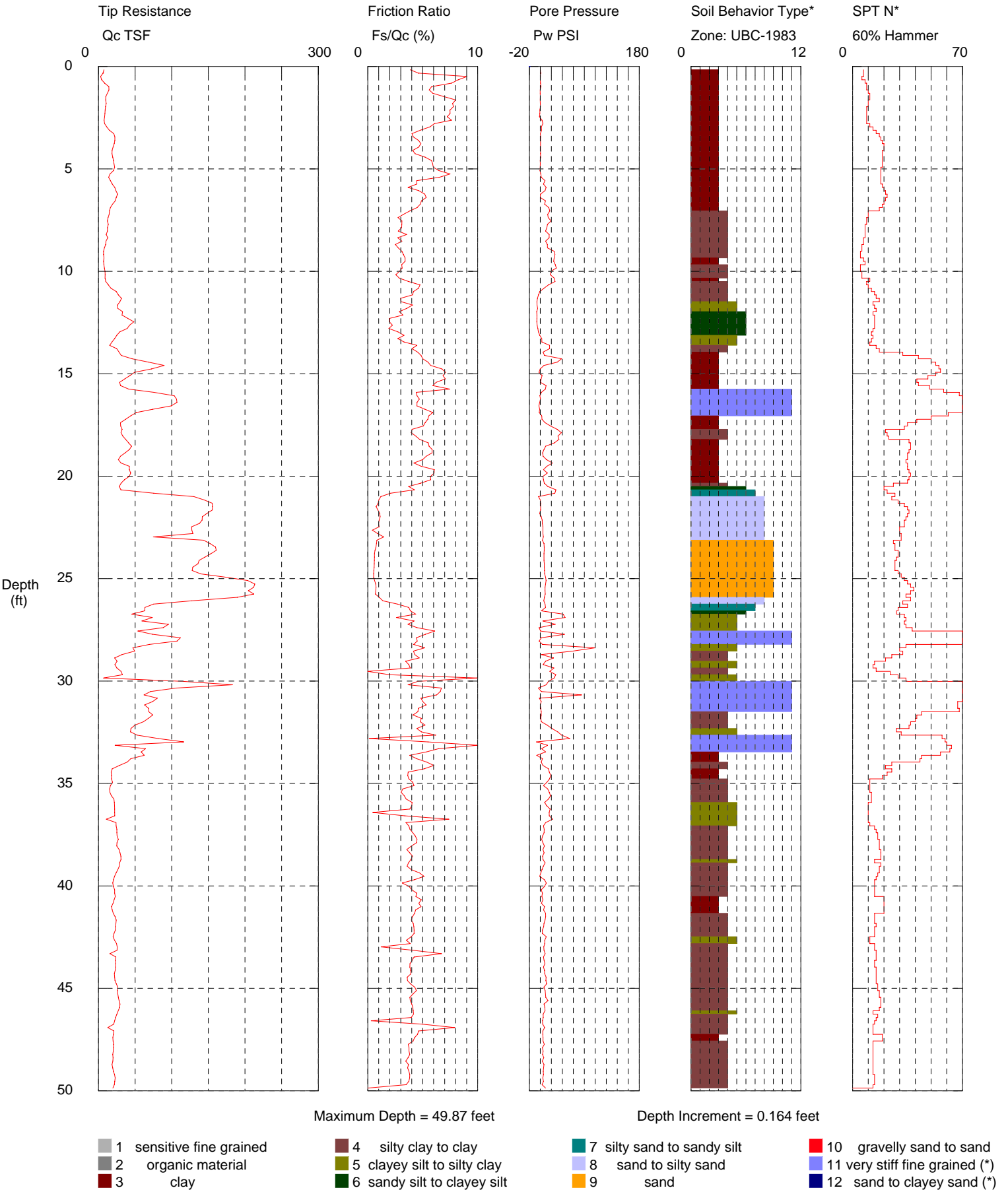


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT045
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 8:43:46 AM
 Location: Levee
 Job Number: ENG-502

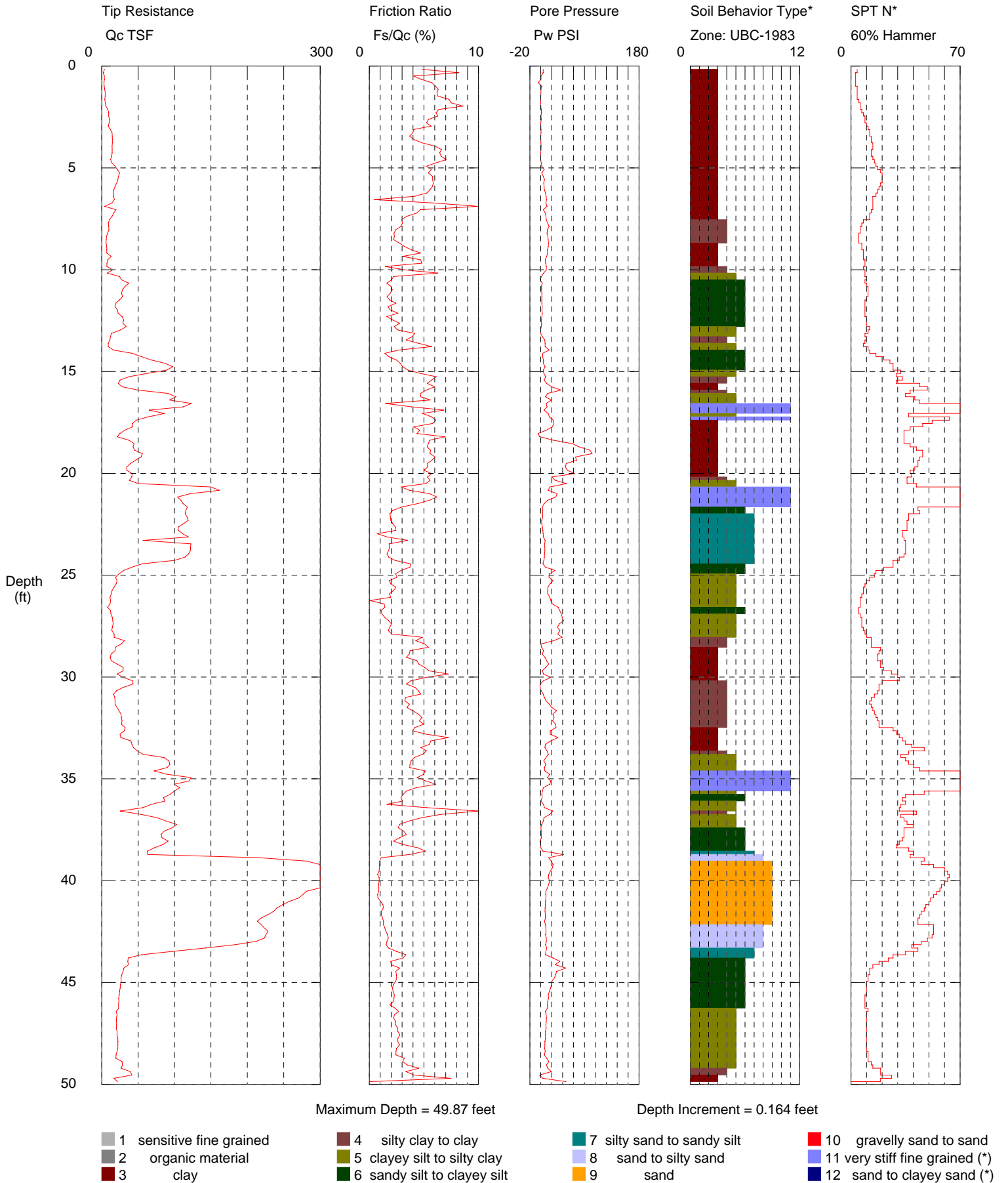


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT046
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 9:14:07 AM
 Location: Levee
 Job Number: ENG-502

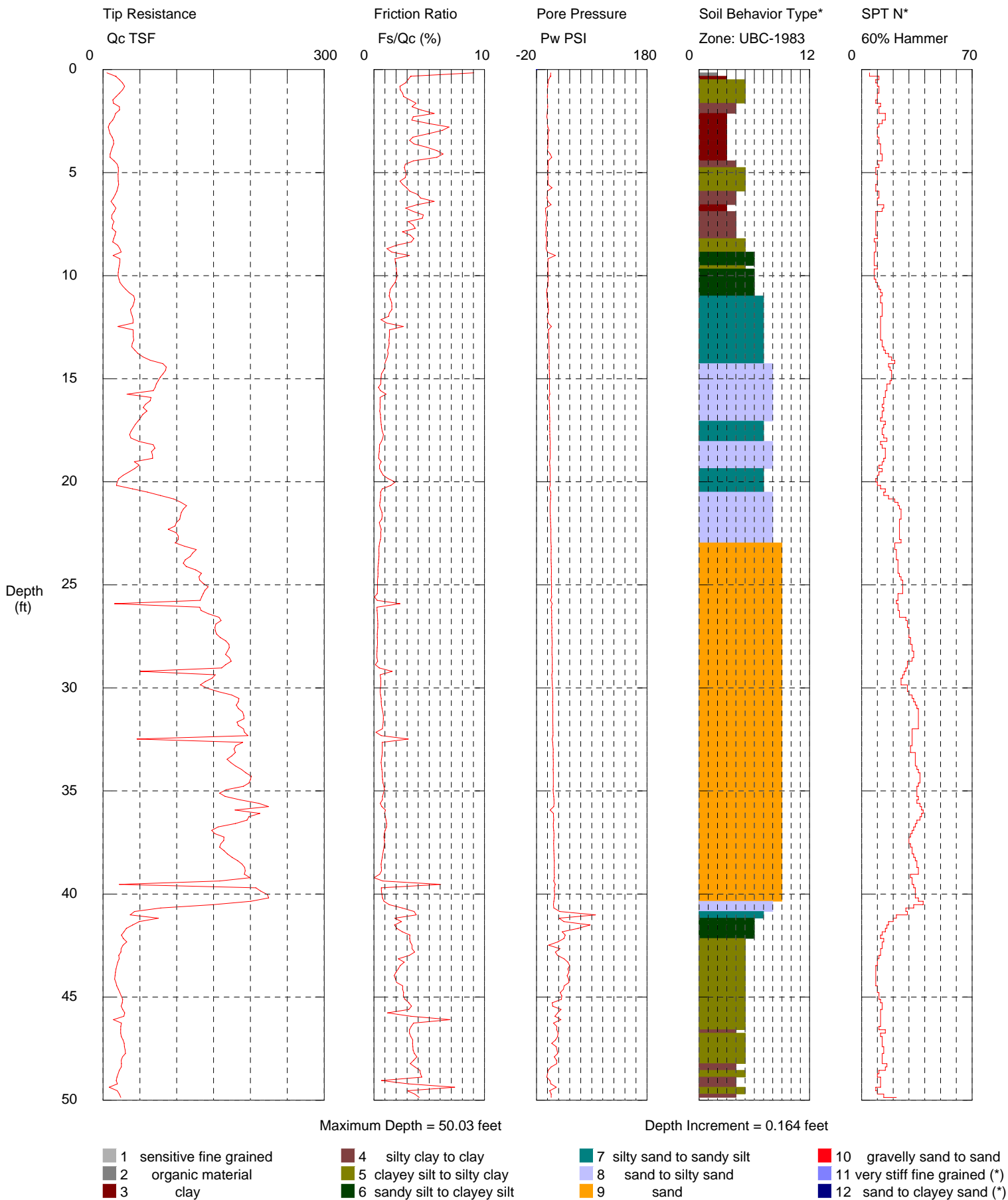


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT047
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 7:10:22 AM
 Location: Levee
 Job Number: ENG-502

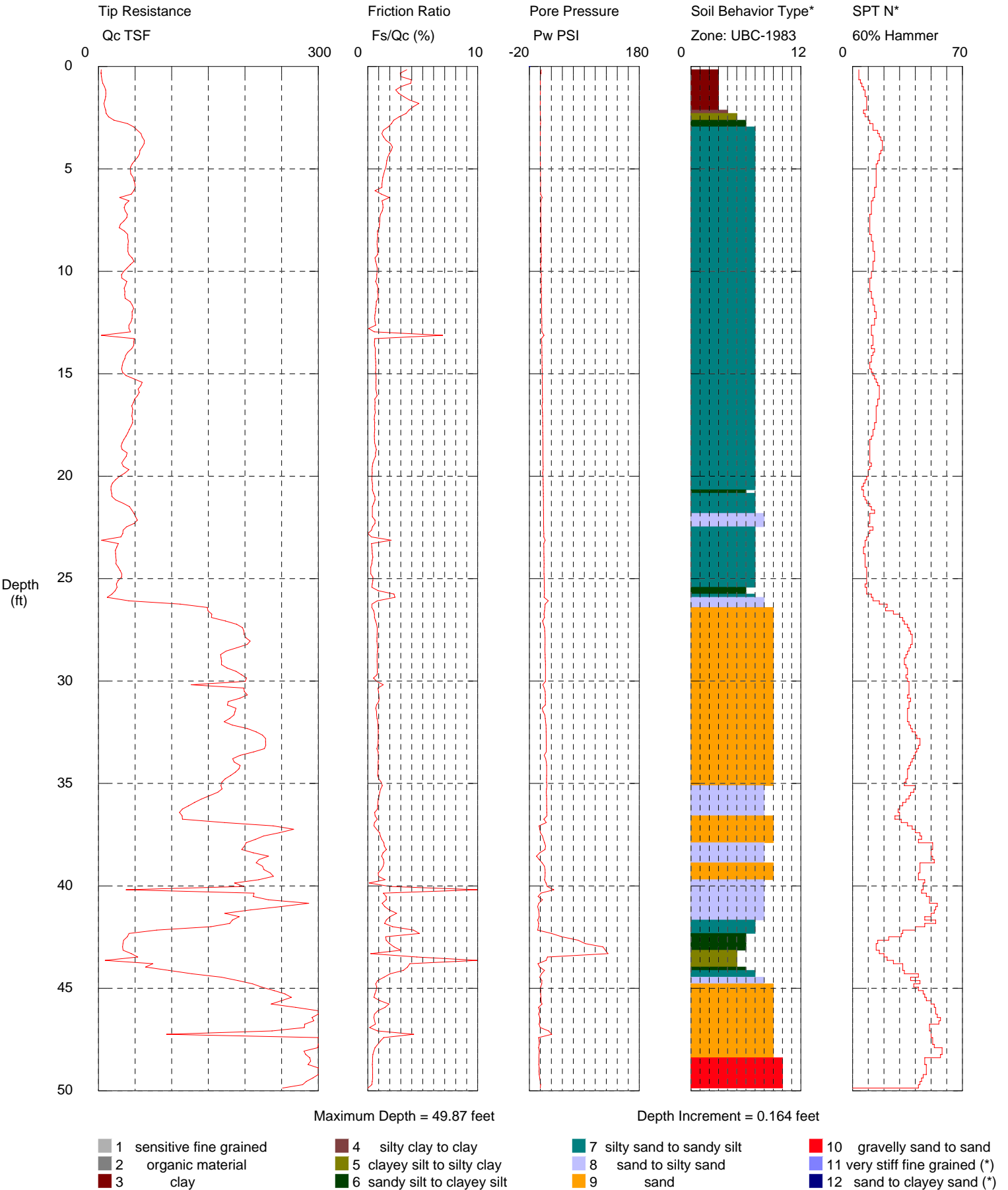


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT048
 Cone Used: DSG1111

CPT Date/Time: 12/30/2014 7:46:11 AM
 Location: Levee
 Job Number: ENG-502

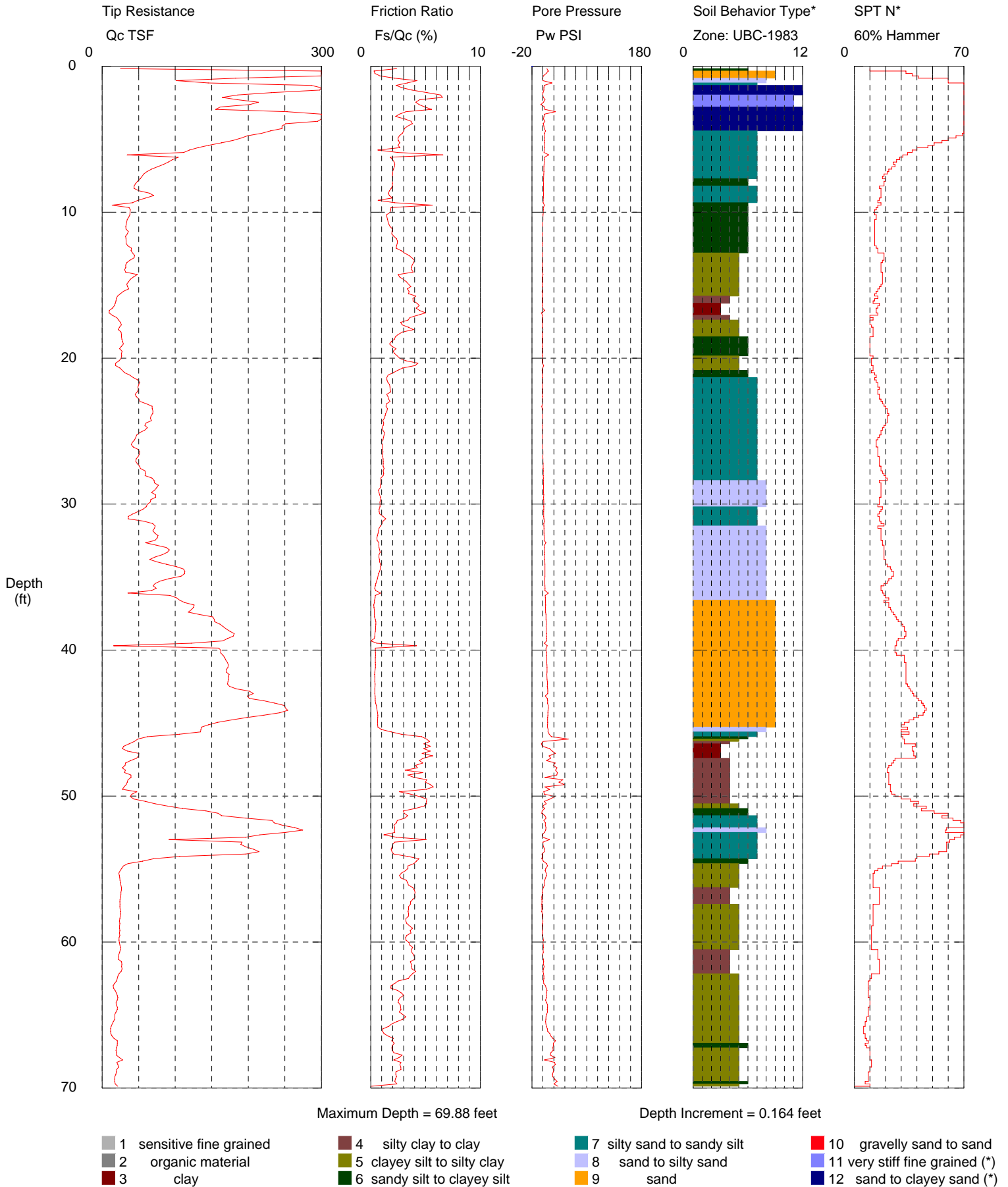


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT049
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 7:21:22 AM
 Location: Levee
 Job Number: ENG-502

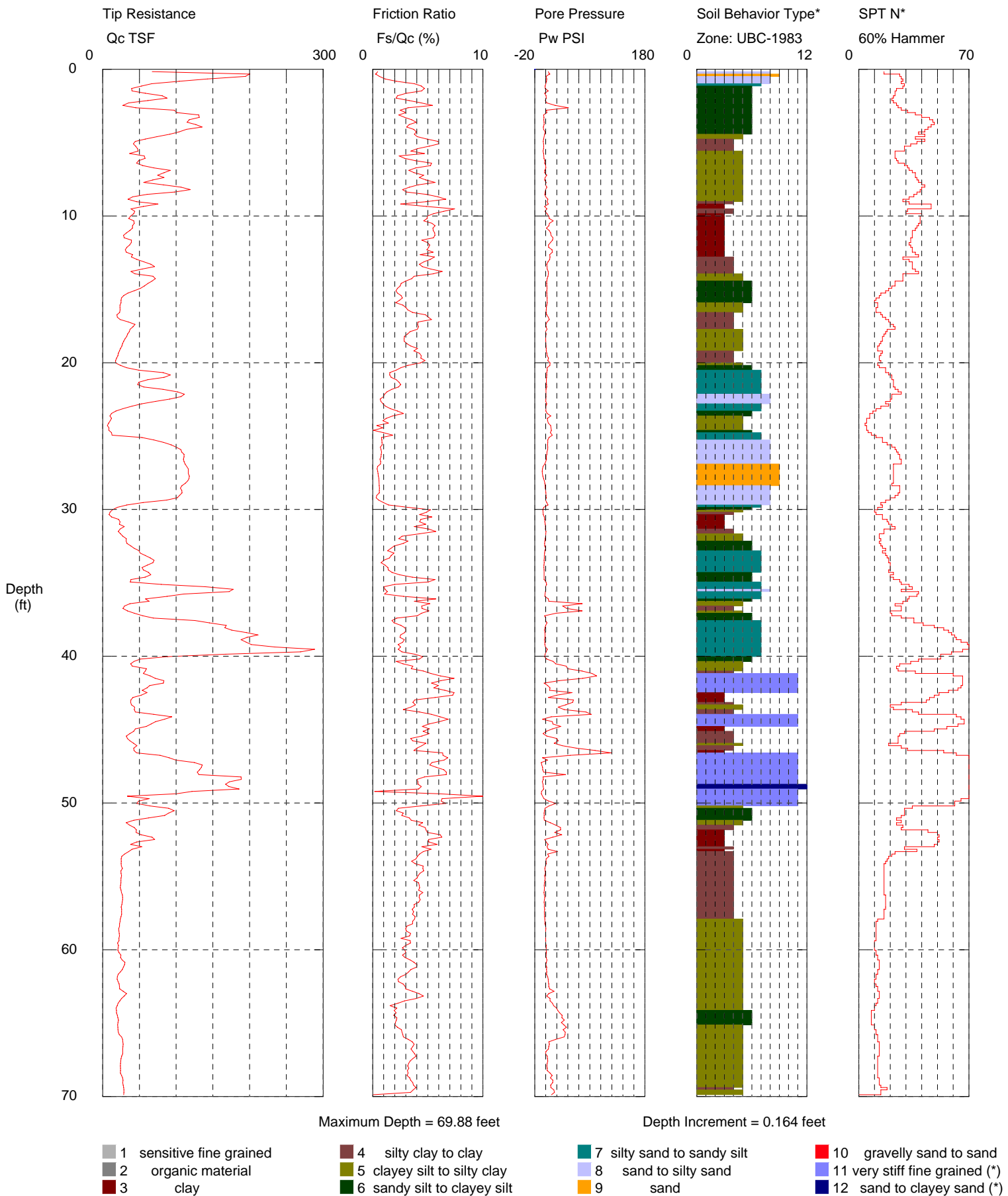


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT050
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 8:02:02 AM
 Location: Levee
 Job Number: ENG-502

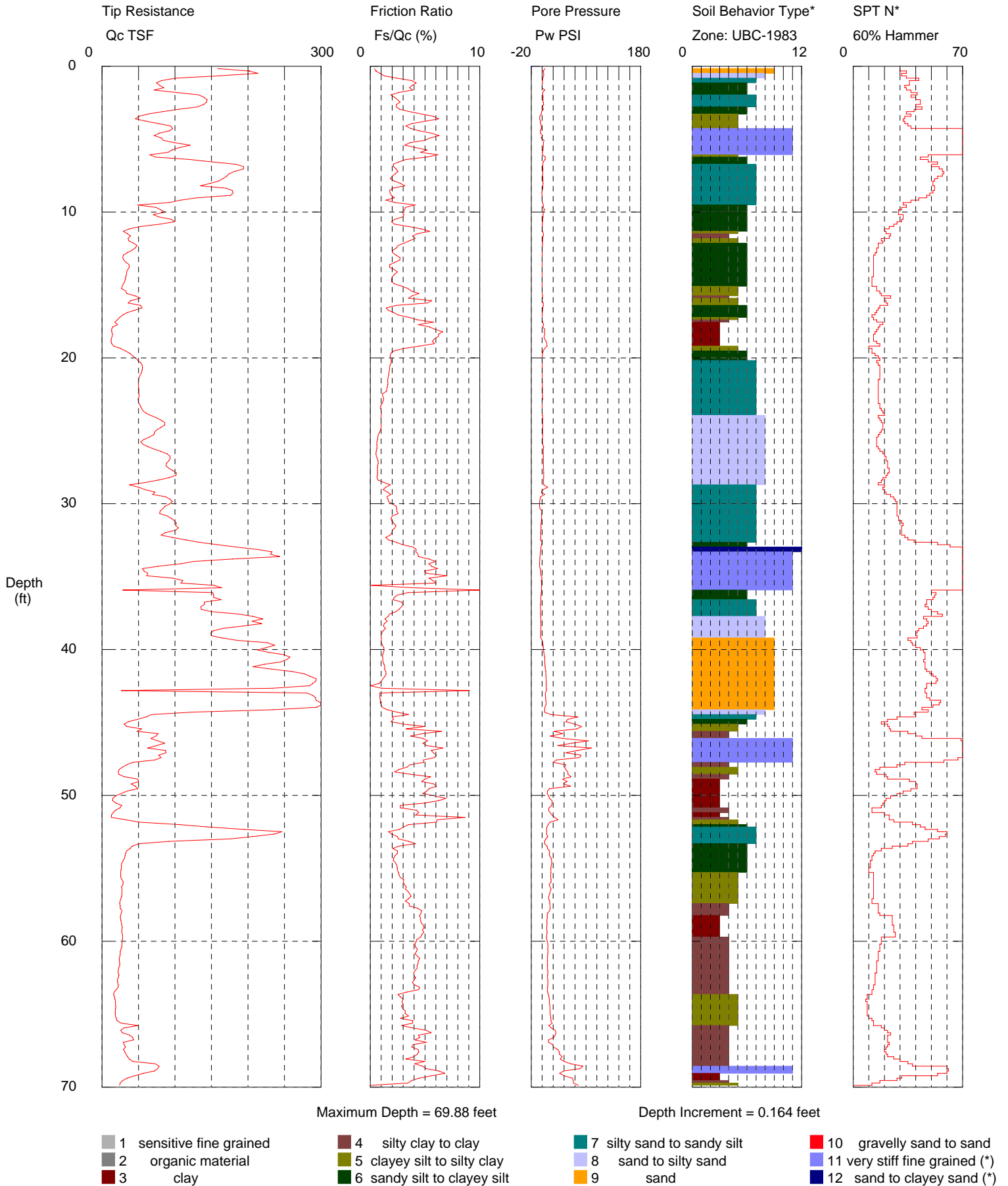


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT051
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 8:40:51 AM
 Location: Levee
 Job Number: ENG-502

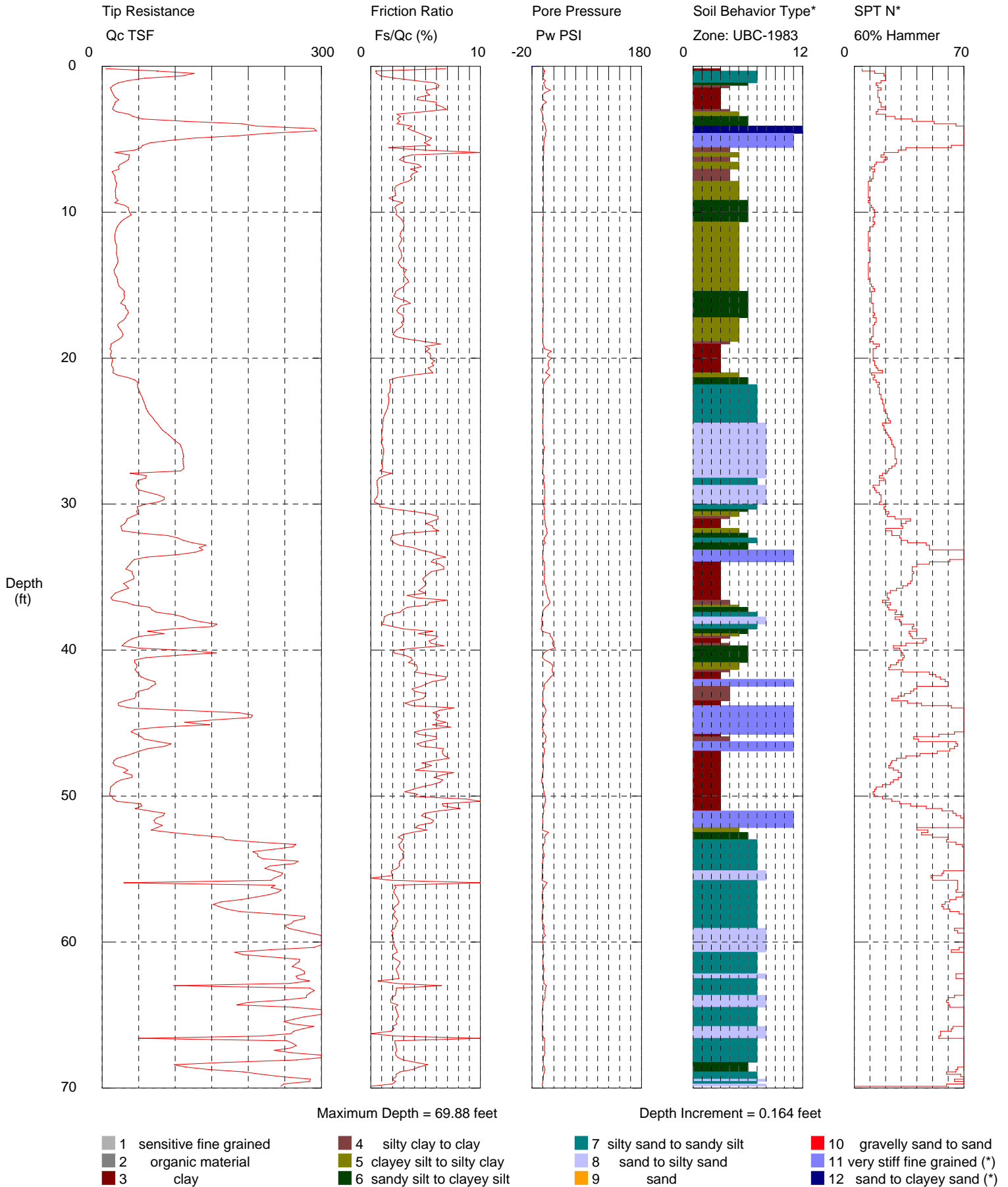


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT052
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 9:22:26 AM
 Location: Levee
 Job Number: ENG-502

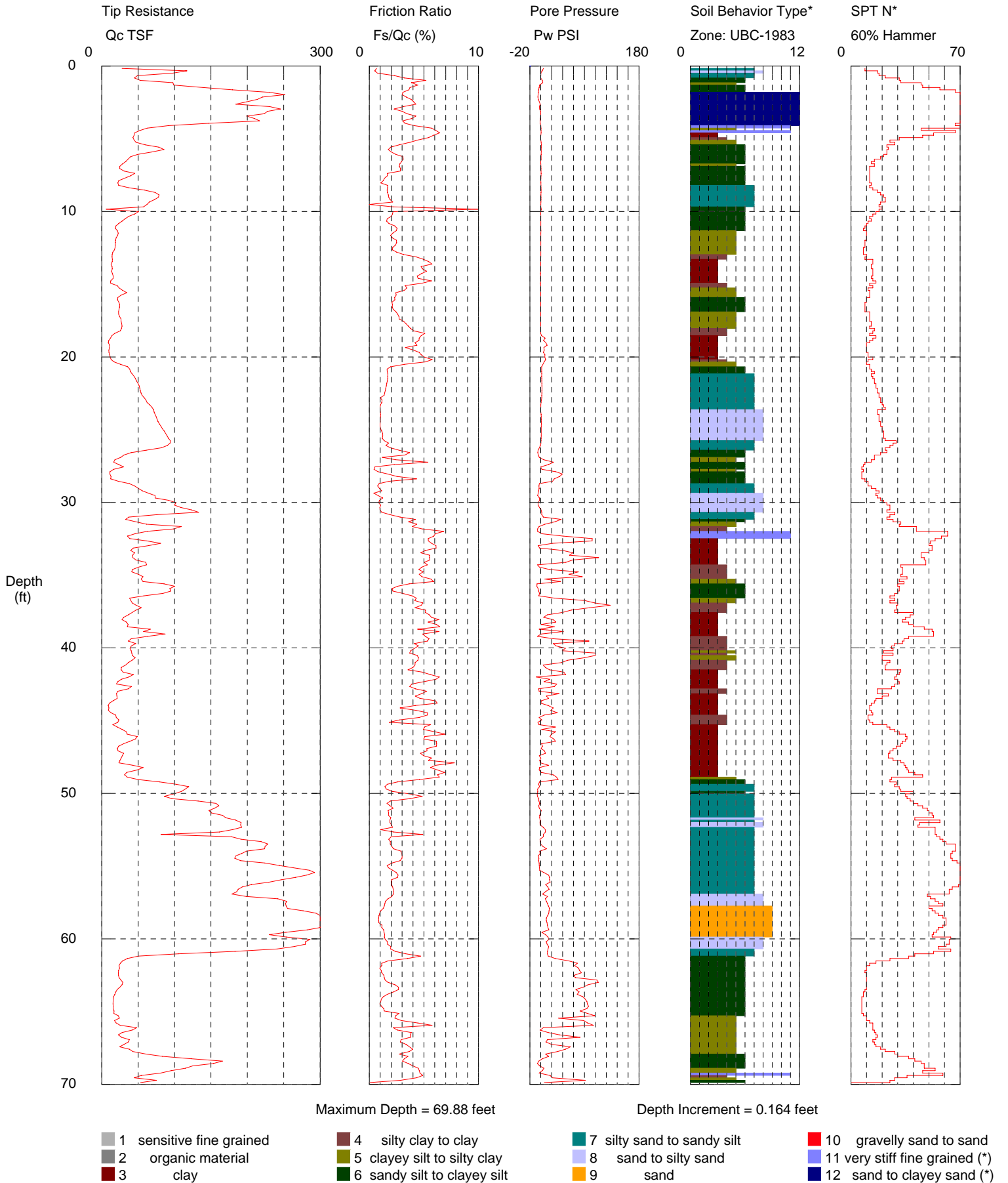


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT053
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 10:04:24 AM
 Location: Levee
 Job Number: ENG-502

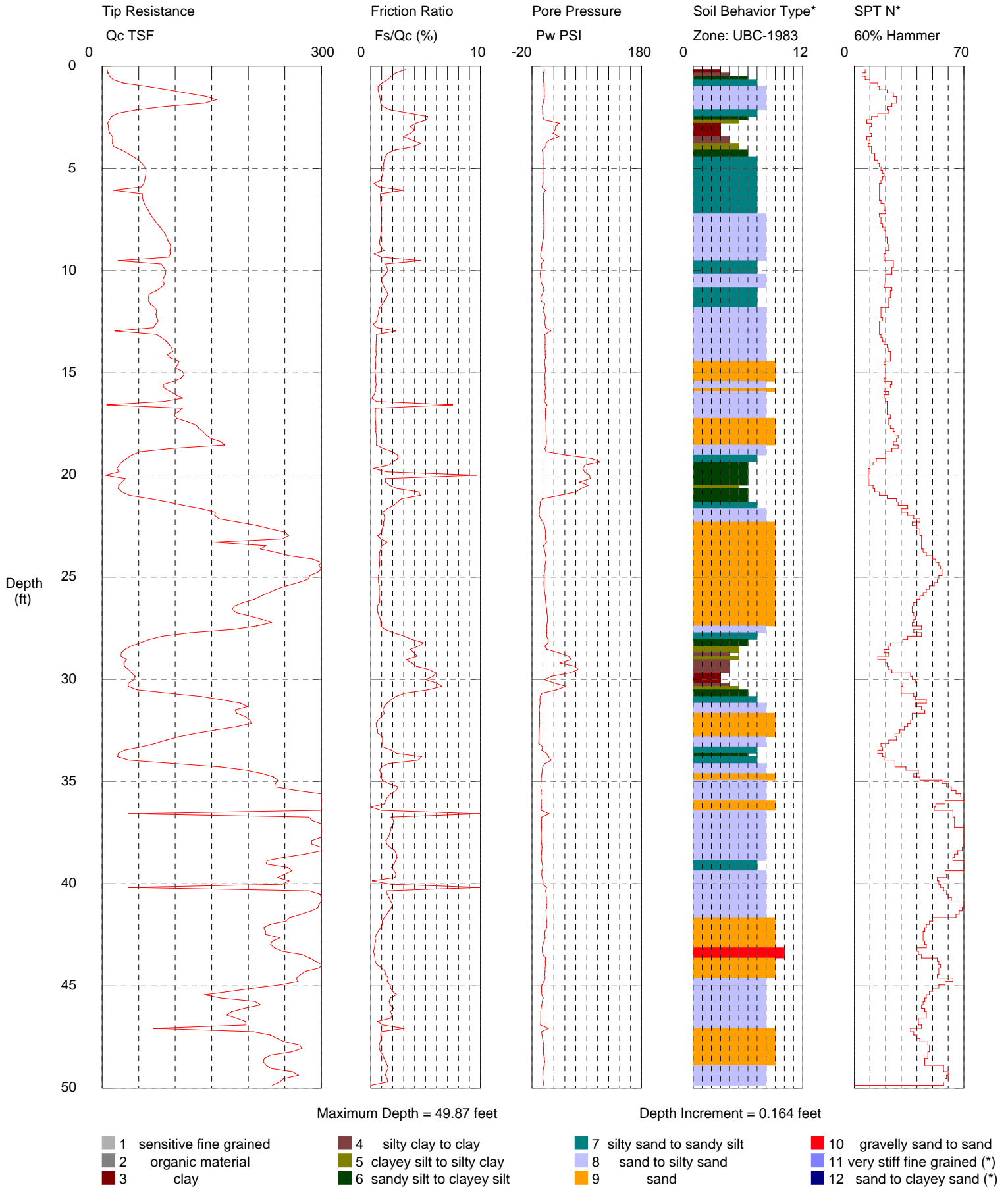


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT054
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 3:00:52 PM
 Location: Levee
 Job Number: ENG-502

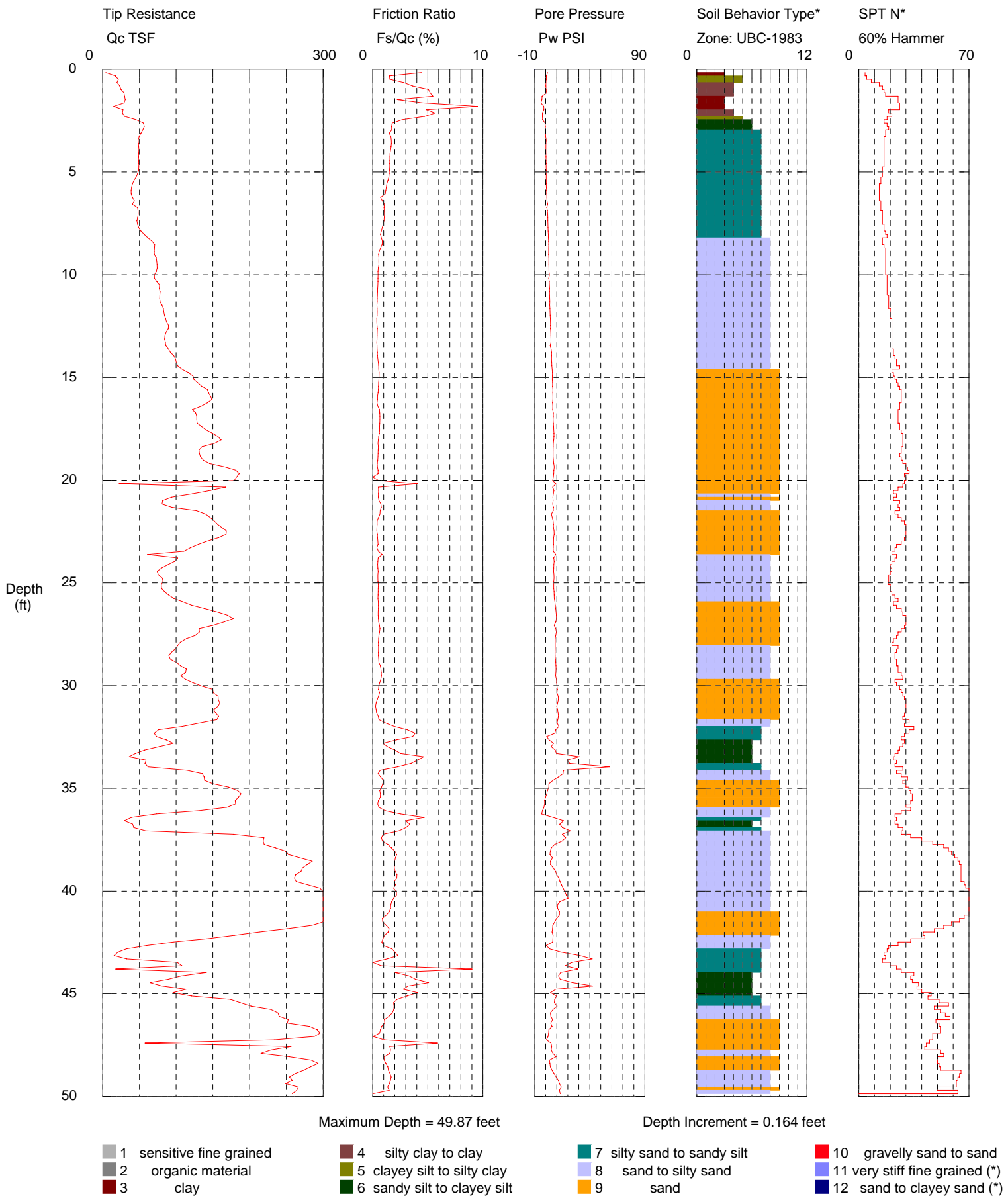


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT055
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 2:27:01 PM
 Location: Levee
 Job Number: ENG-502

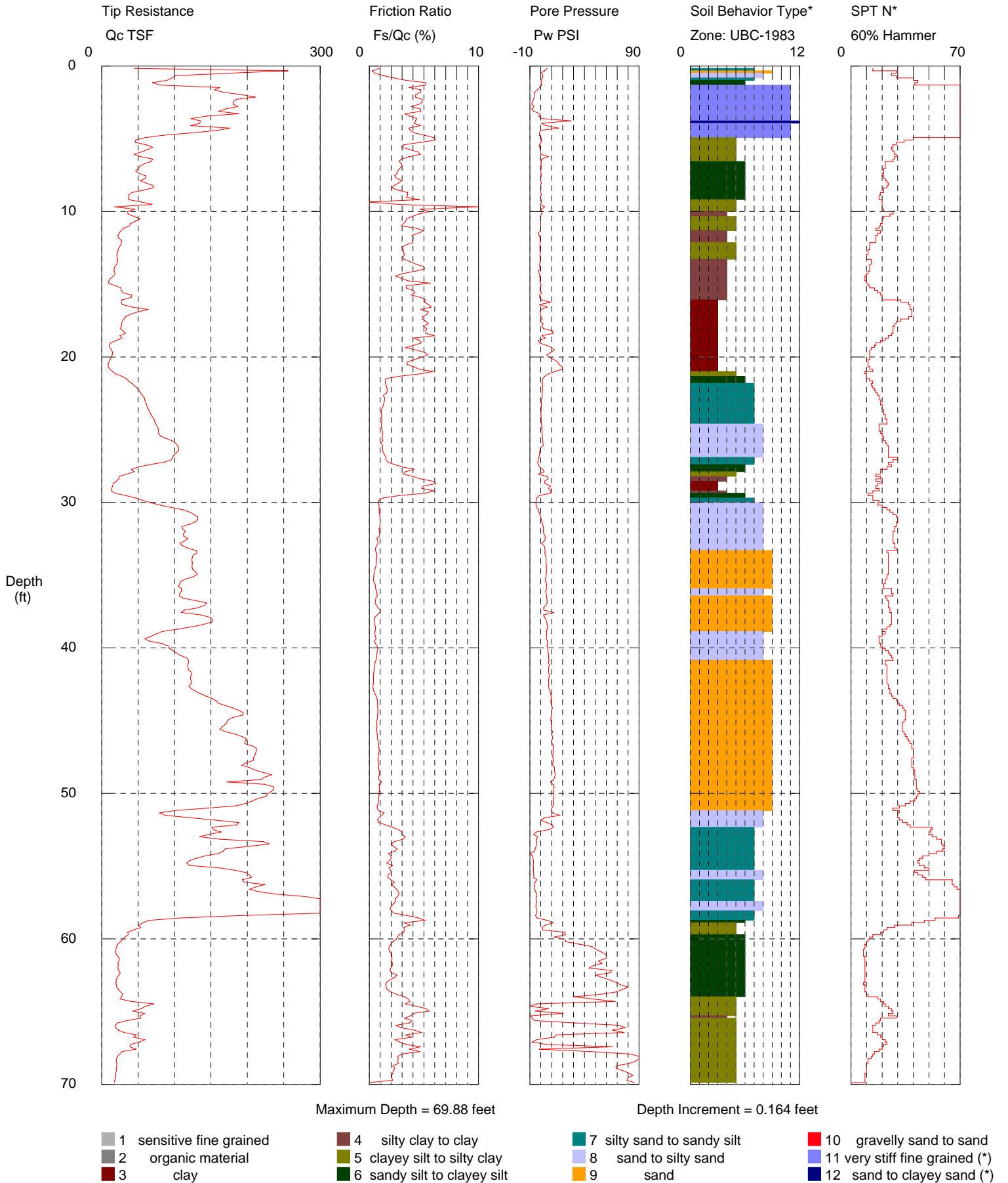


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT056
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 10:51:18 AM
 Location: Levee
 Job Number: ENG-502

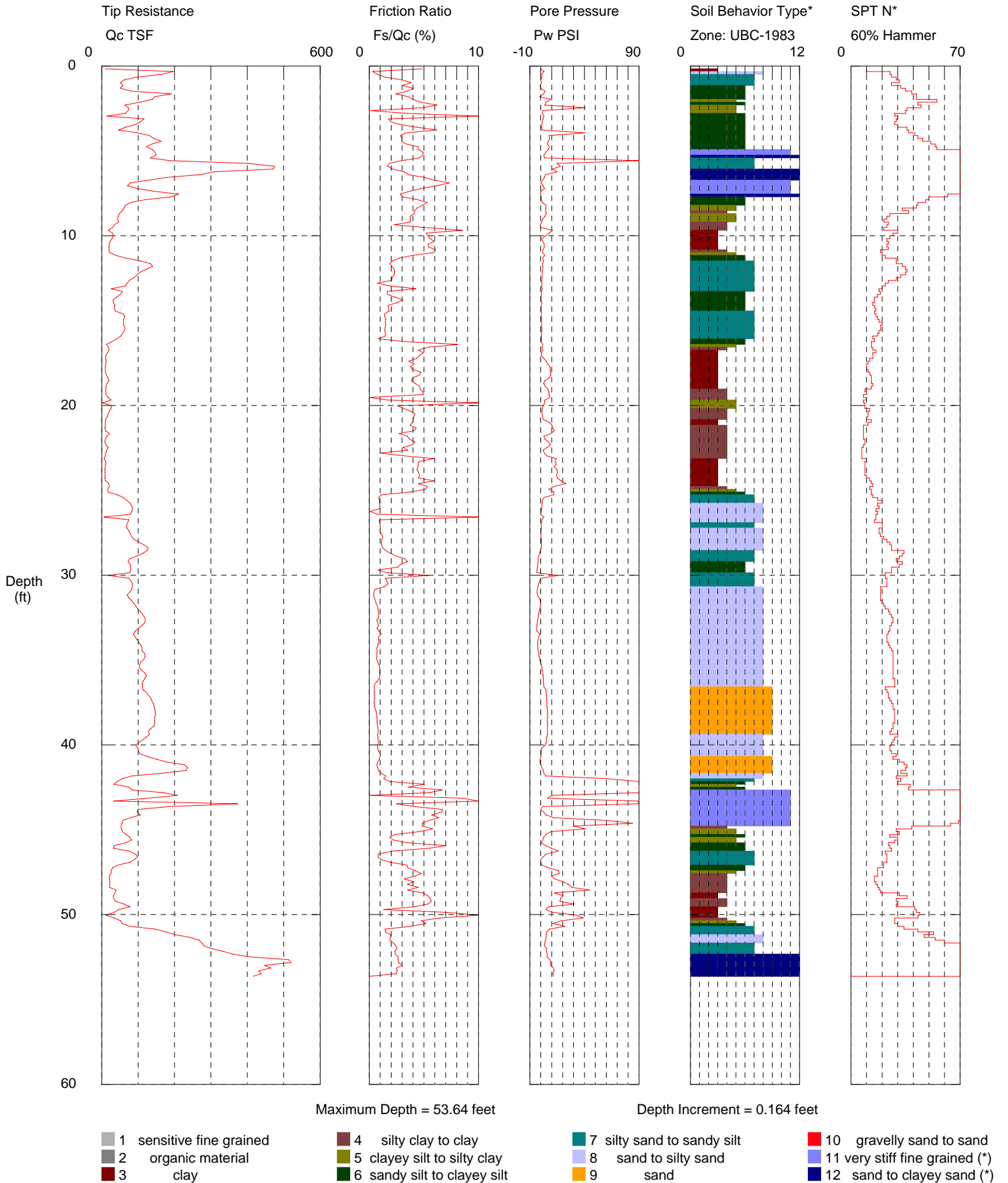


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT057
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 11:34:42 AM
 Location: Levee
 Job Number: ENG-502

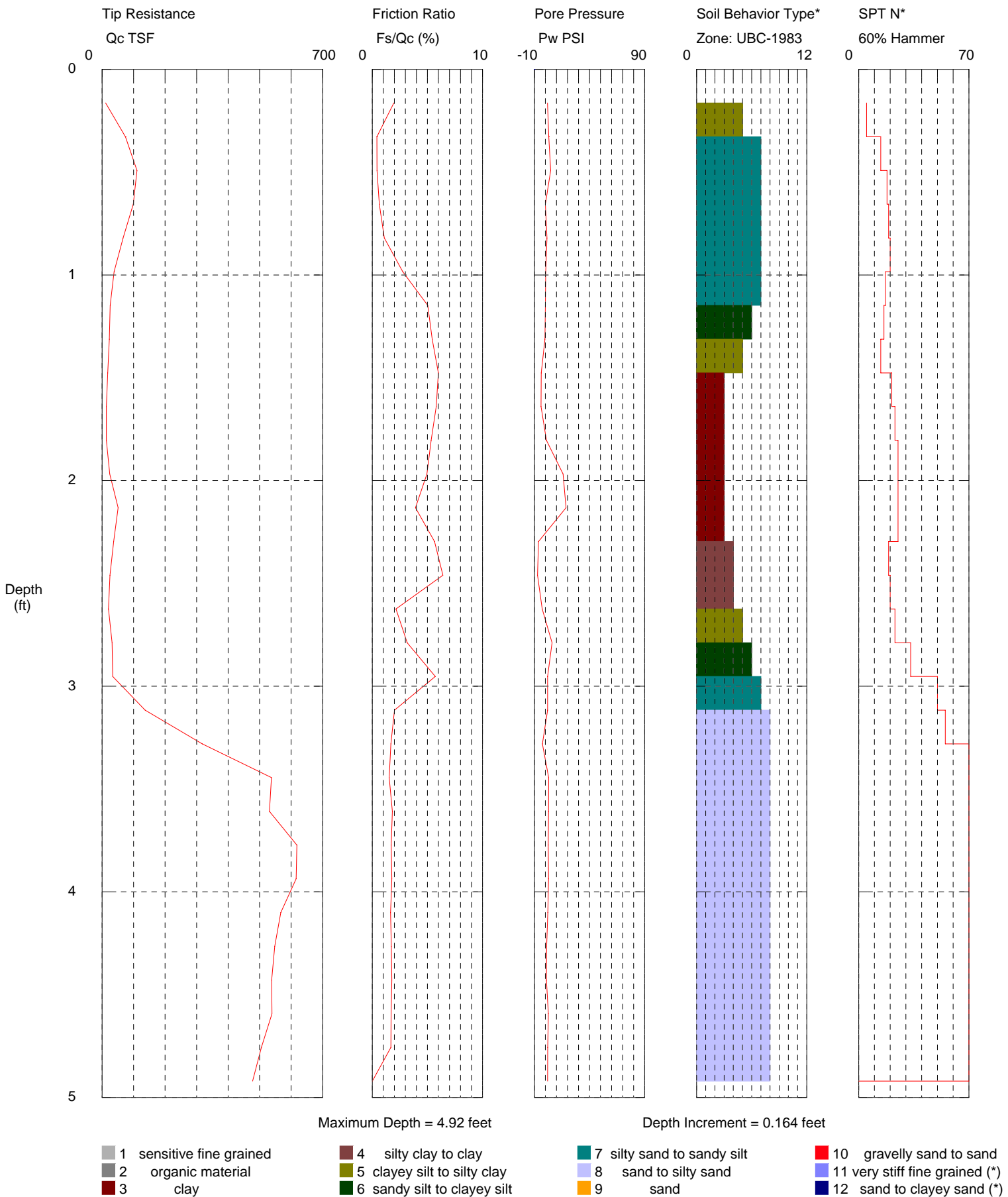


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT058
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 12:33:04 PM
 Location: Levee
 Job Number: ENG-502

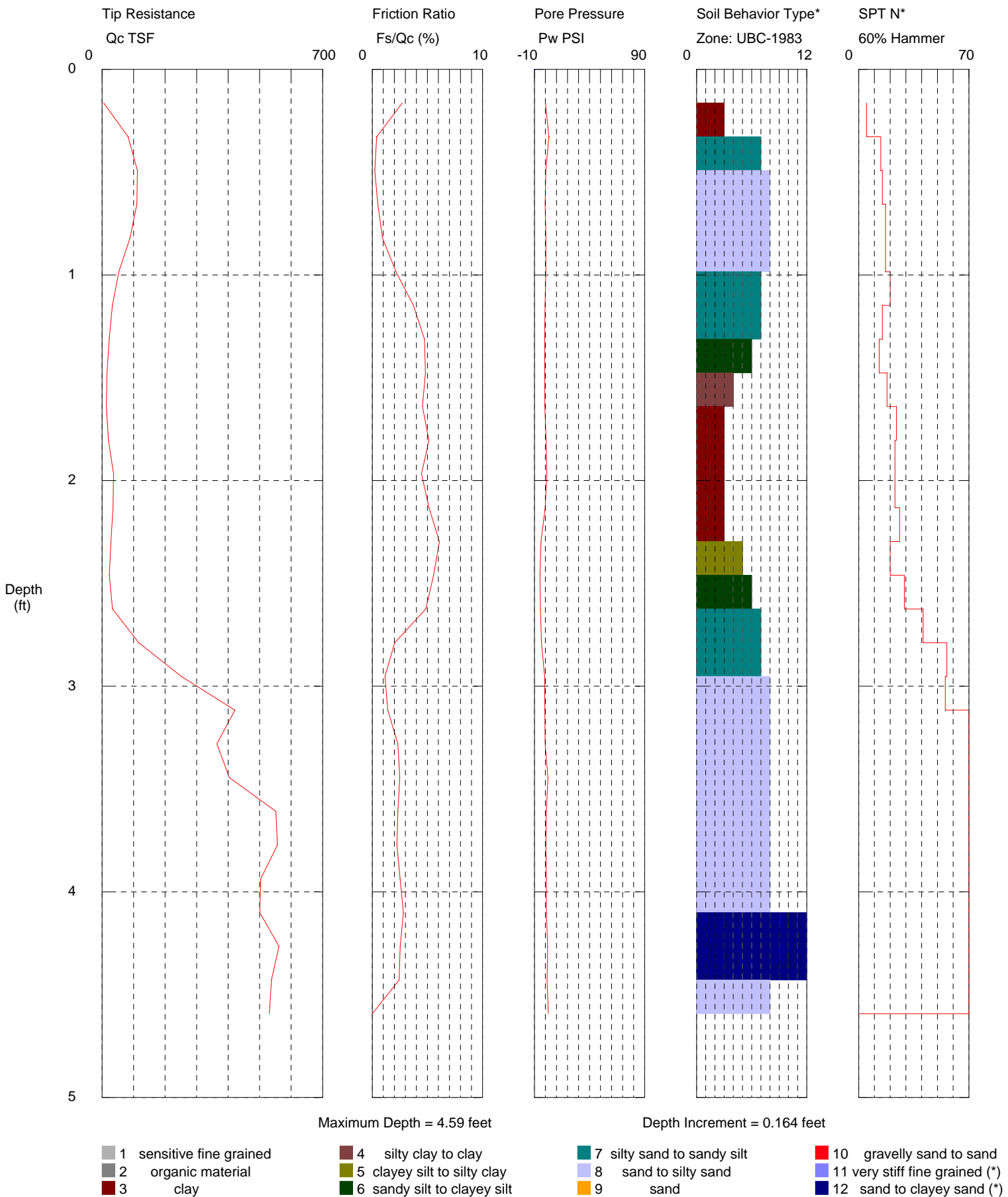


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT058A
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 12:46:52 PM
 Location: Levee
 Job Number: ENG-502

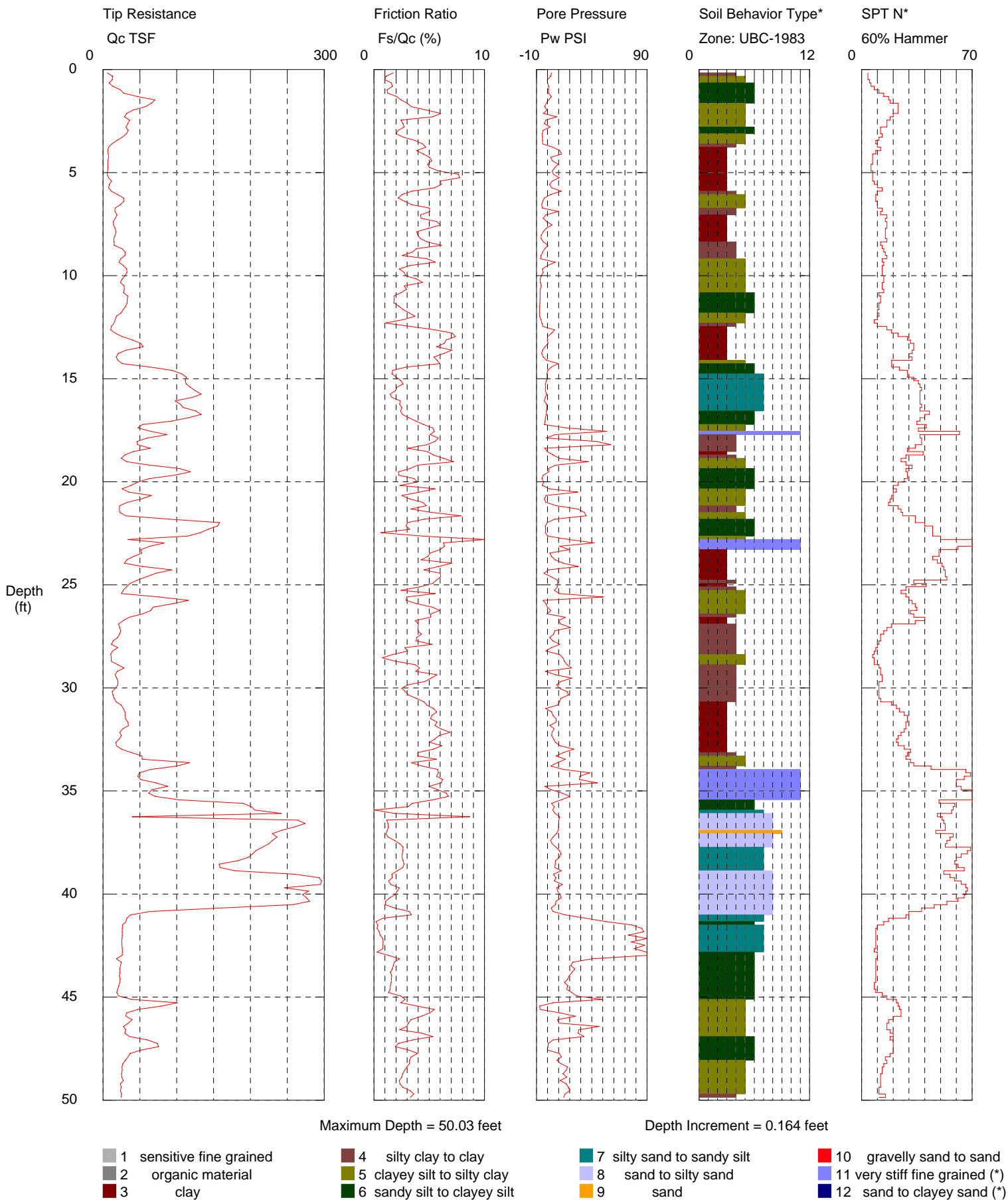


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT059
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 1:18:00 PM
 Location: Levee
 Job Number: ENG-502

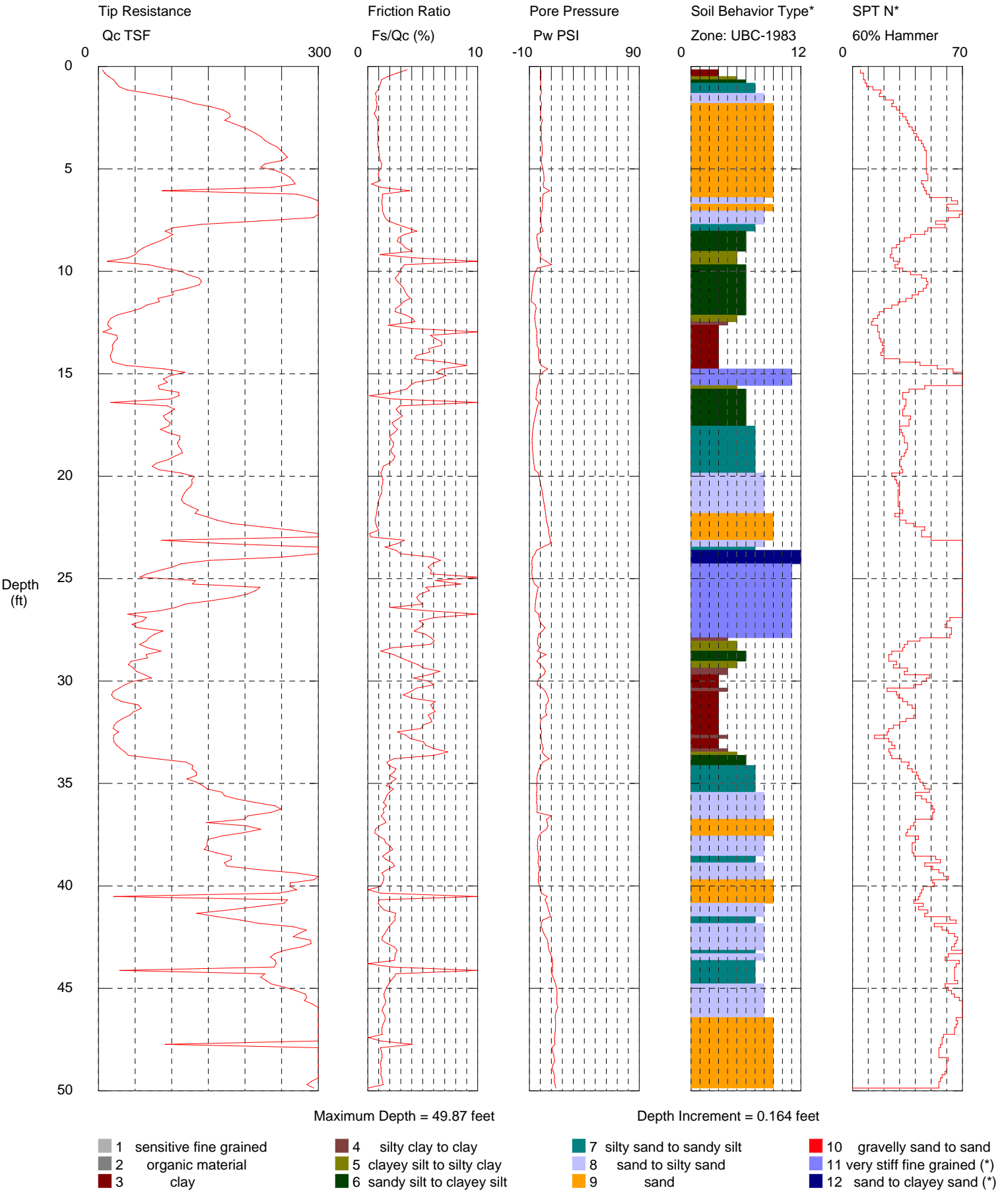


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT060
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 1:43:56 PM
 Location: Levee
 Job Number: ENG-502

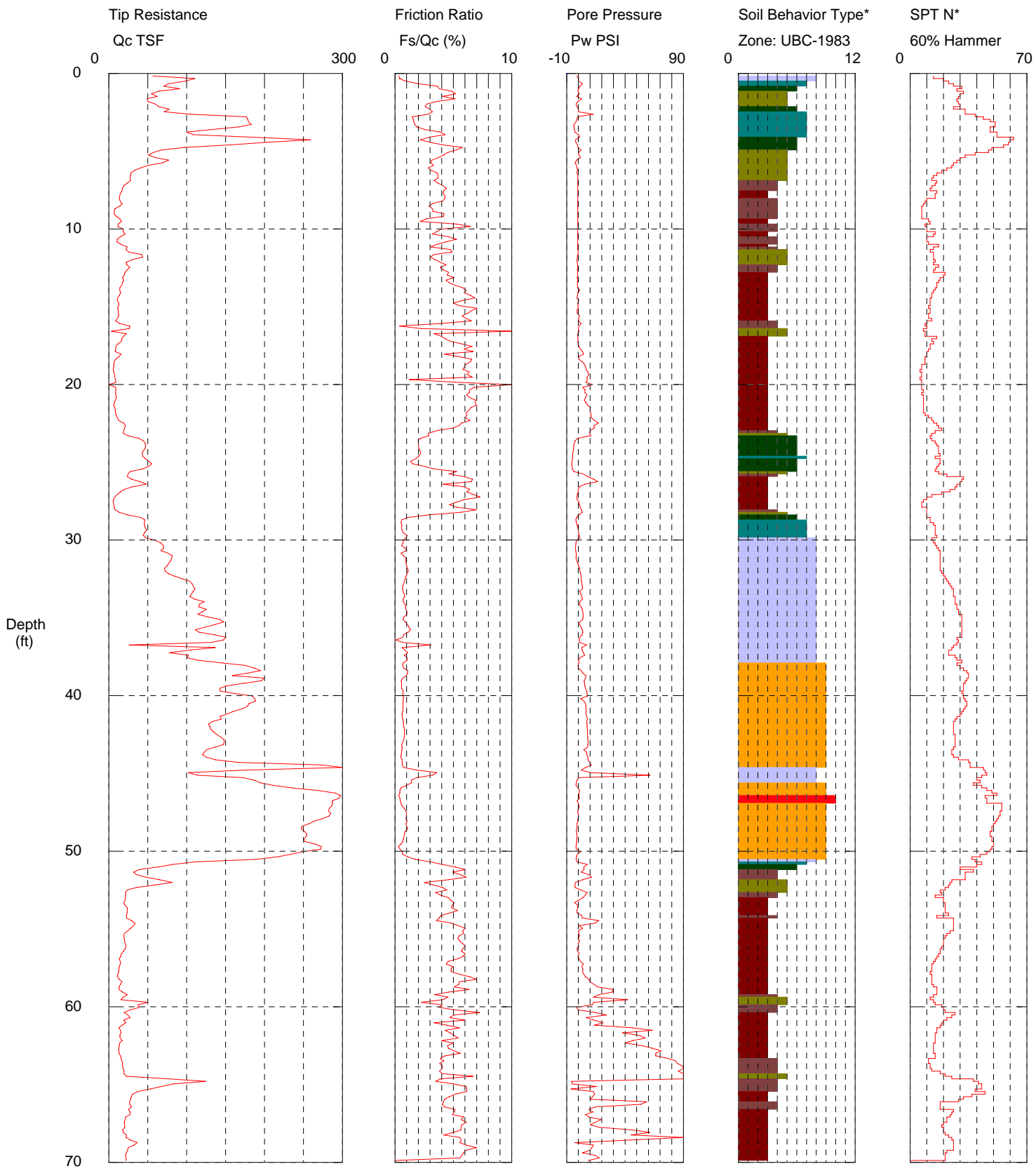


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT061
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 1:01:38 PM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 69.88 feet

Depth Increment = 0.164 feet

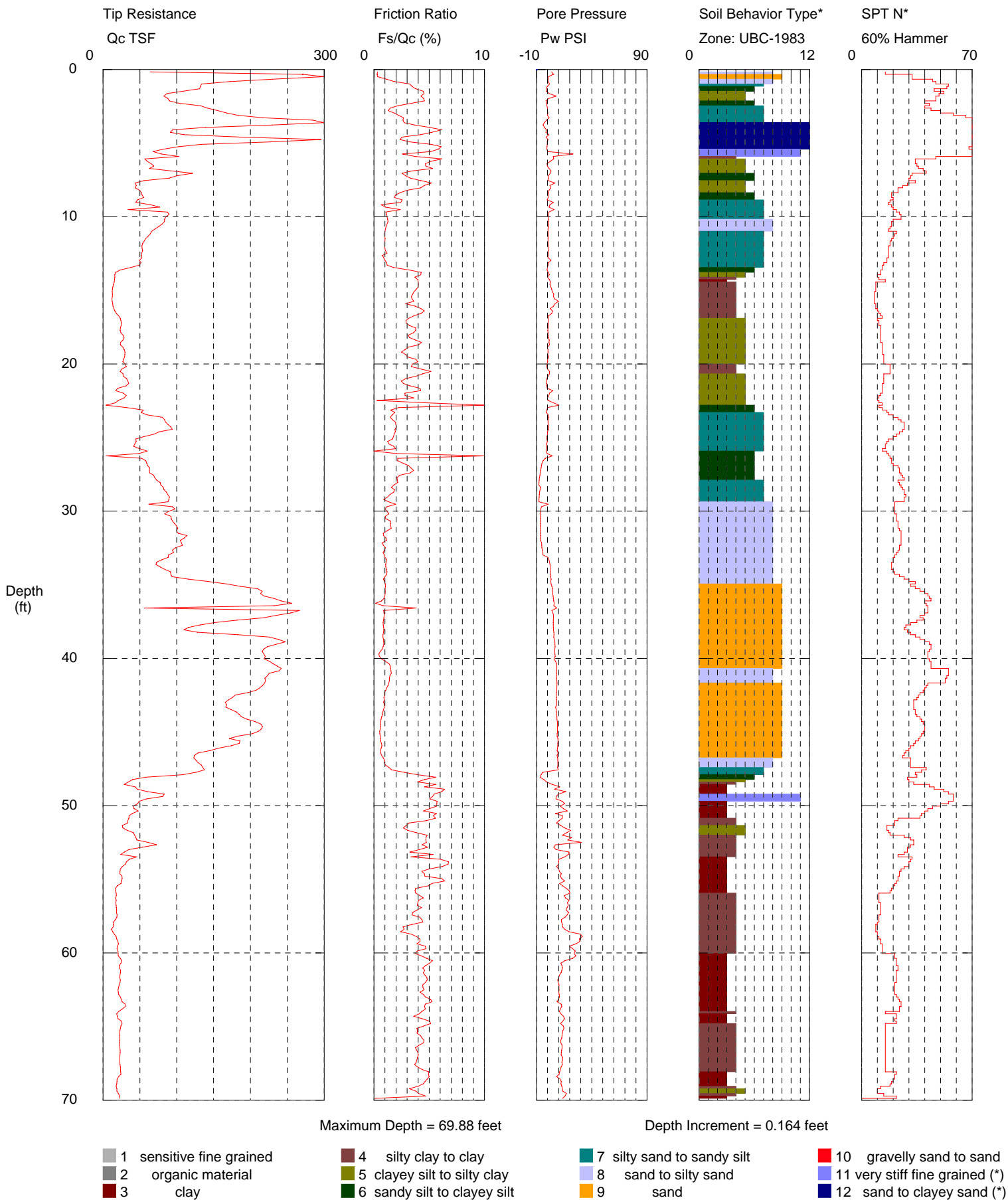
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT062
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 1:44:15 PM
 Location: Levee
 Job Number: ENG-502

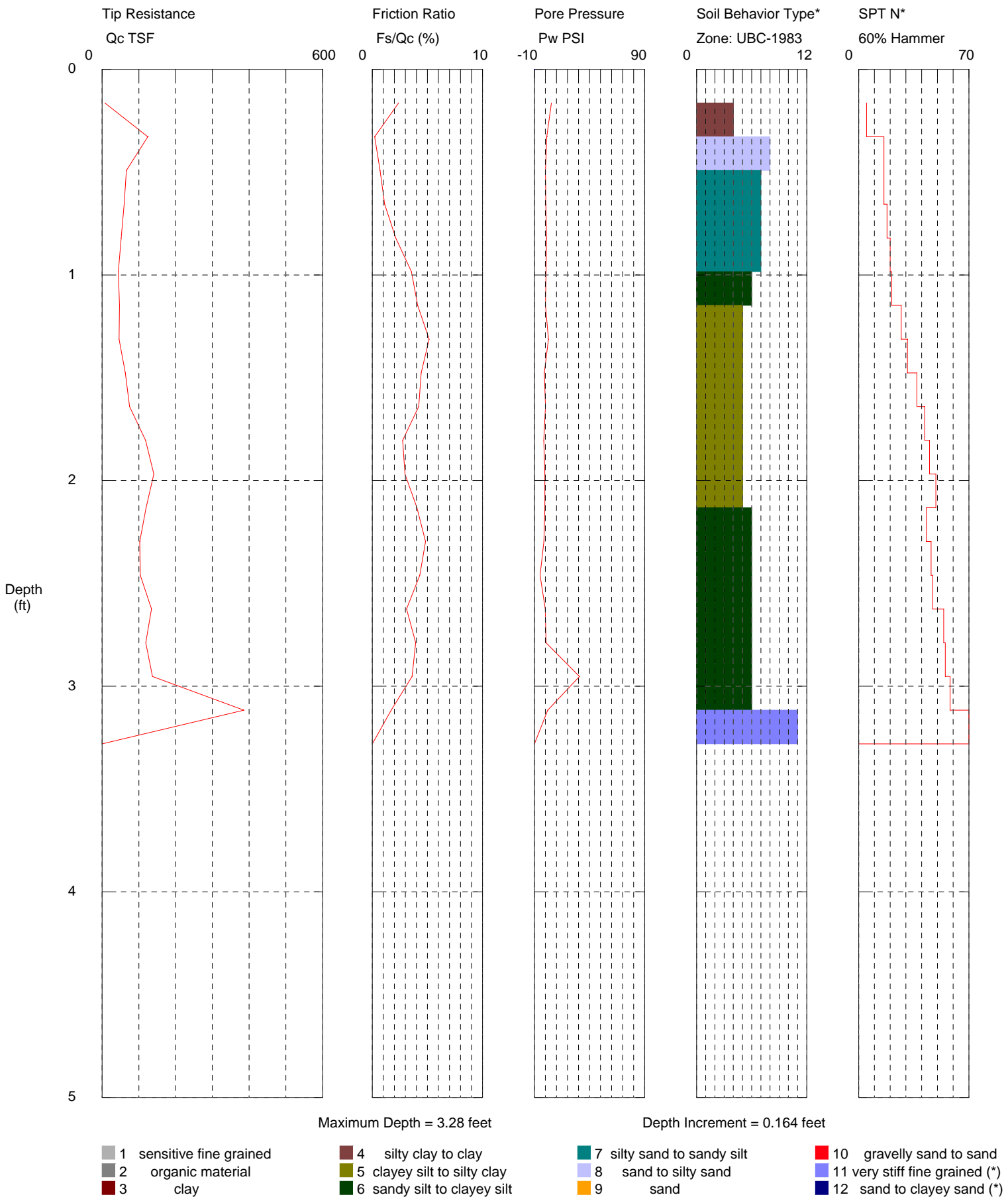


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT063
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 2:27:30 PM
 Location: Levee
 Job Number: ENG-502

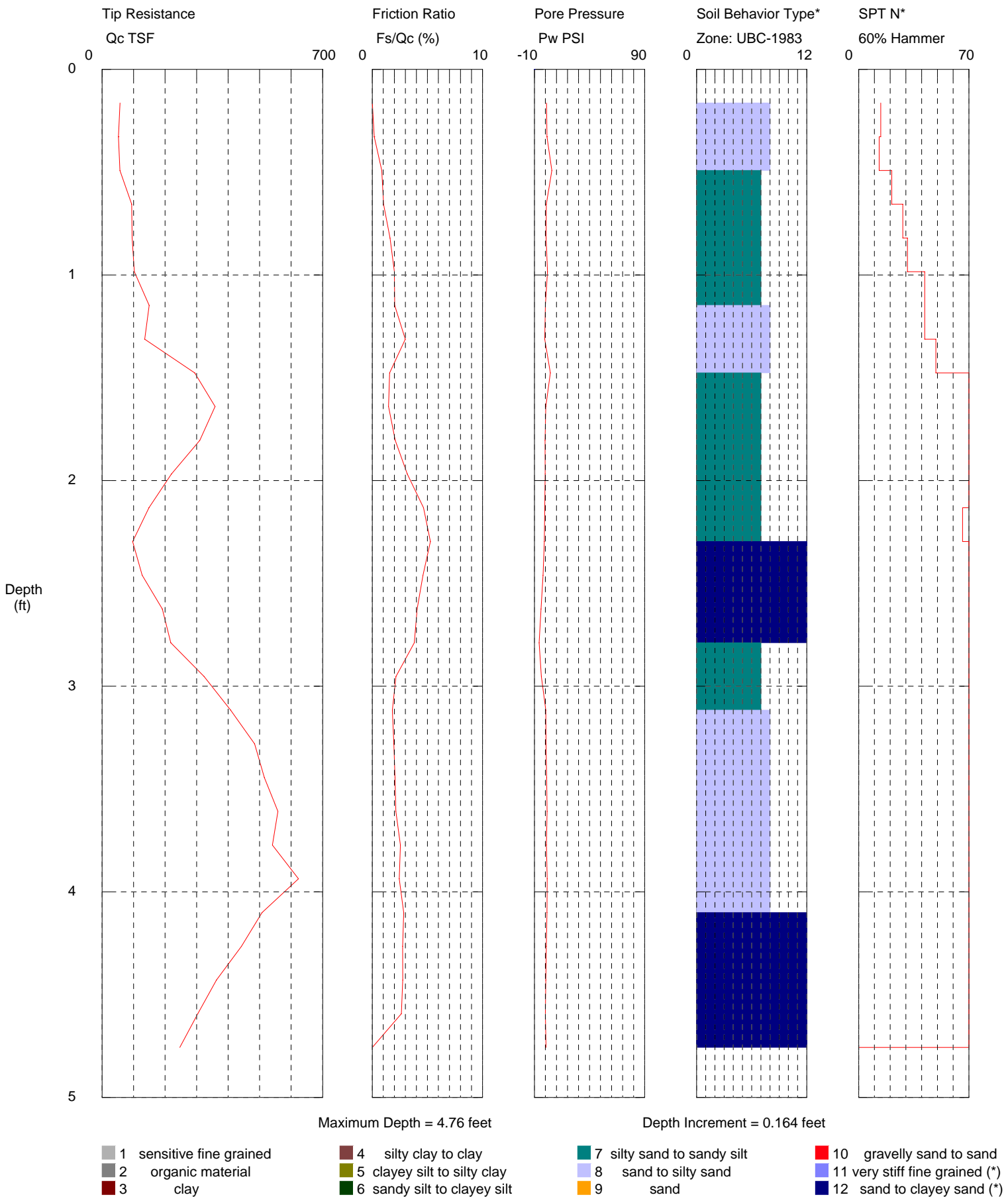


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT063A
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 2:41:45 PM
 Location: Levee
 Job Number: ENG-502

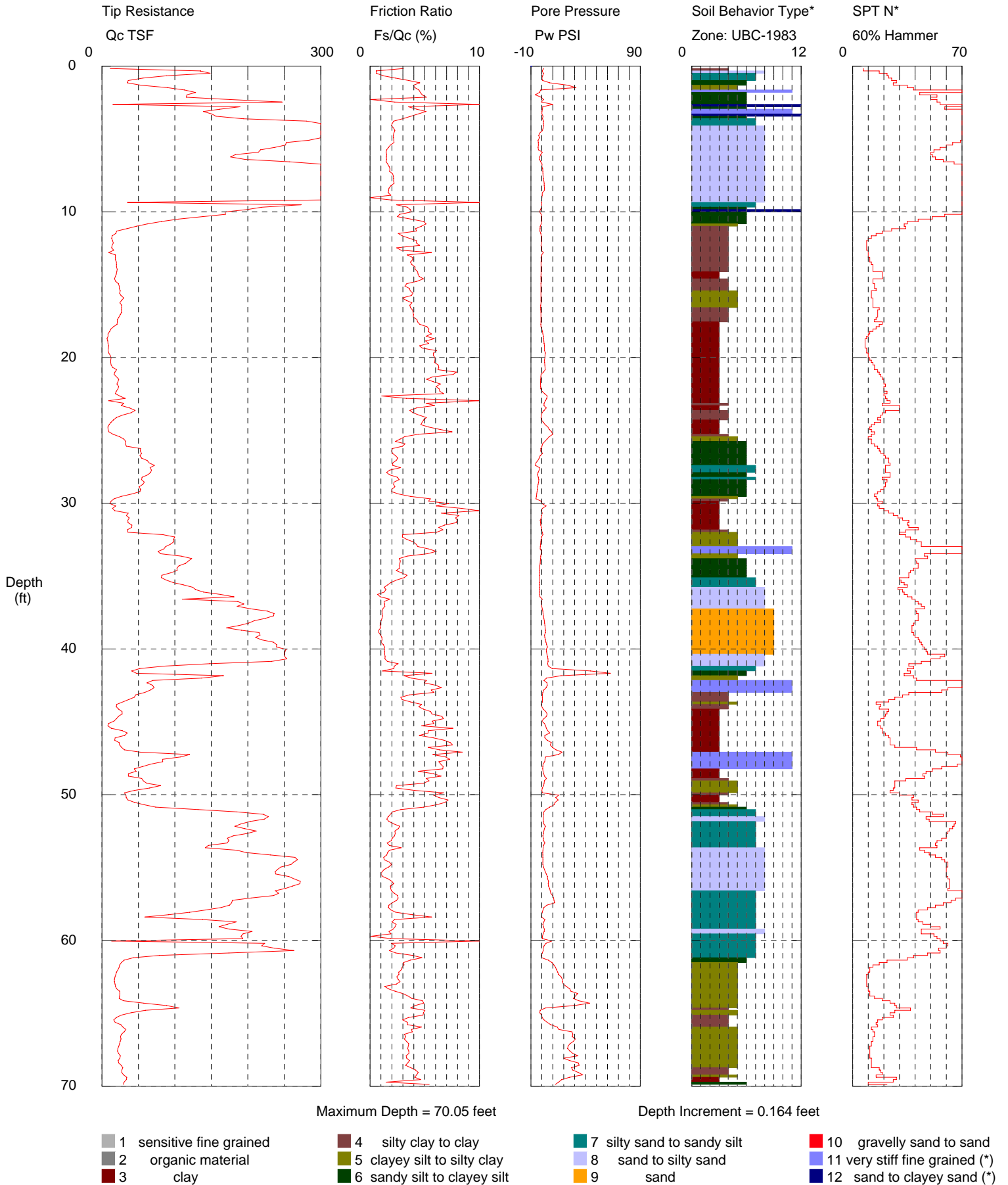


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT064
 Cone Used: DSG1111

CPT Date/Time: 12/28/2014 3:06:13 PM
 Location: Levee
 Job Number: ENG-502

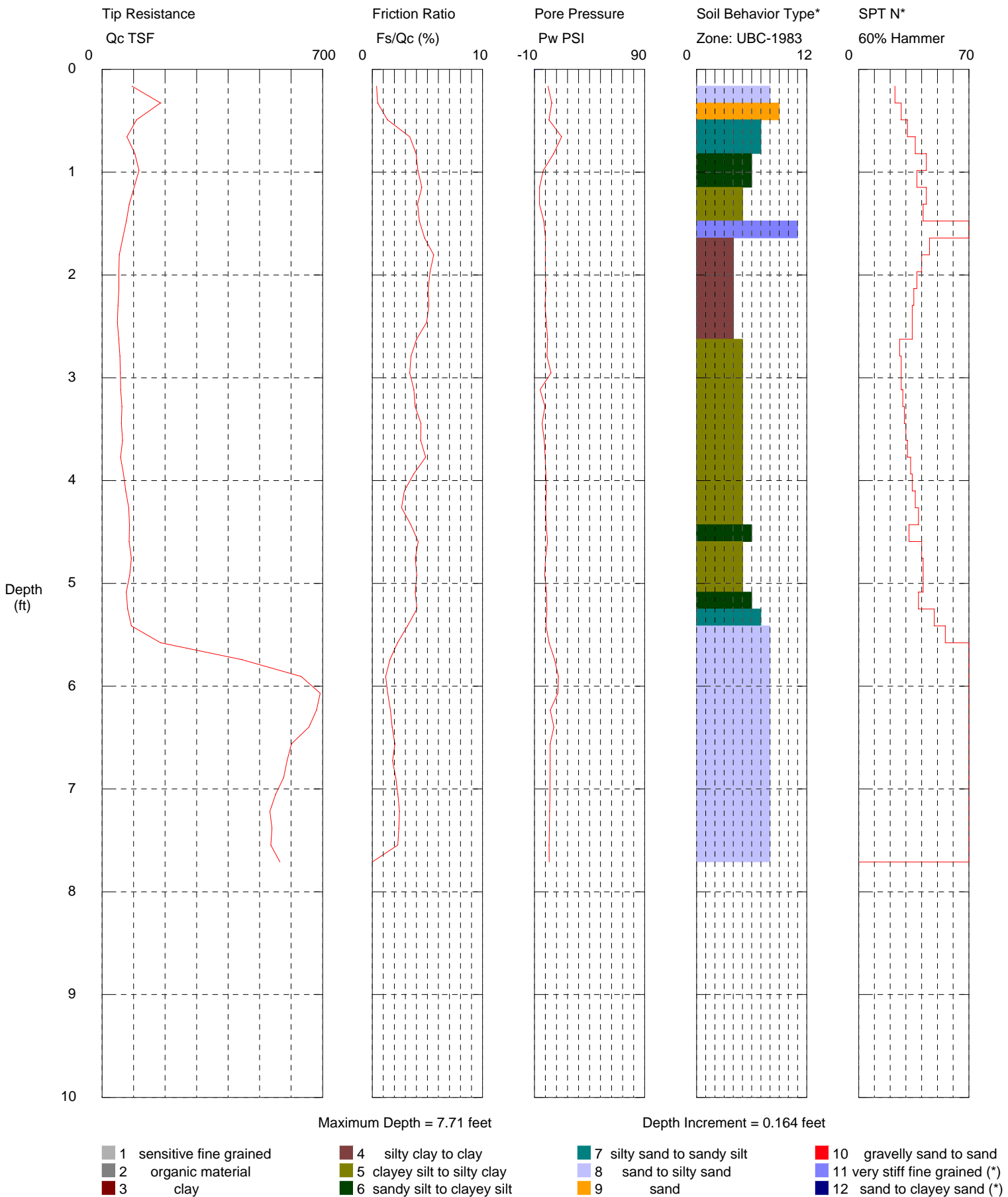


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT065
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 7:23:20 AM
 Location: Levee
 Job Number: ENG-502

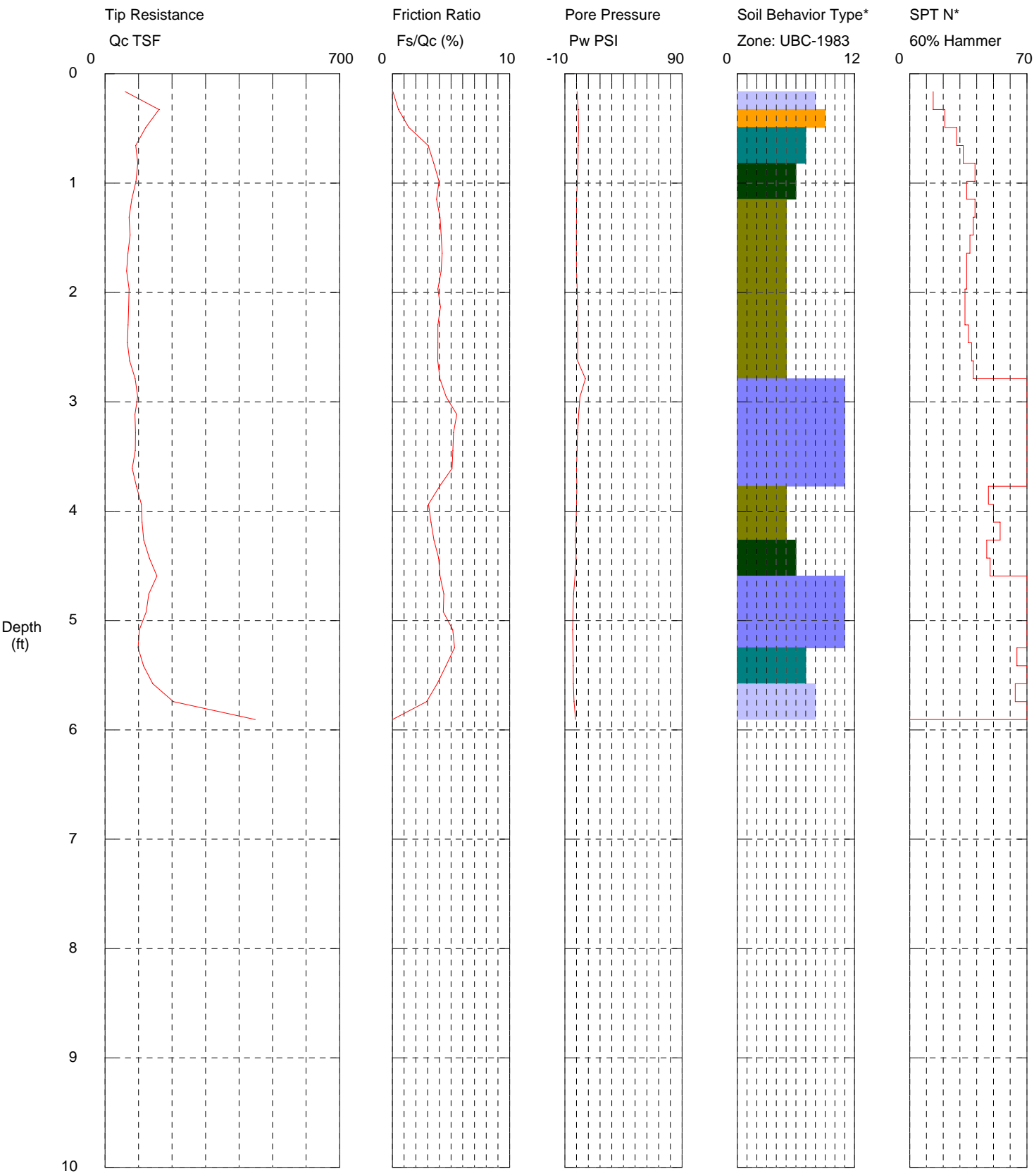


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT065A
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 7:40:10 AM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 5.91 feet

Depth Increment = 0.164 feet

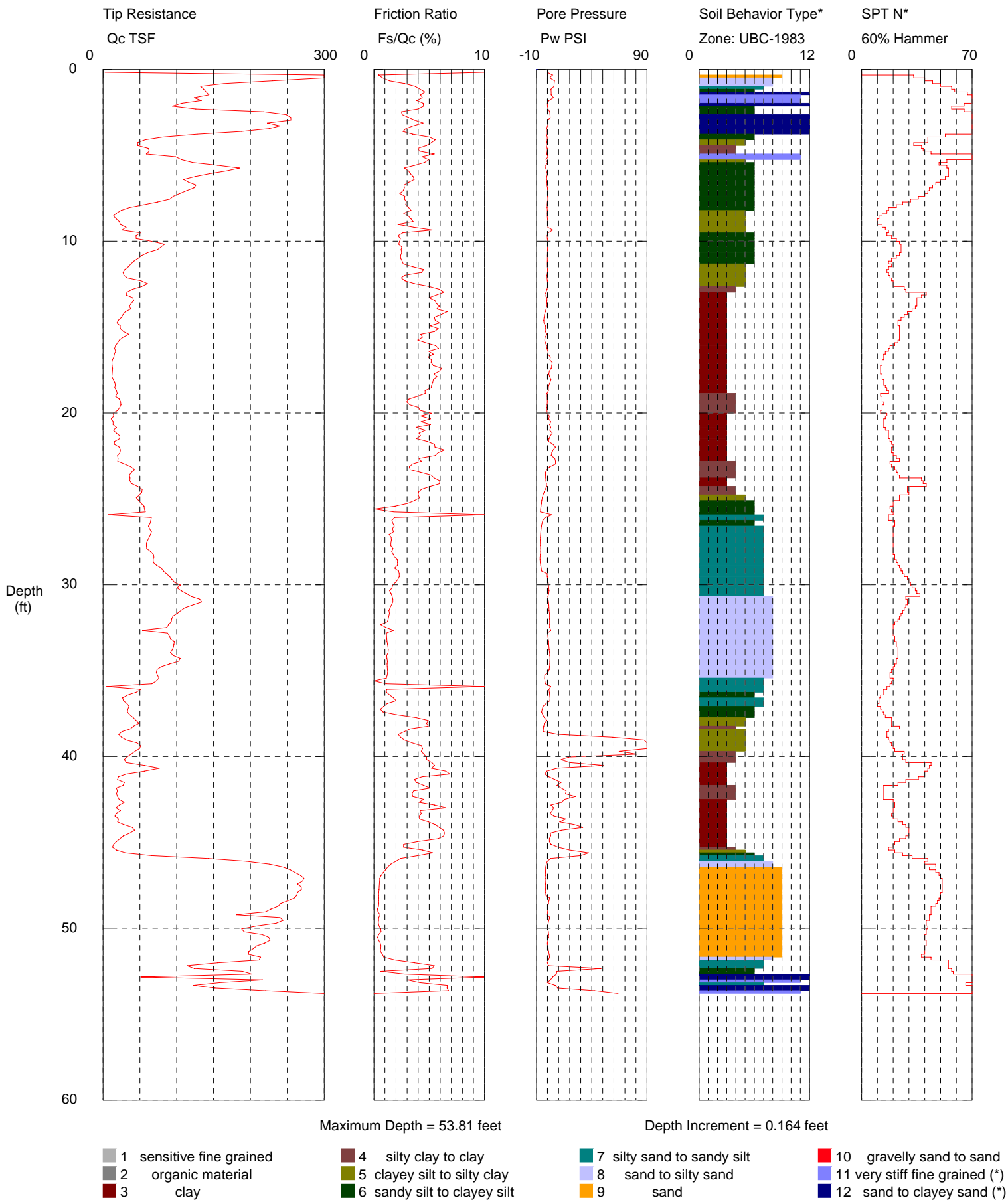
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT066
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 7:57:16 AM
 Location: Levee
 Job Number: ENG-502

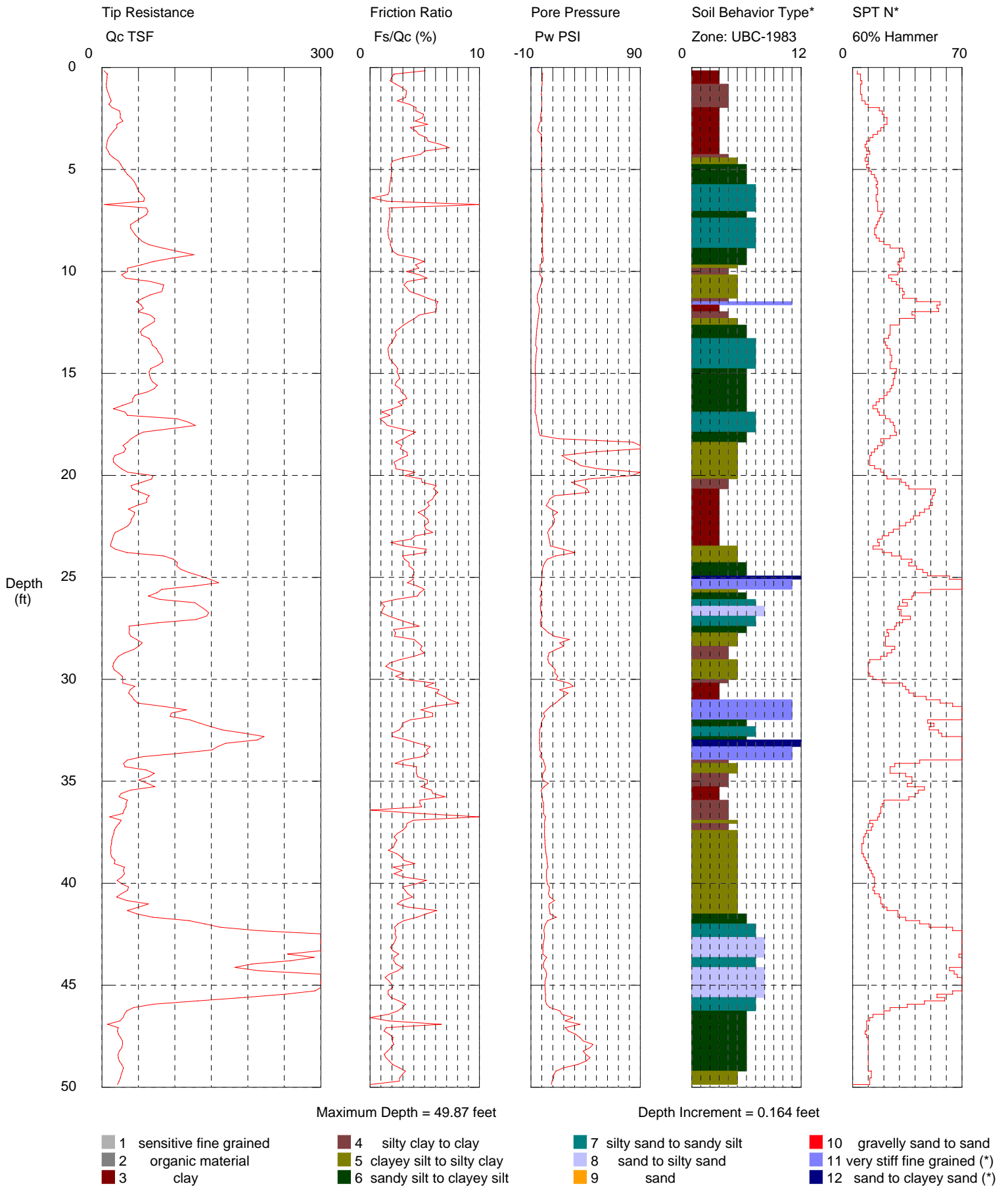


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT067
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 10:50:18 AM
 Location: Levee
 Job Number: ENG-502

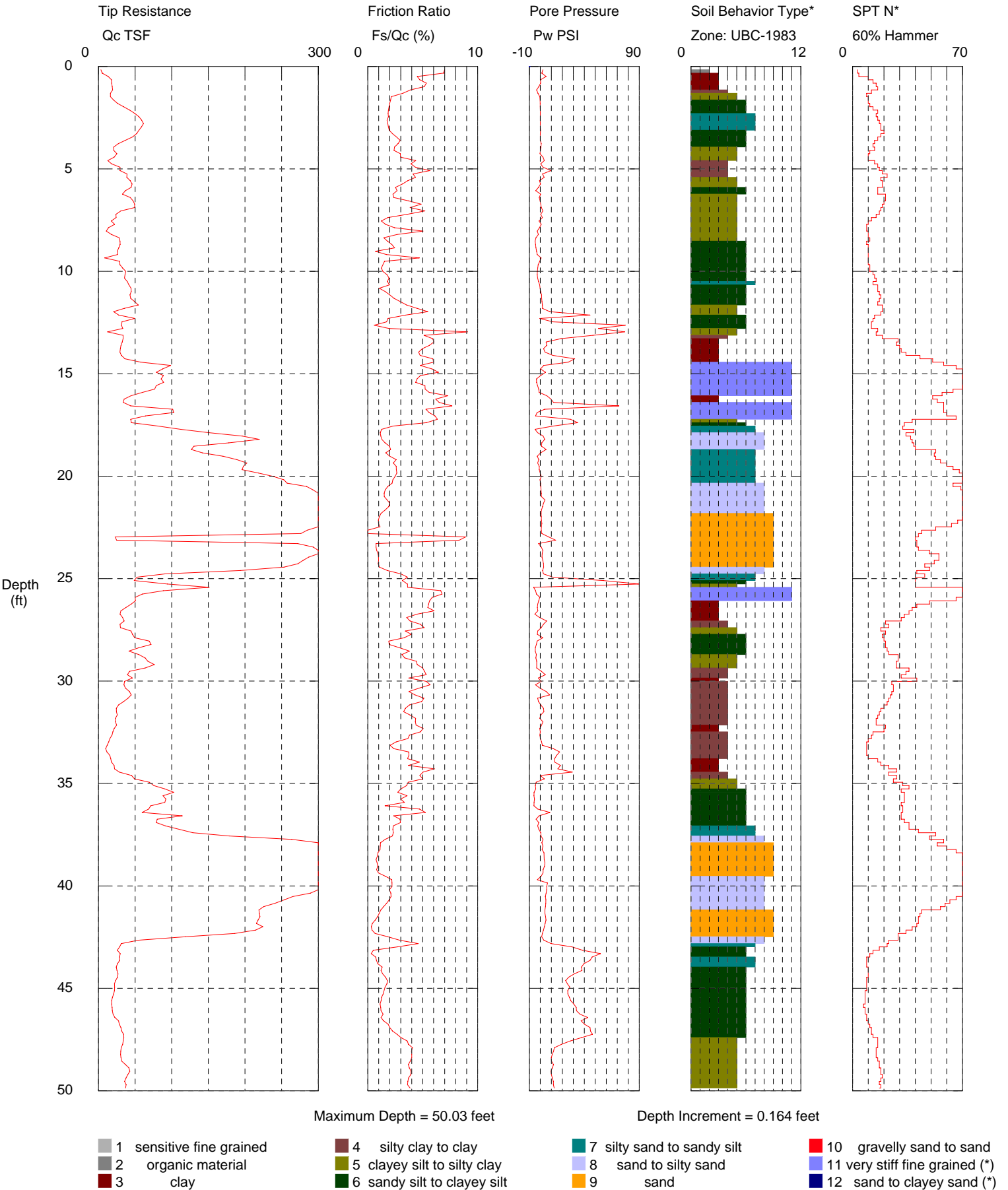


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT068
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 11:36:54 AM
 Location: Levee
 Job Number: ENG-502

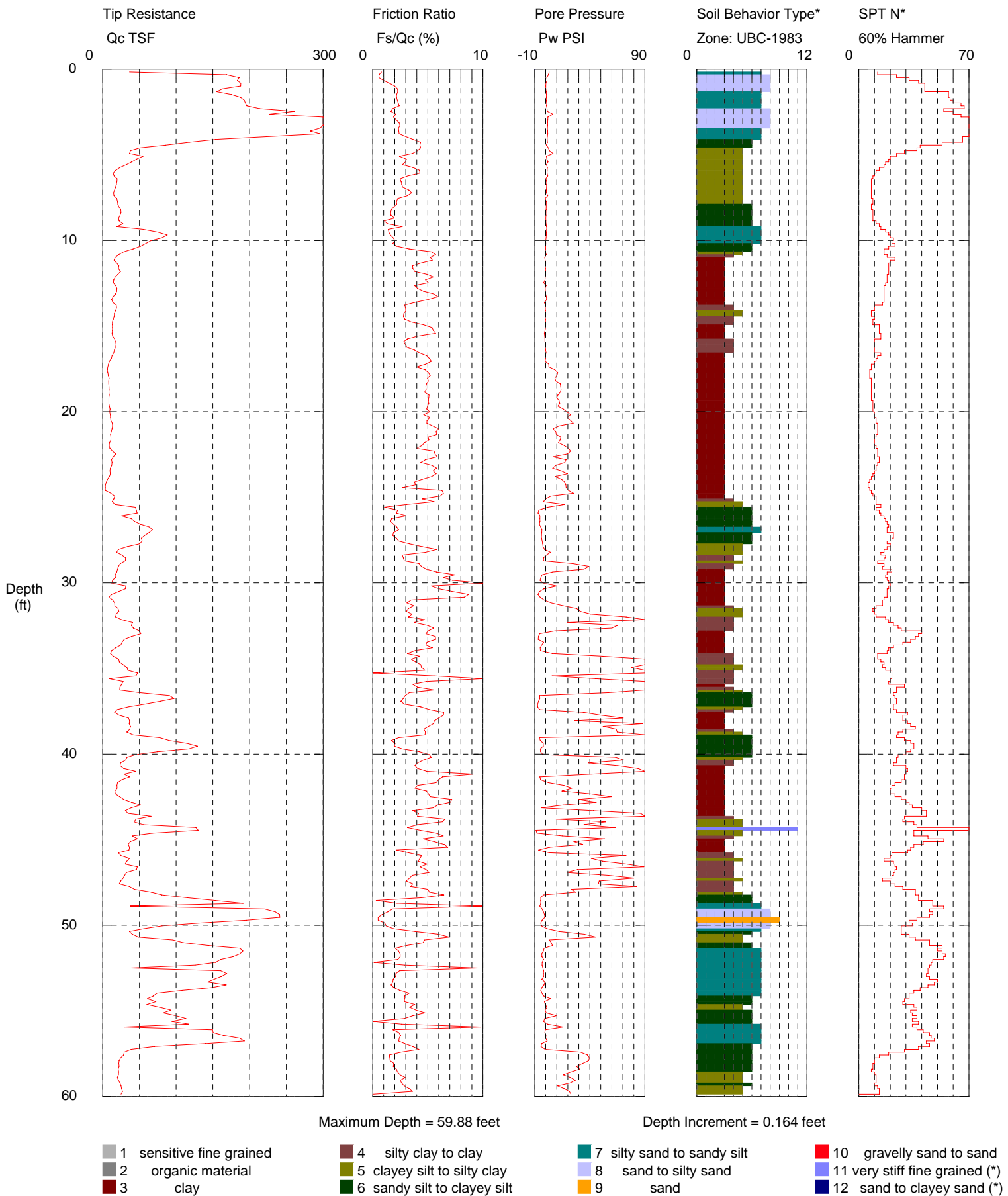


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT069
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 8:35:12 AM
 Location: Levee
 Job Number: ENG-502

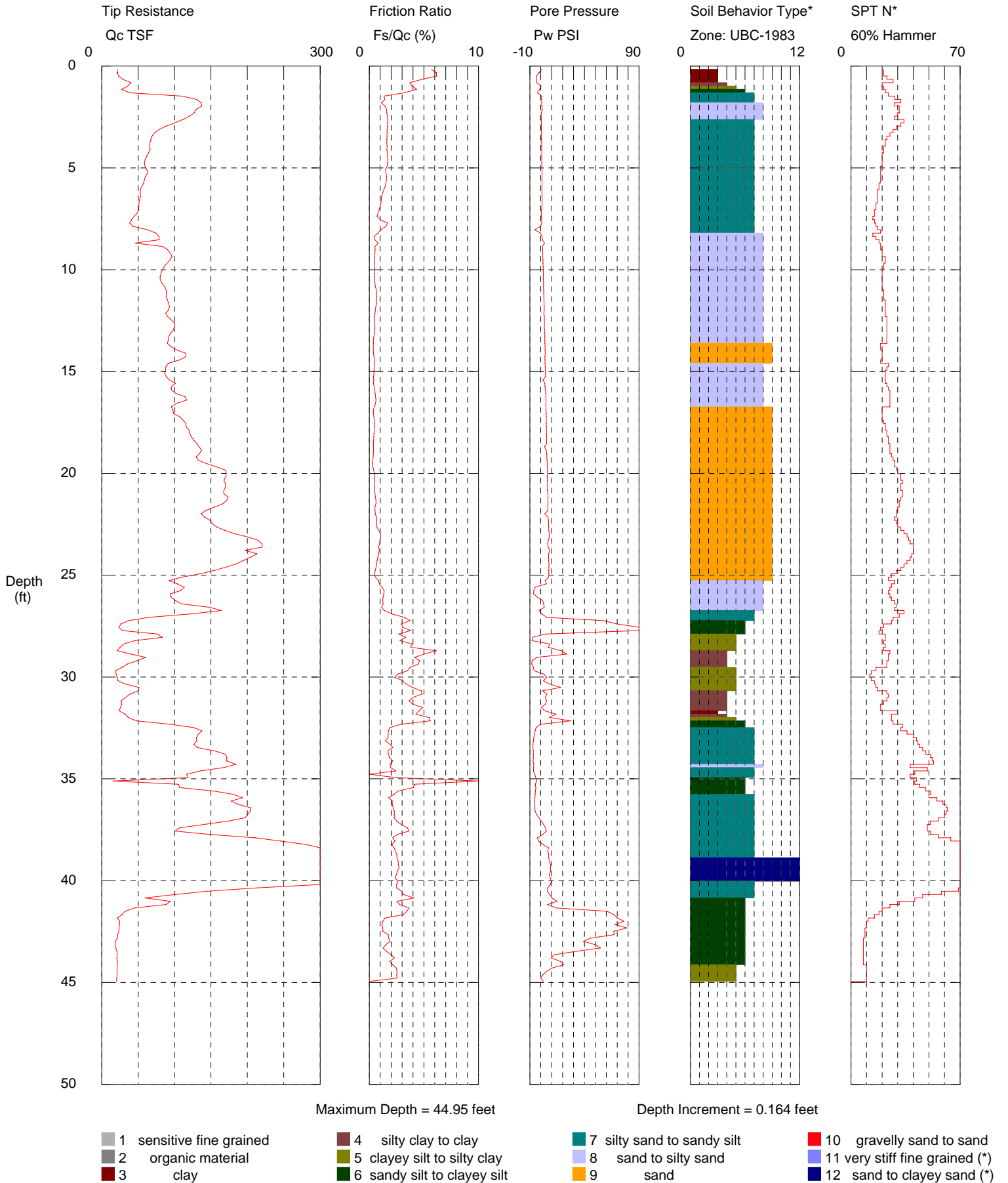


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT070
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 9:40:03 AM
 Location: Levee
 Job Number: ENG-502

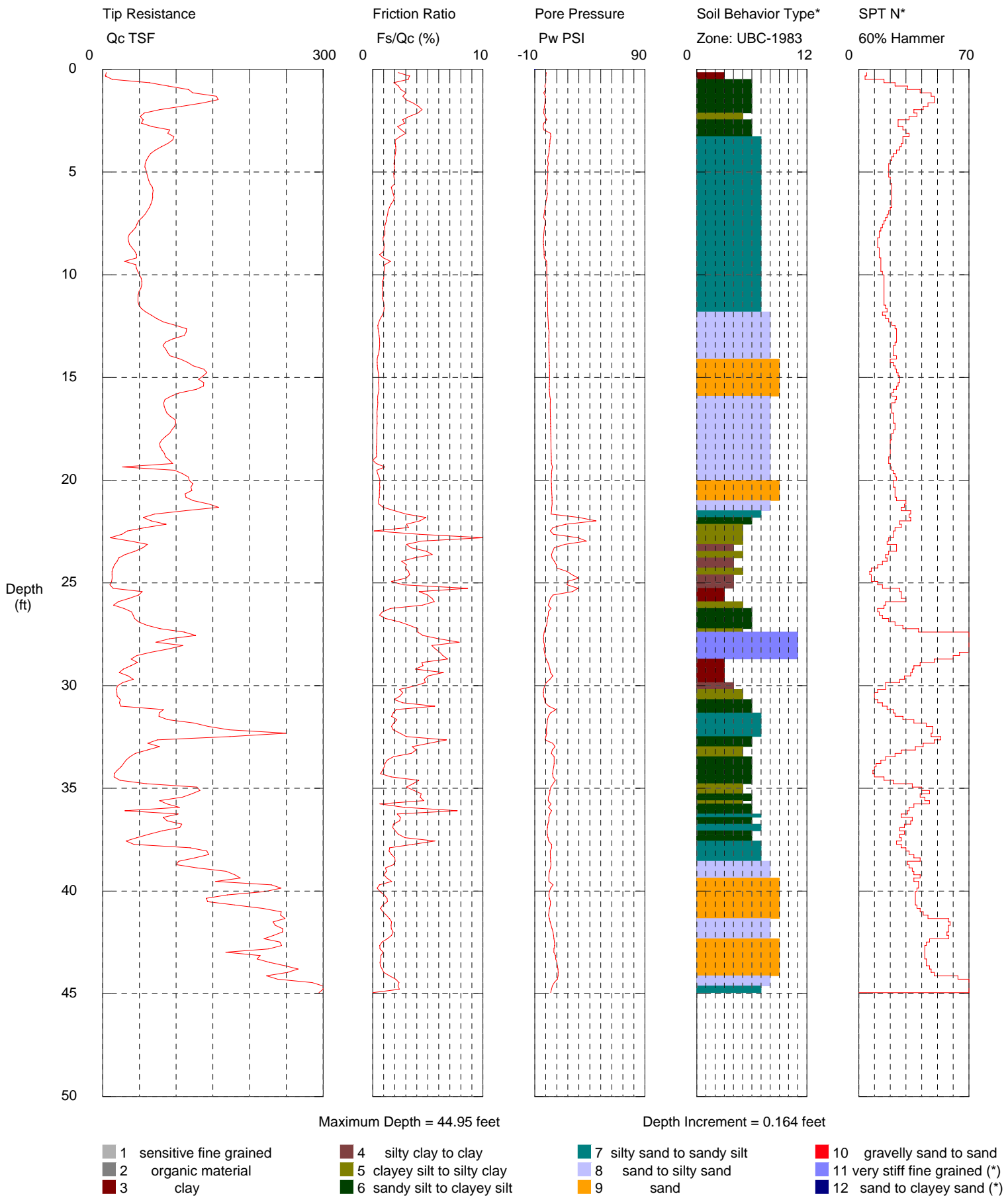


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT071
 Cone Used: DSG1111

CPT Date/Time: 12/29/2014 10:06:49 AM
 Location: Levee
 Job Number: ENG-502

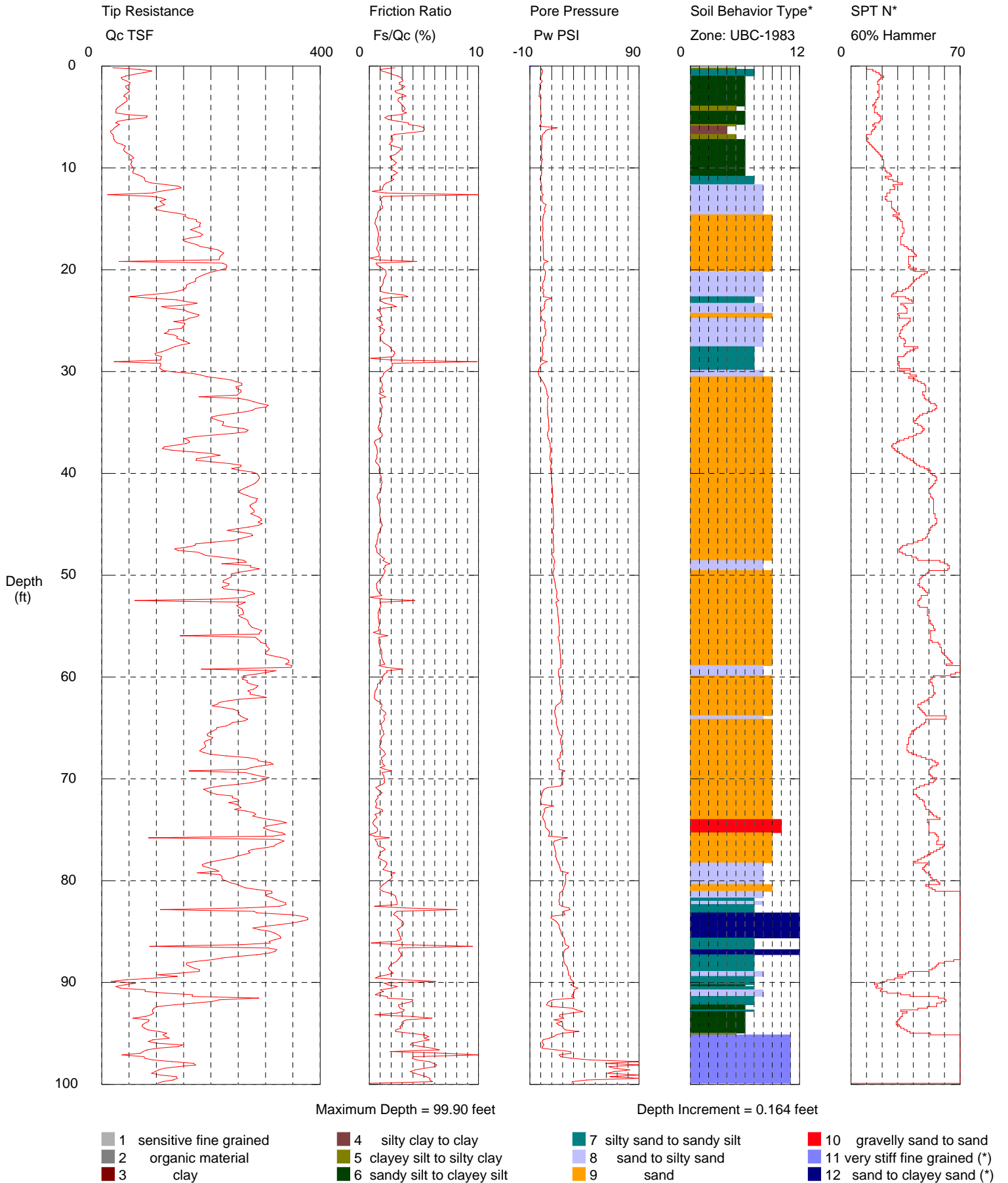


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT072
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 11:10:56 AM
 Location: Levee
 Job Number: ENG-502

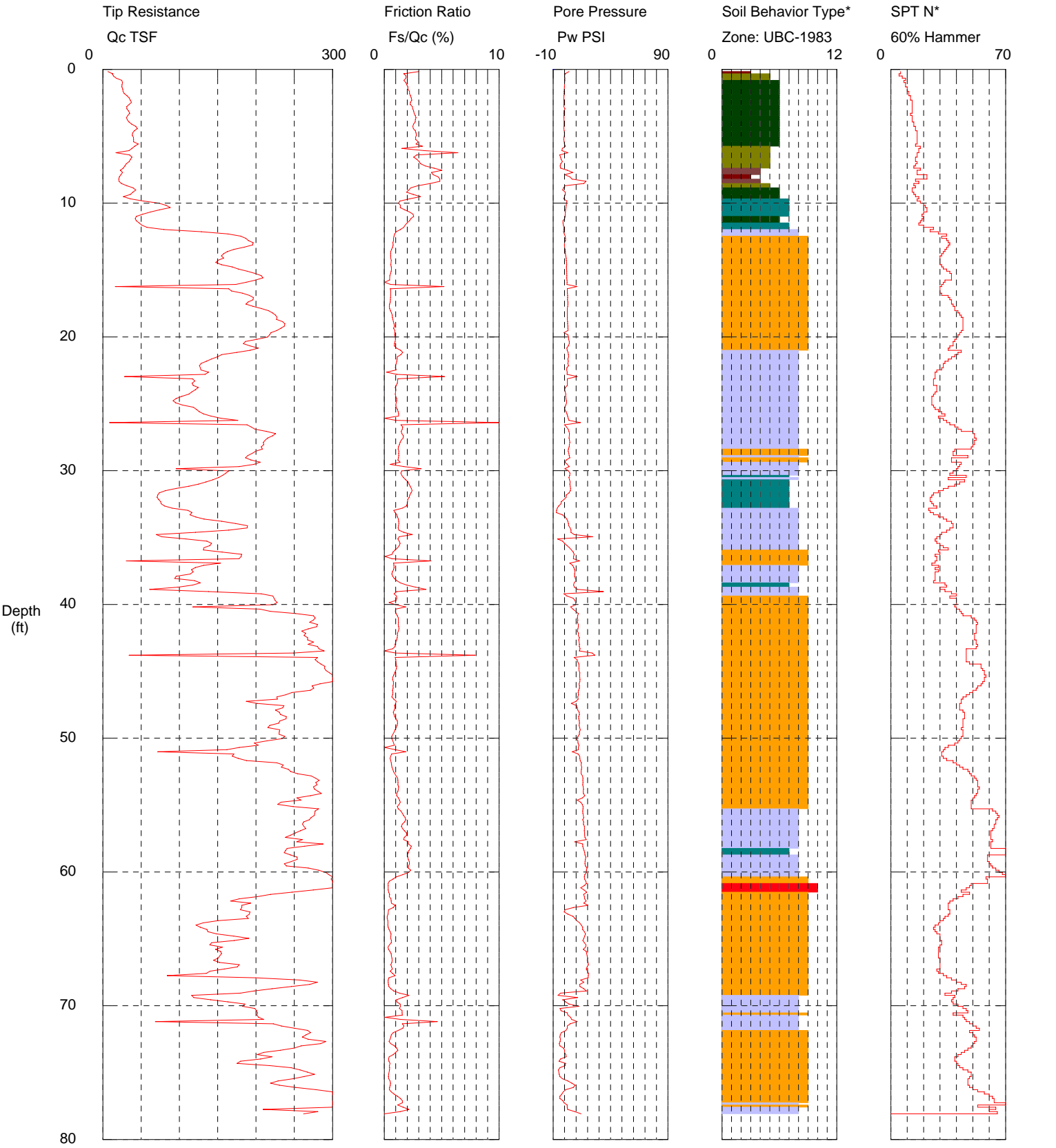


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT073
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 12:22:50 PM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 78.08 feet

Depth Increment = 0.164 feet

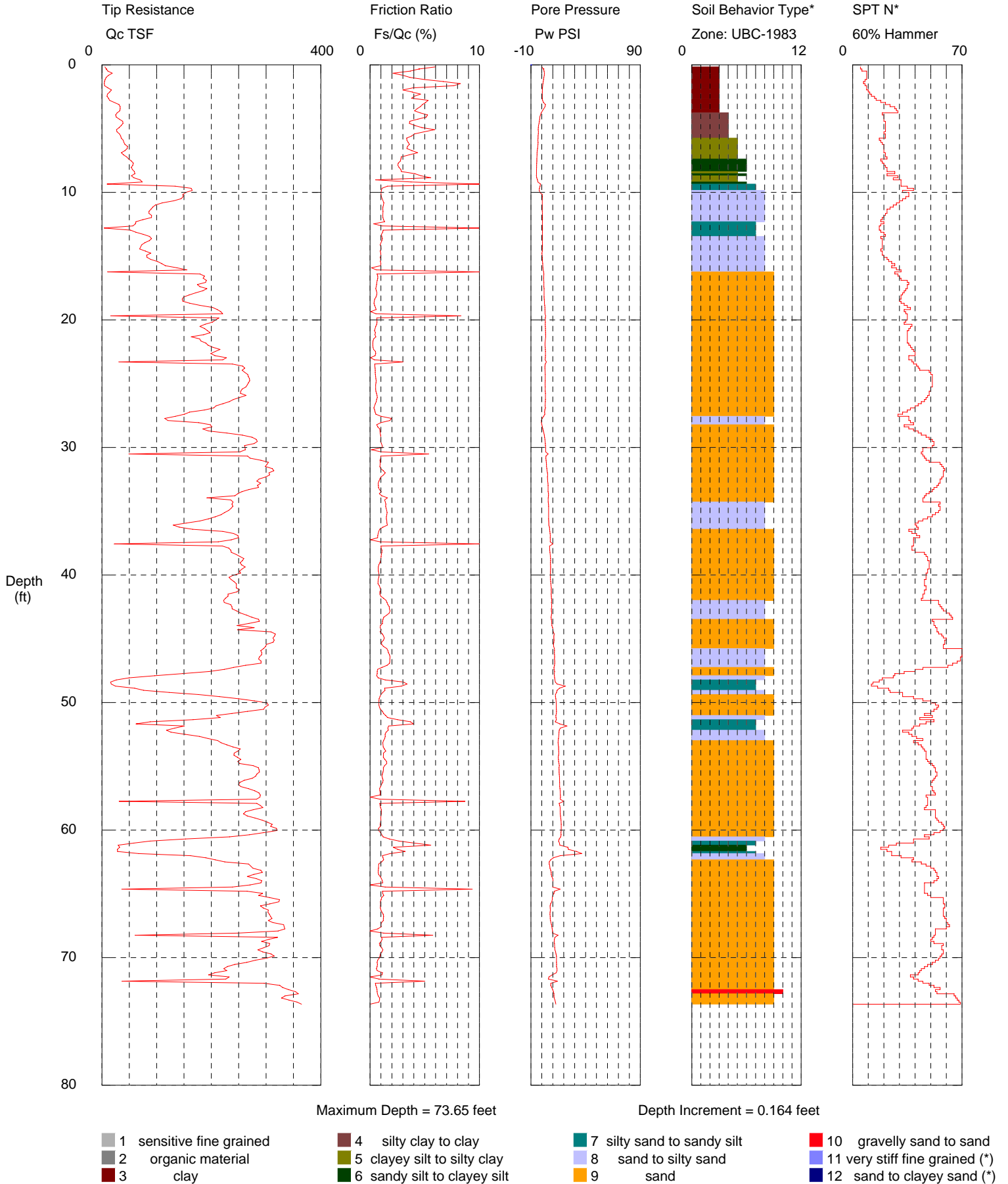
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT074
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 10:18:41 AM
 Location: Levee
 Job Number: ENG-502

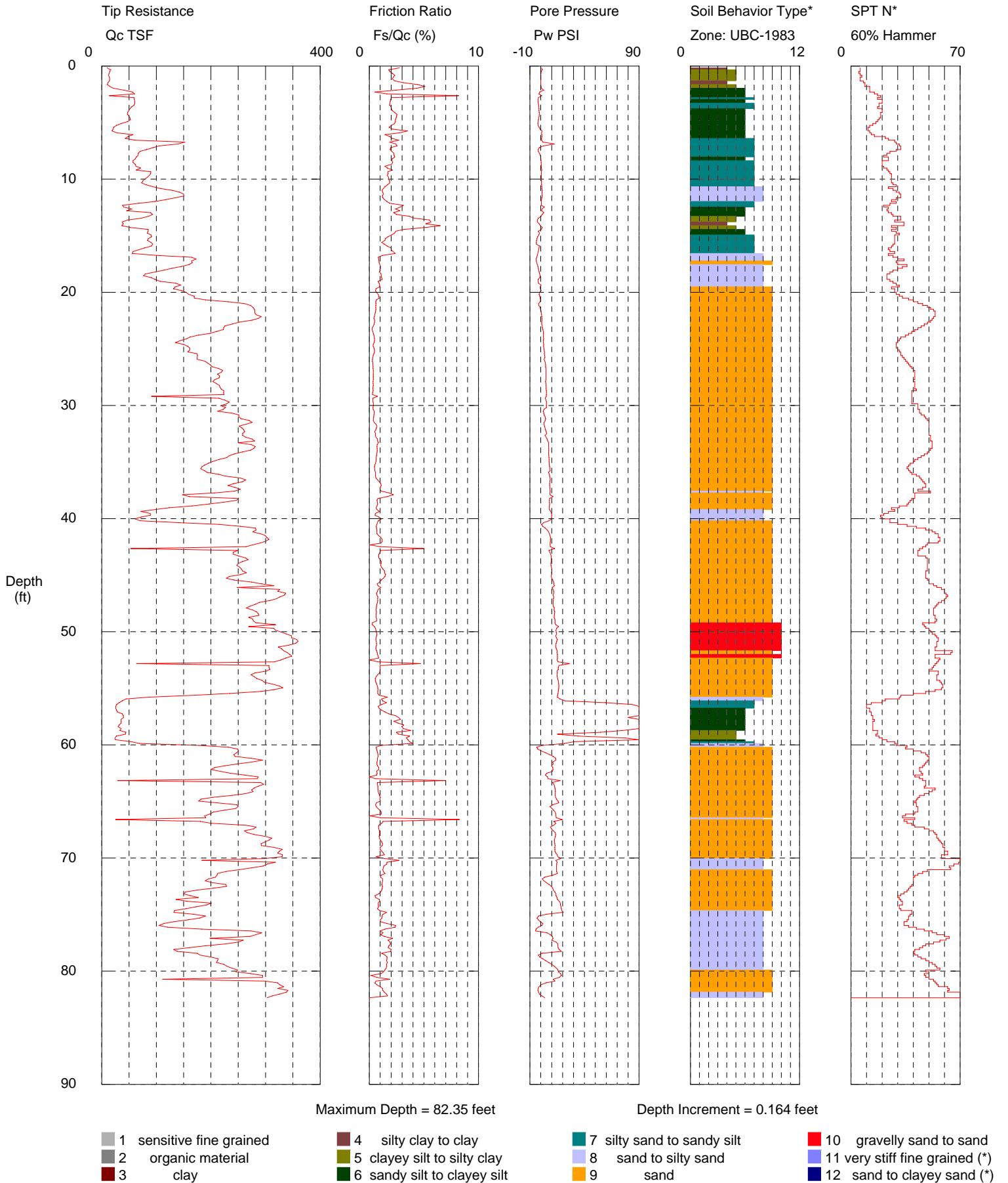


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT075A
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 1:34:50 PM
 Location: Levee
 Job Number: ENG-502

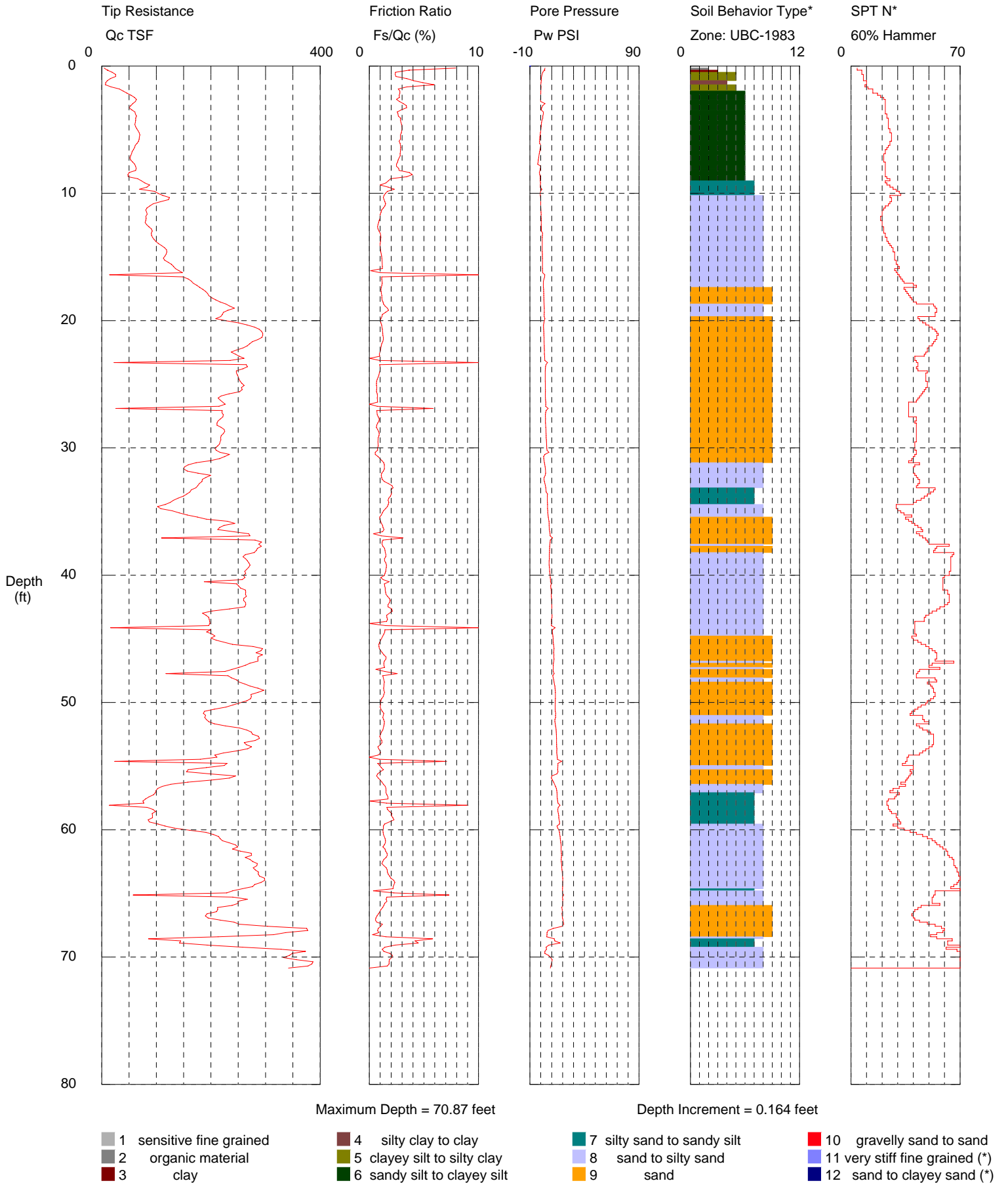


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT076
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 9:35:04 AM
 Location: Levee
 Job Number: ENG-502

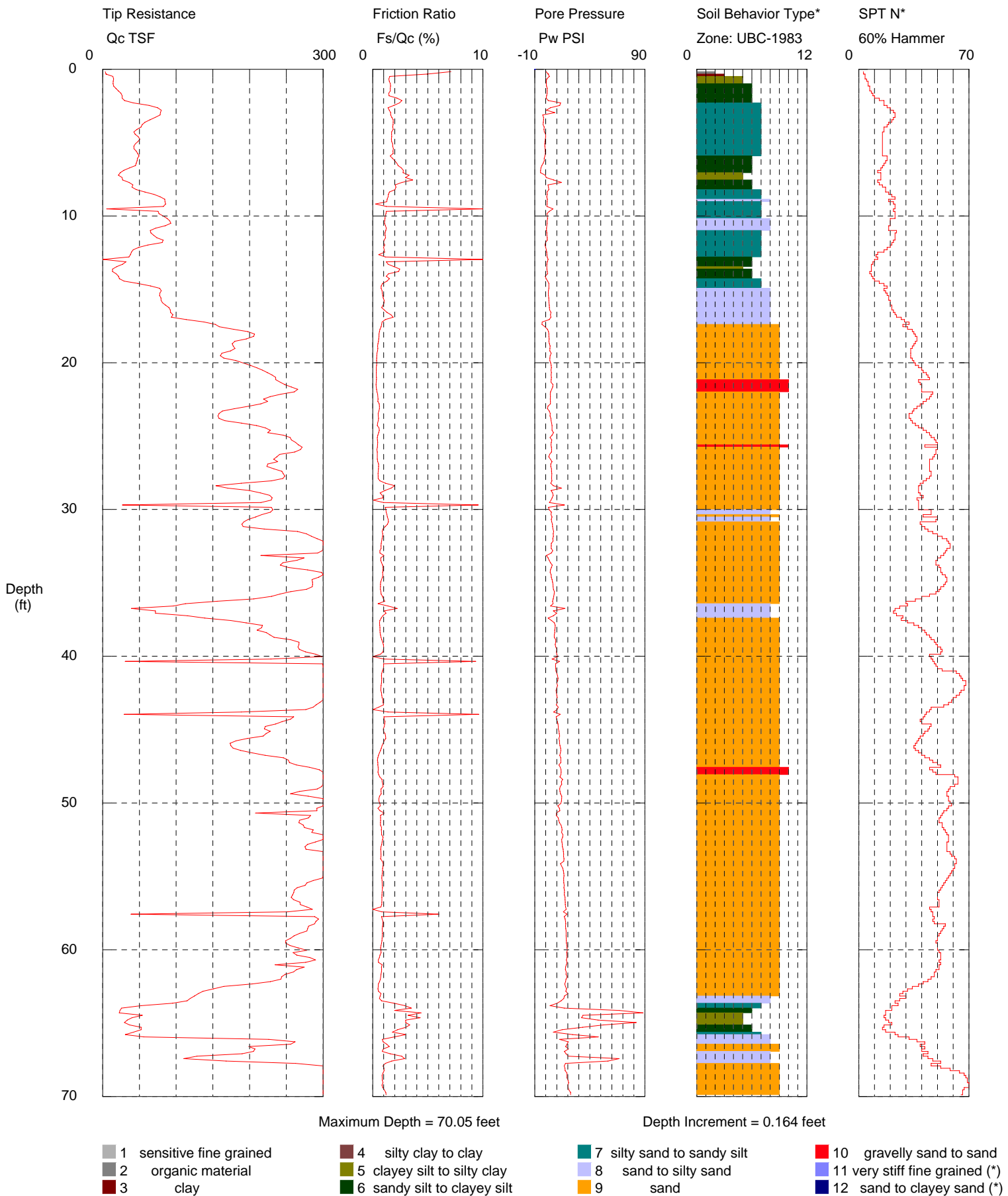


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT077
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 2:31:15 PM
 Location: Levee
 Job Number: ENG-502

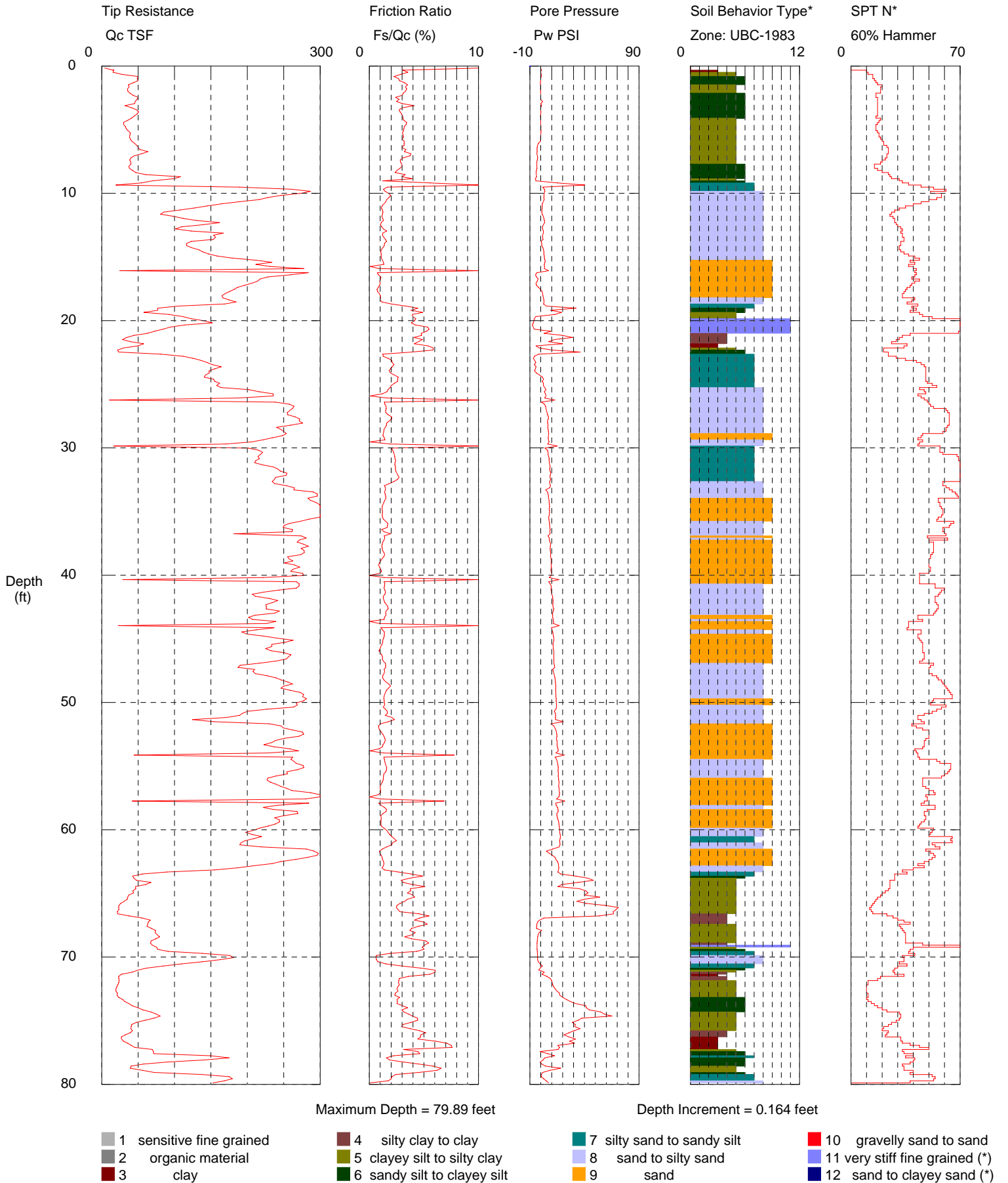


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT078
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 8:44:01 AM
 Location: Levee
 Job Number: ENG-502

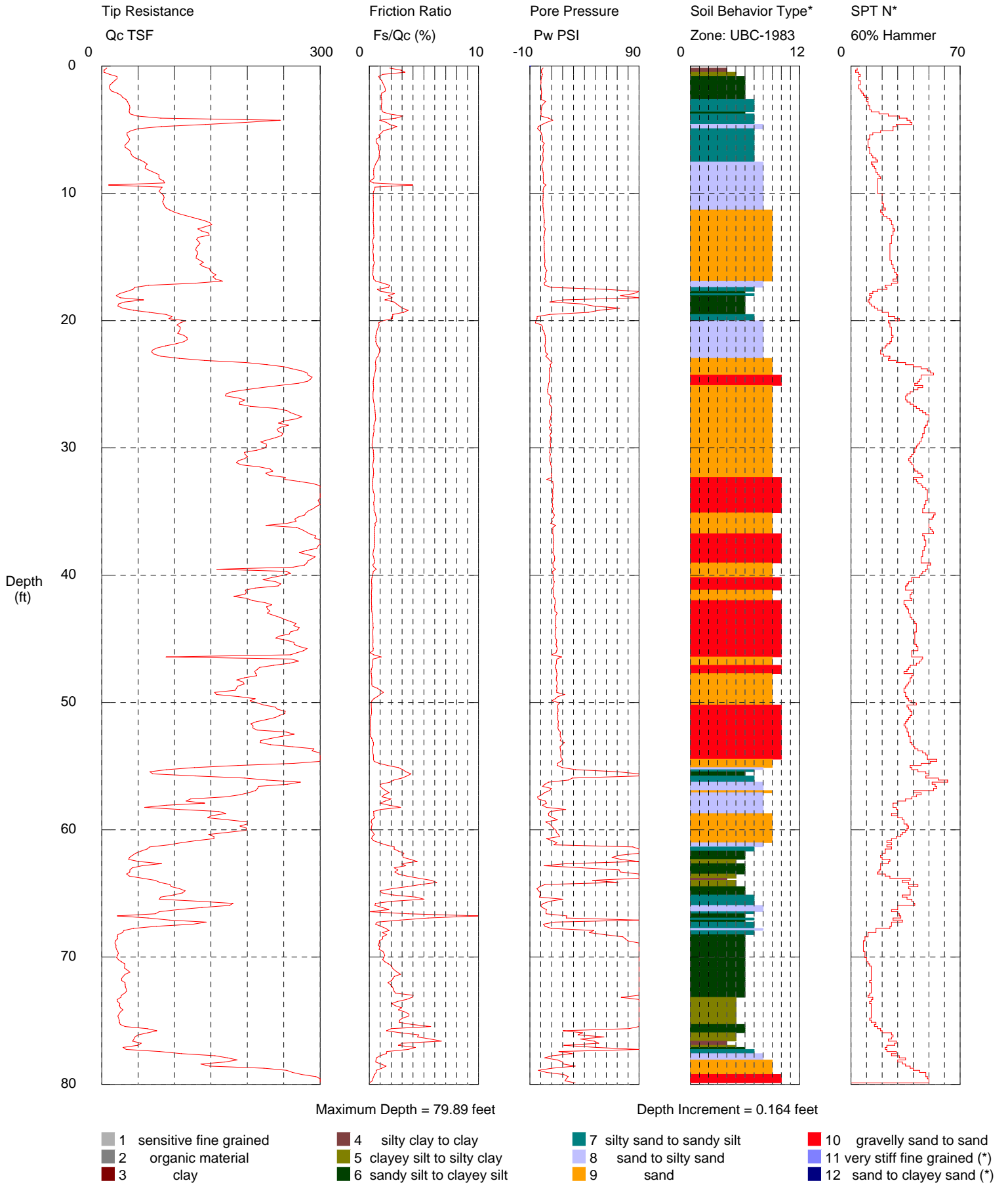


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT079
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 7:19:07 AM
 Location: Levee
 Job Number: ENG-502

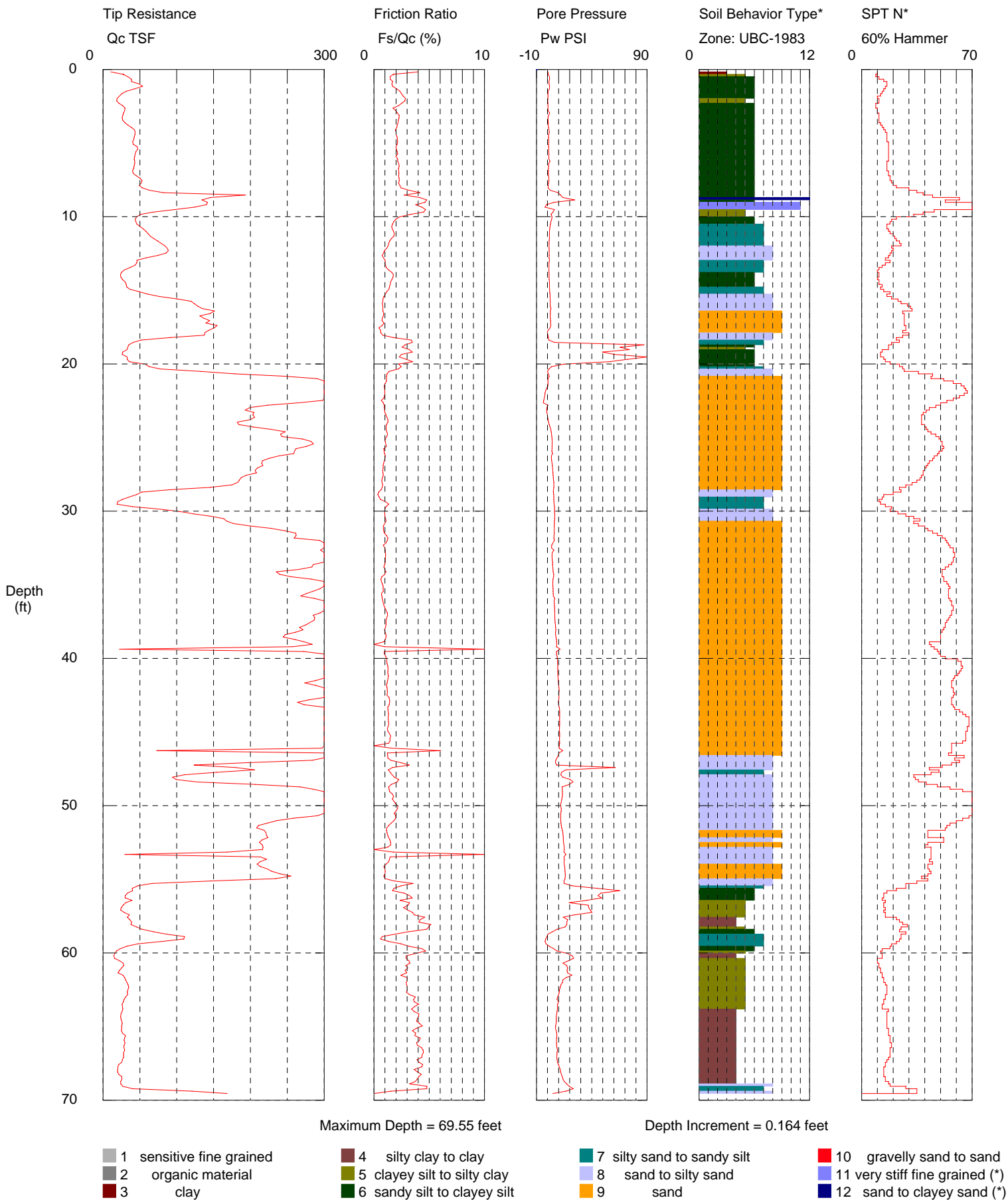


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT080
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 7:56:56 AM
 Location: Levee
 Job Number: ENG-502

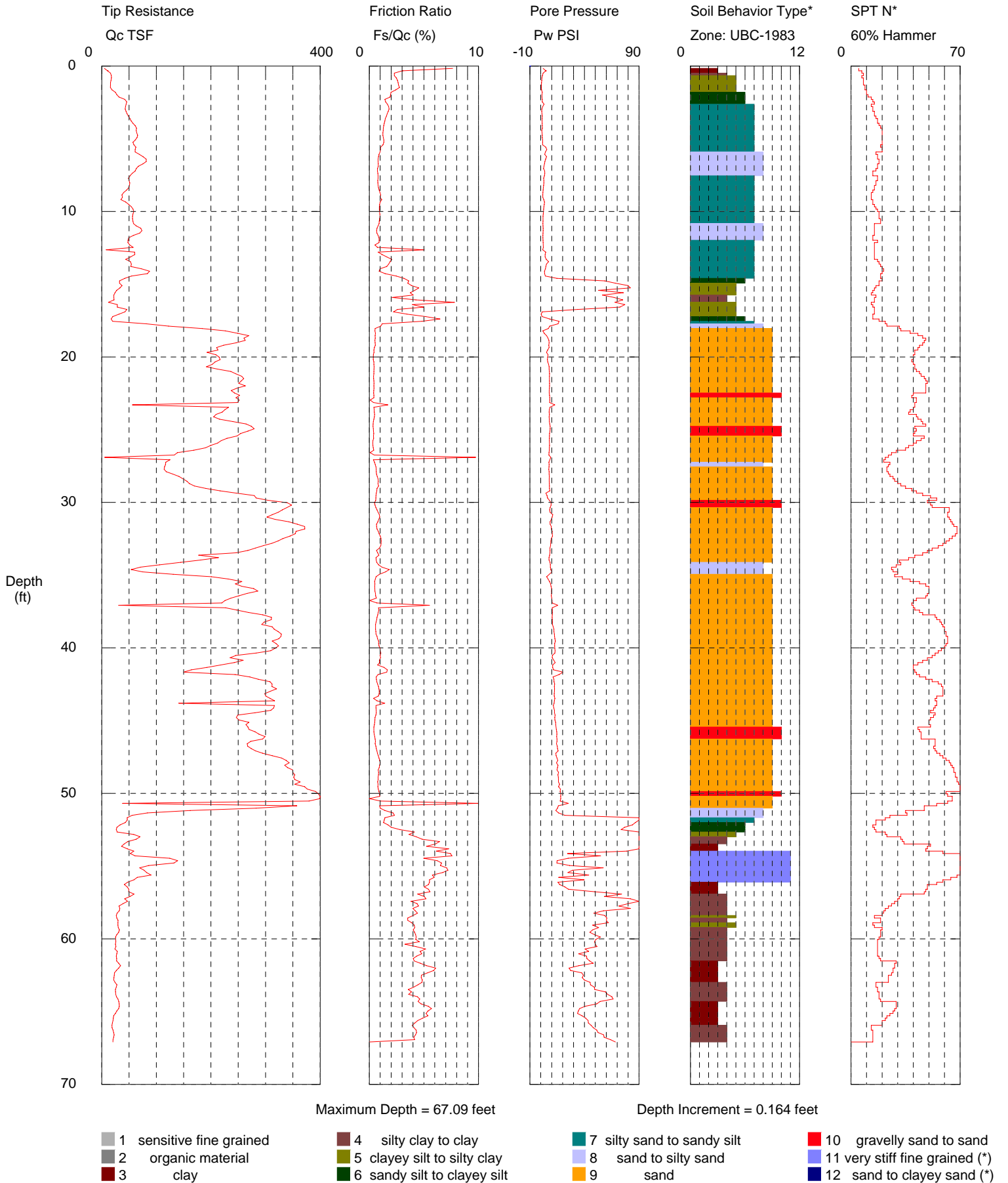


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT081
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 8:06:44 AM
 Location: Levee
 Job Number: ENG-502

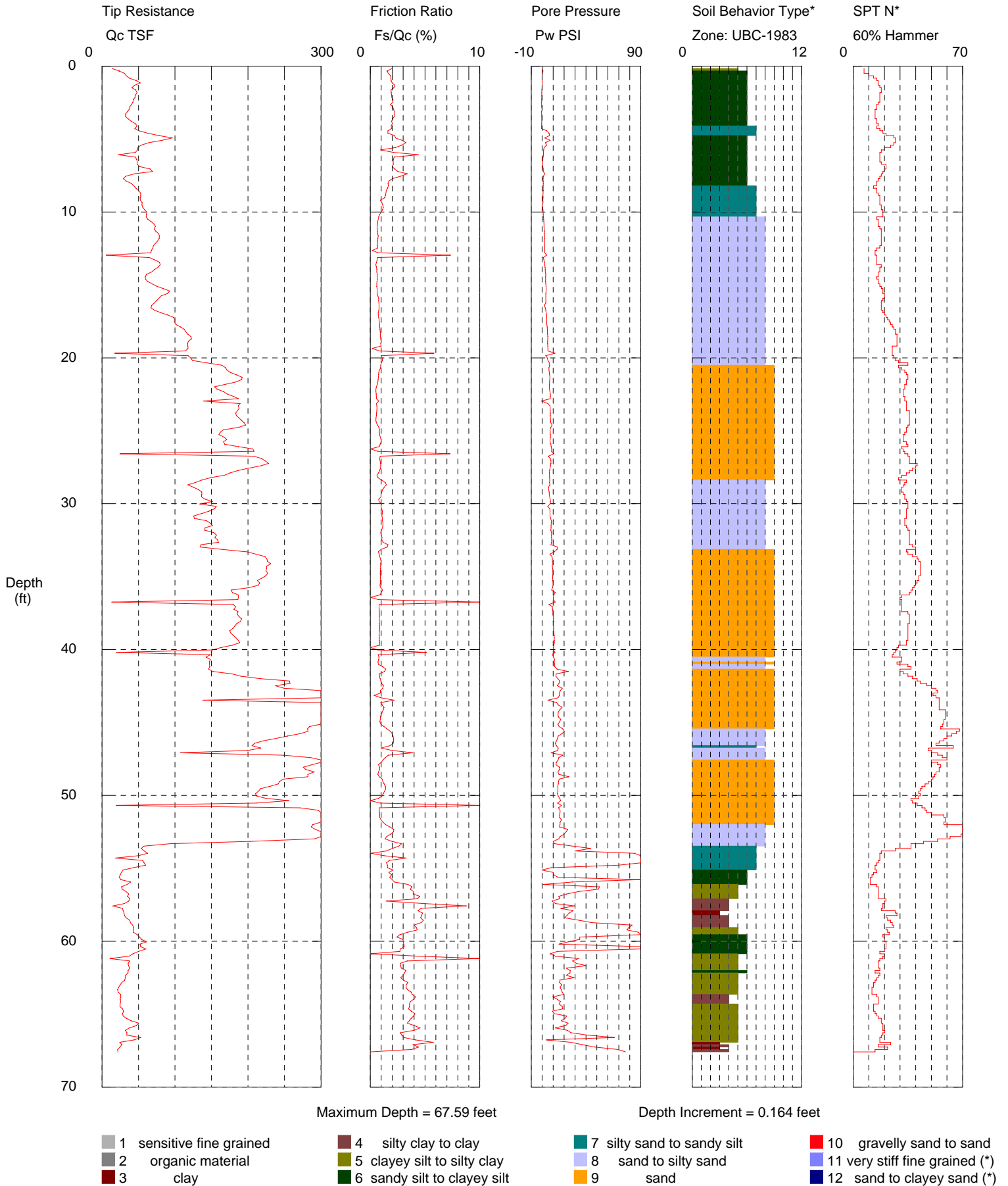


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT082
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 3:19:46 PM
 Location: Levee
 Job Number: ENG-502

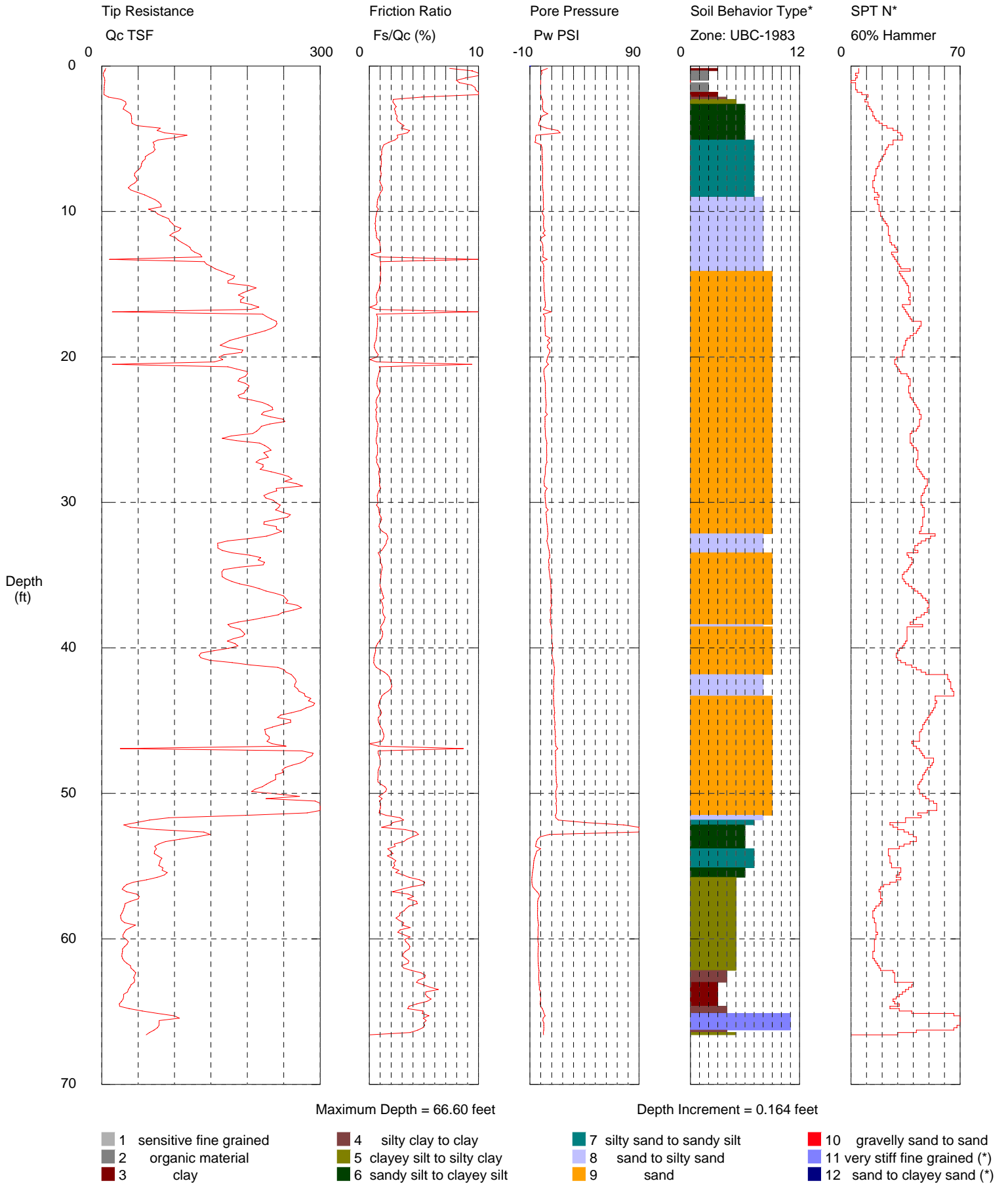


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT083
 Cone Used: DSG1111

CPT Date/Time: 1/1/2015 7:12:13 AM
 Location: Levee
 Job Number: ENG-502

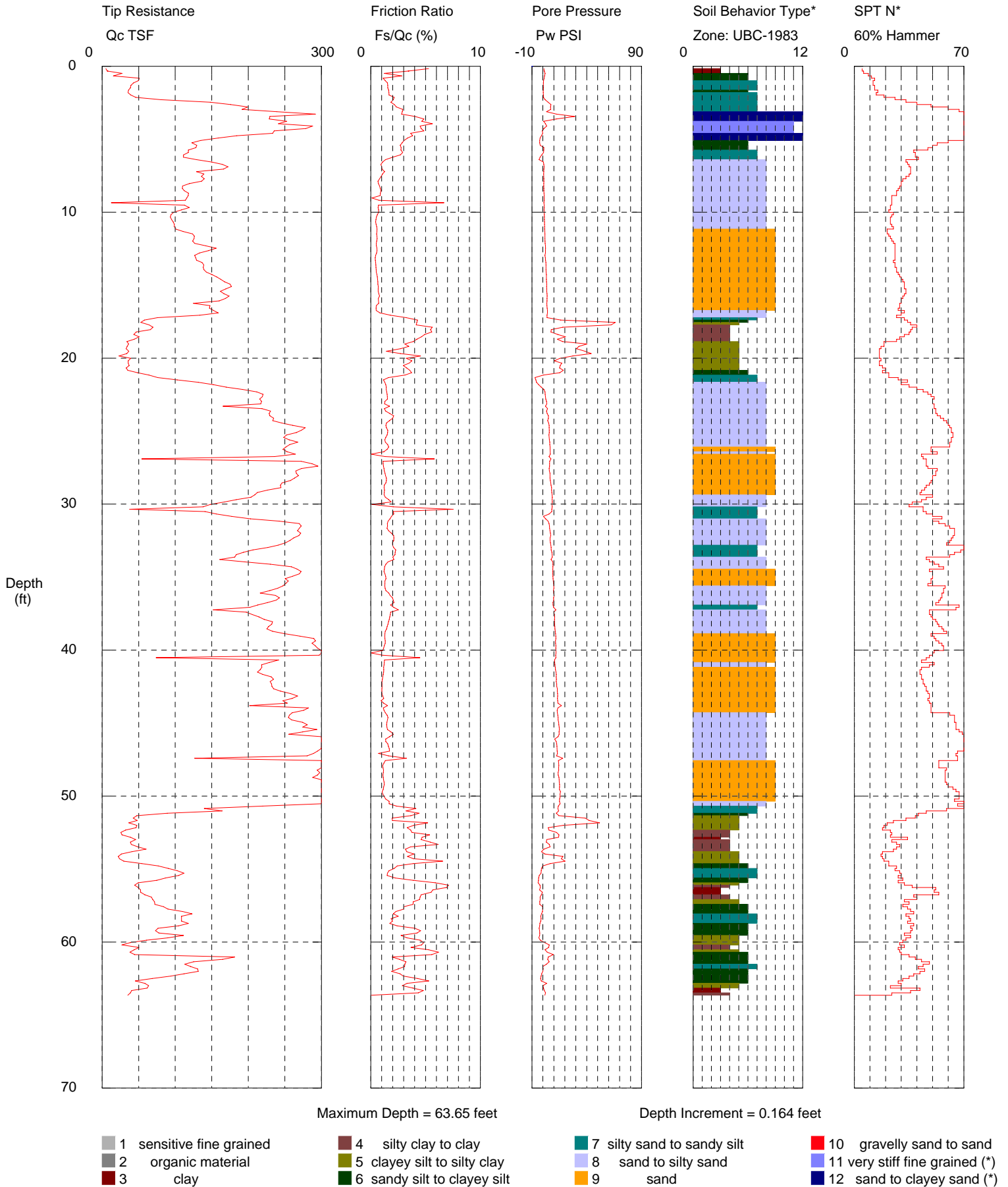


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT084
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 1:52:27 PM
 Location: Levee
 Job Number: ENG-502

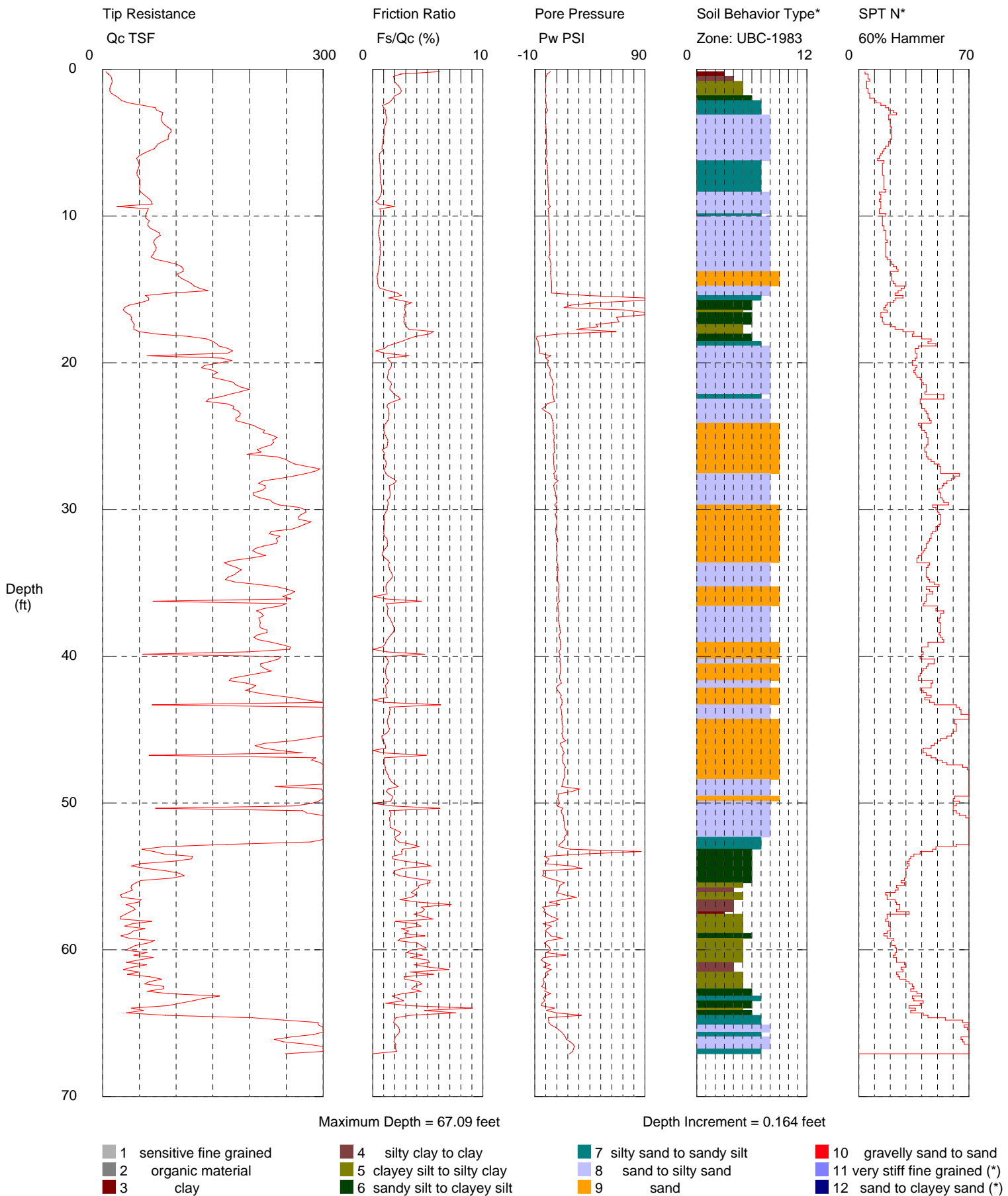


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT085
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 2:40:50 PM
 Location: Levee
 Job Number: ENG-502

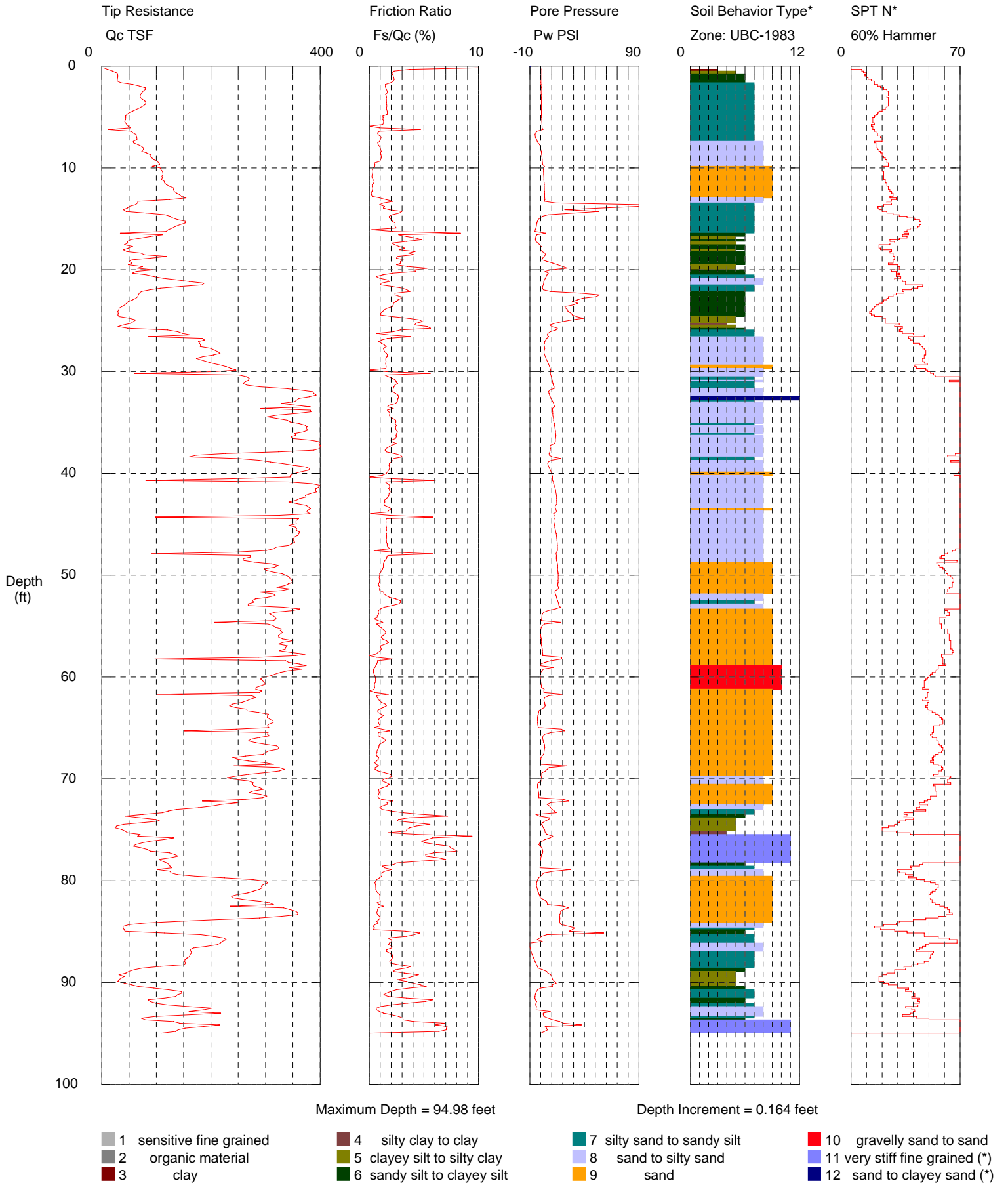


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT086
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 11:45:56 AM
 Location: Levee
 Job Number: ENG-502

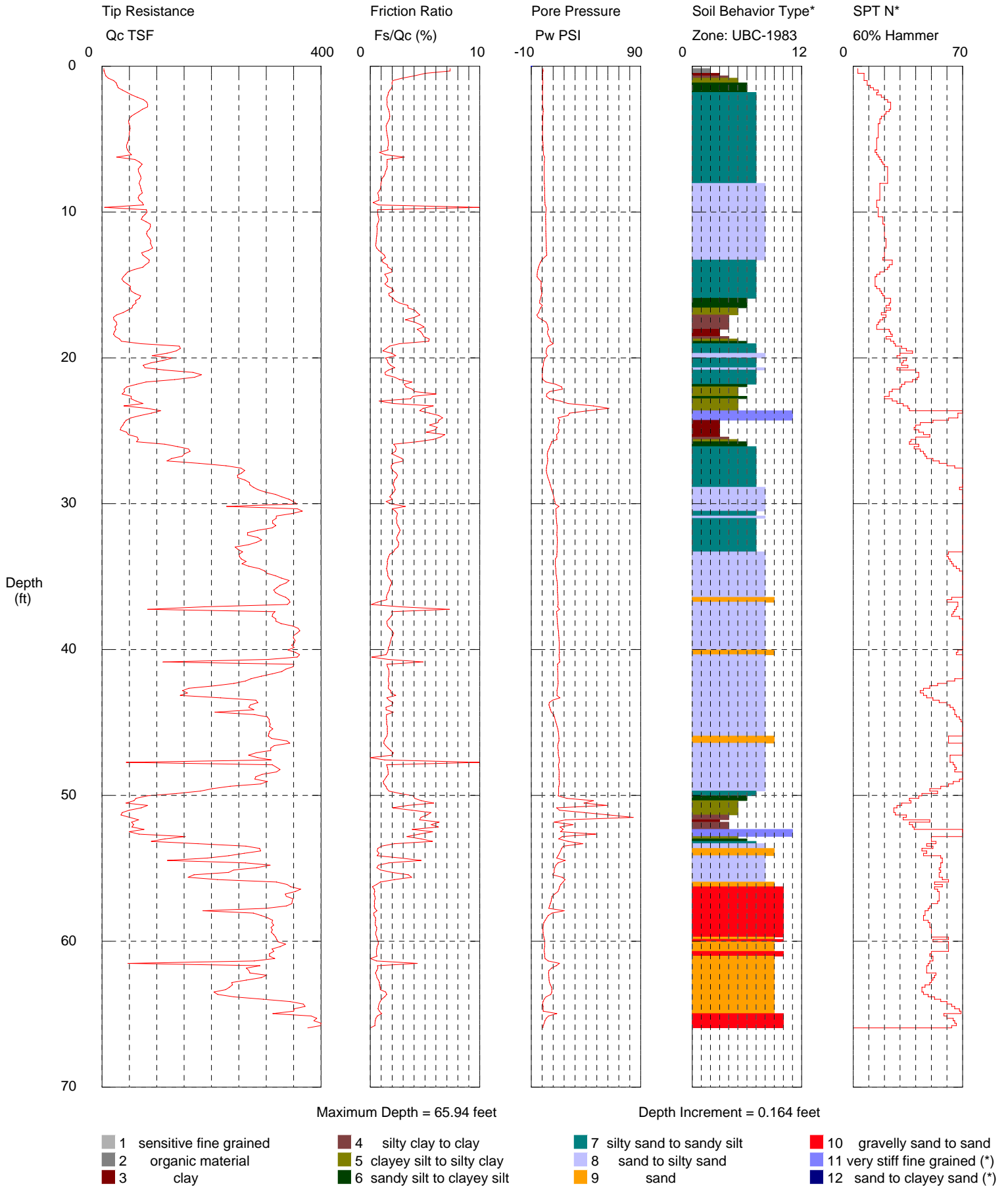


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT087
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 1:00:58 PM
 Location: Levee
 Job Number: ENG-502

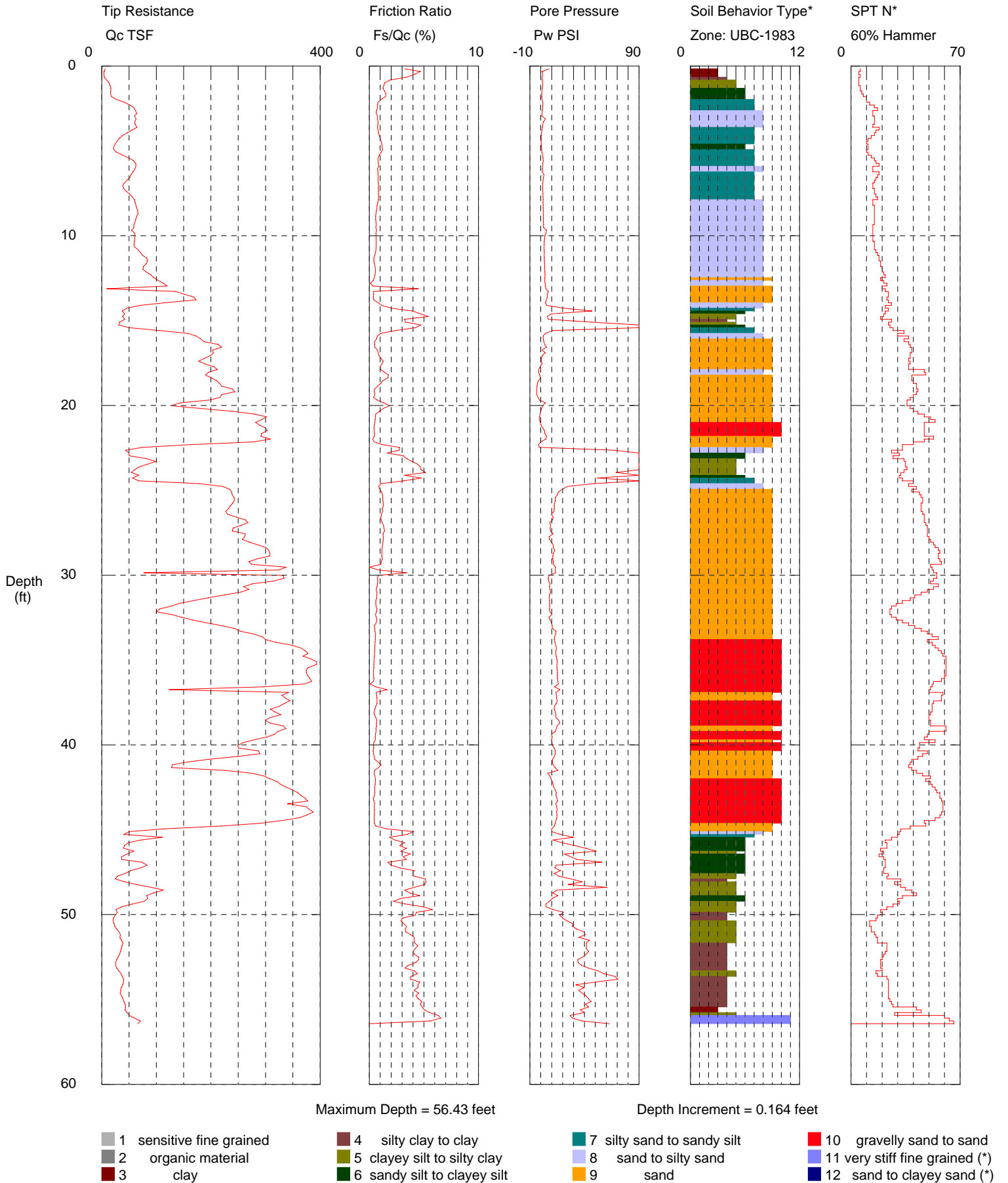


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT088
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 9:28:01 AM
 Location: Levee
 Job Number: ENG-502

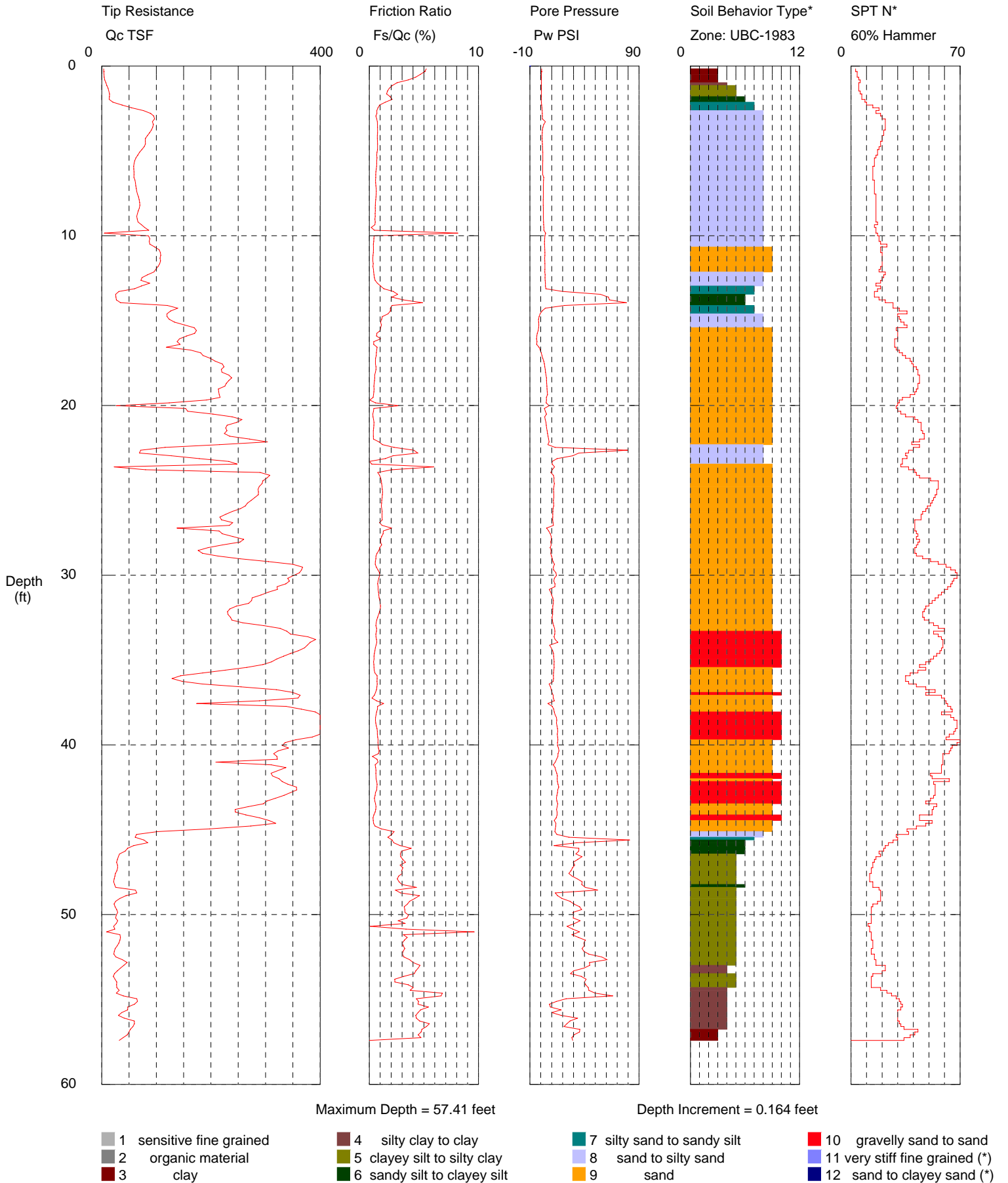


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT089
 Cone Used: DSG1111

CPT Date/Time: 1/2/2015 8:53:48 AM
 Location: Levee
 Job Number: ENG-502

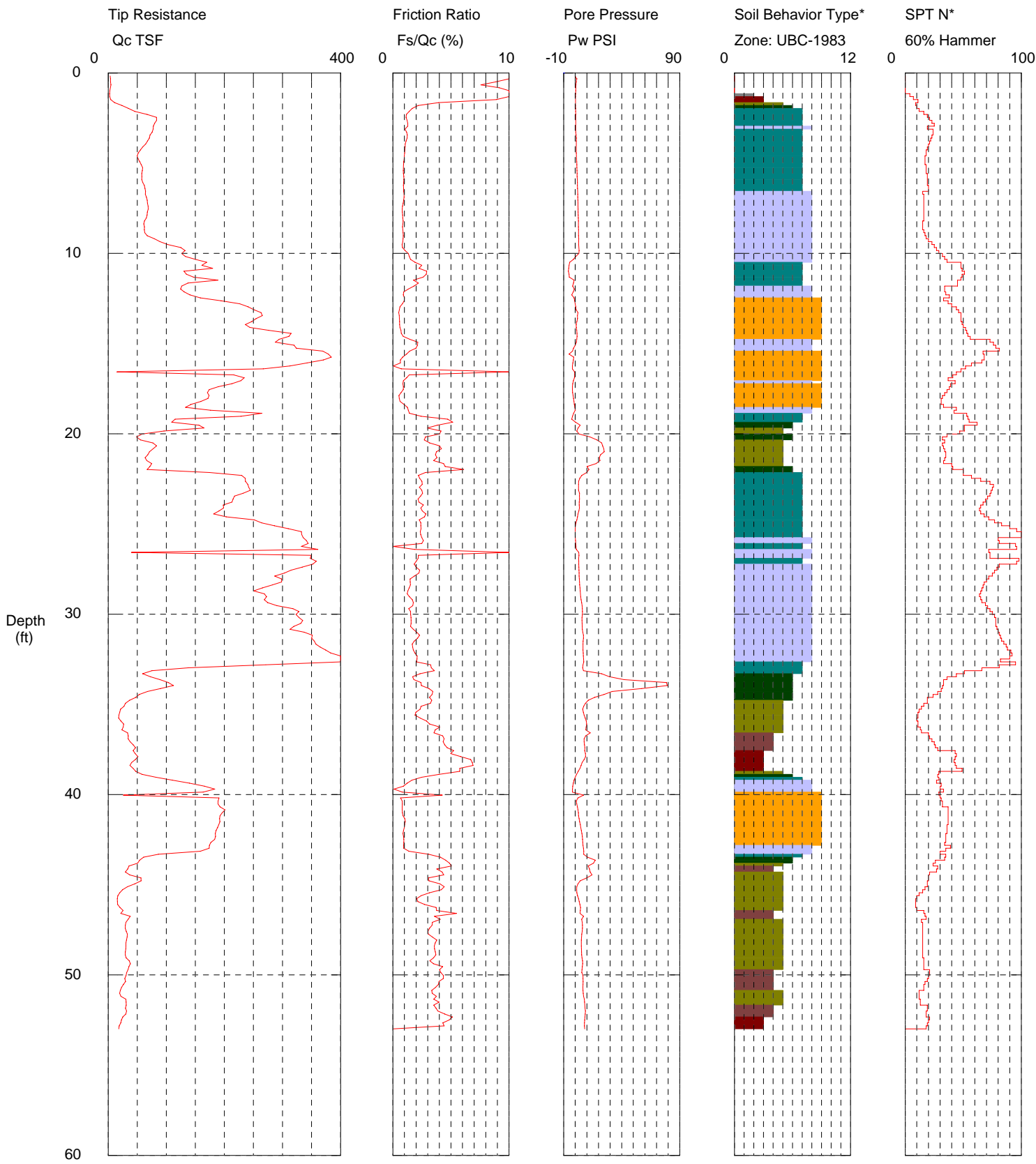


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT090
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 8:21:21 AM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 52.99 feet

Depth Increment = 0.164 feet

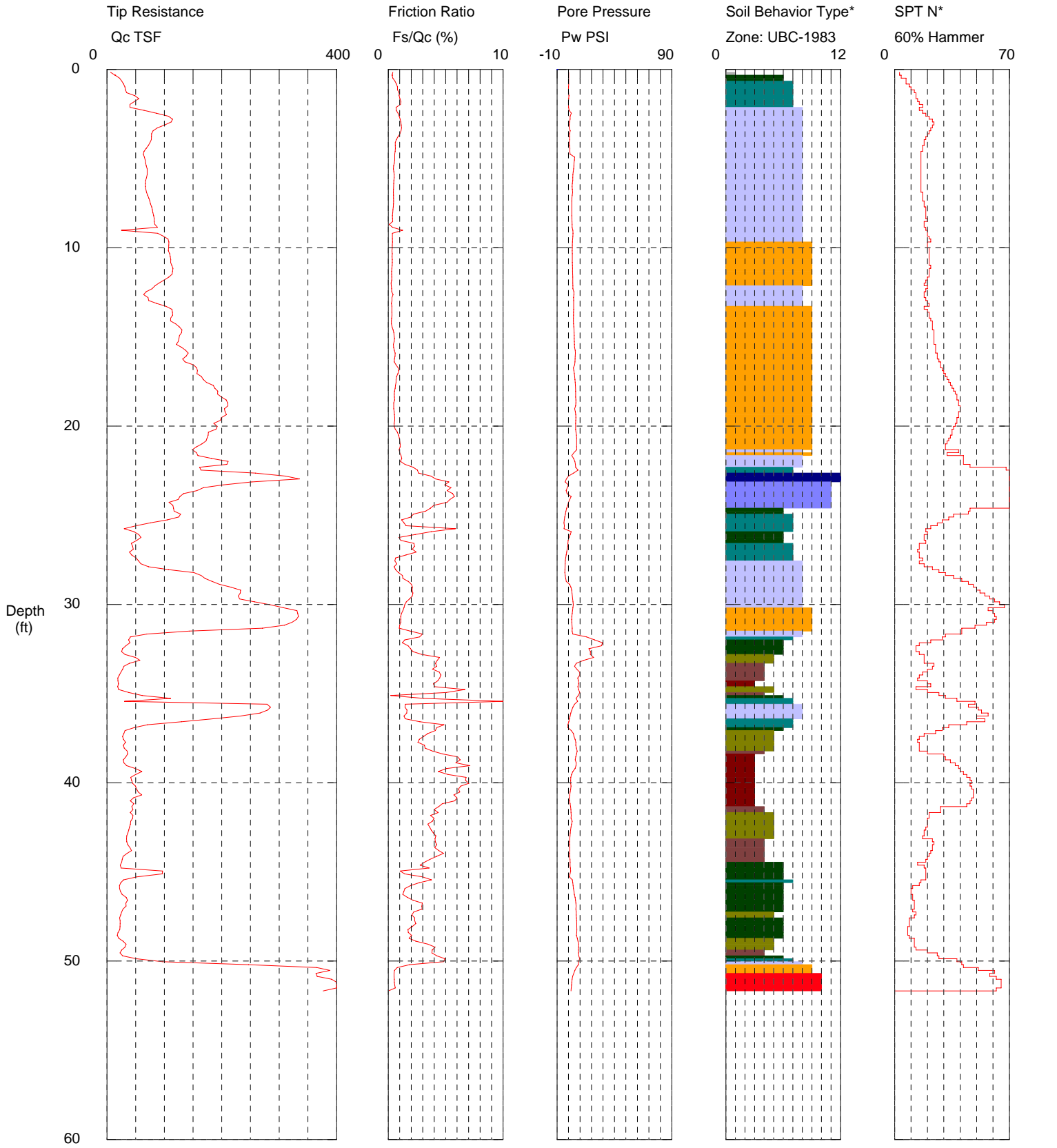
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT091
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 9:04:00 AM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 51.67 feet

Depth Increment = 0.164 feet

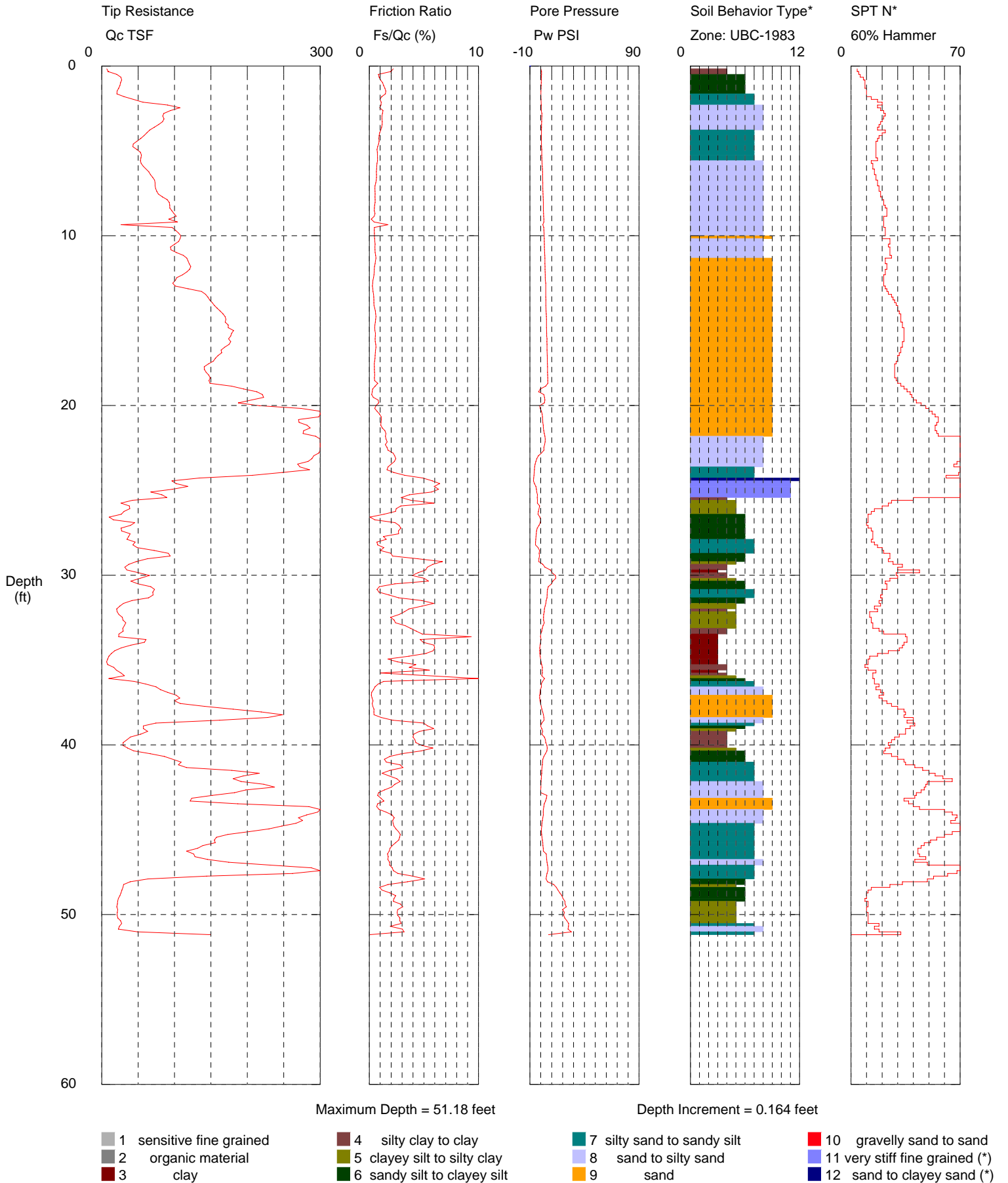
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT092
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 9:40:12 AM
 Location: Levee
 Job Number: ENG-502

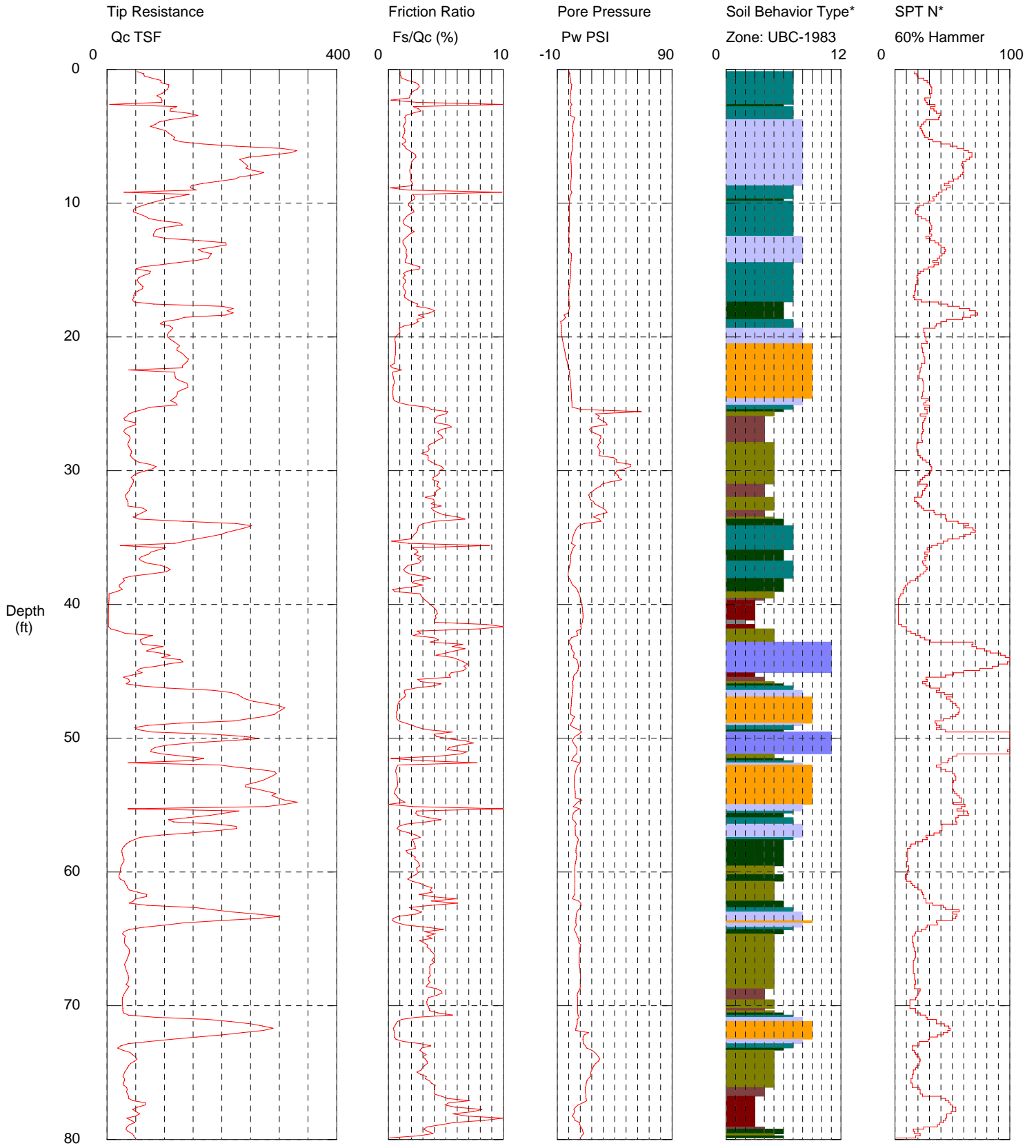


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Miles Brittsan
 Sounding: 7-CPT093
 Cone Used: DSG1111

CPT Date/Time: 12/31/2014 10:15:28 AM
 Location: Levee
 Job Number: ENG-502



Maximum Depth = 79.89 feet

Depth Increment = 0.164 feet

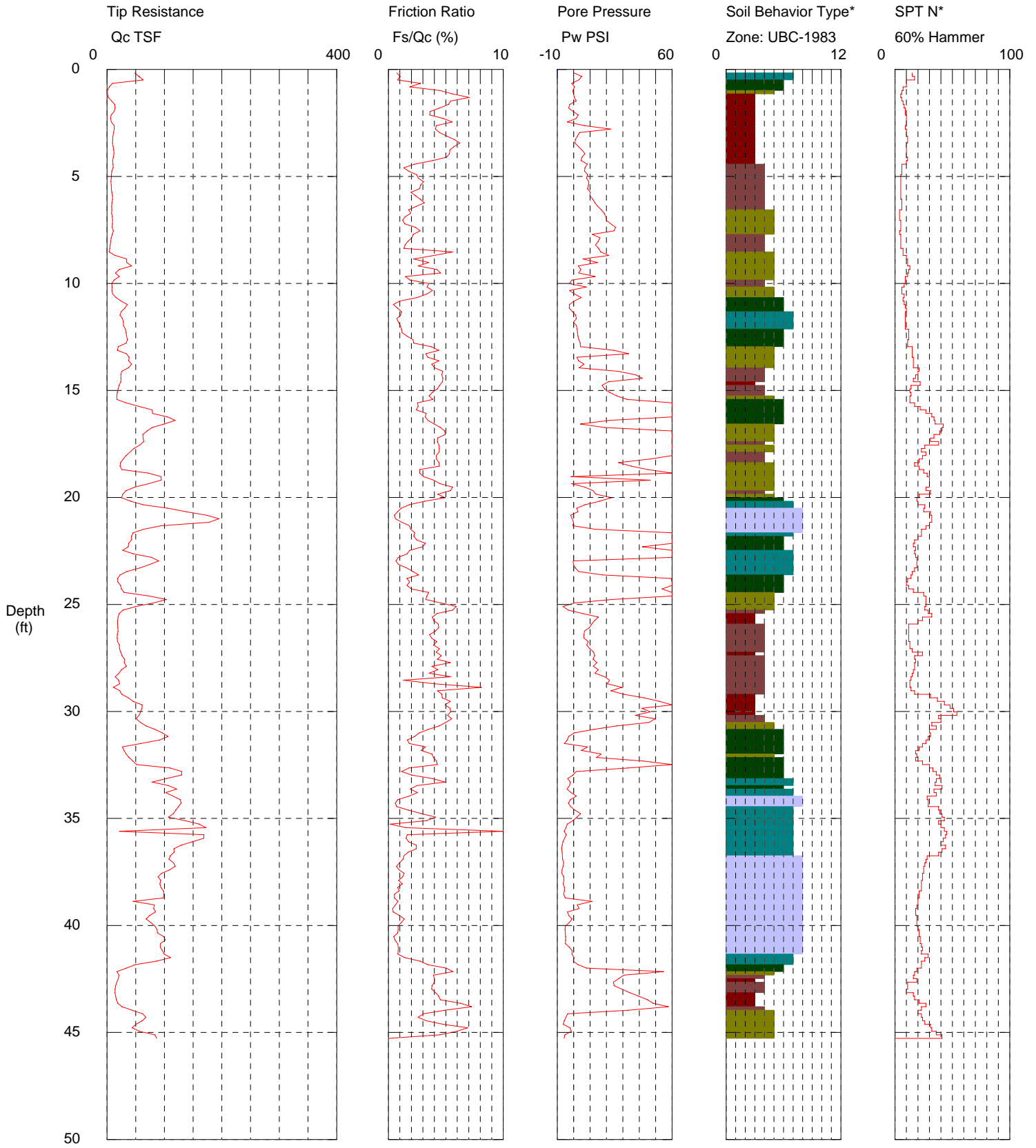
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT094
 Cone Used: DDG1316

CPT Date/Time: 2/4/2015 4:19:31 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

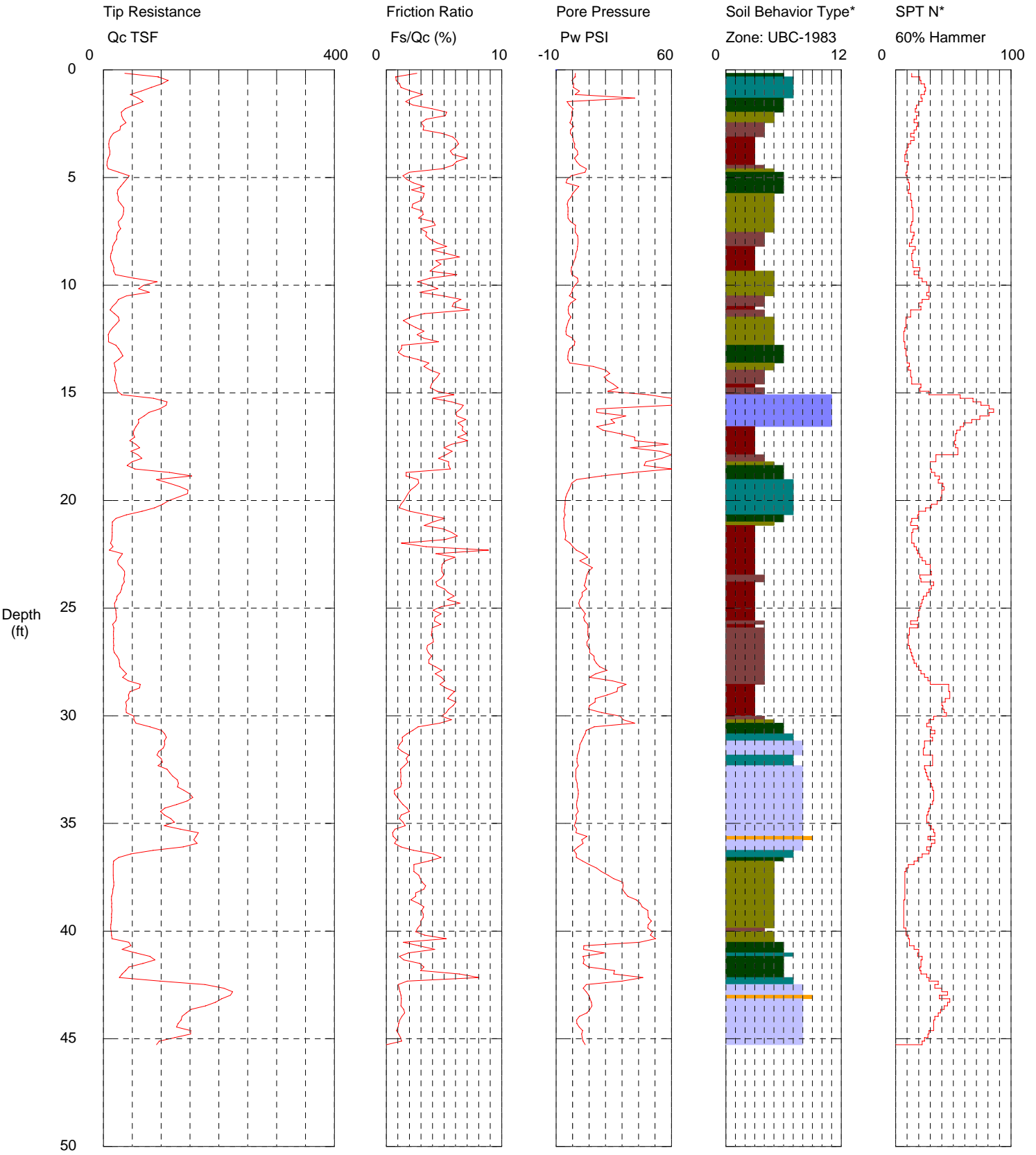
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT095
 Cone Used: DDG1316

CPT Date/Time: 2/4/2015 4:52:47 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

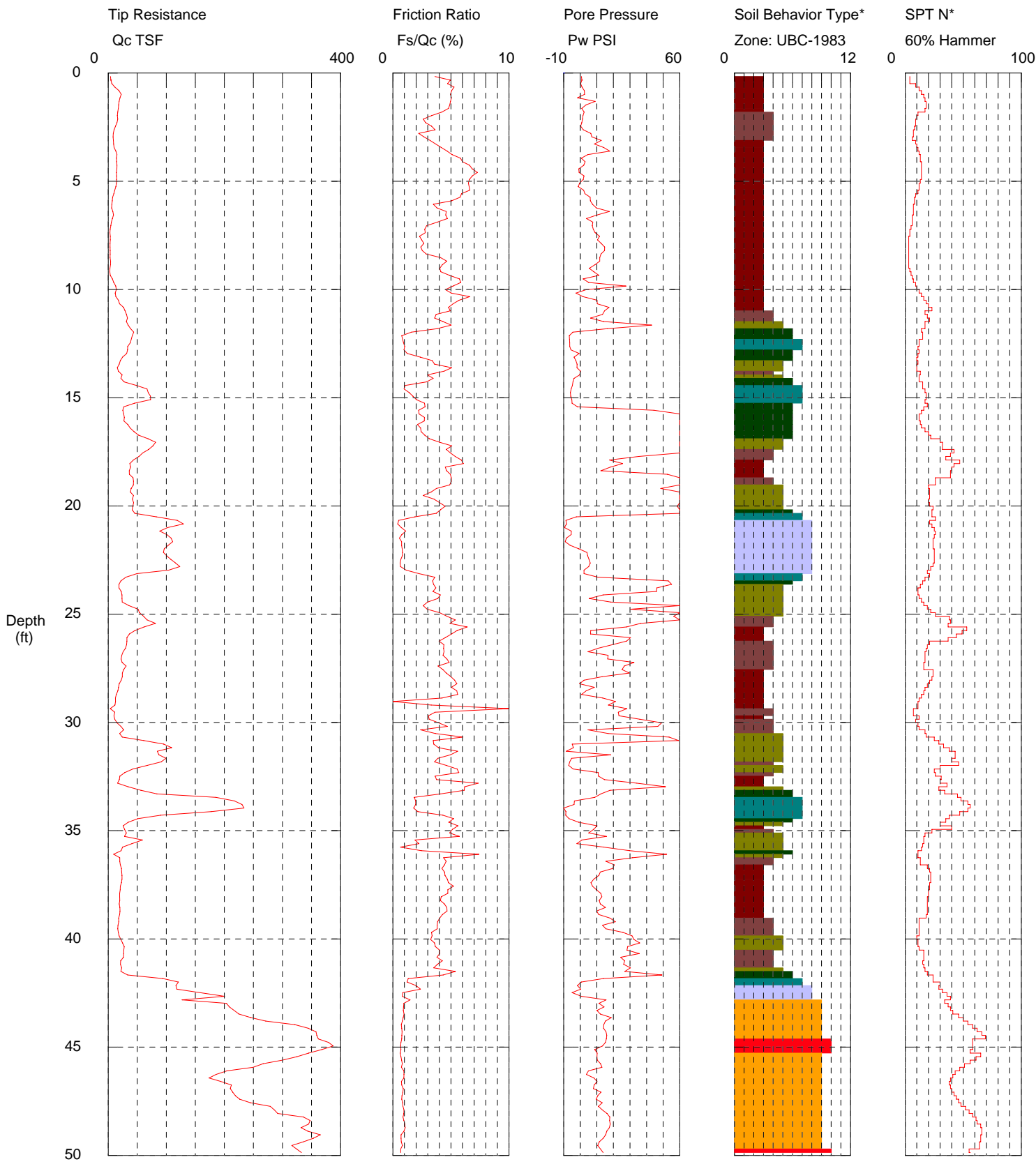
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT096
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 8:09:17 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.03 feet

Depth Increment = 0.164 feet

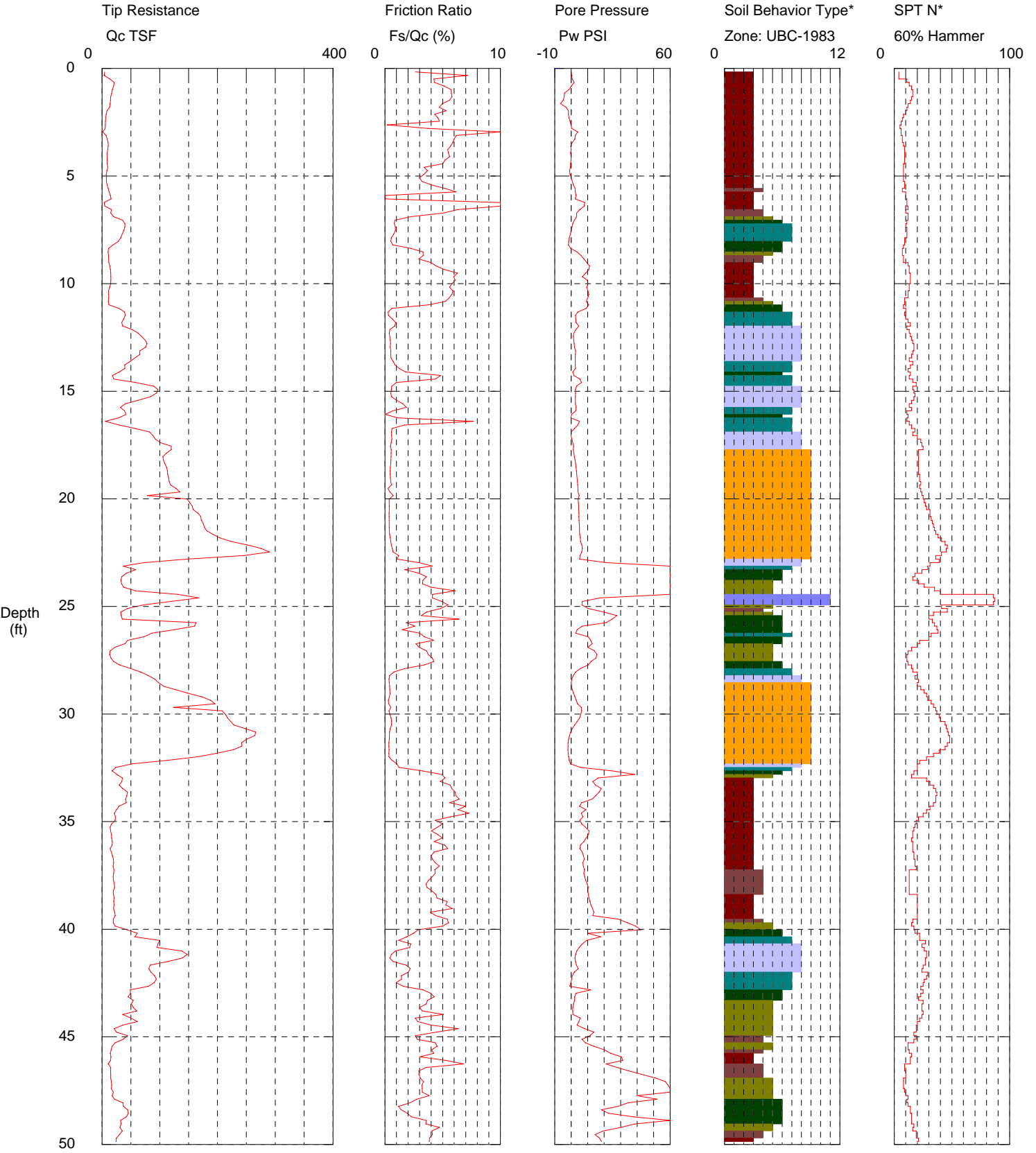
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT097
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 1:32:41 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.36 feet

Depth Increment = 0.164 feet

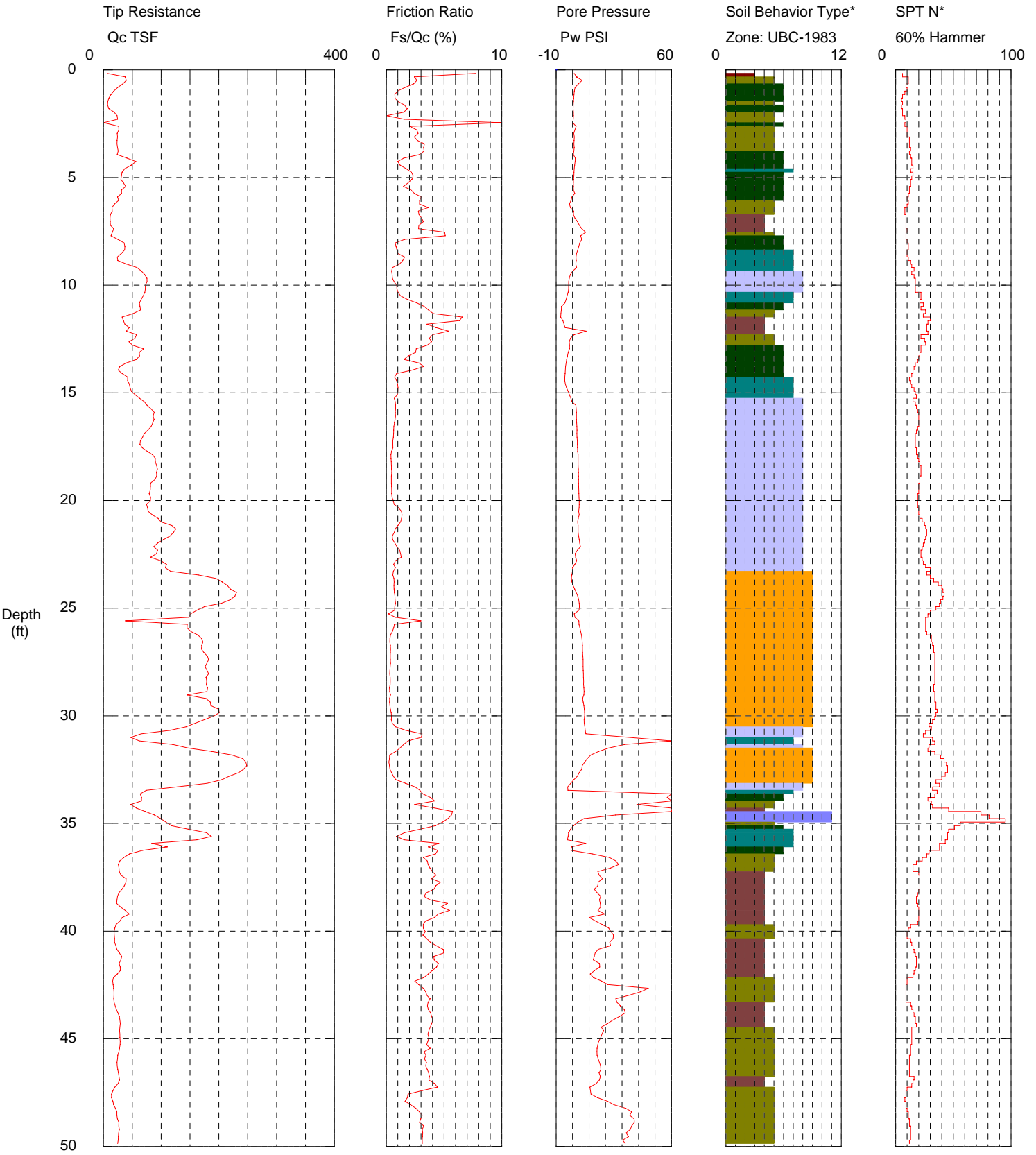
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT098
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 12:56:13 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.36 feet

Depth Increment = 0.164 feet

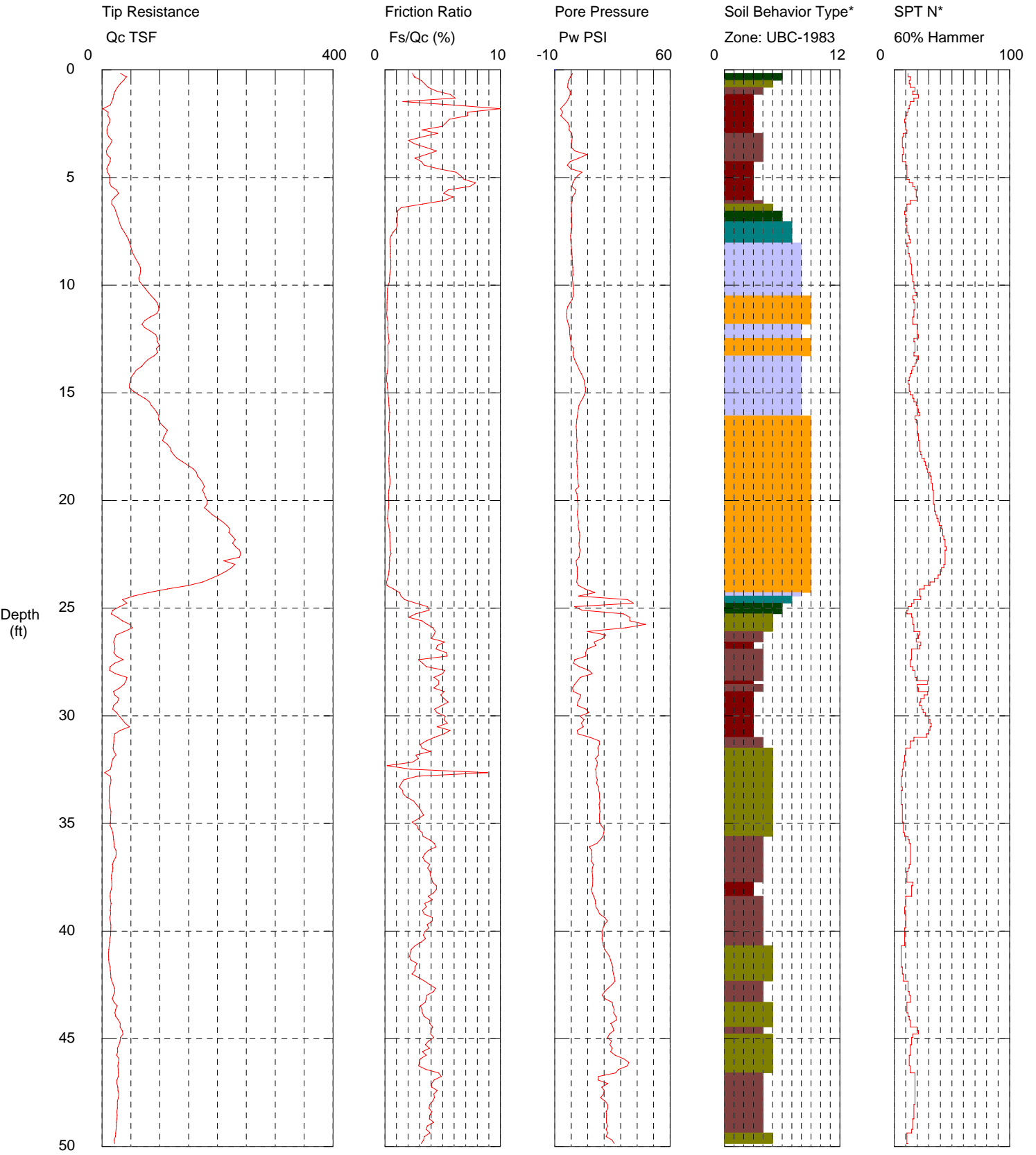
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT099
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 2:14:22 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.36 feet

Depth Increment = 0.164 feet

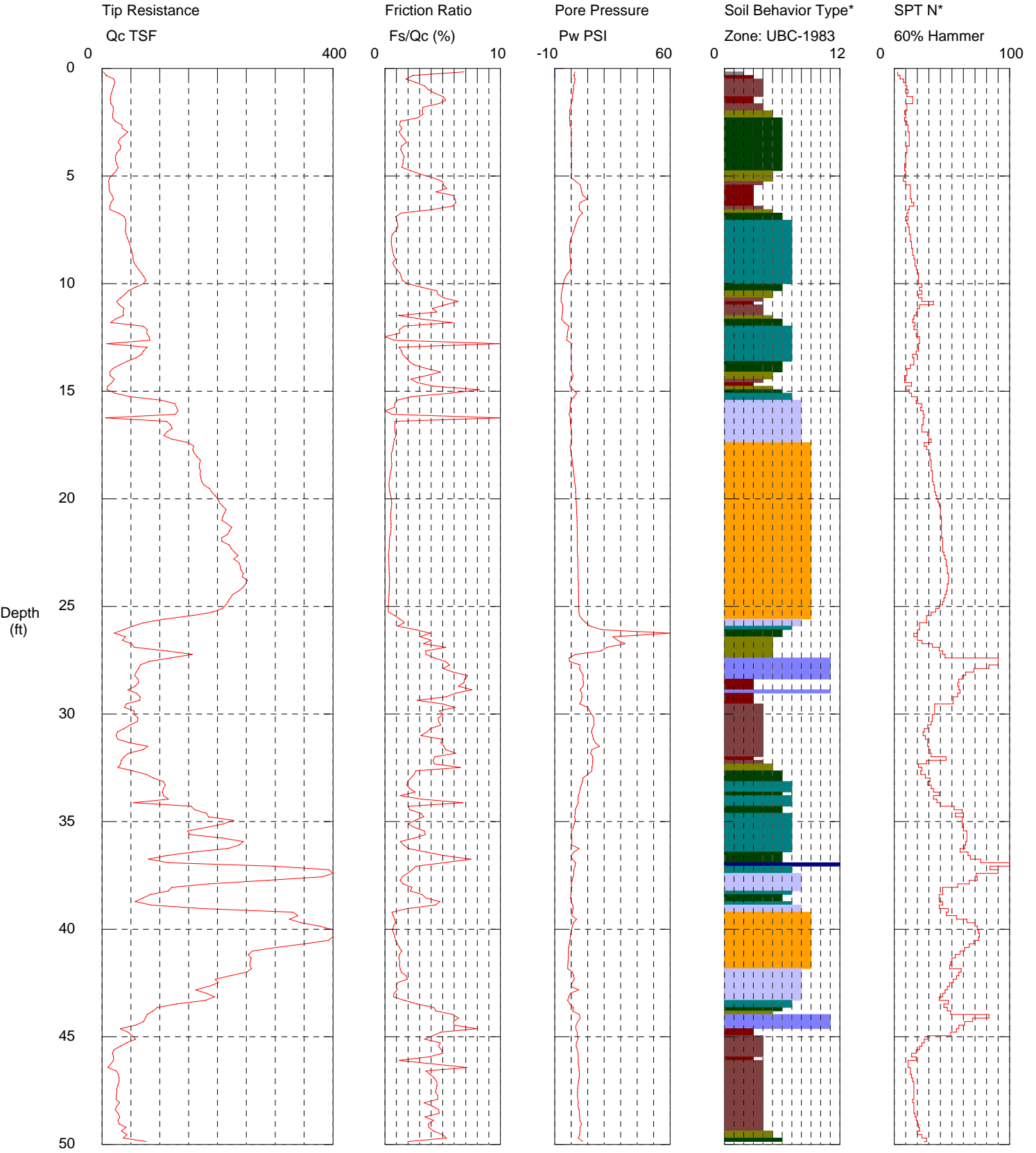
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT100
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 12:11:16 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 50.36 feet

Depth Increment = 0.164 feet

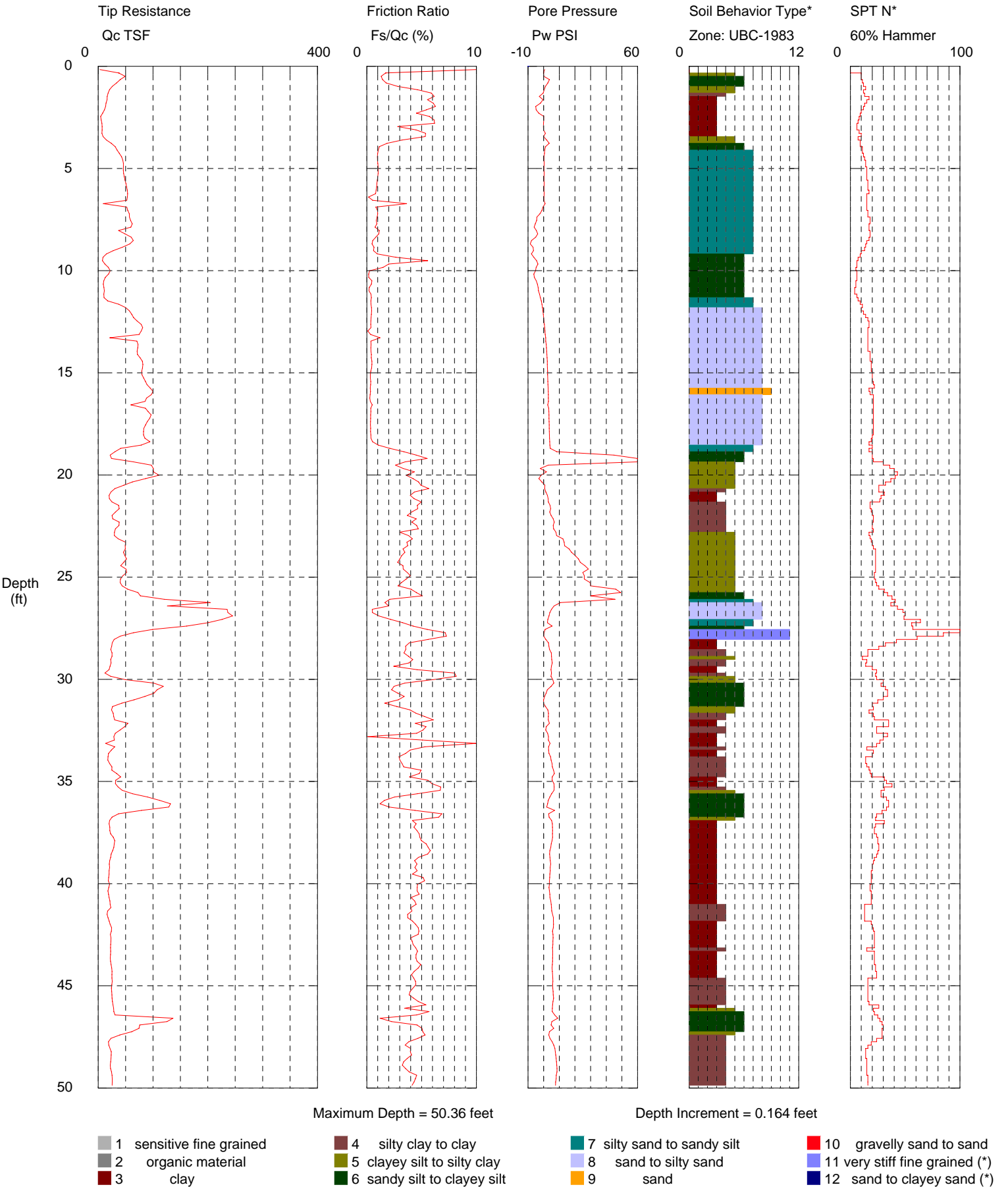
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT101
 Cone Used: DDG1316

CPT Date/Time: 2/5/2015 2:47:08 PM
 Location: LEVEE
 Job Number: ENG-502

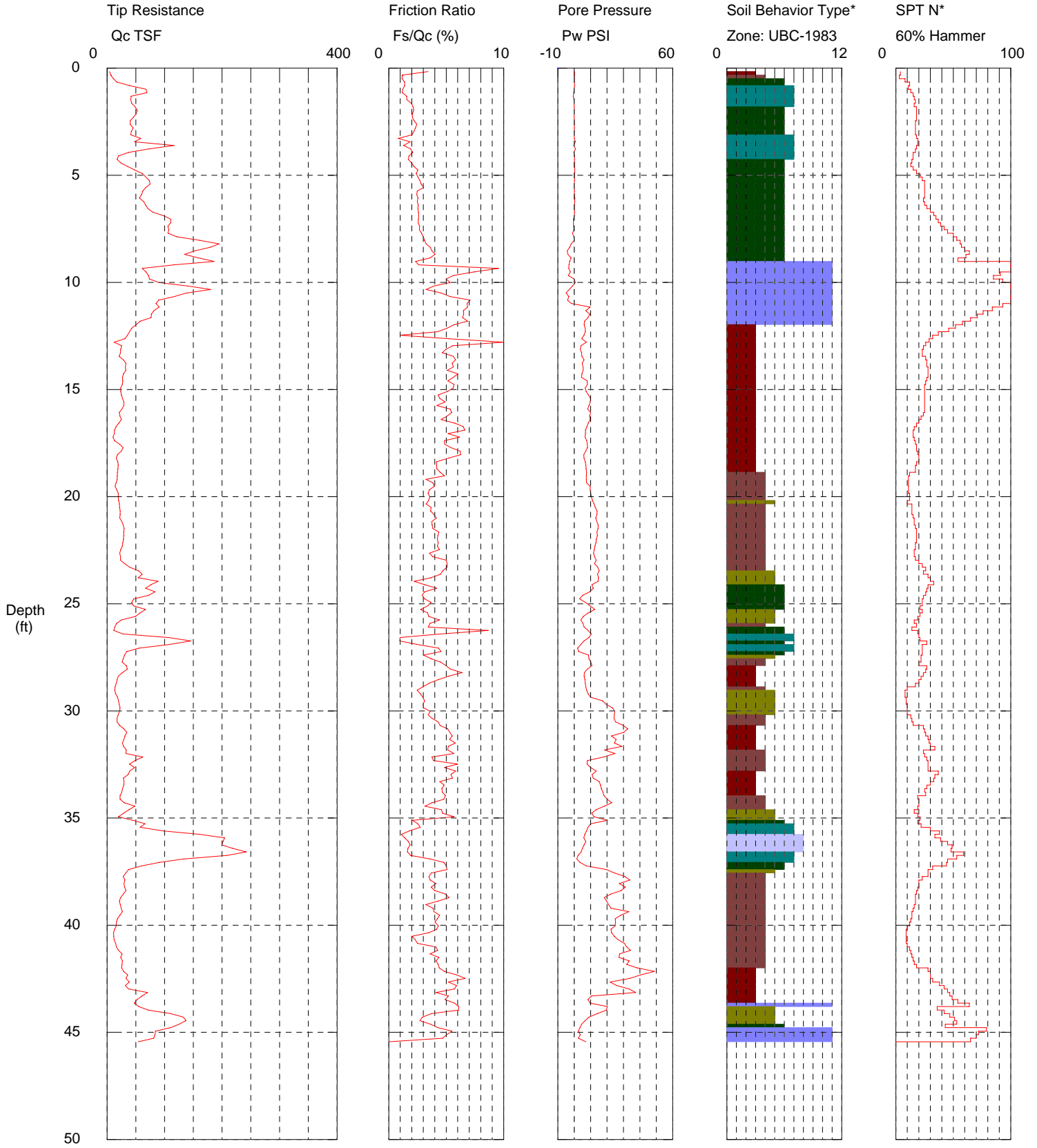


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT102
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 7:47:30 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

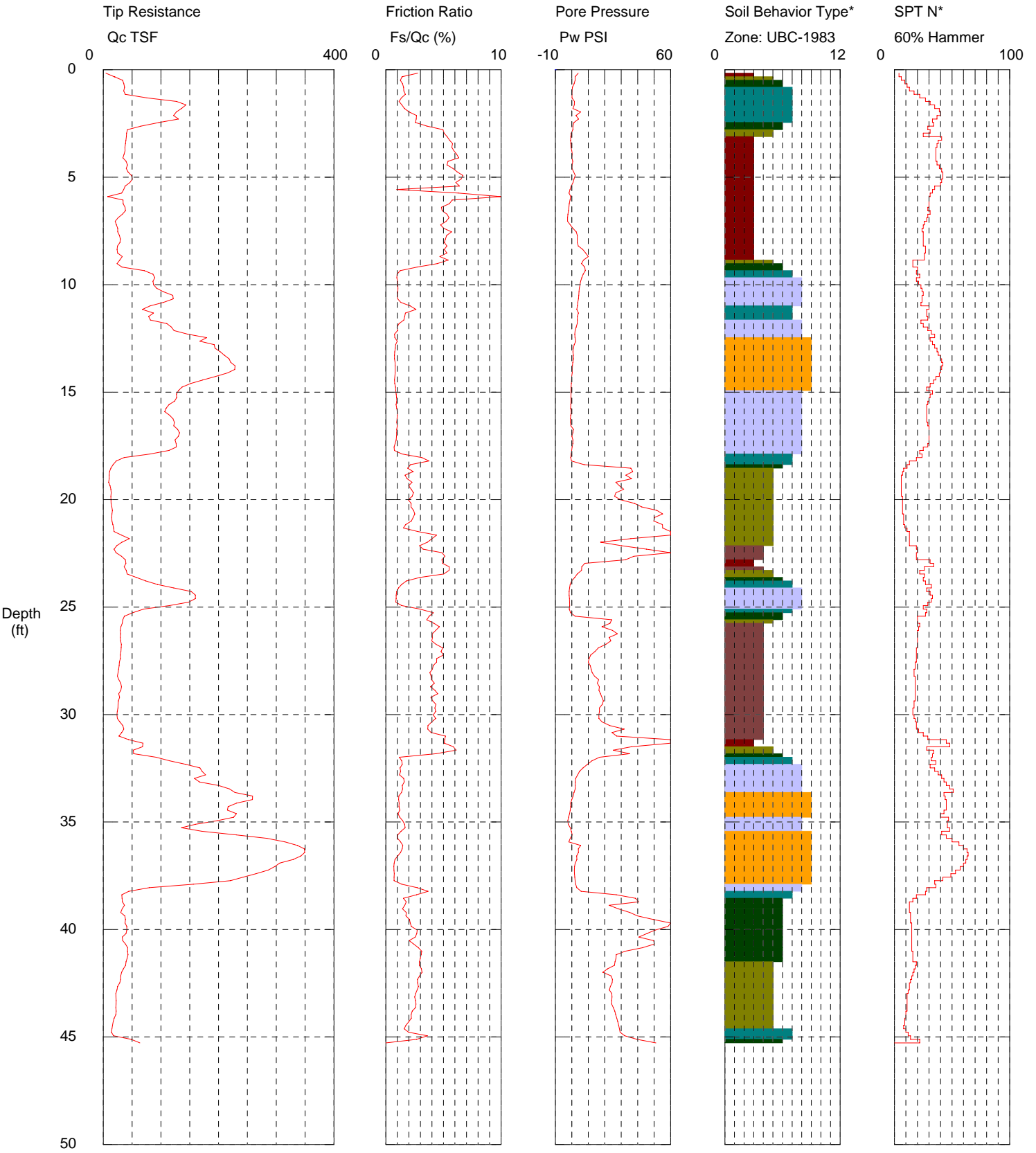
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT103
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 7:17:28 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

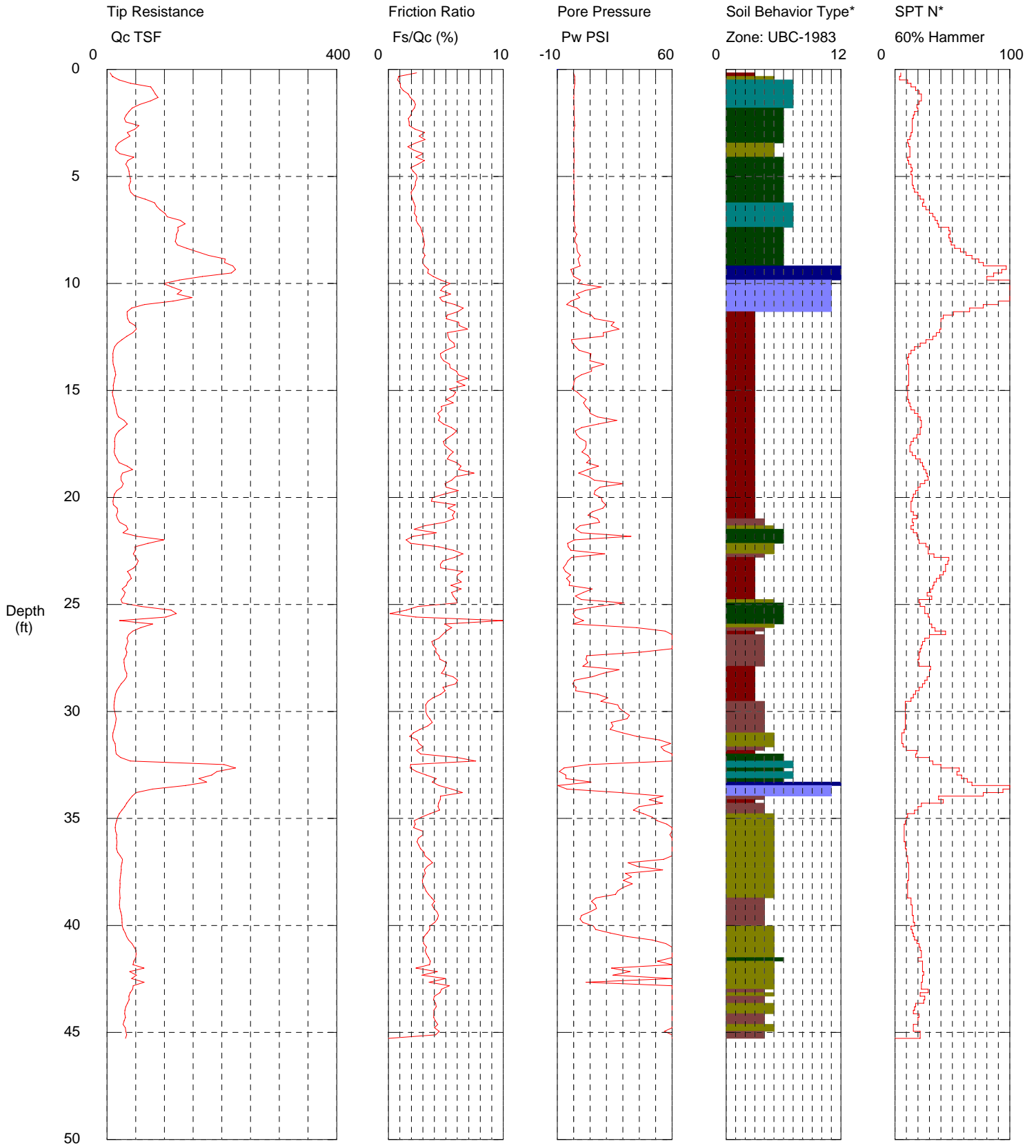
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT104
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 8:54:40 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

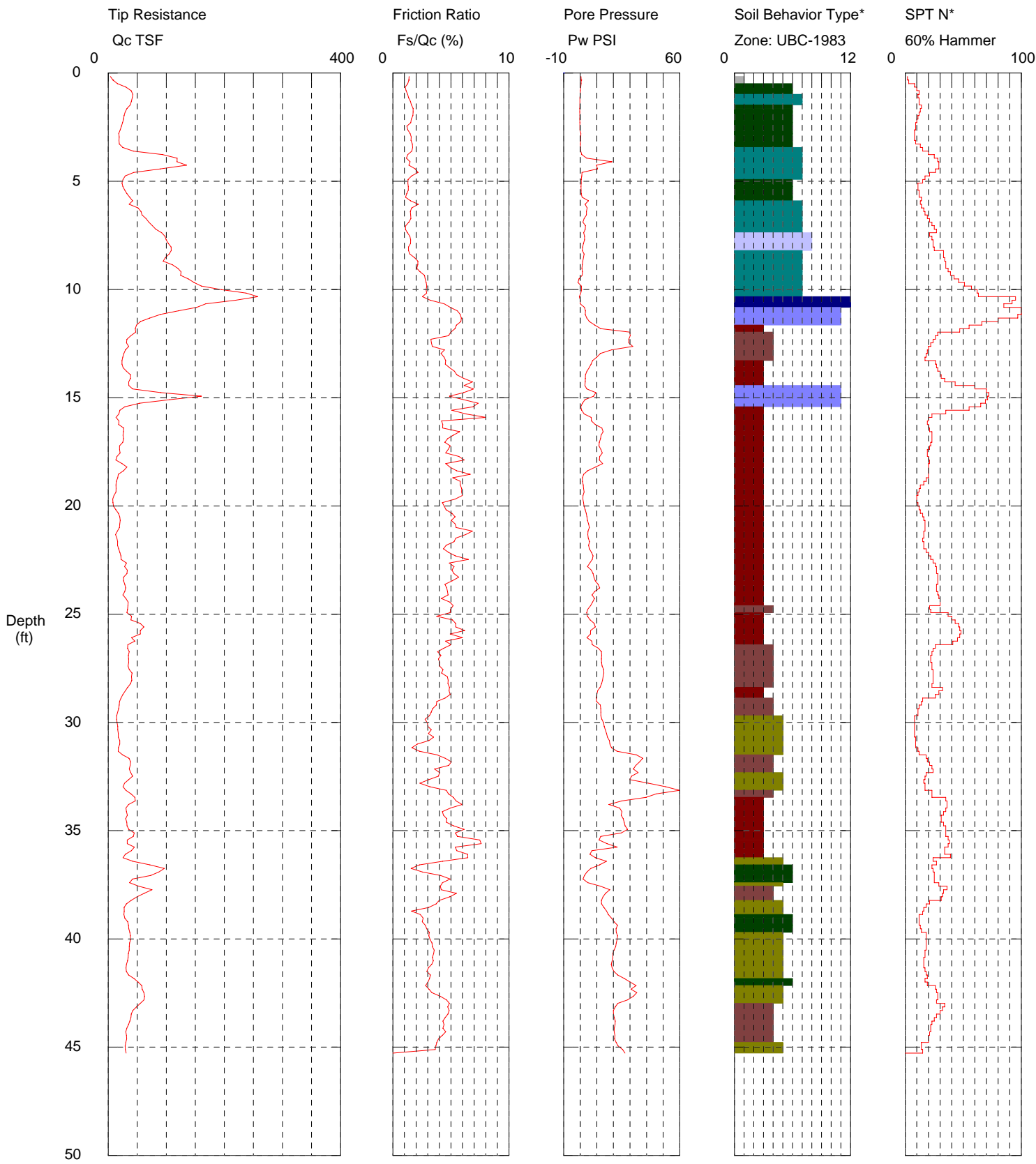
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT105
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 8:18:04 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

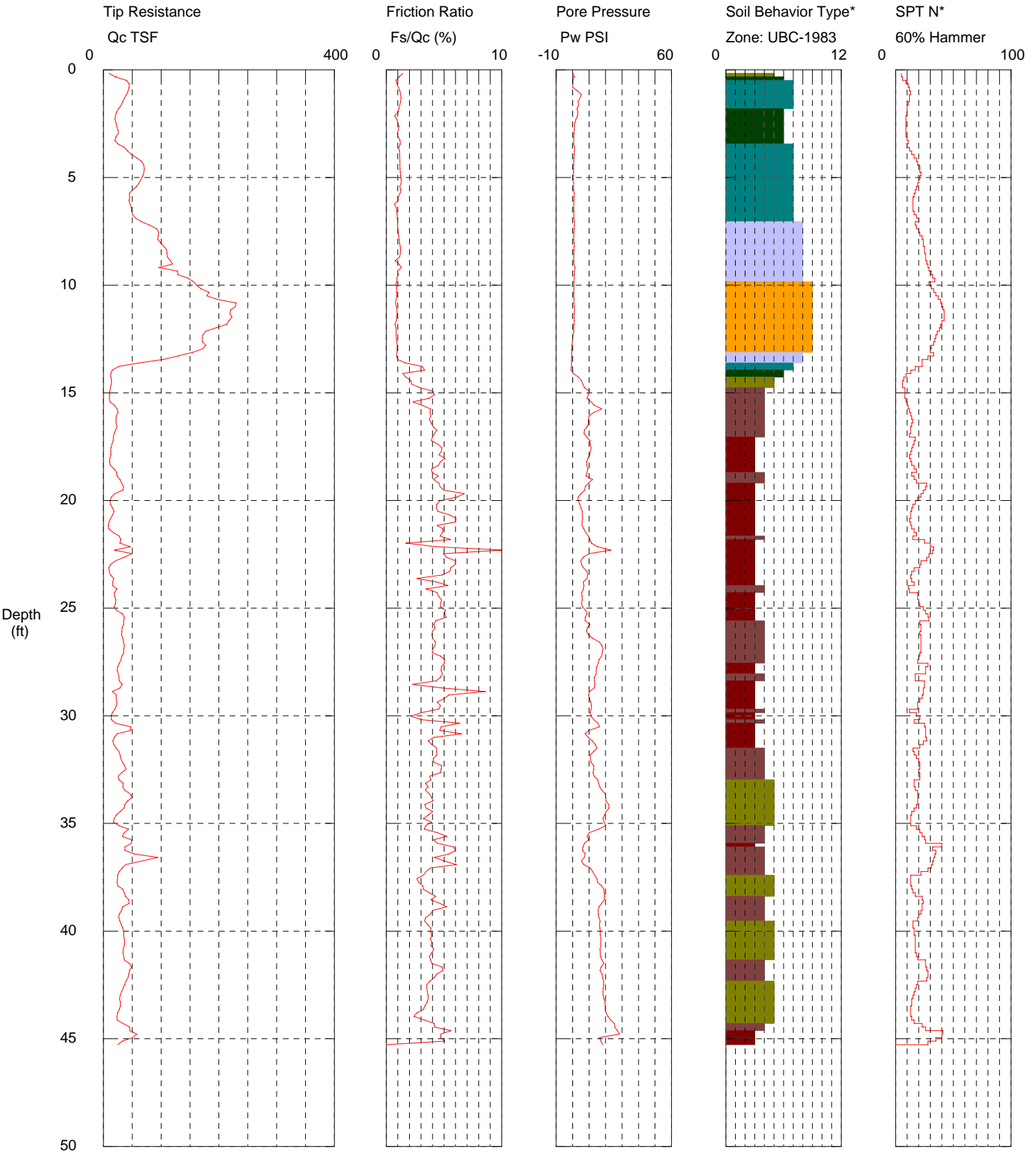
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT106
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 9:30:18 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

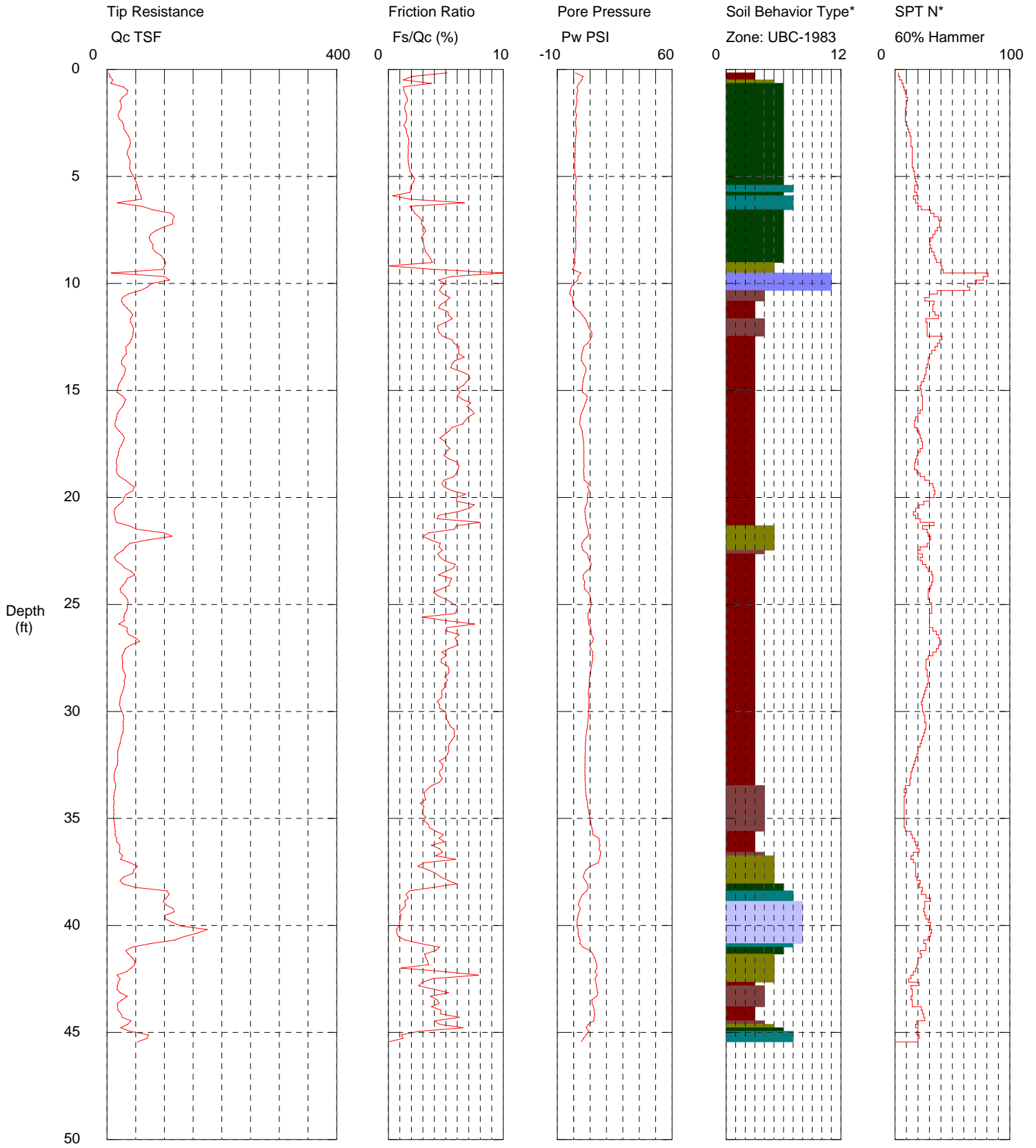
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT107
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 10:00:37 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

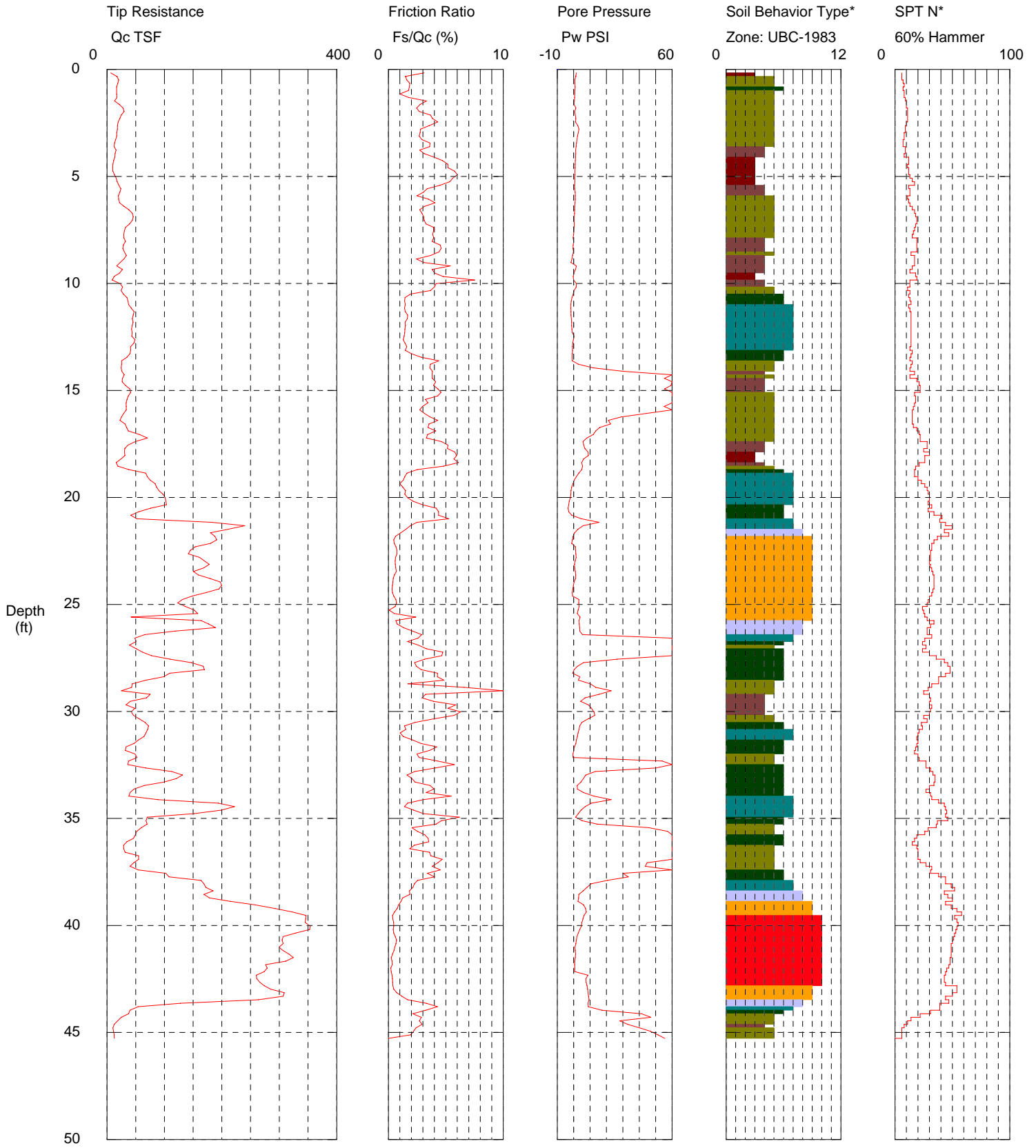
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT108
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 11:15:16 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

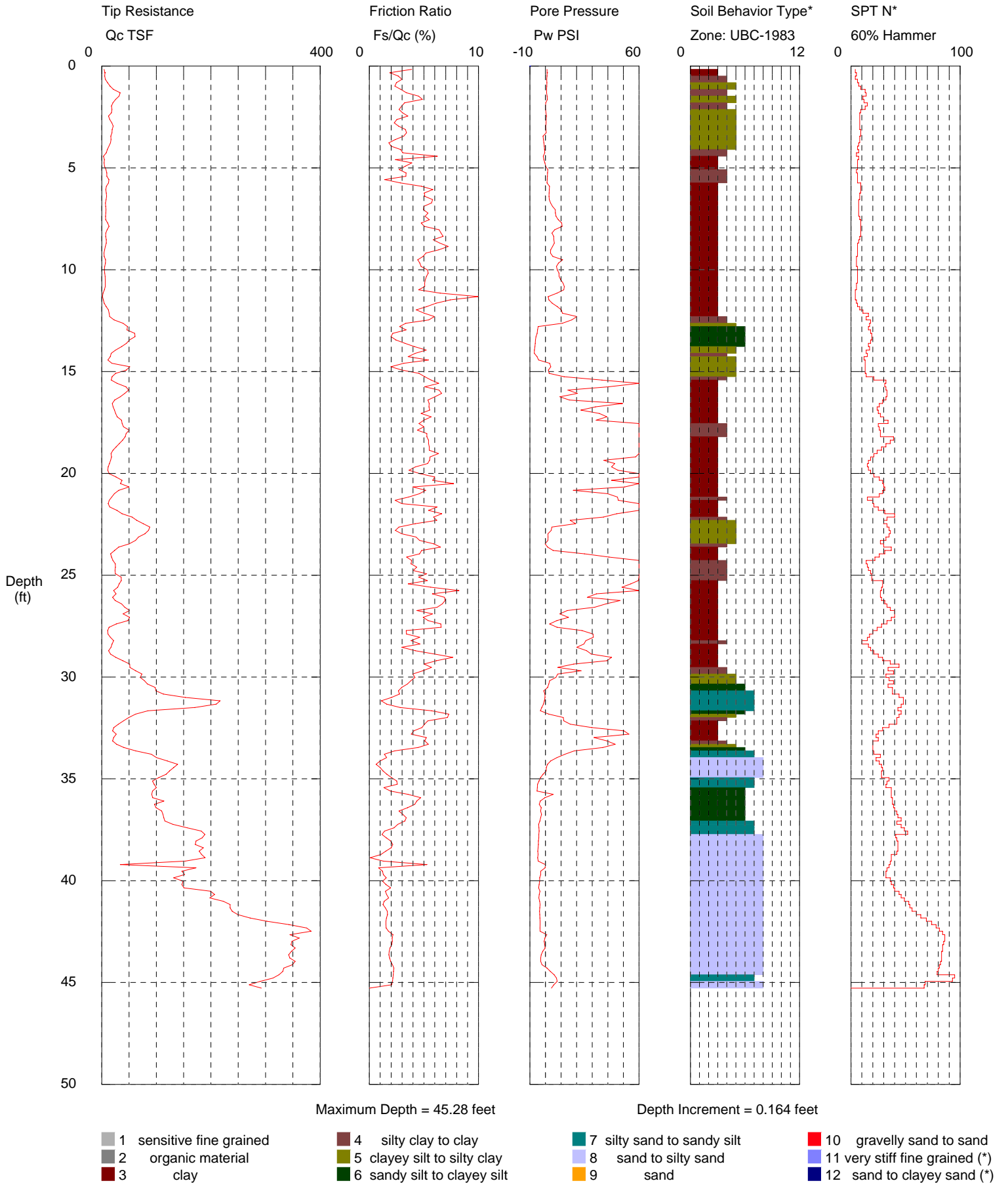
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT109
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 11:52:12 AM
 Location: LEVEE
 Job Number: ENG-502

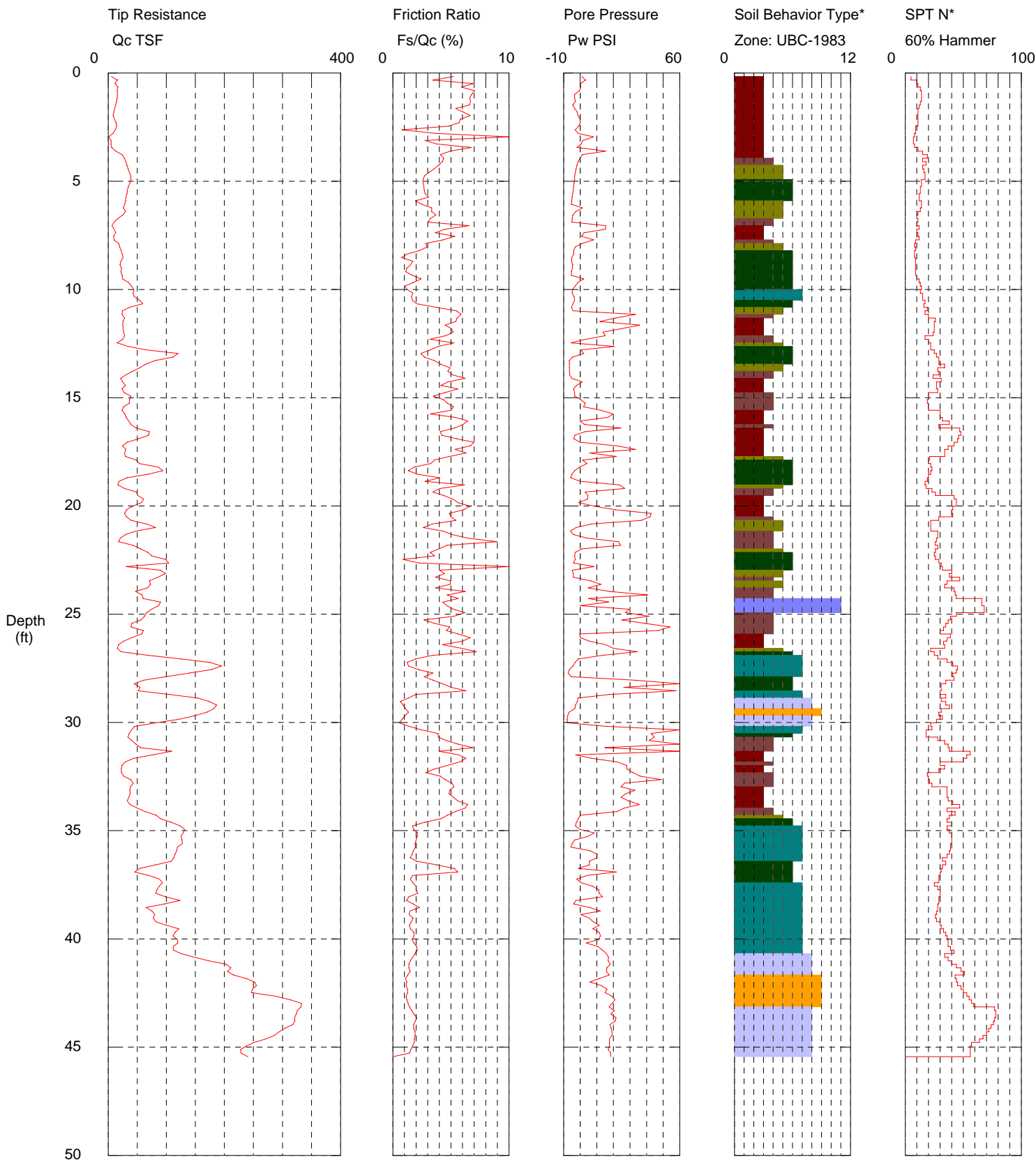


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT110
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 12:36:30 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

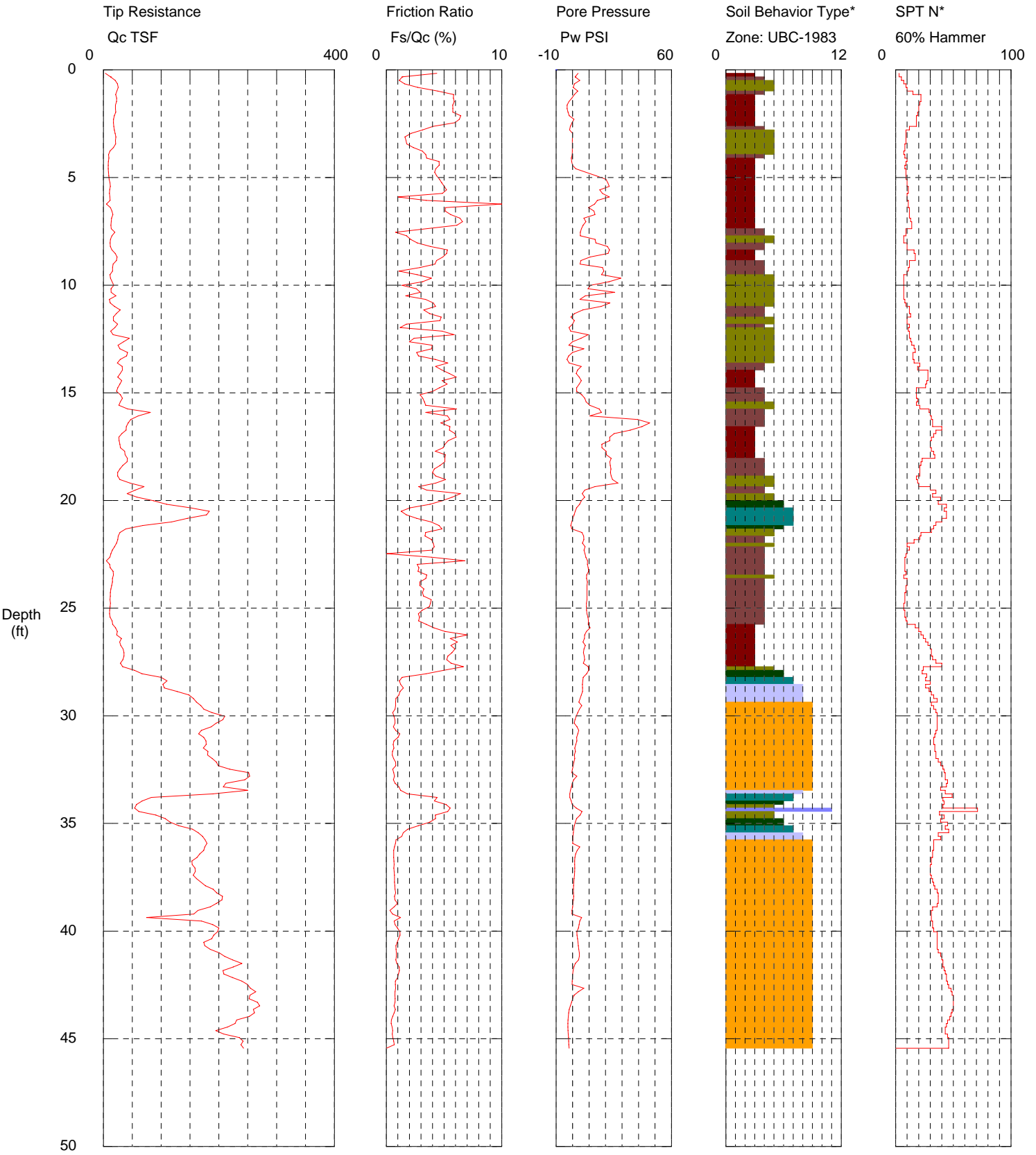
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT111
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 2:12:39 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

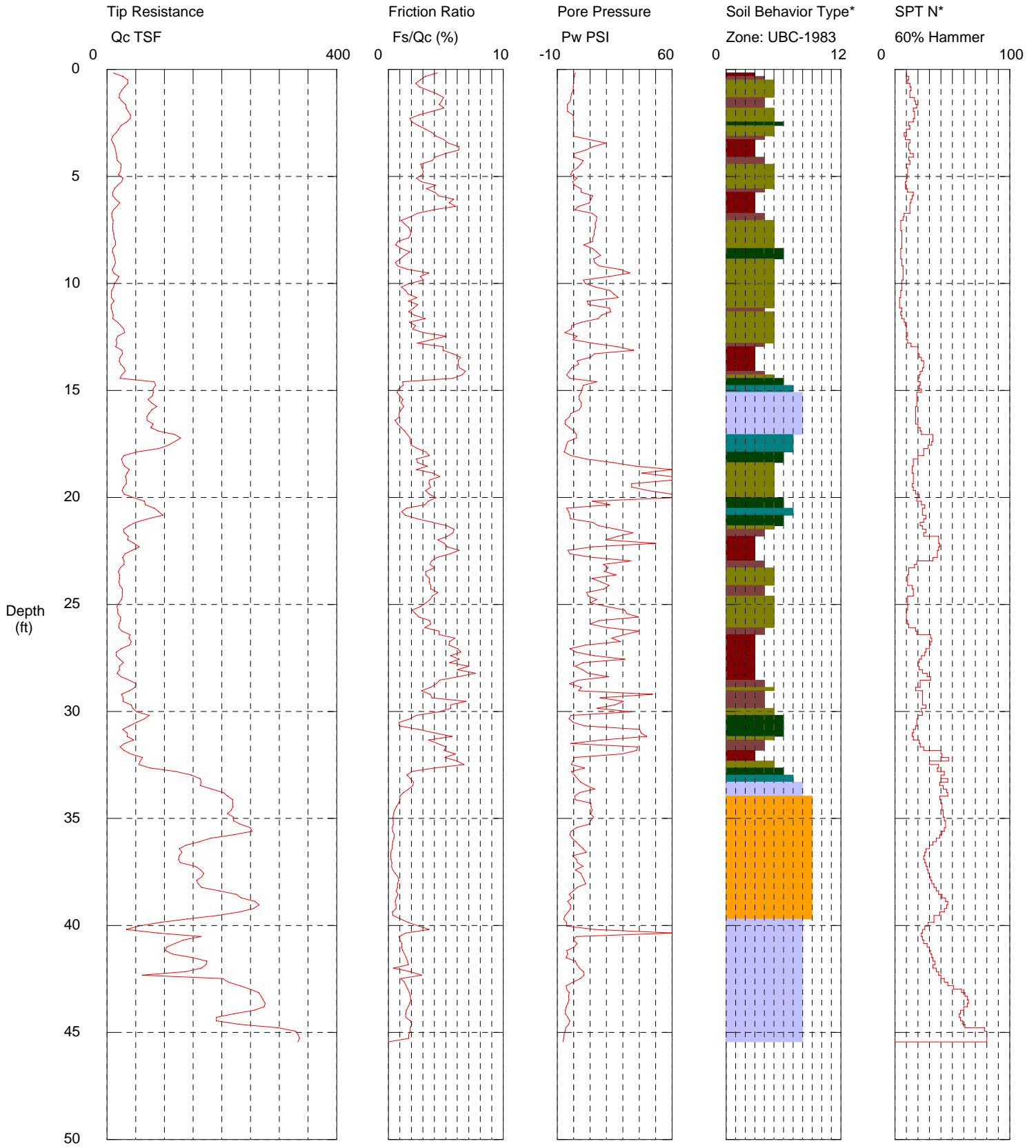
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT112
 Cone Used: DDG1316

CPT Date/Time: 2/6/2015 1:41:33 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

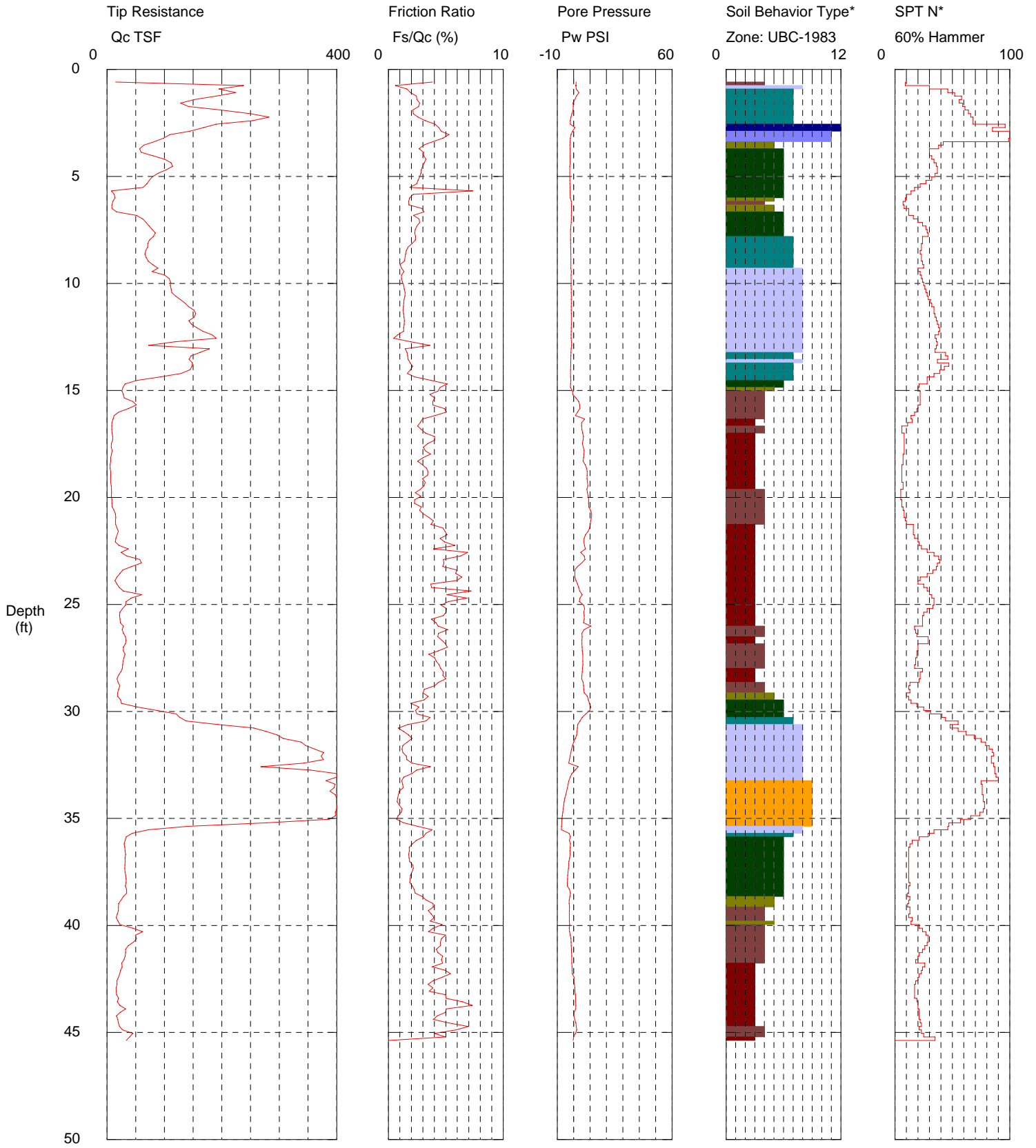
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT113
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 7:26:32 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.37 feet

Depth Increment = 0.164 feet

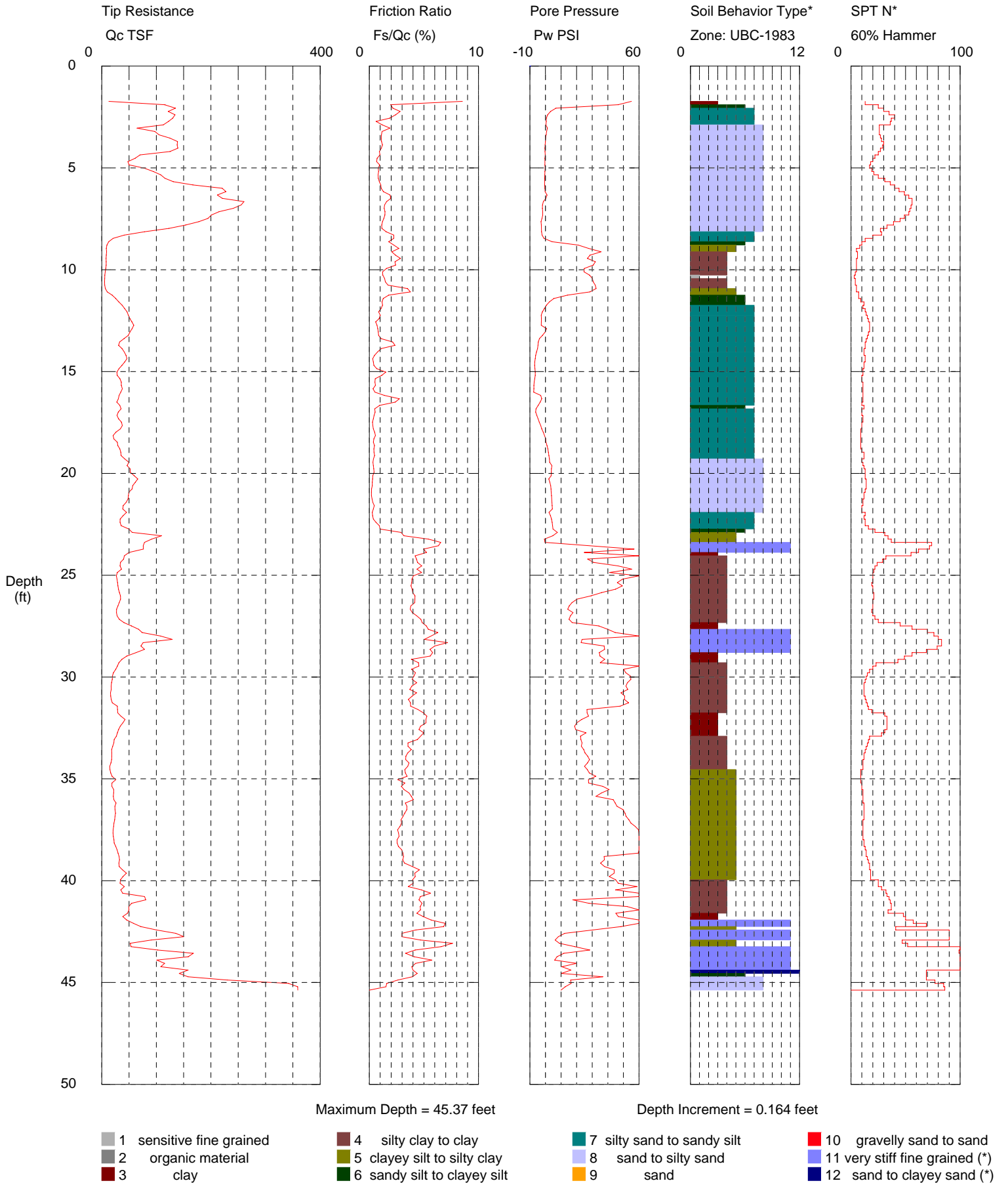
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT114
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 8:40:57 AM
 Location: LEVEE
 Job Number: ENG-502

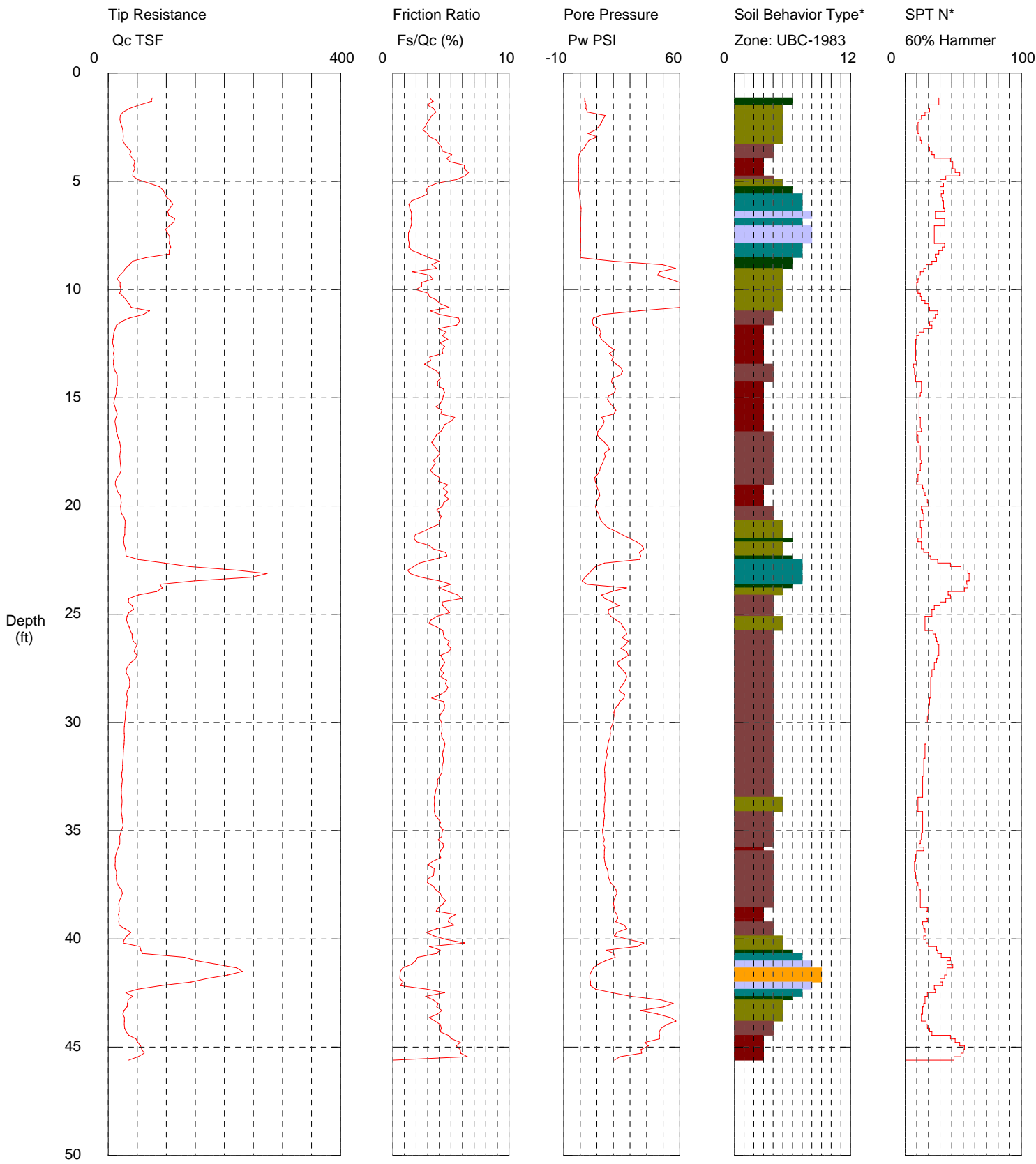


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT115
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 9:34:47 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.60 feet

Depth Increment = 0.164 feet

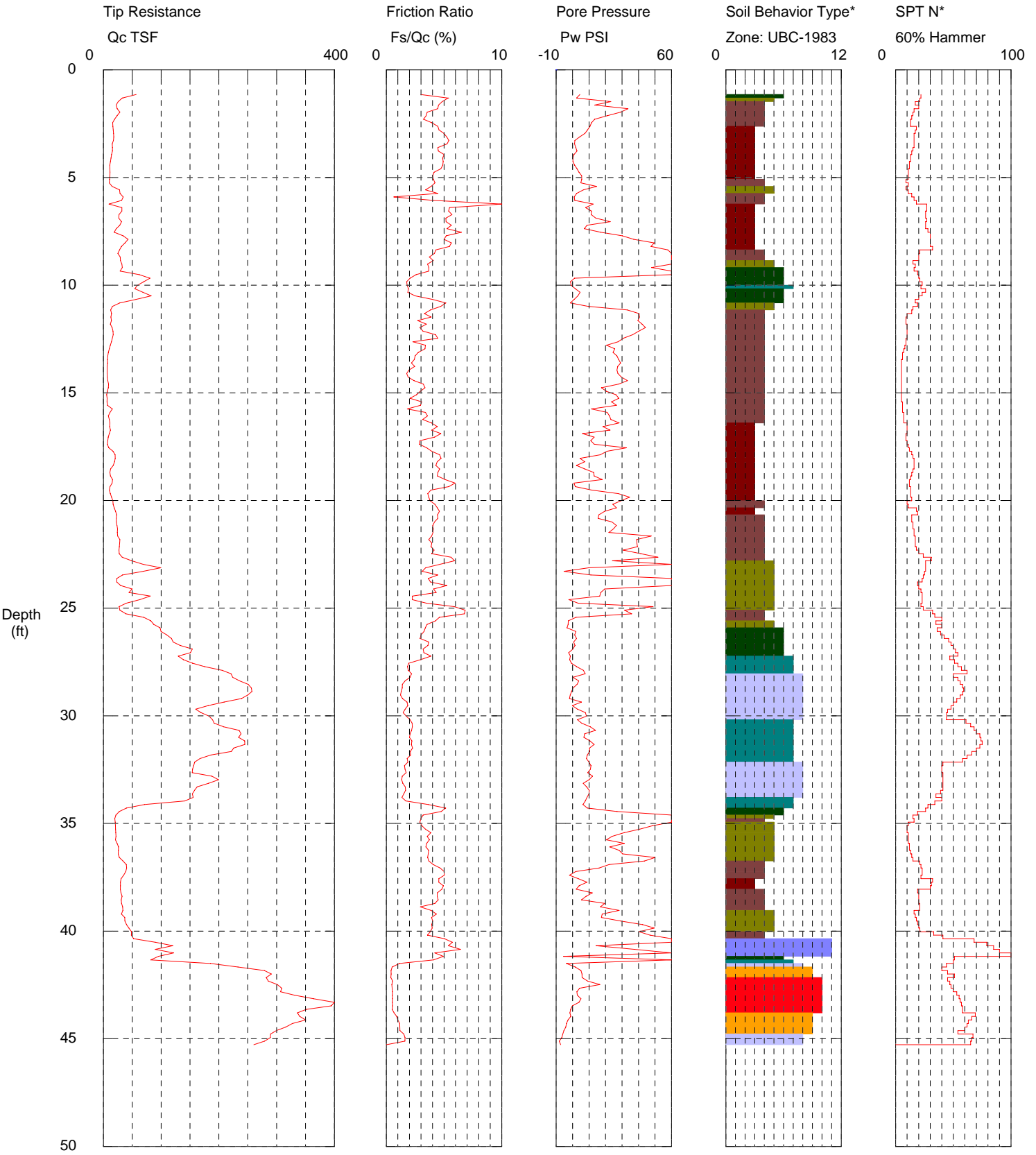
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT116
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 10:20:33 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

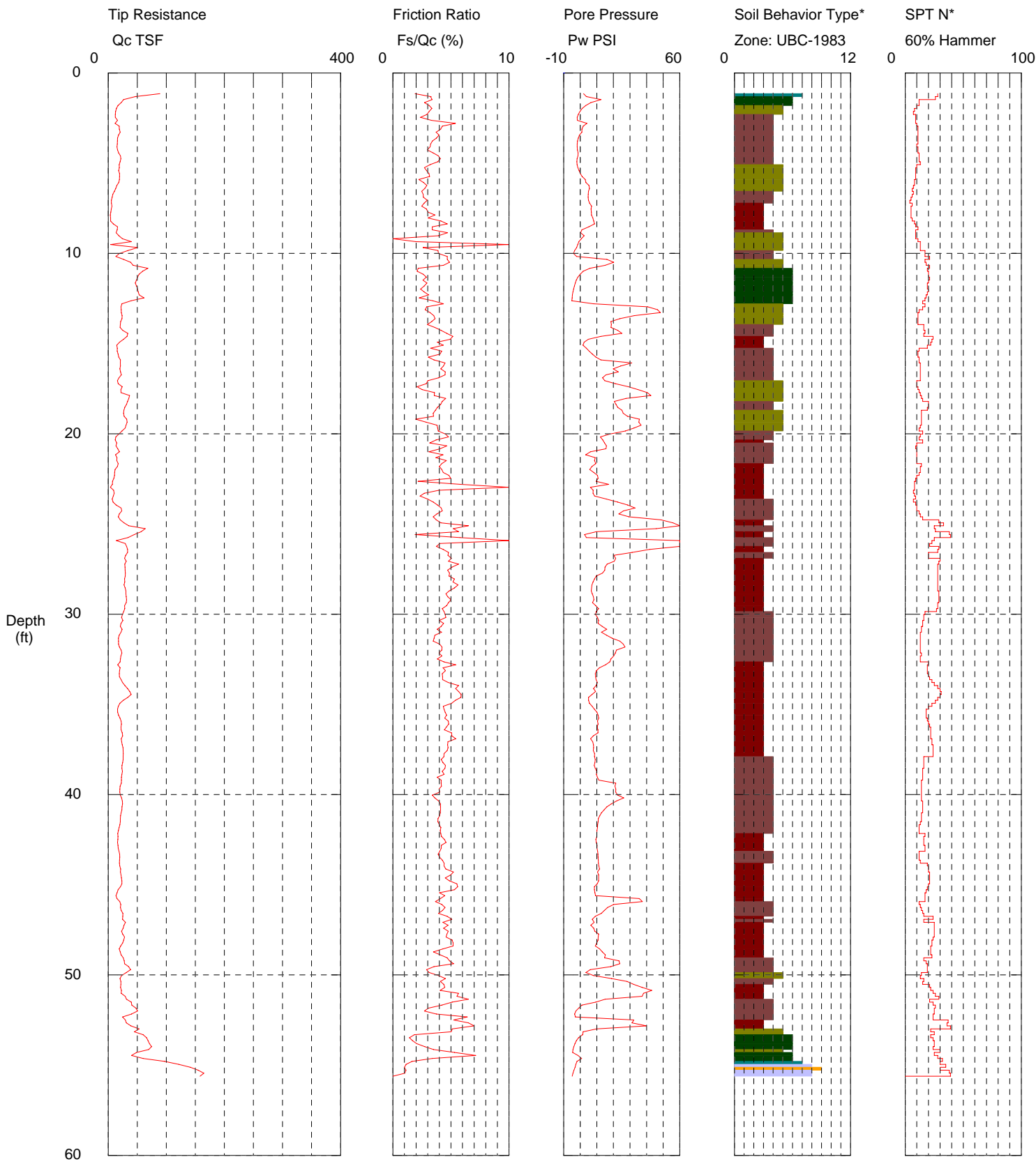
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT117
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 11:19:43 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 55.61 feet

Depth Increment = 0.164 feet

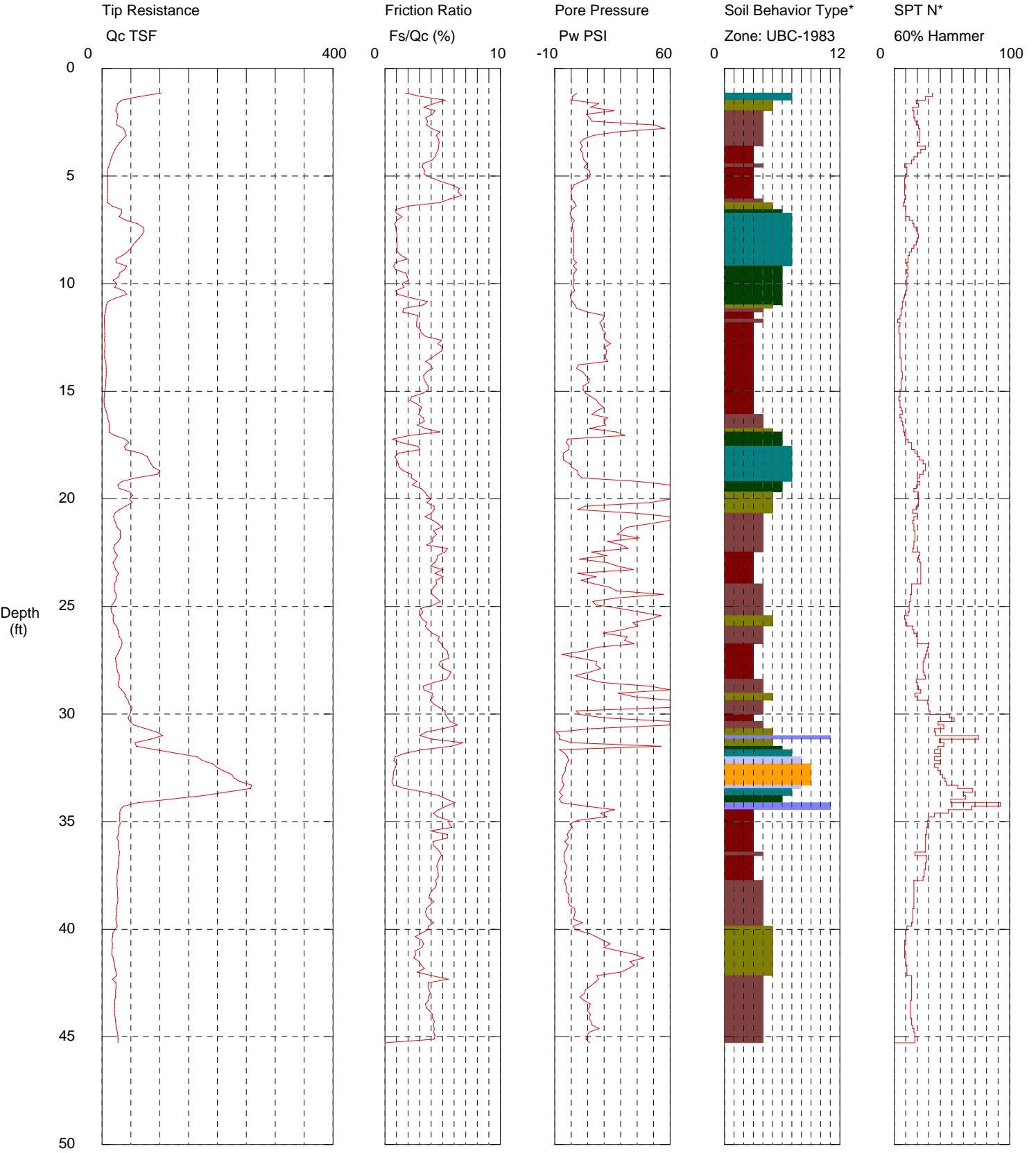
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT118
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 12:33:51 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

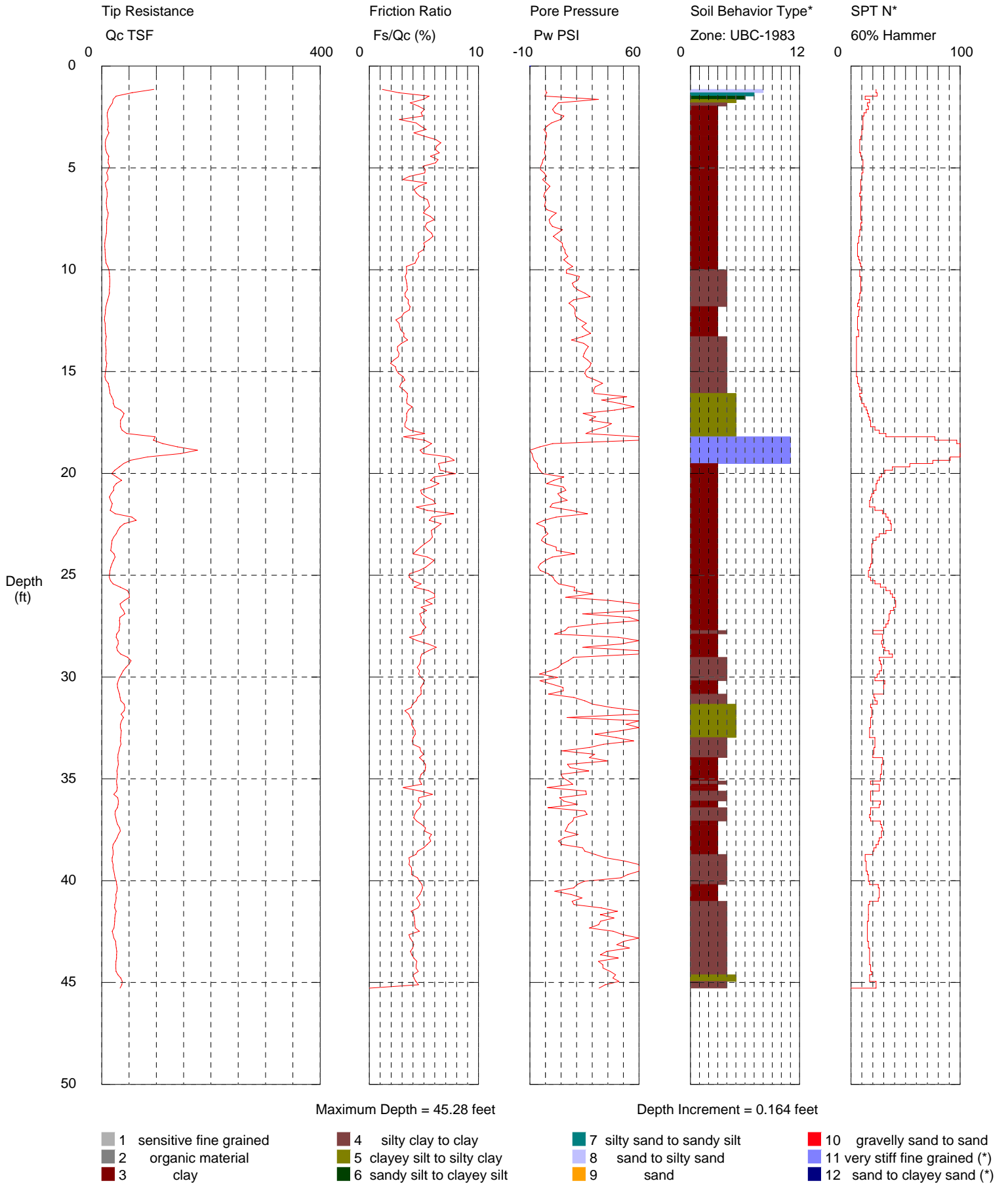
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT119
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 1:26:23 PM
 Location: LEVEE
 Job Number: ENG-502

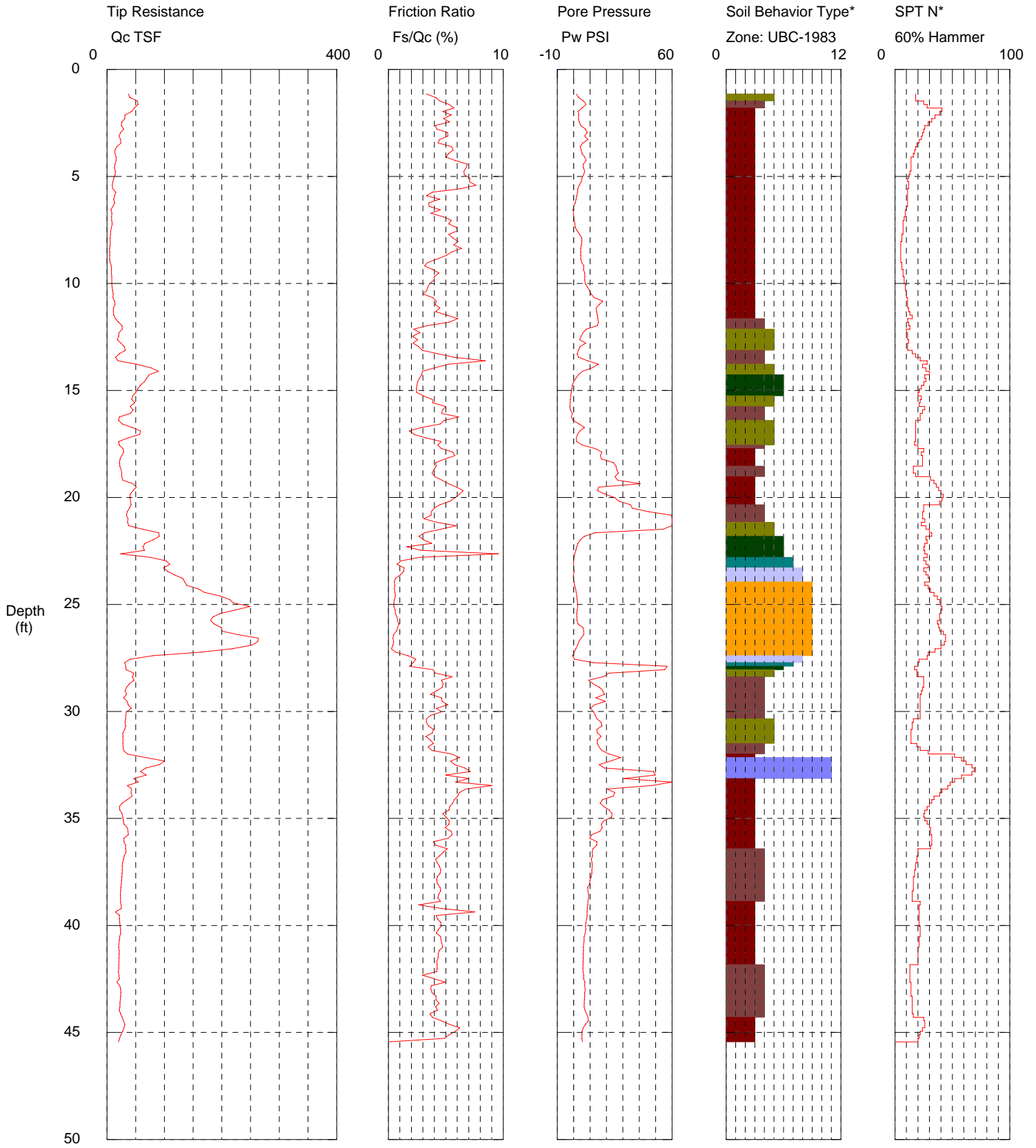


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT120
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 2:07:56 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.44 feet

Depth Increment = 0.164 feet

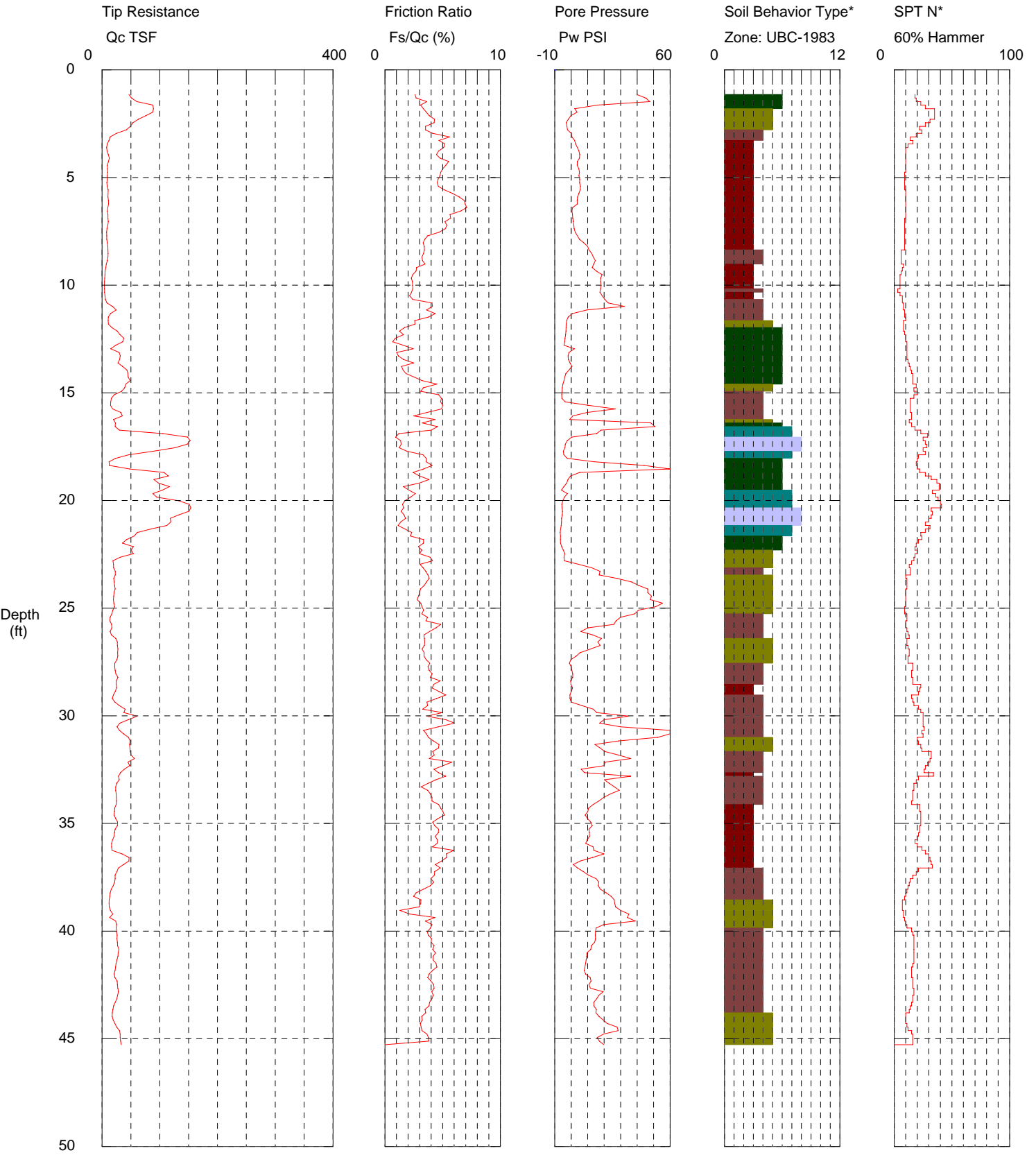
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT121
 Cone Used: DDG1316

CPT Date/Time: 2/7/2015 2:53:02 PM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.28 feet

Depth Increment = 0.164 feet

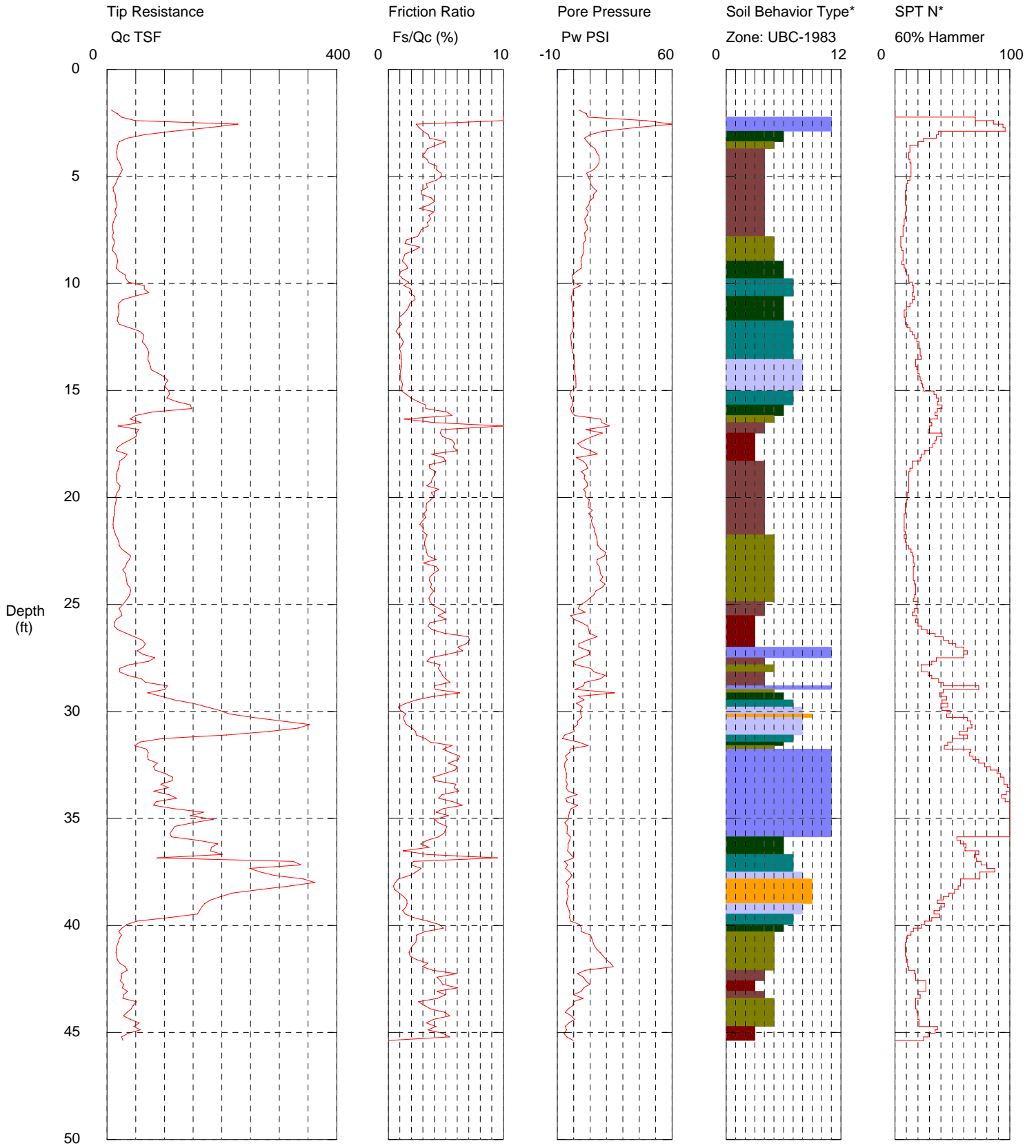
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT122
 Cone Used: DDG1316

CPT Date/Time: 2/8/2015 7:25:11 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.37 feet

Depth Increment = 0.164 feet

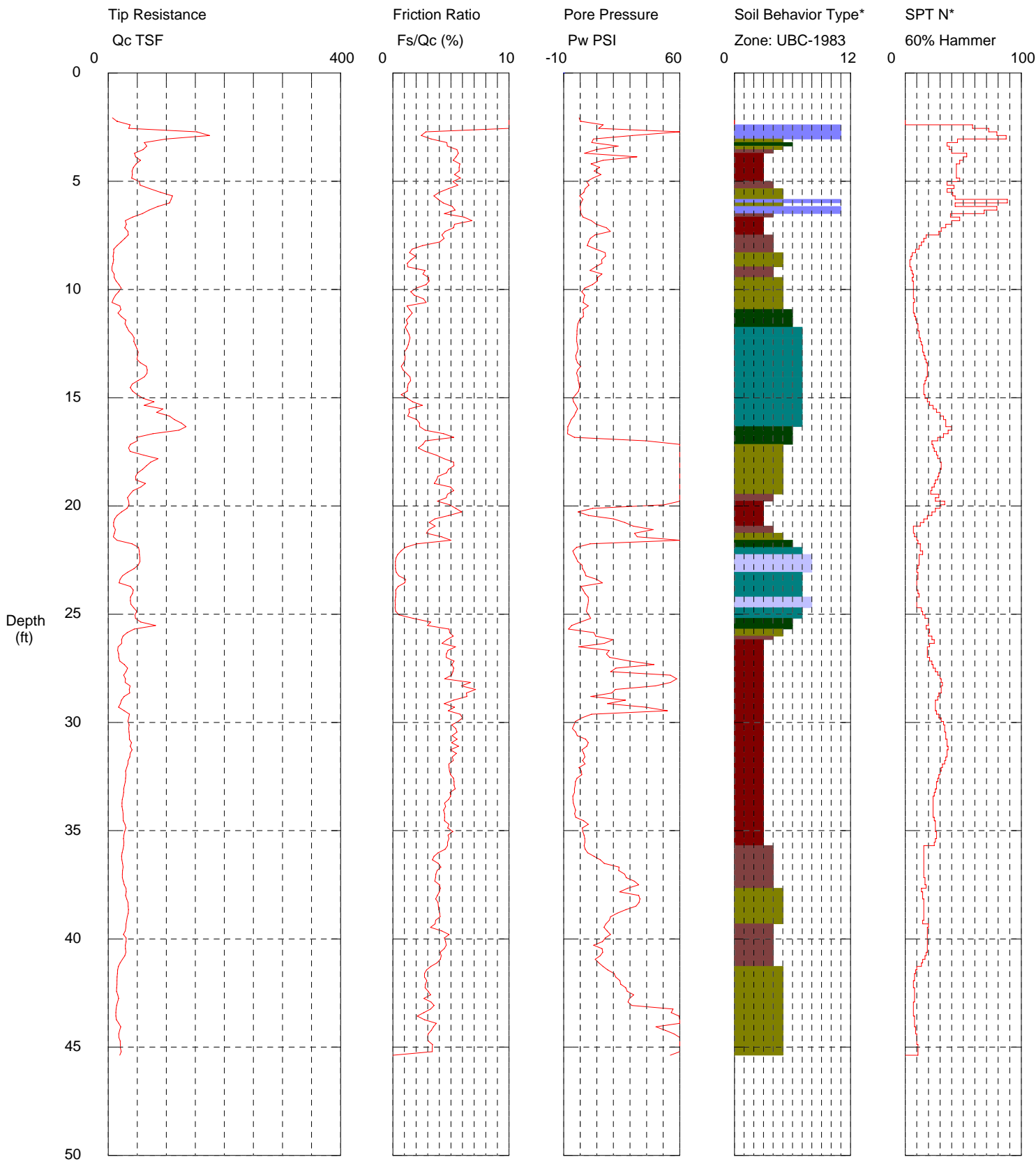
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT123
 Cone Used: DDG1316

CPT Date/Time: 2/8/2015 8:19:54 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.37 feet

Depth Increment = 0.164 feet

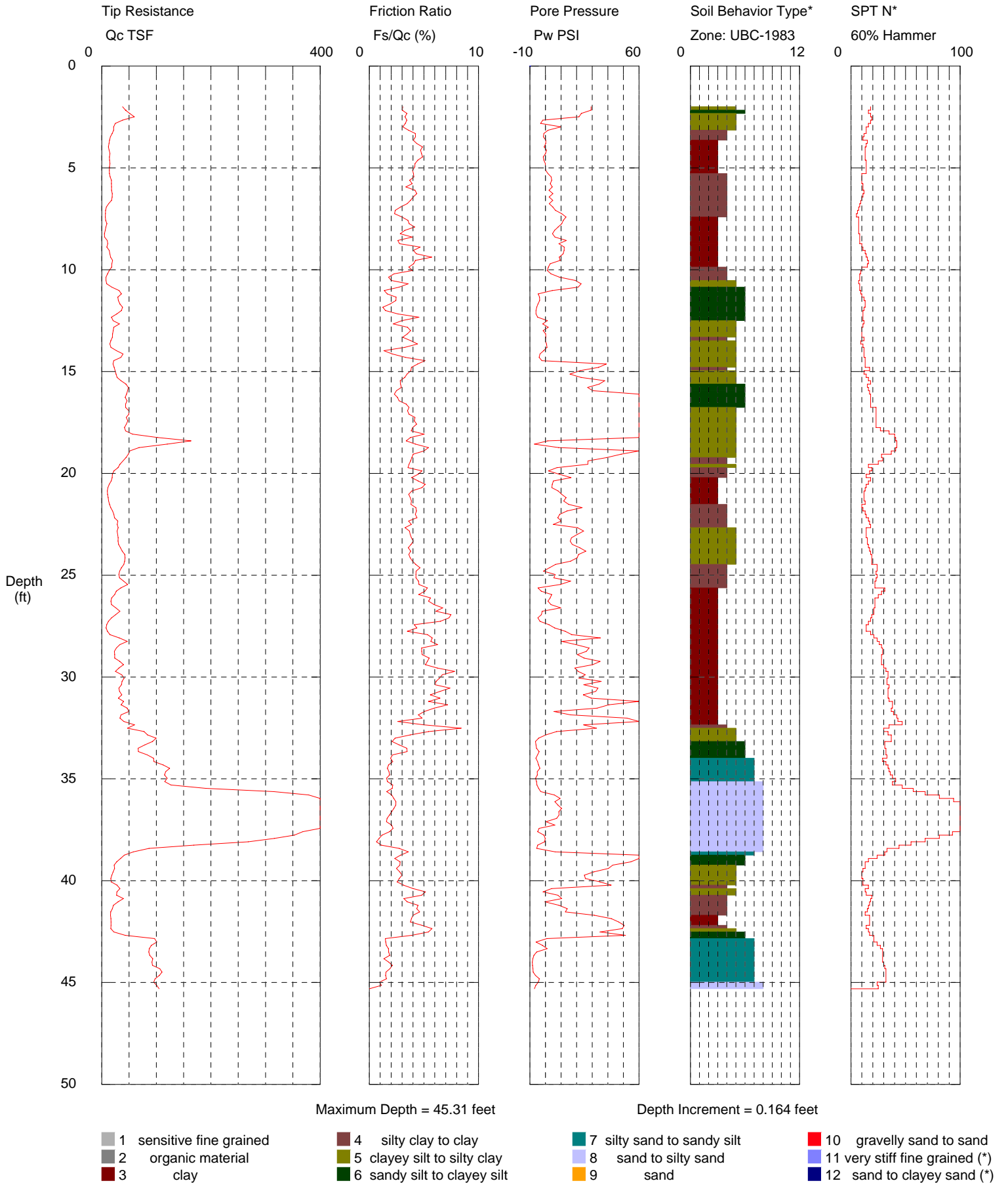
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT124
 Cone Used: DDG1316

CPT Date/Time: 2/8/2015 9:01:05 AM
 Location: LEVEE
 Job Number: ENG-502

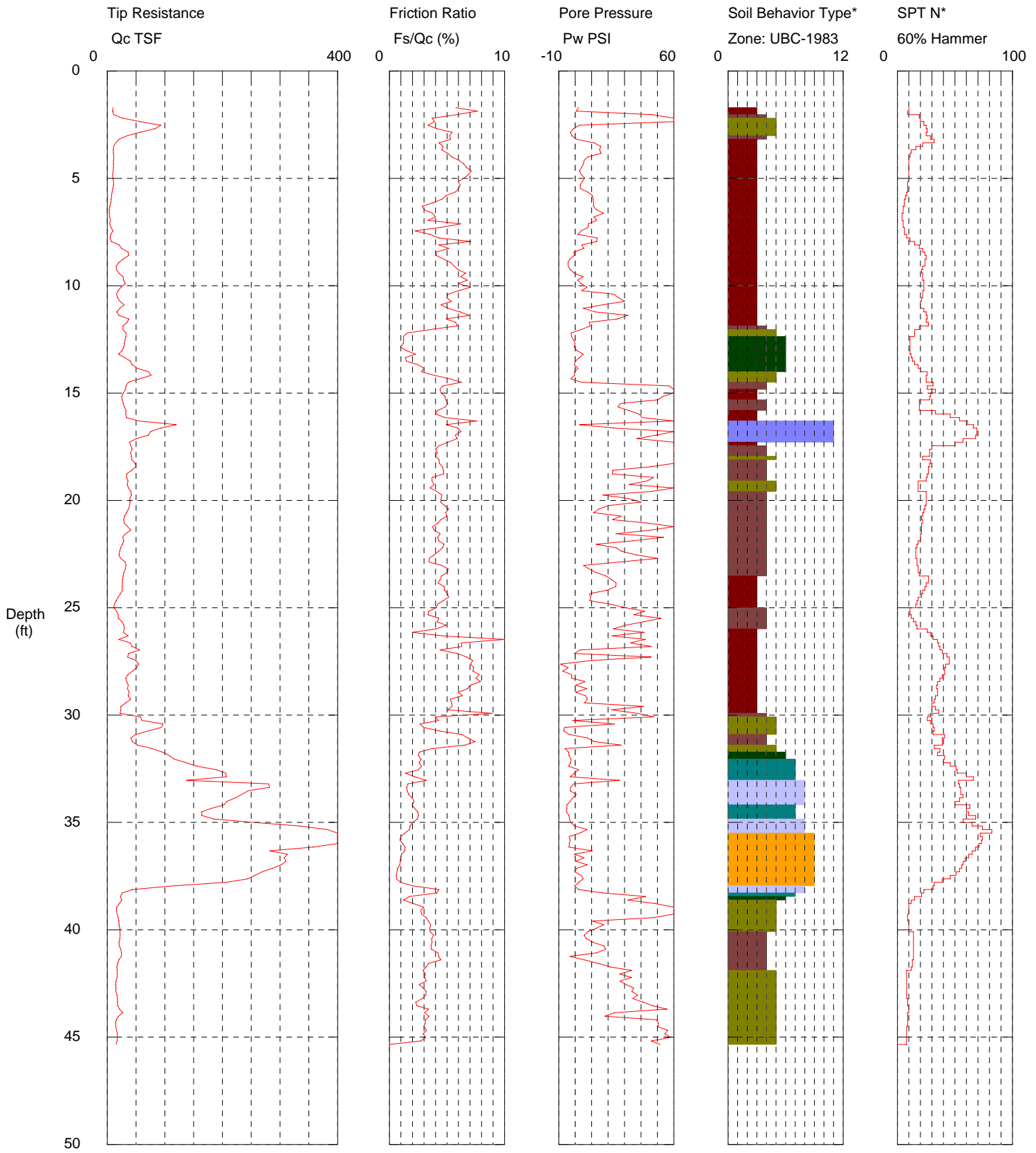


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Rocco
 Sounding: 7-CPT125
 Cone Used: DDG1316

CPT Date/Time: 2/8/2015 10:07:54 AM
 Location: LEVEE
 Job Number: ENG-502



Maximum Depth = 45.34 feet

Depth Increment = 0.164 feet

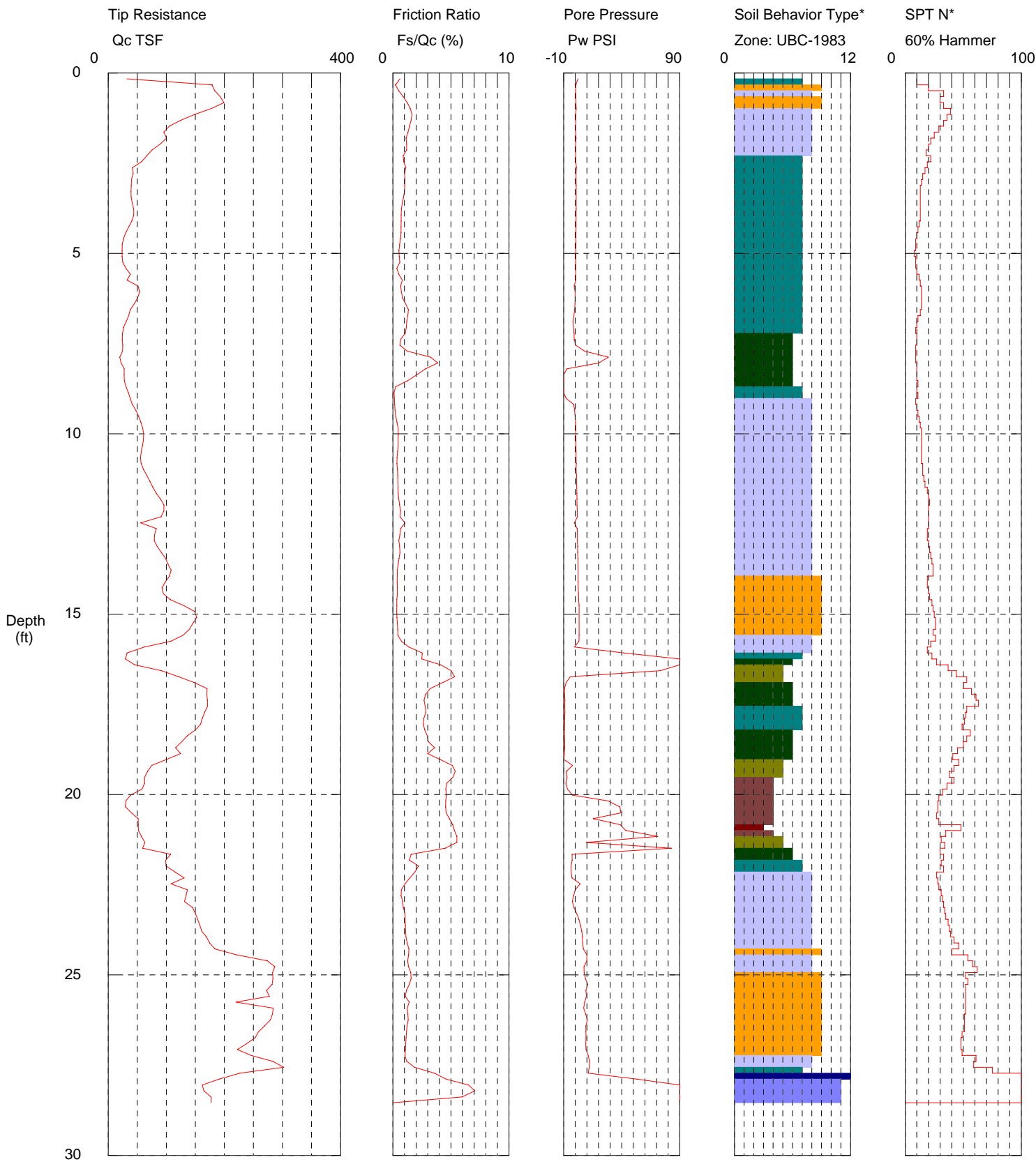
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT126
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 11:42:02 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525



Maximum Depth = 28.54 feet

Depth Increment = 0.164 feet

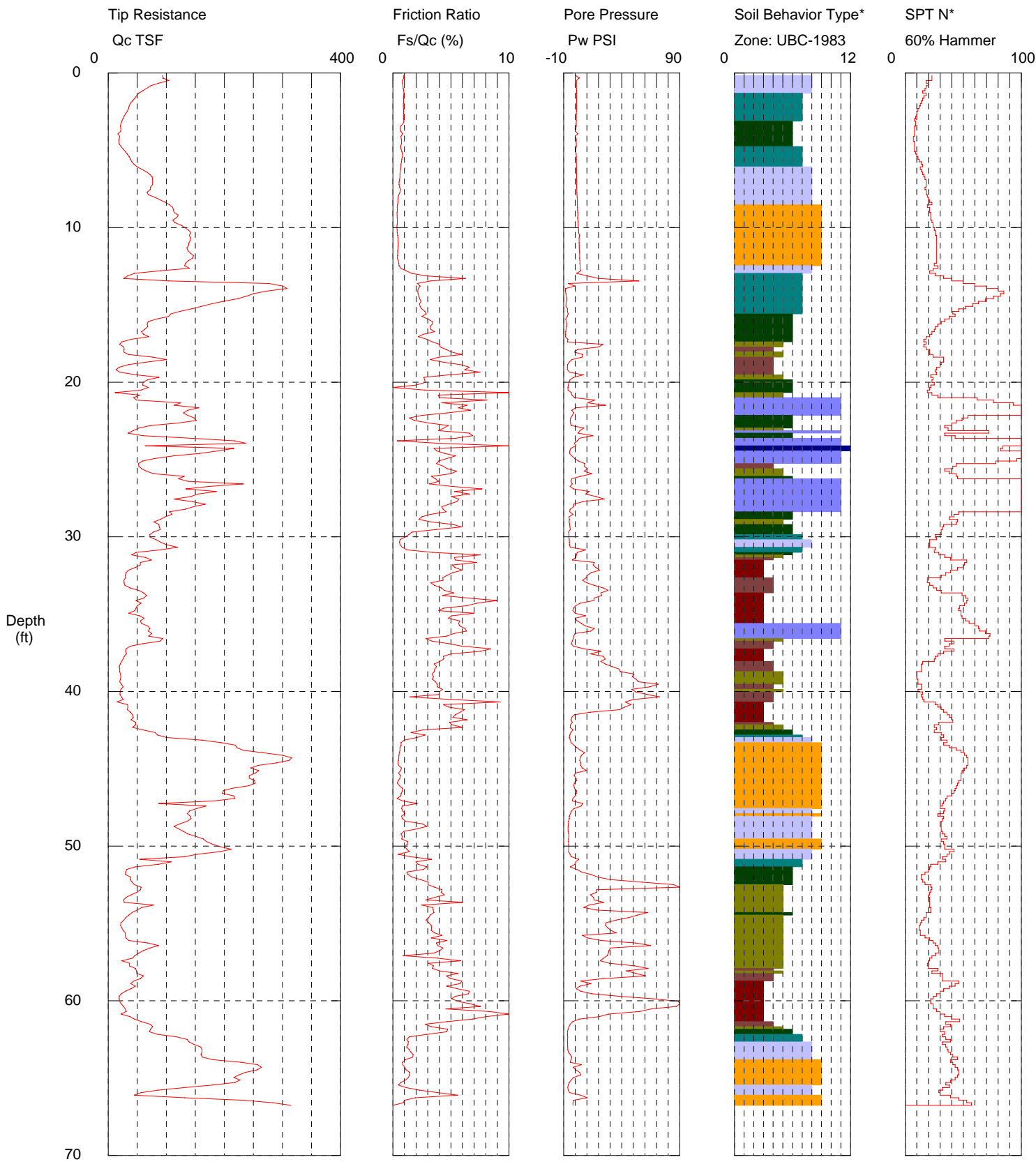
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT127
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 6:06:51 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525



Maximum Depth = 66.77 feet

Depth Increment = 0.164 feet

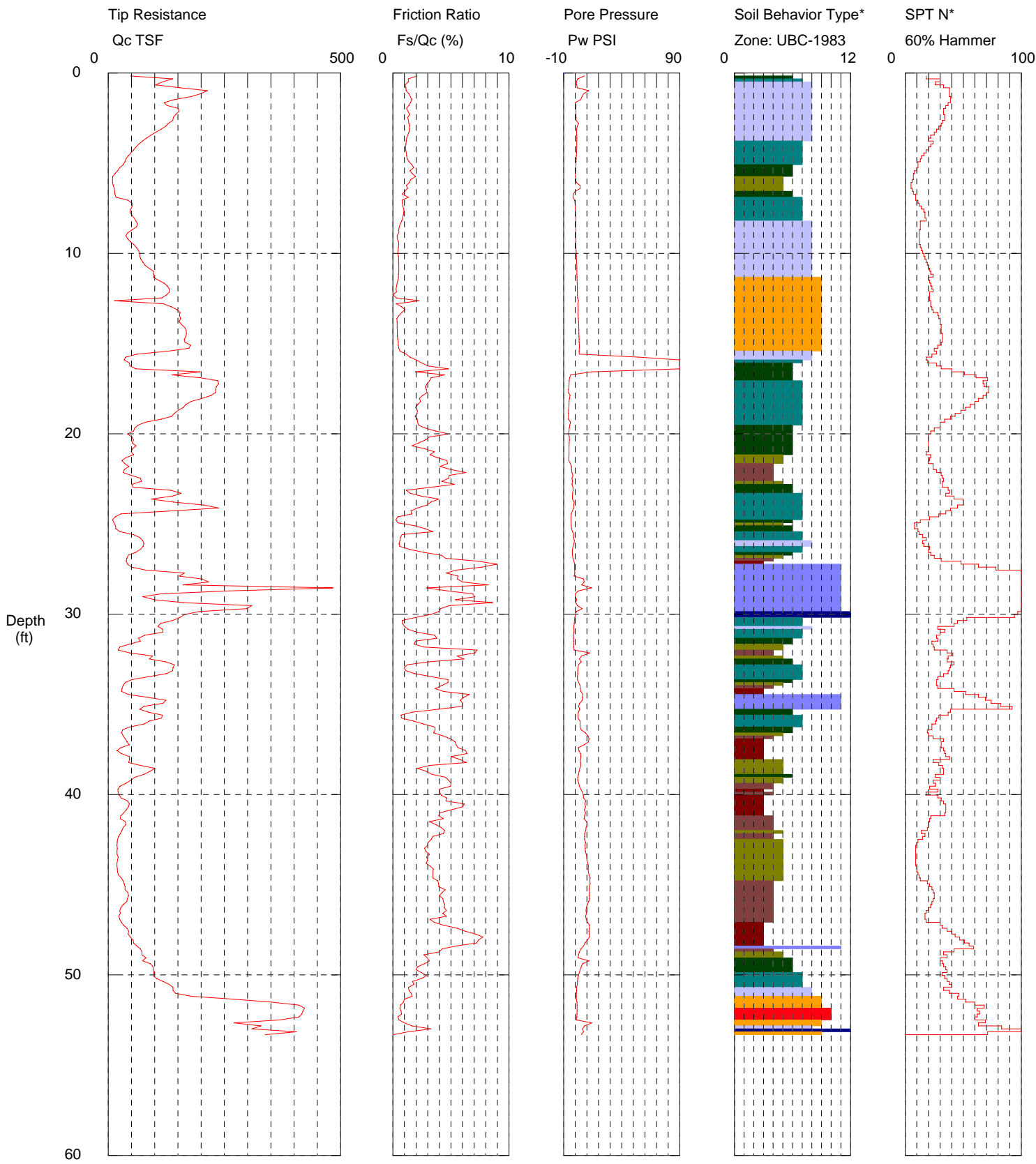
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT128
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 6:49:05 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525



Maximum Depth = 53.31 feet

Depth Increment = 0.164 feet

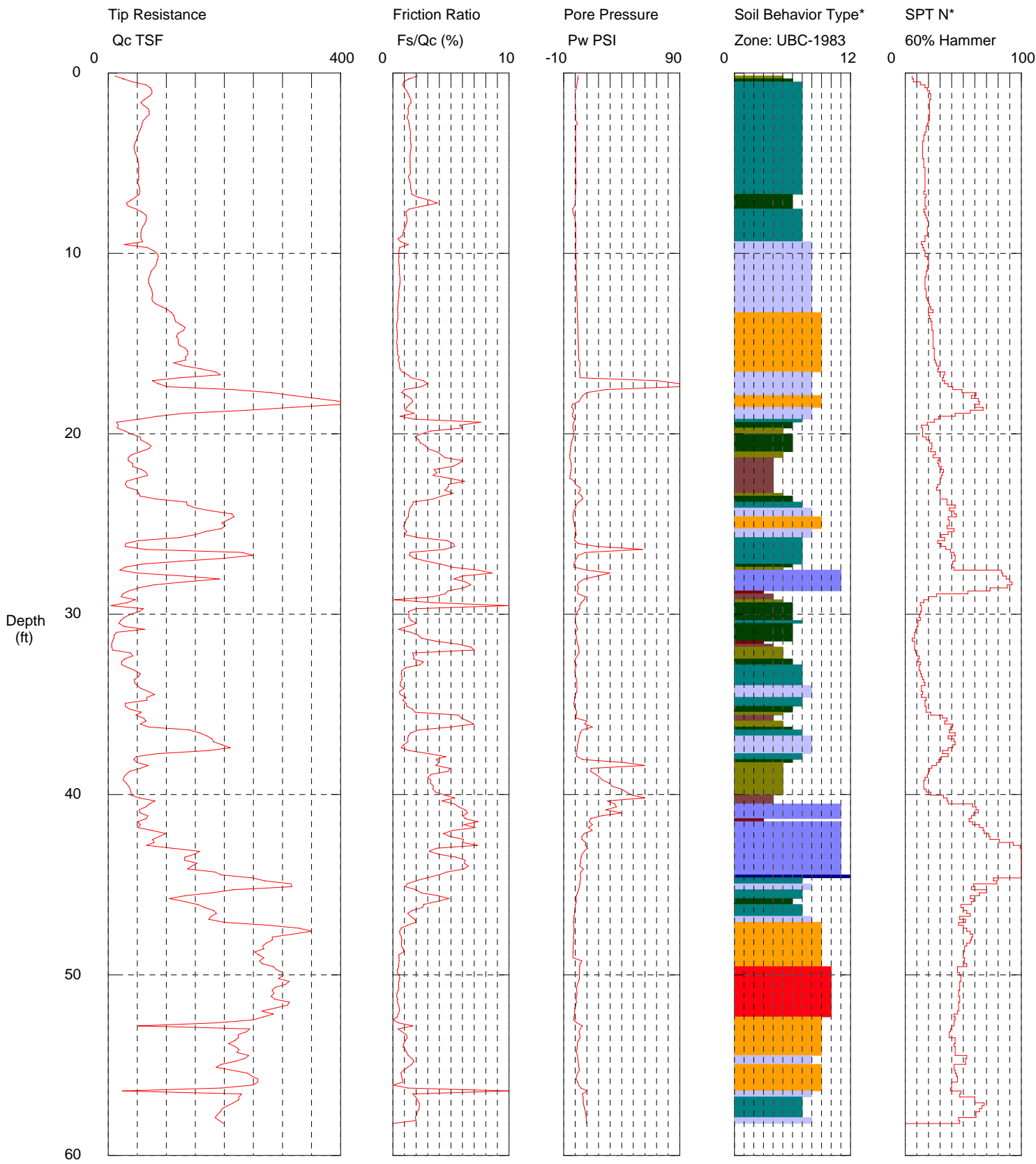
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT129
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 7:23:42 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525



Maximum Depth = 58.23 feet

Depth Increment = 0.164 feet

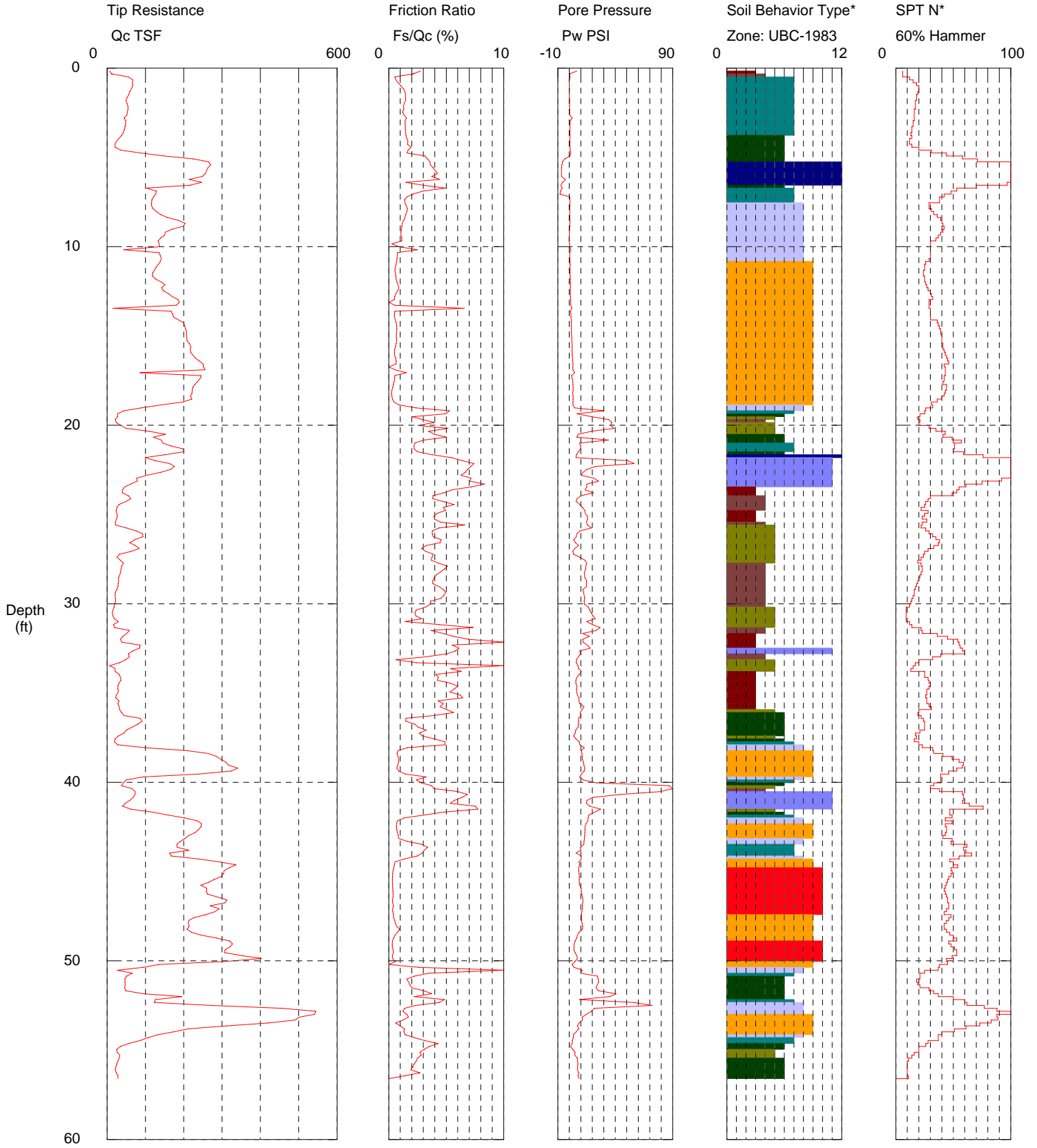
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|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT130
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 7:57:13 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525



Maximum Depth = 56.59 feet

Depth Increment = 0.164 feet

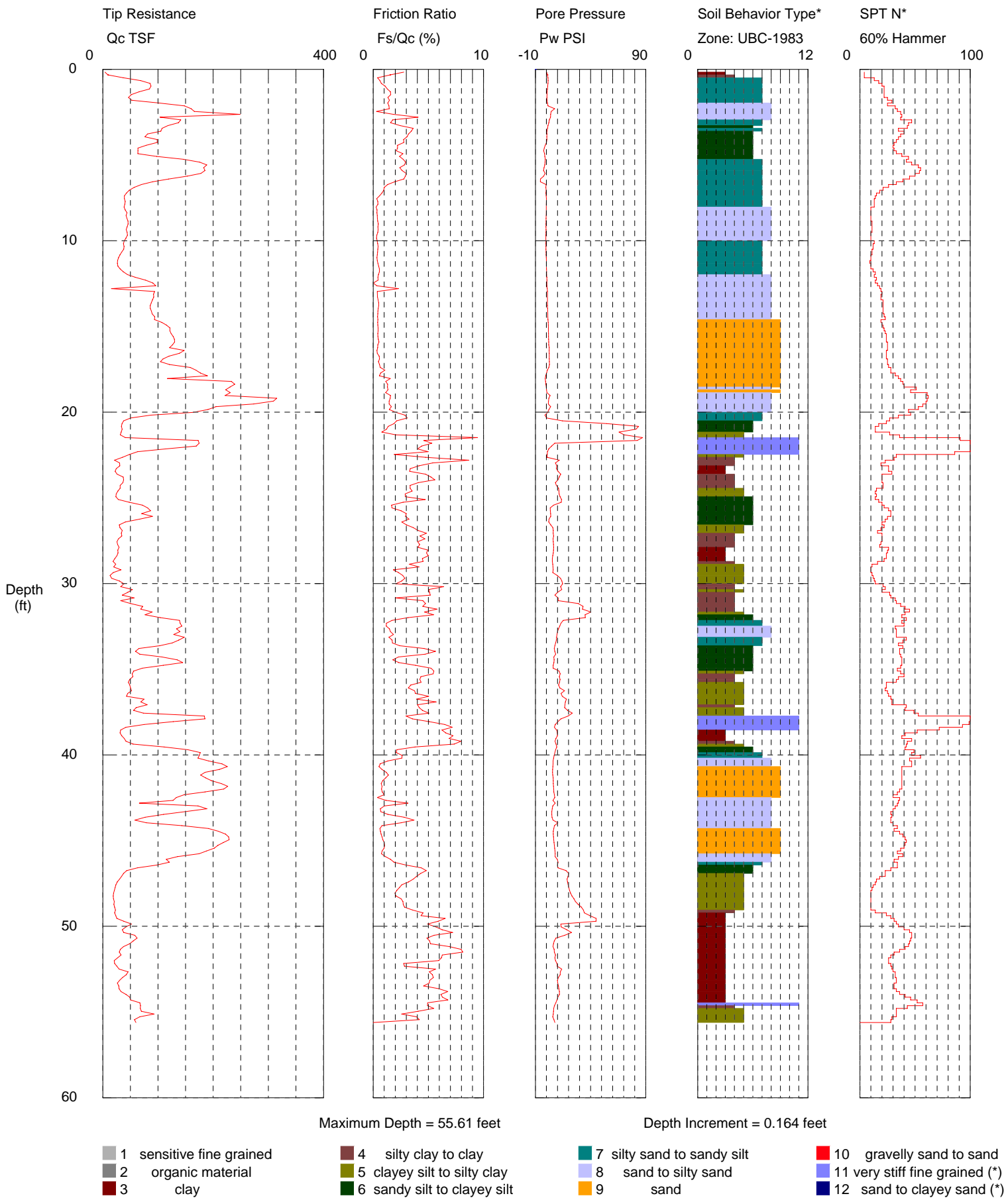
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT131
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 8:34:57 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525

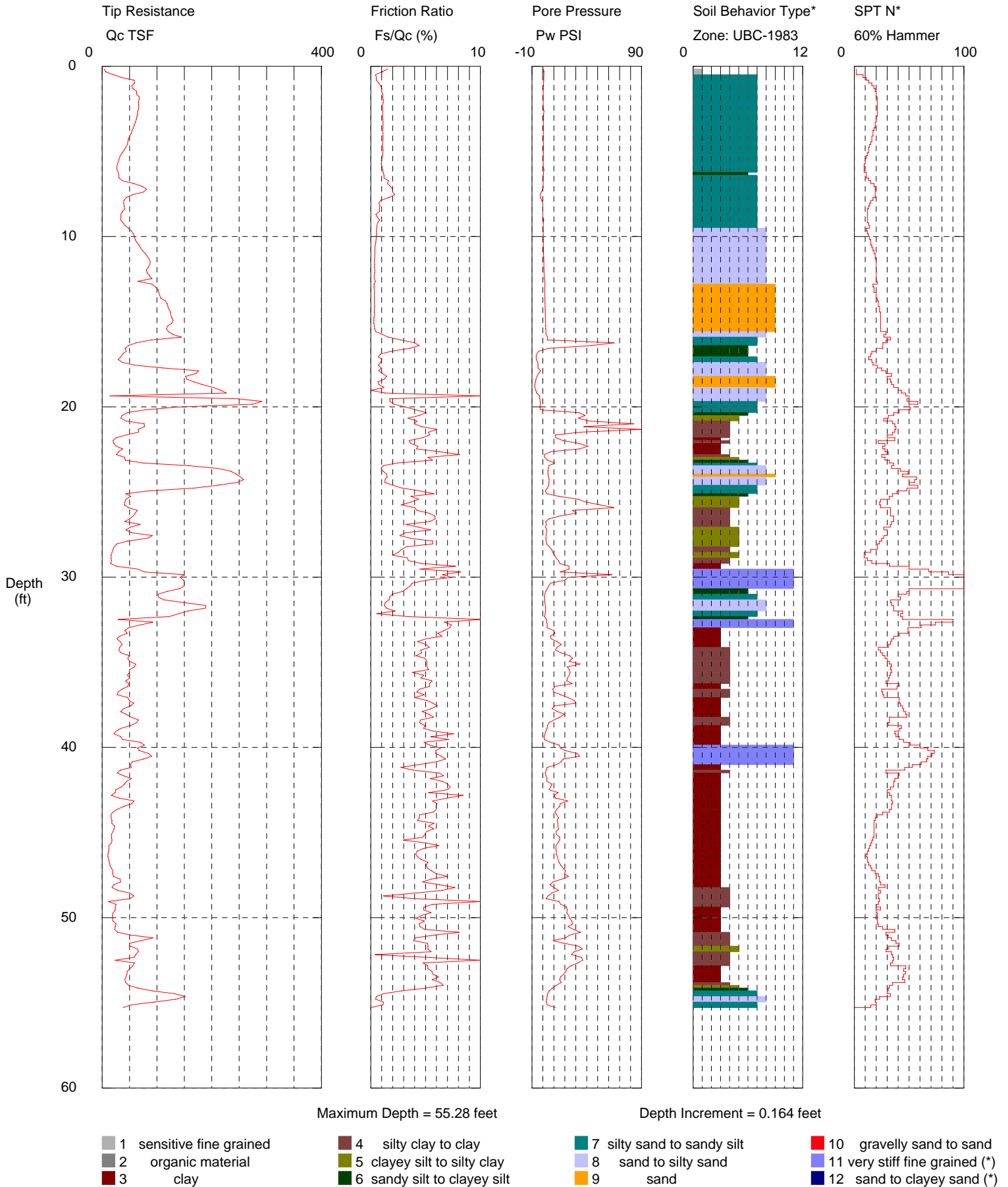


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT132
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 9:10:22 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525

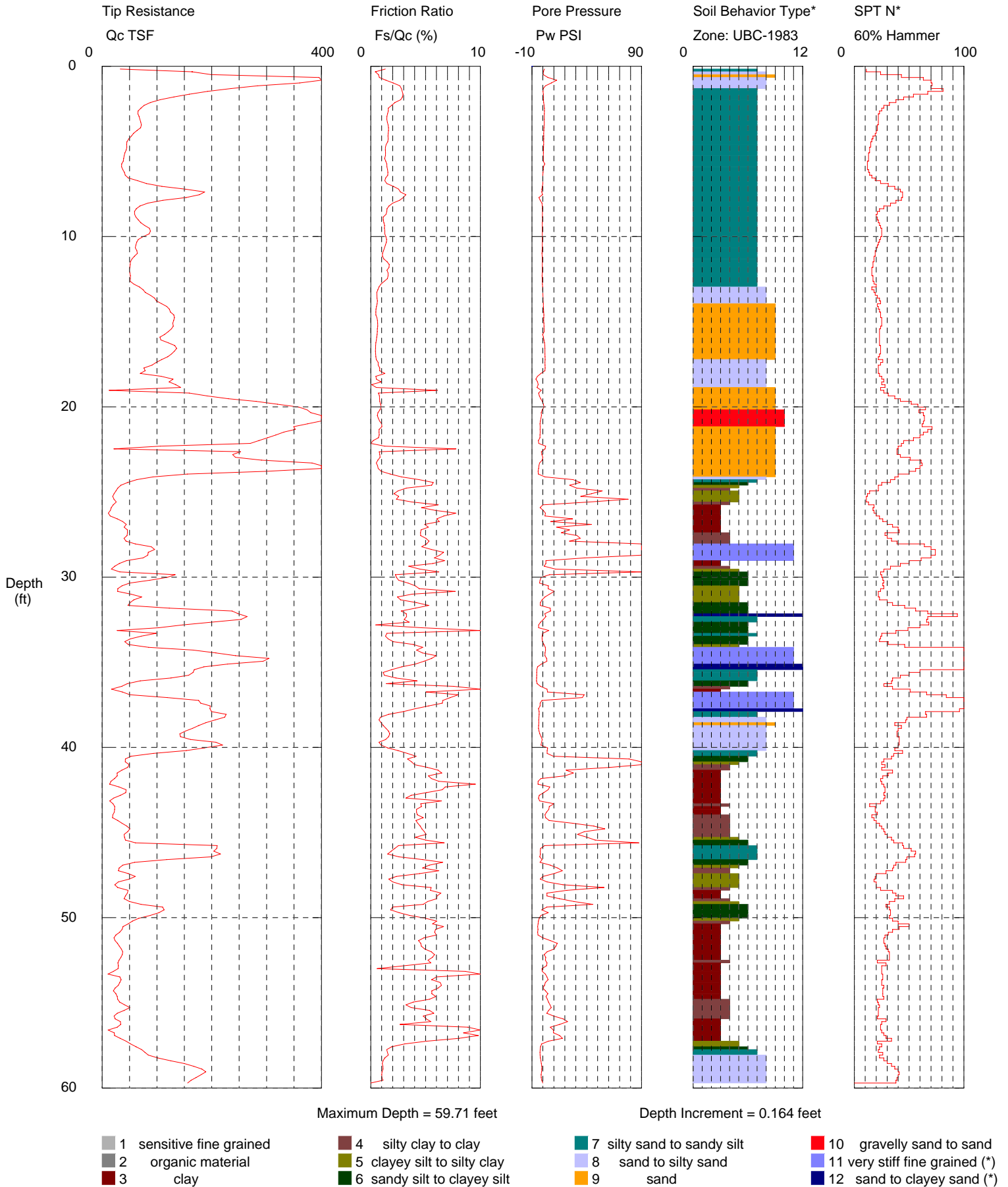


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT133
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 10:55:46 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525

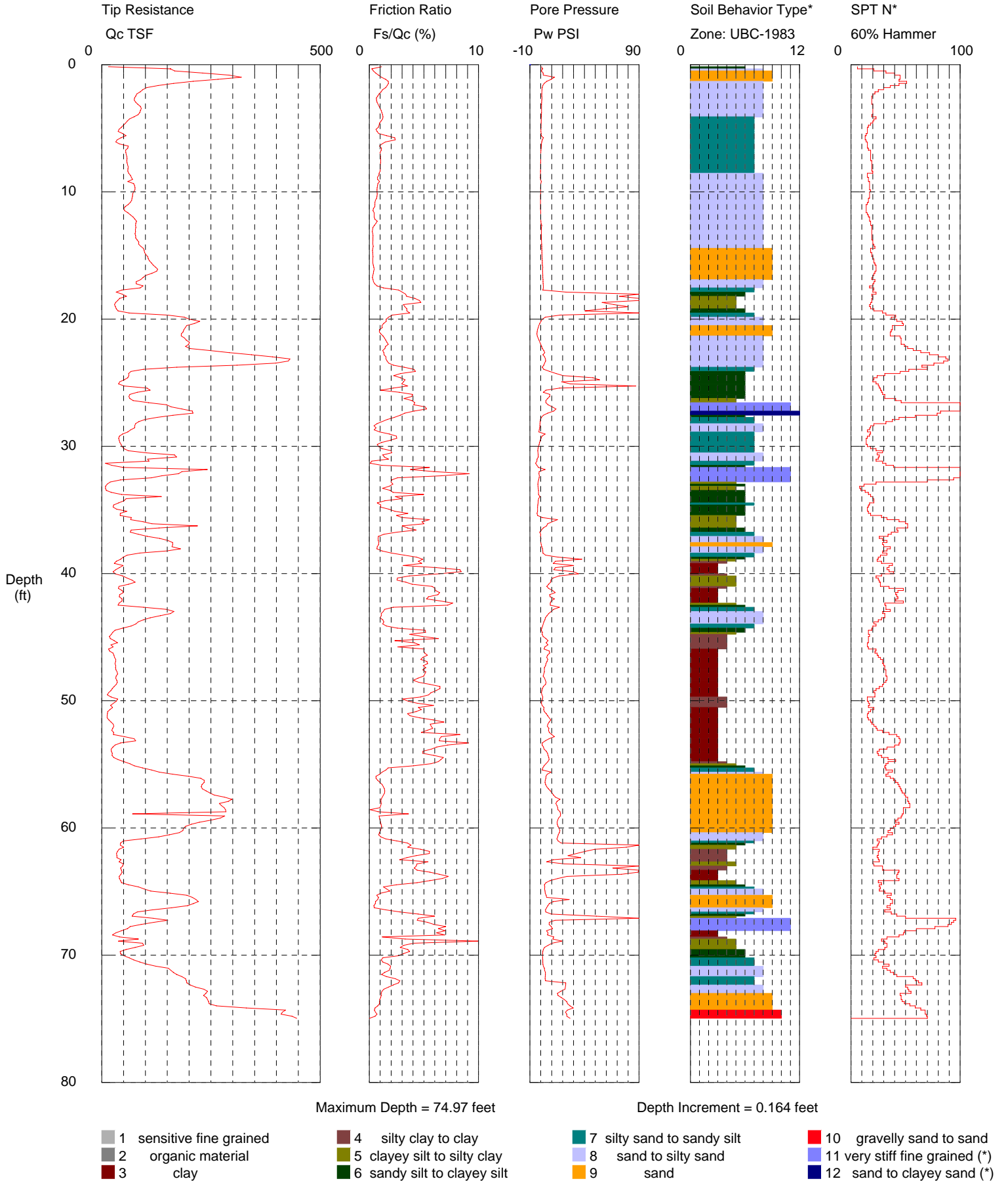


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT134
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 10:07:16 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525

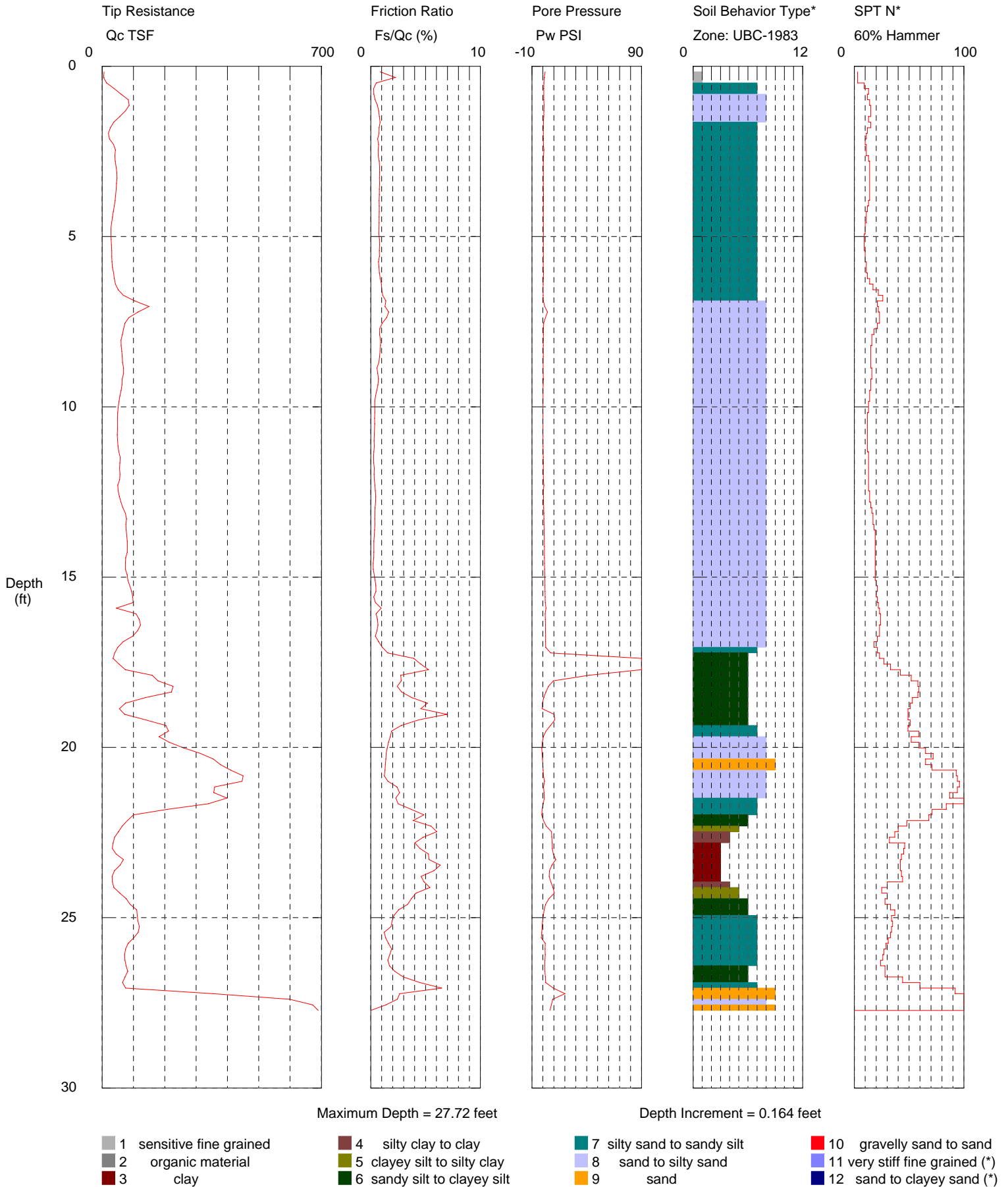


*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 7-CPT135
 Cone Used: DSG1111

CPT Date/Time: 7/11/2015 9:44:17 AM
 Location: San Joaquin East Levee
 Job Number: ENG-525



*Soil behavior type and SPT based on data from UBC-1983

FIELD EXPLORATION LOGS
RECLAMATION DISTRICT No. 17



KEY TO BORING LOGS

MAJOR TYPES		DESCRIPTION	
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW - Well graded gravels or gravel-sand mixtures GP - Poorly graded gravels or gravel-sand mixtures
		GRAVELS WITH OVER 12 % FINES	GM - Silty gravels, gravel-sand and silt mixtures GC - Clayey gravels, gravel-sand and clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW - Well graded sands, or gravelly sand mixtures SP - Poorly graded sands or gravelly sand mixtures
		SANDS WITH OVER 12 % FINES	SM - Silty sand, sand-silt mixtures SC - Clayey sand, sand-clay mixtures
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		ML - Inorganic silt with low to medium plasticity CL - Inorganic clay with low to medium plasticity OL - Low plasticity organic silts and clays
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %		MH - Elastic silt with high plasticity CH - Fat clay with high plasticity OH - Highly plastic organic silts and clays
	HIGHLY ORGANIC SOILS		PT - Peat and other highly organic soils

For fine-grained soils with 15 to 29% retained on the #200 sieve, the words "with sand" or "with gravel" (whichever is predominant) are added to the group name.

For fine-grained soil with >30% retained on the #200 sieve, the words "sandy" or "gravelly" (whichever is predominant) are added to the group name.

GRAIN SIZES

U.S. STANDARD SERIES SIEVE SIZE				CLEAR SQUARE SIEVE OPENINGS				
	200	40	10	4	3/4 "	3"	12"	
SILTS AND CLAYS	SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE			

RELATIVE DENSITY

<u>SANDS AND GRAVELS</u>	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

<u>SILTS AND CLAYS</u>	<u>STRENGTH*</u>
VERY SOFT	0-1/4
SOFT	1/4-1/2
MEDIUM STIFF	1/2-1
STIFF	1-2
VERY STIFF	2-4
HARD	OVER 4

MOISTURE CONDITION

DRY	Dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible freewater

LINE TYPES

—————	Solid - Layer Break
-----	Dashed - Gradational or approximate layer break

GROUND-WATER SYMBOLS

	Groundwater level during drilling
	Stabilized groundwater level

SAMPLER SYMBOLS

	Modified California (3" O.D.) sampler
	California (2.5" O.D.) sampler
	S.P.T. - Split spoon sampler
	Shelby Tube
	Continuous Core
	Bag Samples
	Grab Samples
NR	No Recovery

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket penetrometer



GEOTECHNICAL EXPLORATION RD-17 LEVEE EVALUATION 5747.000.000	DATE DRILLED : November 15, 2010 HOLE DEPTH (FT) : 66 1/2 SURF ELEV (NGVD29) : 25 Feet LATITUDE (NAD83) : 37.85406 LONGITUDE (NAD83) : -121.31956	LOGGED/REVIEWED BY : Z. Crawford/JJT DRILLING CONTRACTOR: Pitcher Drilling DRILLING METHOD : Solid Flight/Mud Rty HAMMER TYPE : Automatic BORING DIAMETER (IN) : 5
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Compressive Strength (tsf) *field approx.
0	0		Gravel (AB)									
			SANDY LEAN CLAY (CL), grayish brown, dense, moist, fine-grained sand, contains <5% fine gravel [Fill] (less gravel at 1')			44			58	12.7		
			SANDY SILT (ML), grayish brown, hard, moist, contains fine-grained sand and clay. [Fill]						1	12.7	120	2.94
	1		POORLY GRADED SAND (SP), brown, medium dense to dense, moist, fine-grained sand. [Fill]			34						
	5					75			3	10.7		
	2		SILT WITH CLAY (ML), dark grayish brown, stiff, moist, approximately 30% fine-grained sand.						25			
			CLAYEY SAND (SC), grayish brown to gray with reddish-brown mottling, dense, moist, fine-grained sand, TxCU@11 feet. [Fill]						30			
	10											
			FAT CLAY (CH), dark grayish brown and brownish gray, very stiff, moist, contains <30% silt, contains <10% fine-grained sand. [Fill] [Torvane= 0.7 tsf]									*1.5
	4		LEAN CLAY (CL), gray, very stiff to hard, moist, contains <5% fine-grained sand. [Fill]				23	10		12.0	99	
	15		POORLY GRADED SAND (SP), light brown, medium dense, moist, fine- to medium-grained sand, contains <5% silt. [Fill]							14.2		*3.0
	5		CLAYEY SAND (SC), grayish brown, loose to medium dense, moist, fine-grained sand.						25	10.6		
			thin 1"-2" layers of poorly graded sand from 17.5'-18'						16	50		
			LEAN CLAY WITH SAND (CL), dark gray, stiff, moist, fine-grained sand. [Torvane= 0.65 tsf]						20	22.4	100	*1.75
	20								11	78		
	7											
	25				▽							

GEOTECHNICAL EXPLORATION RD-17 LEVEE EVALUATION 5747.000.000	DATE DRILLED : November 5, 2010 HOLE DEPTH (FT) : 101 1/2 SURF ELEV (NGVD29) : 28 1/2 Feet LATITUDE (NAD83) : 37.81032 LONGITUDE (NAD83) : -121.32061	LOGGED/REVIEWED BY : M. Turner/ZAC DRILLING CONTRACTOR: Pitcher Drilling DRILLING METHOD : Hollow Stem/Mud Rot. HAMMER TYPE : Automatic HOLE DIAMETER (IN) : 5
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Compressive Strength (tsf) *field approx.
0	0		SILTY GRAVEL (GM), brown, angular fine to coarse gravel. [AB Fill]									
			POORLY GRADED SAND WITH SILT (SP-SM), yellowish brown, loose, moist, fine-grained sand.			18			6			
1						23						
5			POORLY GRADED SAND (SP), light yellowish brown, loose, moist, fine-grained sand.			12				6.1		
						8			3	3.4		
10						3				3.0		
			POORLY GRADED SAND WITH SILT (SP-SM), light yellowish brown, very loose to medium dense, moist, fine-grained sand, <5% fine sub-rounded gravel and coarse-grained sand.						6			
15						15				4.1	91	
						13			6	6.0		
20						8				4.4		
			SILTY SAND (SM), dark brown, very loose, moist, approximately 30% fines, fine-grained sand.			3				25.7		
25			LEAN CLAY (CL), dark brown, stiff, moist.							37.2		
30			SILTY SAND (SM), dark gray, wet, fine-grained sand.						47			

GEOTECHNICAL EXPLORATION RD-17 LEVEE EVALUATION 5747.000.000	DATE DRILLED : November 3, 2010 HOLE DEPTH (FT) : 80 SURF ELEV (NGVD29) : 31 feet LATITUDE (NAD83) : 37.80786 LONGITUDE (NAD83) : 121.32205	LOGGED/REVIEWED BY : M. Turner/ZAC DRILLING CONTRACTOR: Pitcher DRILLING METHOD : Mud Rotary HAMMER TYPE : Automatic HOLE DIAMETER (IN) : 6
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry unit weight)	Dry Unit Weight (pcf)	Compressive Strength (tsf) *field approx.
50			FAT CLAY (CH), gray with oxidation, very stiff, wet, contains fine-grained sand			23	53	33	91	26.2	99	2.5
16						15						
55			LEAN CLAY (CL), gray, very stiff, wet, contains fine-grained sand									
17												
18												
60						17						
19			SANDY SILT (ML), grayish brown, very stiff, wet, fine-grained sand			29	49	32	69	26.4	97	
65												
20			SANDY LEAN CLAY (CL), gray with oxidation, stiff, wet, fine-grained sand									
21												
70			SILTY SAND (SM), gray, dense, wet, fine-grained sand			54	42	24	69		28	
75			POORLY GRADED SAND WITH SILT (SP-SM), gray, dense, wet, fine-grained sand			43			11			

GEOTECHNICAL EXPLORATION RD-17 LEVEE EVALUATION 5747.000.000	DATE DRILLED : September 27, 2010 HOLE DEPTH (FT) : 83 SURF ELEV (NGVD29) : 31 feet LATITUDE (NAD83) : 37.77680 LONGITUDE (NAD83) : 121.29858	LOGGED/REVIEWED BY : M. Swanson/ZAC DRILLING CONTRACTOR: Pitcher Drilling DRILLING METHOD : Mud Rotary HAMMER TYPE : Automatic HOLE DIAMETER (IN) : 6
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Compressive Strength (tsf) *field approx.
0	0		AGGREGATE BASE									
			SILTY SAND (SM), dark yellowish brown, very dense, moist, fine to coarse subangular gravel, fine to coarse-grained sand [Fill]			79			29	8.7		
	1		(grades to coarse gravel, medium dense)			29						
	5		SILTY SAND (SM), olive brown, loose, moist, fine to coarse-grained sand [Fill]			16			29	10.0	113	
	2		(light yellowish brown, contains <5% fine subangular gravel)			7						
	10					13			37	7.2		
	3					9			44	12.5	102	
	4		LEAN CLAY (CL), dark brown, stiff, moist, contains fine-grained sand [Native]			11	46	25	91	27.8	91	1.3
	15		Torvane = 1.4 tsf						71			*2.5
	5		LEAN CLAY WITH SAND (CL), dark brown, stiff, moist, fine-grained sand			8			42	11.8		
	20		SILTY SAND (SM), dark yellowish brown, loose, moist, fine-grained sand									
	6		SILT (ML), olive brown, medium stiff, moist, contains fine-grained sand			12			88	28.7		
	7		FAT CLAY (CH), dark yellowish brown, stiff, moist, <5% fine-grained sand			11						
	25		Torvane = 0.6 tsf				50	26	96	37.1	80	

GEOTECHNICAL EXPLORATION RD-17 LEVEE EVALUATION 5747.000.000	DATE DRILLED : December 30, 2010 HOLE DEPTH (FT) : 61 SURF ELEV (NGVD29) : 5 feet LATITUDE (NAD83) : 37.87824 LONGITUDE (NAD83) : -121.33132	LOGGED/REVIEWED BY : R. Montalvo/JJT DRILLING CONTRACTOR: Gregg Drilling DRILLING METHOD : Mud Rotary HAMMER TYPE : Automatic HOLE DIAMETER (IN) : 6
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Compressive Strength (tsf) *field approx.
0	0		SANDY LEAN CLAY (CL), dark brown, very stiff, moist, fine-grained sand.			8	31	11	70	23.9		*<0.5 *2.0 *3.0
			SANDY SILT (ML), dark brown, stiff, moist, fine- to medium-grained sand.			10			53	28.0		
	1		SILTY SAND (SM), dark grayish brown, loose, moist, fine- to medium-grained sand.			5			41			
	5		SANDY LEAN CLAY (CL), dark grayish brown, medium stiff, moist, fine-grained sand.			9			52	29.2	94	*0.5
	2					9	29	9	52			
			SANDY SILT (ML), dark grayish brown, moist, soft to medium stiff, fine-grained sand.			5			62	29.4		
	10					8			70			
						6			26.5			
	4		CLAYEY SAND (SC), grayish brown, medium dense, moist, fine- to medium-grained sand, approximately 30% fines.			10			24			
			SILTY SAND (SM), light grayish brown, medium dense, moist, fine- to medium-grained sand.			18			34.5		88	
	15		LEAN CLAY WITH SAND (CL), dark yellowish brown, stiff, moist, fine-grained sand.			13	28	8	88			
	5		LEAN CLAY (CL), dark yellowish brown, medium stiff, moist, contains fine-grained sand.			8						
			grades very stiff to hard, <5% fine-grained sand			13	33	12				*2.0
	20					25			19.6		108	*3.5
			grades to dark yellowish brown, <15% fine-grained sand									
	7											
	25					12						*2.5

1**SOIL CLASSIFICATION CHART****2 COLOR**

MAJOR TYPES

DESCRIPTION

COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES		GW - Well graded gravels or gravel-sand mixtures
		GRAVELS WITH OVER 12 % FINES		GP - Poorly graded gravels or gravel-sand mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES		SW - Well graded sands, or gravelly sand mixtures
		SANDS WITH OVER 12 % FINES		SP - Poorly graded sands or gravelly sand mixtures
	FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50 % OR LESS		ML - Inorganic silt with low to medium plasticity
				CL - Inorganic clay with low to medium plasticity
			OL - Low plasticity organic silts and clays	
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50 %			MH - Inorganic silt with high plasticity	
		CH - Inorganic clay with high plasticity		
HIGHLY ORGANIC SOILS		OH - Highly plastic organic silts and clays		
			PT - Peat and other highly organic soils	

U.S. STANDARD SERIES SIEVE SIZE

GRAIN SIZES

CLEAR SQUARE SIEVE OPENINGS

200 40 10 4 3/4 " 3" 12"

SILTS
AND
CLAYS

SAND

GRAVEL

COBBLES

BOULDERS

FINE

MEDIUM

COARSE

FINE

COARSE

3 RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT	
	(S.P.T.)	(ModCal 3")*
VERY LOOSE	0-4	0-9
LOOSE	4-10	9-23
MEDIUM DENSE	10-30	23-68
DENSE	30-50	68-114
VERY DENSE	OVER 50	> 114

3 CONSISTENCY

SILTS AND CLAYS	STRENGTH*	BLOWS/FOOT	
		(S.P.T.)	(ModCal 3")*
VERY SOFT	0-1/4	0-2	0-4
SOFT	1/4-1/2	2-4	4-9
MEDIUM STIFF	1/2-1	4-8	9-18
STIFF	1-2	8-15	18-34
VERY STIFF	2-4	15-30	34-68
HARD	OVER 4	OVER 30	>68

4 MOISTURE CONDITION

DRY	Absence of moisture, dusty, dry to touch
MOIST	Damp but no visible water
WET	Visible free water
SATURATED	Below the water table

5 PRIMARY CHARACTERISTICS

Soil structures or textures, precipitates, burrows, mottling, etc.

6 MINOR CONSTITUENT QUANTITIES (BY WEIGHT)

TRACE	Particles are present, but estimated to the less than 5%
SOME	5 to 15%
WITH	15 to 30%
.....Y	30 to 50% (exception: "silty" see above)

LINE TYPES

	Solid - Layer Break
	Dashed - Gradational or approximate layer break

GROUND-WATER SYMBOLS

	Groundwater level during drilling
	Stabilized groundwater level

SAMPLER SYMBOLS

	Modified California (3" O.D.) sampler
	California (2.5" O.D.) sampler
	S.P.T. - Split spoon sampler
	Shelby Tube
	Continuous Core
	Bag Samples
	Grab Samples
NR	No Recovery

ENGEO
INCORPORATED
EXCELLENT SERVICE SINCE 1971

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) sampler

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by pocket penetrometer

* Blow counts adjusted by factors from LaCroix and Horn, 1973

6-20-07 ver.



LOG OF BORING 4-B1

Geotechnical Exploration
RD-17 Station 761+00
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/21/2009
HOLE DEPTH: Approx. 101½ ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NVGD29): Approx. 30¾ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0			GRAVELLY SILTY SAND (SM), olive brown, medium dense to dense, moist, fine- to medium-grained sand, fine gravel, 5-15% clay [Fill]			43							
1			SAND (SM), brown, medium dense, moist, fine-grained sand, 20-25% silt, 5-15% fine gravel, < 5% clay [Fill]			15				21	3.5		
5			SAND (SP), grayish brown, loose, dry to moist, fine-grained sand, < 5% silt [Fill]			20				6			
2						7					2.7		
10						7					3.0		
4						4							
15			SILT (ML), dark grayish brown, medium stiff, moist, 5-15% clay [Fill]										
5			SILTY SAND (SM), olive brown, loose, moist, fine-grained sand [Fill]			14					7.3	1.5*	
6						6				34	9.6		
20			SANDY CLAY (CL), brown, stiff, moist, fine-grained sand, 15-29% silt [Native] TORVANE = 0.88 tsf										
7			SILT (ML), brown, stiff, moist, < 5% fine-grained sand										3.25*
25			SAND (SP), brown, medium dense, moist, fine-grained sand, < 5% silt			12					18.9		
8													
30													



LOG OF BORING 4-B1

Geotechnical Exploration
RD-17 Station 761+00
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/21/2009
HOLE DEPTH: Approx. 101½ ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NVDG29): Approx. 30¾ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
5			SAND (SP-SM), brown, loose, wet, fine-grained sand			5				6			
10			grades to medium dense, gray										
35	11		SILTY SAND (SM), gray, medium dense, wet, fine- to medium-grained sand, < 5% fine gravel			13				27			
40	12		grades dark gray, loose, < 3% wood/organics/peat			12				27.9			
45	14		grades medium dense, no organics			49							
50	15		SAND (SP), gray, very dense, wet, fine-grained sand, < 5% silt							16.8			
60	18												

LOG - GEOTECHNICAL RD-17 6C 4-B1.GPJ ENGEO INC.GDT 12/16/09



LOG OF BORING 4-B1

Geotechnical Exploration
RD-17 Station 761+00
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/21/2009
HOLE DEPTH: Approx. 101½ ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NVGD29): Approx. 30¾ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
19	65		SAND (SP), gray, very dense, wet, fine-grained sand, < 5% silt			53							
21	70		GRAVEL (GM), gray, dense, wet, subangular fine gravel, 10-29% fine to coarse-grained sand, < 10% silt										
21	70		SILTY SAND (SM), bluish gray, dense, wet, fine-grained sand, < 15% silt			38	44	19	25	59			4.25*
22	75		SANDY CLAY (CL), bluish gray, very stiff to hard, wet, fine-grained sand, 20-29% silt, TORVANE = 1.75 tsf										
25	80		SILTY CLAY (CH), olive gray mottled with reddish brown, very stiff to hard, wet, < 5% fine-grained sand, TORVANE = 1.5 tsf			26	56	22	34		29.9	95	4.25*
26	85												
27	90		SILTY CLAY (CL), olive, stiff, wet, 15-29% silt										

LOG - GEOTECHNICAL RD-17 6C 4-B1.GPJ ENGEO INC.GDT 12/16/09



LOG OF BORING 4-B1





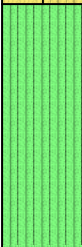
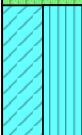
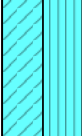



Geotechnical Exploration
RD-17 Station 761+00
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/21/2009
HOLE DEPTH: Approx. 101½ ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (NVDG29): Approx. 30¾ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SILTY CLAY (CL), olive, stiff, wet, 15-29% silt			26				62	28.9	99	1.75*
	28		SANDY CLAY (CL), olive, stiff, wet, fine-grained sand, 15-29% silt TORVANE = 0.68 tsf										
	95												
	29												
	30												
	100		CLAYEY SAND (SC), olive gray, medium dense, wet, fine-grained sand, 15-20% silt			28				45	18.7		
			Bottom of boring at approximately 101 1/2 feet. Groundwater encountered at approximately 30 feet during drilling.										

Geotechnical Investigation RD-17 Levee Evaluation Lathrop, California 5747.000.000	DATE DRILLED : 10/22/2009 HOLE DEPTH (FT) : 51 1/2 SUFR ELEV (MSL) : 28 1/4 feet LATITUDE (NAD83) : 37.81015 LONGITUDE (NAD83) : -121.32095	LOGGED/REVIEWED BY : Z. Crawford/JJT DRILLING CONTRACTOR: Gregg Drilling DRILLING METHOD : Mud Rotary HAMMER TYPE : Automatic HOLE DIAMETER (IN) : 5
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Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Graphic	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Strength (tsf) *field approx
0	0		SANDY GRAVEL (GM), olive brown, dense to very dense, moist, fine- to coarse-grained sand, fine gravel, <10% clay, 10-15% silt [Fill]			55						
1	1		CLAYEY SAND (SC), olive brown, medium dense, moist, fine-grained sand, 15-29% silt, <10% fine gravel [Fill]			41			7			
5	5		SILTY SAND (SP), olive brown, dense, moist, fine- to coarse-grained sand, 5-10% silt, 5-15% gravel [Fill]									
2	2		SAND (SP-SM), brownish gray, loose, moist, fine-grained sand, 5-15% silt, TxUU@9 feet [Fill]							19.3	99	
10	10		SAND (SP-SM), brownish gray, loose, moist, fine-grained sand, 5-15% silt, TxUU@9 feet [Fill]			7						
4	4		SILTY SAND (SM), olive brown mottled with brownish gray, loose to medium dense, moist, fine-grained sand, <15% clay [Fill]									
15	15		SILTY SAND (SM), olive brown mottled with brownish gray, loose to medium dense, moist, fine-grained sand, <15% clay [Fill]			11			47			
20	20		CLAYEY SILT (CL-ML), olive gray mottled with reddish brown, stiff to very stiff, moist, 5-15% fine-grained sand, TxUU@18 feet [Native]							28.1	83	
7	7		CLAYEY SILT (CL-ML), olive gray mottled with reddish brown, stiff to very stiff, moist, 5-15% fine-grained sand, TxUU@18 feet [Native]			8	37	15	89			
25	25		SILTY CLAY (CL), olive gray, stiff to medium stiff, moist to wet, <10% fine-grained sand, TxUU@27 feet									
8	8		SILTY CLAY (CL), olive gray, stiff to medium stiff, moist to wet, <10% fine-grained sand, TxUU@27 feet							29.9	99	4.0*
30	30		CLAYEY SAND TO SANDY CLAY (SC-CL), olive gray, stiff to loose, wet, fine-grained sand, 15-29% silt									
			SILTY CLAY (CL), olive gray, medium stiff, wet, <10% fine-grained sand			7						2.0*



LOG OF BORING 4-B3

Geotechnical Exploration
RD-17 Station 697+80
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/22/2009
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 5.0 in.
SURF ELEV (MSL): Approx. 29 ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY GRAVEL (GM) [Fill]										
1			SAND (SC), brownish olive, medium dense, moist, fine- to coarse-grained sand, 15-20% silt, 20-29% clay, 5-12% gravel [Fill] (brick fragments)			31				35			
5			SAND (SP), light olive brown, medium dense, moist, fine- to medium-grained sand, < 5% silt [Fill]			13							
10			grades to loose			8				3			
15			SILT (ML), brown, soft to medium stiff, wet, 15-29% clay, < 5% fine-grained sand [Native]									1.5*	
20			CLAYEY SILT TO SILTY CLAY (CL/ML), olive, medium stiff, wet, 10-15% fine-grained sand			6				98	32.8 27.4	83	
25			SANDY SILT (ML), olive, medium stiff, wet, fine-grained sand, < 10% clay			7					96	46.6	
30												1.25*	



LOG OF BORING 4-B3

Geotechnical Exploration
RD-17 Station 697+80
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/22/2009
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 5.0 in.
SURF ELEV (MSL): Approx. 29 ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY SILT (ML), olive, medium stiff, wet, fine-grained sand, < 10% clay										
	10		CLAYEY SILT (ML), olive gray, stiff to very stiff, wet, 5-10% fine-grained sand							20.6	89		
35	11		SAND (SP-SM), olive gray, medium dense, wet, fine- to medium-grained sand, 5-15% silt			12			10				
40	12					18							
45	13												
50	14		grades to dense										
	15					35							
			Bottom of boring at approximately 51 1/2 feet. Groundwater encountered at approximately 18 feet during drilling.										



LOG OF BORING 4-B4

Geotechnical Exploration
 RD-17 Station 810+95
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 10/23/2009
 HOLE DEPTH: Approx. 51½ ft.
 HOLE DIAMETER: 5.0 in.
 SURF ELEV (NVGD29): Approx. 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
 DRILLING CONTRACTOR: Gregg Drilling & Testing
 DRILLING METHOD: Mud Rotary
 HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SANDY GRAVEL (GM), olive gray, very dense, moist, fine gravel, fine- to coarse-grained sand, 10-15% silt [Fill]			51 for 6"							
			SILTY SAND TO SANDY SILT (SM-ML), grayish brown, dense to very stiff, moist, fine-grained sand, 10-15% clay [Fill]			39				7.4			
1			grades to medium dense to stiff, 15-29% clay			26			62				
5			grades to 10-20% clay			10							
10			grades to olive brown			11				11			
15													
20			SILTY SAND (SM), brown, loose, wet, < 10% clay [Fill]			5				72			
			SILT (ML), olive gray, medium stiff, wet, fine-grained sand, 20-29% fine-grained sand, < 10% clay [Native]										
			SILTY CLAY (CH), olive gray mottled with reddish brown, medium stiff to stiff, wet									1.75*	
25						6	55	24	31				
			SILT (ML), olive, medium stiff, wet, 15-29% clay, 15-29% fine-grained sand									1.5*	
30													

LOG - GEOTECHNICAL RD-17 AREA V1-C.GPJ ENGEO INC.GDT 12/9/09



LOG OF BORING 4-B4

Geotechnical Exploration
RD-17 Station 810+95
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/23/2009
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 5.0 in.
SURF ELEV (NVGD29): Approx. 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
10	3		SILT (ML), olive, medium stiff, wet, 15-29% clay, 15-29% fine-grained sand			3					17		
35	11		SAND (SM), olive brown, medium dense, wet, fine- to medium-grained sand, 15-25% silt, 5-10% clay			17				33			
40	12		SAND (SP-SM), brown, medium dense, wet, fine- to medium-grained sand, < 10% silt grades to gray			24				7			
50	15					20							
			Bottom of boring at approximately 51 1/2 feet. Groundwater not noted during drilling due to drilling method.										



LOG OF BORING 4-B5

Geotechnical Exploration
RD-17 Station 825+75
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/23/2009
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 5.0 in.
SURF ELEV (NVGD29): Approx. 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			GRAVELLY SAND (GM), brown, medium dense, moist, fine- to medium-grained sand, fine gravel, 15-30% silt, 10-15% clay [Fill]			30							
			SILTY SAND (SM), dark brown, loose, moist, fine-grained sand, 10-15% clay [Fill]			11				8.6			
1			SANDY CLAY (CL), grayish brown, stiff, moist, fine-grained sand, 15-29% silt [Fill]										
5			SILT (ML), dark grayish olive, soft to medium stiff, moist, 15-25% fine-grained sand, 15-25% clay [Fill]			5				77		3.25*	
2			grades to < 5% sand			2							
10			SANDY CLAY (CL), grayish olive, stiff, moist, fine-grained sand, 15-25% silt [Fill]			4	37	19	18			3.25*	
4			SILT (ML), grayish olive, stiff, moist, 10-15% clay, 10-15% fine-grained sand [Fill]			7				19.1			
15			SILTY CLAY (CL), dark olive, stiff, moist, < 5% fine-grained sand [Native]									2.0*	
5						13							
7			SILTY CLAY (CL), dark grayish brown, stiff, moist to wet									2.75*	
25						9	55	24	31	20	27.5		
8													
30													

LOG - GEOTECHNICAL RD-17 AREA VII-F.GPJ ENGEO INC.GDT 12/9/09



LOG OF BORING 4-B5

Geotechnical Exploration
RD-17 Station 825+75
San Joaquin County, California
5747.000.000

DATE DRILLED: 10/23/2009
HOLE DEPTH: Approx. 51½ ft.
HOLE DIAMETER: 5.0 in.
SURF ELEV (NVDG29): Approx. 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: Gregg Drilling & Testing
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Automatic Trip Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
10			SILTY CLAY (CL), dark grayish brown, stiff, moist to wet			7						1.75*	
35	11		CLAYEY SILT (ML), grayish olive, medium stiff to stiff, wet, < 5% fine-grained sand										
40	12		SAND (SM), gray, loose to medium dense, wet, fine- to medium-grained sand, 10-20% silt			9			20				
45	13												
50	14		SAND (SP), gray, medium dense, wet, fine- to medium-grained sand, < 5% silt										
	15					19							
			Bottom of boring at approximately 51 1/2 feet. Groundwater encountered at approximately 20 feet during drilling.										



LOG OF BORING 4-B6

Geotechnical Exploration
RD-17 Station 764+50
San Joaquin County, California
5747.000.000

DATE DRILLED: 11/15/2009
HOLE DEPTH: Approx. 10 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (NVDG29): Approx. 17 ft.

LOGGED / REVIEWED BY: R. Ludwig / JJT
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILT (ML), brown, moist, 18% fine-grained sand							82			
1	1		SANDY SILT (ML), brown, moist							51			
2	2		SAND (SP-SM), light brown, moist, fine- to coarse-grained sand							1			
3	3		Bottom of boring at approximately 10 feet. Groundwater not encountered during drilling.										



LOG OF BORING 3-B1

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 1/23/2009
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 29½ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), dark brown, dense, moist, with clay, (Fill)			58							
1	1		SILTY CLAY (CL), brown, medium stiff to stiff, moist, with fine-grained sand, (Fill)			20							
2	2		SILT (ML), light brown, stiff, moist, with fine-grained sand, some clay, (Fill)			16			10				
3	3		SAND (SM), light grayish brown, medium dense, dry, fine-grained sand, some silt, (Fill)			29							
4	4		SAND (SM), light grayish brown, medium dense, dry, fine-grained sand, some silt, (Fill)										
5	5		SILTY CLAY (CL), dark grayish brown, very stiff, moist									1.75*	
6	6		SANDY SILT (ML), brown, very stiff, moist, fine-grained sand, trace clay										

LOG - GEOTECHNICAL RD-17 4-B1 TO 4 B3.GPJ ENGEO INC.GDT 2/24/09



LOG OF BORING 3-B1

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 1/23/2009
HOLE DEPTH: Approx. 31½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 29½ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
7			SANDY SILT (ML), (Continued)			33							
8						21							
9			SILTY CLAY (CL), bluish gray, very stiff, moist to saturated, some fine-grained sand		▽	35							
Bottom of boring at approximately 31 1/2 feet below ground surface. Groundwater encountered at approximately 29 feet below ground surface.													



LOG OF BORING 3-B2

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 1/23/2009
HOLE DEPTH: Approx. 26½ ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 29½ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), brown, very dense, dry to moist, fine- to medium-grained sand, with clay, with silt, (Fill)										
1	0.3					57							
5	1.5					556'	39	19	20	37			
10	3.0	Trace organics				556'							
15	4.5		SILTY SAND (SM), gray, dense, moist, fine- to medium-grained sand, some clay			45							
20	6.0		SANDY SILT (ML), dark gray, very stiff, moist, fine- to medium-grained sand										

LOG - GEOTECHNICAL RD-17 4-B1 TO 4 B3.GPJ ENGEO INC.GDT 2/24/09



LOG OF BORING 3-B2

Geotechnical Exploration
 RD-17 Levee Seepage Evaluation
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 1/23/2009
 HOLE DEPTH: Approx. 26½ ft.
 HOLE DIAMETER: 4.0 in.
 SURF ELEV (msl): Approx. 29½ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
 DRILLING CONTRACTOR: West Coast Exploration
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
7			SANDY SILT (ML), (Continued)			28							
26			SILTY CLAY (CL), dark gray mottled with reddish brown, very stiff, moist			29							
8			Bottom of boring at approximately 26 1/2 feet below ground surface. Groundwater not encountered during drilling.										



LOG OF BORING 3-B3

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 1/23/2009
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 29½ ft.

LOGGED / REVIEWED BY: Z. Crawford / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb. Rope and Cathead

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY SAND (SM), light brown, medium dense, dry, fine- to medium-grained sand, some clay, trace gravel, (Fill)										
1	1		CLAYEY SAND (SC), brown and dark brown, dense, moist, fine-grained sand, with silt, trace gravel, (Fill)			47	38	18	20	42			
5	2		SILTY SAND (SM), dark brown, dense to very dense, moist, fine- to medium-grained sand, with clay, with silt, (Fill)			69	39	21	18	34			
10	3					506"							
15	5		SILTY CLAY (CL), dark grayish brown, stiff to very stiff, moist			39							
20	6		Bottom of boring at approximately 20 feet below ground surface. Groundwater not encountered during drilling.										



LOG OF BORING 3-B4

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 1/29/2009
HOLE DEPTH: Approx. 15 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (msl): Approx. 9½ ft.

LOGGED / REVIEWED BY: M. Swanson / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY CLAY (CL), dark reddish brown, moist, trace fine-grained sand										
1	0.3												
5	1.5												
2	0.6		SILT (ML), brown, moist, some fine-grained sand						88				
10	3.0	X											
4	1.2		SILT (ML), brown, wet, some fine-grained sand		▽								
15	4.5		Bottom of boring at approximately 15 feet below ground surface. Groundwater encountered at approximately 12 1/2 feet below ground surface.										



LOG OF BORING 3-B5

Geotechnical Exploration
 RD-17 Levee Seepage Evaluation
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 1/29/2009
 HOLE DEPTH: Approx. 15 ft.
 HOLE DIAMETER: 4.0 in.
 SURF ELEV (msl): Approx. 8¾ ft.

LOGGED / REVIEWED BY: M. Swanson / JJT
 DRILLING CONTRACTOR: West Coast Exploration
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY CLAY (CL), dark reddish brown, moist, trace fine-grained sand										
1	0.3												
5	1.5												
2	0.6		SILT (ML), brown, moist, some fine-grained sand										
10	3.0	X	SILT (ML), brown, moist, with fine-grained sand, trace clay						74				
15	4.5		Bottom of boring at approximately 15 feet below ground surface. Groundwater not encountered during drilling.										



LOG OF BORING 3-B6

Geotechnical Exploration
 RD-17 Levee Seepage Evaluation
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 1/29/2009
 HOLE DEPTH: Approx. 15 ft.
 HOLE DIAMETER: 4.0 in.
 SURF ELEV (msl): Approx. 9¼ ft.

LOGGED / REVIEWED BY: M. Swanson / JJT
 DRILLING CONTRACTOR: West Coast Exploration
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SILTY CLAY (CL), dark reddish brown, moist, trace fine-grained sand										
			SILTY CLAY (CL), brown, moist, some fine-grained sand										
			SILT (ML), brown, moist, with fine-grained sand, trace clay										
		X							84				
			Bottom of boring at approximately 15 feet below ground surface. Groundwater not encountered during drilling.										



LOG OF BORING 3-B7

Geotechnical Exploration
 RD-17 Levee Seepage Evaluation
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 1/29/2009
 HOLE DEPTH: Approx. 15 ft.
 HOLE DIAMETER: 4.0 in.
 SURF ELEV (msl): Approx. 81. ft.

LOGGED / REVIEWED BY: M. Swanson / JJT
 DRILLING CONTRACTOR: West Coast Exploration
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY CLAY (CL), dark reddish brown, moist, trace fine-grained sand										
1	0.3												
5	1.5												
2	0.6		SILT (ML), light brown, moist, some fine-grained sand										
3	0.9												
10	3.0												
4	1.2												
15	4.5		Bottom of boring at approximately 15 feet below ground surface. Groundwater not encountered during drilling.										



LOG OF BORING 3-B8

Geotechnical Exploration
 RD-17 Levee Seepage Evaluation
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 2/19/2009
 HOLE DEPTH: Approx. 20 ft.
 HOLE DIAMETER: 4.0 in.
 SURF ELEV (MSL): Approx. 12 ft.

LOGGED / REVIEWED BY: R. Gandolfo / JJT
 DRILLING CONTRACTOR: West Coast Exploration
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY CLAY (CL), dark brown, moist, some fine-grained sand							81			
1	1		SAND (SM), yellowish brown, moist, fine-grained sand, with silt										
5	5												
10	10									16			
15	15		CLAYEY SAND (SC-CL), yellowish brown, moist, fine-grained sand, some silt							50			
20	20		SILTY SAND (SM), yellowish brown, wet, fine-grained sand										
			Bottom of boring at approximately 20 feet below ground surface. Groundwater encountered at approximately 14 feet below ground surface.										



LOG OF BORING 3-B9

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 2/19/2009
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (MSL): Approx. 13½ ft.

LOGGED / REVIEWED BY: R. Gandolfo / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		CLAYEY SILT (ML), dark brown, moist, trace fine-grained sand							91			
1	1												
5	5												
2	2												
10	10		SILTY CLAY (CL), light grayish brown, moist, with fine-grained sand										
15	15		SILT (ML), yellowish brown, wet, with fine-grained sand										
20	20		Bottom of boring at approximately 20 feet below ground surface. Groundwater encountered at approximately 12 feet below ground surface.										



LOG OF BORING 3-B10

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 2/19/2009
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (MSL): Approx. 12¾ ft.

LOGGED / REVIEWED BY: R. Gandolfo / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			GRAVEL (GP), light yellowish gray, moist, with silt, and fine- to coarse-grained sand										
			CLAYEY SILT (ML), dark brown, moist, with fine- to medium-grained sand										
1													
5			SILTY CLAY (CL), dark reddish brown, moist, trace fine-grained sand										
2													
10			SILTY SAND (SM), orange brown, moist, fine-grained sand										
4									36				
15			Grades to gray										
5													
20			SILTY SAND (SM), gray, wet, fine-grained sand										
6													
			Bottom of boring at approximately 20 feet below ground surface. Groundwater encountered at approximately 15 feet below ground surface.										

LOG - GEOTECHNICAL RD-17.GPJ ENGE O INC.GDT 3/24/09



LOG OF BORING 3-B11

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 2/19/2009
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 4.0 in.
SURF ELEV (MSL): Approx. 12 ft.

LOGGED / REVIEWED BY: R. Gandolfo / JJT
DRILLING CONTRACTOR: West Coast Exploration
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SANDY SILT (ML), light brown, moist, fine-grained sand, with clay							67			
2	2		CLAYEY SAND (SC), reddish brown, moist, fine-grained sand										
10	10		SAND (SM), grayish brown, moist, fine-grained sand, with silt										
20	20		SILTY SAND (SM), gray, wet, fine-grained sand										
20	20		Bottom of boring at approximately 20 feet below ground surface. Groundwater encountered at approximately 12 1/2 feet below ground surface.										



LOG OF BORING 3-B12

Geotechnical Exploration
 RD-17 Levee Seepage Evaluation
 San Joaquin County, California
 5747.000.000

DATE DRILLED: 2/19/2009
 HOLE DEPTH: Approx. 20 ft.
 HOLE DIAMETER: 4.0 in.
 SURF ELEV (MSL): Approx. 11 ft.

LOGGED / REVIEWED BY: R. Gandolfo / JJT
 DRILLING CONTRACTOR: West Coast Exploration
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0												
1	0.3		GRAVEL (GP), light yellowish gray, moist, with fine- to coarse-grained sand										
5	1.5		SANDY SILT (ML), dark brown, moist, fine-grained sand, with clay						66				
10	3.0		CLAYEY SILT (ML), brown, moist, trace fine-grained sand										
15	4.5		SAND (SP-SM), brown, wet, fine-grained sand						12				
20	6.0		Bottom of boring at approximately 20 feet below ground surface. Groundwater encountered at approximately 13 feet below ground surface.										

LOG - GEOTECHNICAL RD-17.GPJ ENGEO INC.GDT 3/24/09



LOG OF BORING 3-B13

Geotechnical Exploration
RD-17 Levee Seepage Evaluation
San Joaquin County, California
5747.000.000

DATE DRILLED: 3/18/2009
HOLE DEPTH: Approx. 11 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (MSL): Approx. 12 ft.

LOGGED / REVIEWED BY: R. Gandolfo / JJT
DRILLING CONTRACTOR: --
DRILLING METHOD: Hand Auger
HAMMER TYPE: N/A

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
		X	CLAYEY SILT (ML), grayish brown, moist, some fine-grained sand										
		X	SILTY SAND (SM), yellowish brown, moist, fine-grained sand										
1		X	CLAYEY SILT (ML), grayish brown, moist										
		X	SILTY SAND (SM), yellowish brown, moist, fine-grained sand										
5		X	SILTY CLAY (CL), grayish brown mottled with dark orange, moist, trace fine-grained sand										
		X	SILTY SAND (SM), light grayish brown, moist, fine-grained sand										
10		X	grades to some fine to coarse sub rounded gravel.										
			Bottom of boring at approximately 11 feet bgs. Groundwater encountered at approximately 11 feet bgs during drilling.										

LOG OF BORING CS1-B1

Levee Seepage Evaluation
Land Park
Lathrop, California
5747.4.100.01

DATE DRILLED: 5/17/2007
HOLE DEPTH: Approx. 20 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (FT-msl): Approx. 11 ft.

LOGGED / REVIEWED BY: R. Gandolfo /
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE:

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0	0		SILTY CLAY (CL), dark olive brown, dry to moist, trace fine-grained sand										
1	1												
5	5												
2	2		CLAYEY SILT (ML), dark grayish brown, moist, trace fine-grained sand										
3	3		SILT (ML), dark gray, moist to saturated, with fine-grained sand, some clay		▽								
10	10												
4	4		SANDY SILT (ML), dark grayish brown, saturated, with clay										
15	15		SAND (SM), dark grayish brown, saturated, fine-grained sand, with silt, some clay										
5	5												
20	20		SILTY SAND (SM), dark grayish brown, saturated, fine-grained sand, trace clay										
			Bottom of boring at approximately 20 feet. Groundwater encountered at approximately 9 feet.										

LOG OF BORING CS1-B2

Levee Seepage Evaluation
Land Park
Lathrop, California
5747.4.100.01

DATE DRILLED: 5/17/2007
HOLE DEPTH: Approx. 13 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (FT-msl): Approx. 11 ft.

LOGGED / REVIEWED BY: M. Swanson /
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE:

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
0			SILTY CLAY (CL), dark olive brown, dry to moist, trace fine-grained sand										
1													
5													
2			SILTY CLAY (CL), dark gray, moist to saturated, trace fine-grained sand										
10					▽								
3													
			Bottom of boring at approximately 13 feet. Groundwater encountered at approximately 9 feet.										



LOG OF BORING CS2-B1

Levee Seepage Evaluation
Land Park
Lathrop, California
5747.4.100.01

DATE DRILLED: 5/17/2007
HOLE DEPTH: Approx. 10 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (FT-msl): Approx. 14 ft.

LOGGED / REVIEWED BY: R. Gandolfo /
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE:

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SILTY CLAY (CL), dark olive brown, dry to moist, trace fine-grained sand										
			SAND (SP), orangeish brown, moist, fine- to medium-grained sand, trace silt										
1													
5													
			SAND (SP), grayish and orangeish brown, moist, fine- to medium-grained sand										
2			SAND (SP), grayish and orangeish brown, moist, fine- to medium-grained sand, some silt										
			SAND (SP), gray, moist to saturated										
10			Cave-in at approximately 10 feet.		▽								
			Bottom of boring at approximately 10 feet. Groundwater encountered at approximately 10 feet.										



Expect Excellence.

LOG OF BORING CS2-B2

Levee Seepage Evaluation
Land Park
Lathrop, California
5747.4.100.01

DATE DRILLED: 5/17/2007
HOLE DEPTH: Approx. 12 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (FT-msl): Approx. 14 ft.

LOGGED / REVIEWED BY: M. Swanson /
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE:

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SILTY CLAY (CL), dark olive brown, dry to moist, trace fine-grained sand										
			SAND (SP), orangeish brown, moist, some silt										
1													
5			SANDY CLAY (CL), dark olive brown, moist, fine-grained sand										
2			SAND (SP), orangeish brown and grayish brown, moist to saturated, fine- to medium-grained sand										
10		3											
			Cave-in at approximately 11 feet.										
			Bottom of boring at approximately 12 feet. Groundwater encountered at approximately 10 feet.										



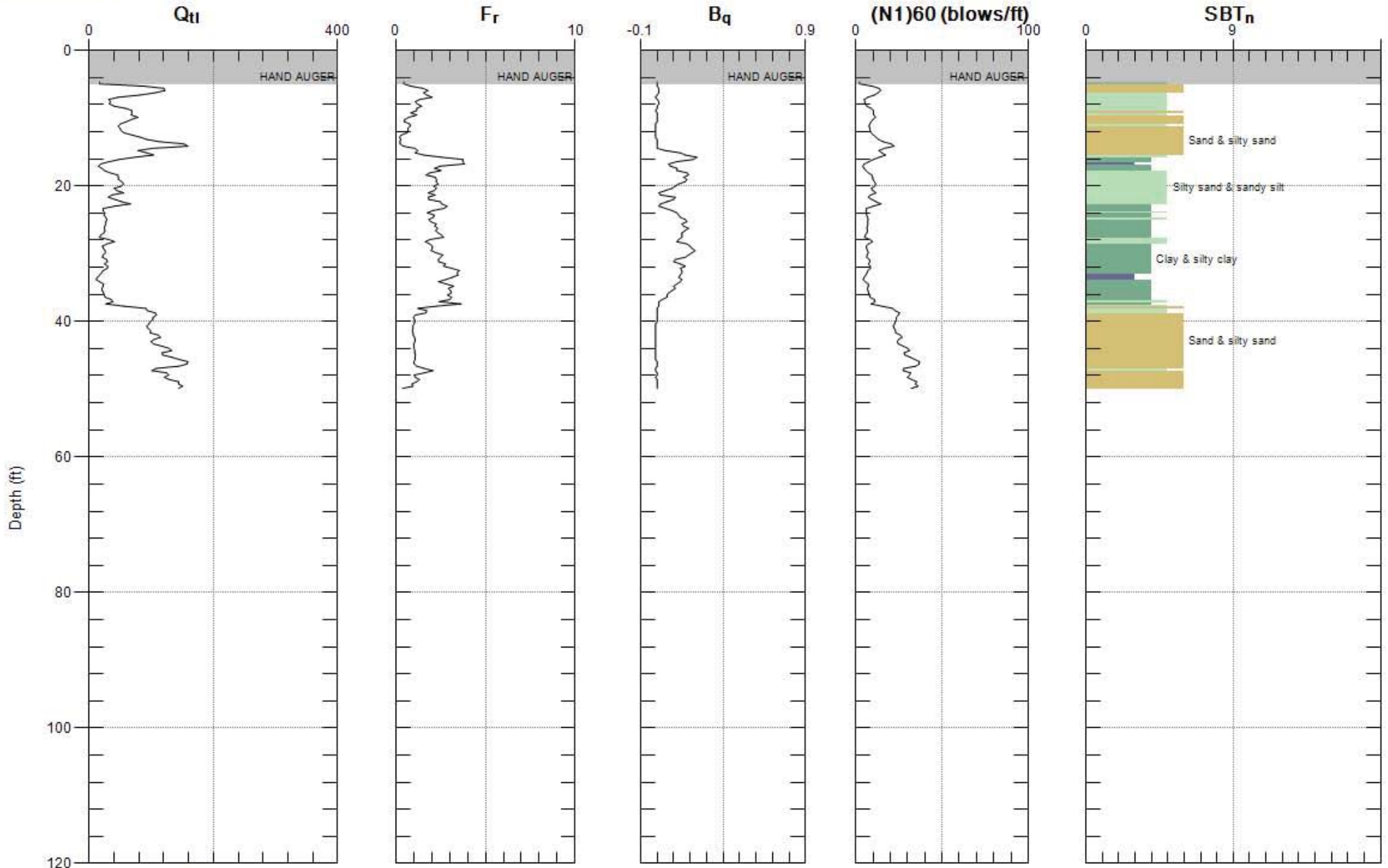
LOG OF BORING CS2-B3

Levee Seepage Evaluation
Land Park
Lathrop, California
5747.4.100.01

DATE DRILLED: 5/17/2007
HOLE DEPTH: Approx. 10 ft.
HOLE DIAMETER: 3.0 in.
SURF ELEV (FT-msl): Approx. 14 ft.

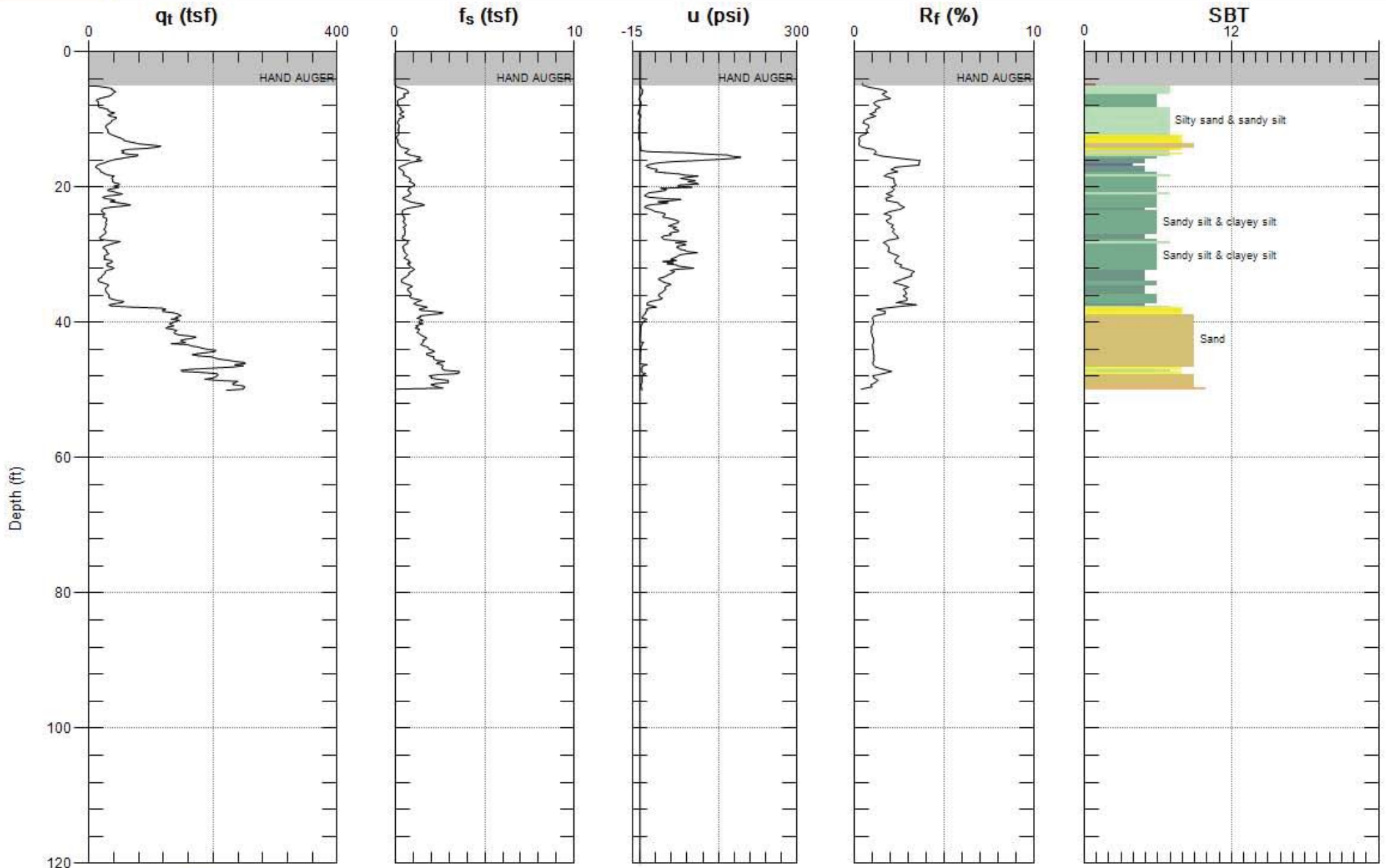
LOGGED / REVIEWED BY: R. Gandolfo /
DRILLING CONTRACTOR: ENGEO Incorporated
DRILLING METHOD: Hand Auger
HAMMER TYPE:

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbo	Water Level	Blow Count/Foot	Atterberg Limits			Fines Content (% passing #200 sieve)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
							Liquid Limit	Plastic Limit	Plasticity Index				
			SILTY CLAY (CL), dark olive brown, dry to moist, trace fine-grained sand										
			SAND (SP), orangeish brown, moist to saturated, fine- to medium-grained sand										
1													
5													
2													
10			Cave-in at approximately 10 feet.										
			Bottom of boring at approximately 10 feet. Groundwater encountered at approximately 10 feet.										



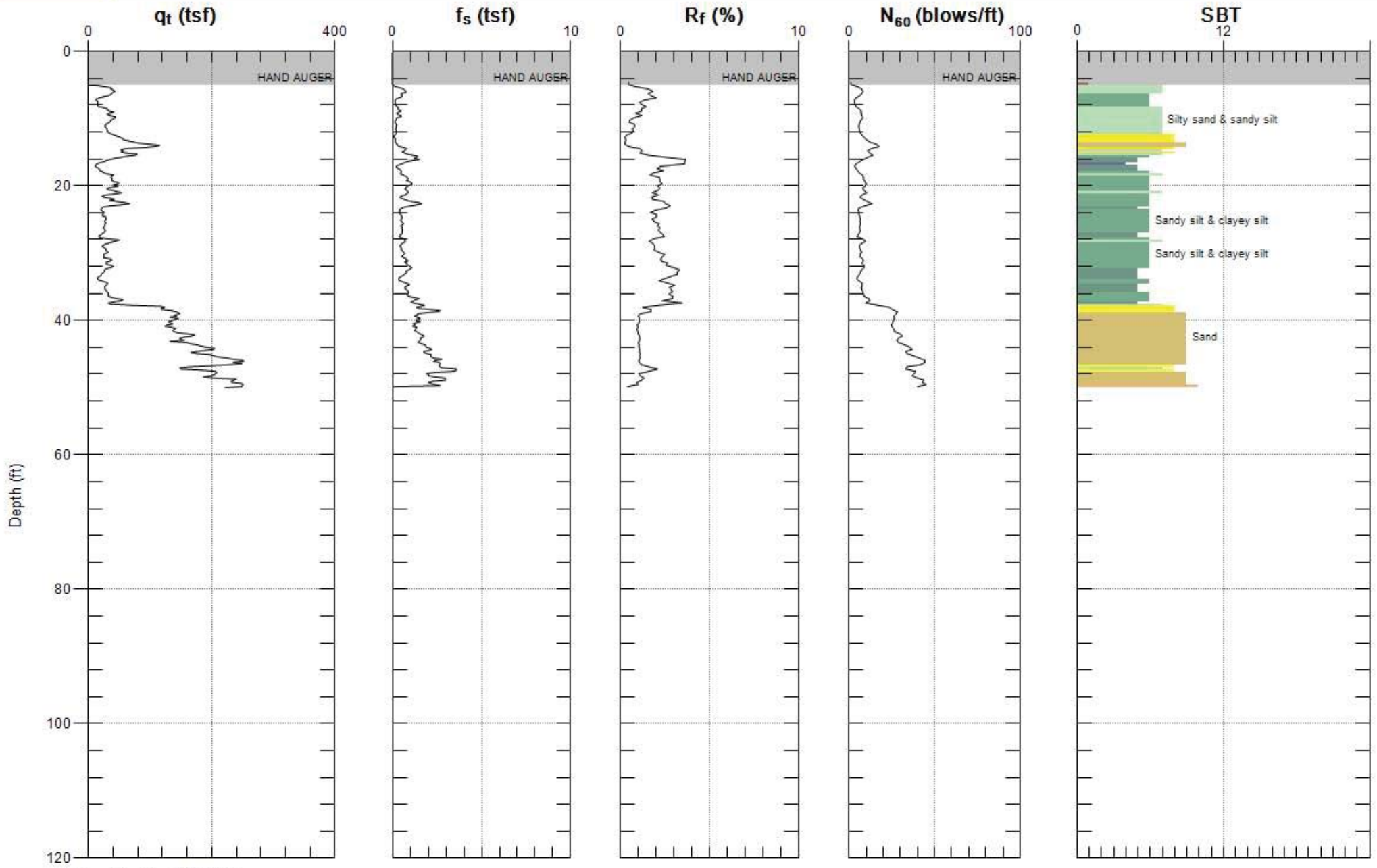
Max. Depth: 50.033 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 50.033 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



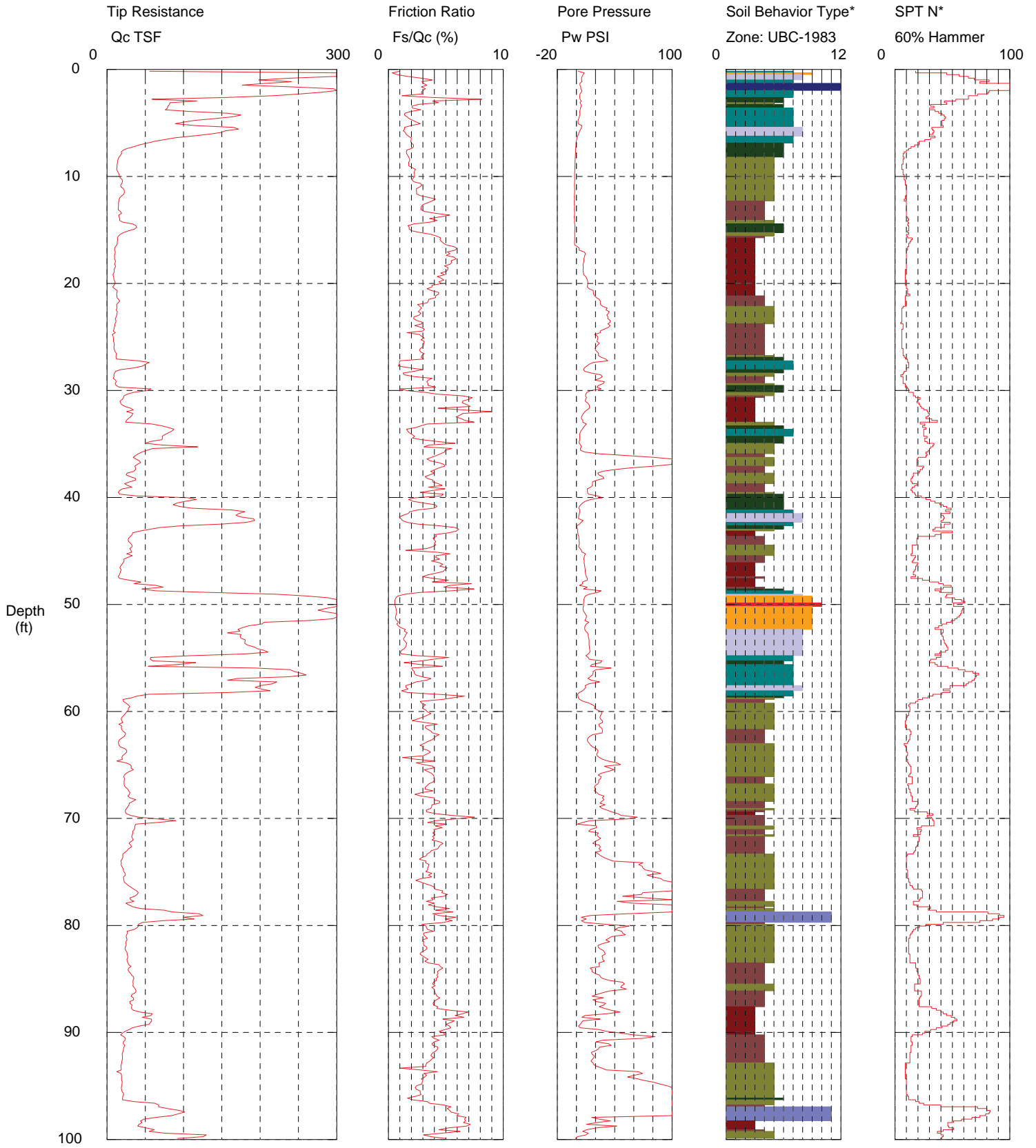
Max. Depth: 50.033 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

ENGEO

Operator: Doug
 Sounding: 5-CPT-2
 Cone Used: DSG1150

CPT Date/Time: 9/23/2010 9:17:49 AM
 Location: RD-17
 Job Number: 376



Maximum Depth = 100.72 feet

Depth Increment = 0.164 feet

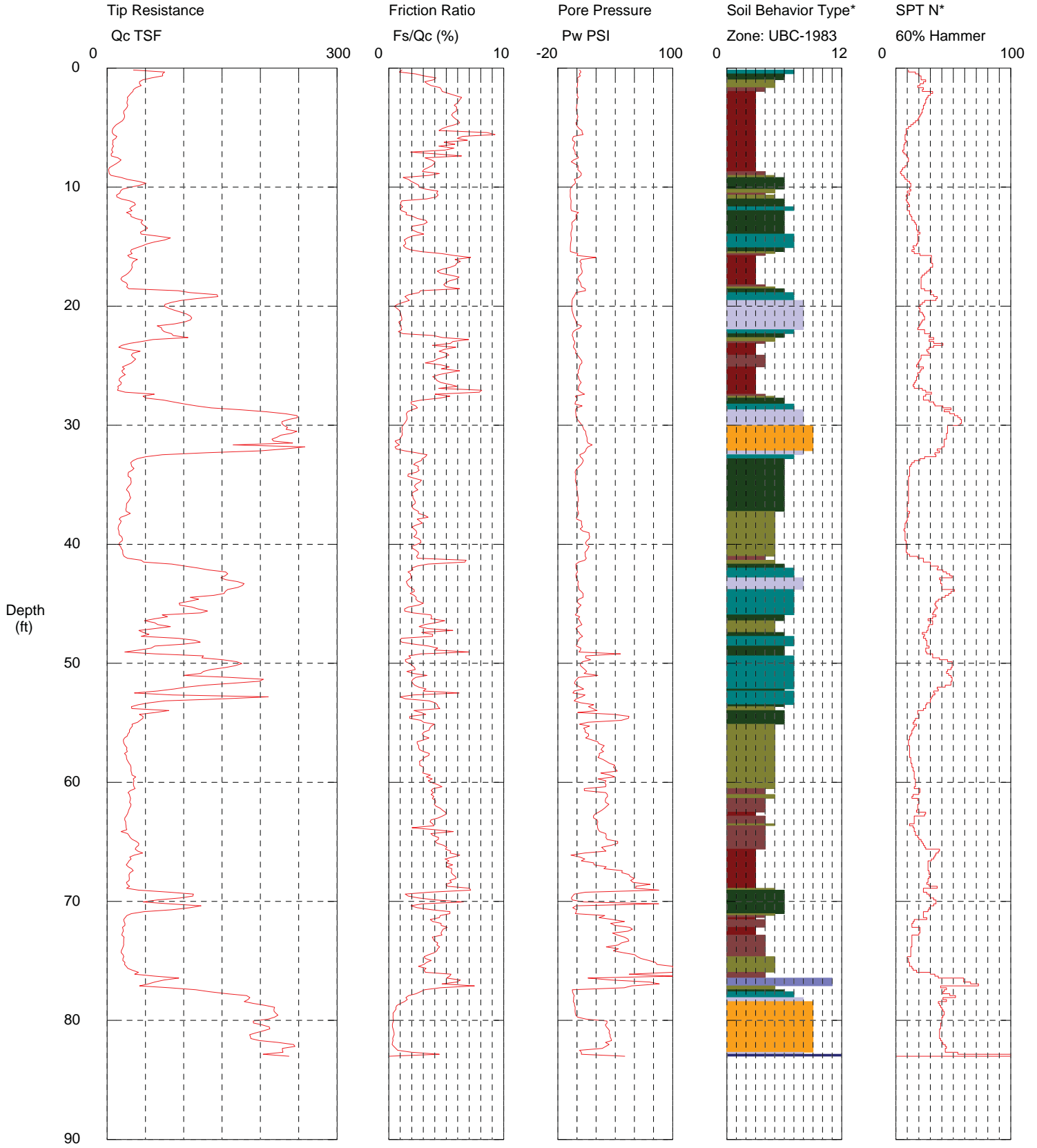
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983

ENGEO

Operator: Doug
 Sounding: 5-CPT-3
 Cone Used: DSG1150

CPT Date/Time: 9/23/2010 10:33:04 AM
 Location: RD-17
 Job Number: 376

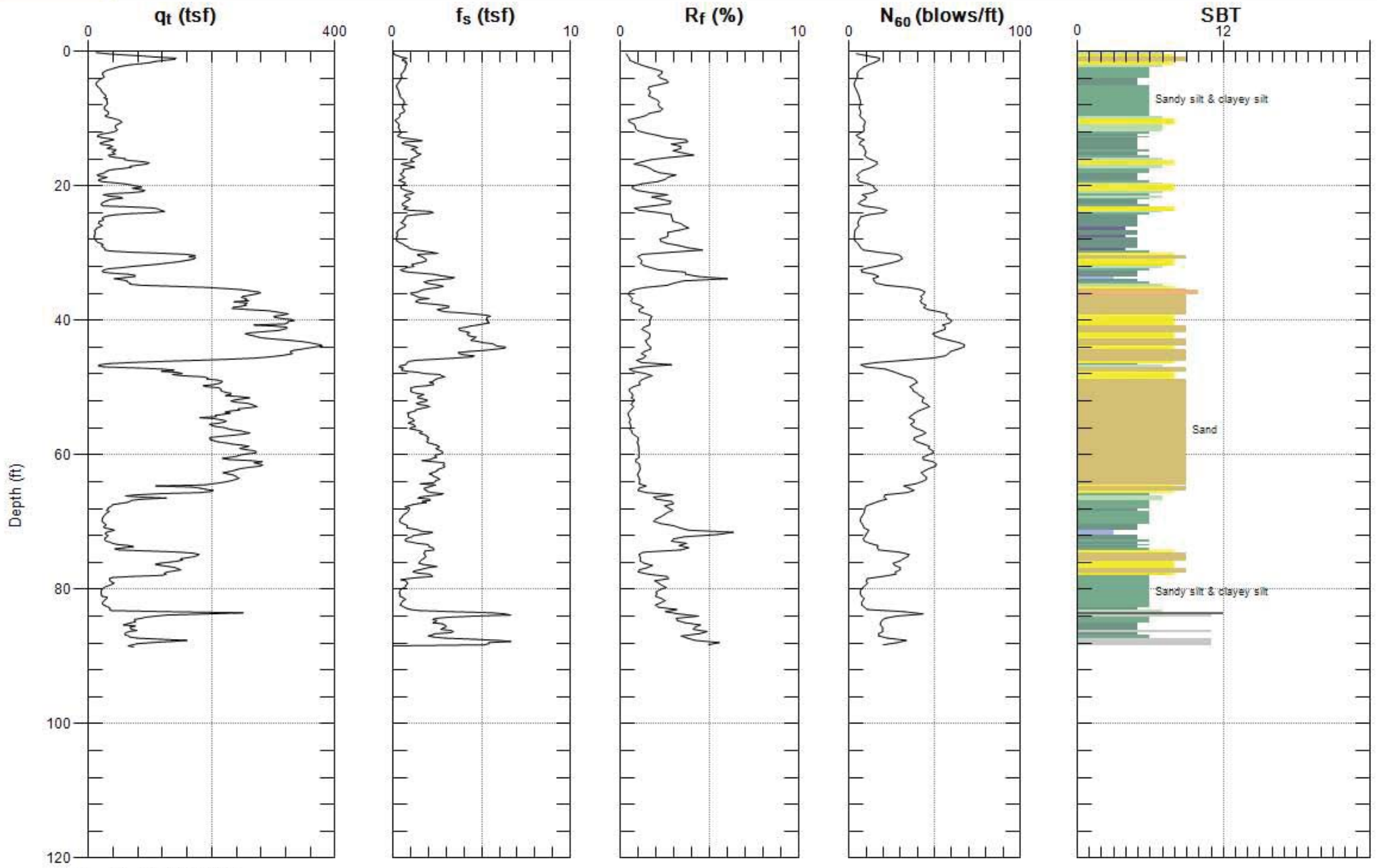


Maximum Depth = 83.01 feet

Depth Increment = 0.164 feet

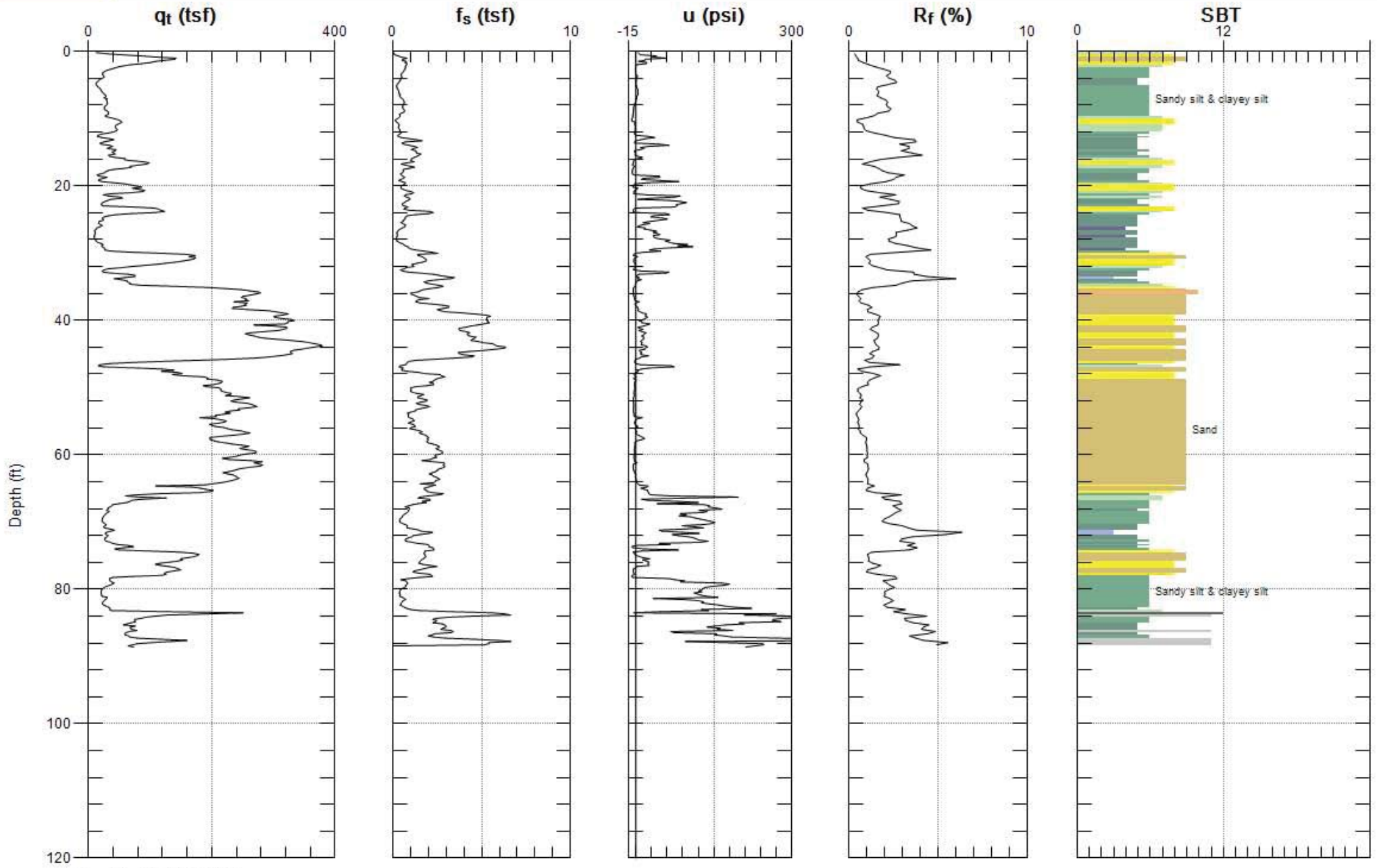
- | | | | |
|--------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 sensitive fine grained | 4 silty clay to clay | 7 silty sand to sandy silt | 10 gravelly sand to sand |
| 2 organic material | 5 clayey silt to silty clay | 8 sand to silty sand | 11 very stiff fine grained (*) |
| 3 clay | 6 sandy silt to clayey silt | 9 sand | 12 sand to clayey sand (*) |

*Soil behavior type and SPT based on data from UBC-1983



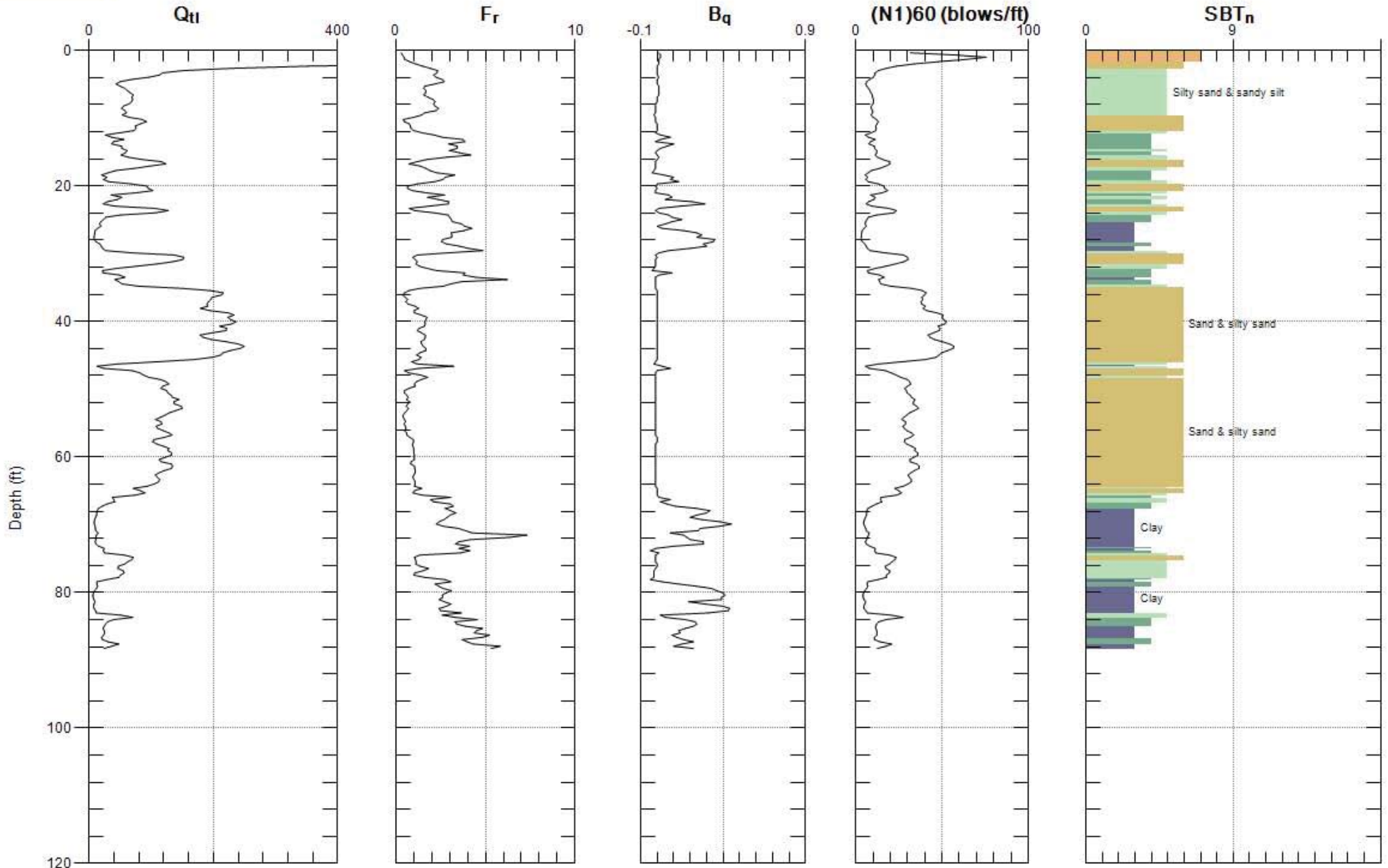
Max. Depth: 88.583 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



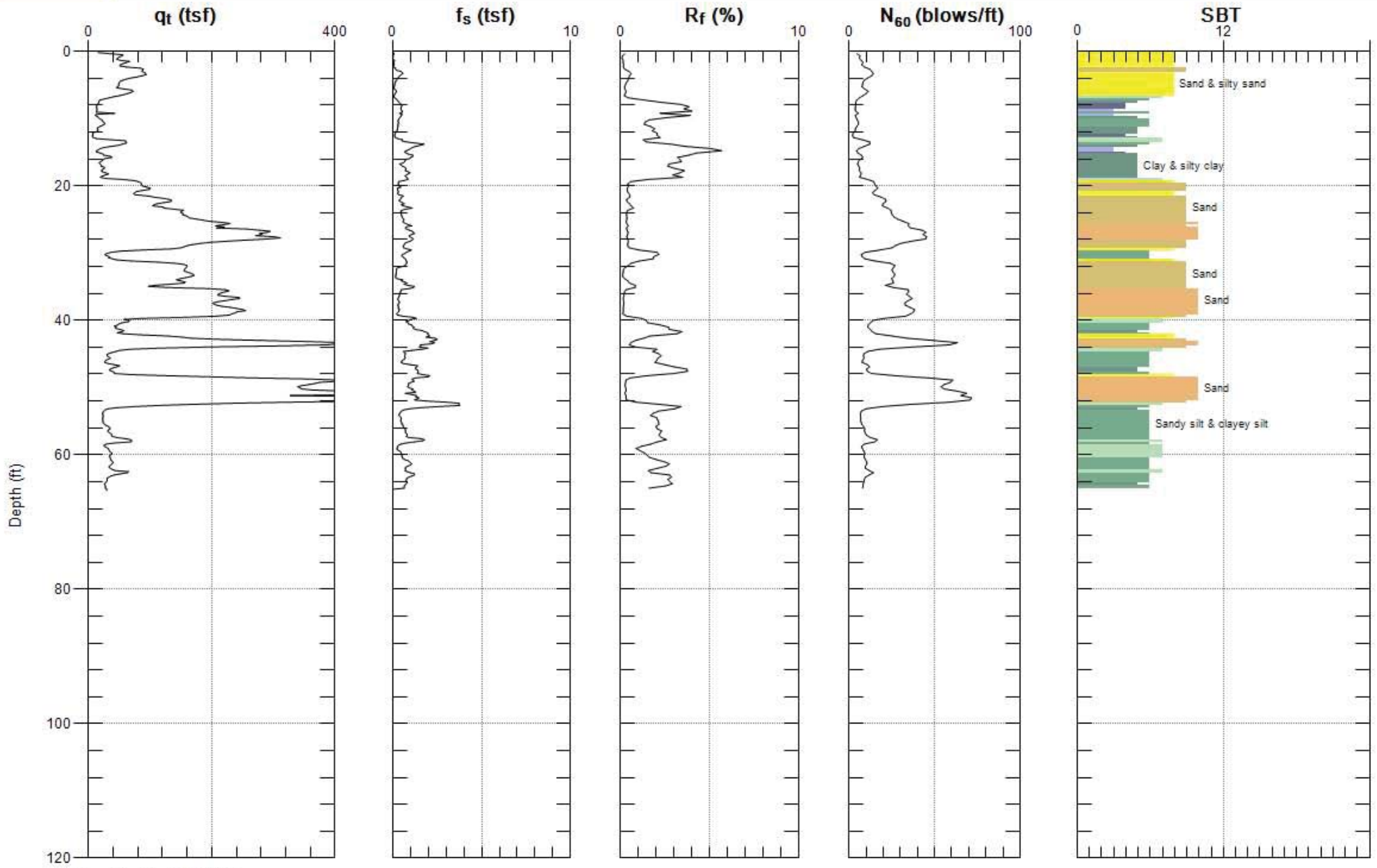
Max. Depth: 88.583 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



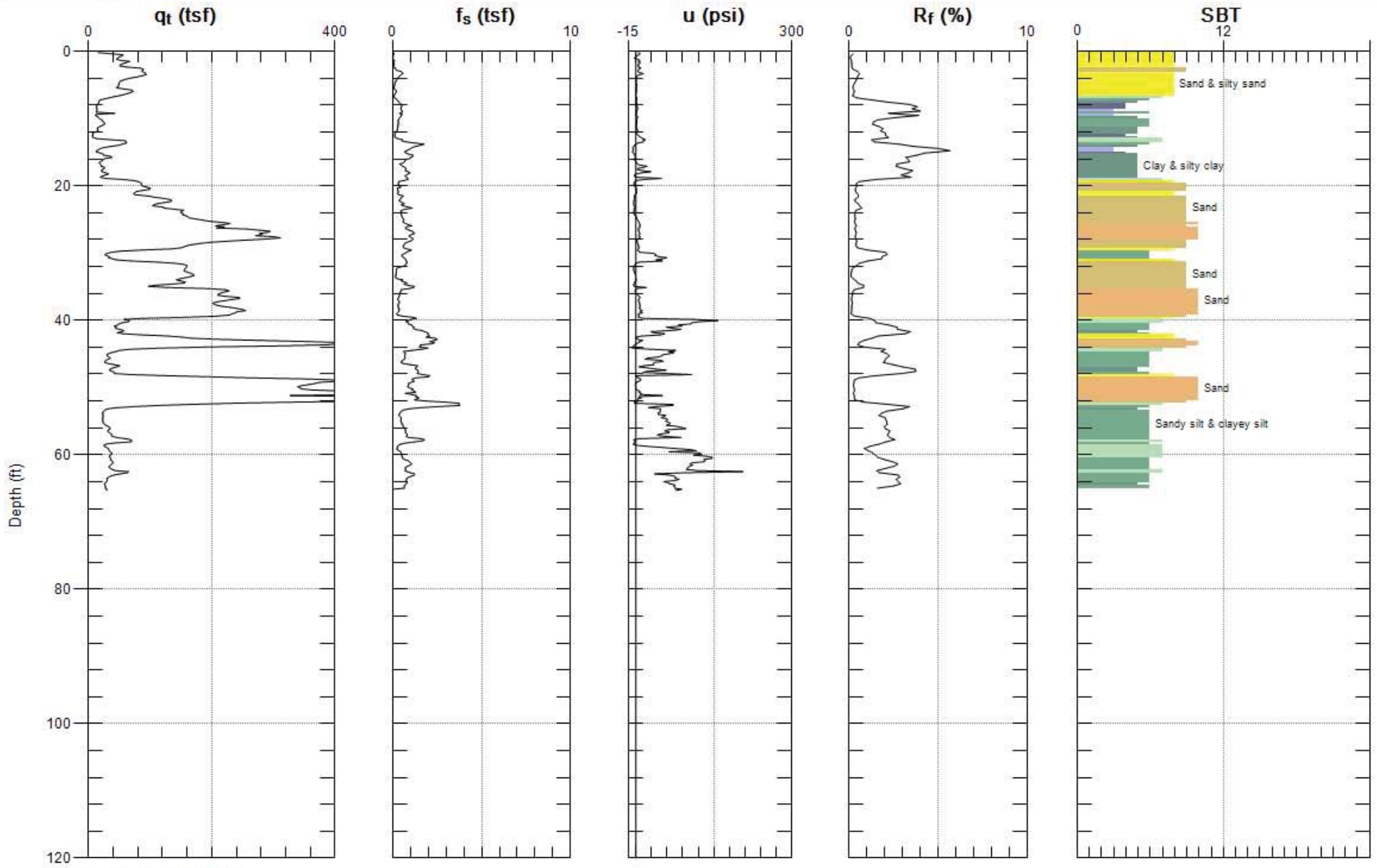
Max. Depth: 88.583 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



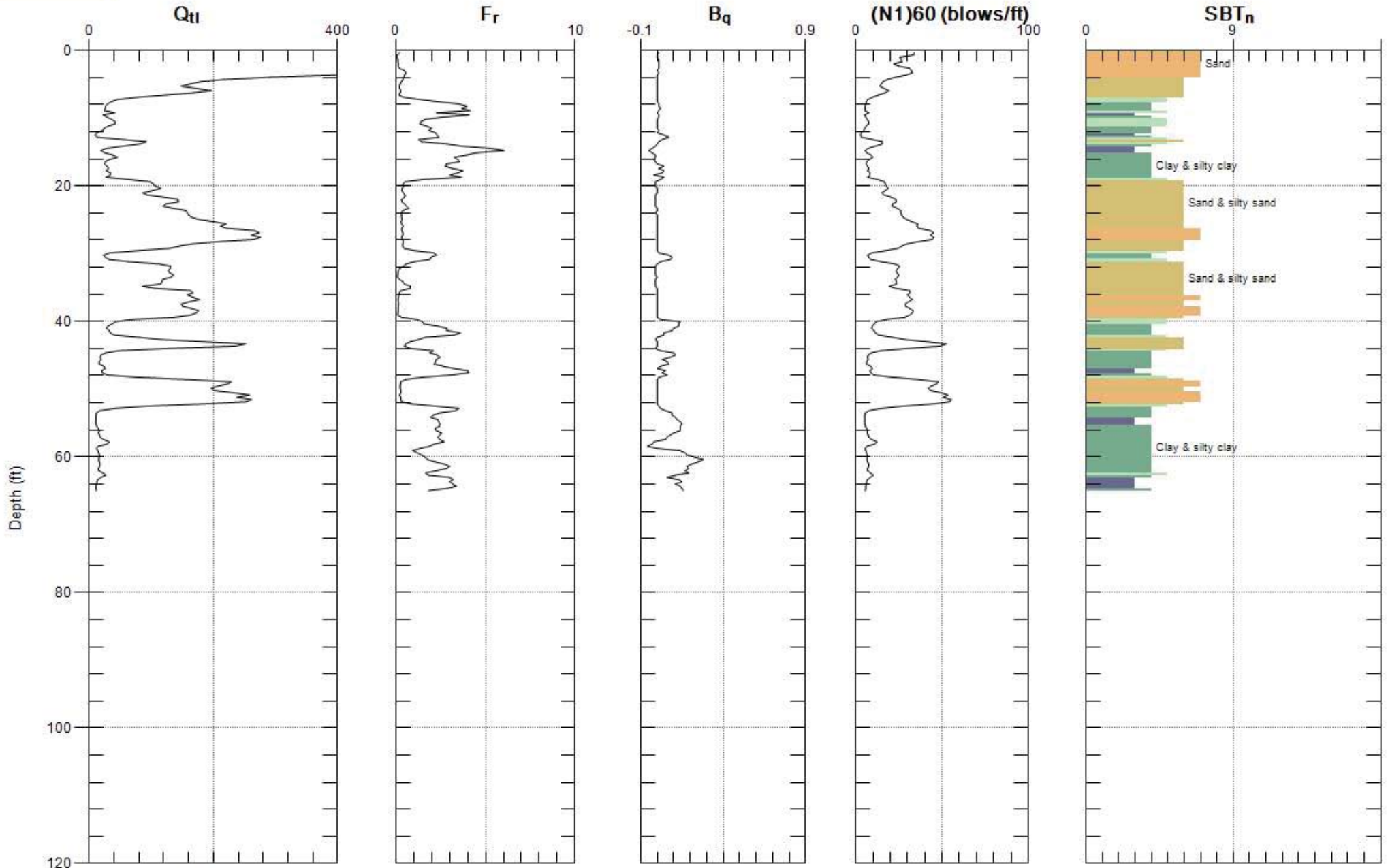
Max. Depth: 65.289 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



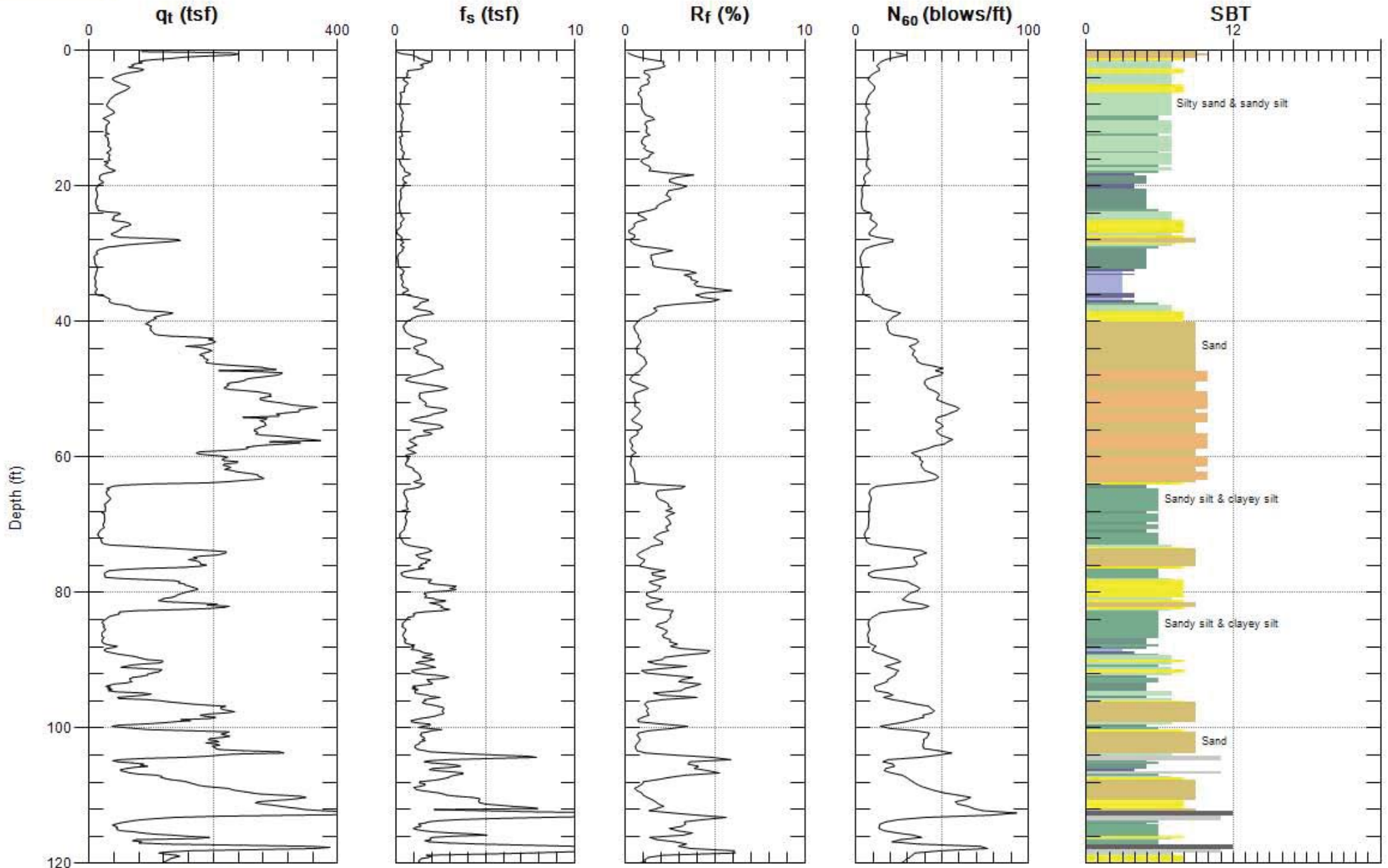
Max. Depth: 65.289 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



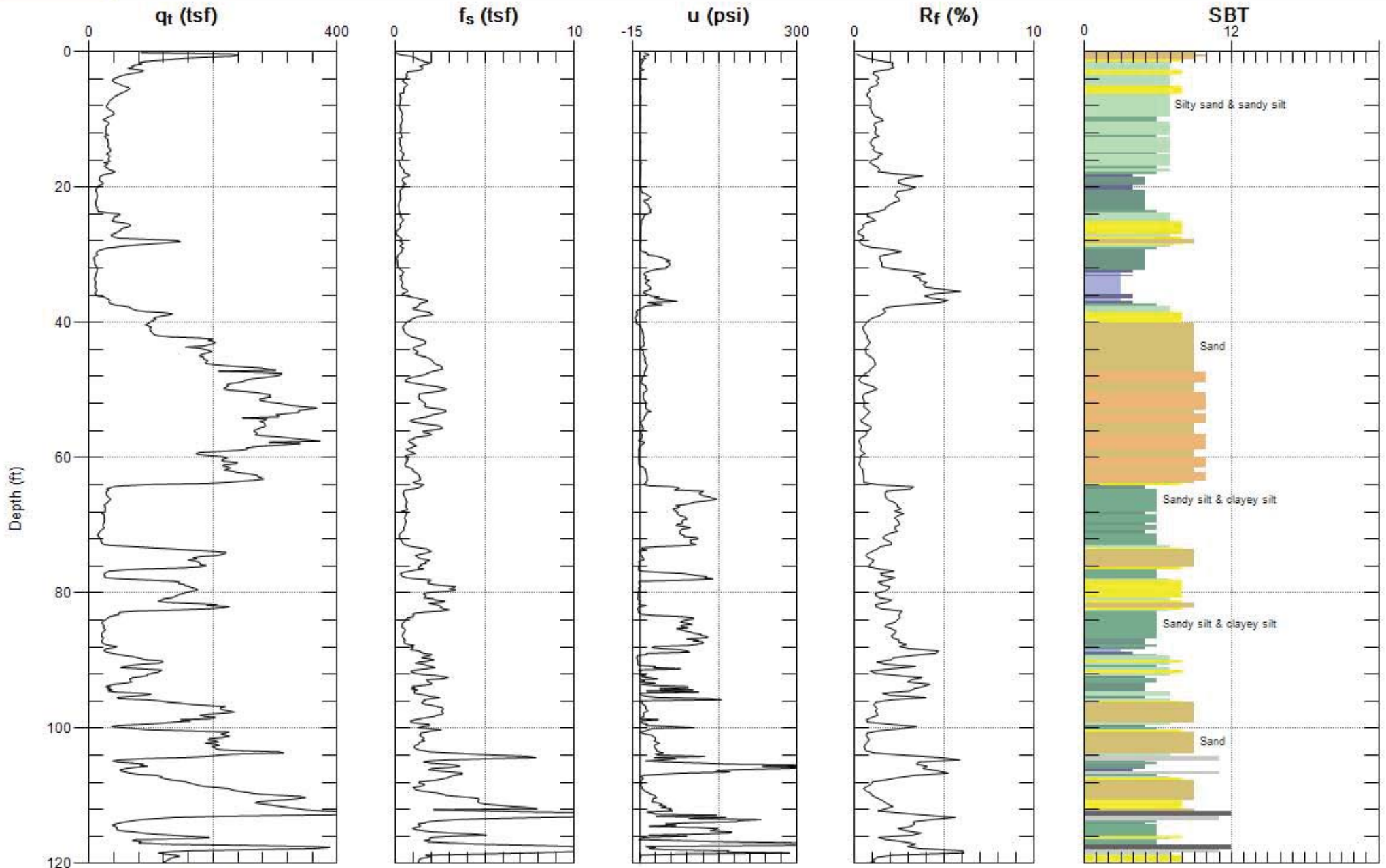
Max. Depth: 65.289 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



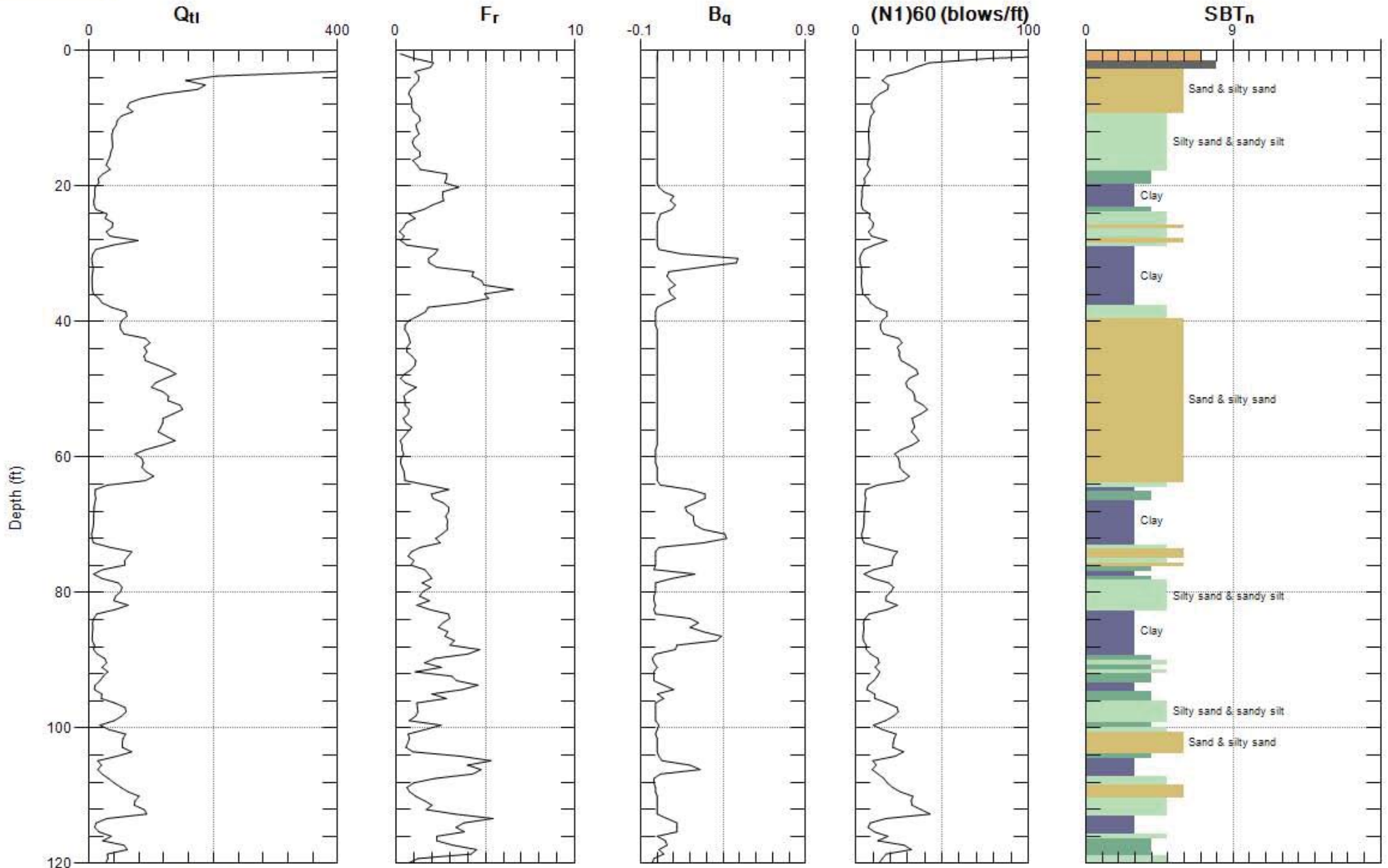
Max. Depth: 120.243 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



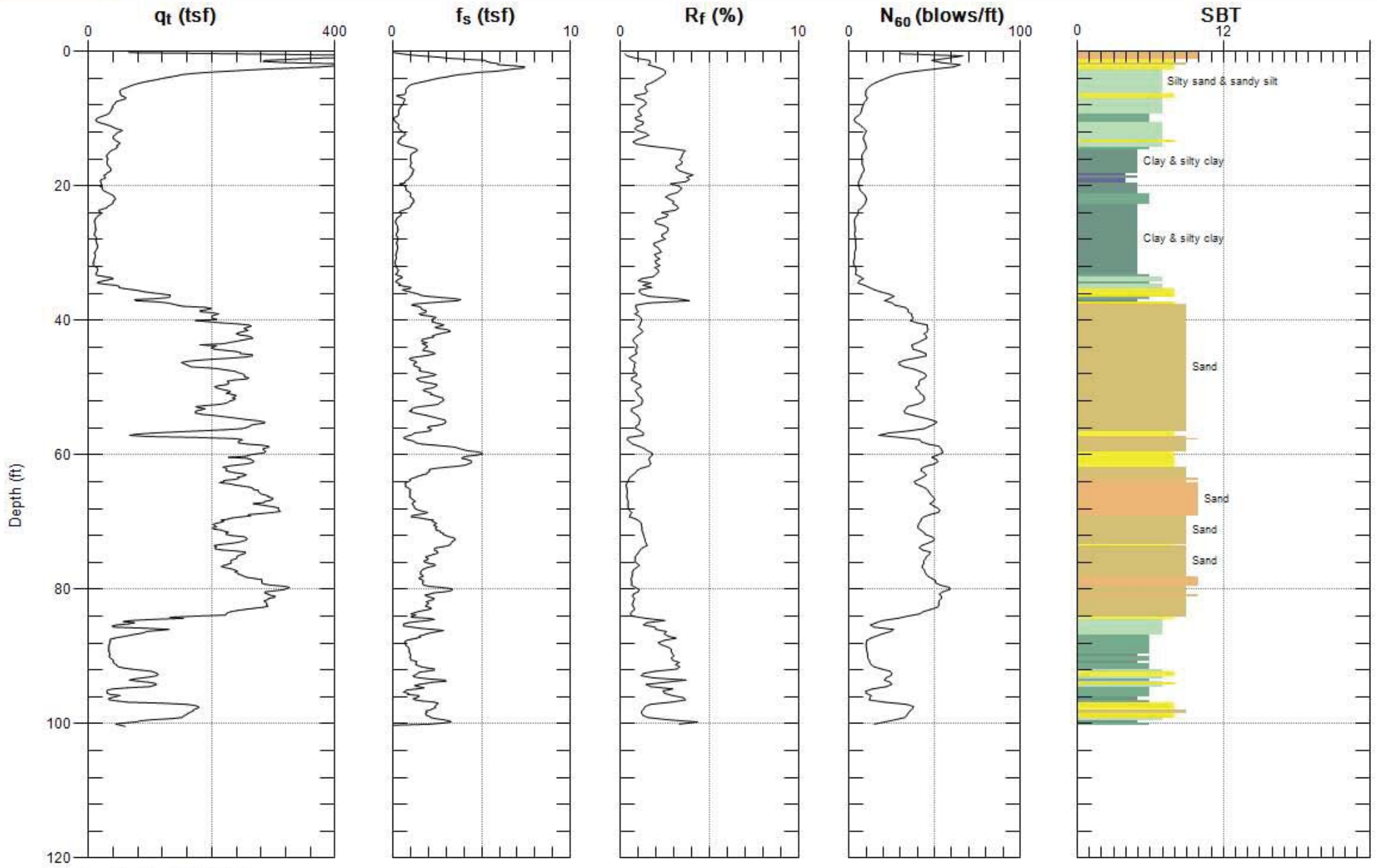
Max. Depth: 120.243 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



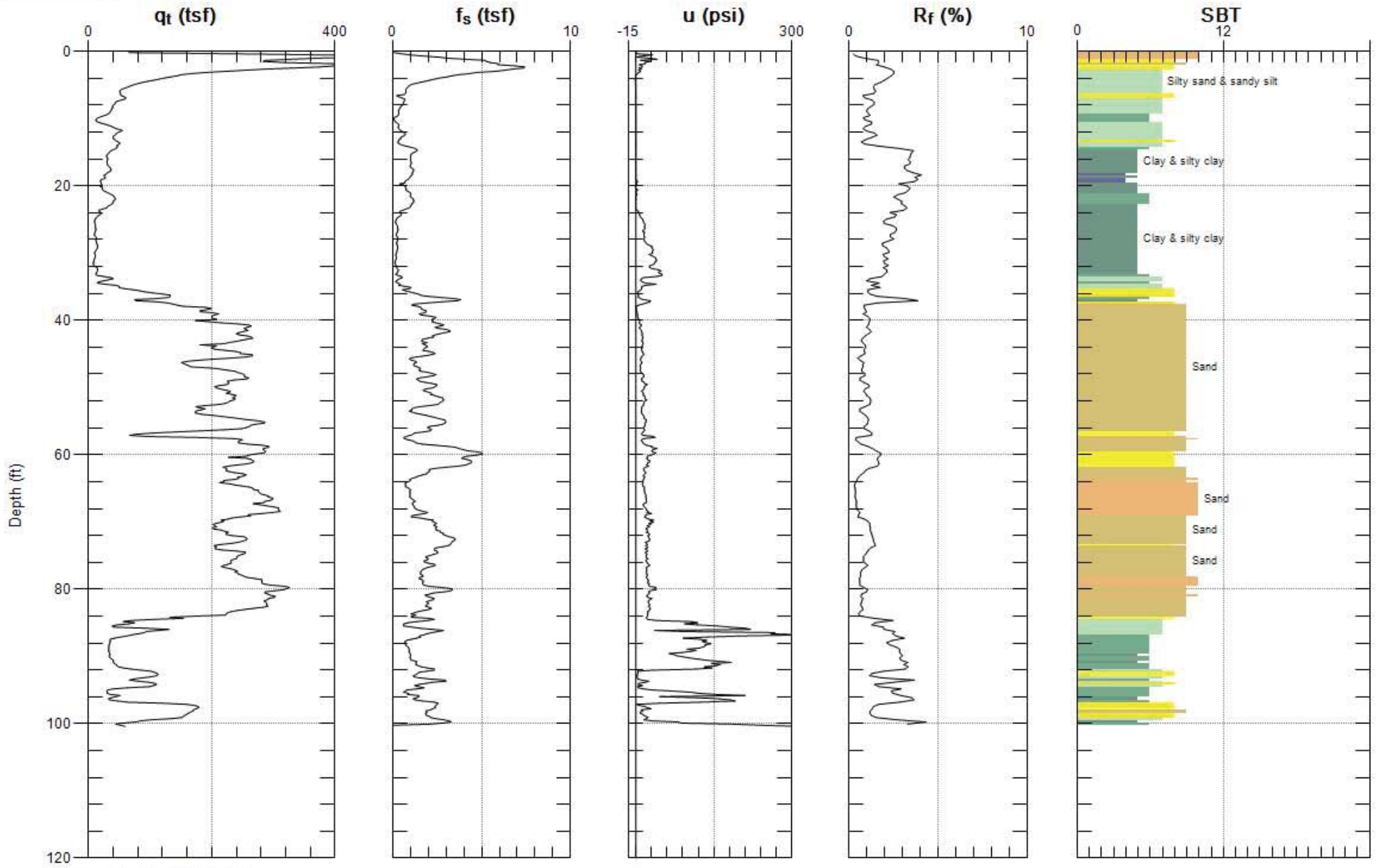
Max. Depth: 120.243 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



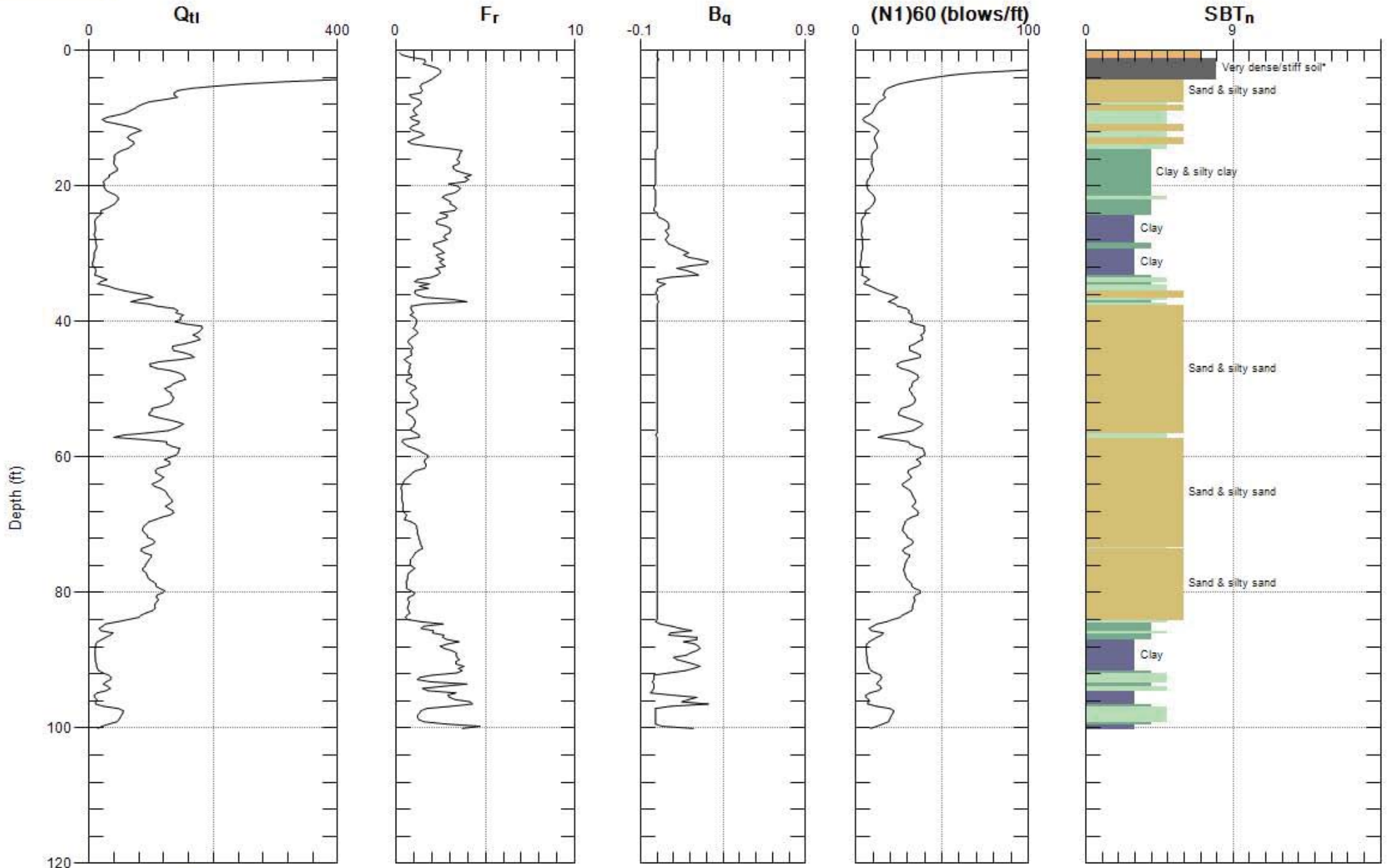
Max. Depth: 100.394 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



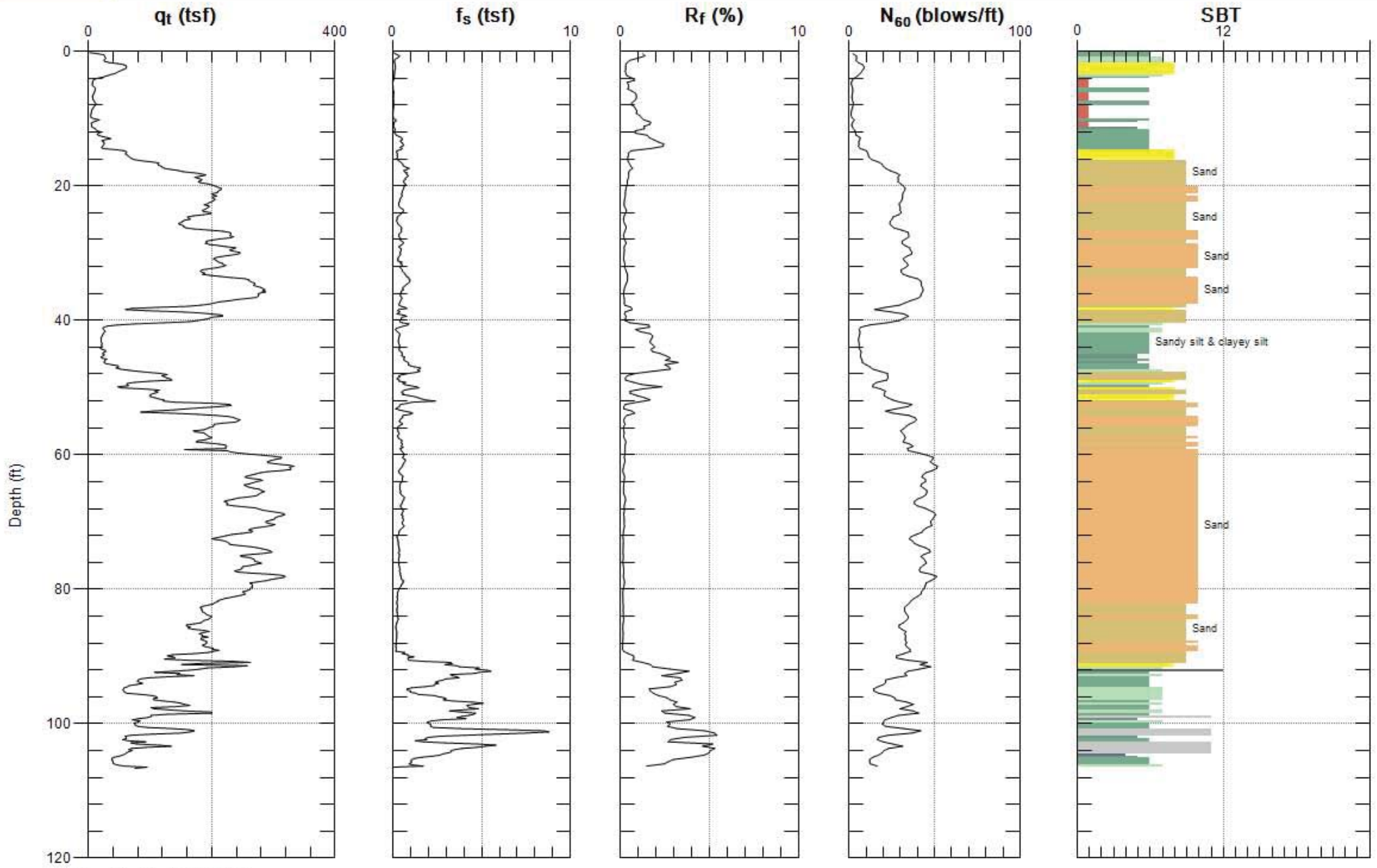
Max. Depth: 100.394 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



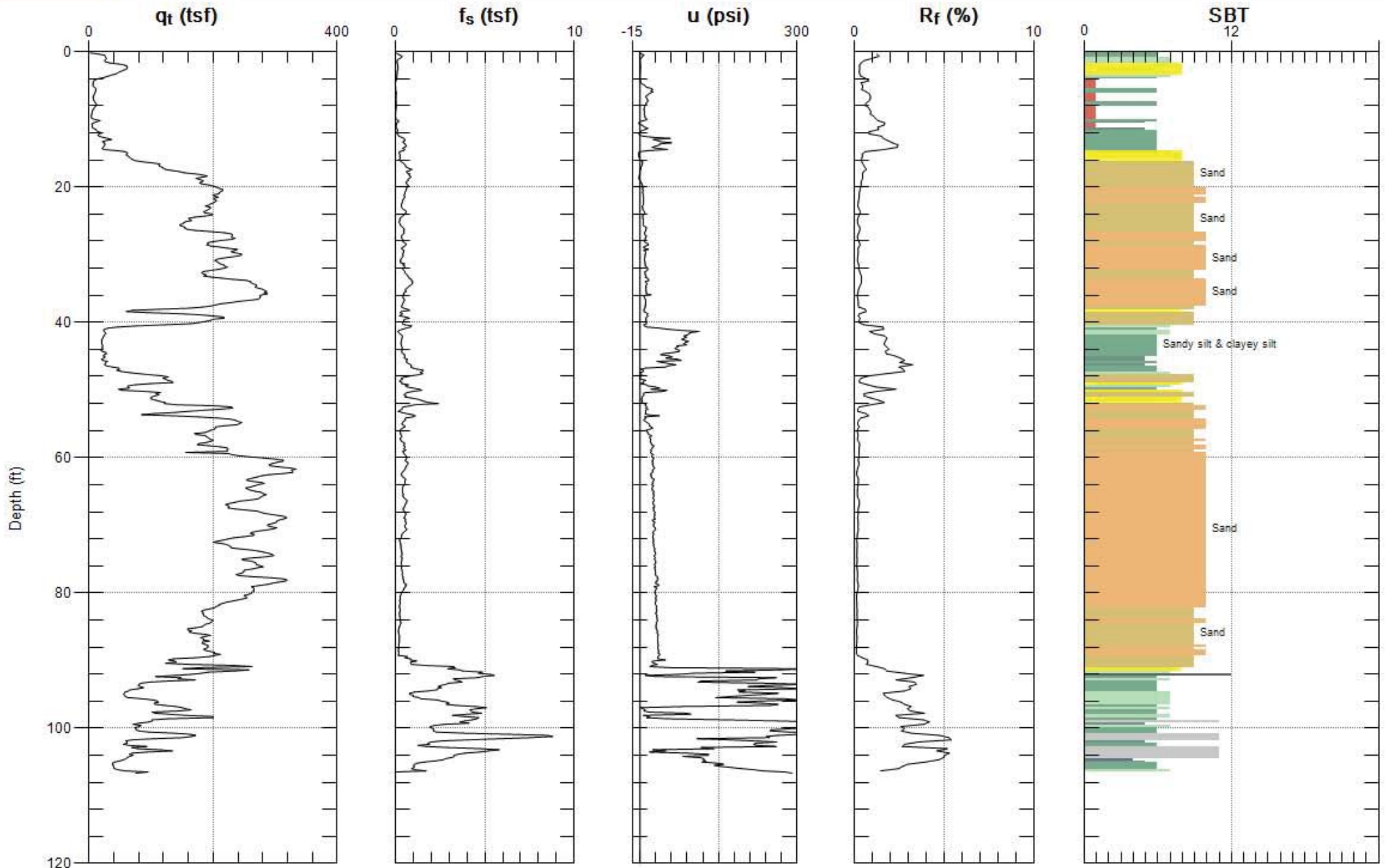
Max. Depth: 100.394 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



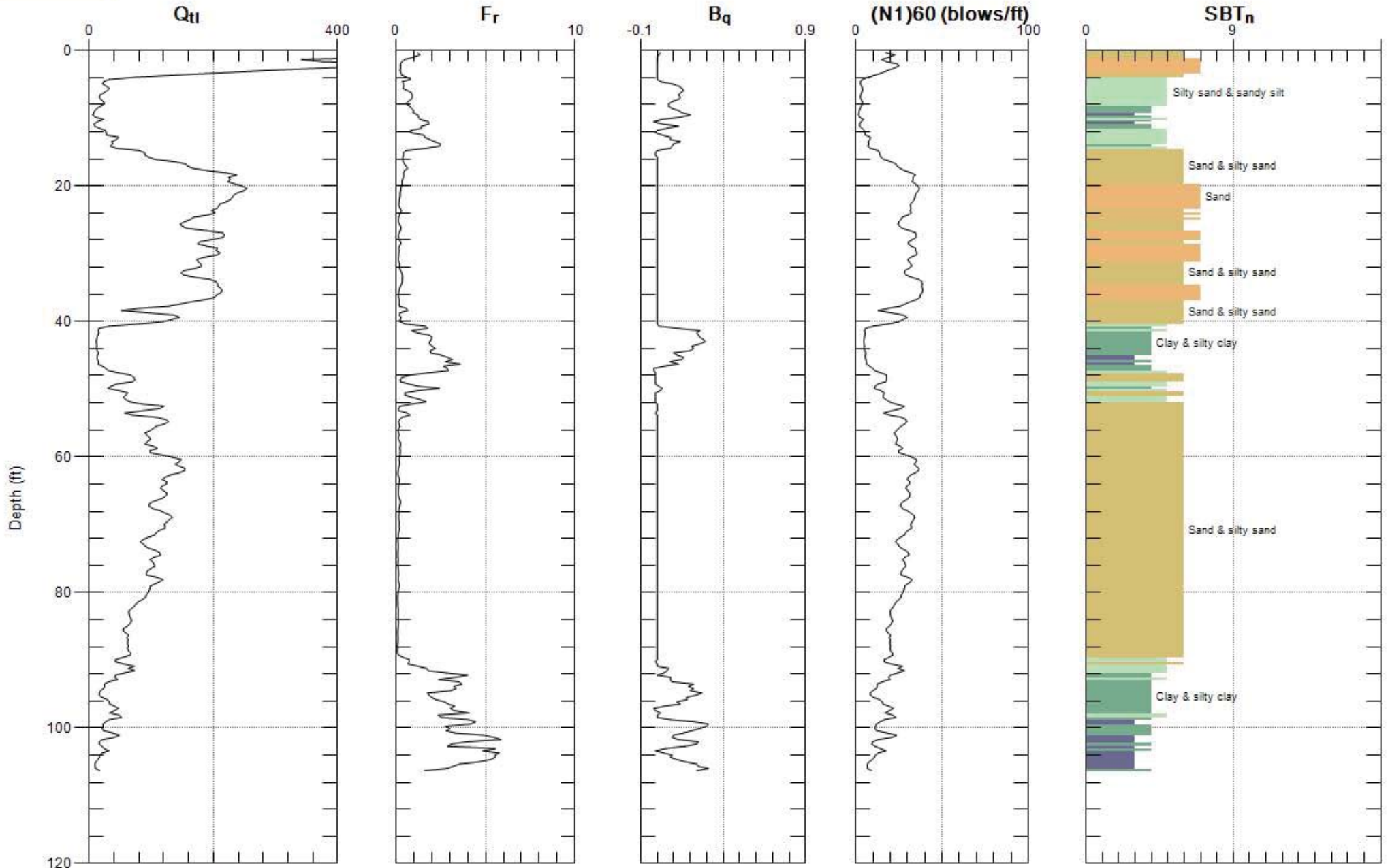
Max. Depth: 106.627 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



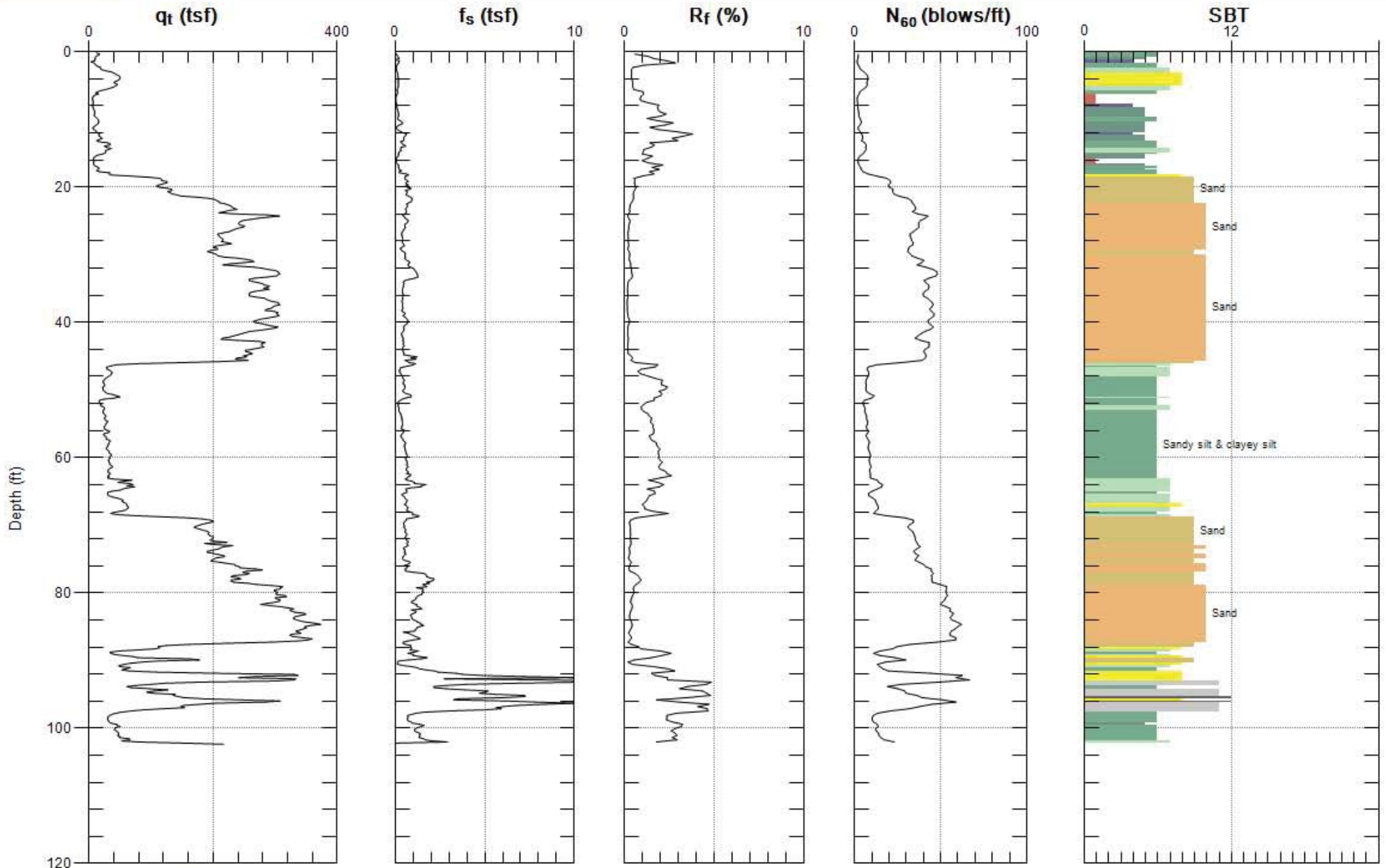
Max. Depth: 106.627 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



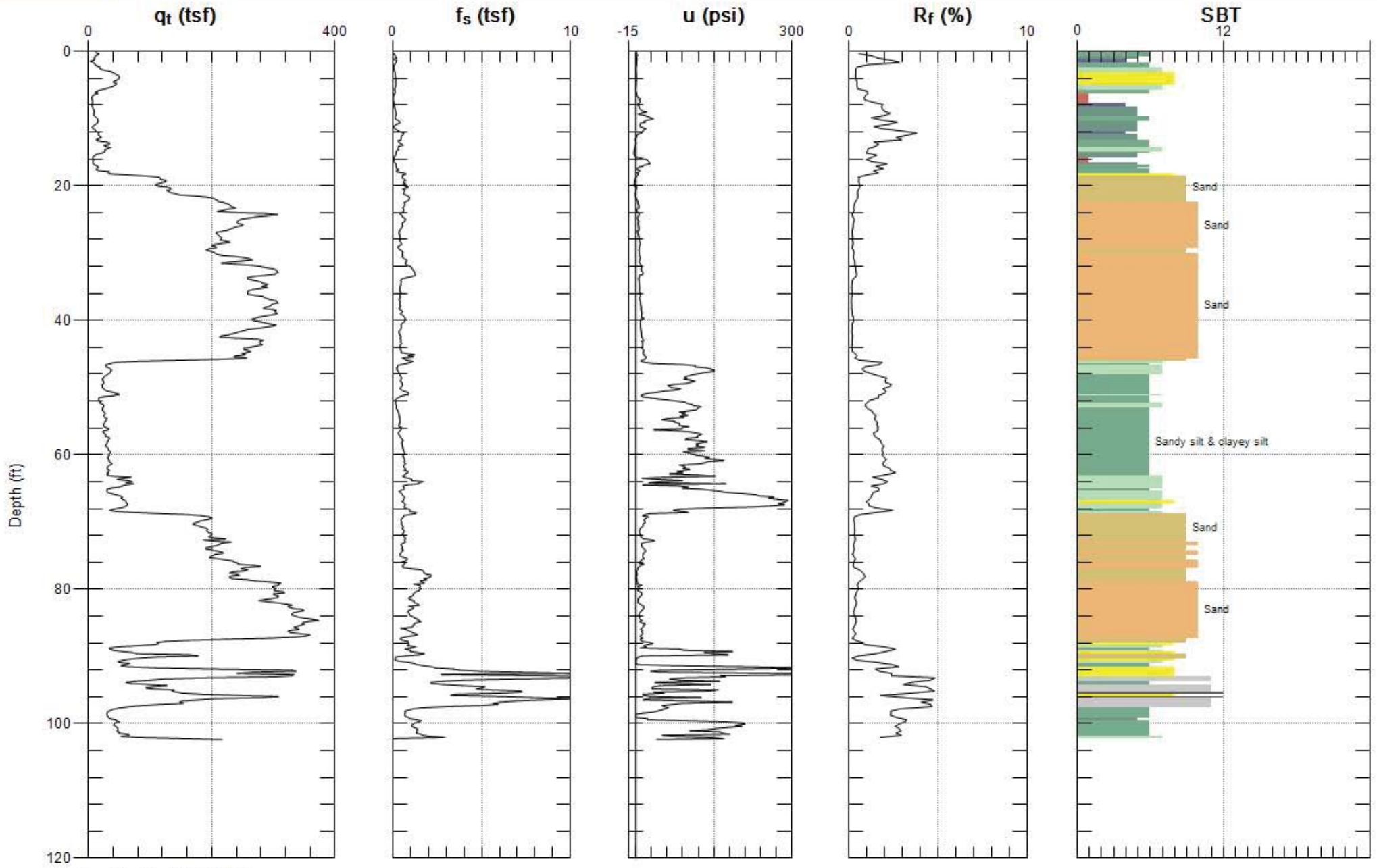
Max. Depth: 106.627 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



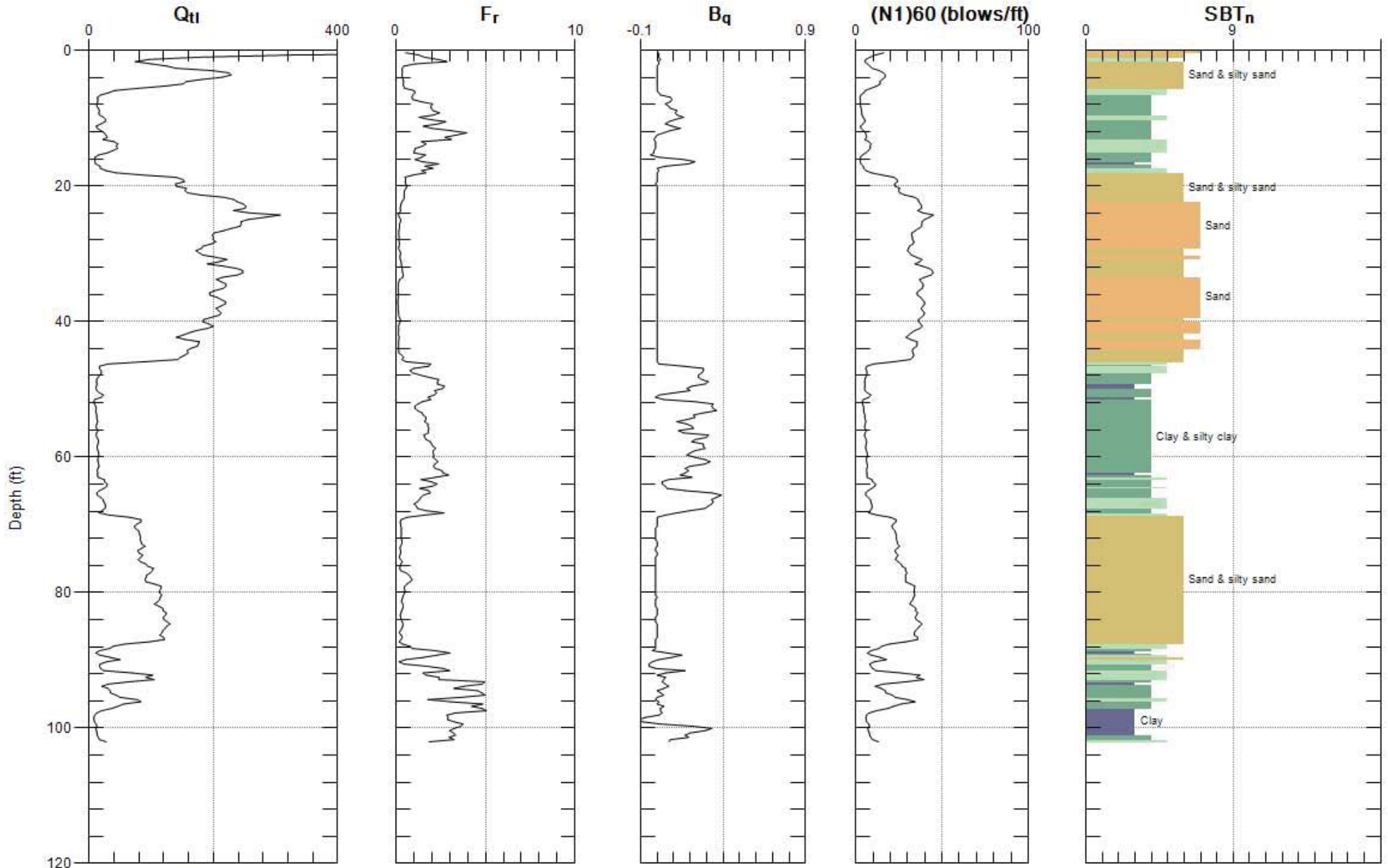
Max. Depth: 102.362 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



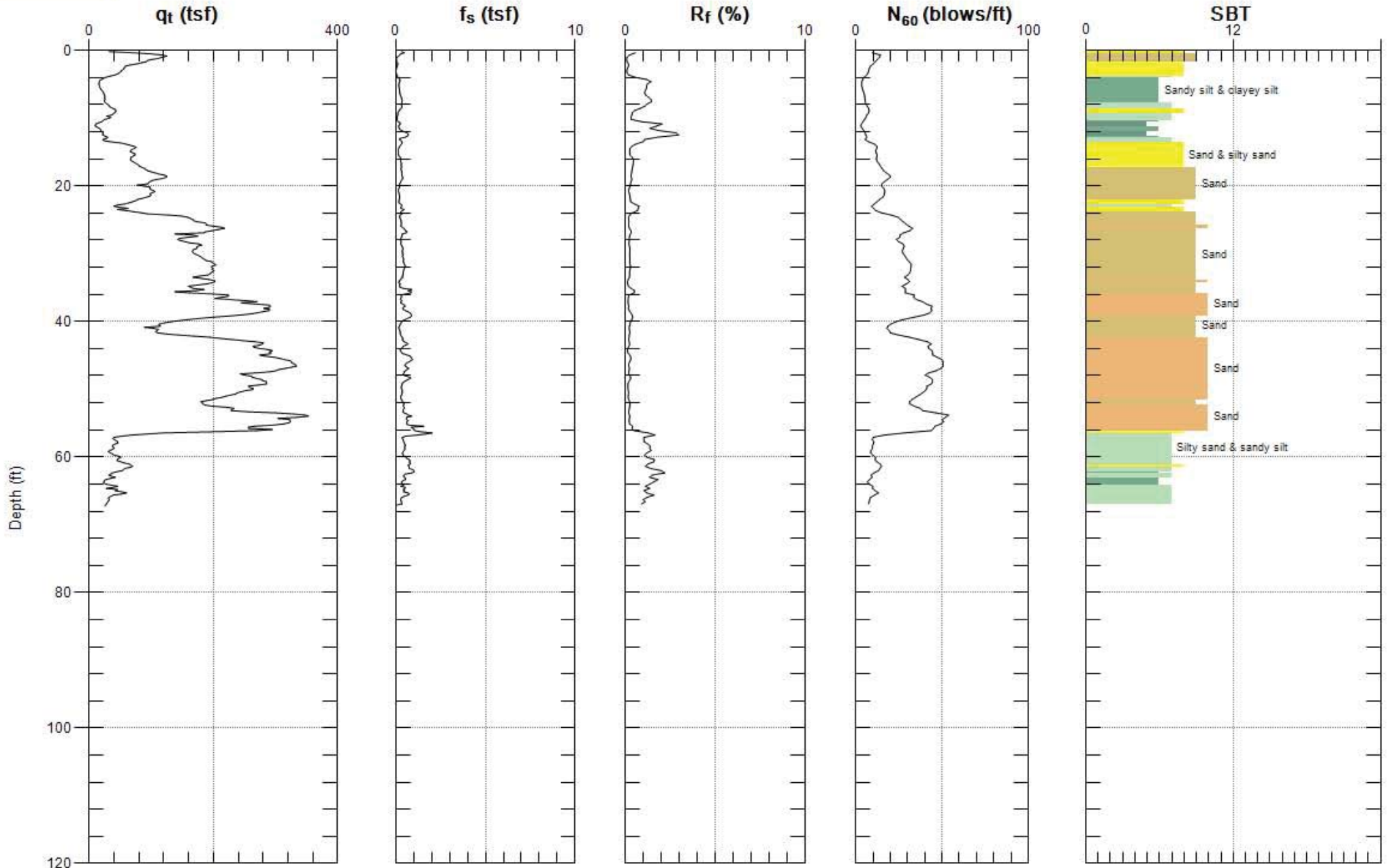
Max. Depth: 102.362 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



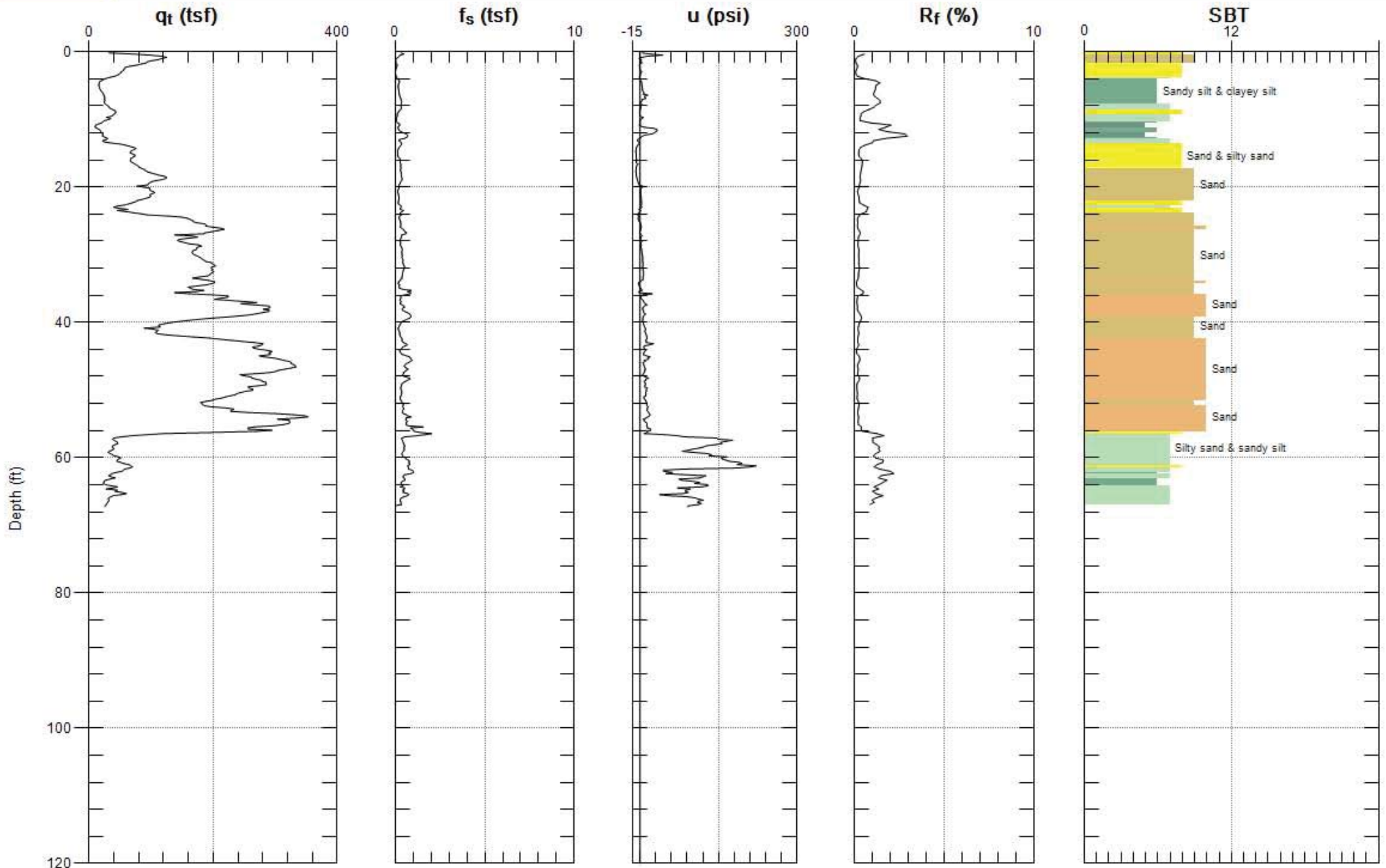
Max. Depth: 102.362 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



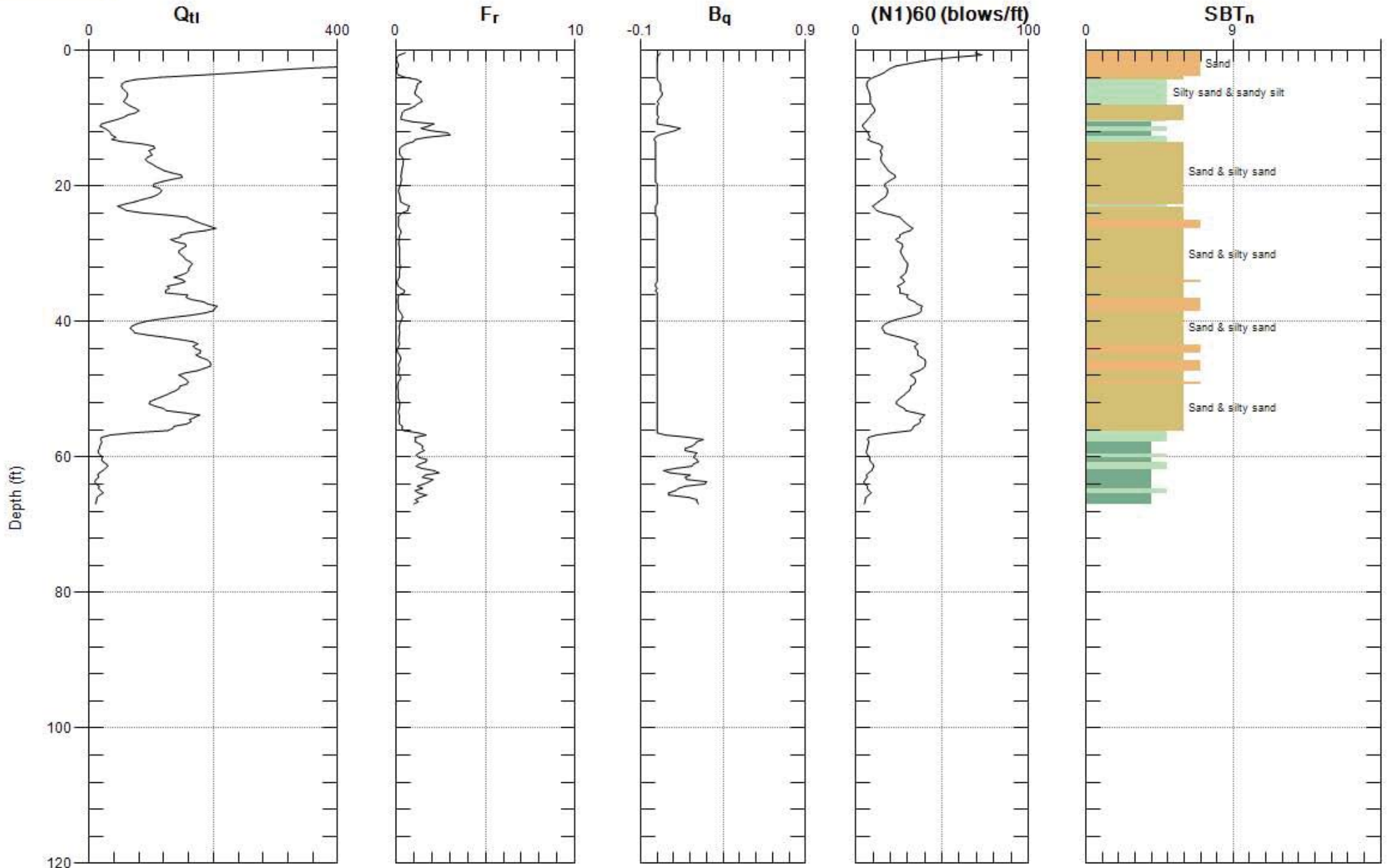
Max. Depth: 67.257 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



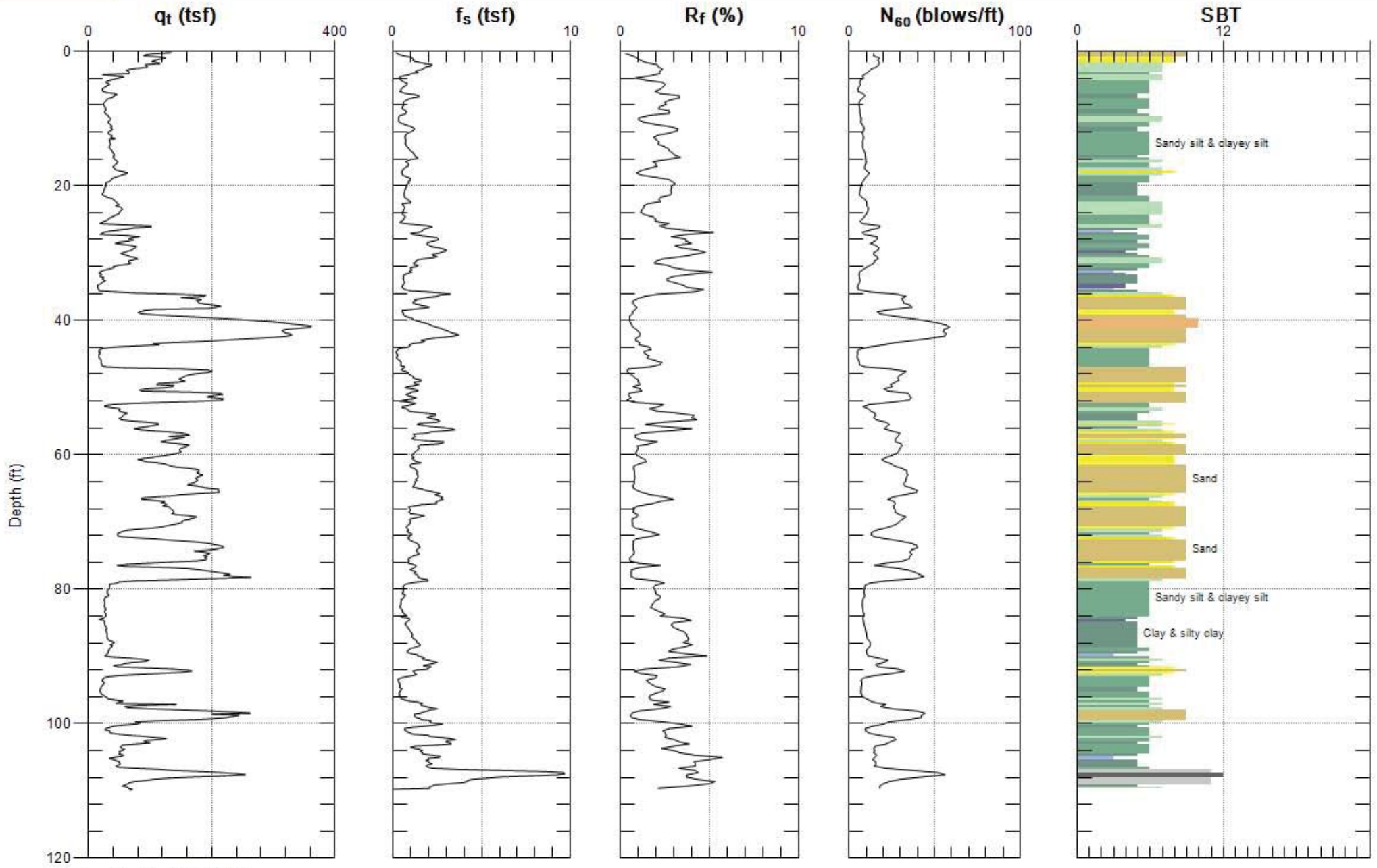
Max. Depth: 67.257 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



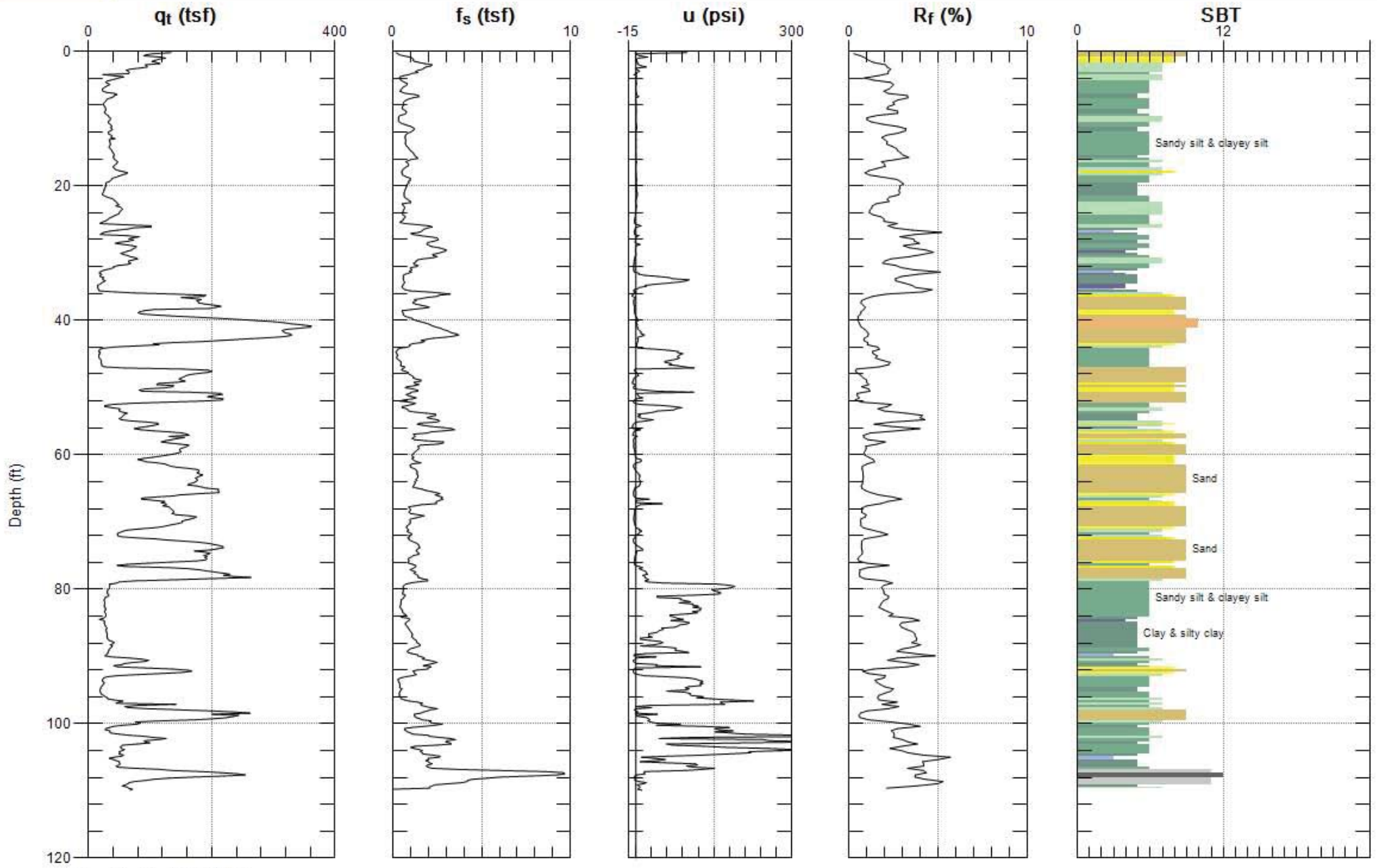
Max. Depth: 67.257 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



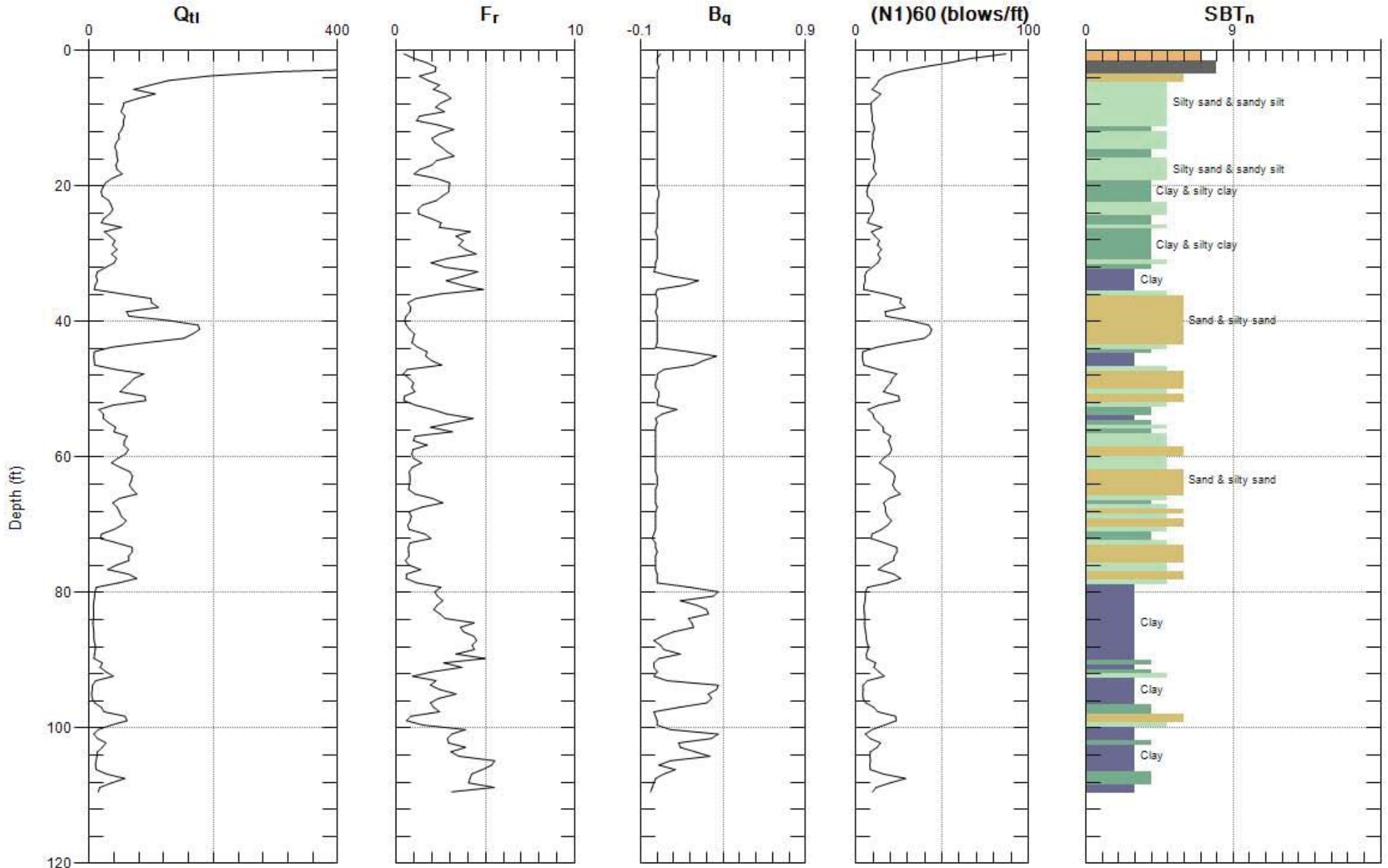
Max. Depth: 109.908 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



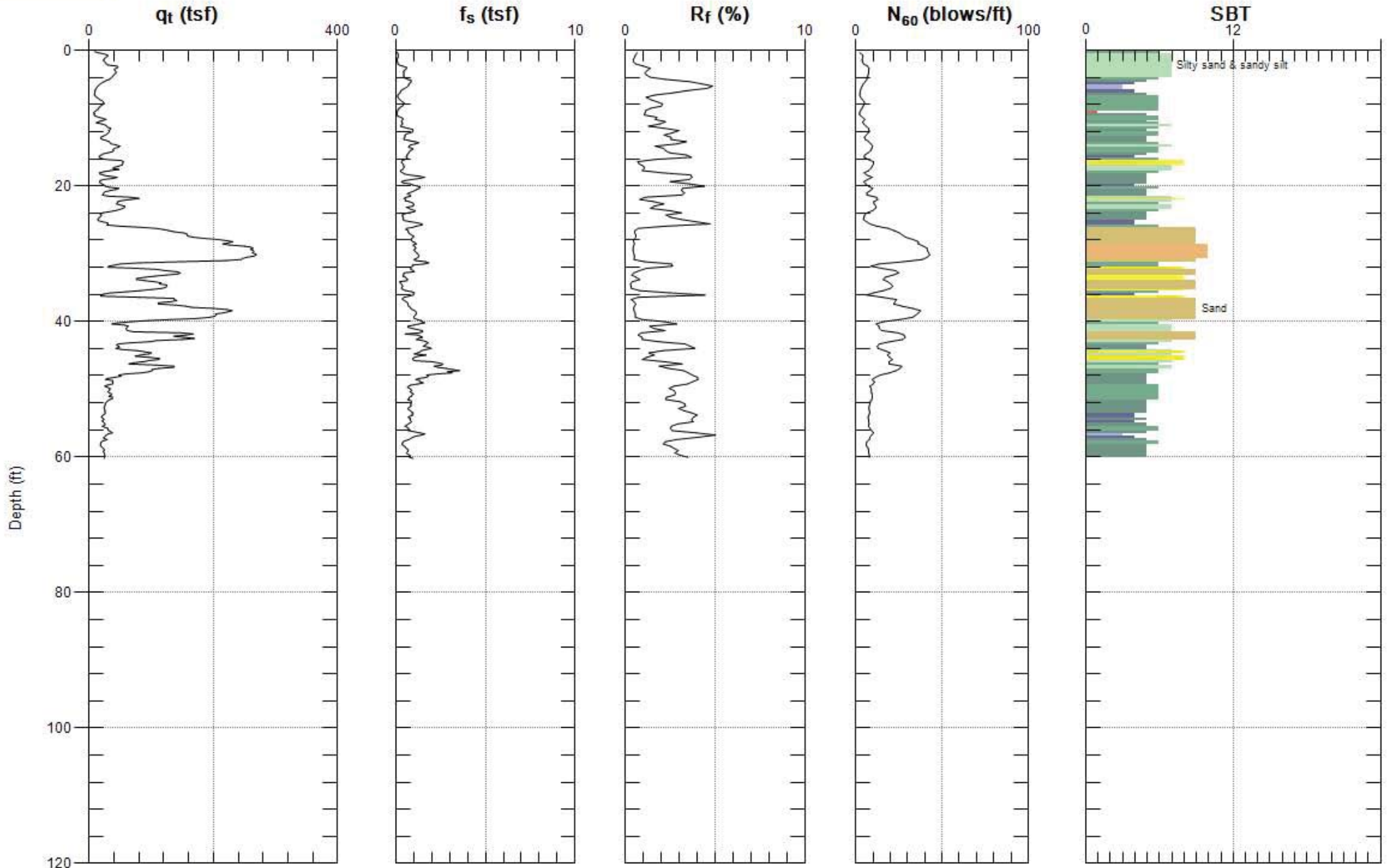
Max. Depth: 109.908 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



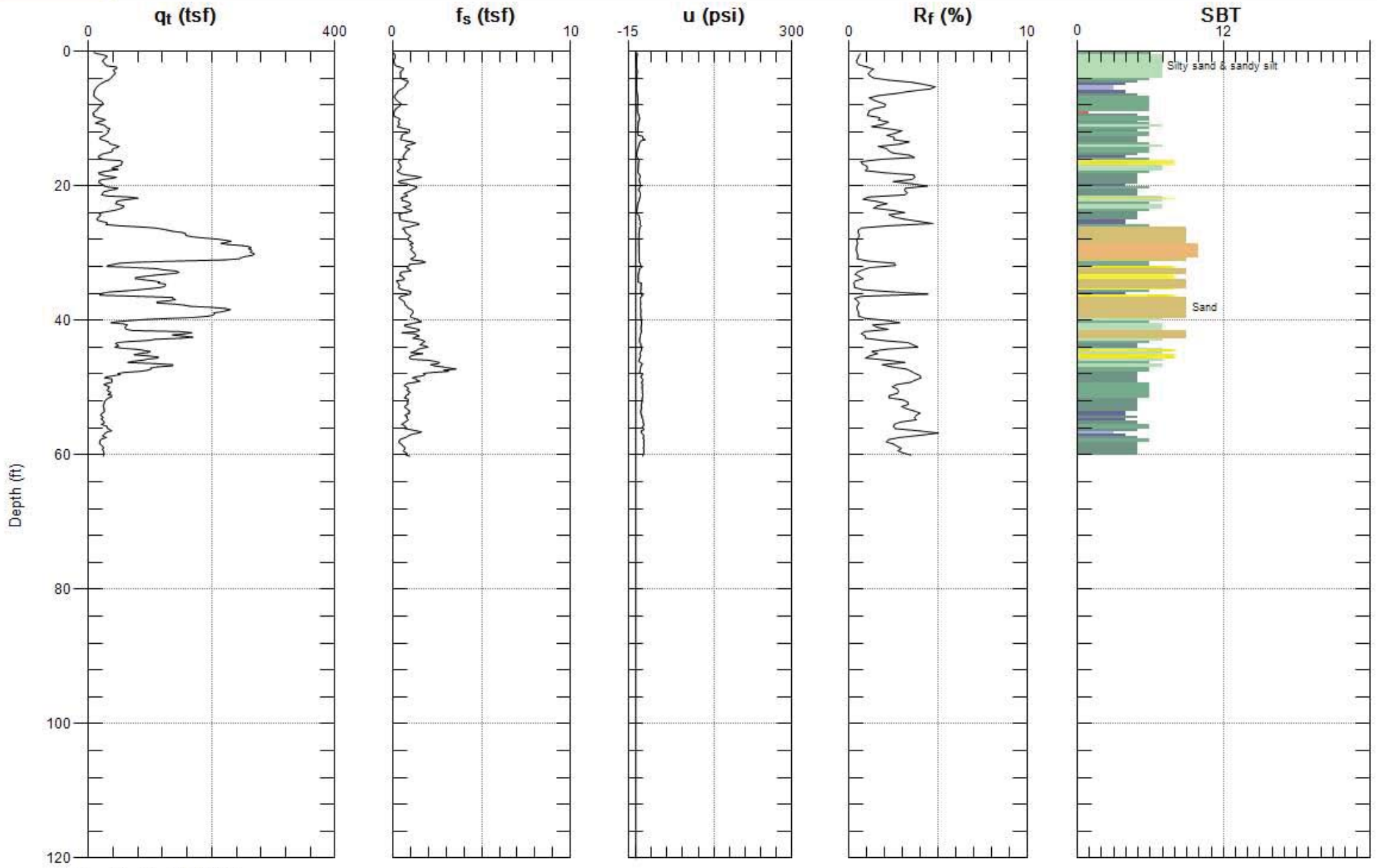
Max. Depth: 109.908 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



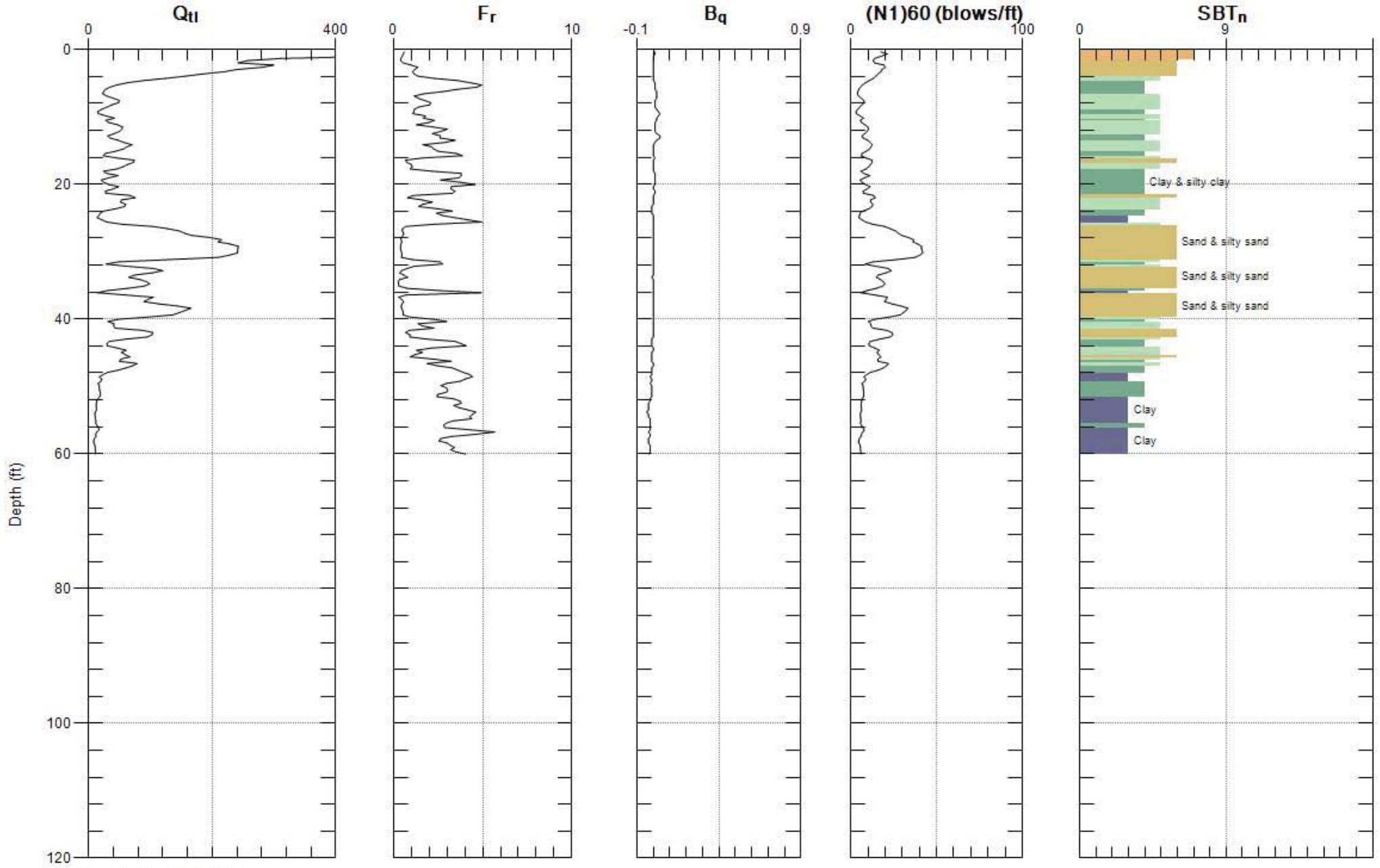
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



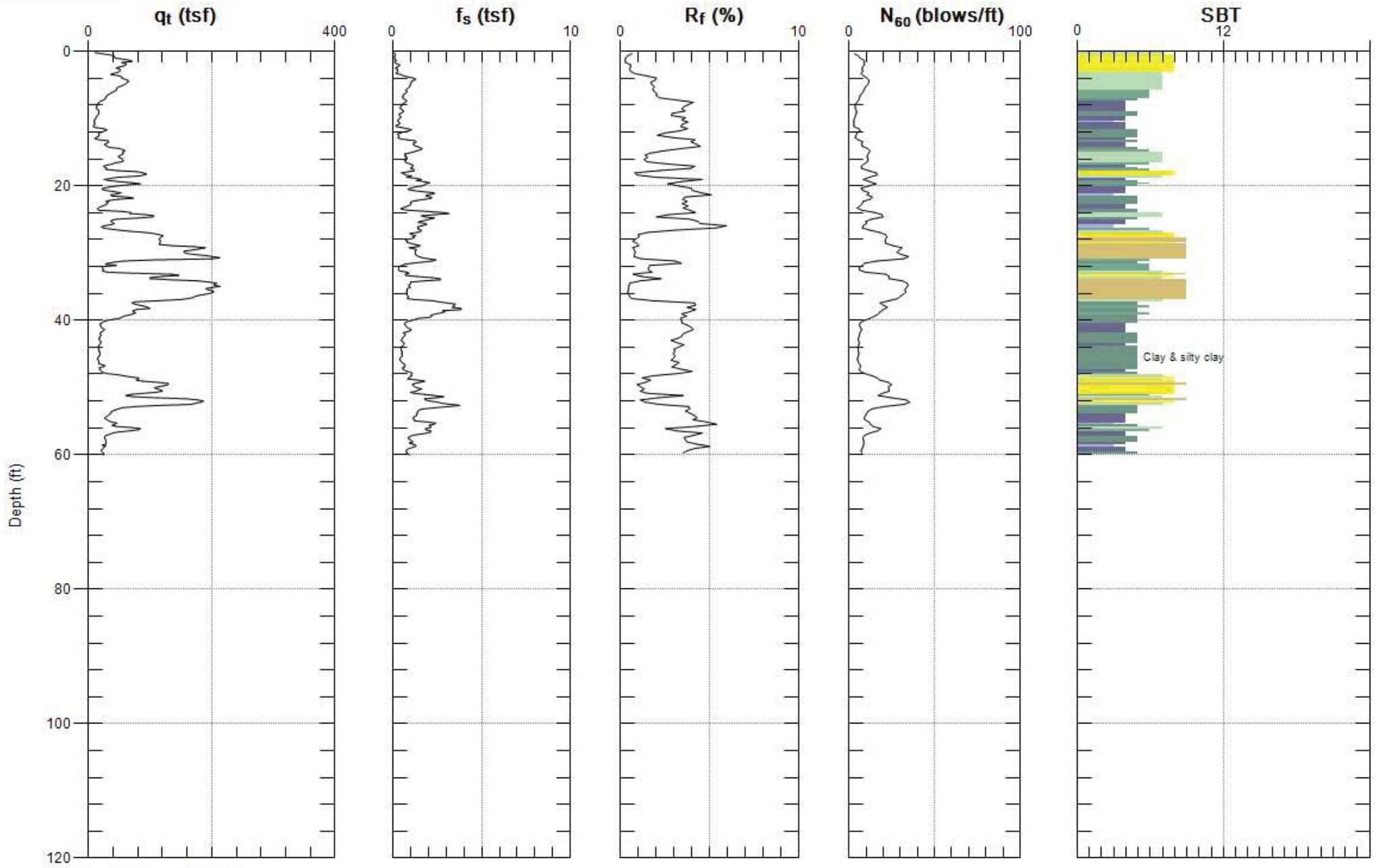
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



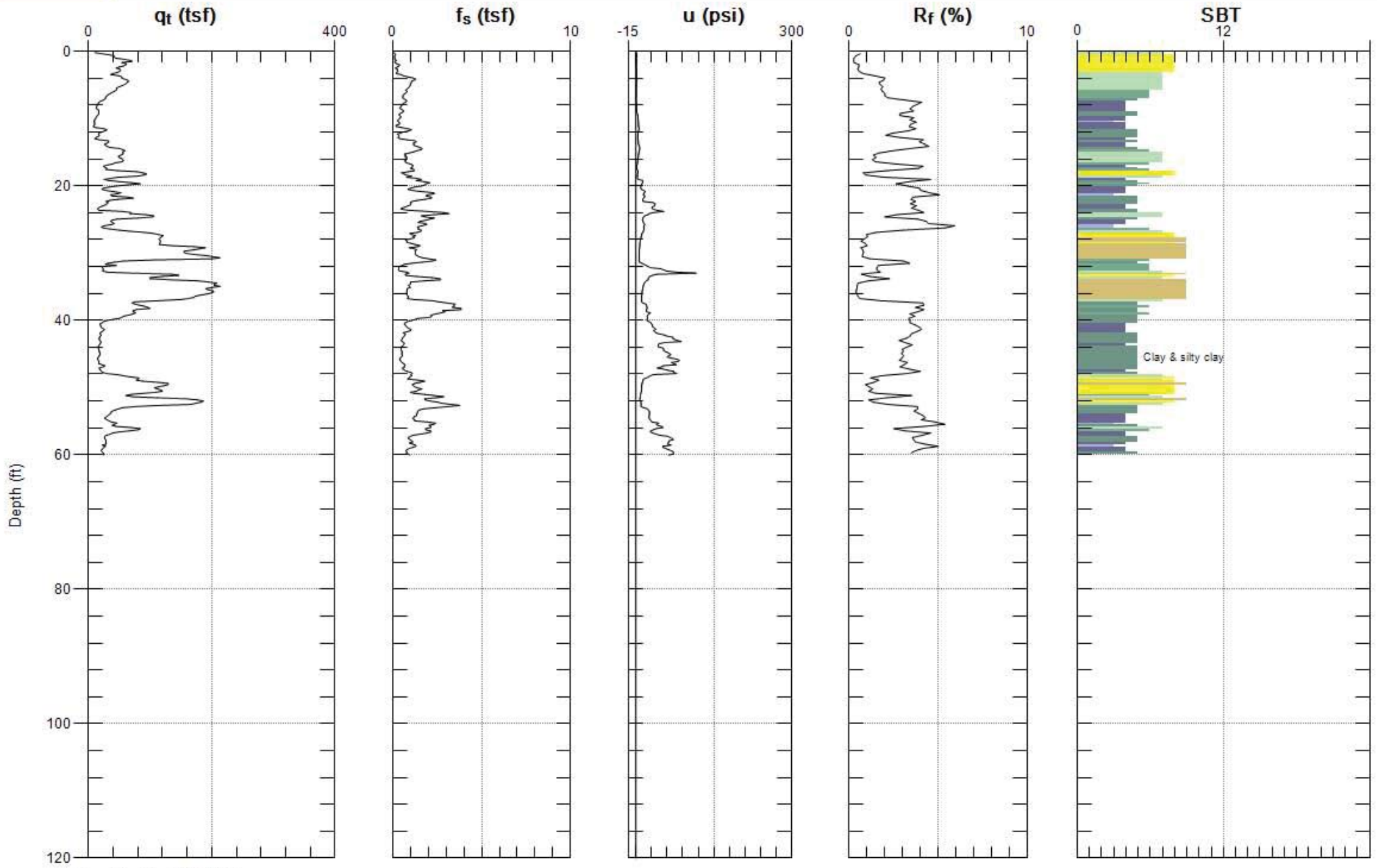
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



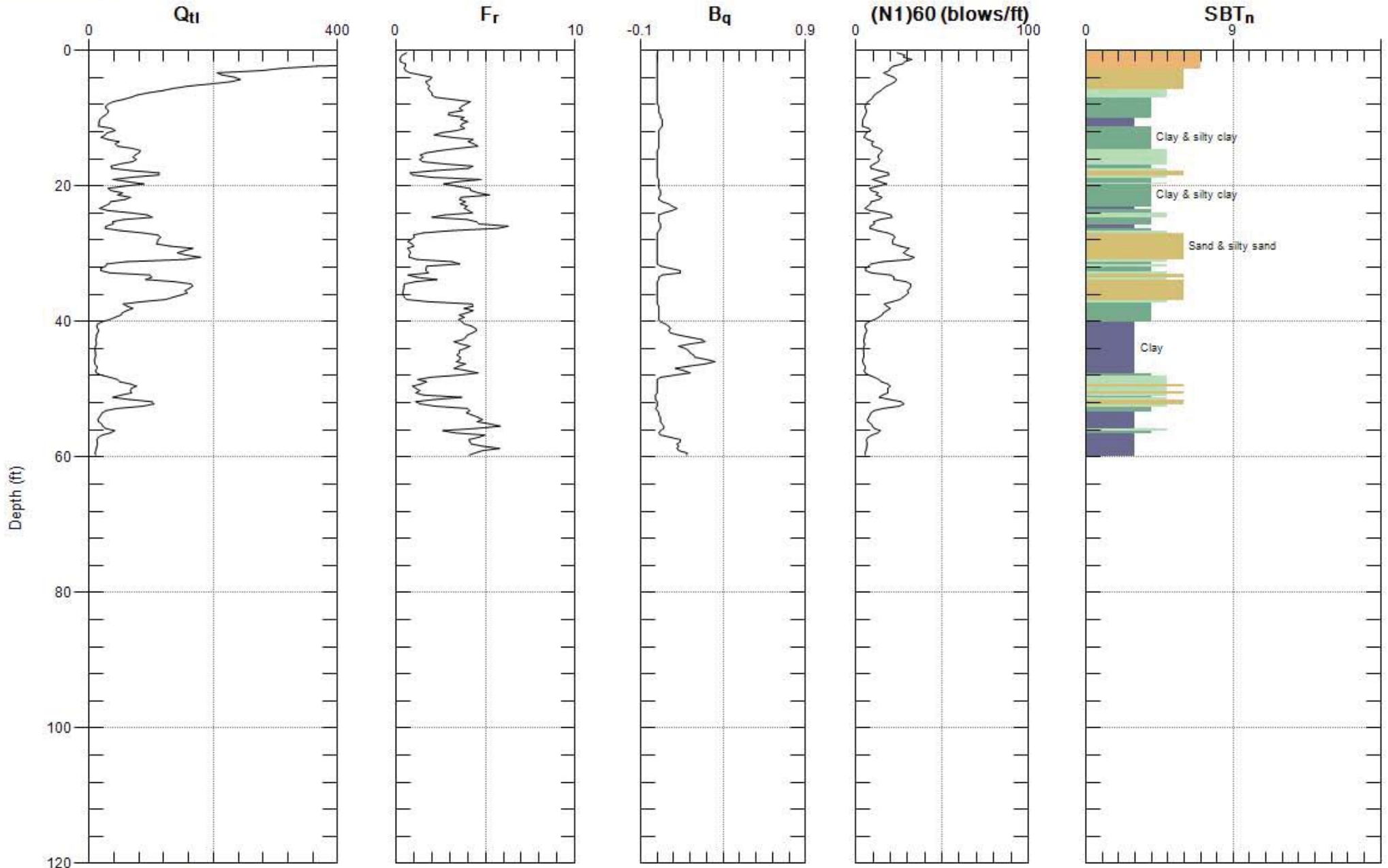
Max. Depth: 60.039 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



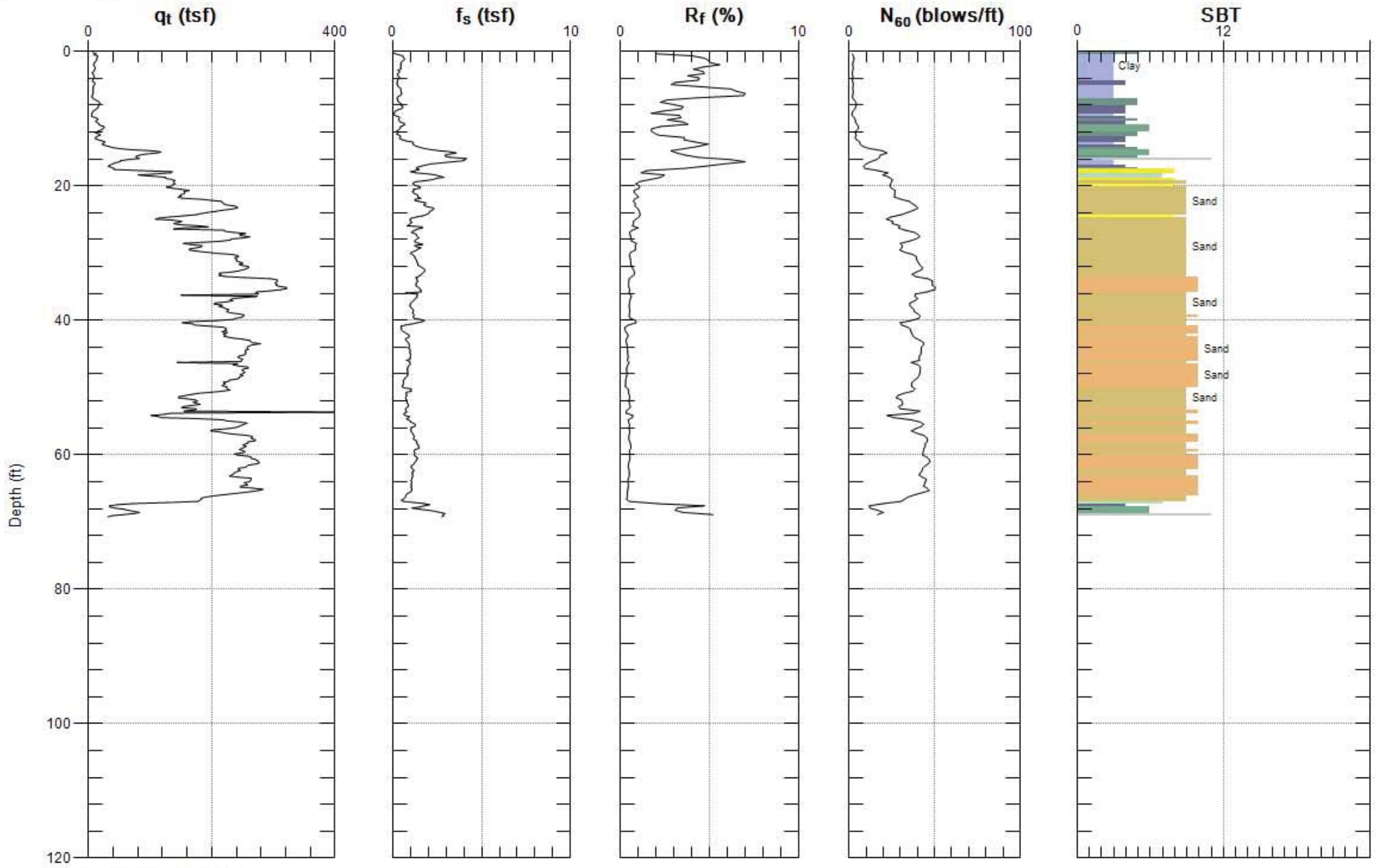
Max. Depth: 60.039 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



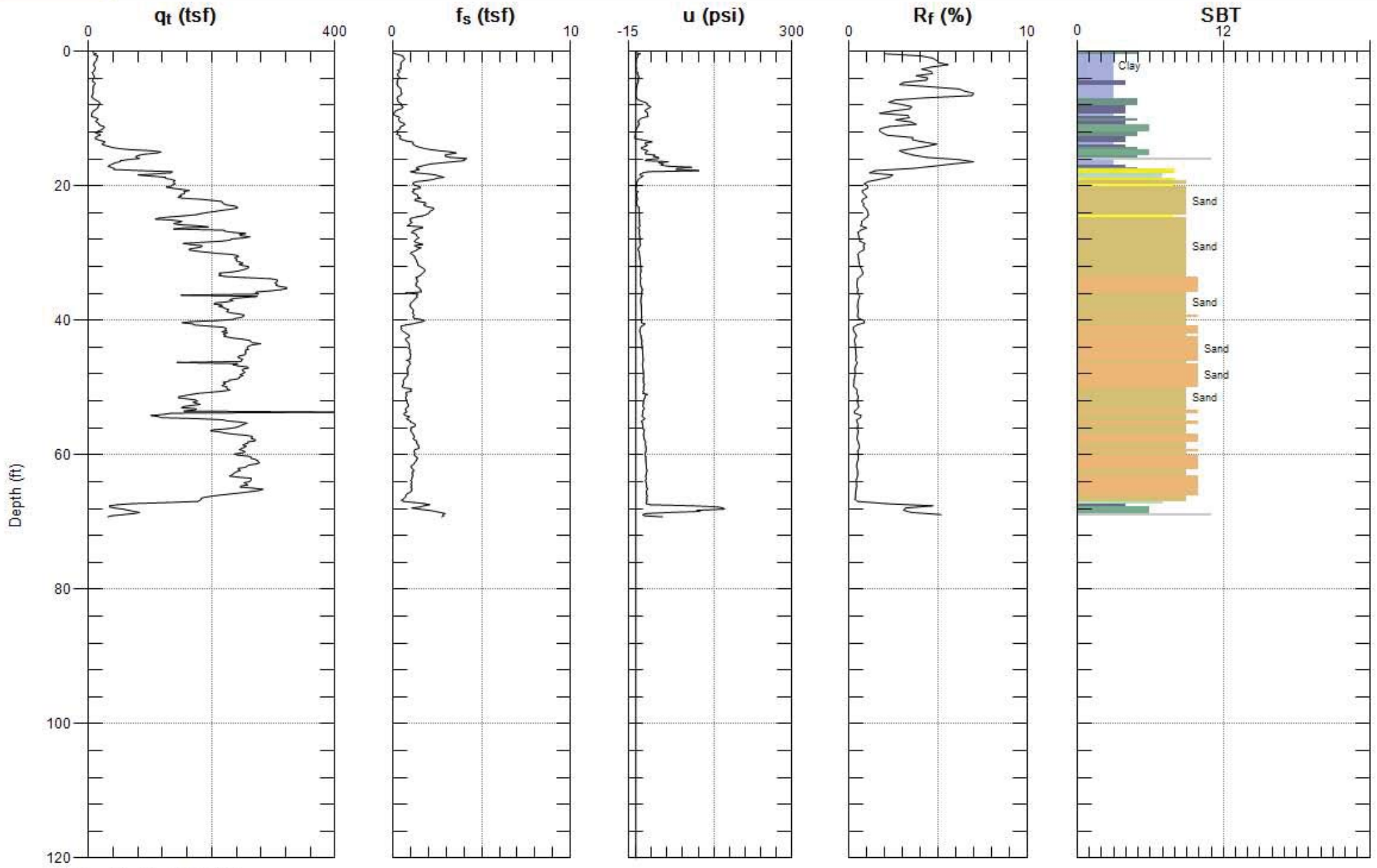
Max. Depth: 60.039 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



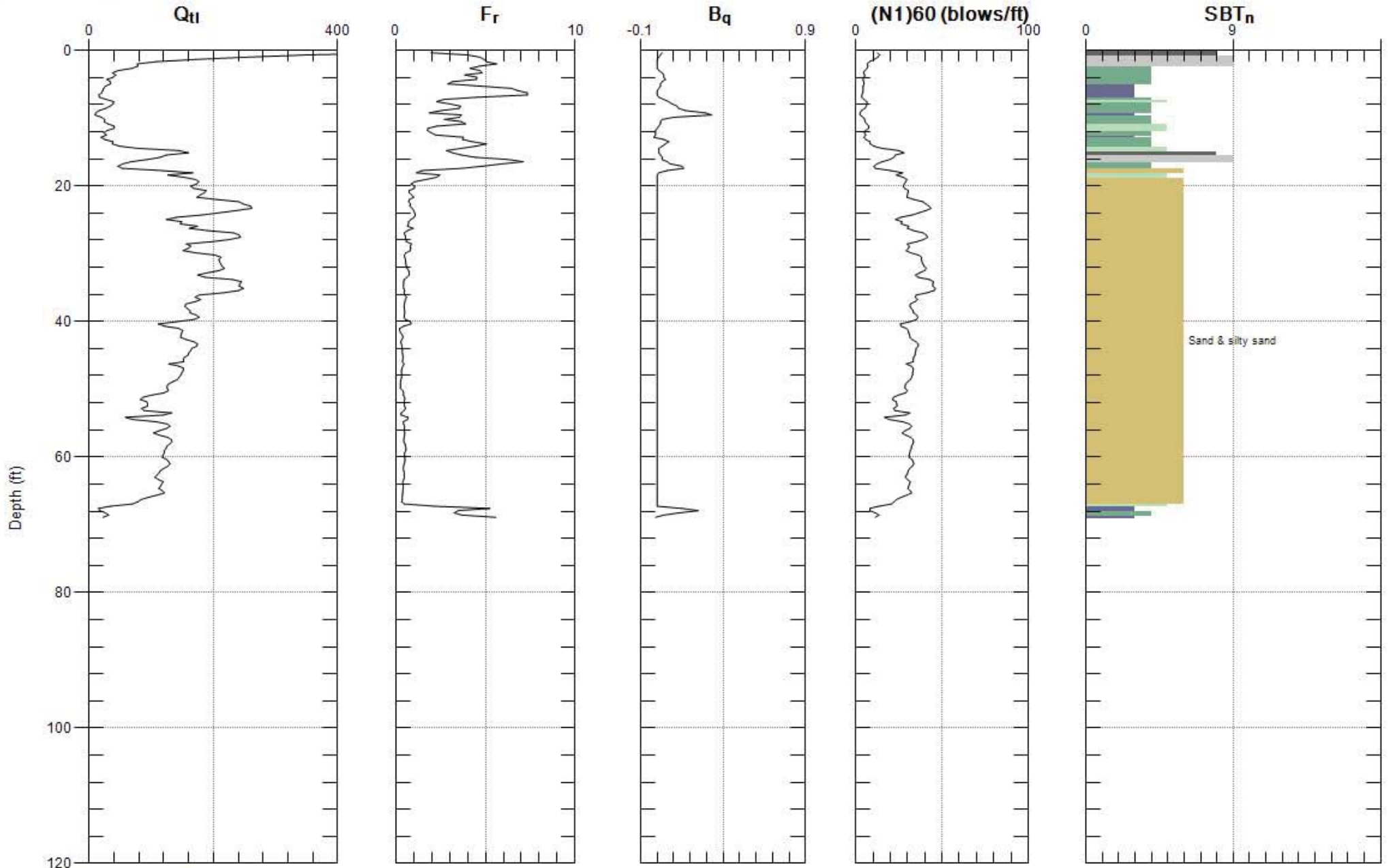
Max. Depth: 69.226 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



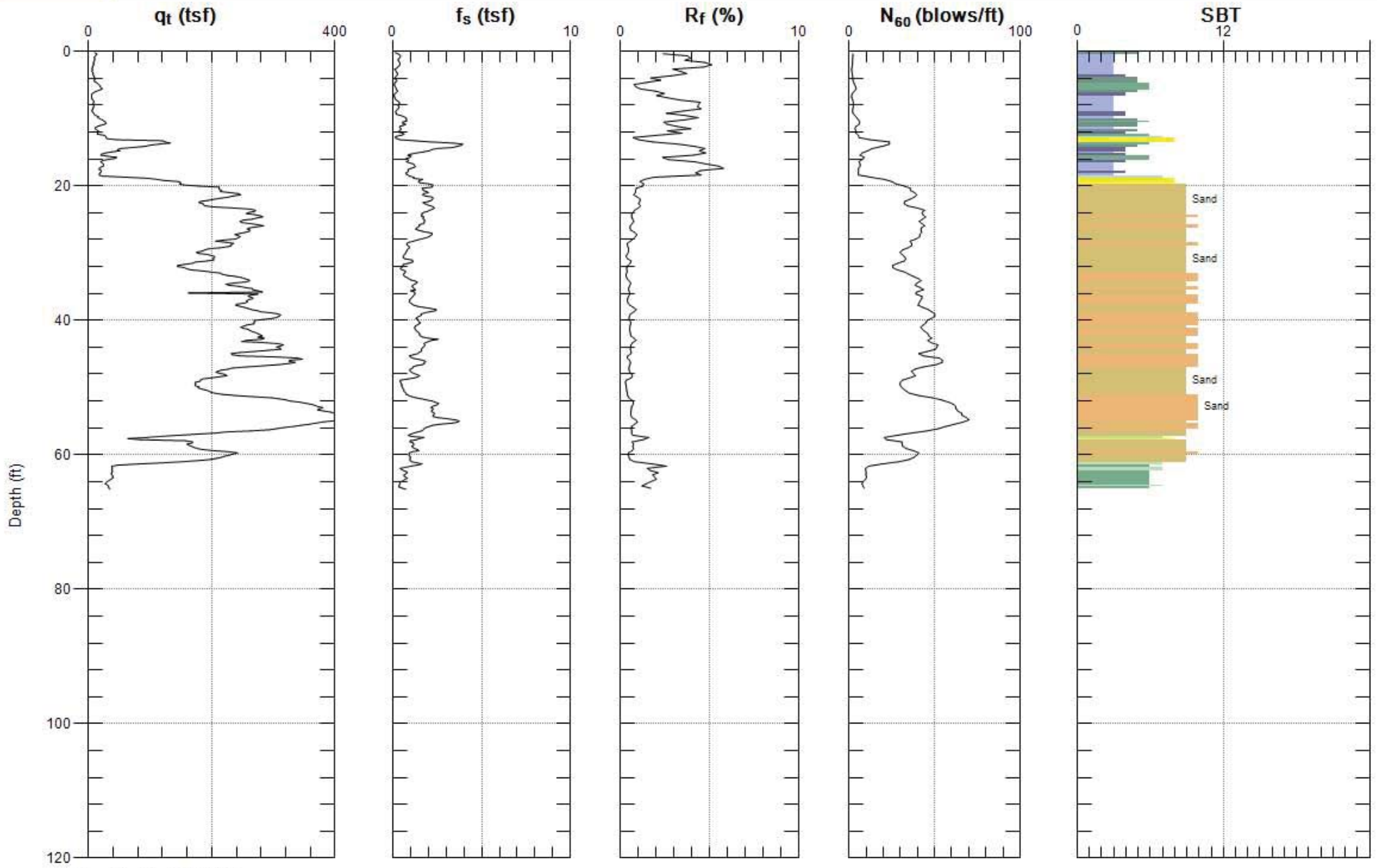
Max. Depth: 69.226 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



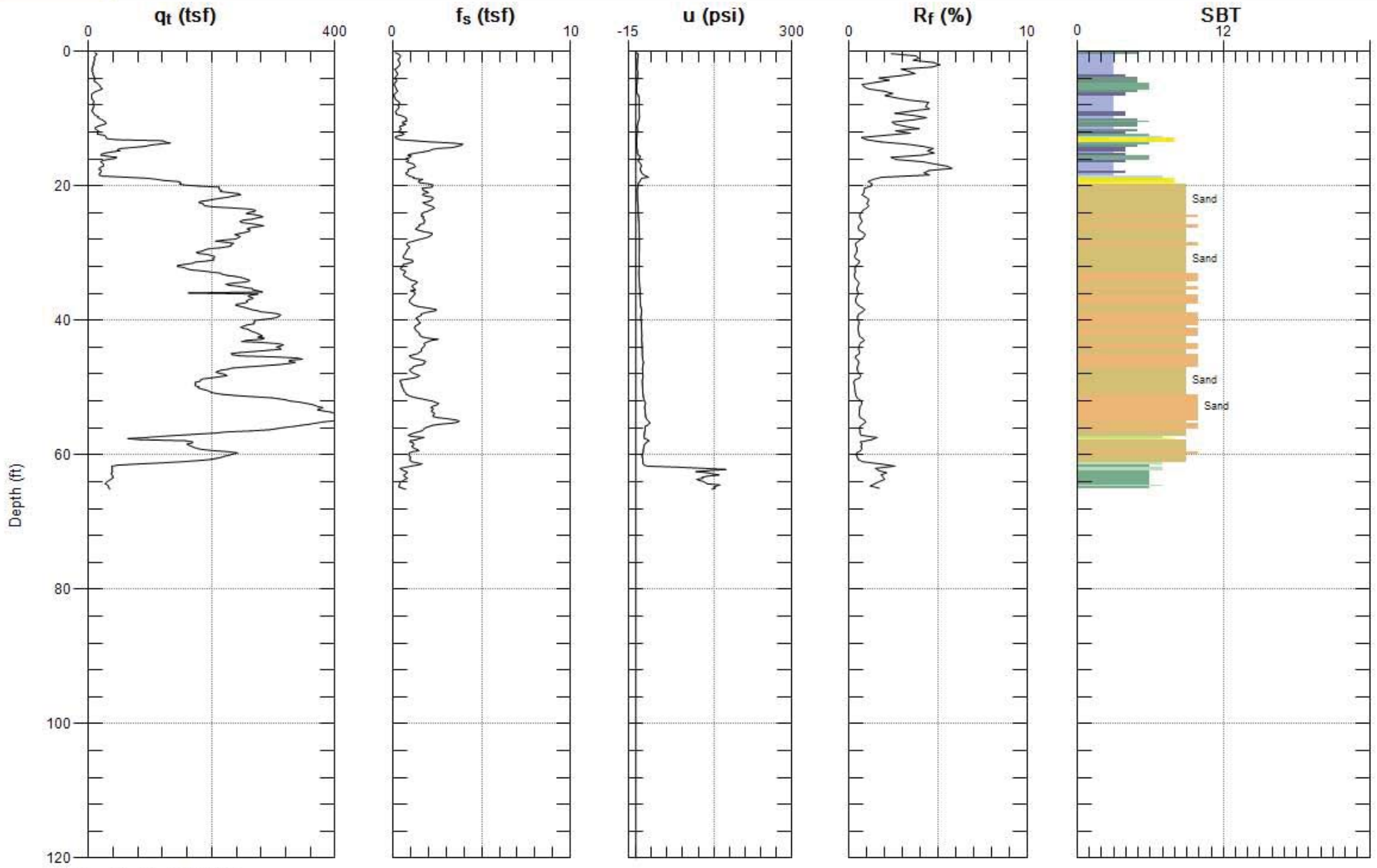
Max. Depth: 69.226 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



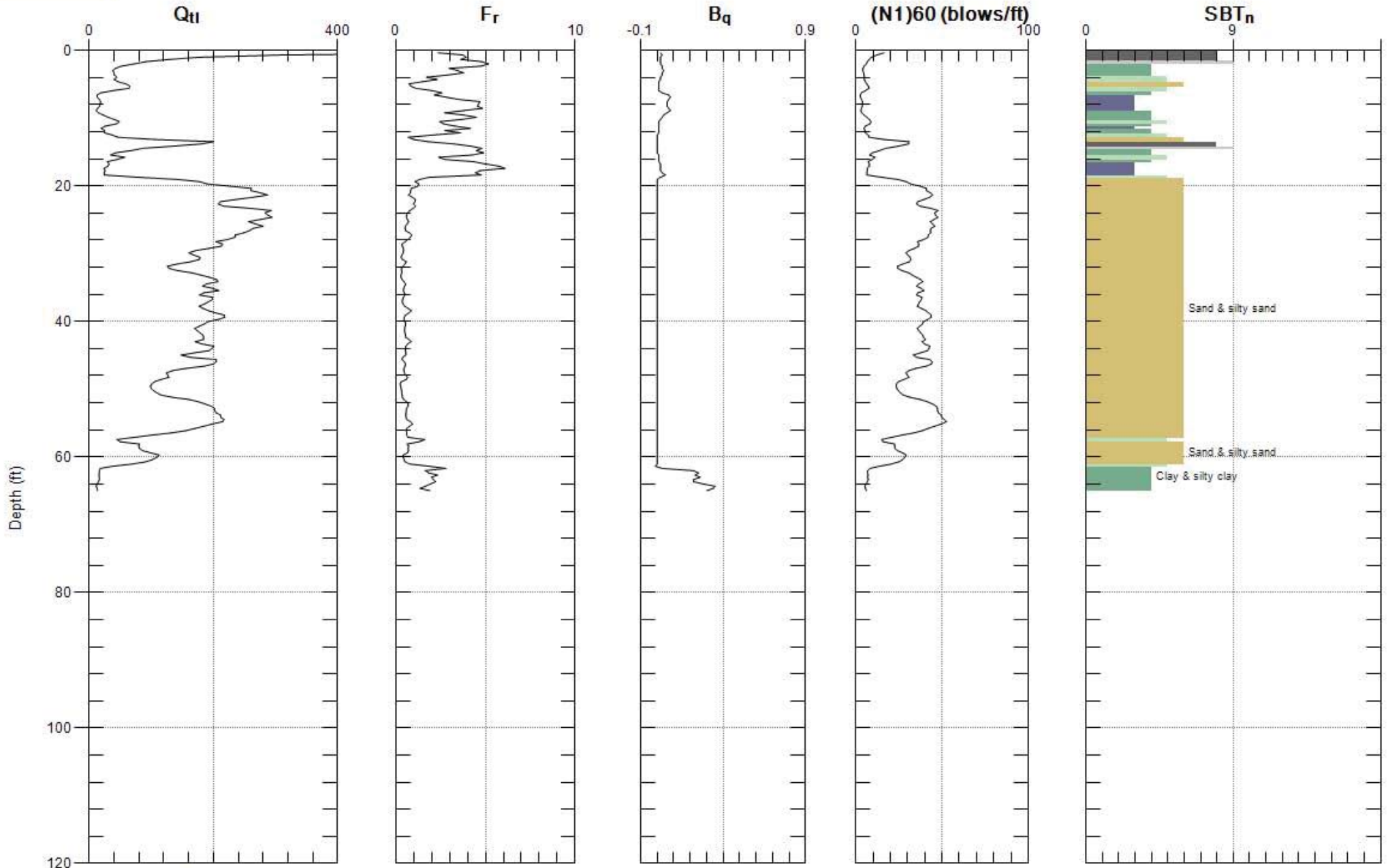
Max. Depth: 65.125 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



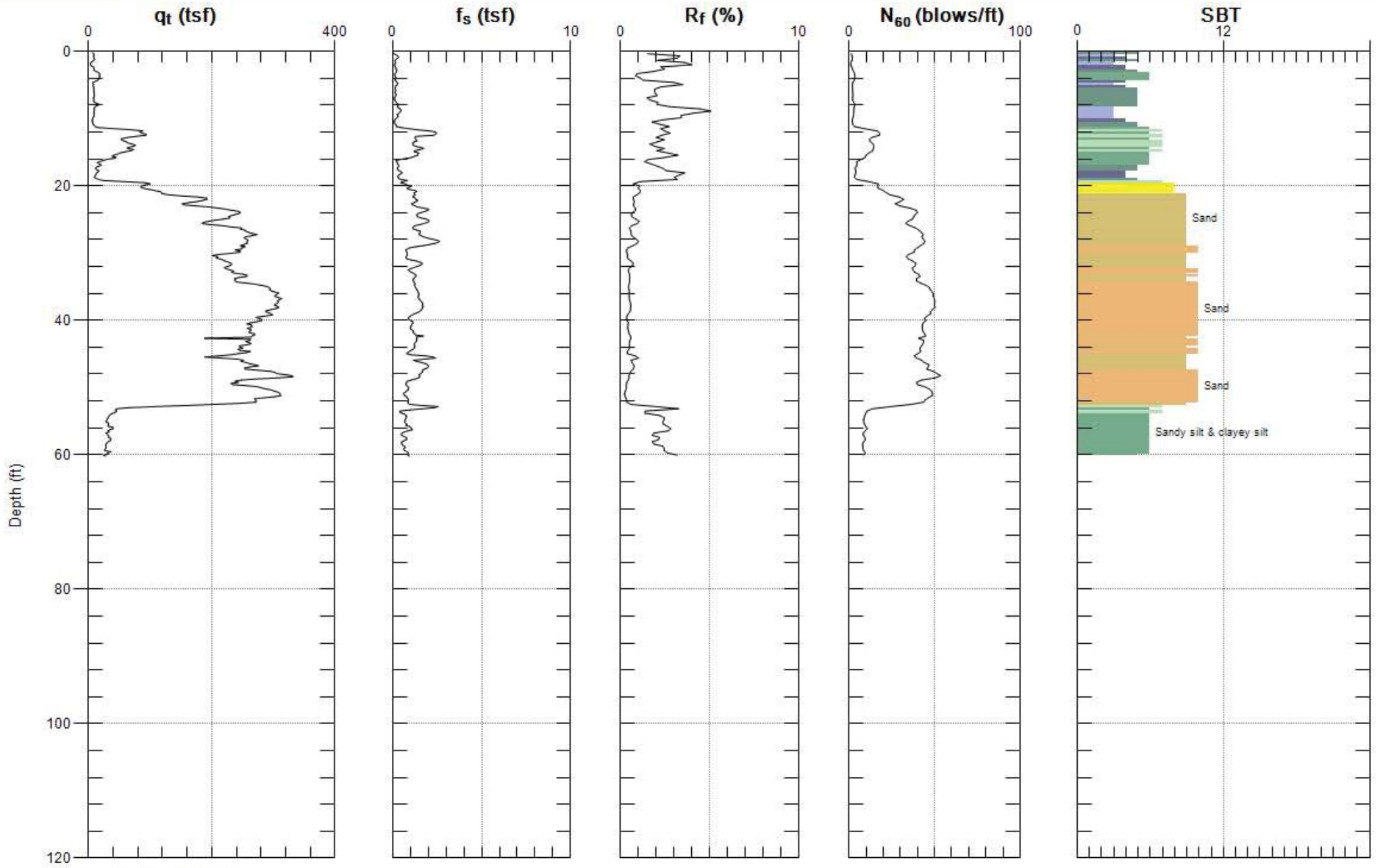
Max. Depth: 65.125 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



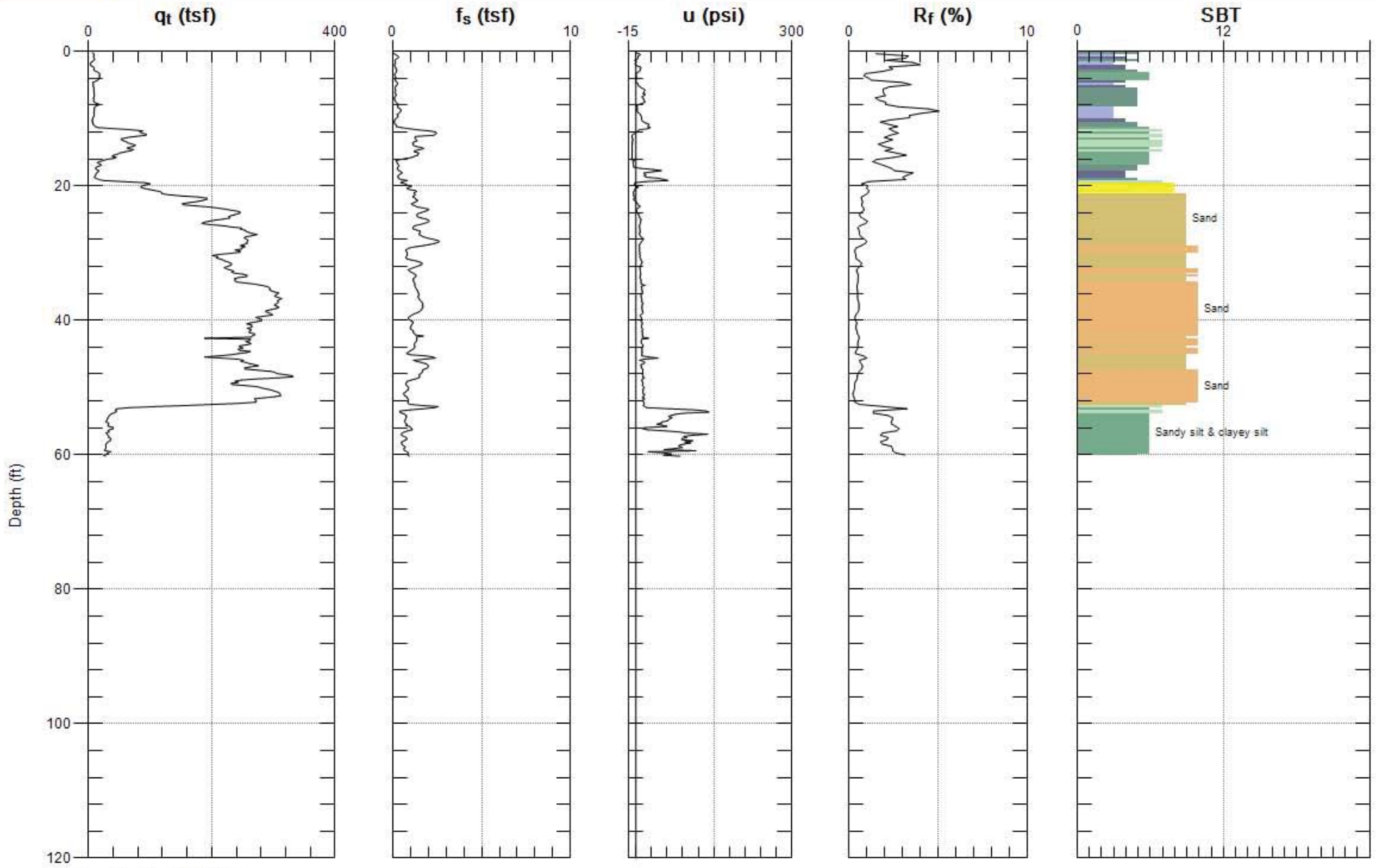
Max. Depth: 65.125 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



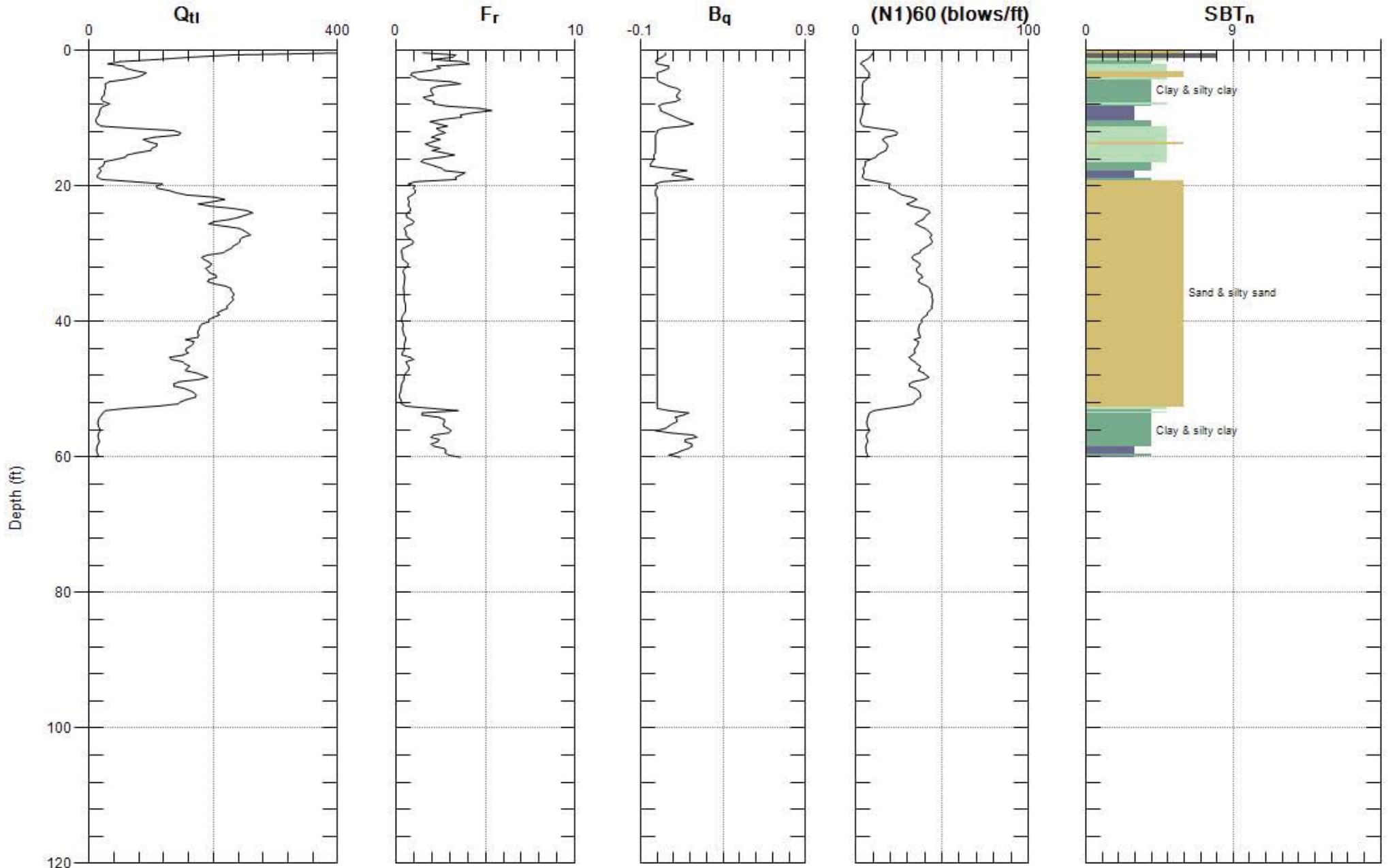
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



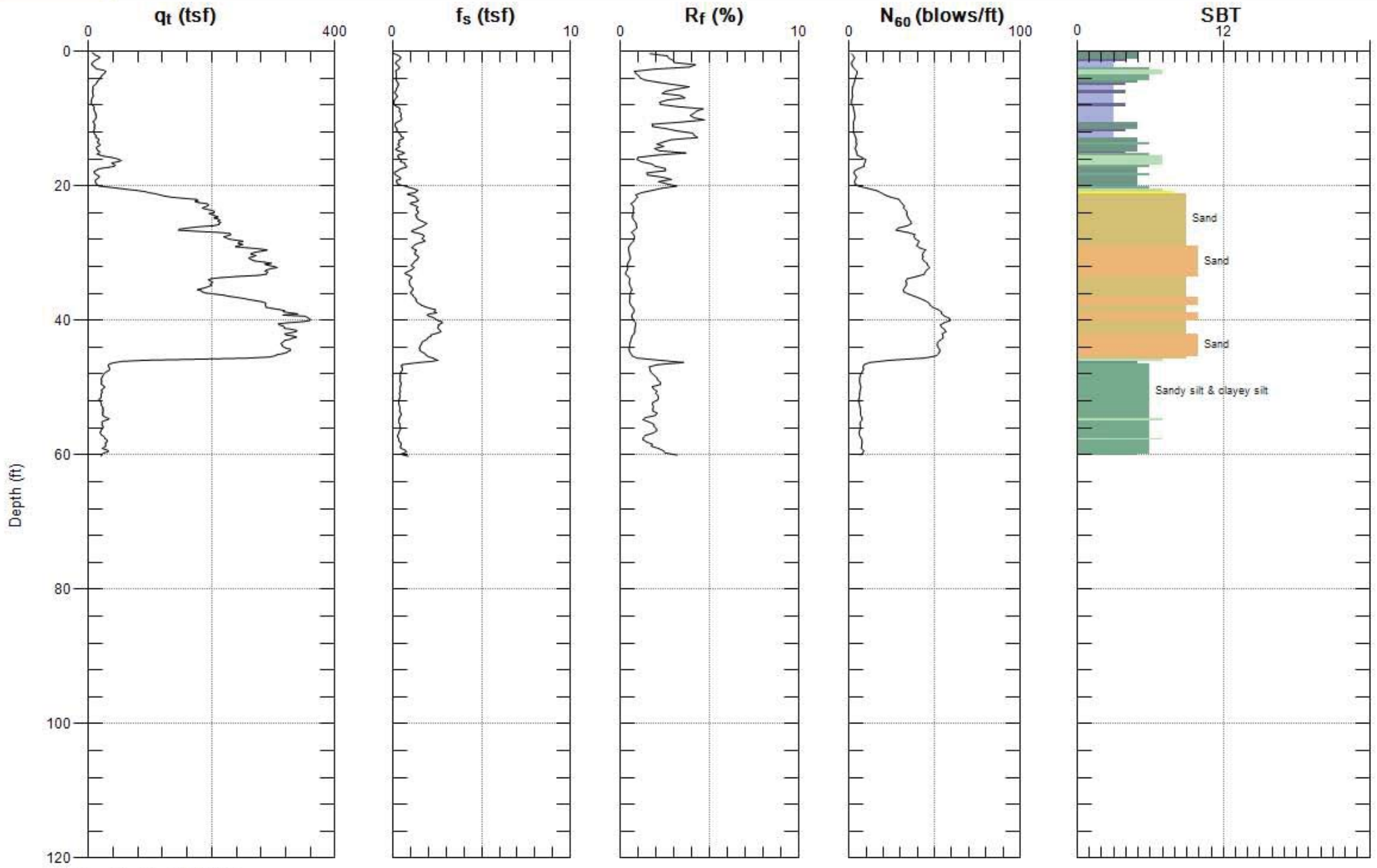
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



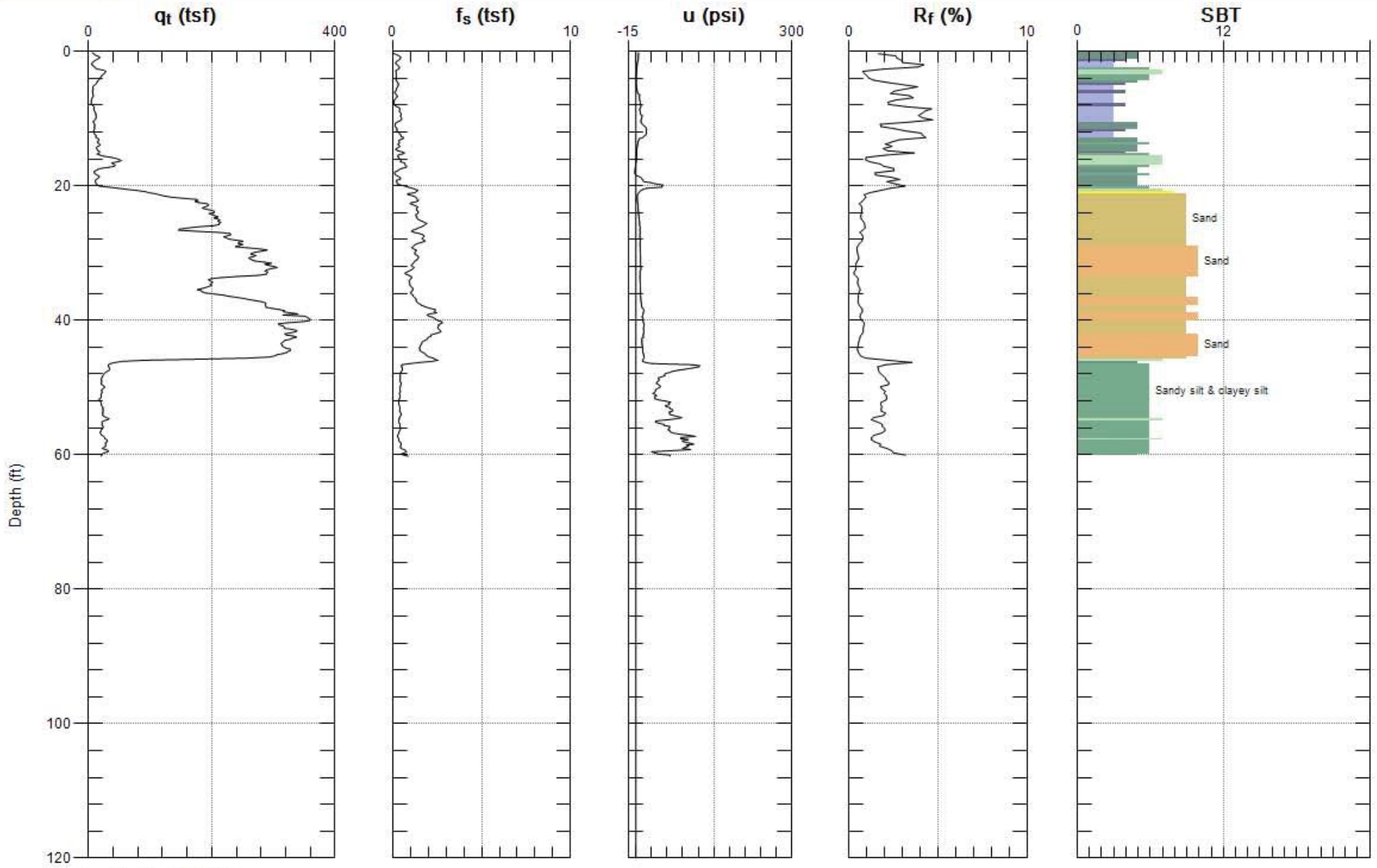
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



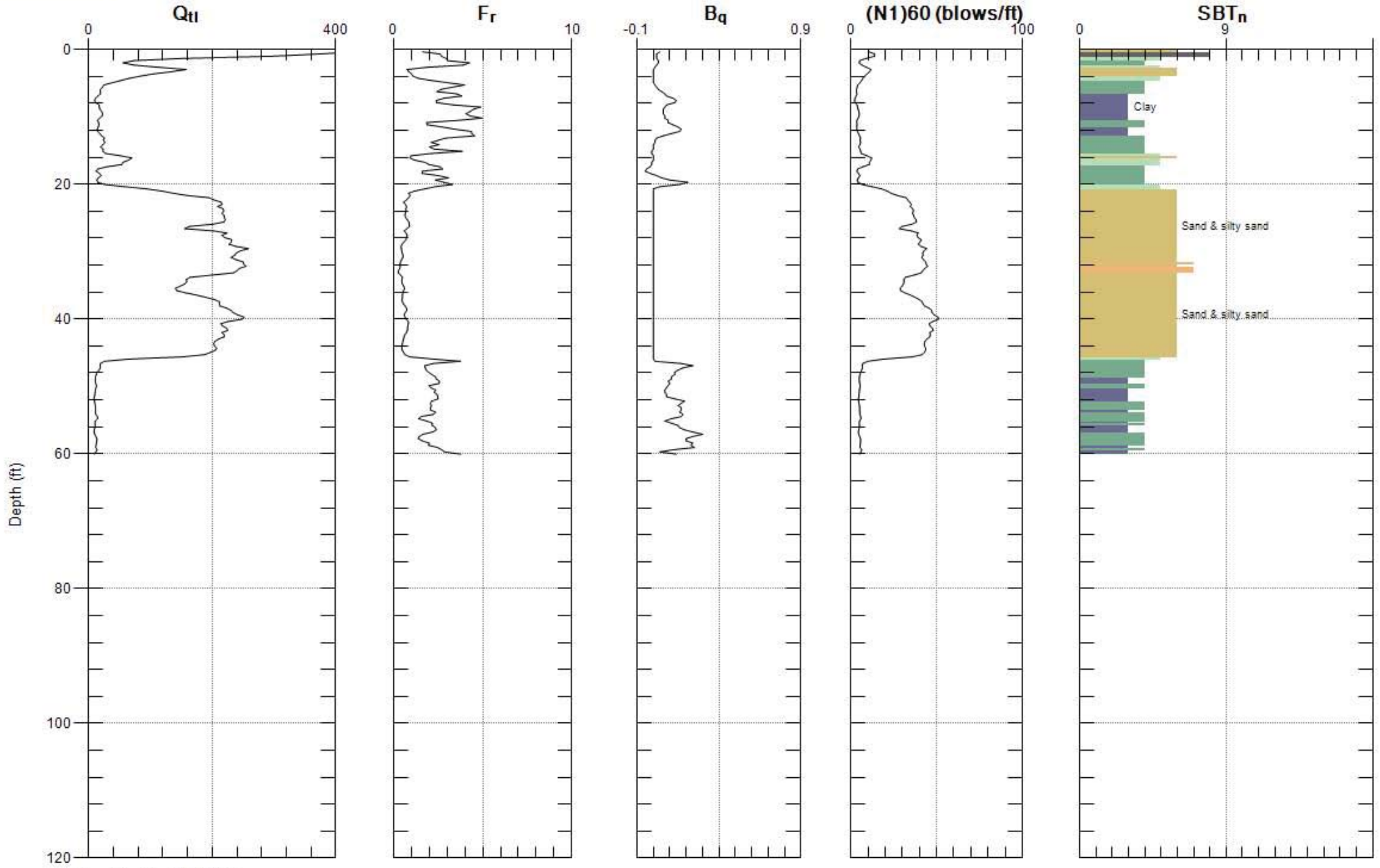
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



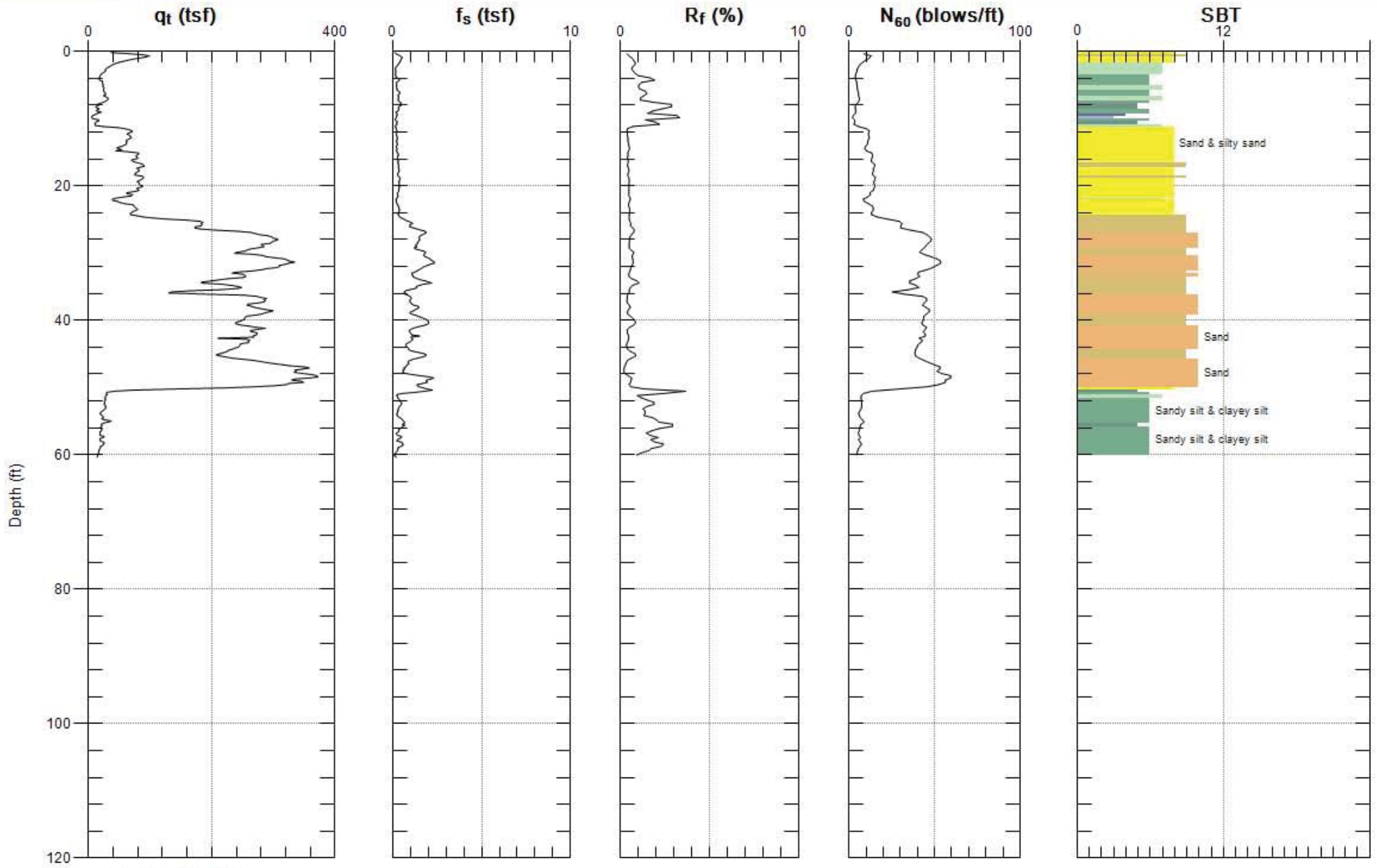
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



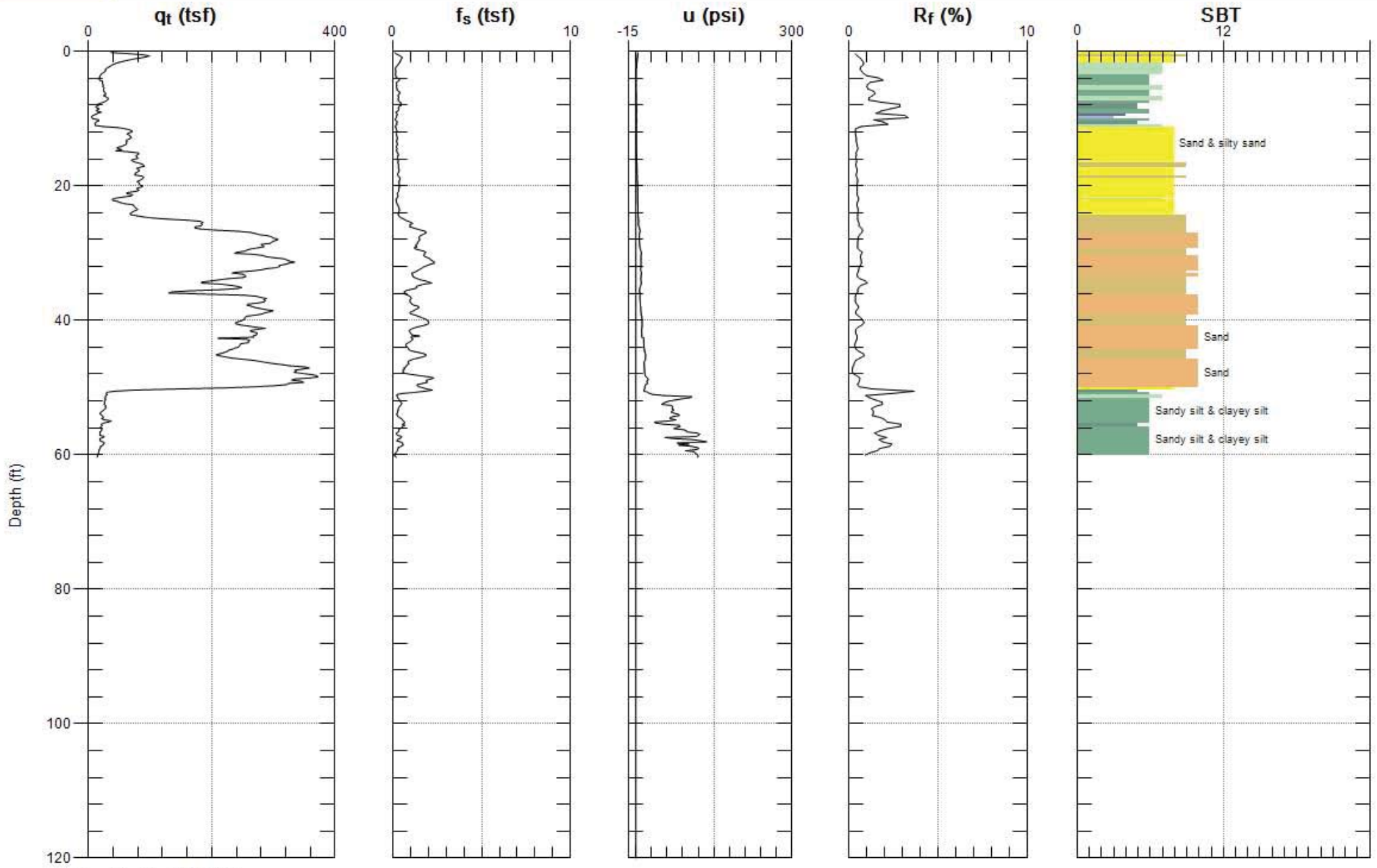
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



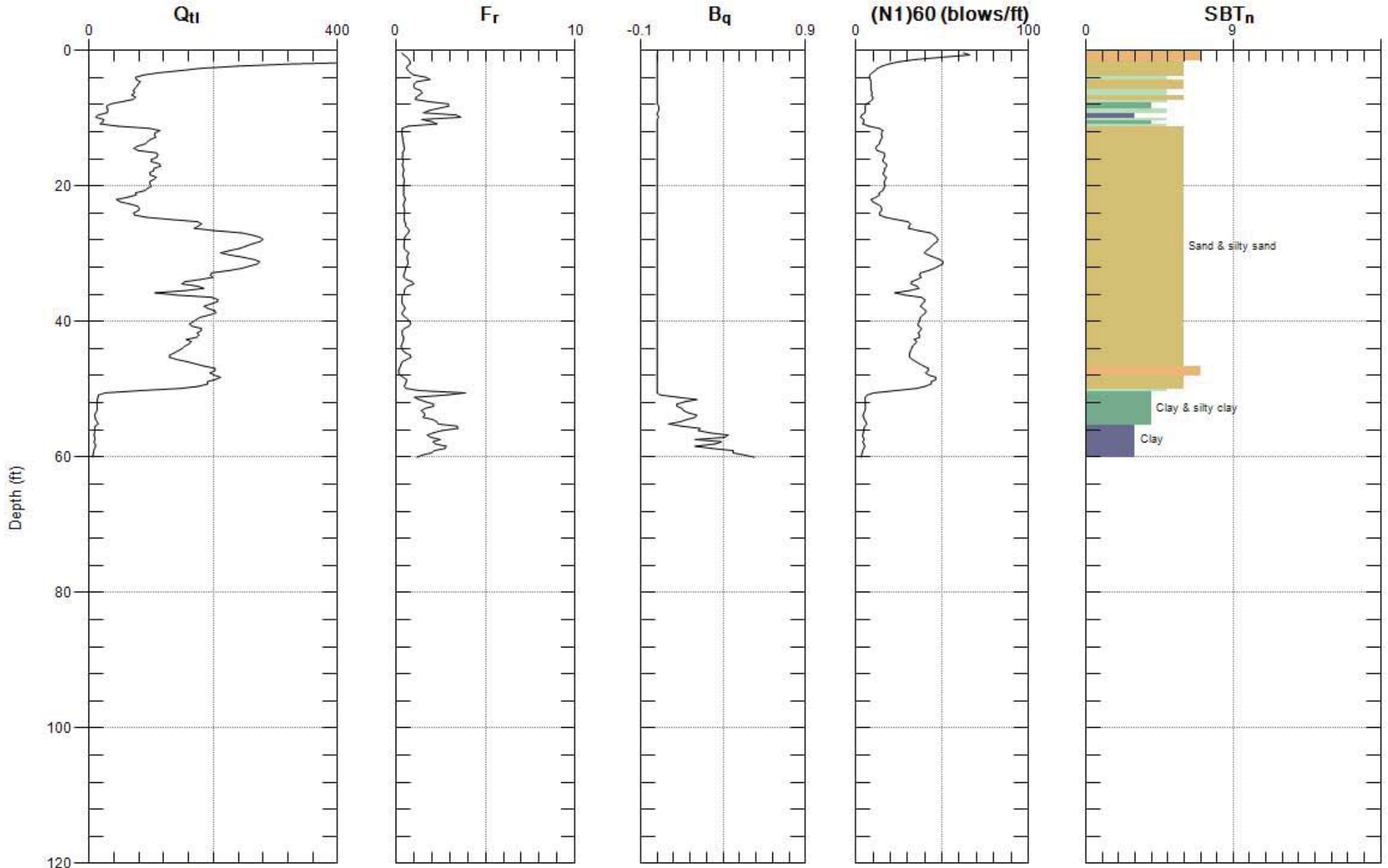
Max. Depth: 60.367 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



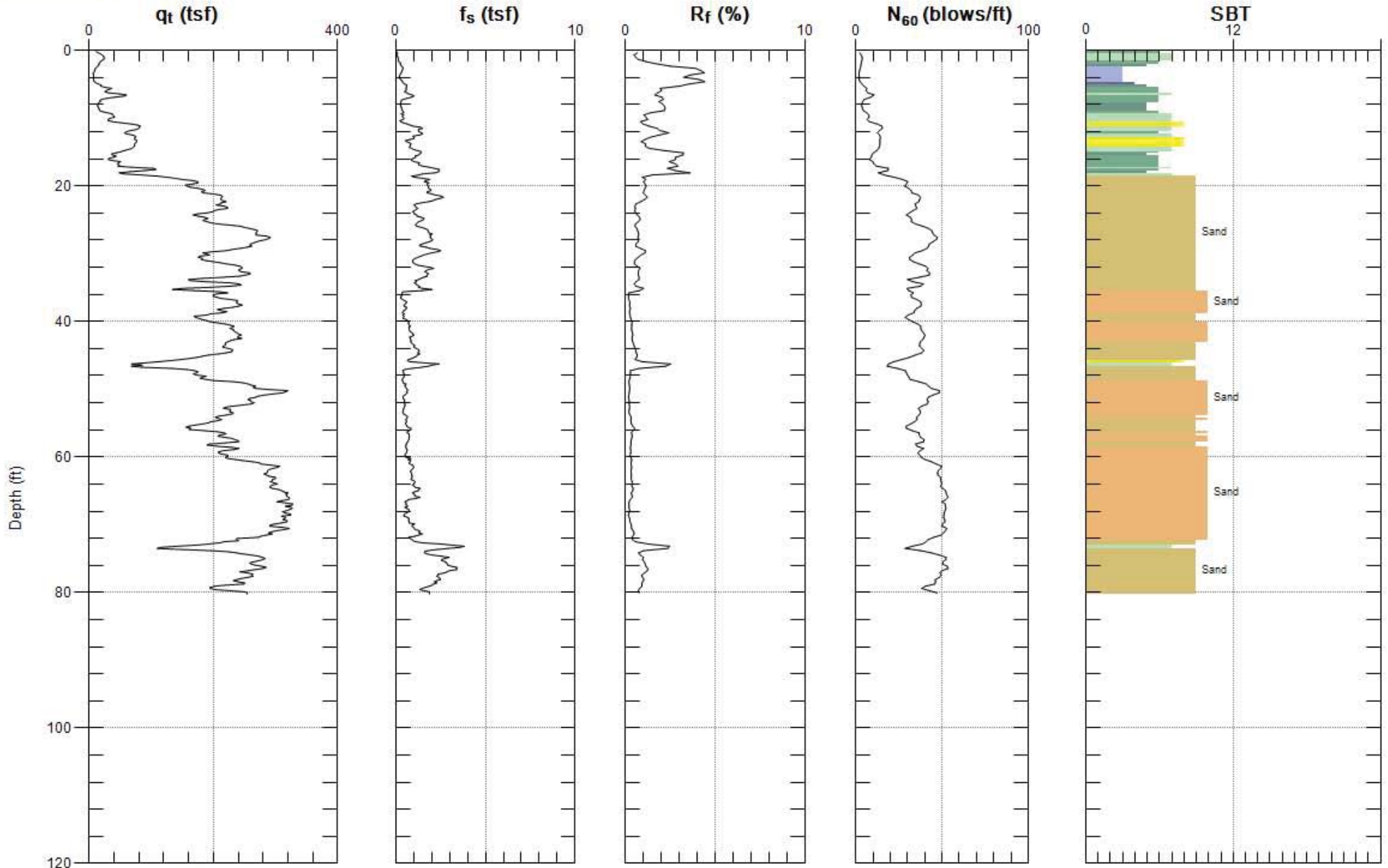
Max. Depth: 60.367 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



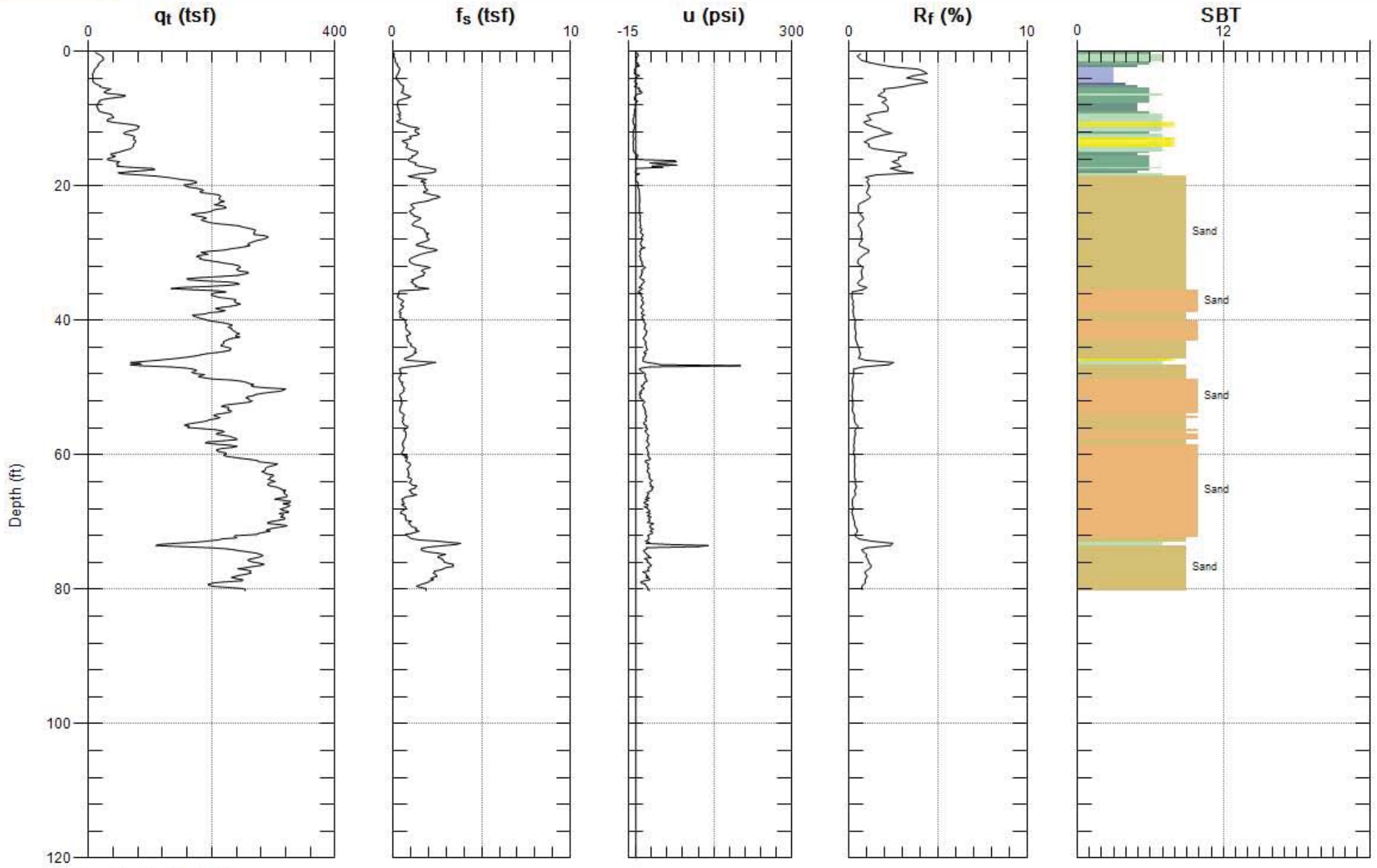
Max. Depth: 60.367 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



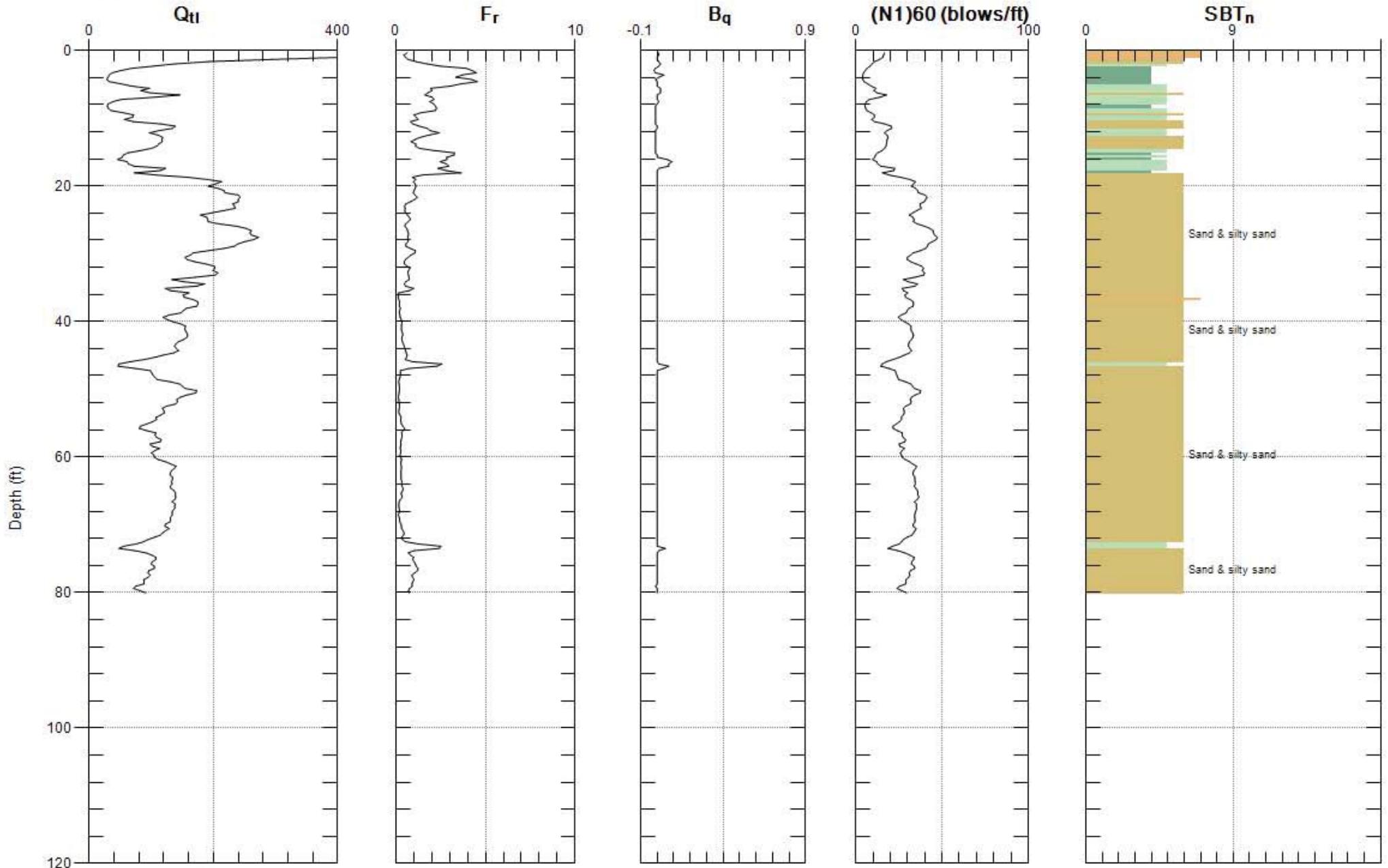
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



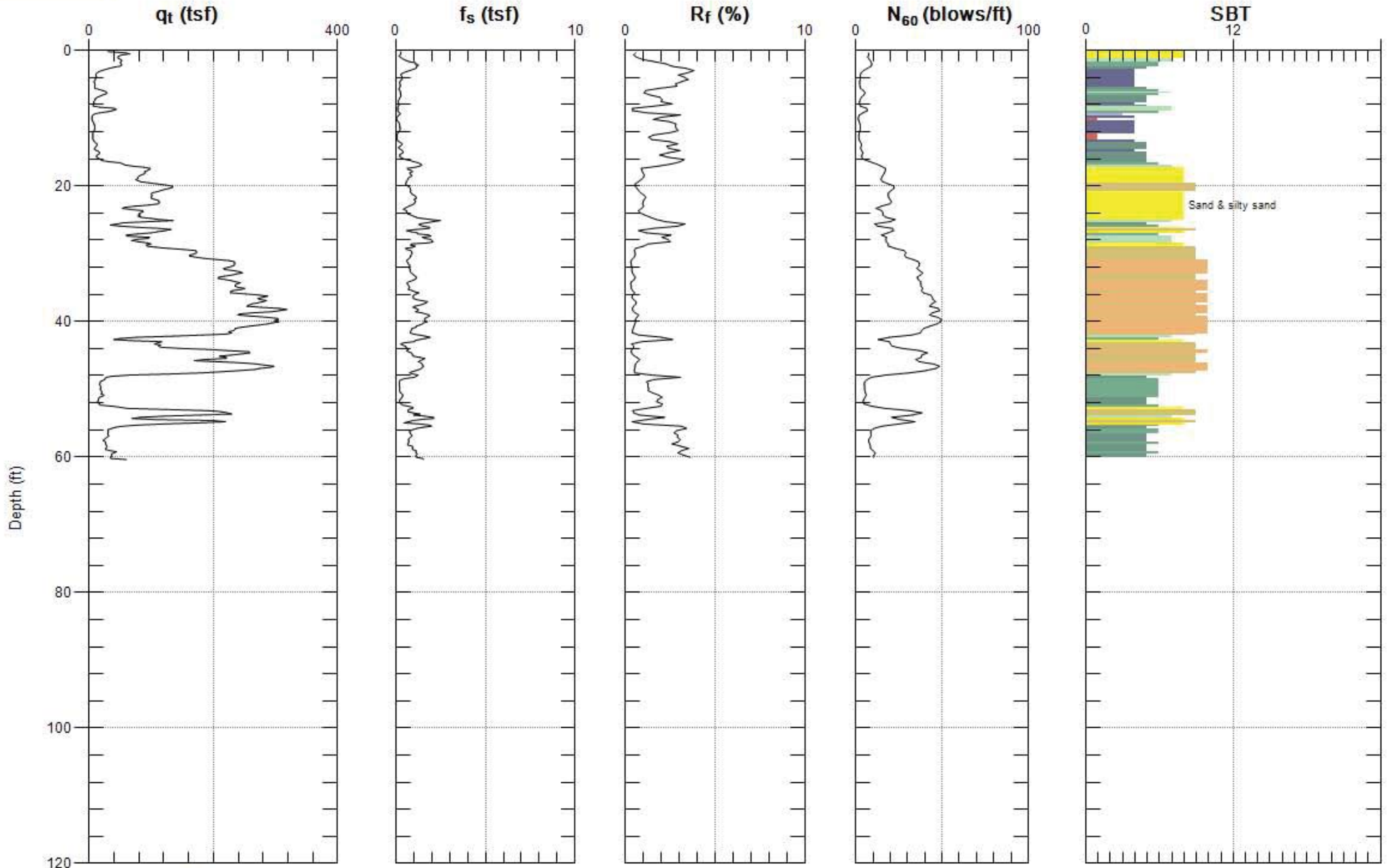
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



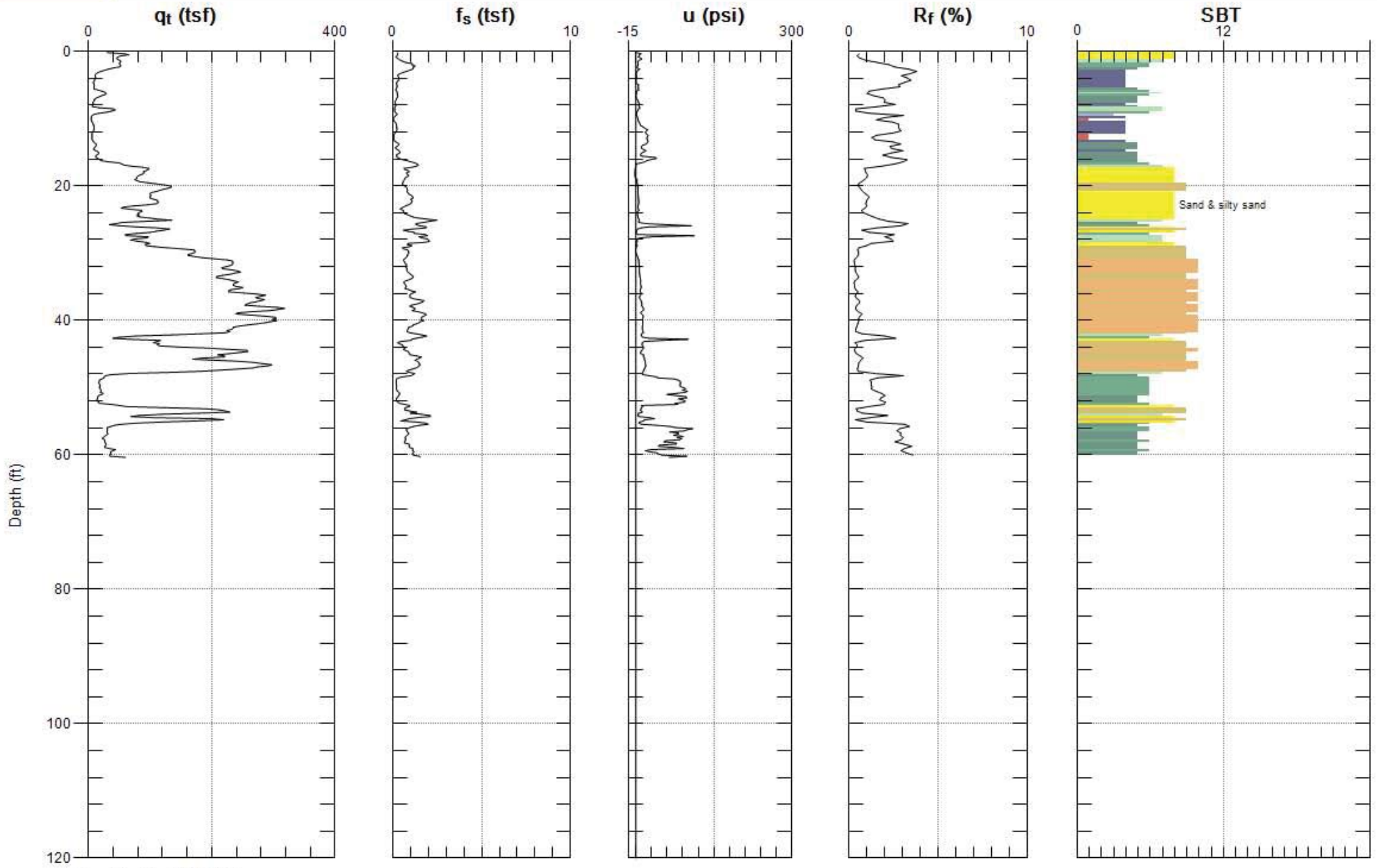
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



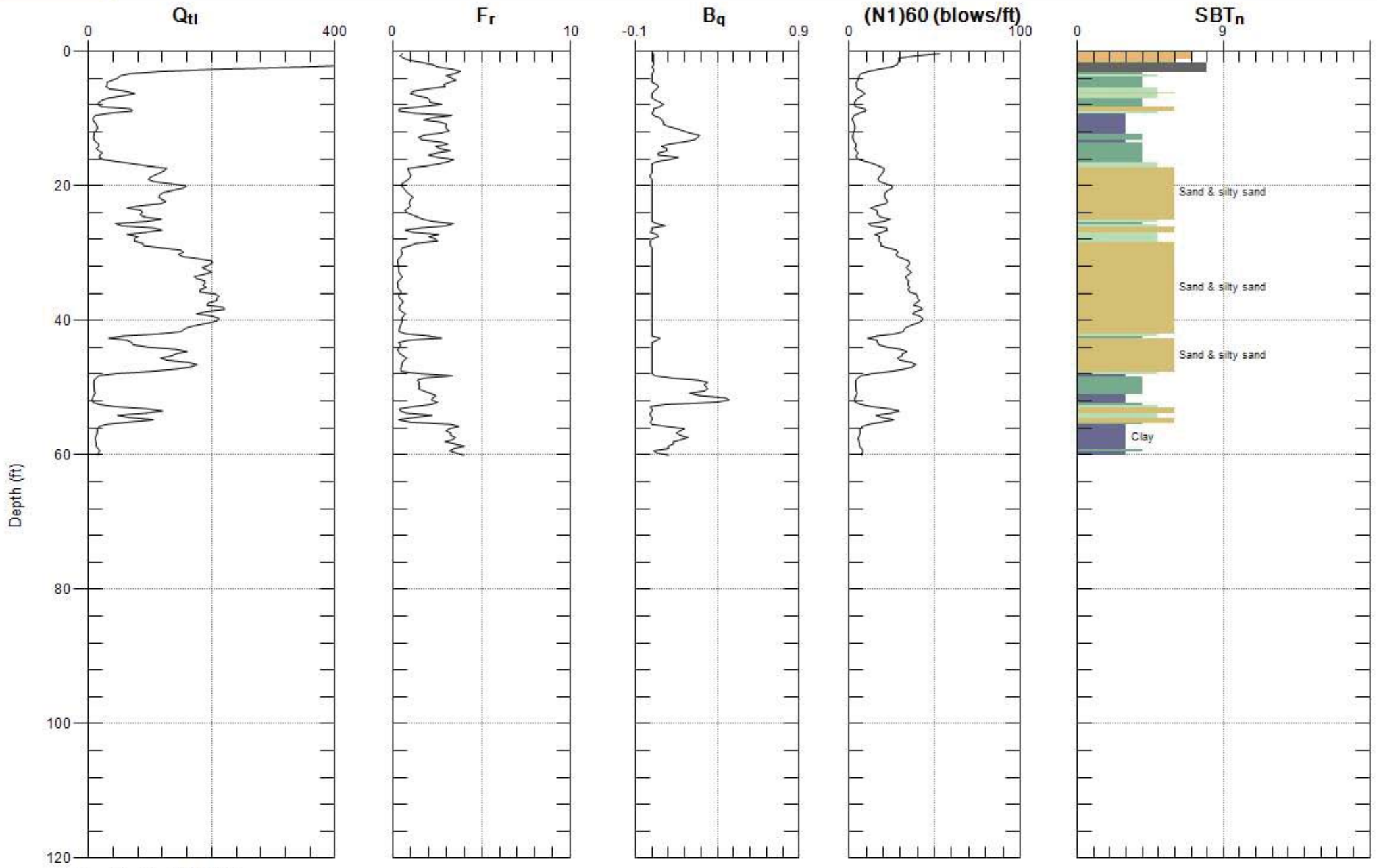
Max. Depth: 60.367 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



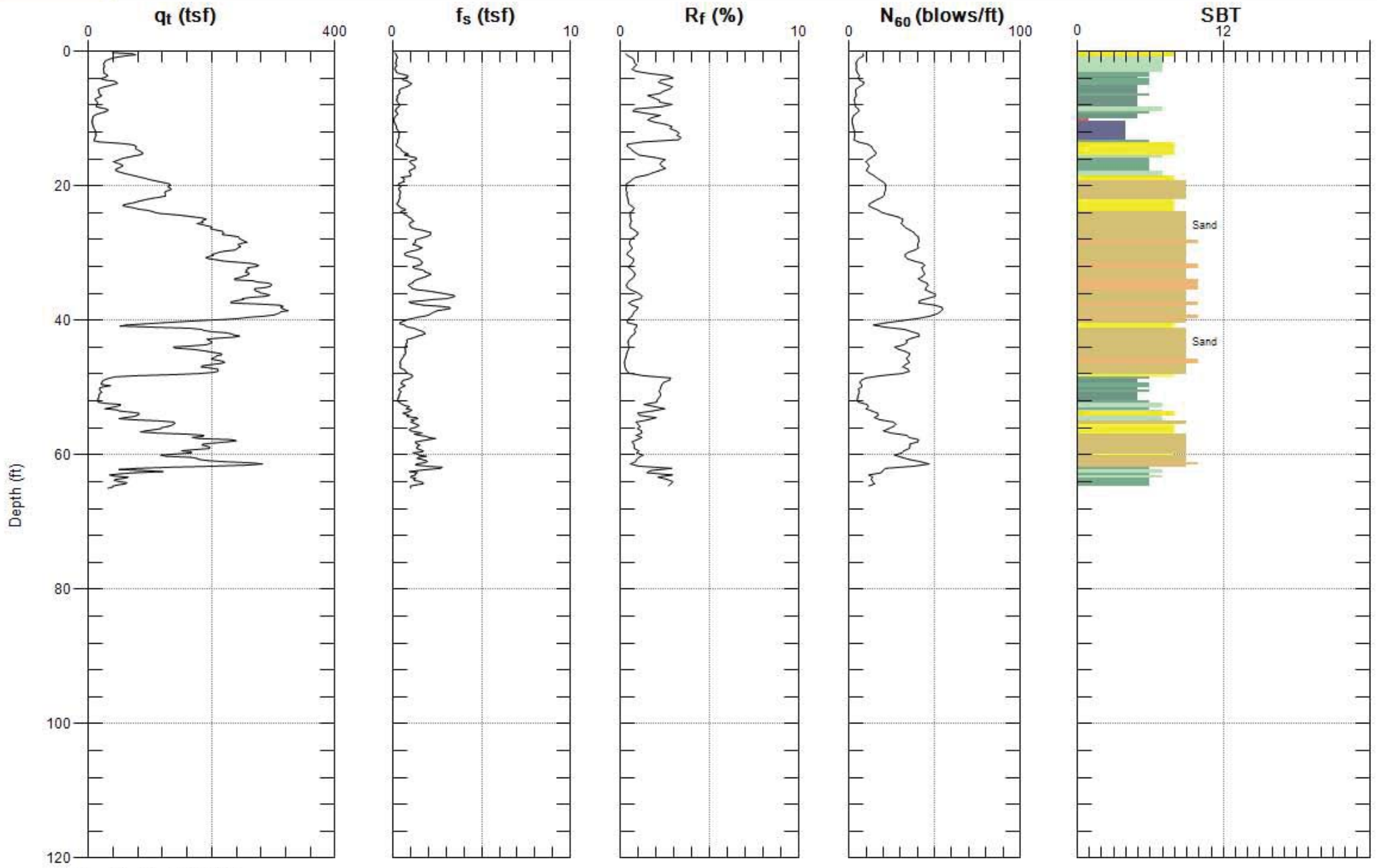
Max. Depth: 60.367 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



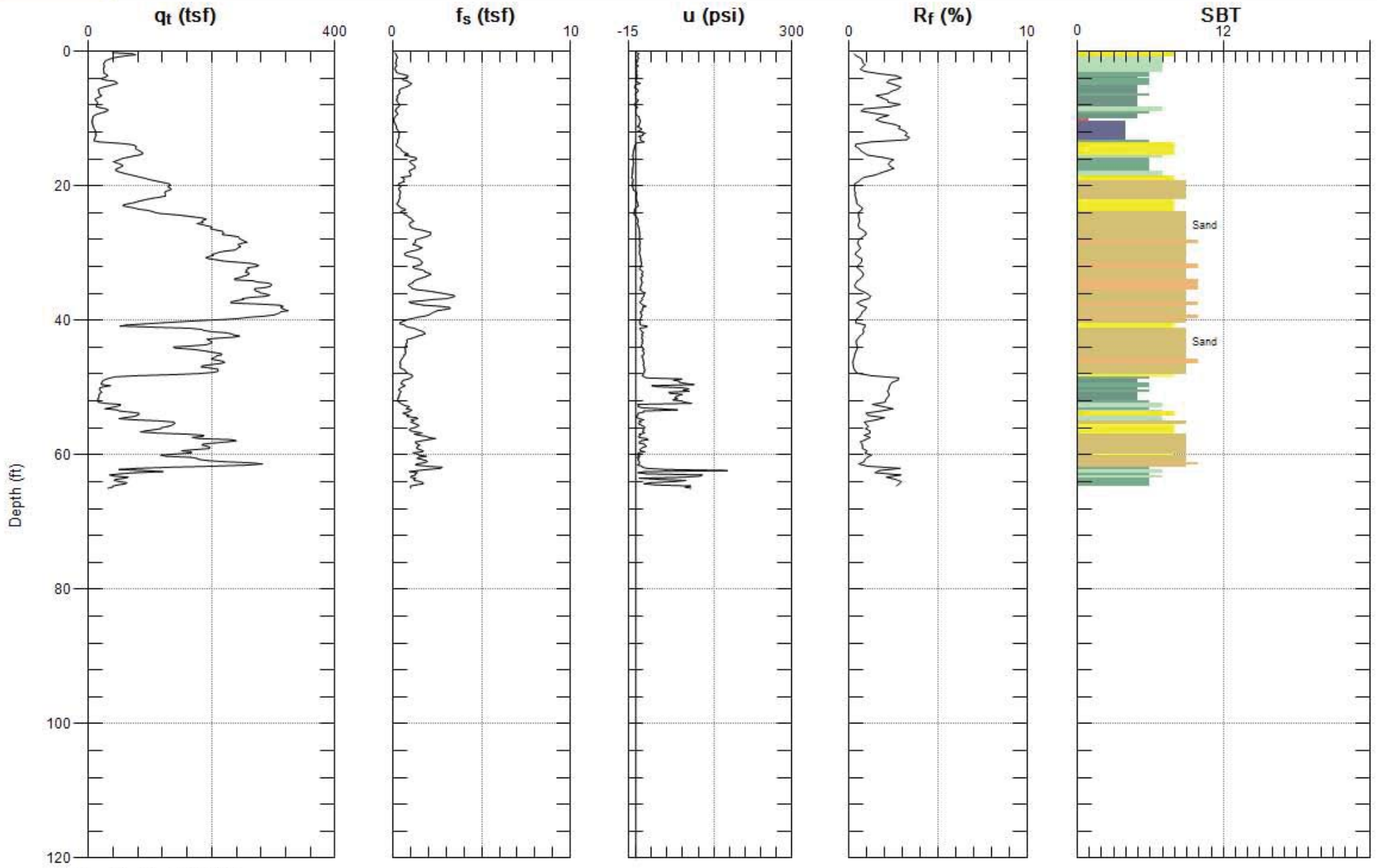
Max. Depth: 60.367 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



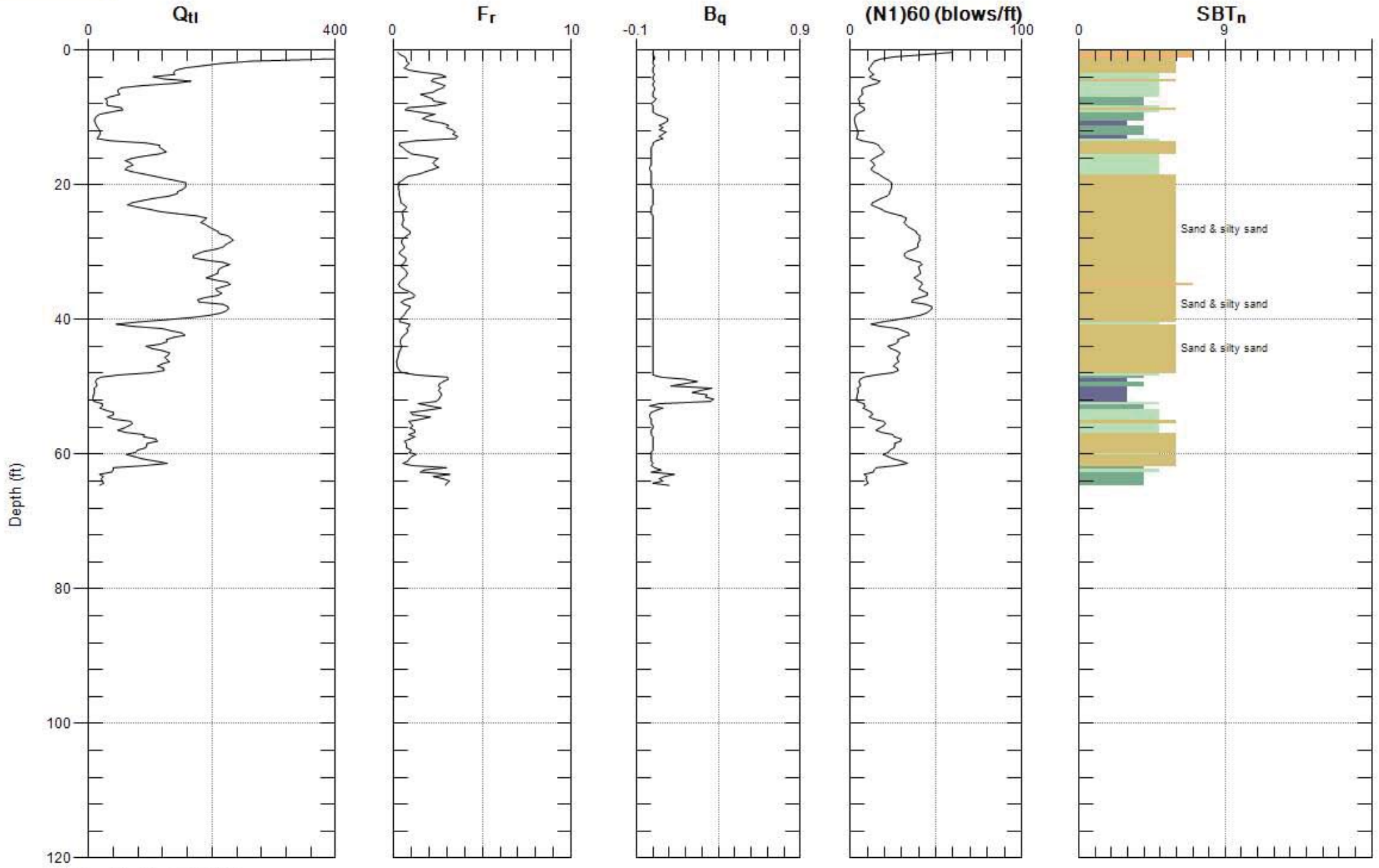
Max. Depth: 64.961 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



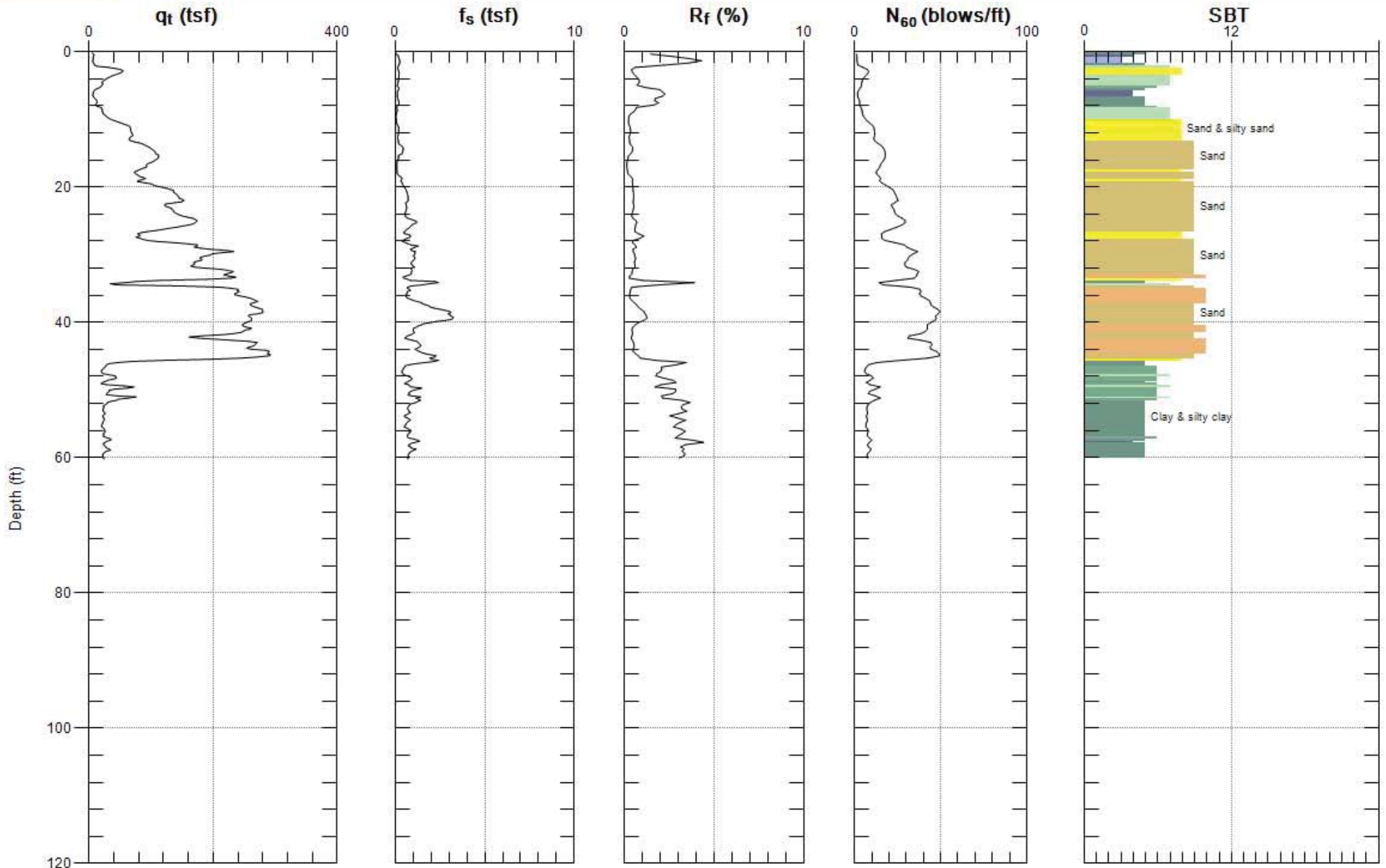
Max. Depth: 64.961 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



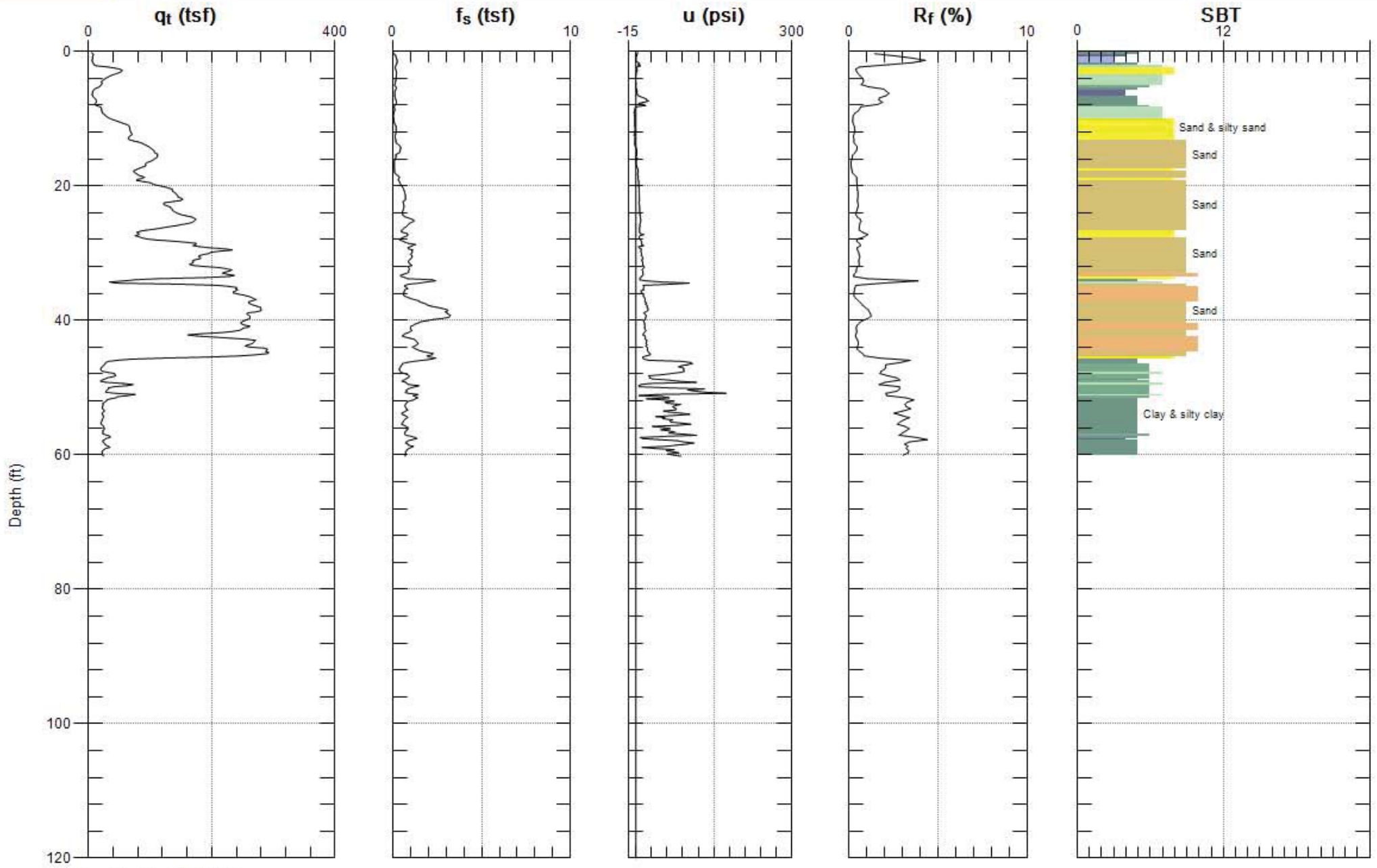
Max. Depth: 64.961 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



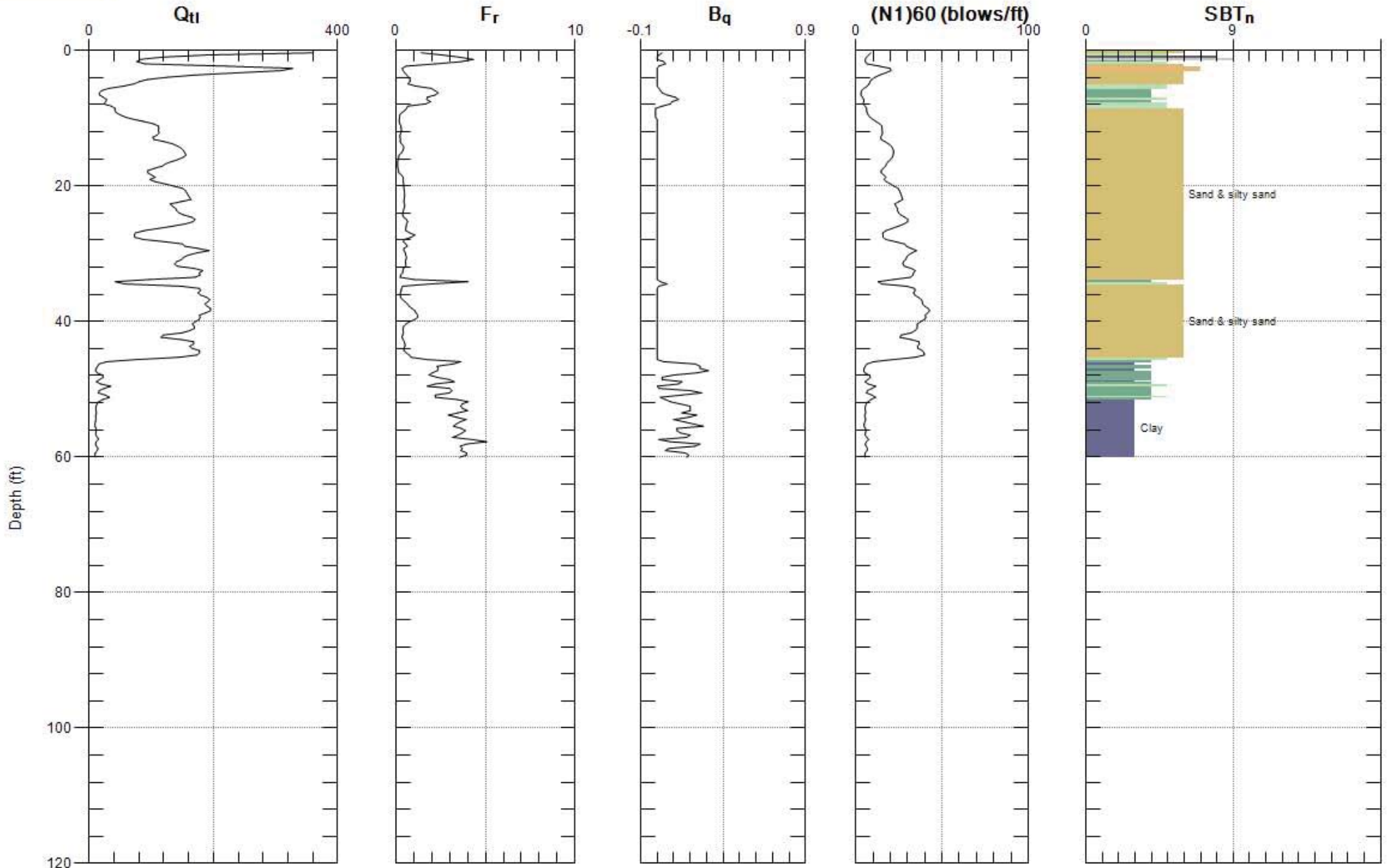
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



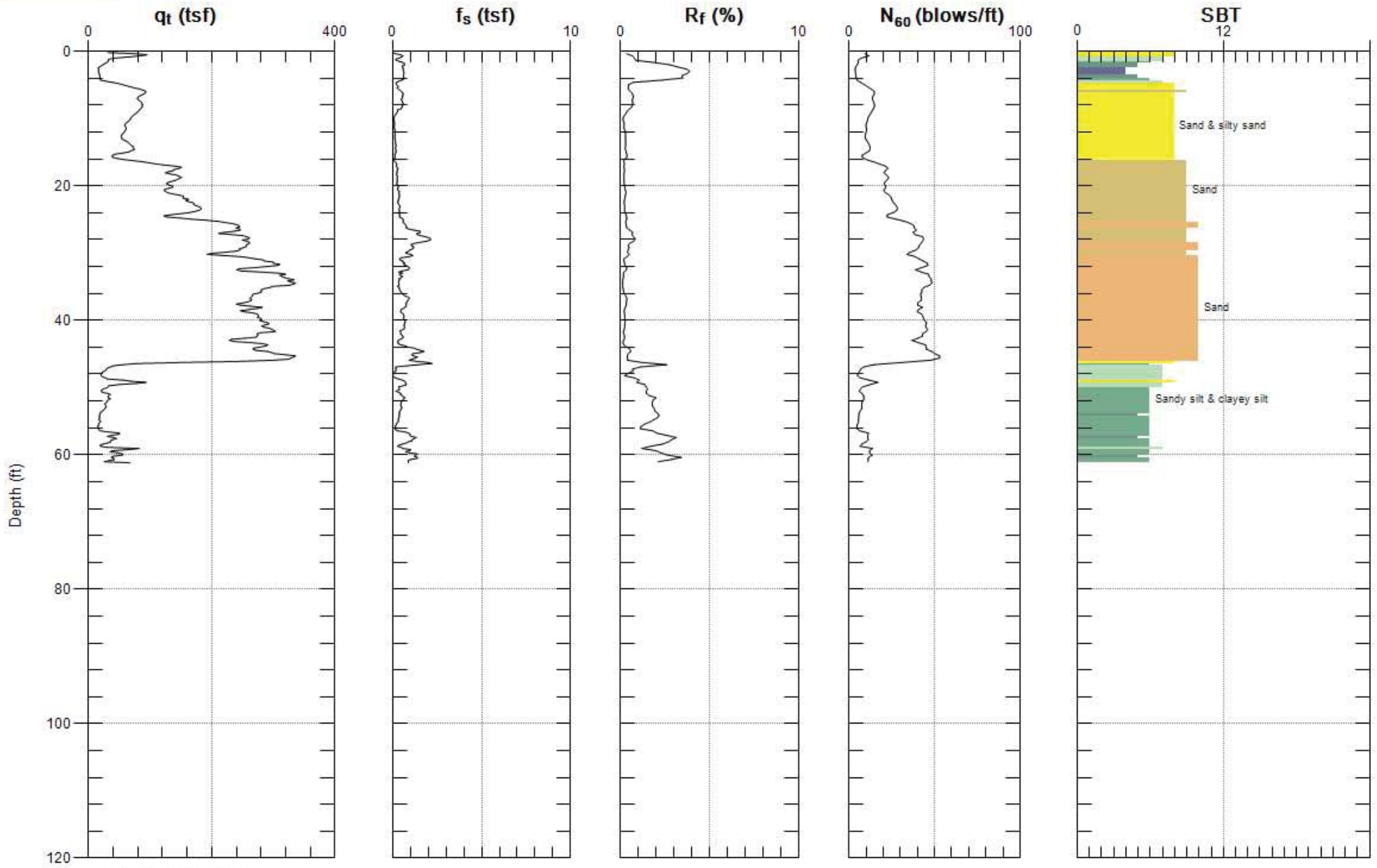
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



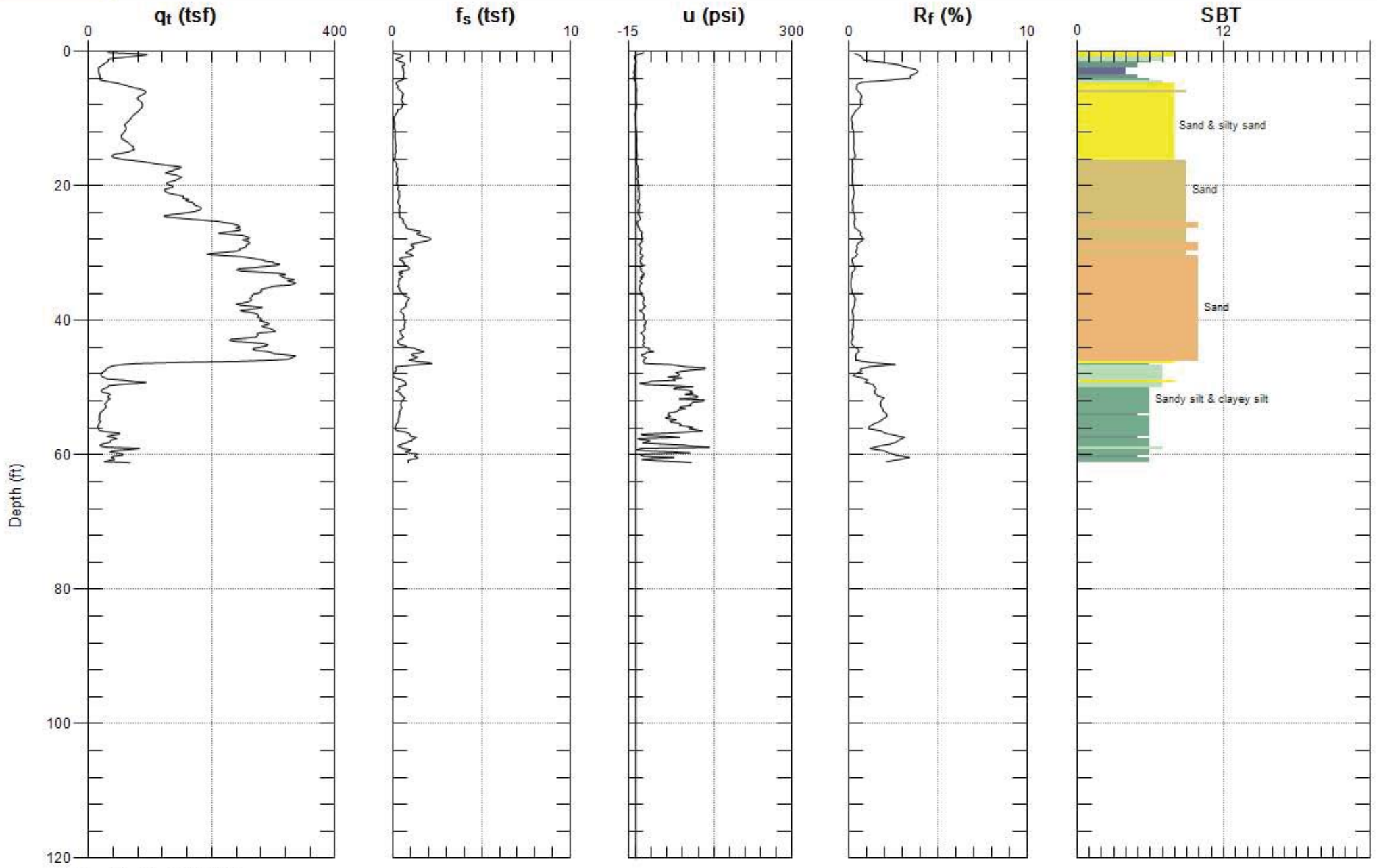
Max. Depth: 60.203 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



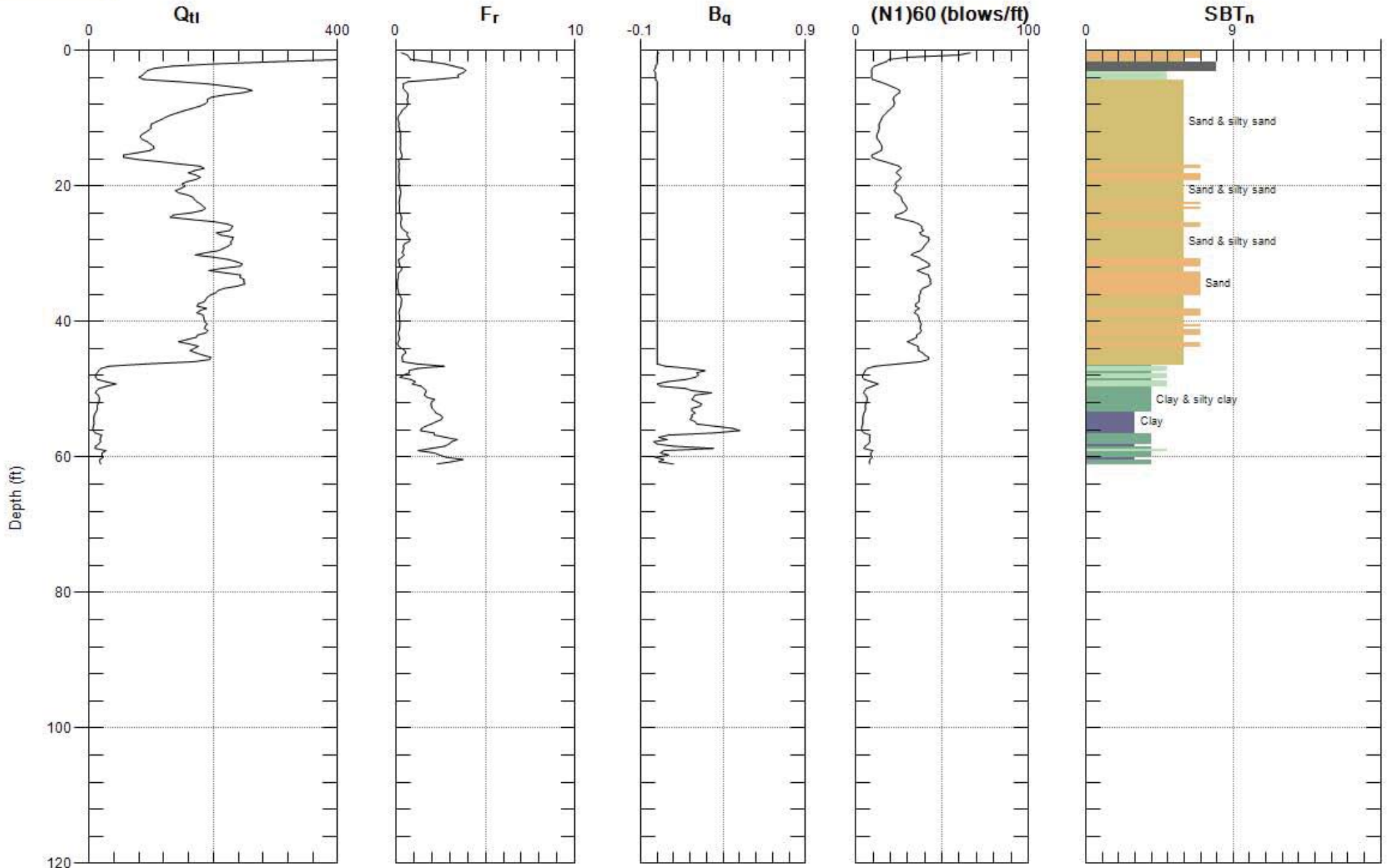
Max. Depth: 61.188 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



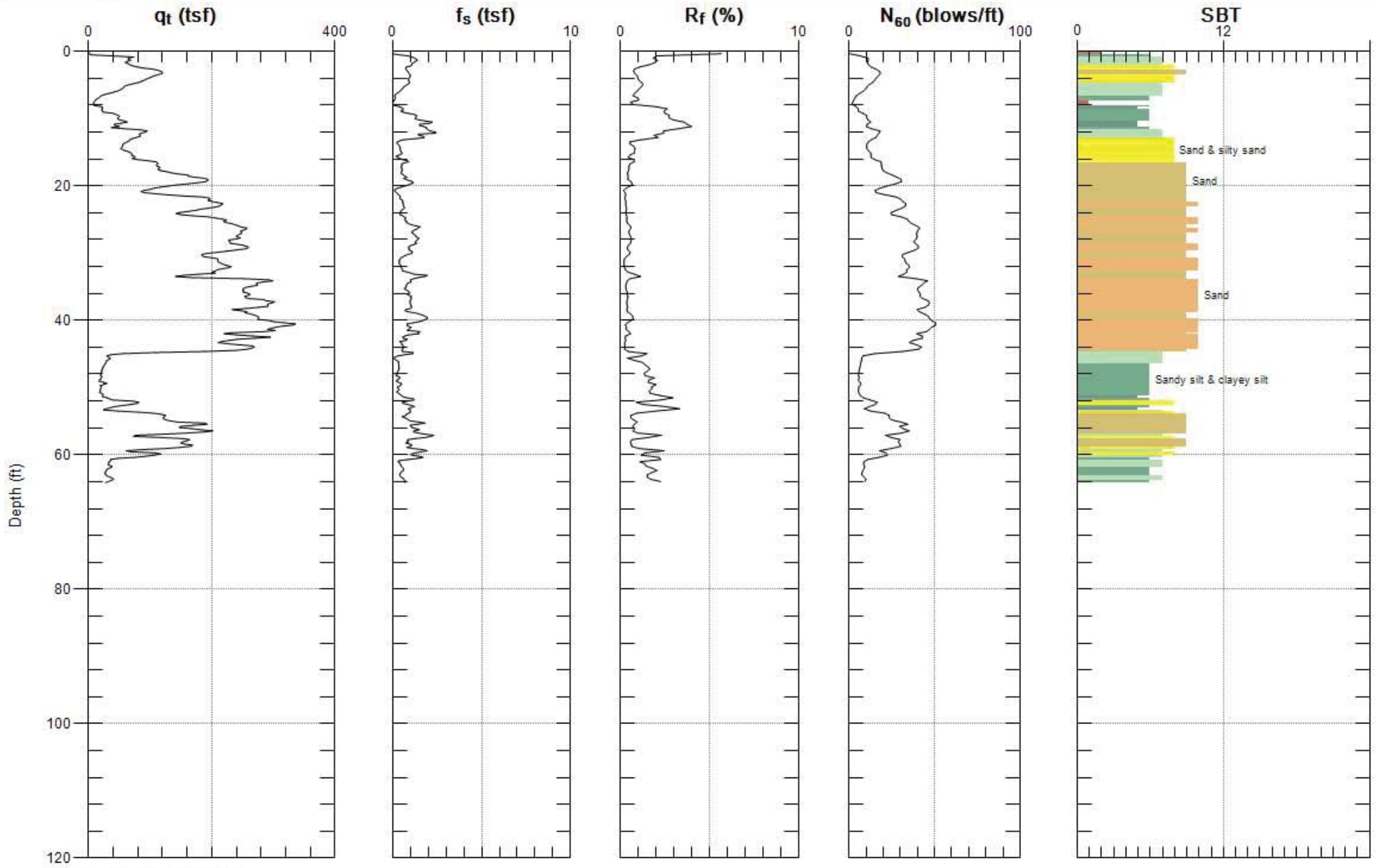
Max. Depth: 61.188 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



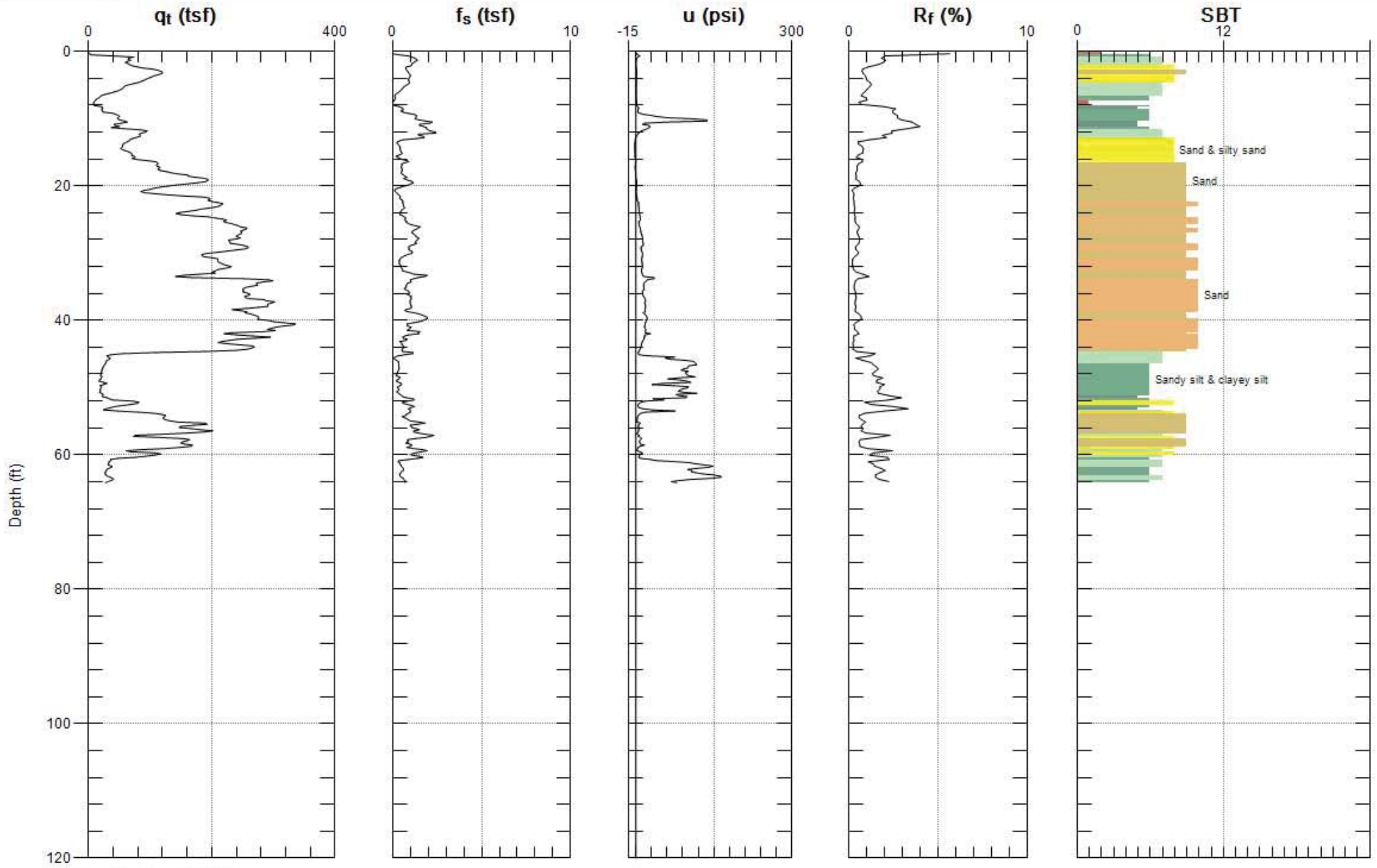
Max. Depth: 61.188 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



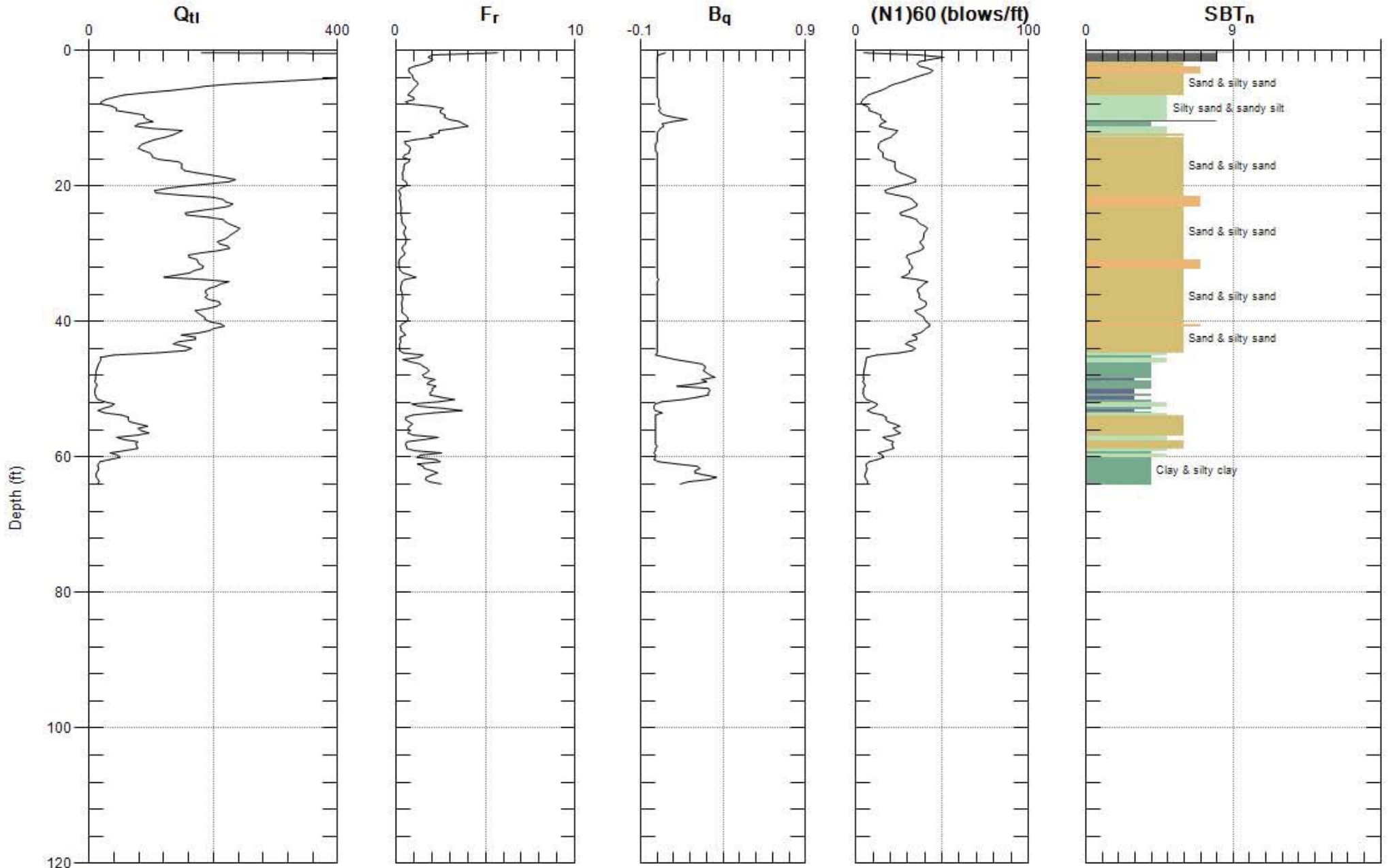
Max. Depth: 64.140 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



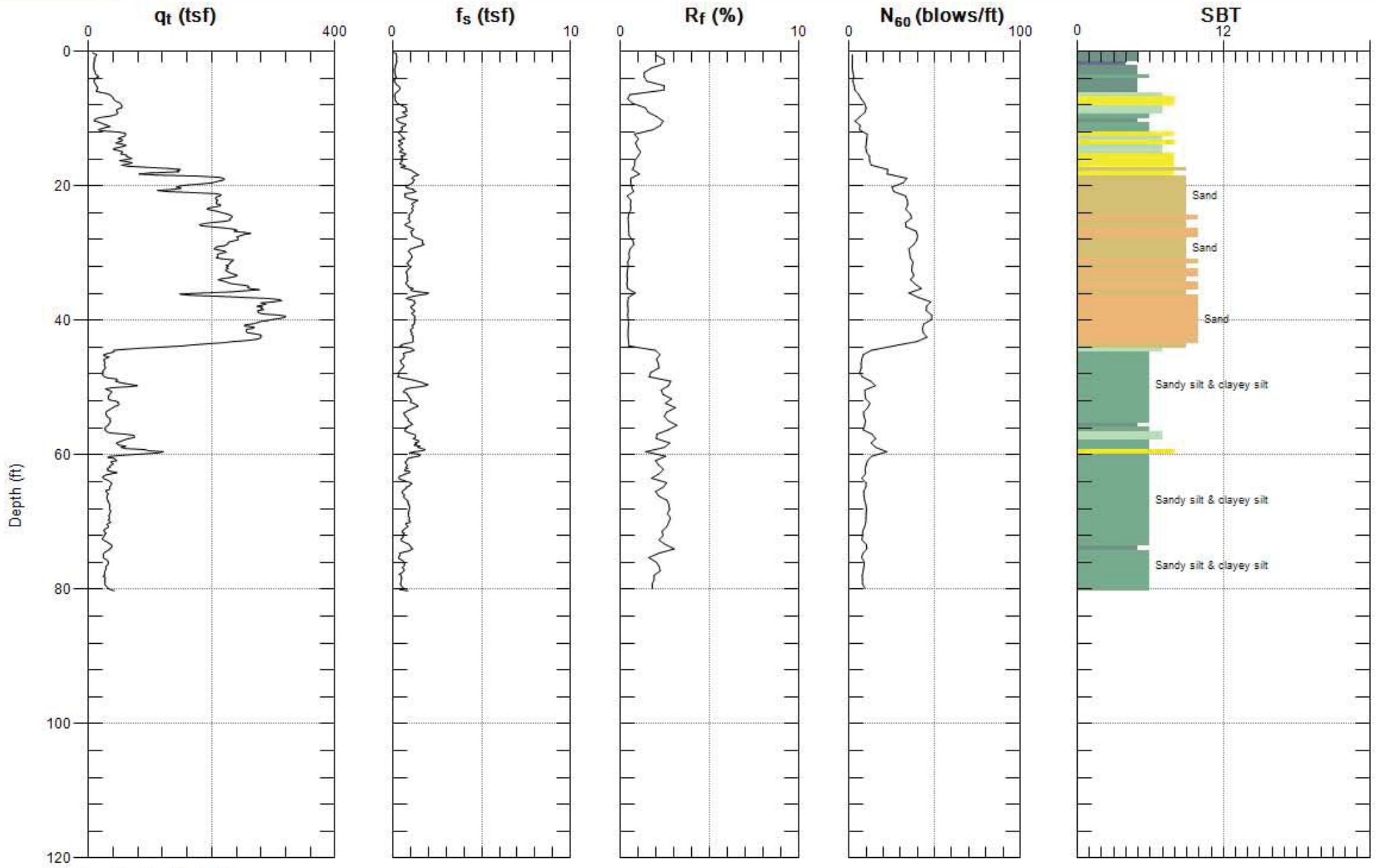
Max. Depth: 64.140 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



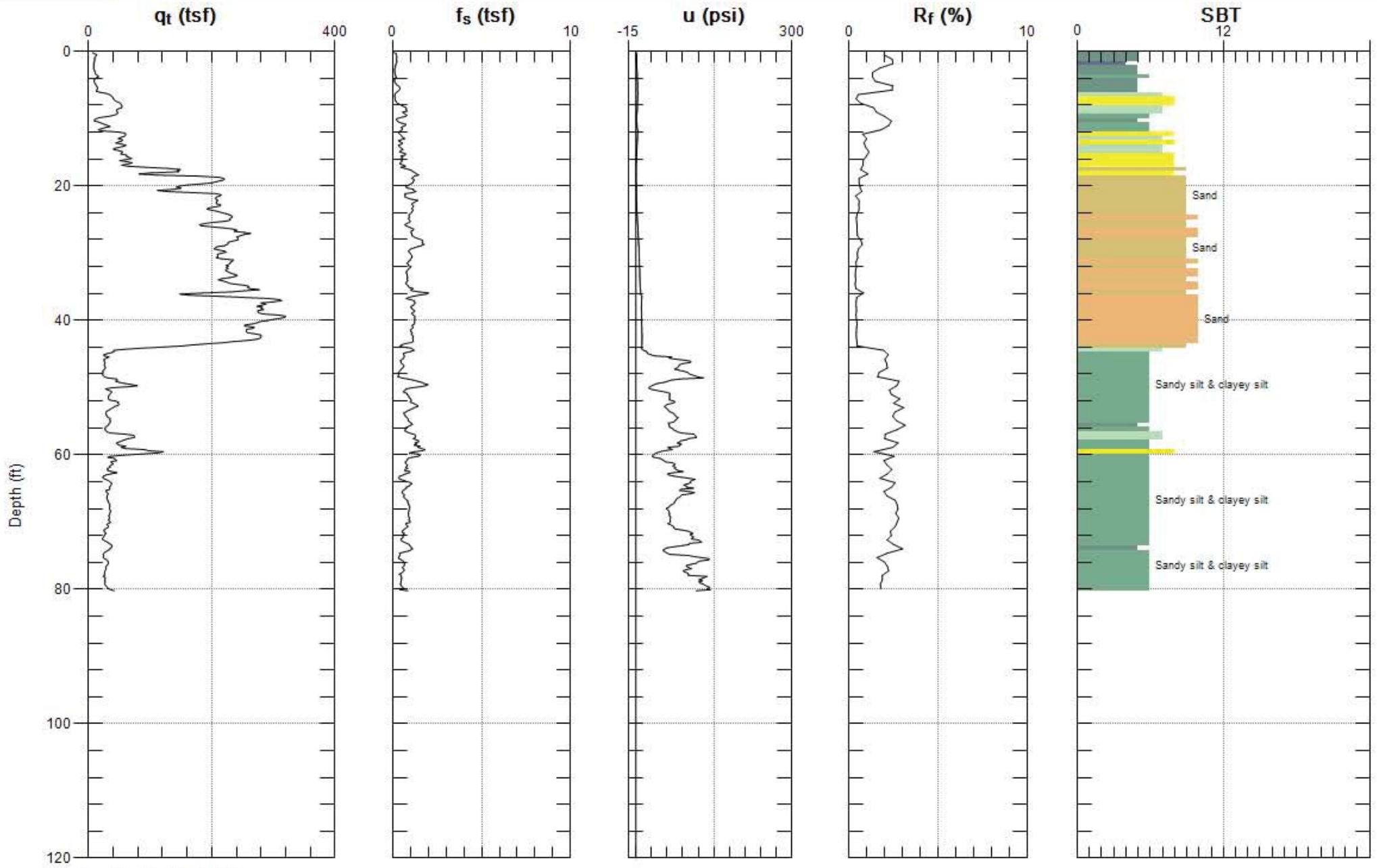
Max. Depth: 64.140 (ft)
 Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)



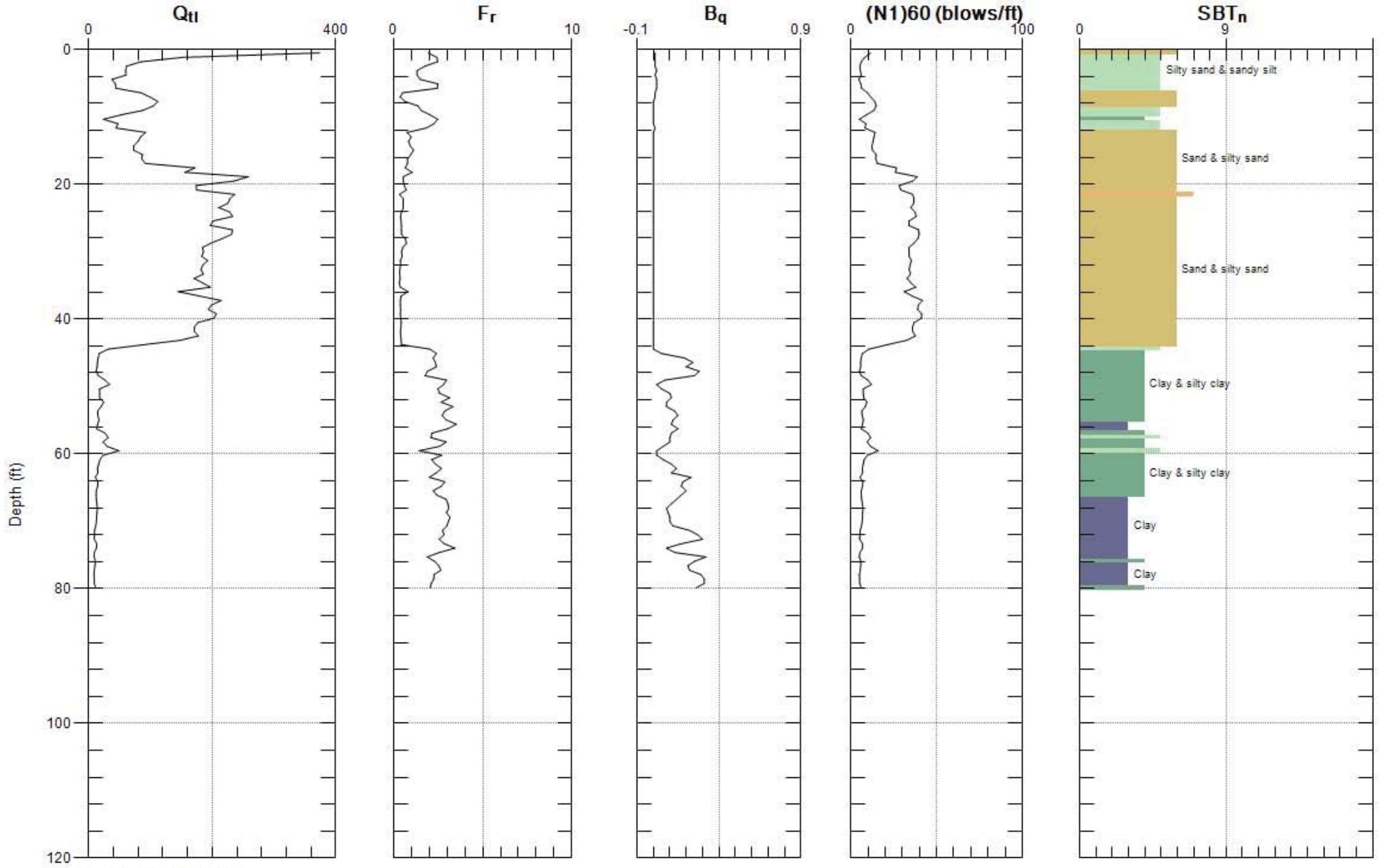
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



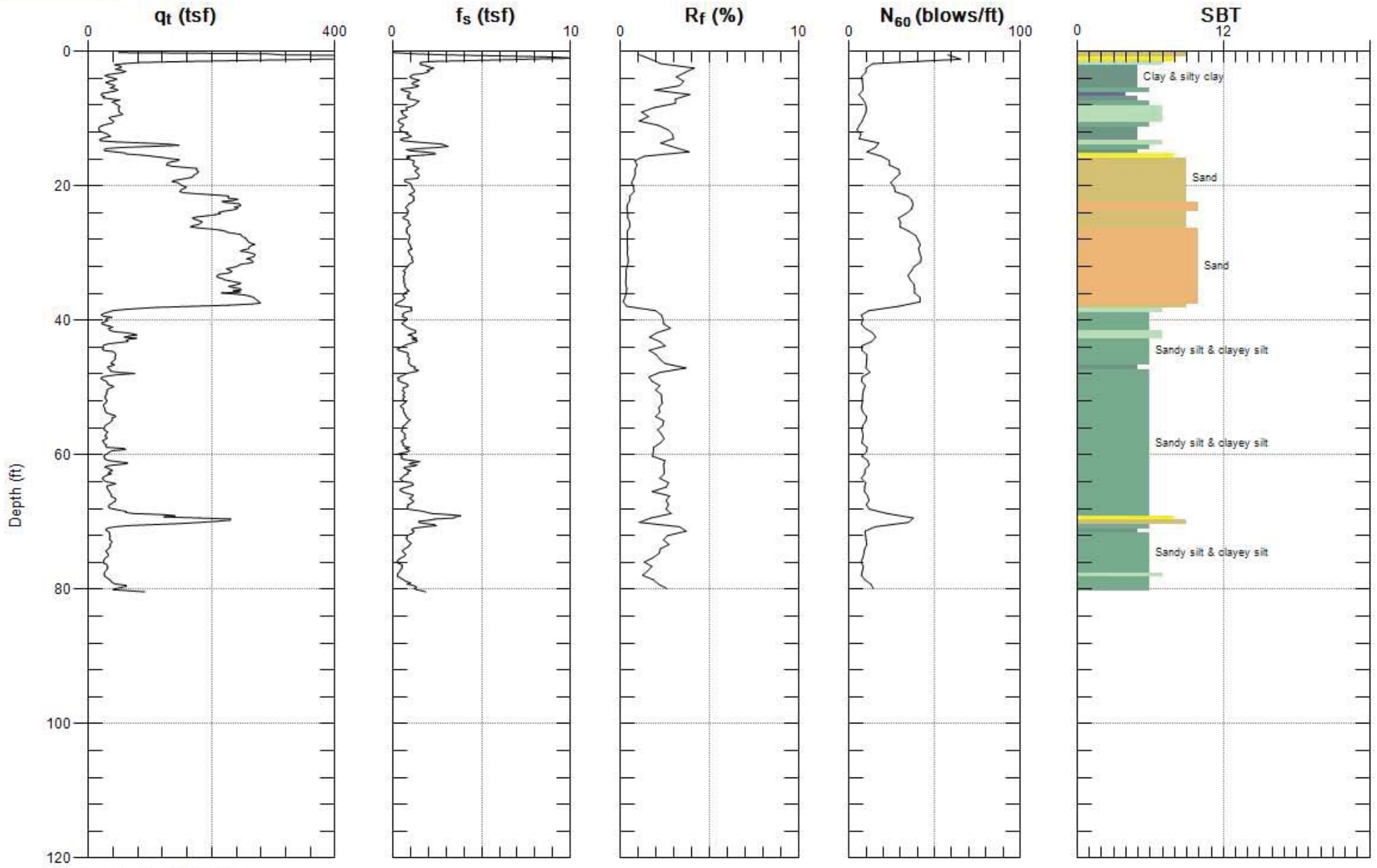
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



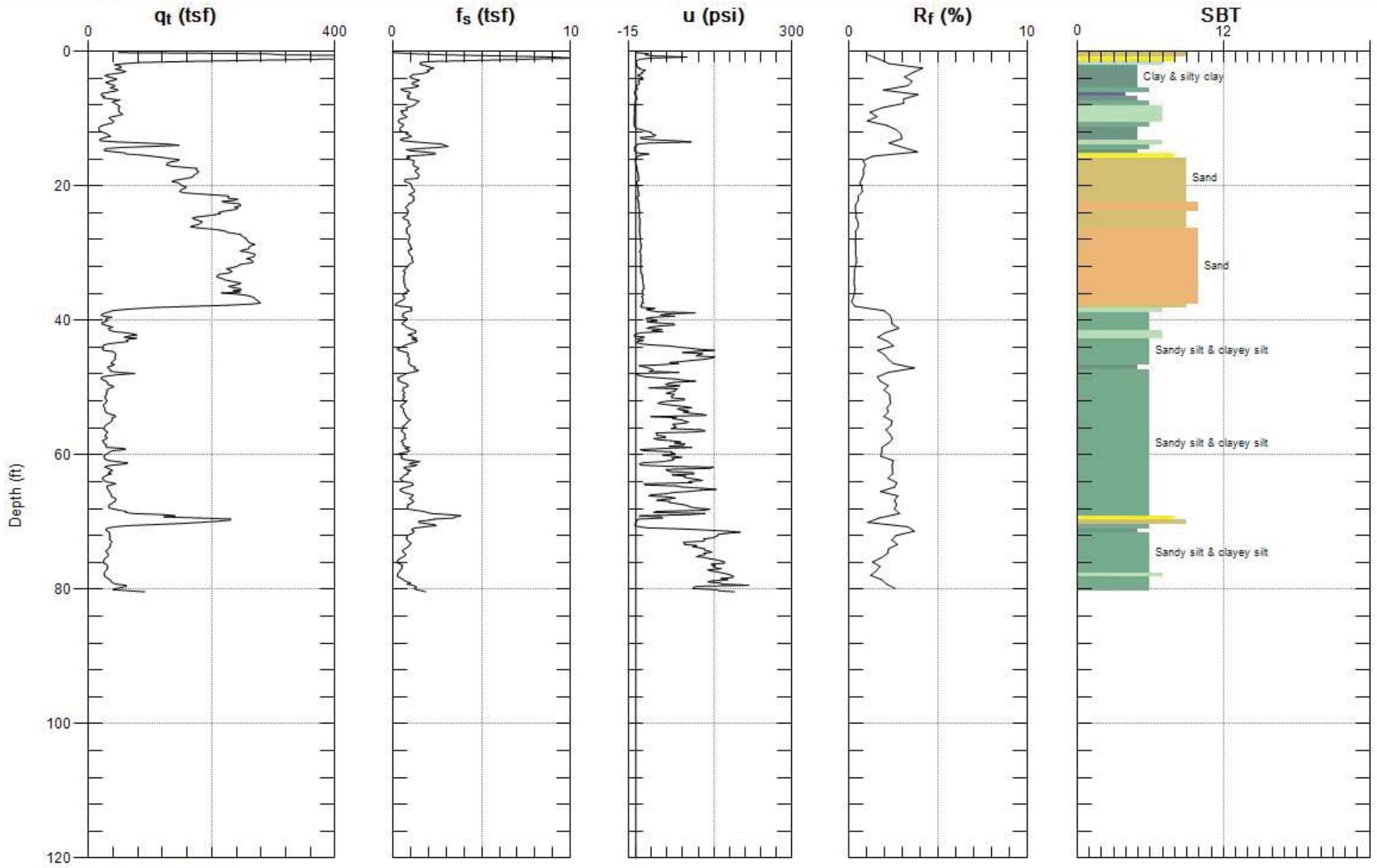
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



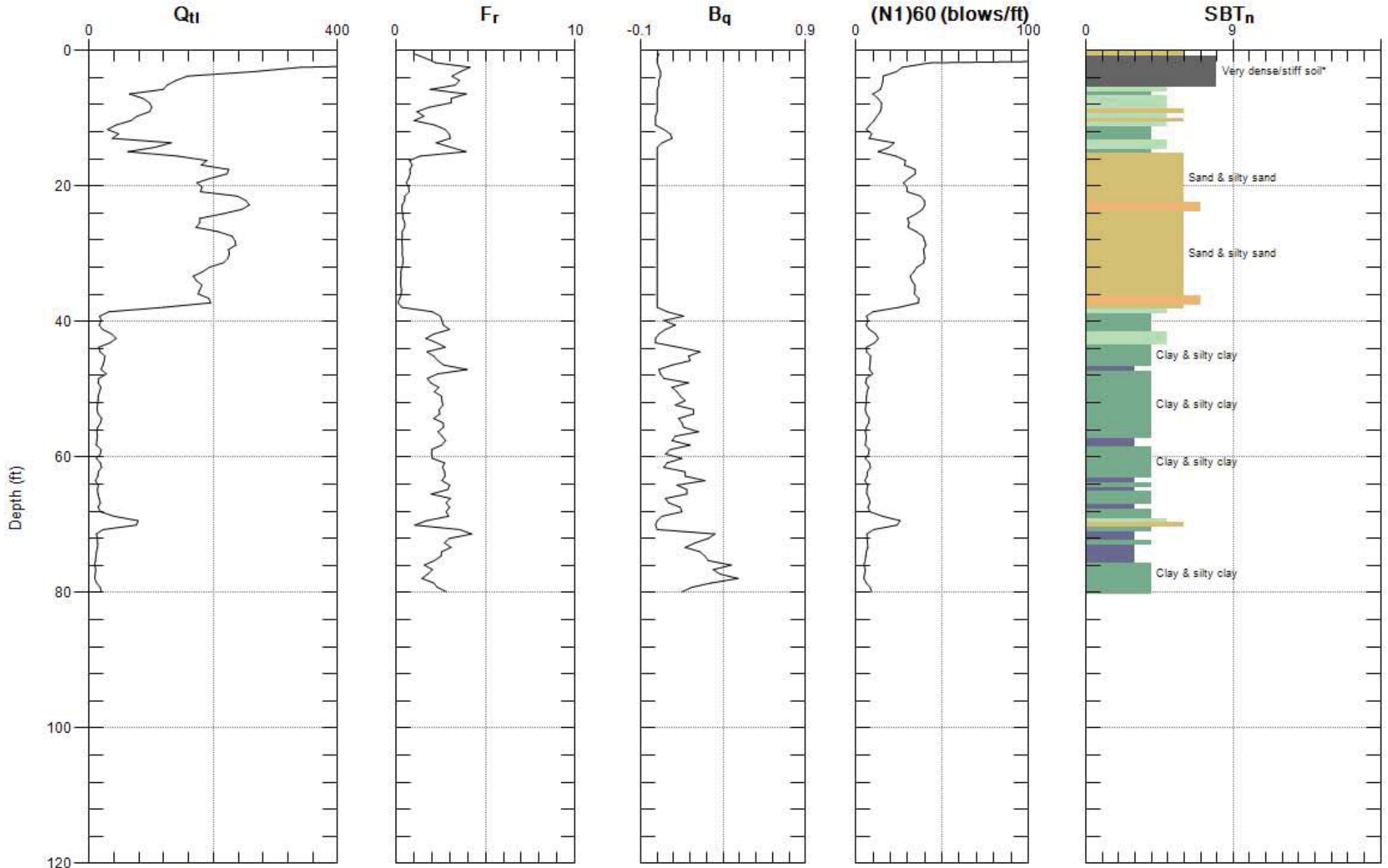
Max. Depth: 80.381 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



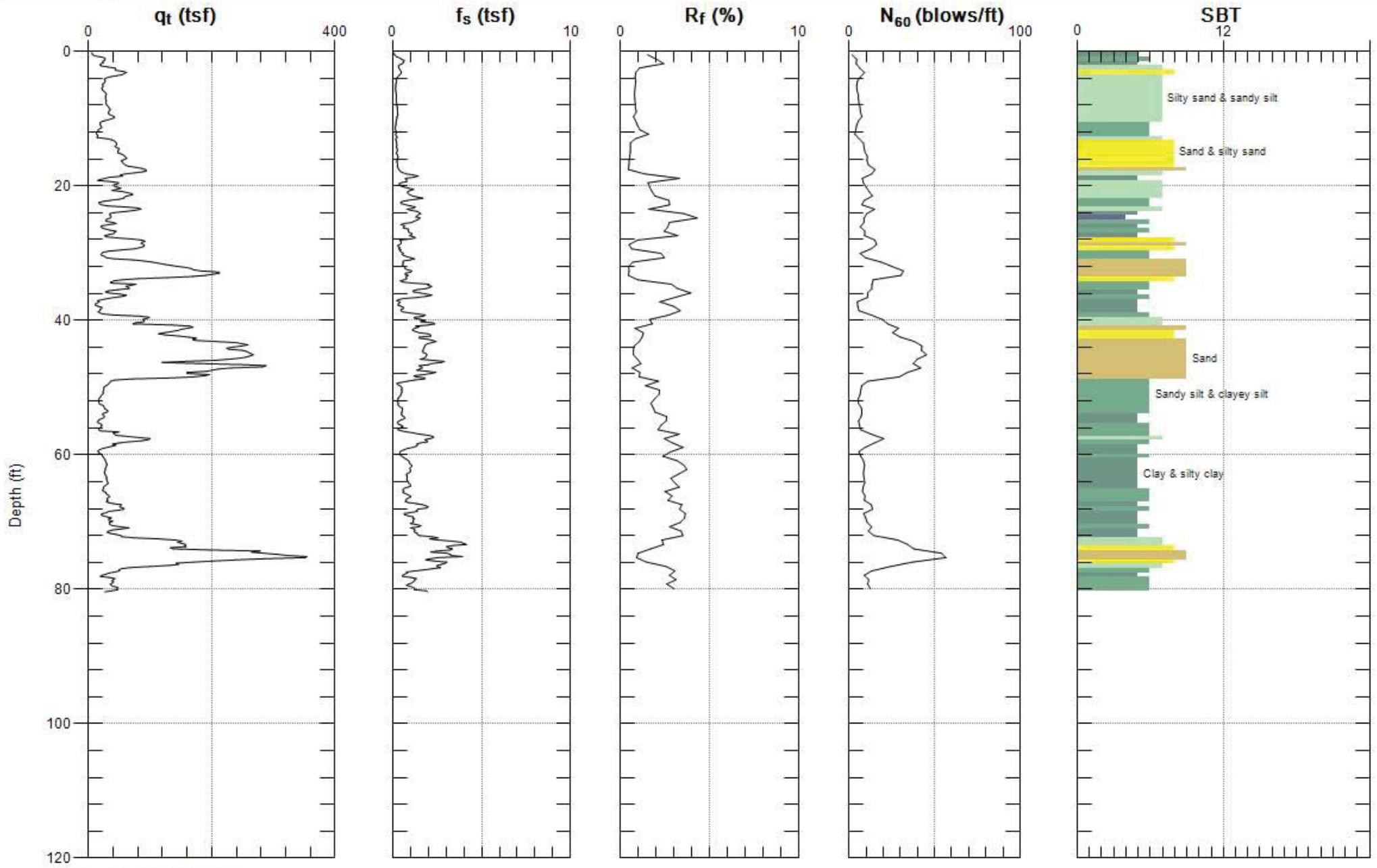
Max. Depth: 80.381 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



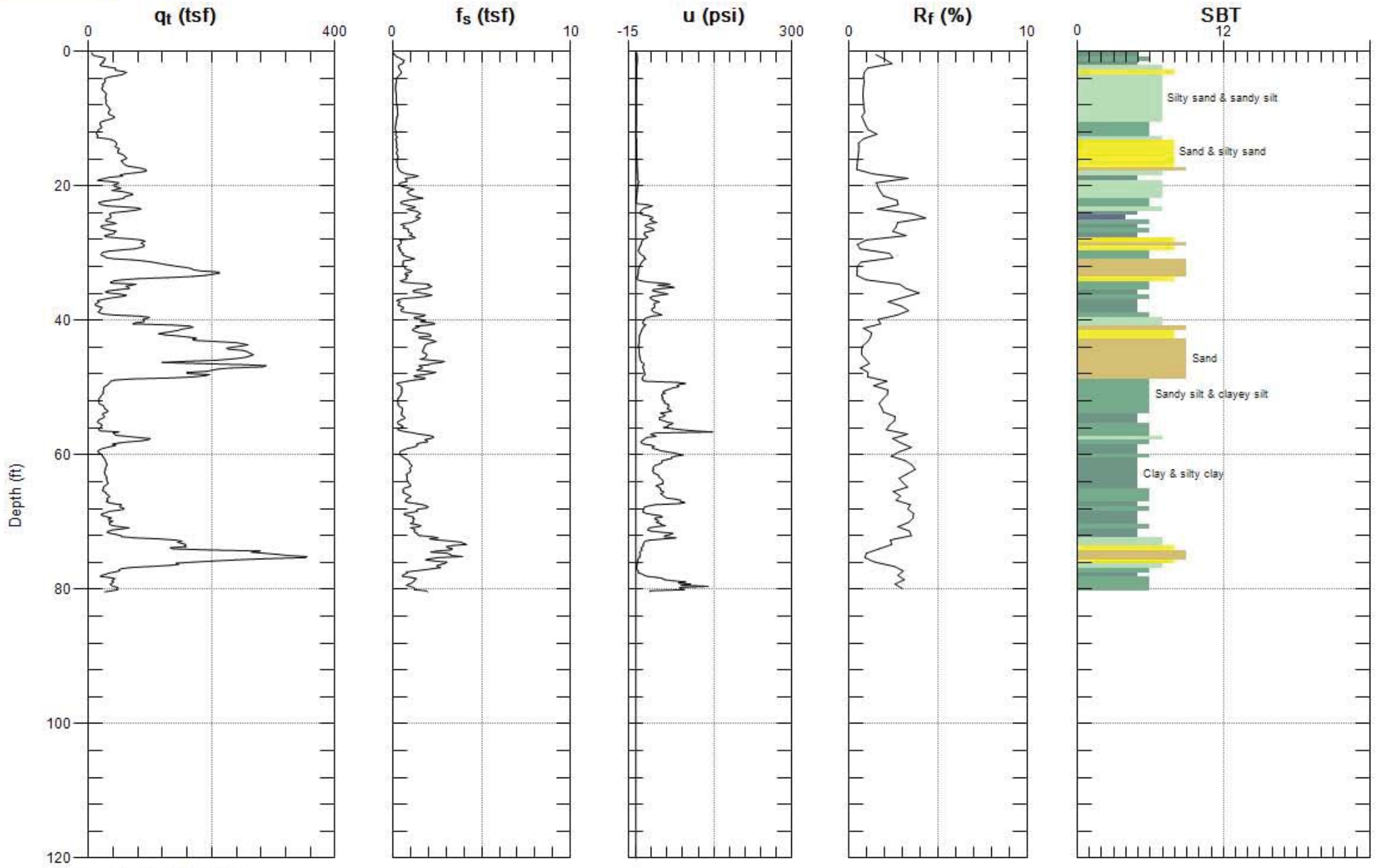
Max. Depth: 80.381 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



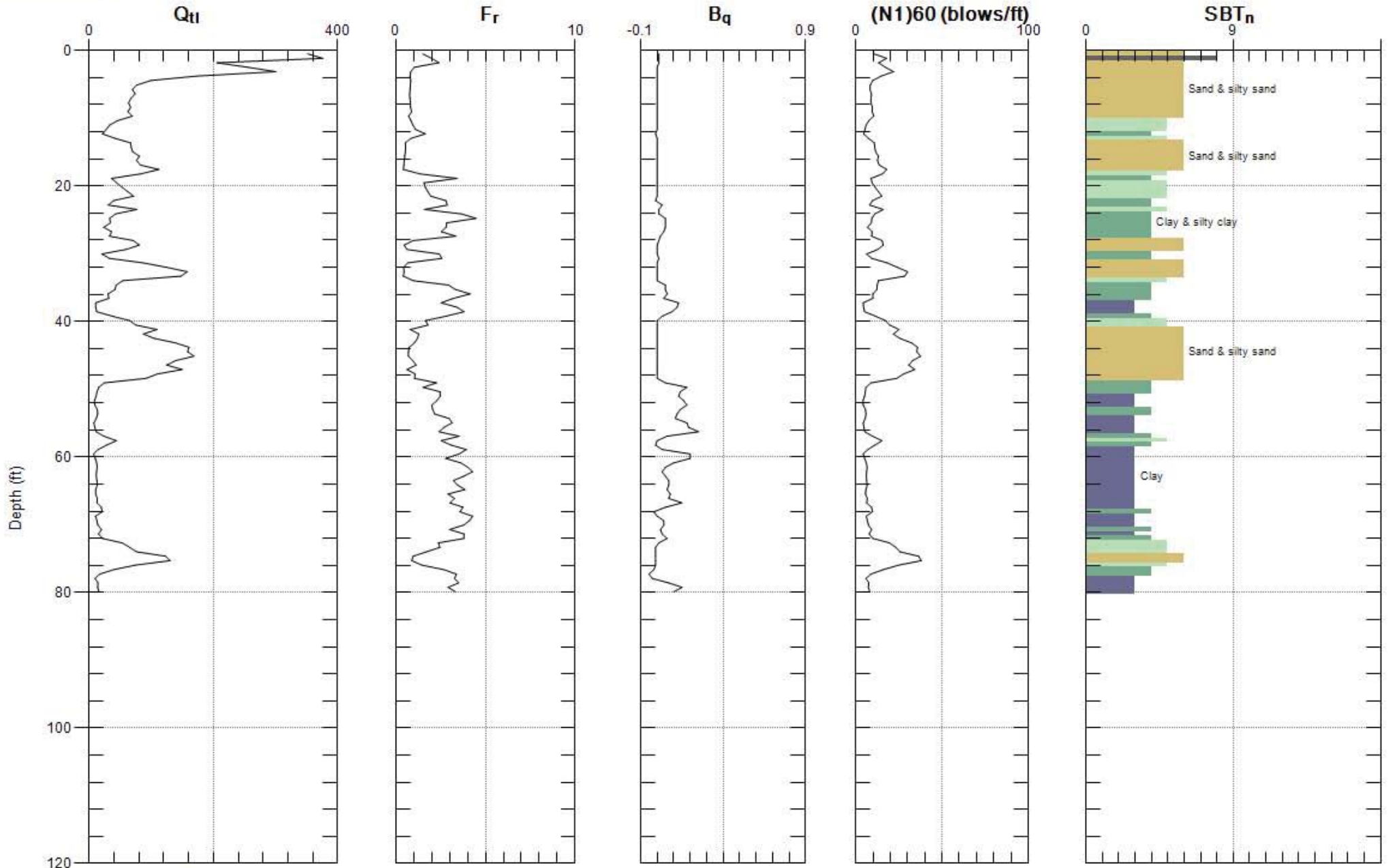
Max. Depth: 80.381 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



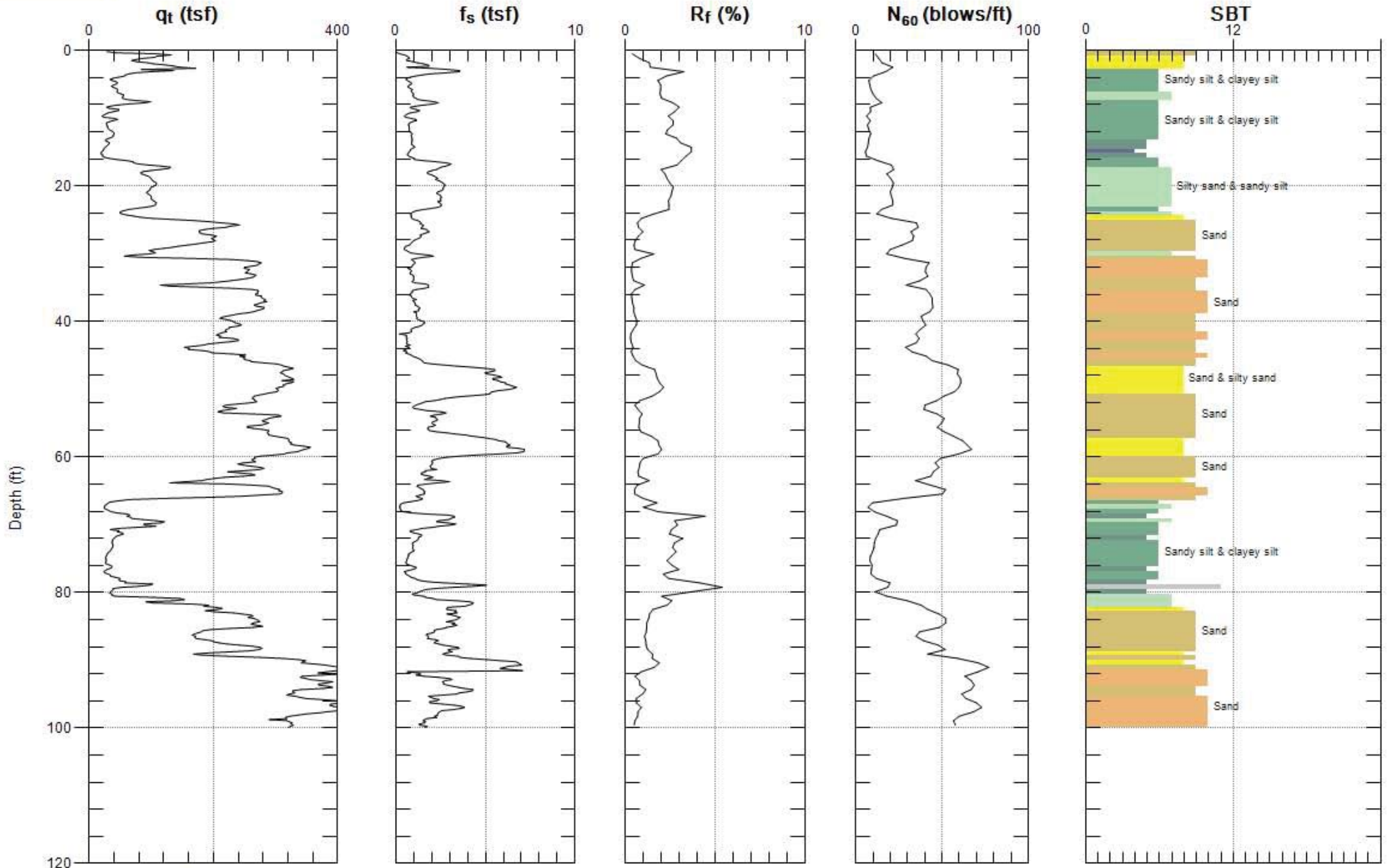
Max. Depth: 80.381 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



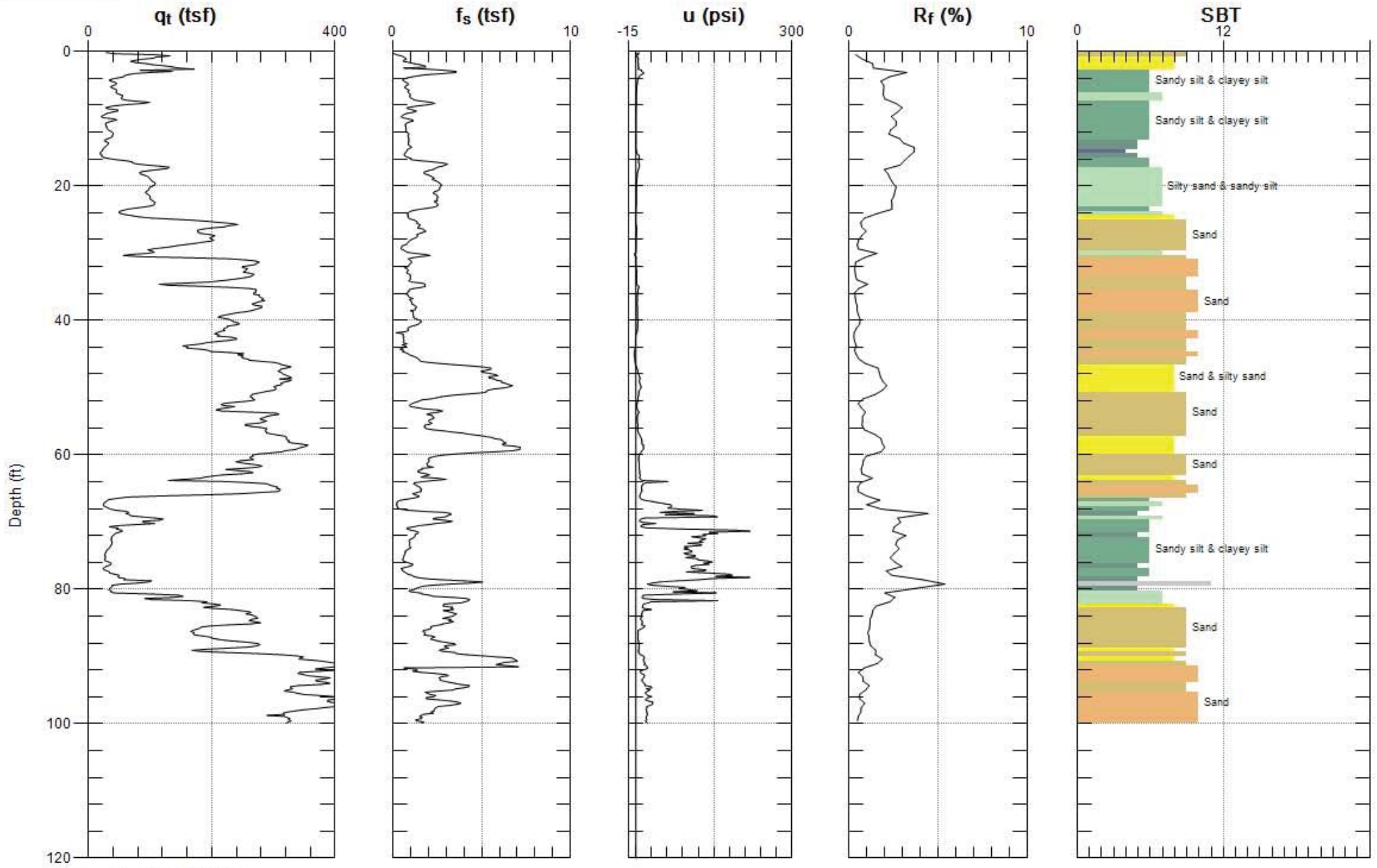
Max. Depth: 80.381 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



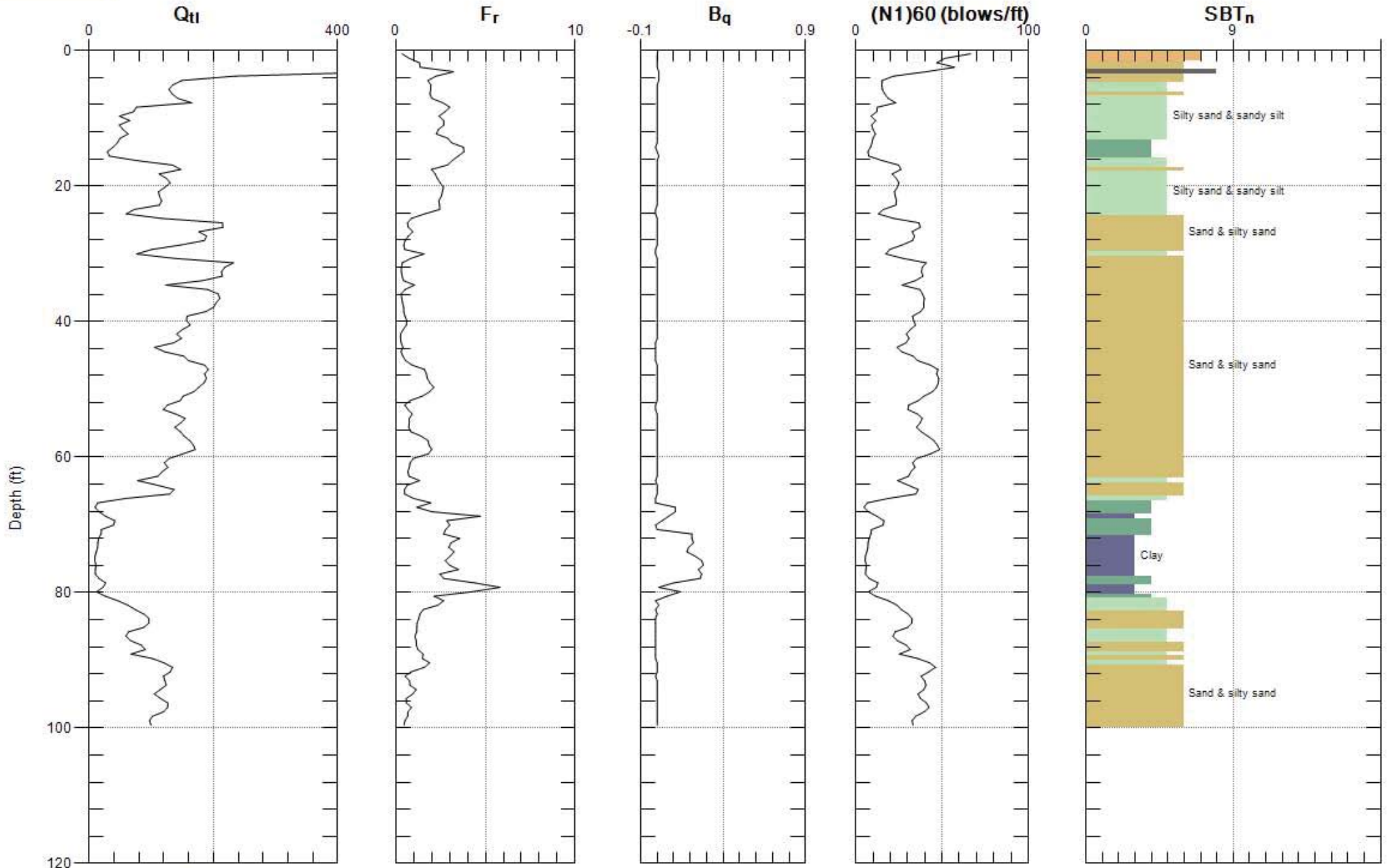
Max. Depth: 99.902 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



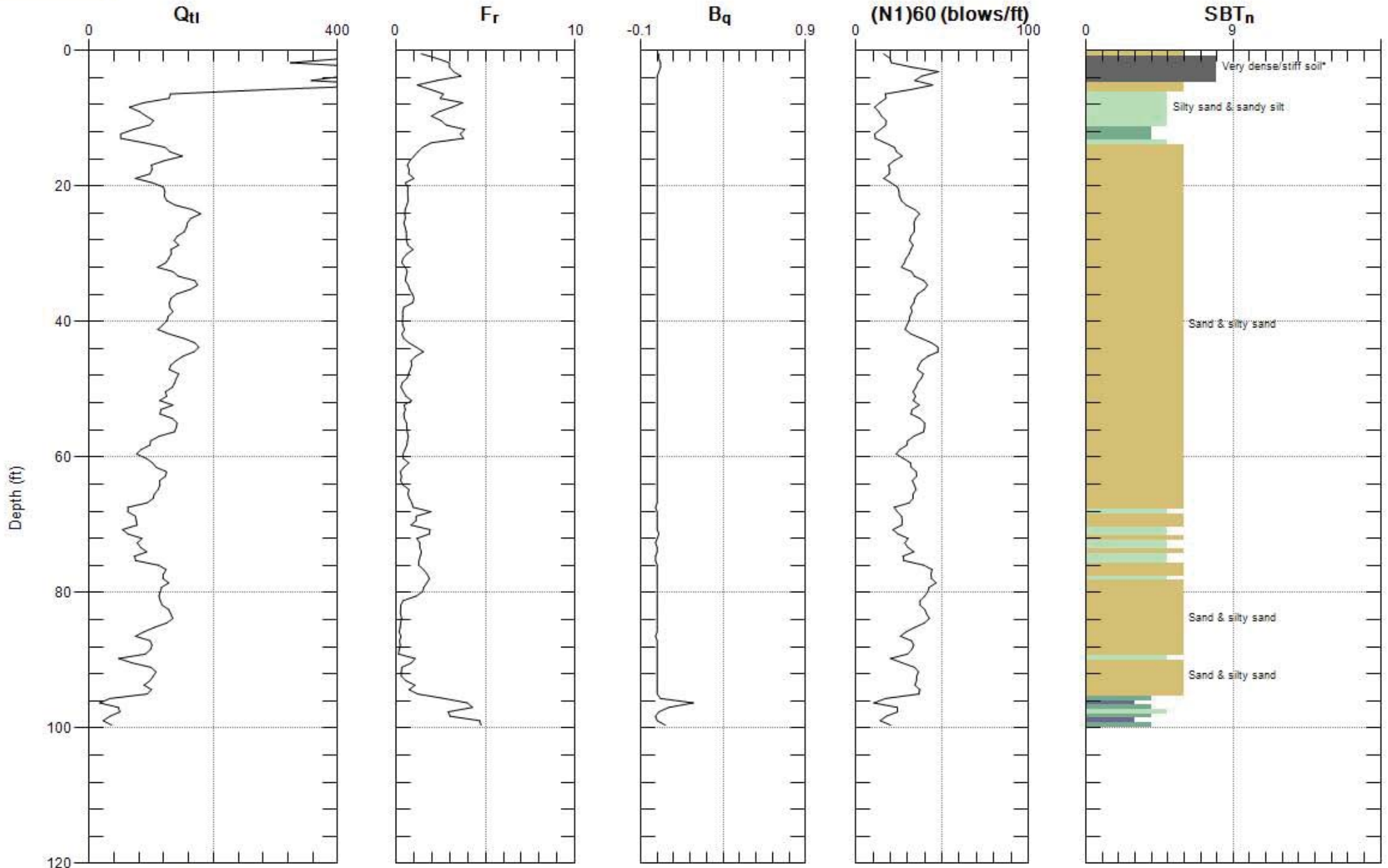
Max. Depth: 99.902 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



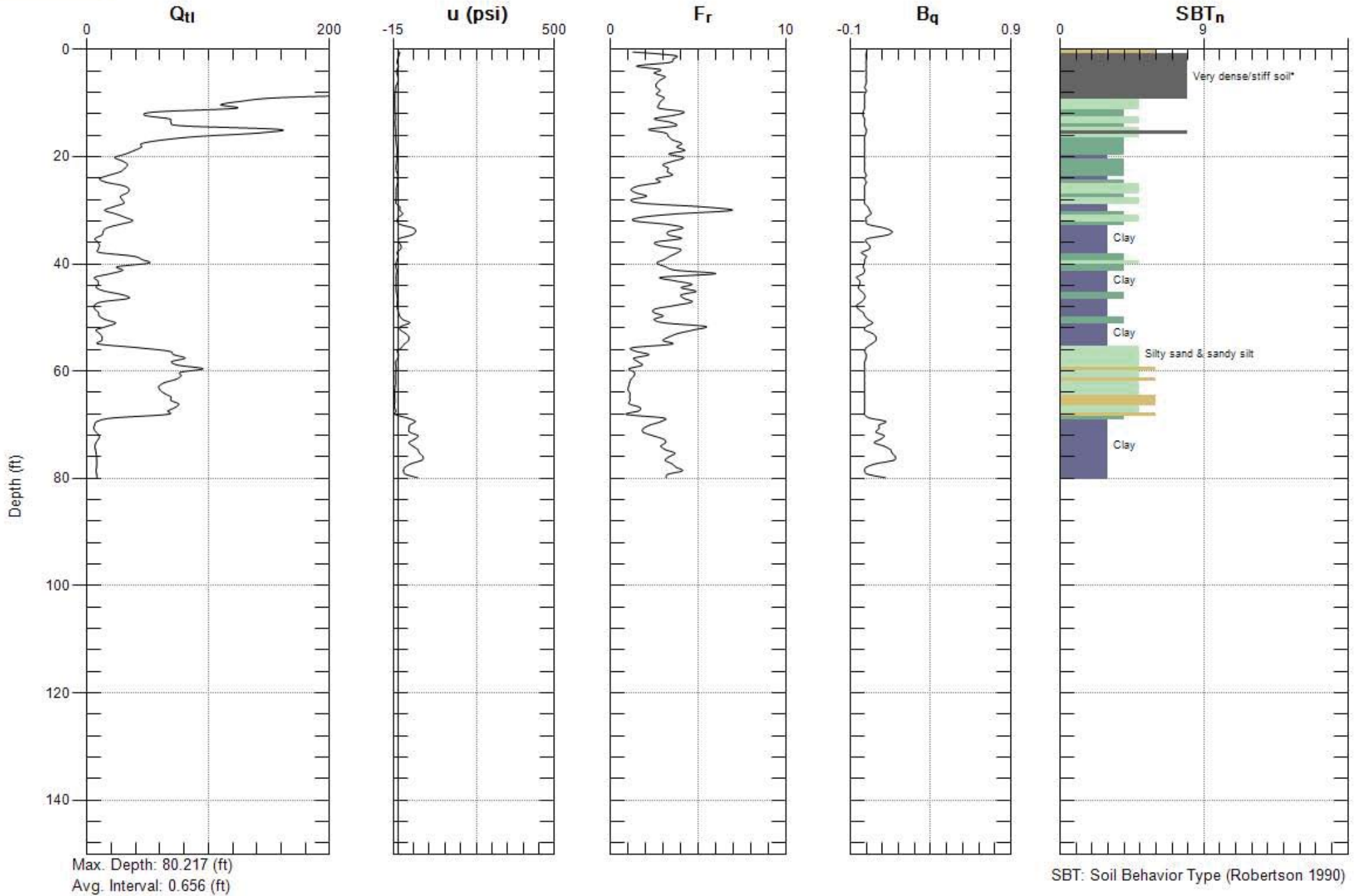
Max. Depth: 99.902 (ft)
 Avg. Interval: 0.656 (ft)

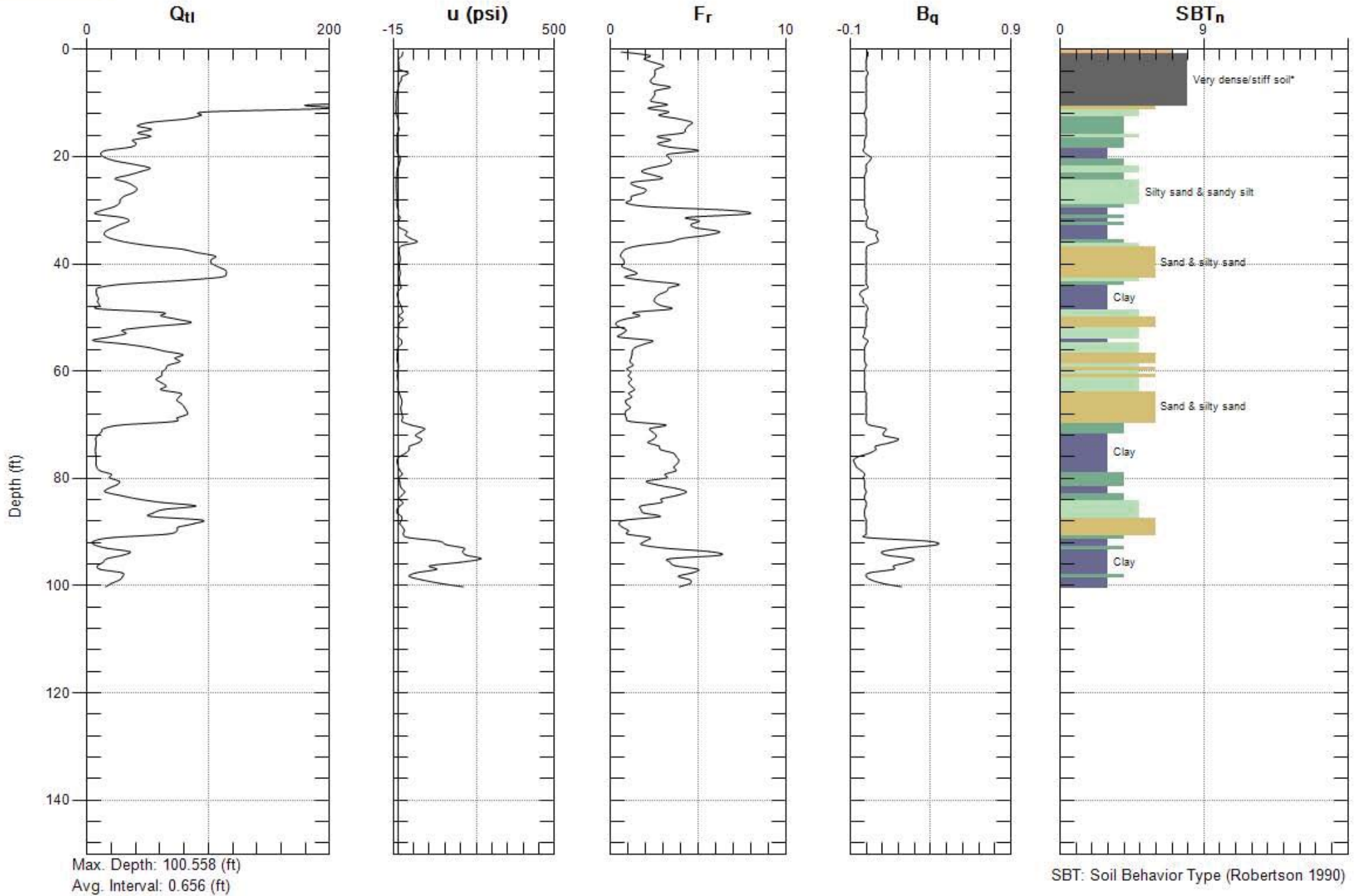
SBT: Soil Behavior Type (Robertson 1990)

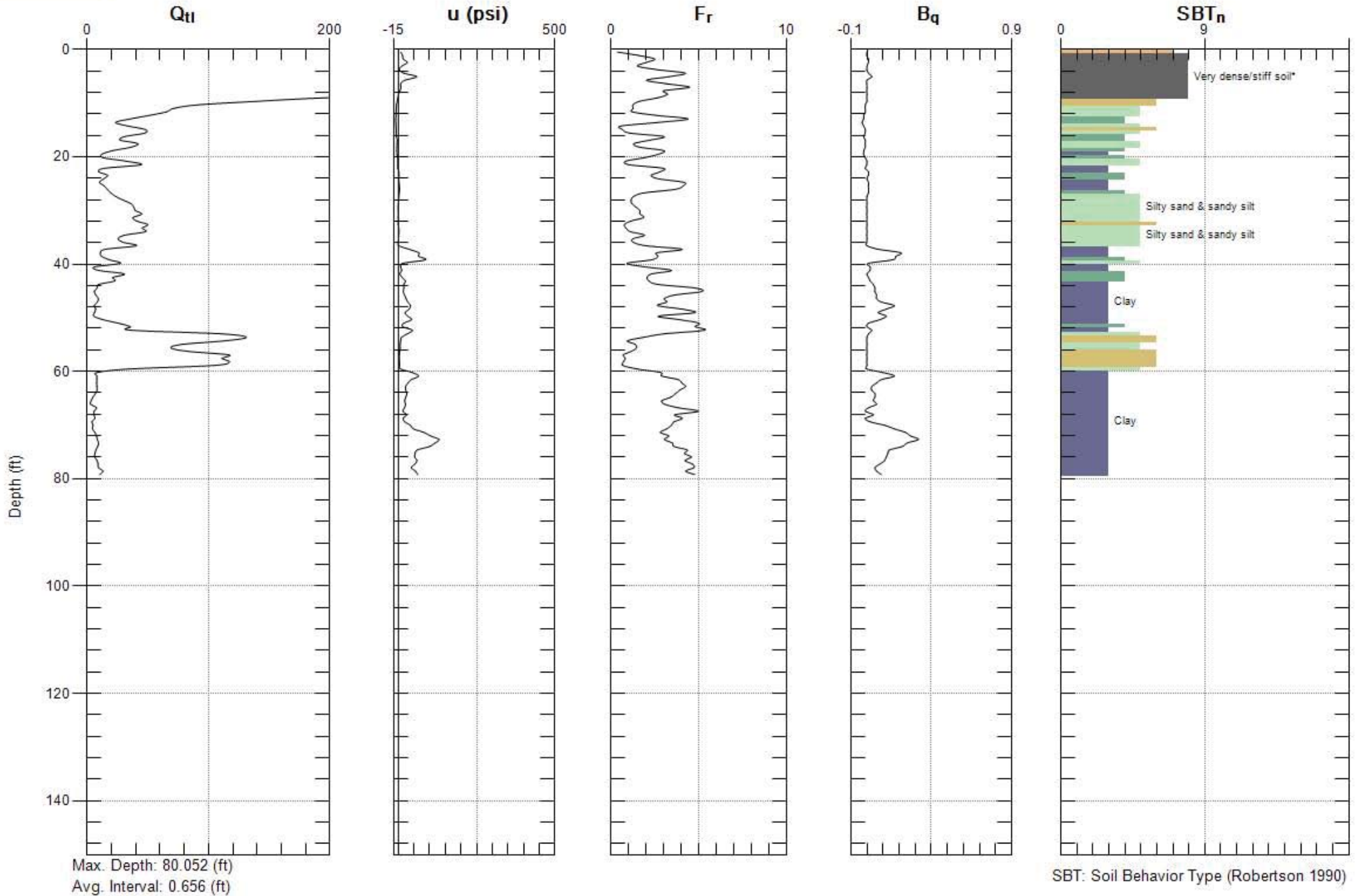


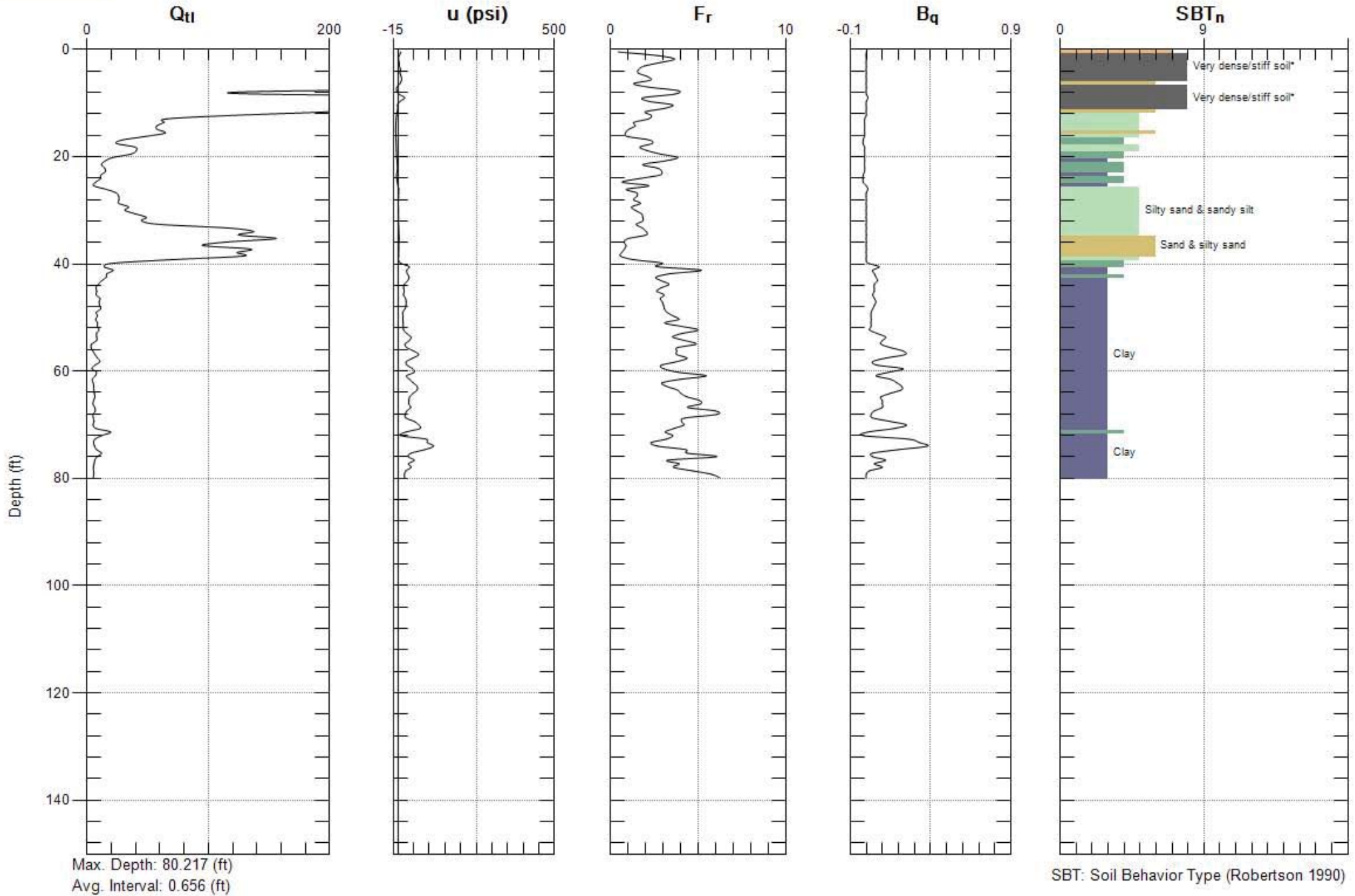
Max. Depth: 100.394 (ft)
 Avg. Interval: 0.656 (ft)

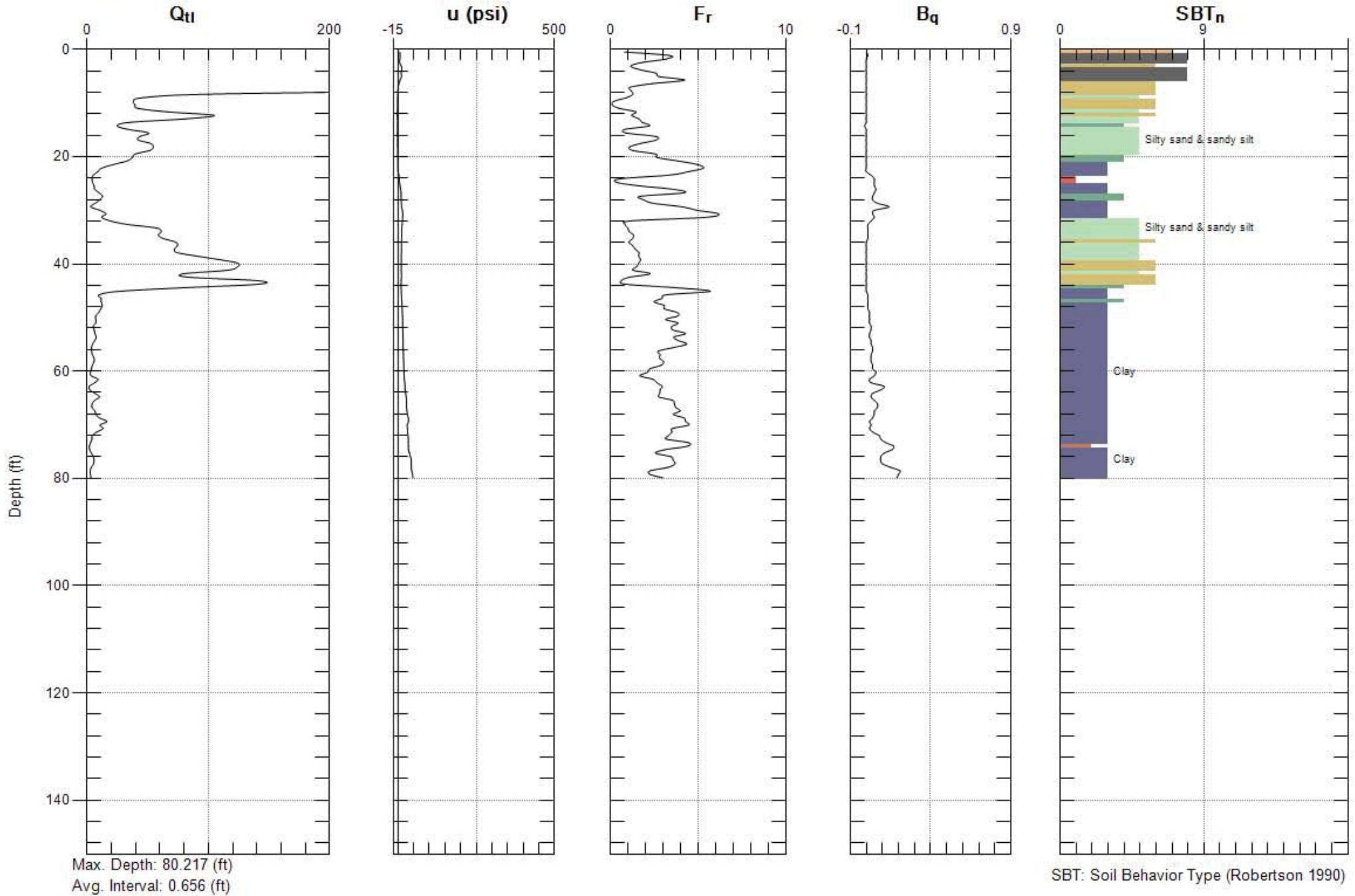
SBT: Soil Behavior Type (Robertson 1990)





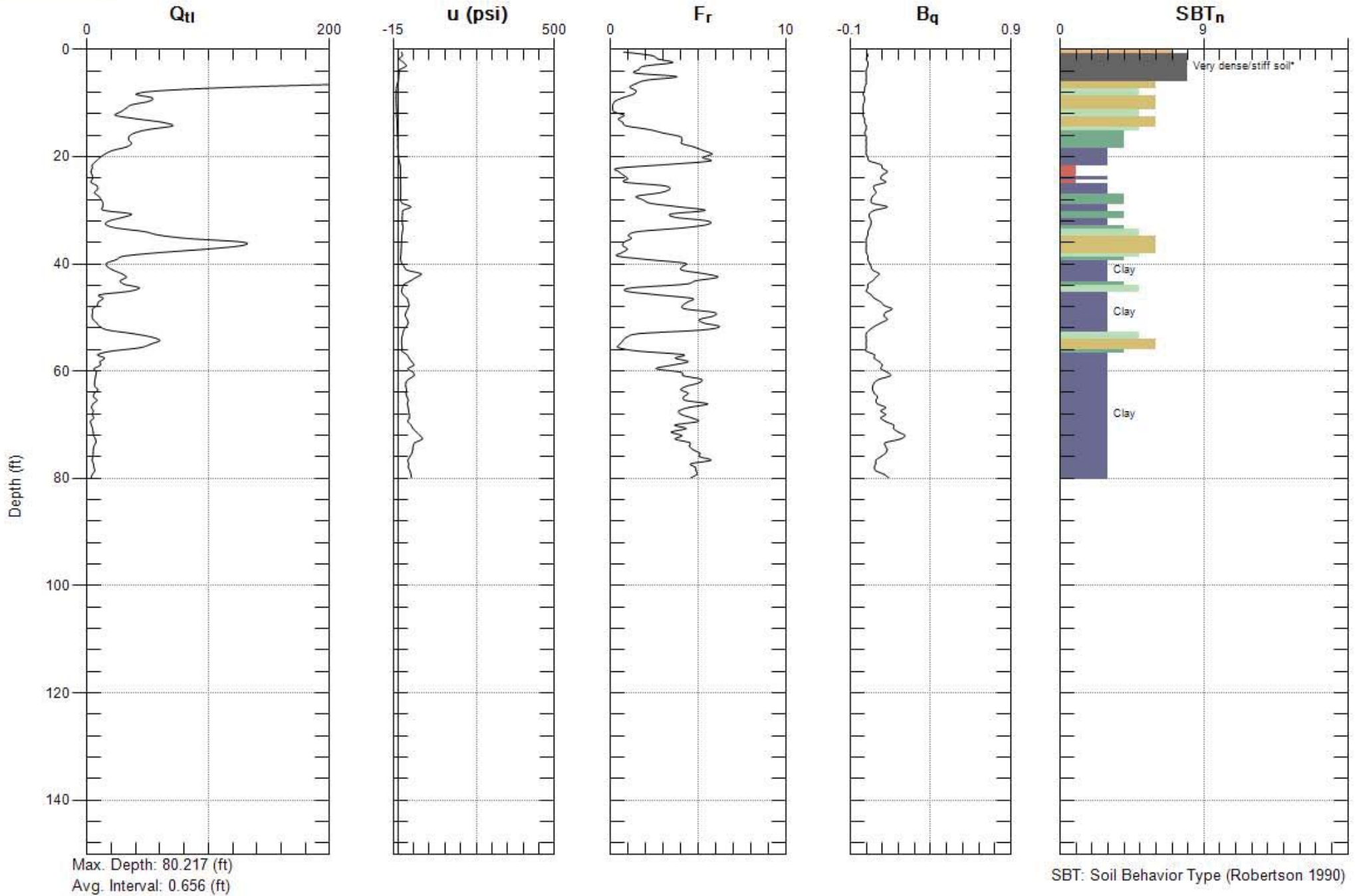






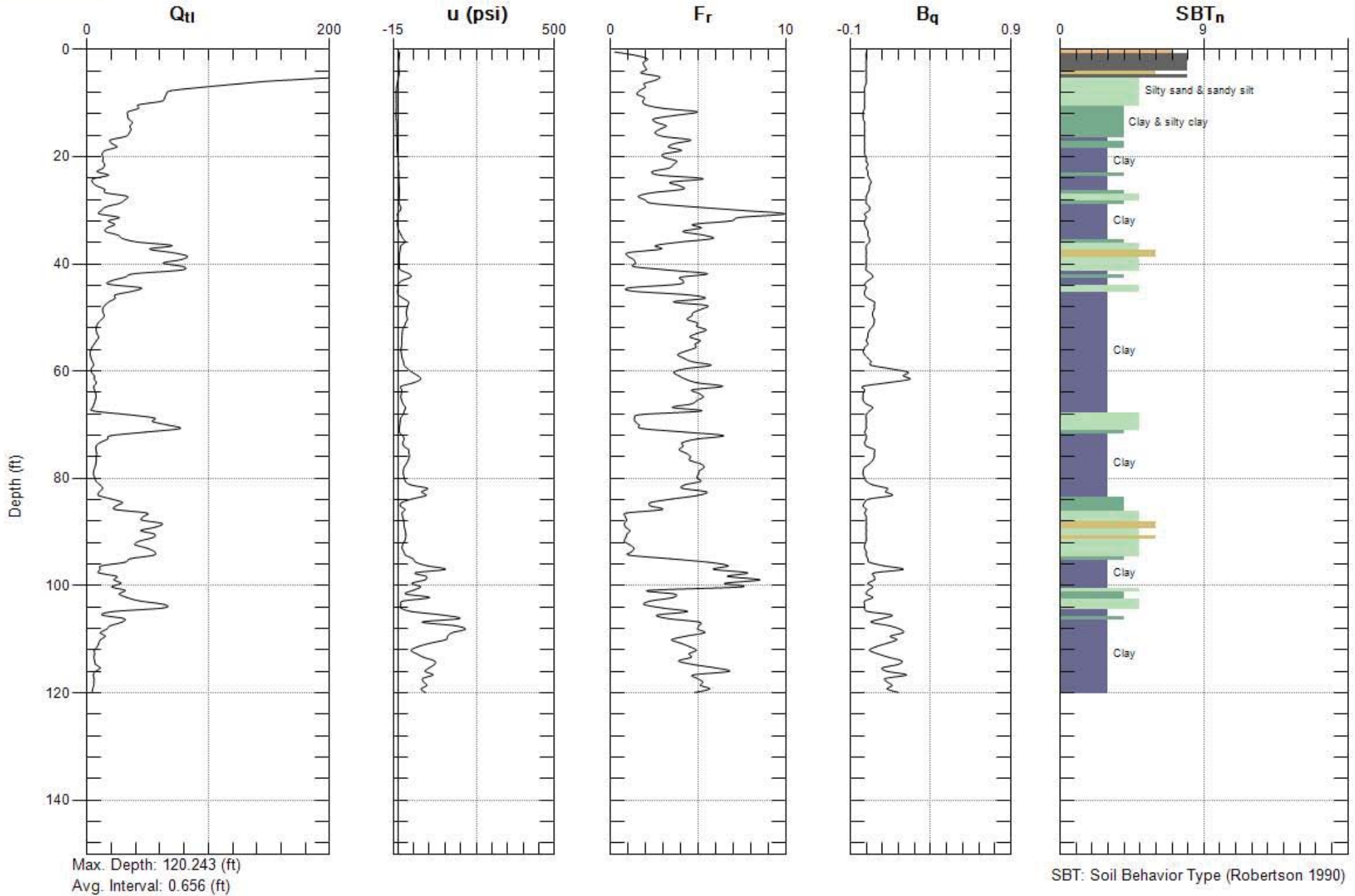
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.656 (ft)

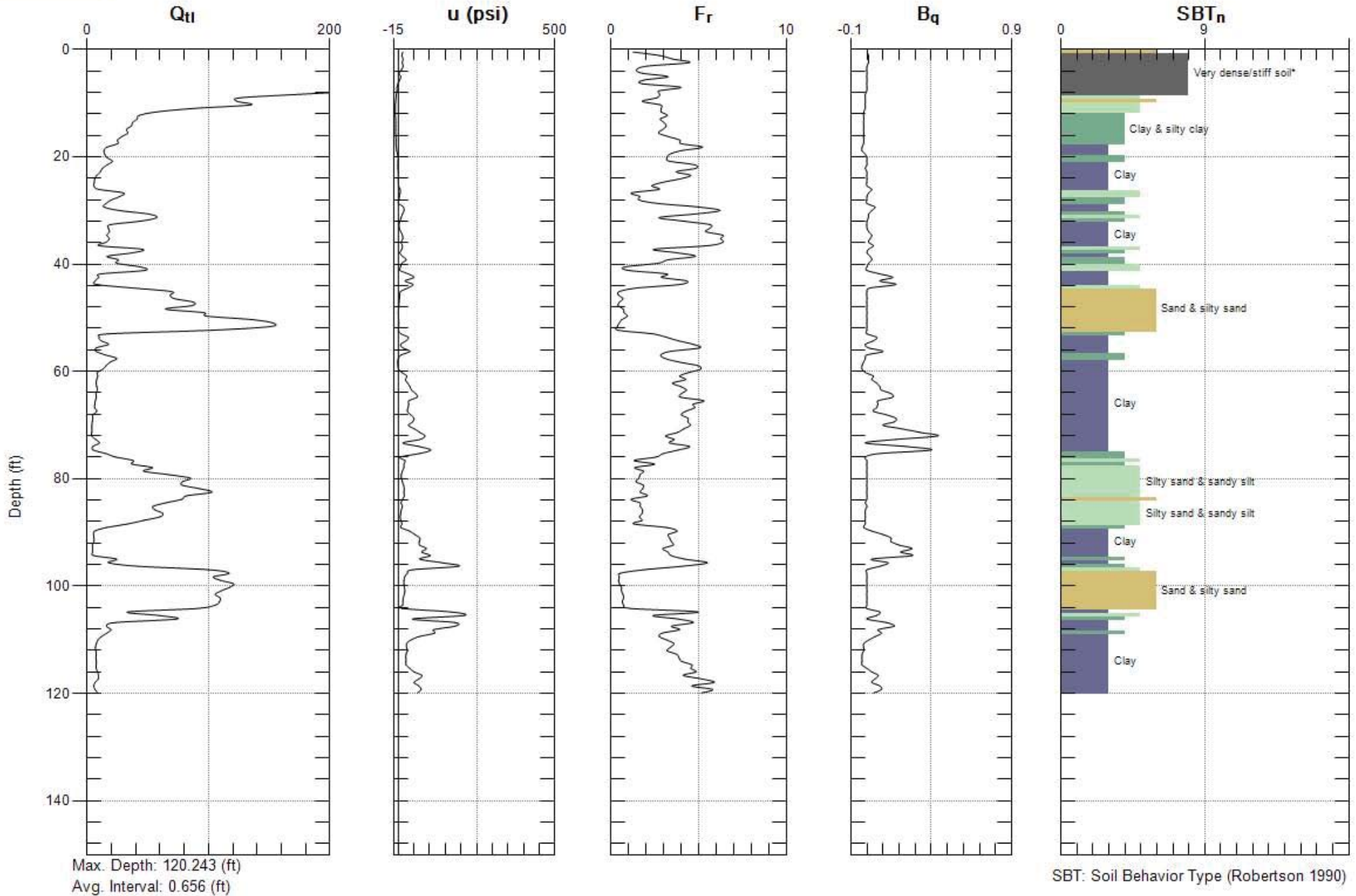
SBT: Soil Behavior Type (Robertson 1990)

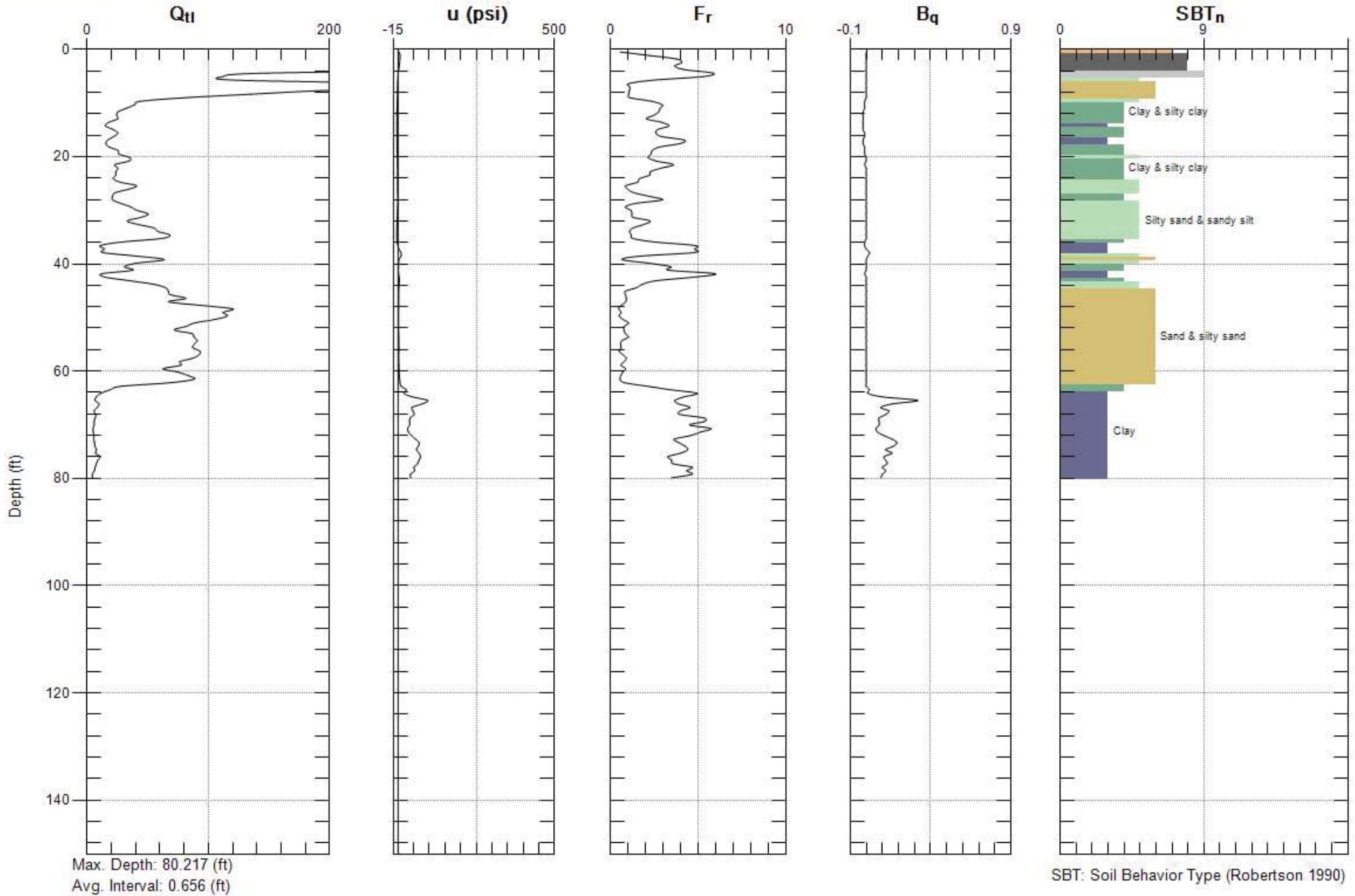


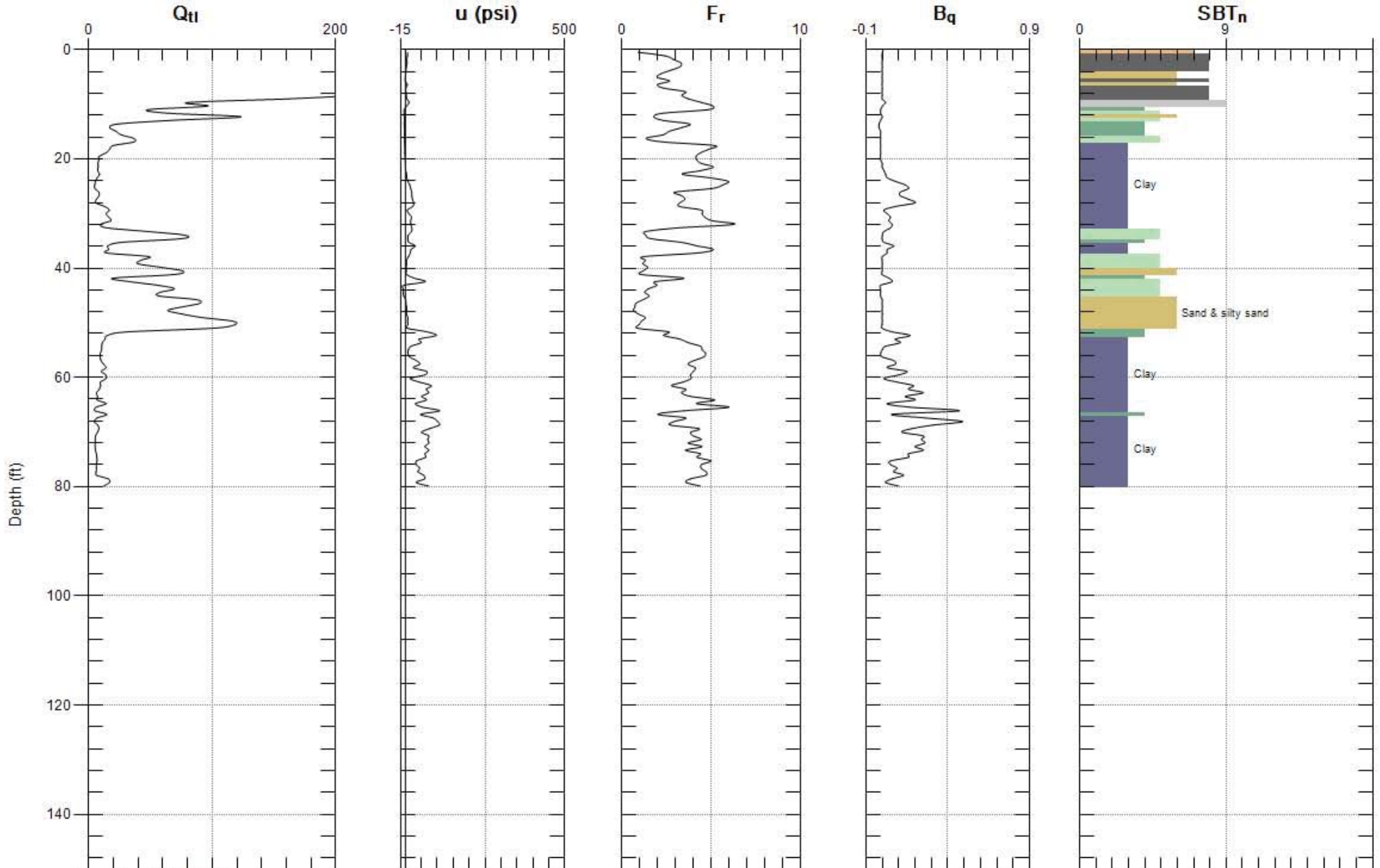
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)



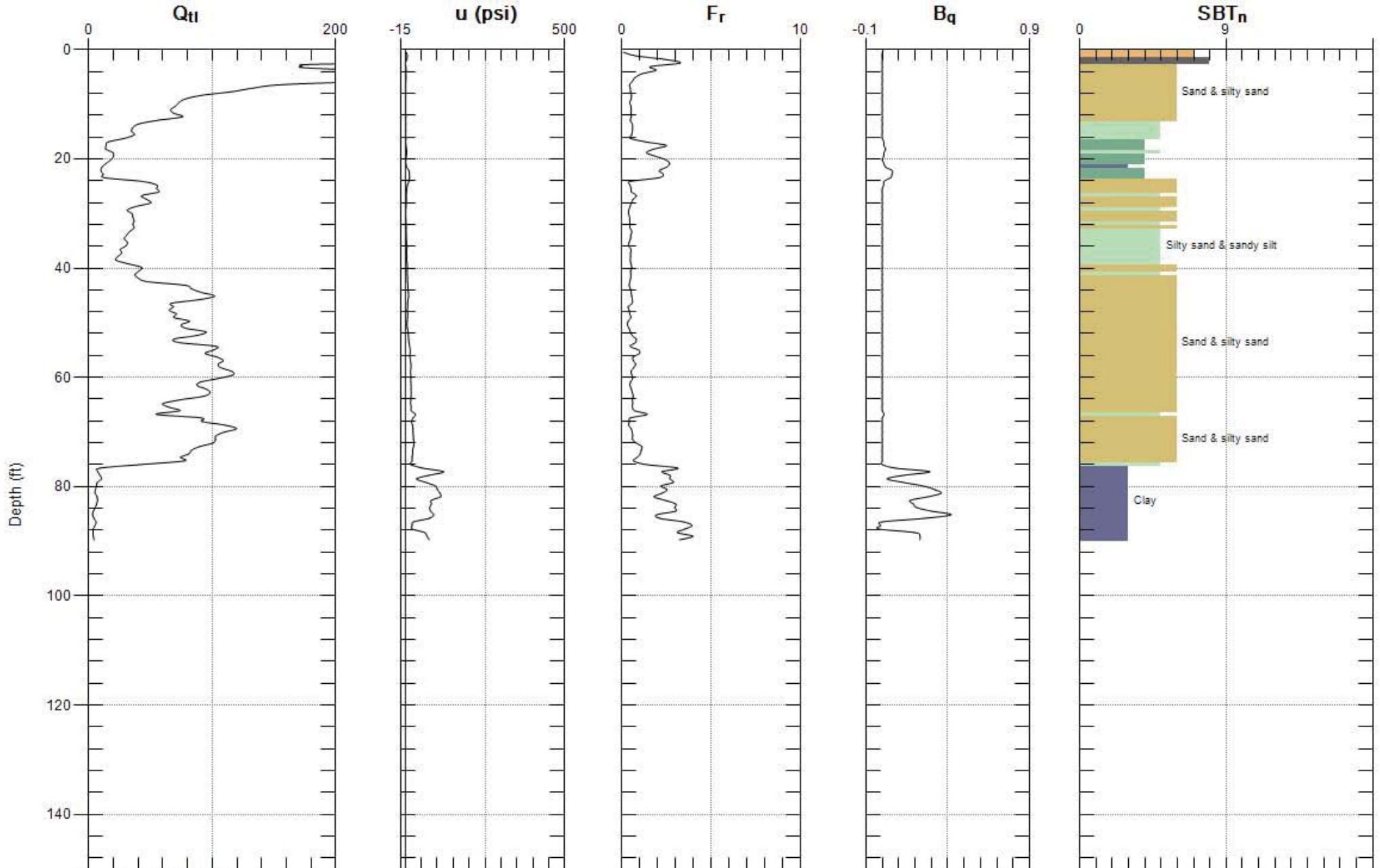






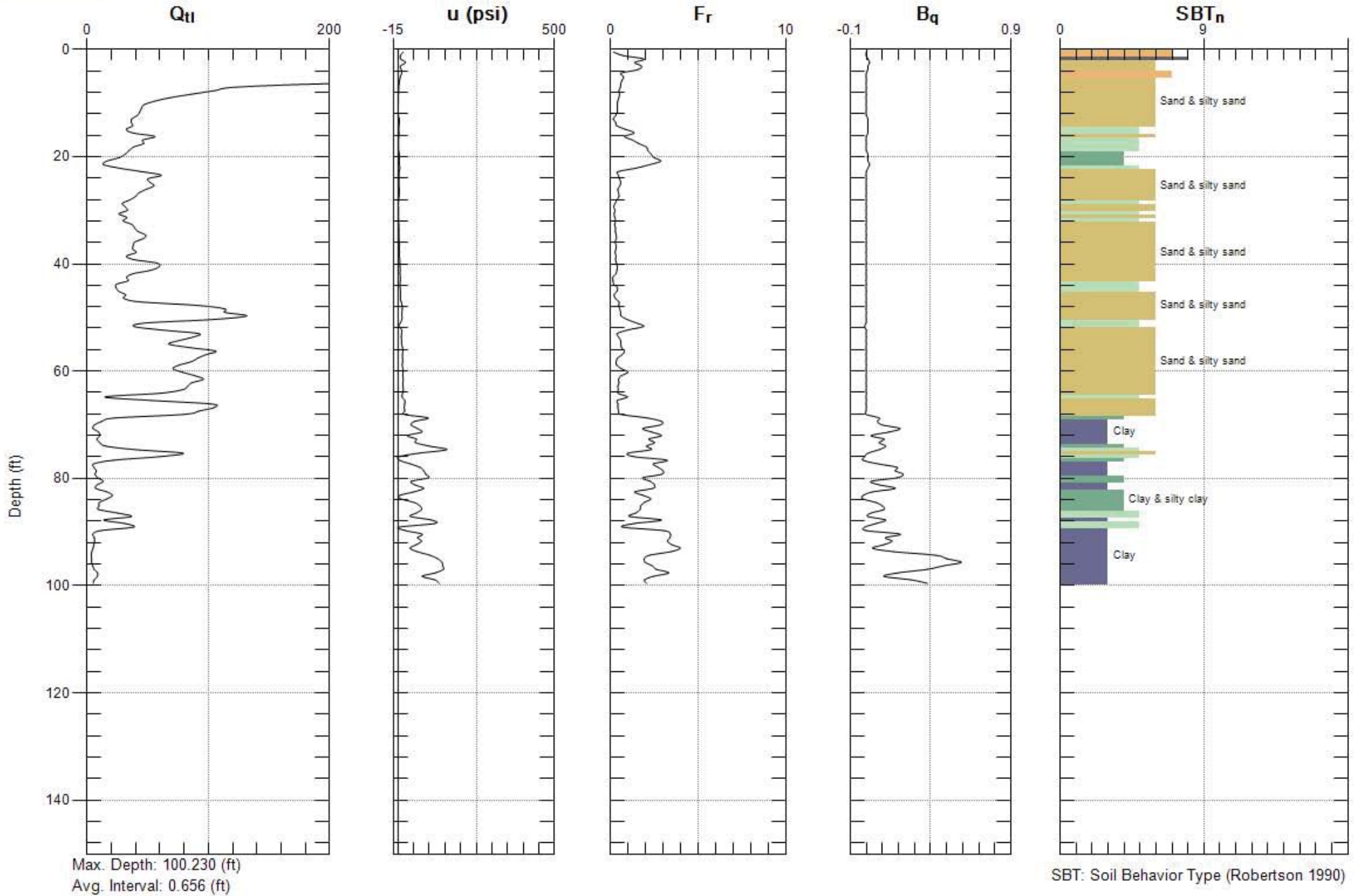
Max. Depth: 80.217 (ft)
 Avg. Interval: 0.656 (ft)

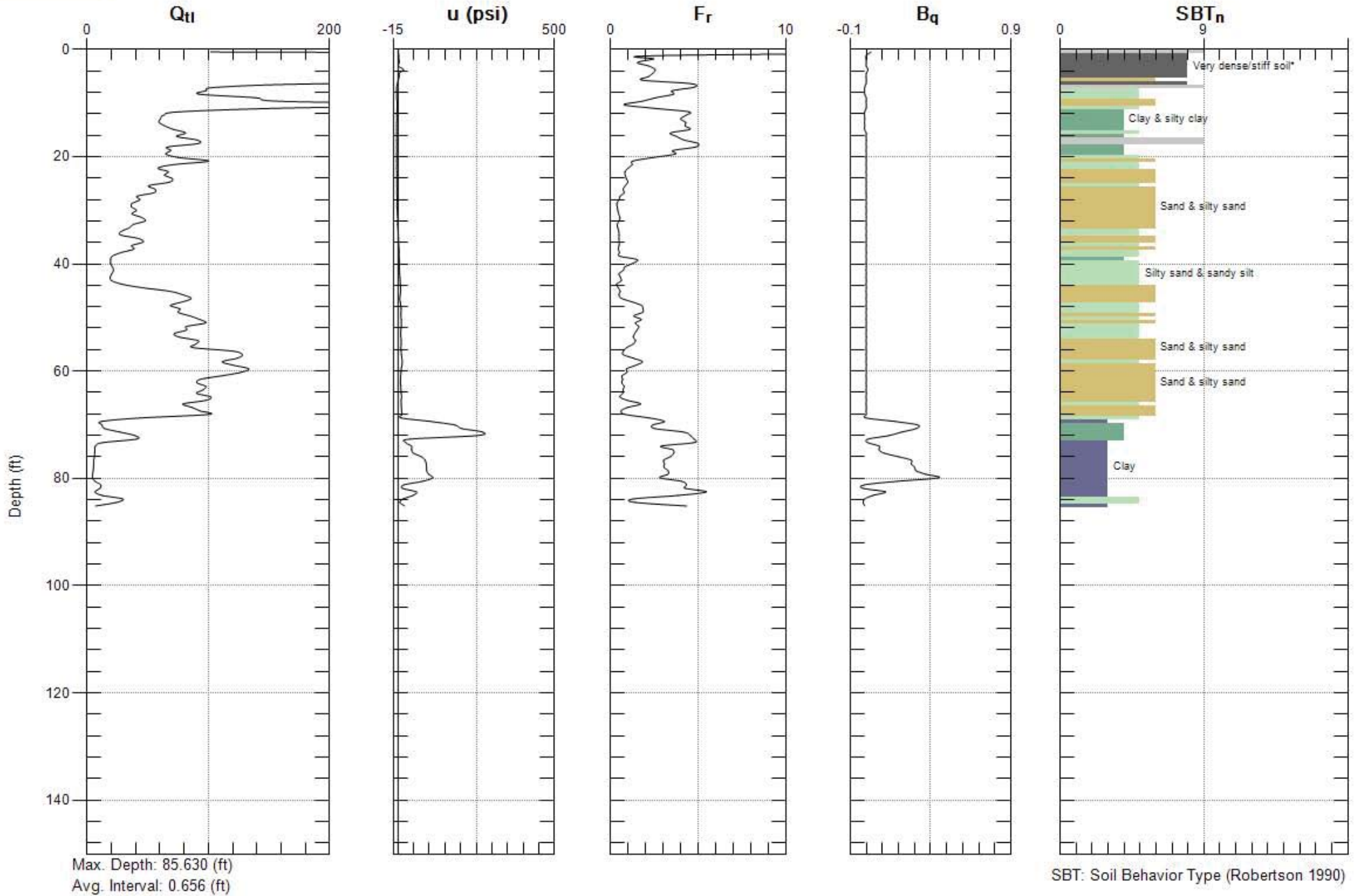
SBT: Soil Behavior Type (Robertson 1990)

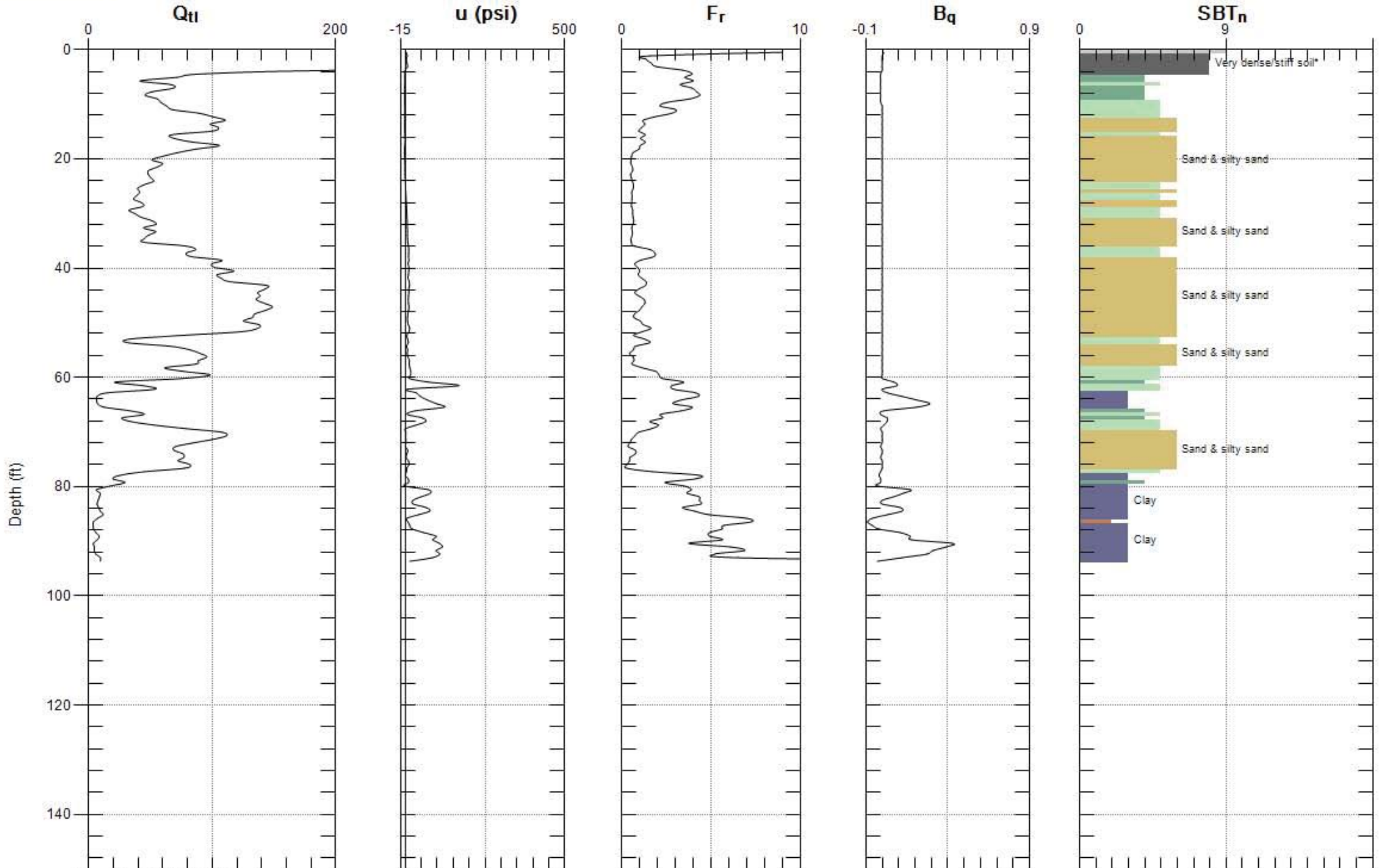


Max. Depth: 90.387 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

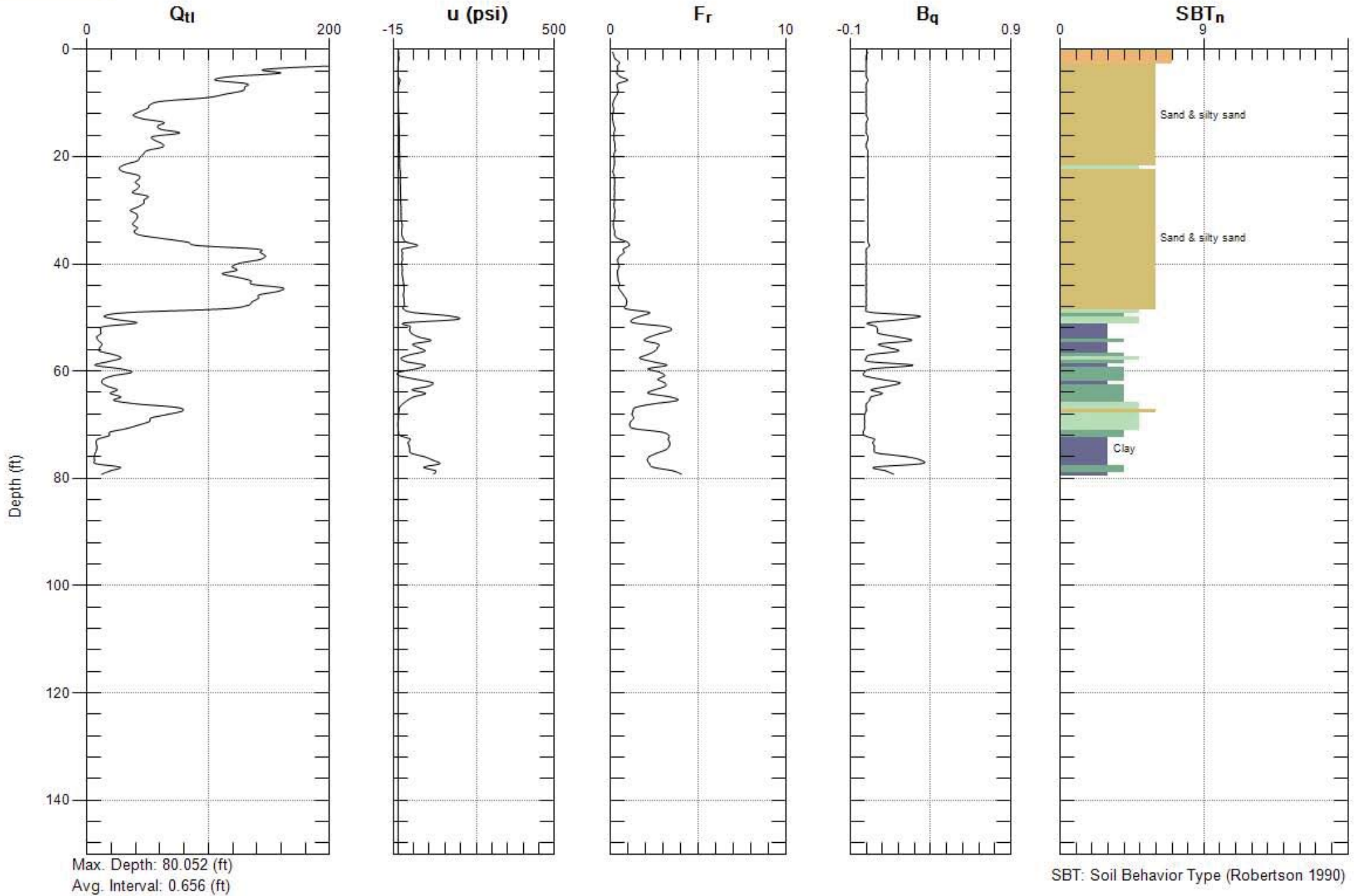


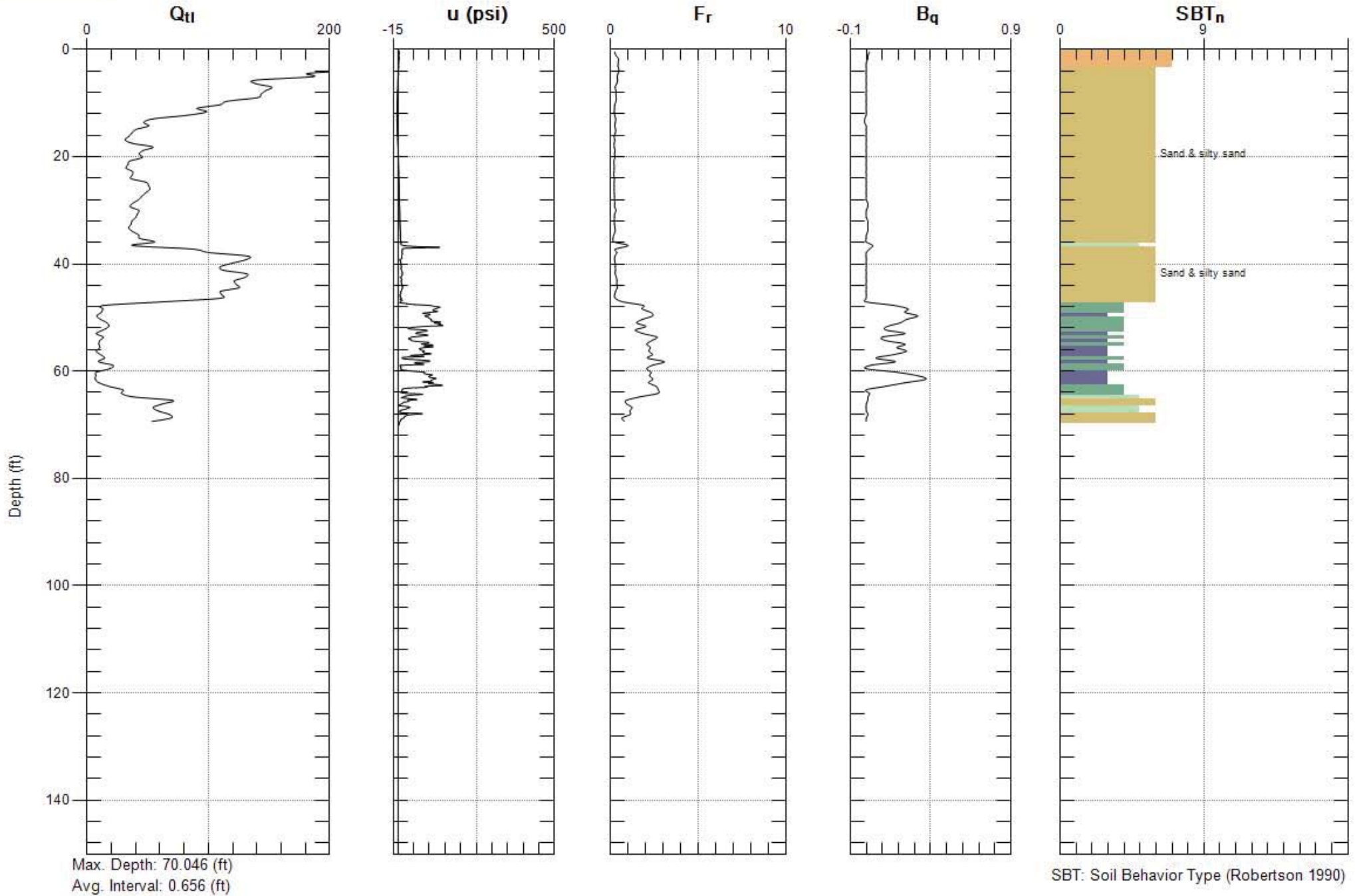


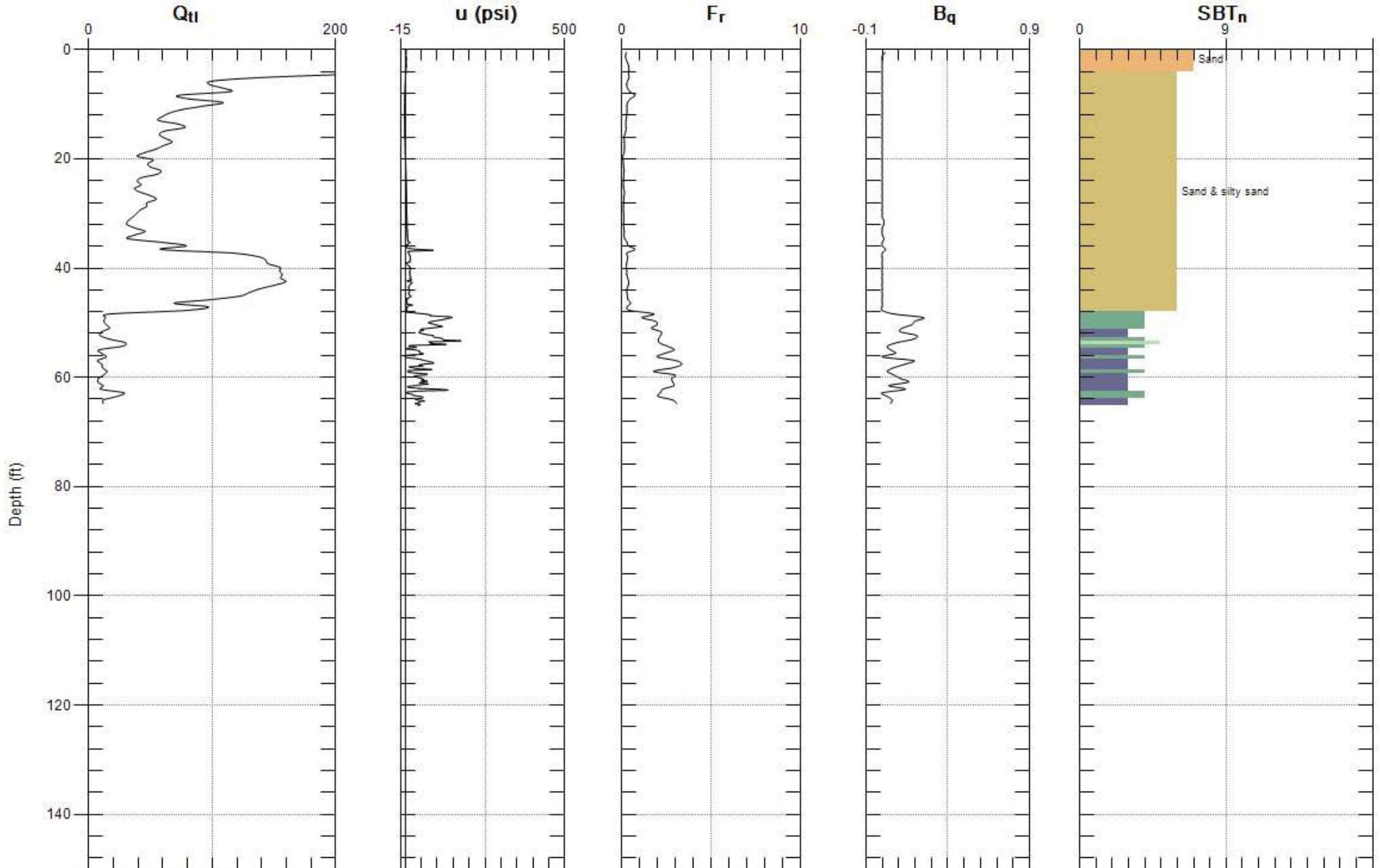


Max. Depth: 94.324 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

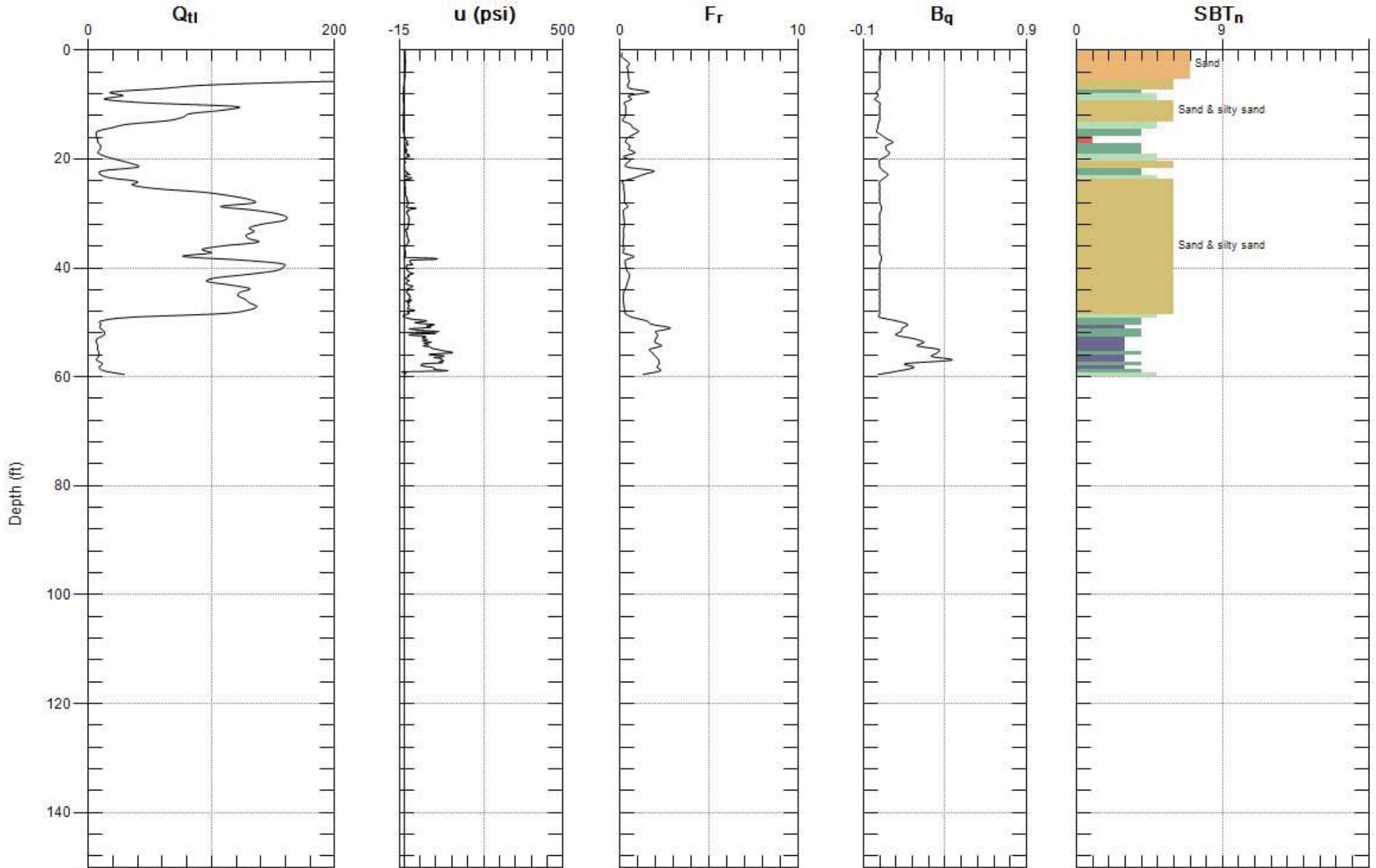






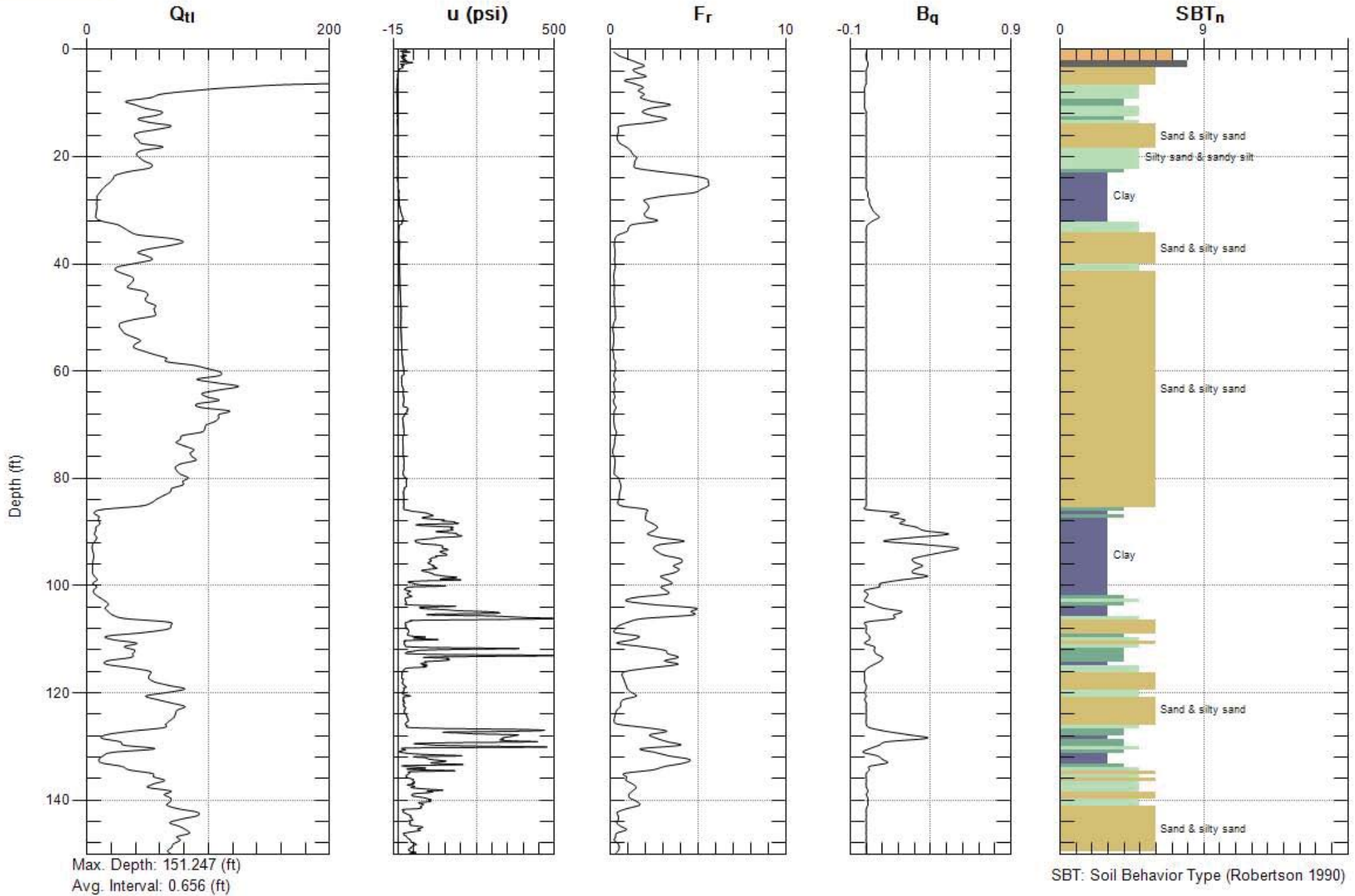
Max. Depth: 65.125 (ft)
 Avg. Interval: 0.656 (ft)

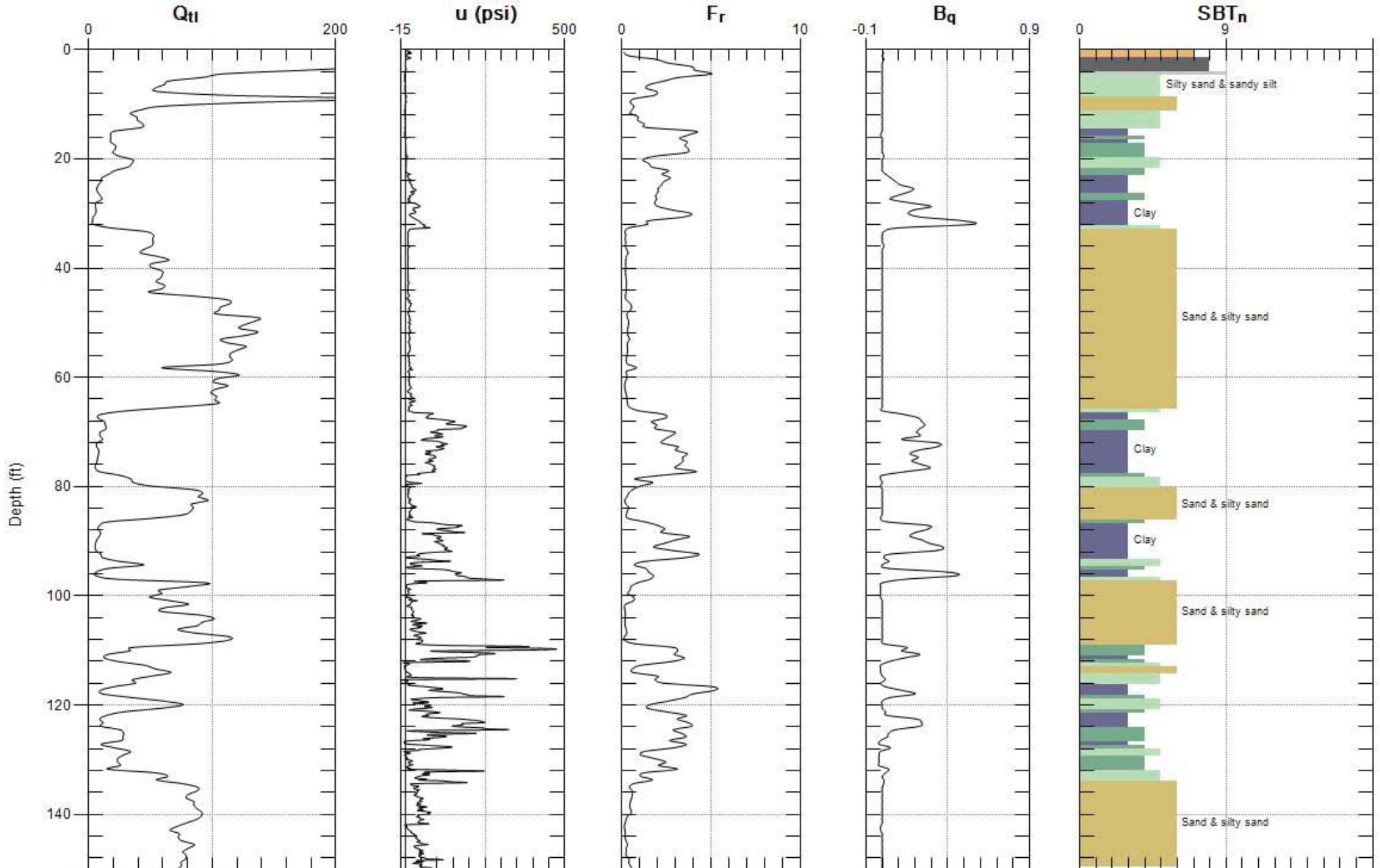
SBT: Soil Behavior Type (Robertson 1990)



Max. Depth: 60.203 (ft)
 Avg. Interval: 0.656 (ft)

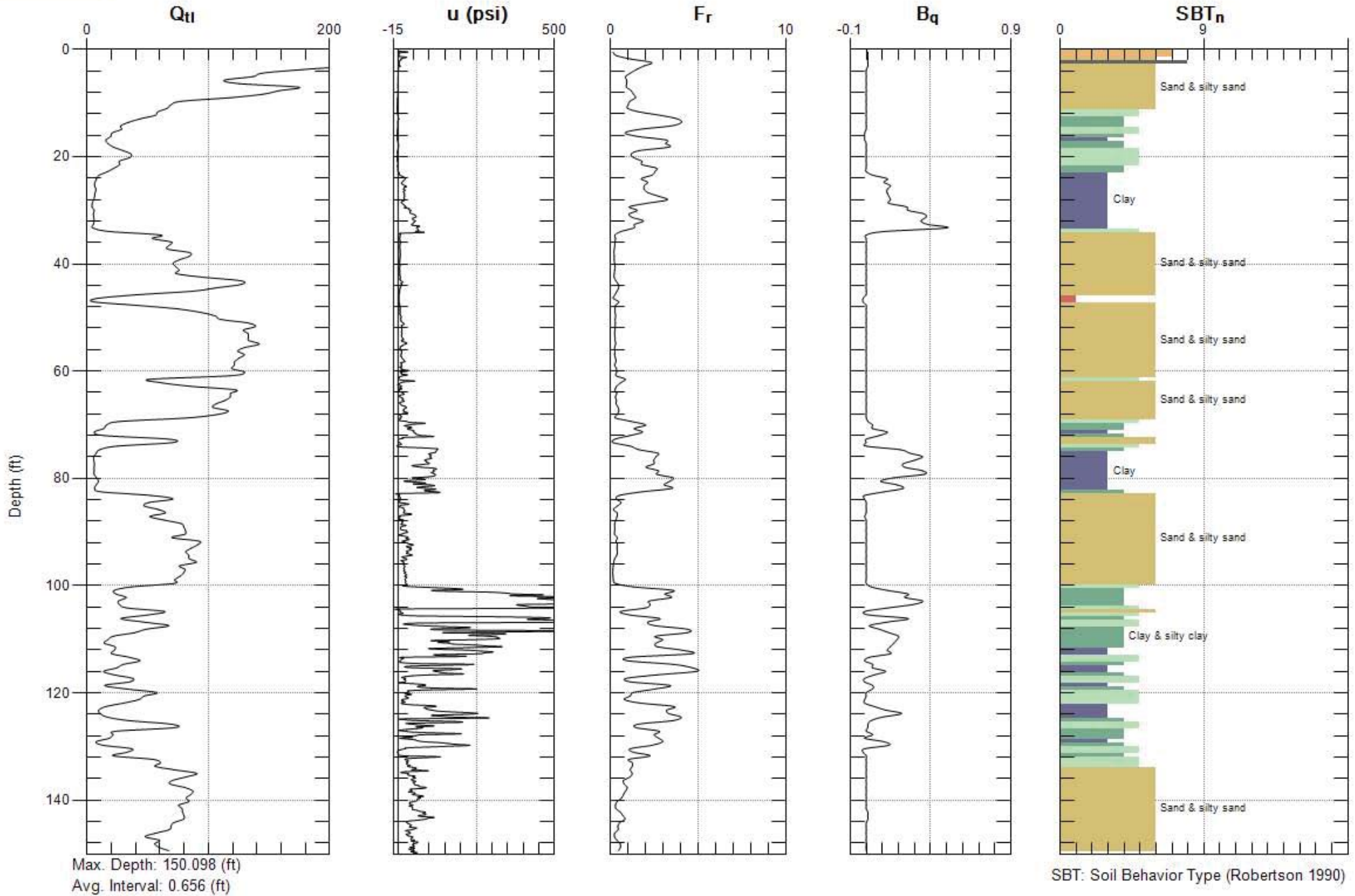
SBT: Soil Behavior Type (Robertson 1990)

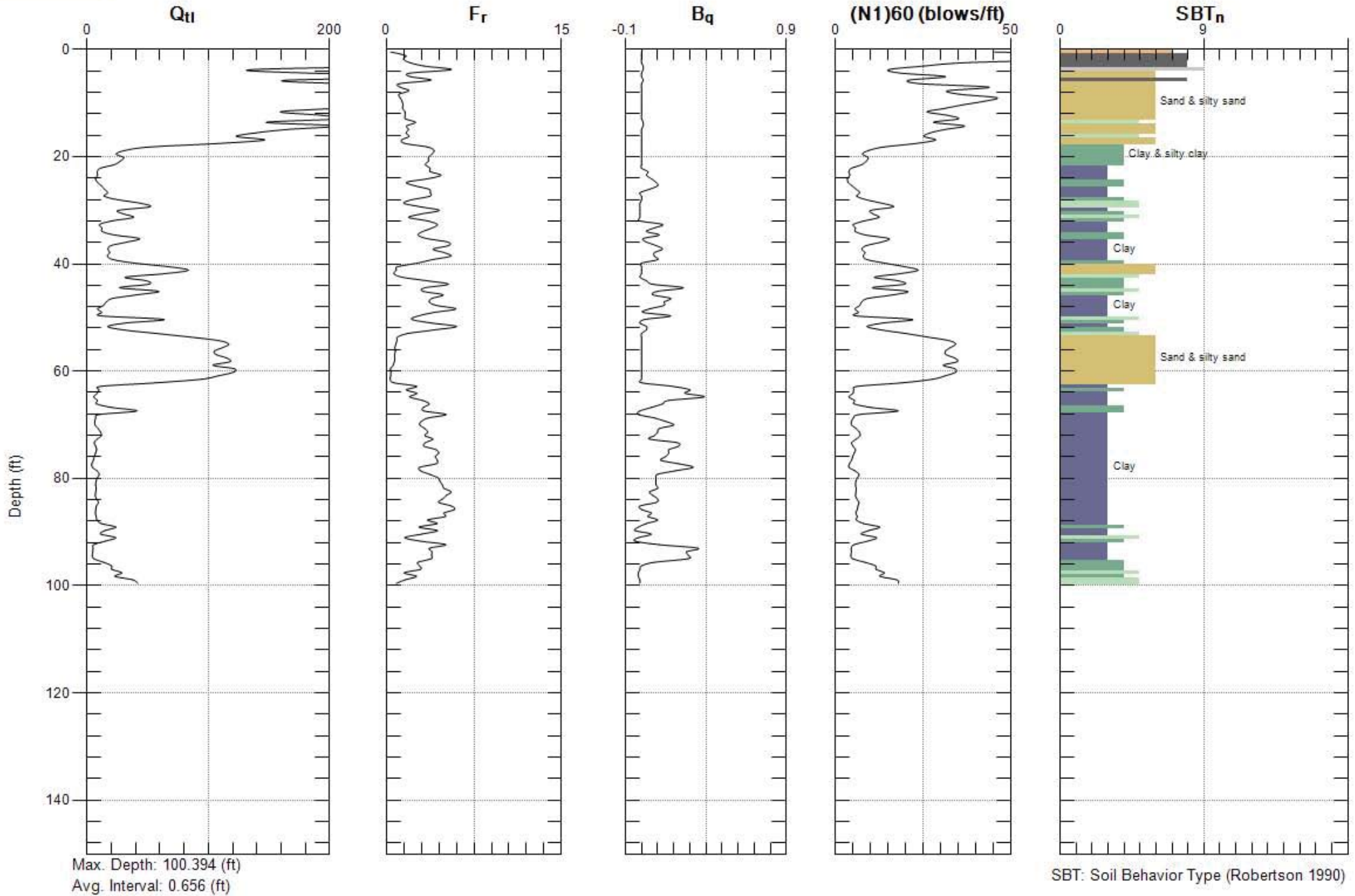


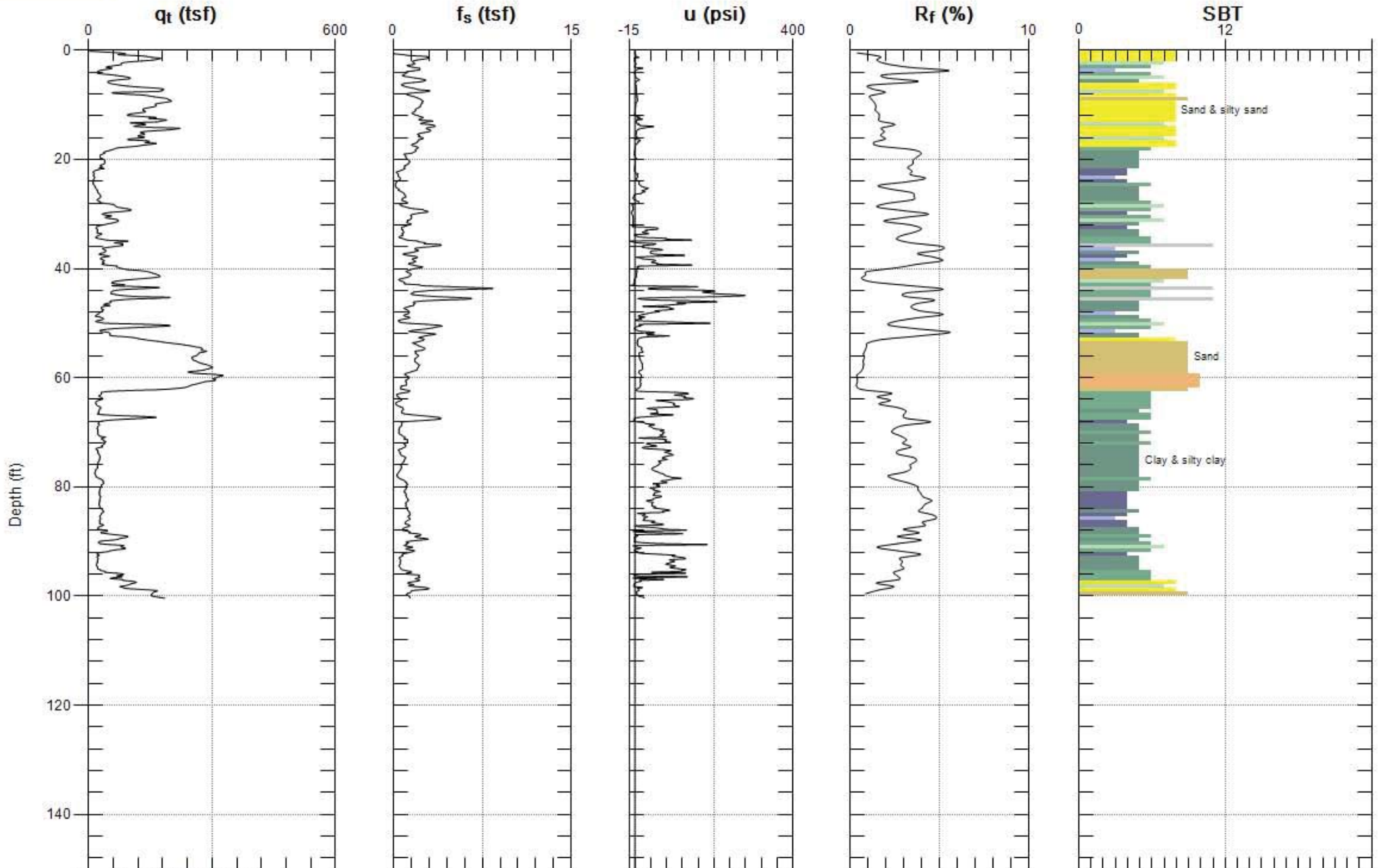


Max. Depth: 150.591 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)

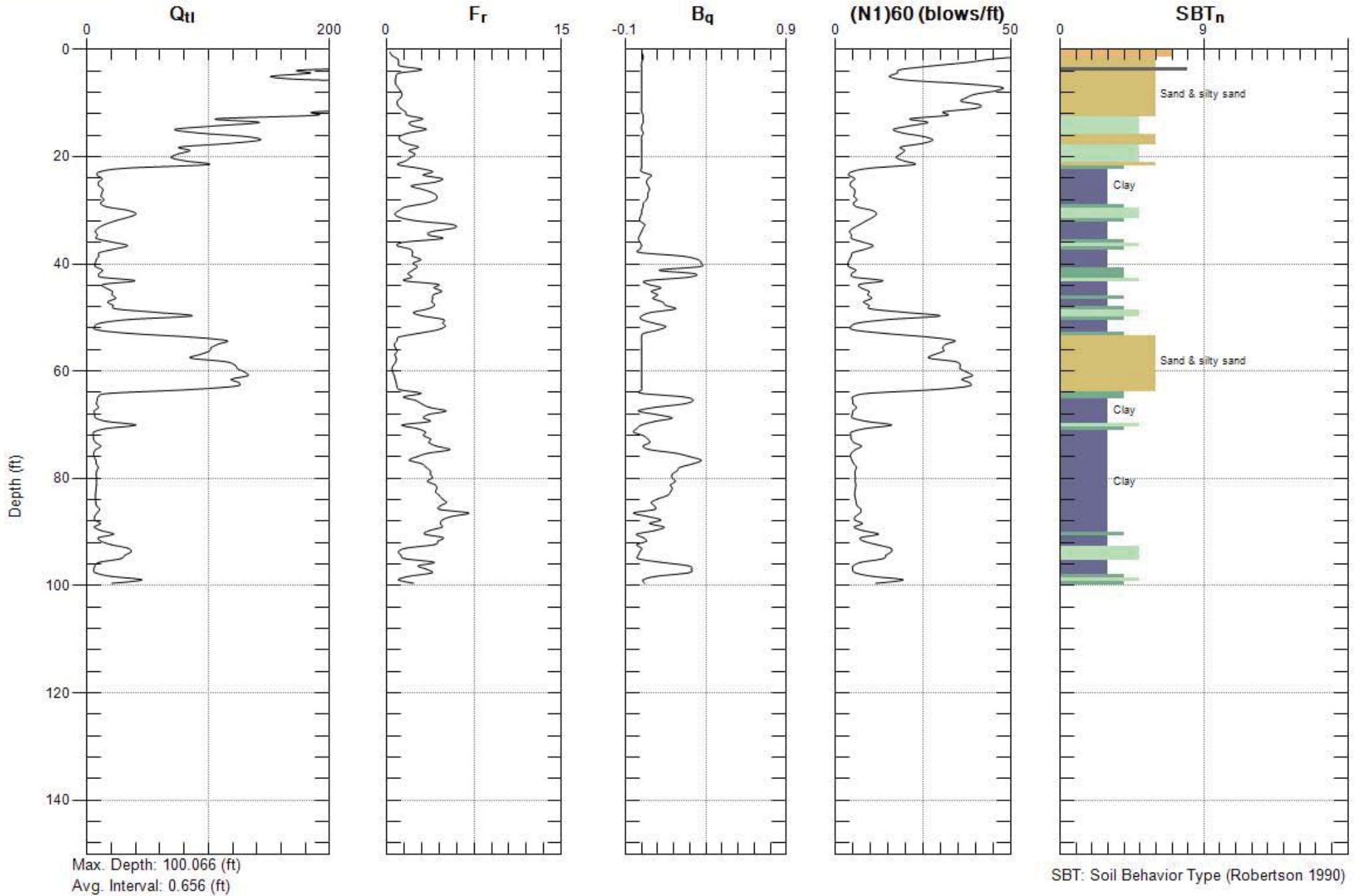


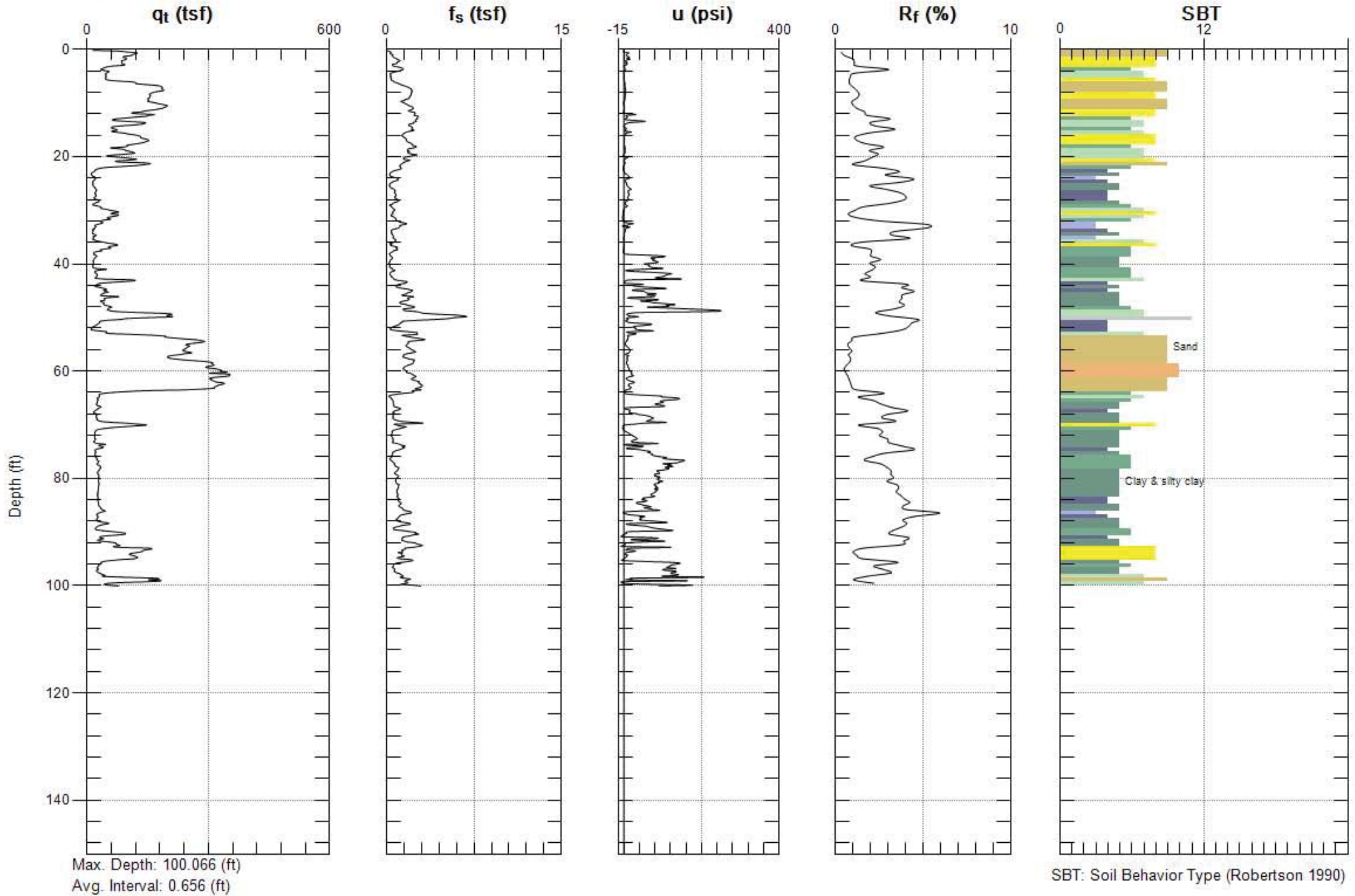


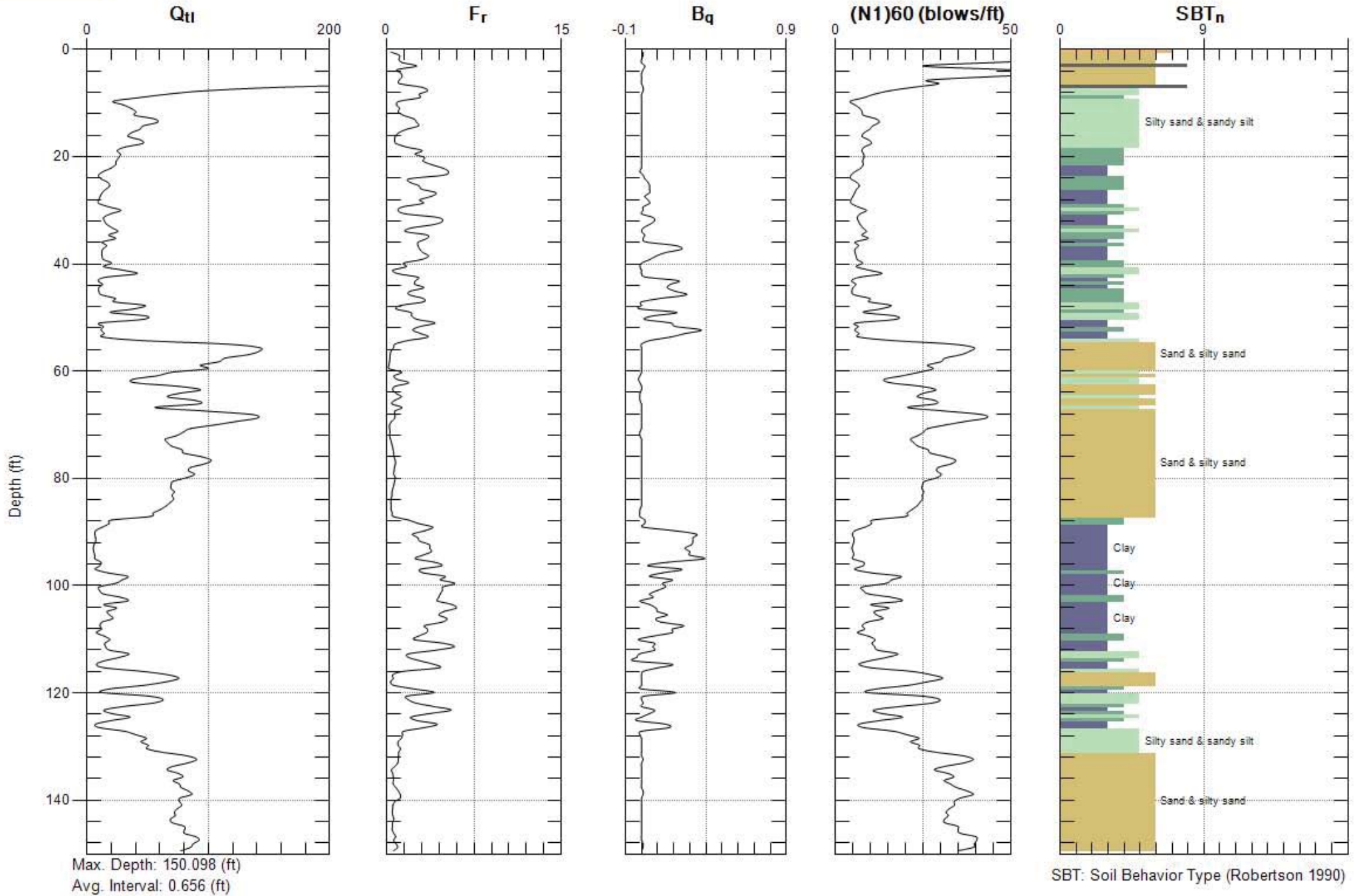


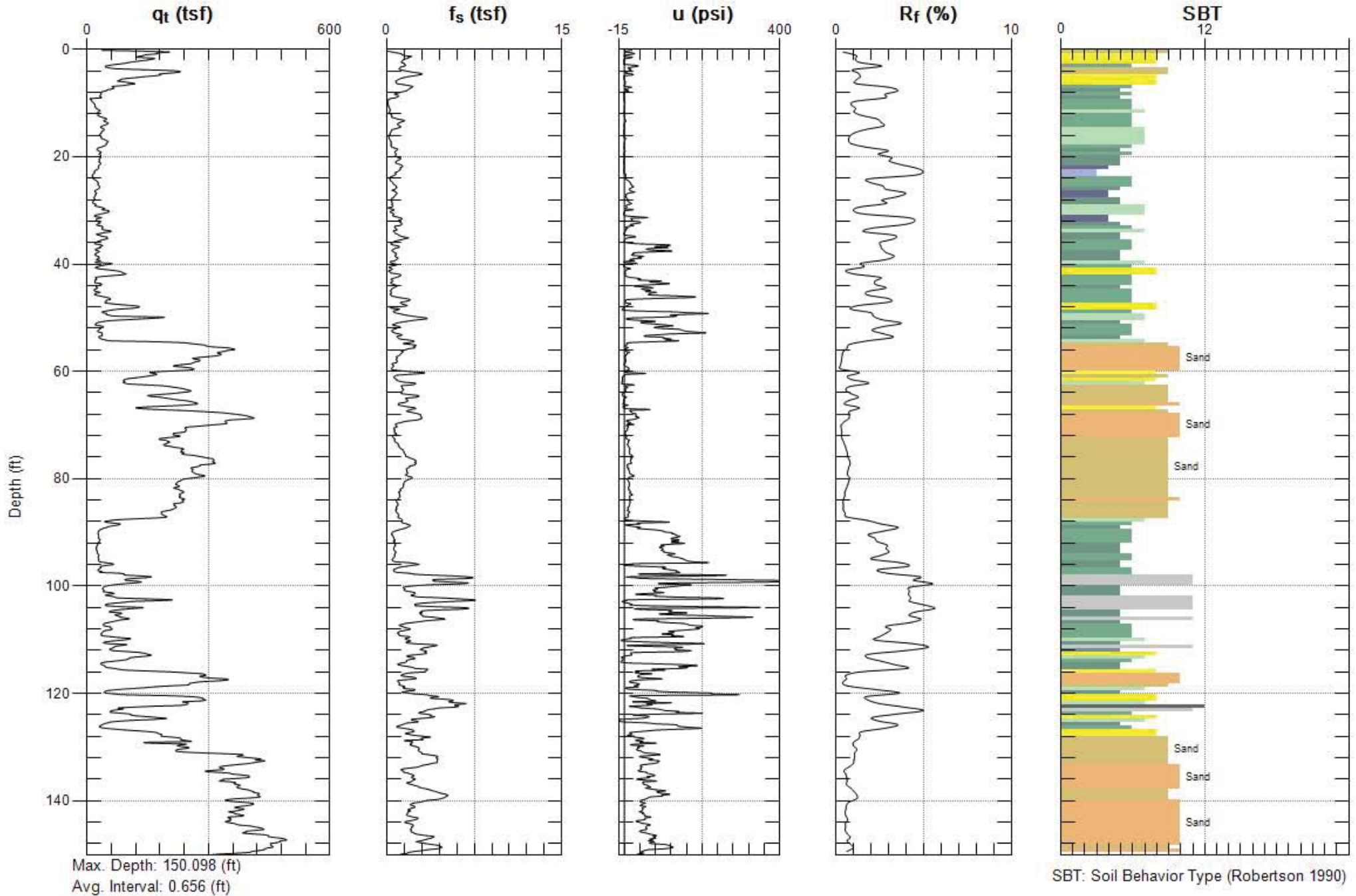
Max. Depth: 100.394 (ft)
Avg. Interval: 0.656 (ft)

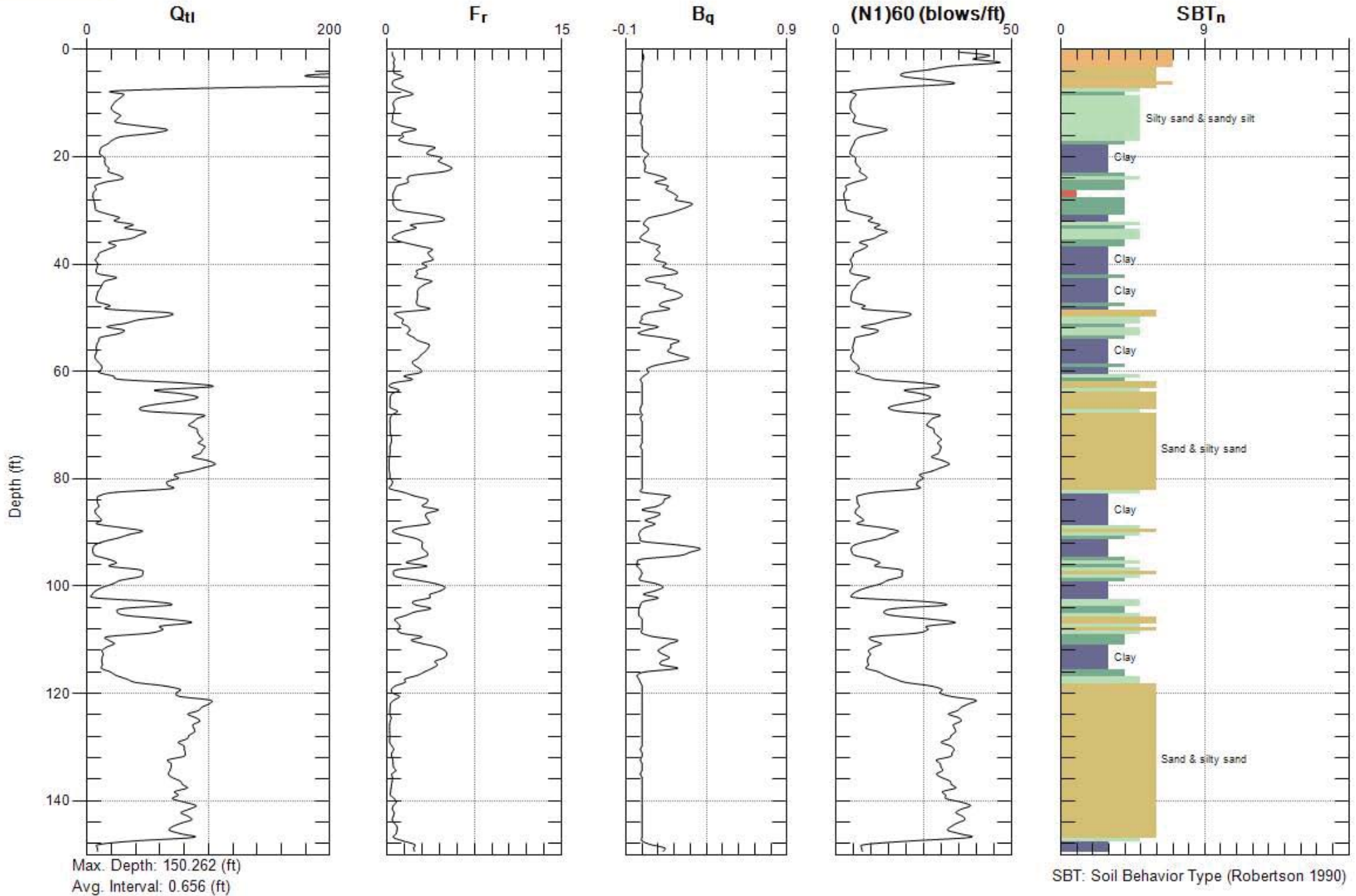
SBT: Soil Behavior Type (Robertson 1990)

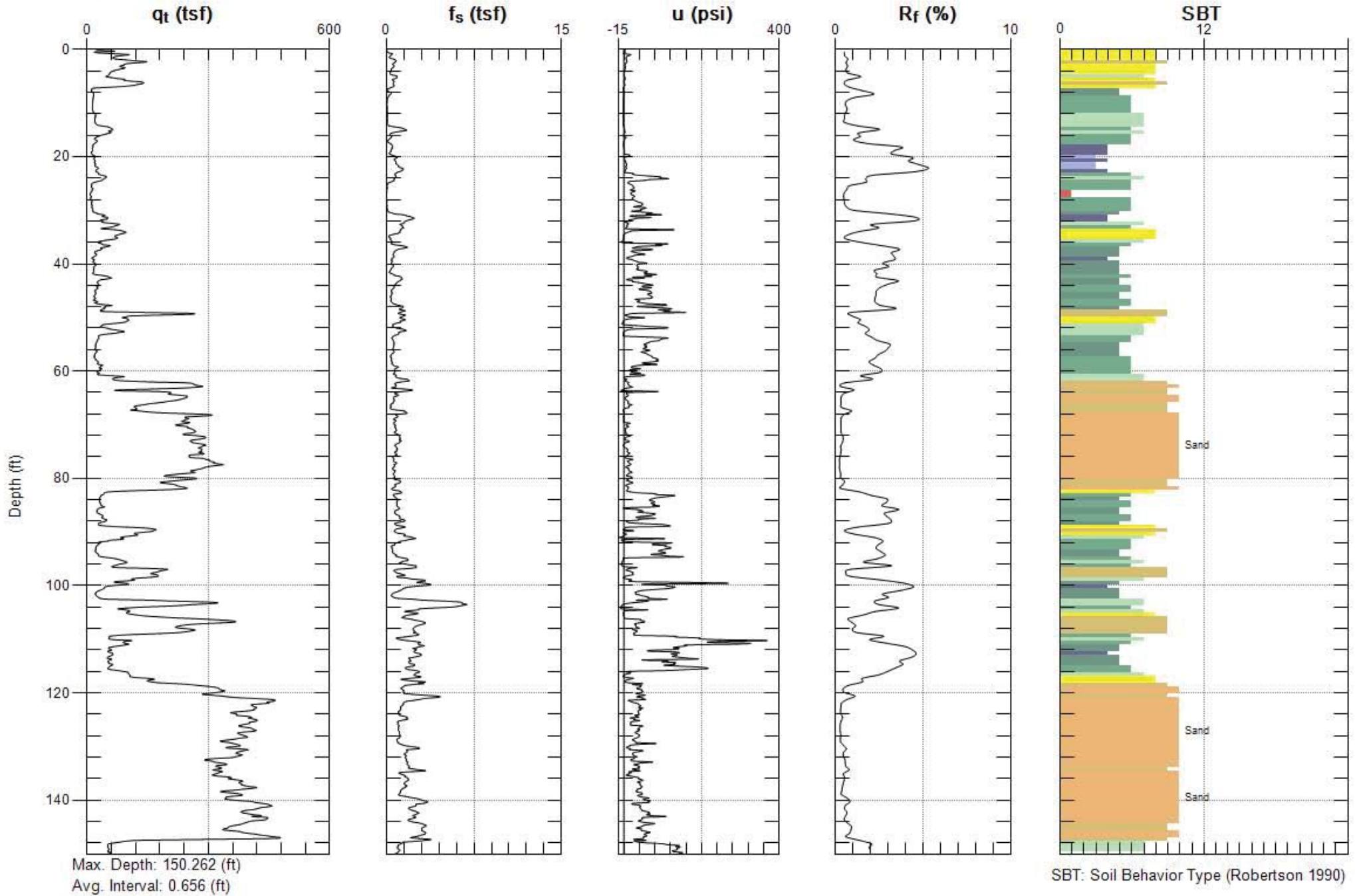


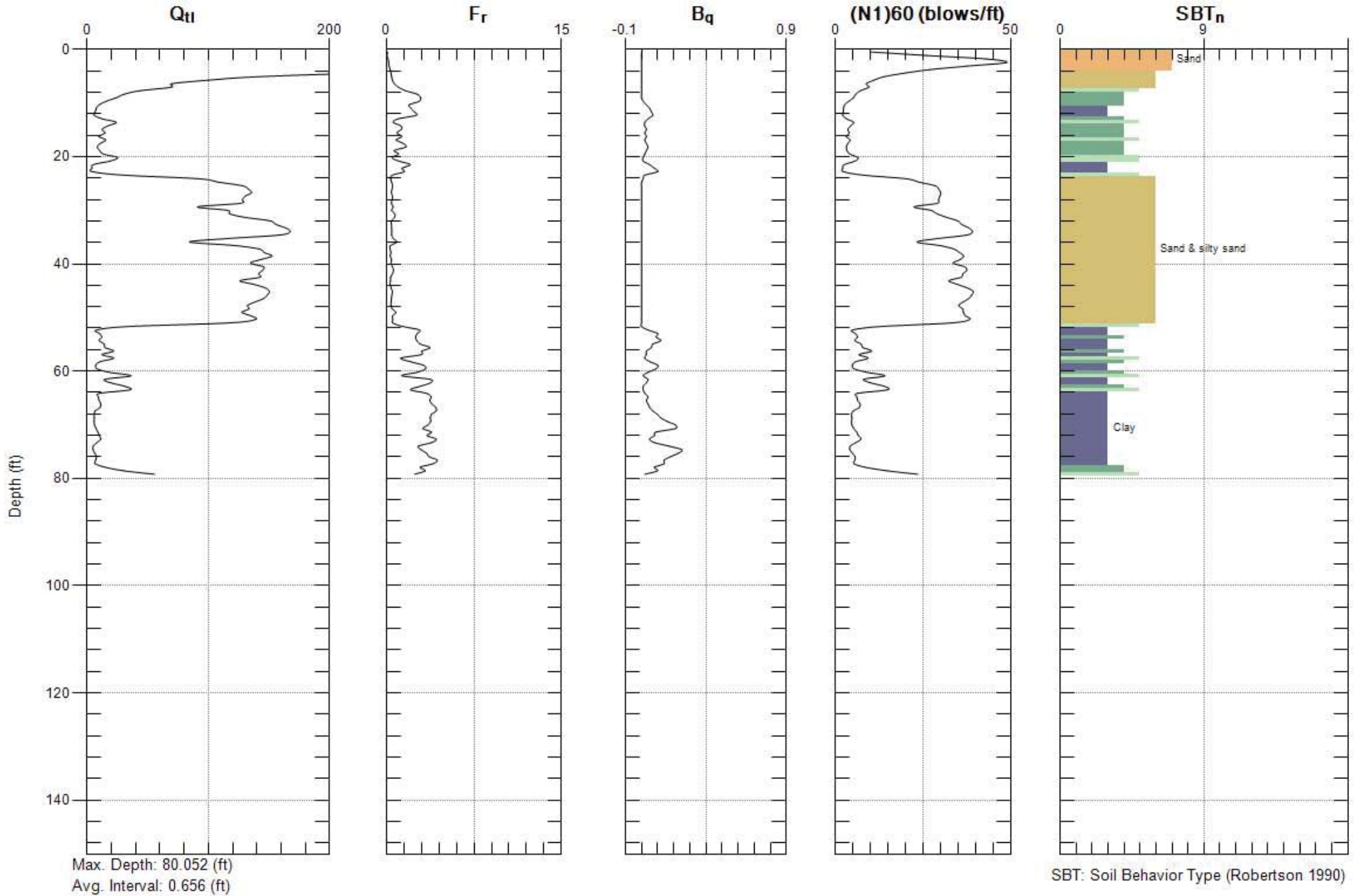


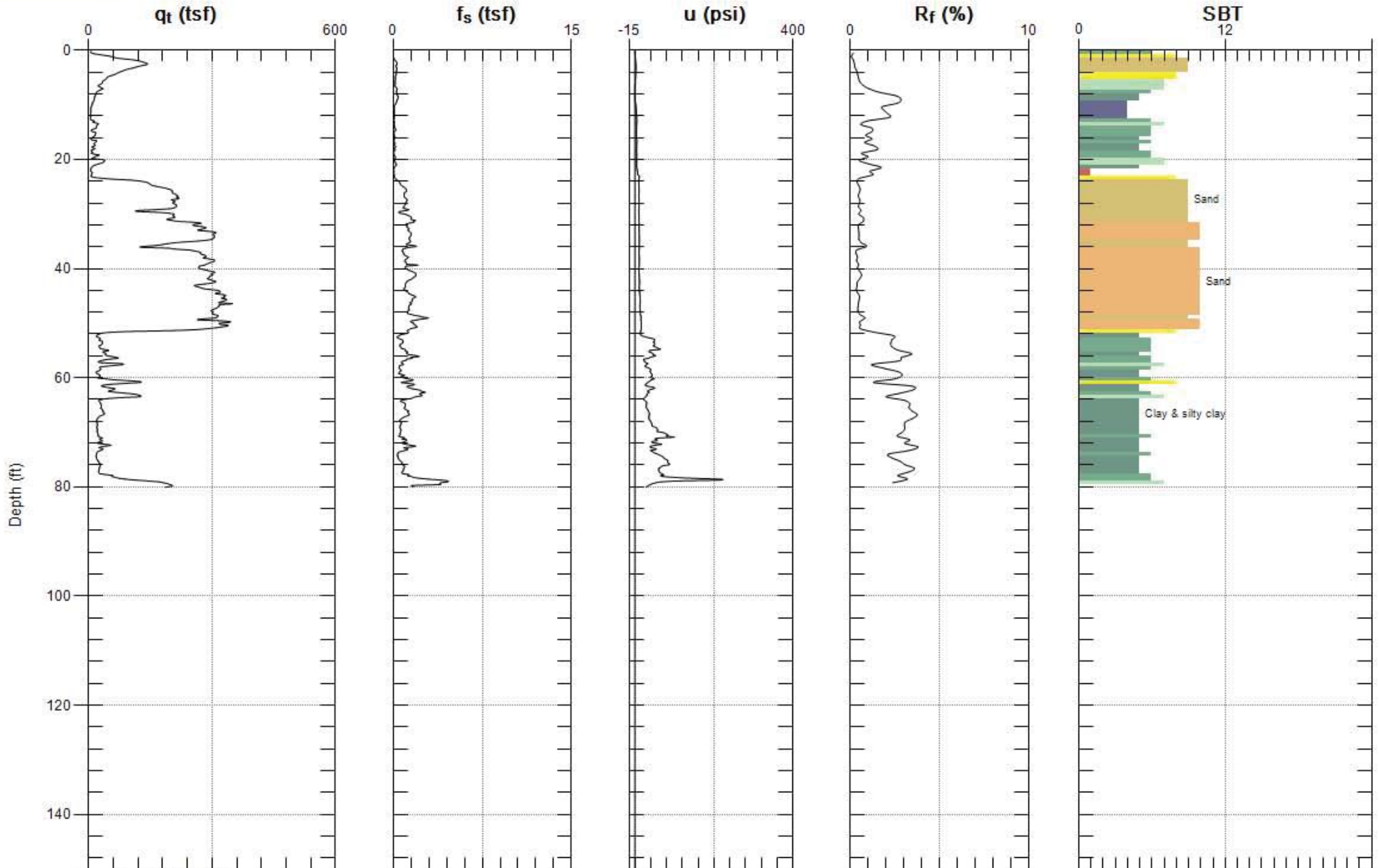






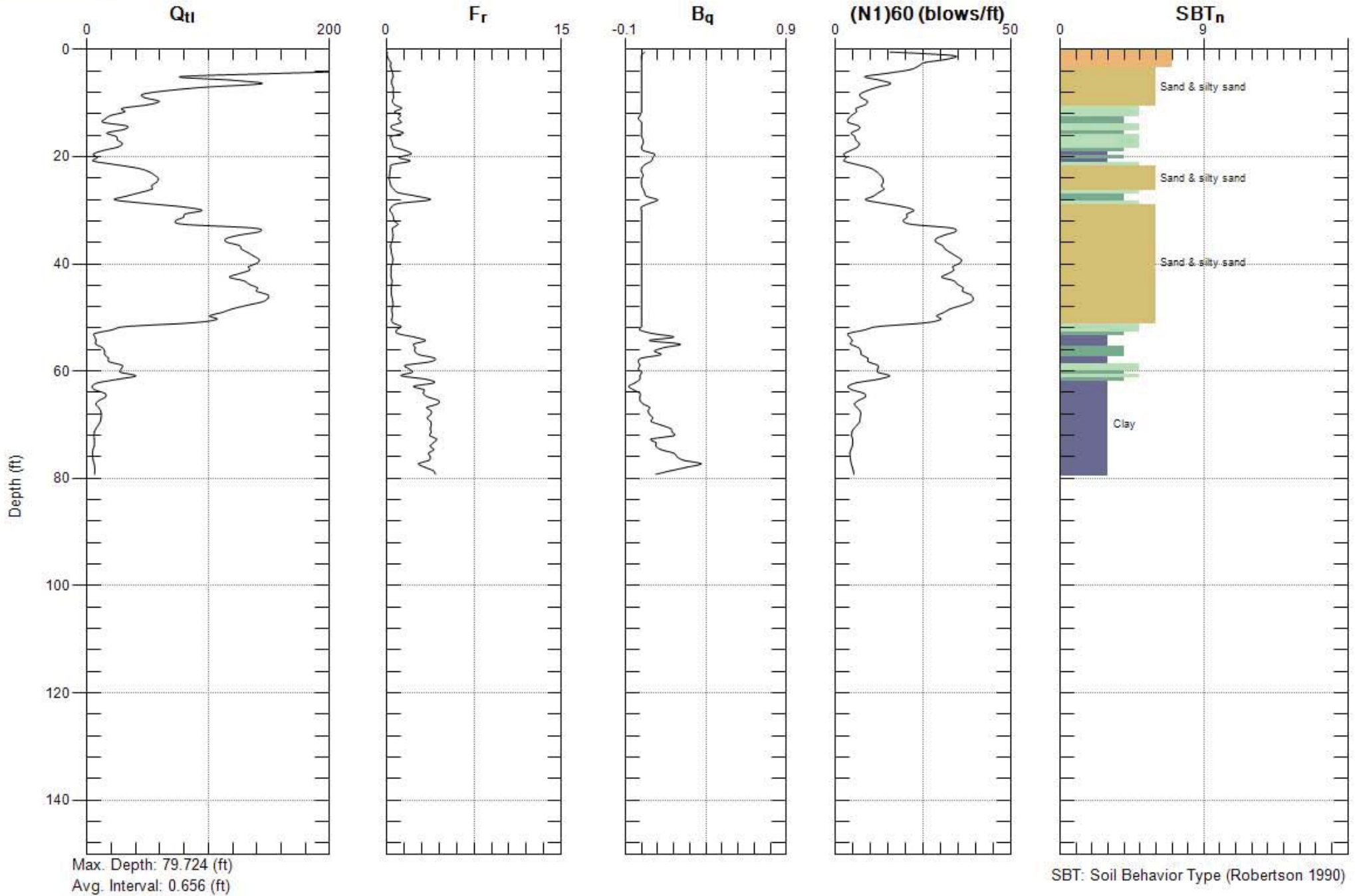


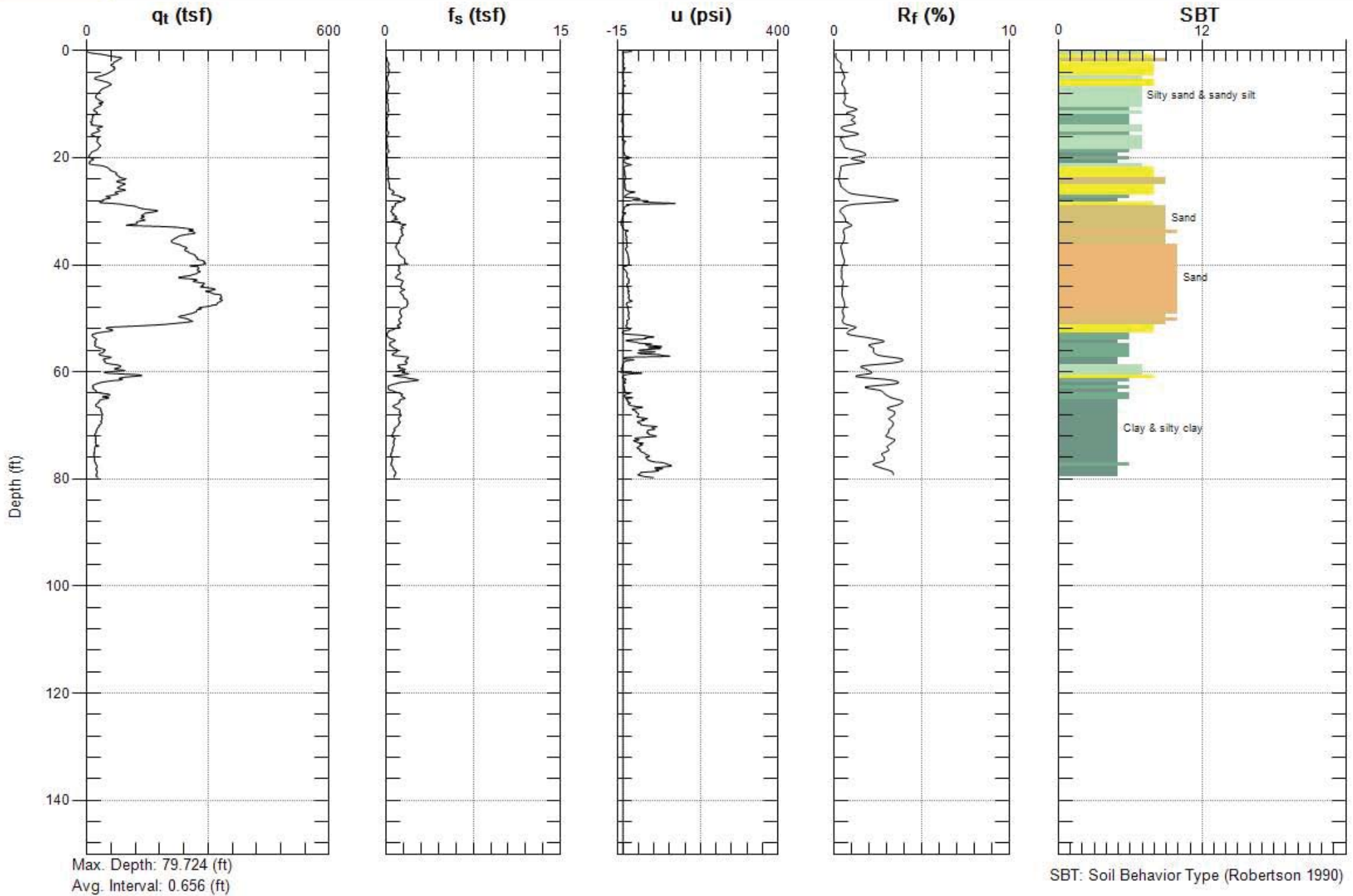


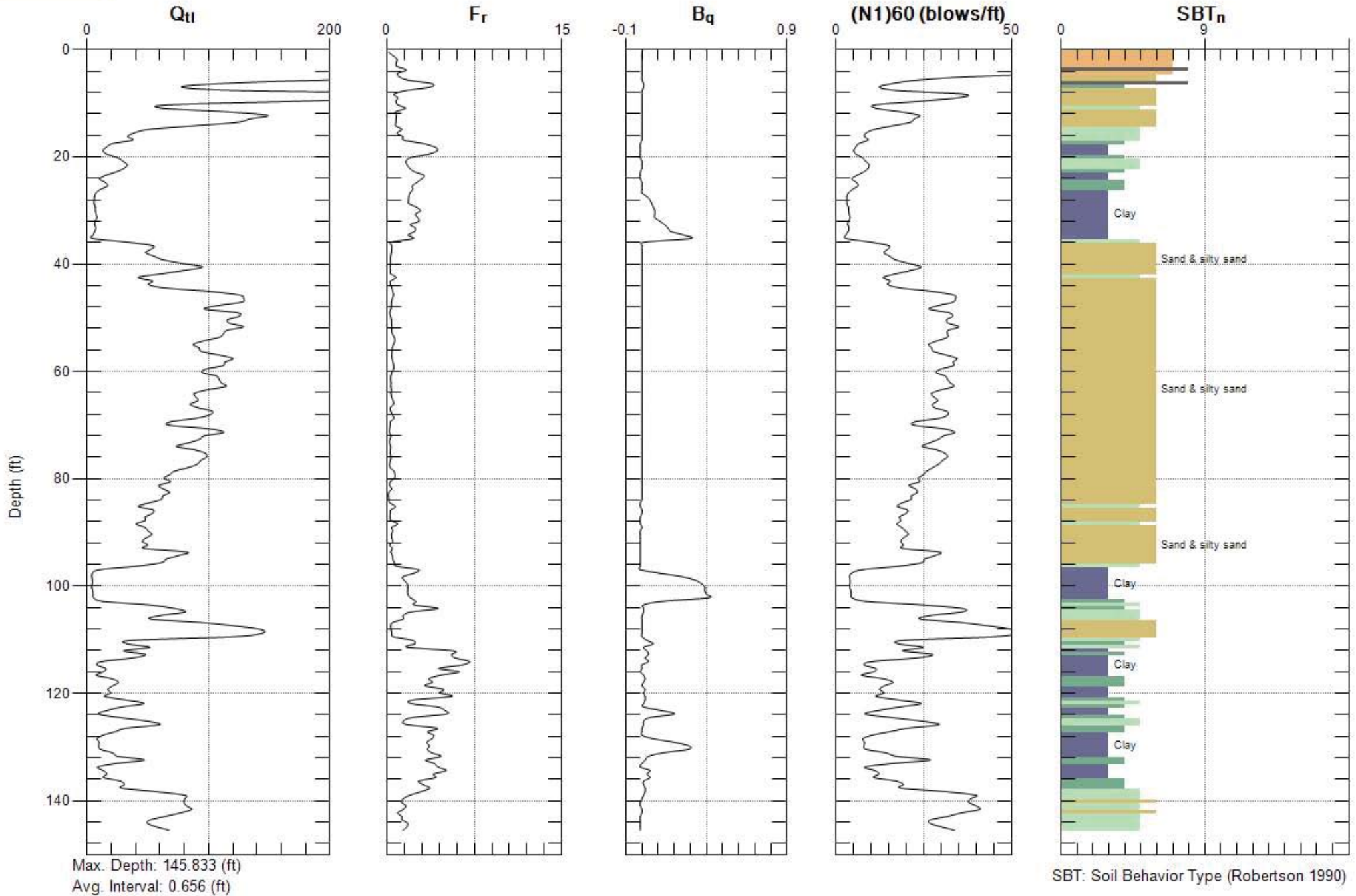


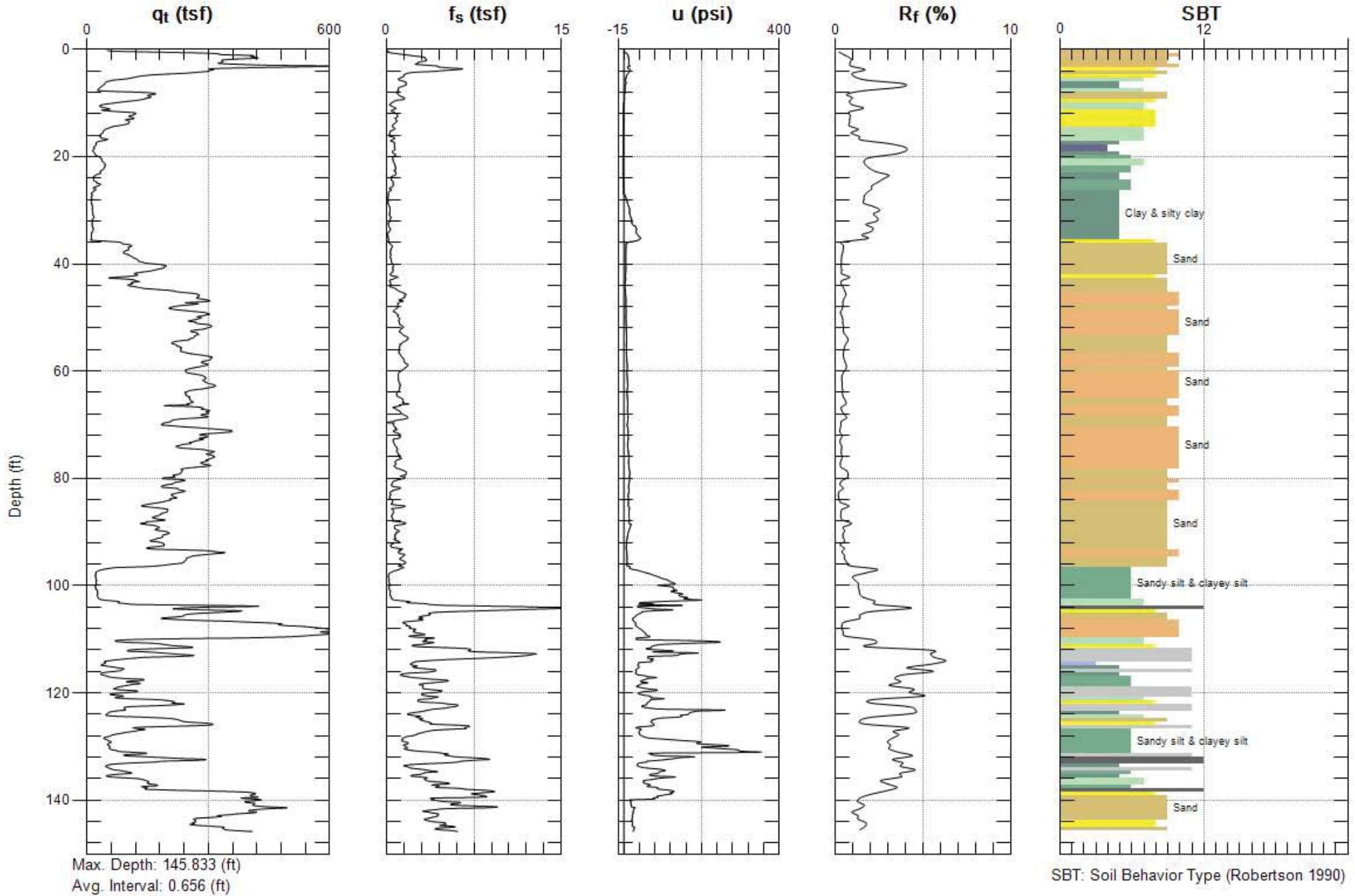
Max. Depth: 80.052 (ft)
Avg. Interval: 0.656 (ft)

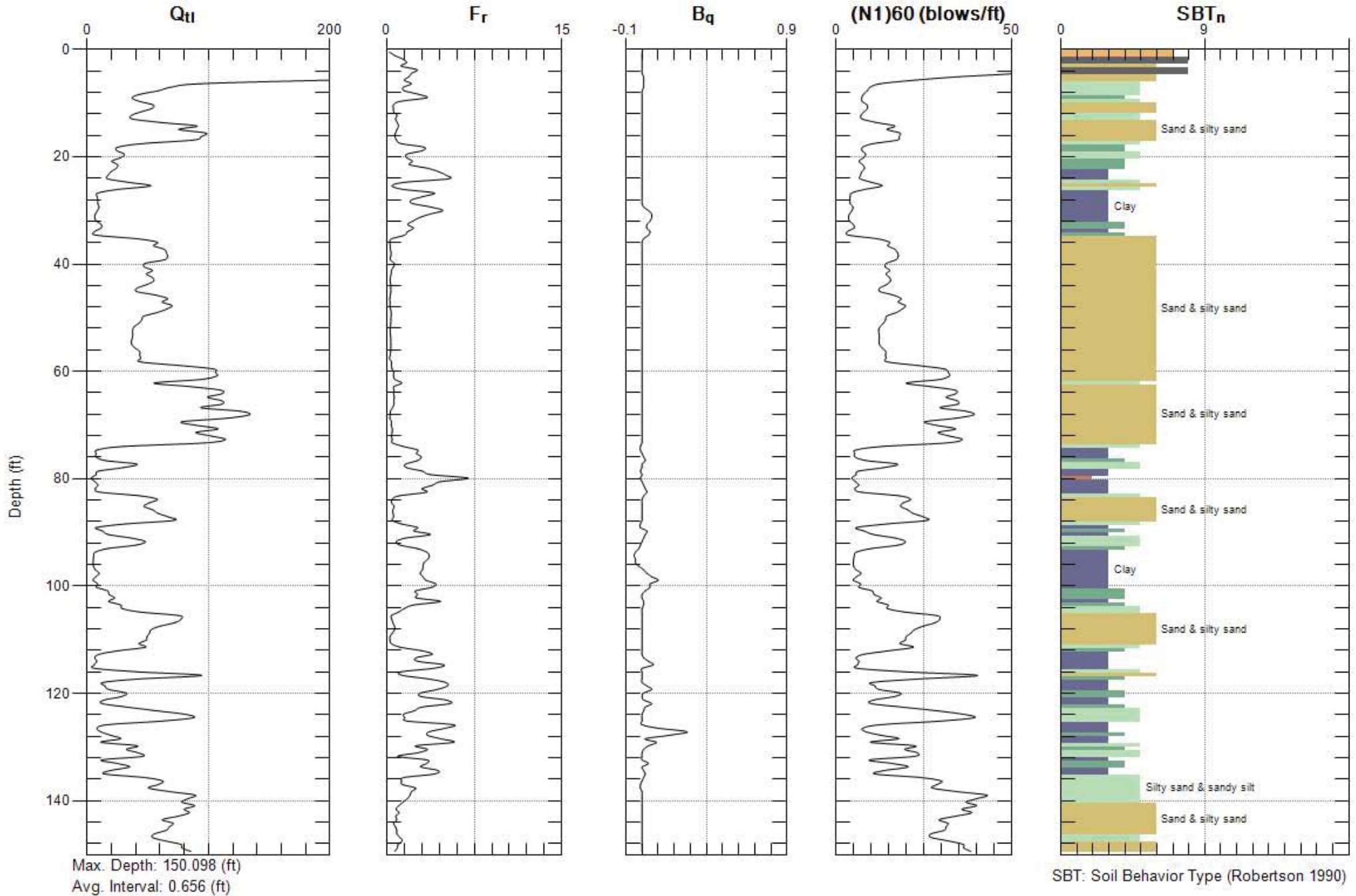
SBT: Soil Behavior Type (Robertson 1990)

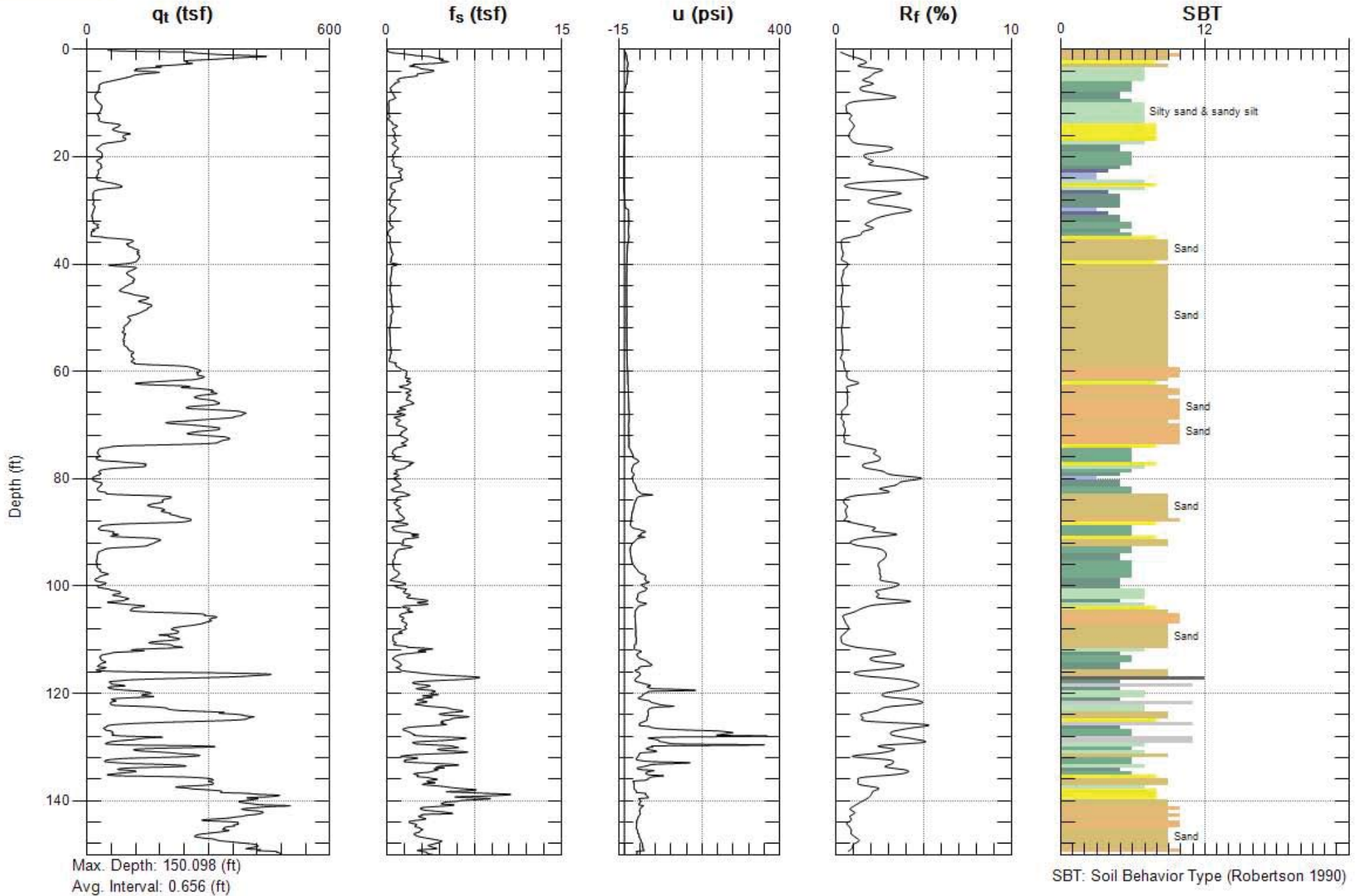


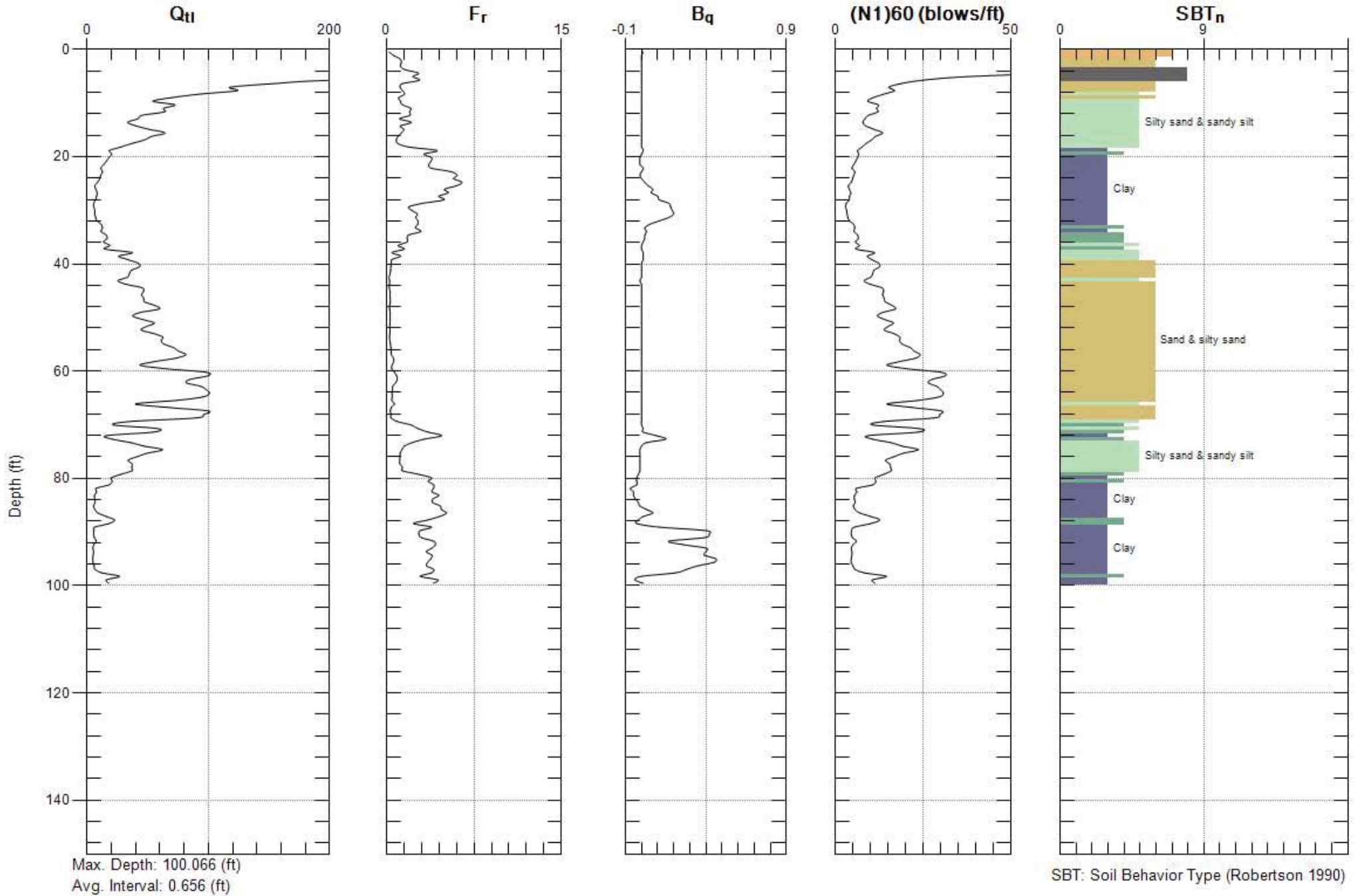


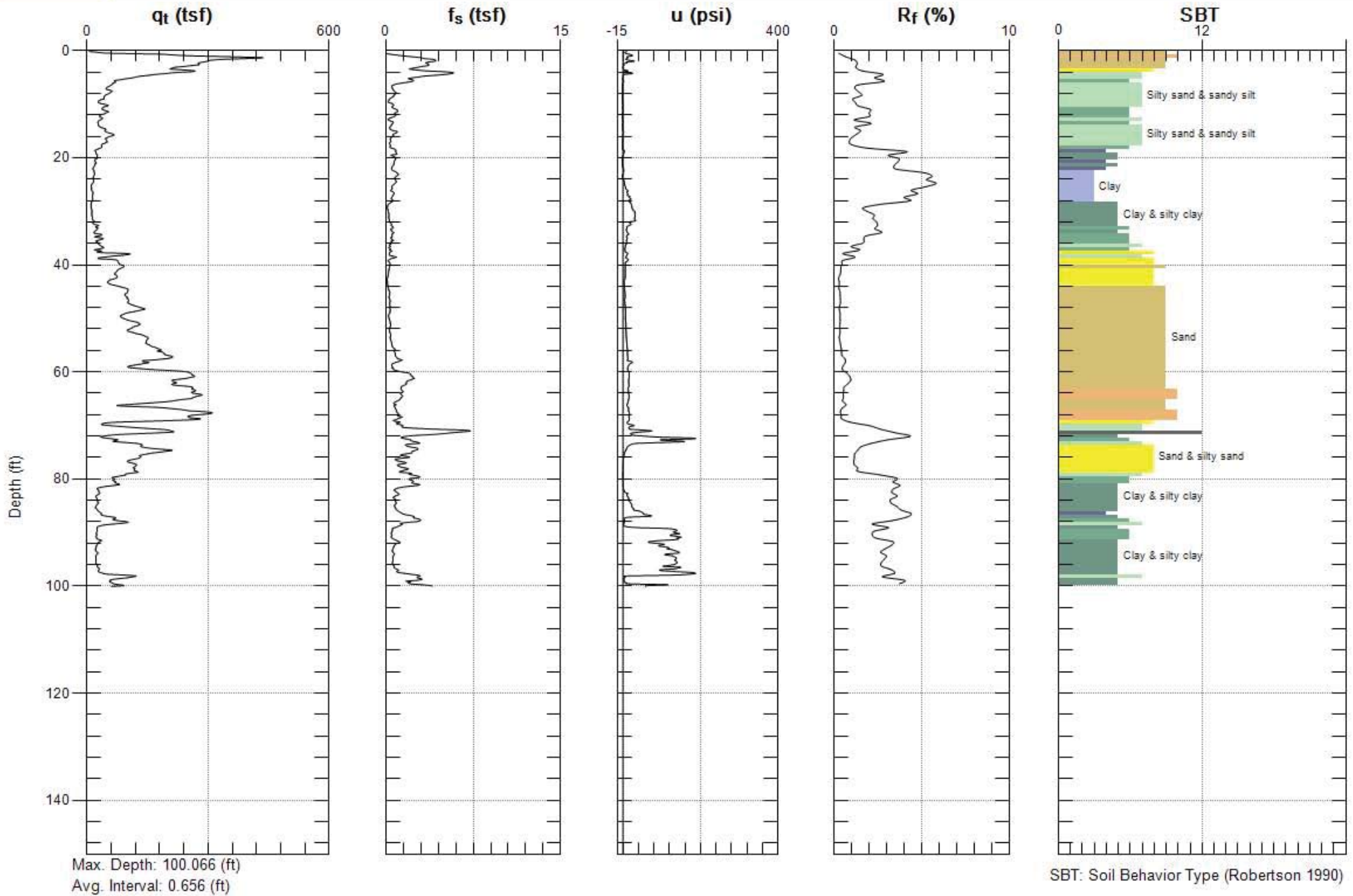


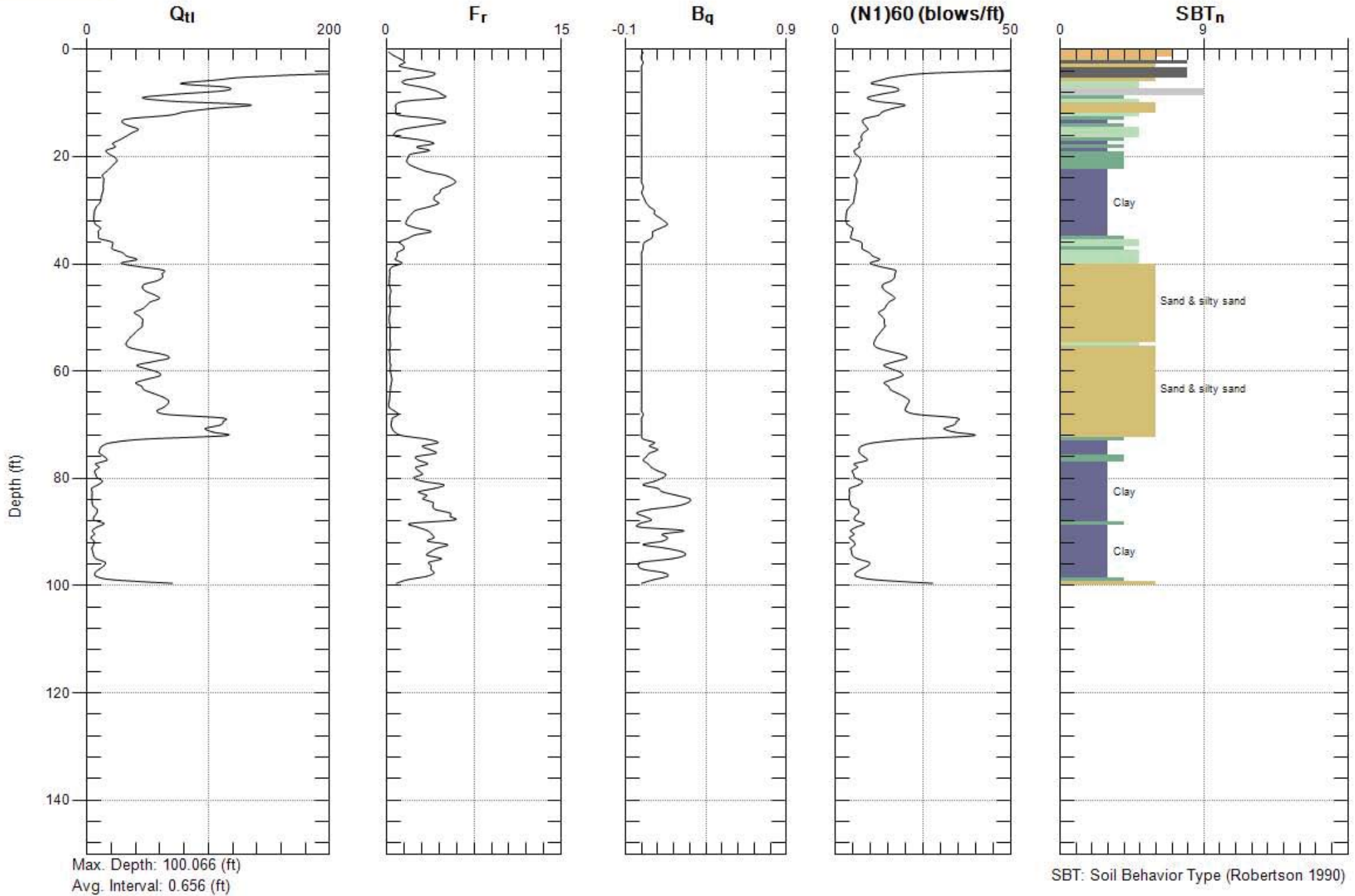


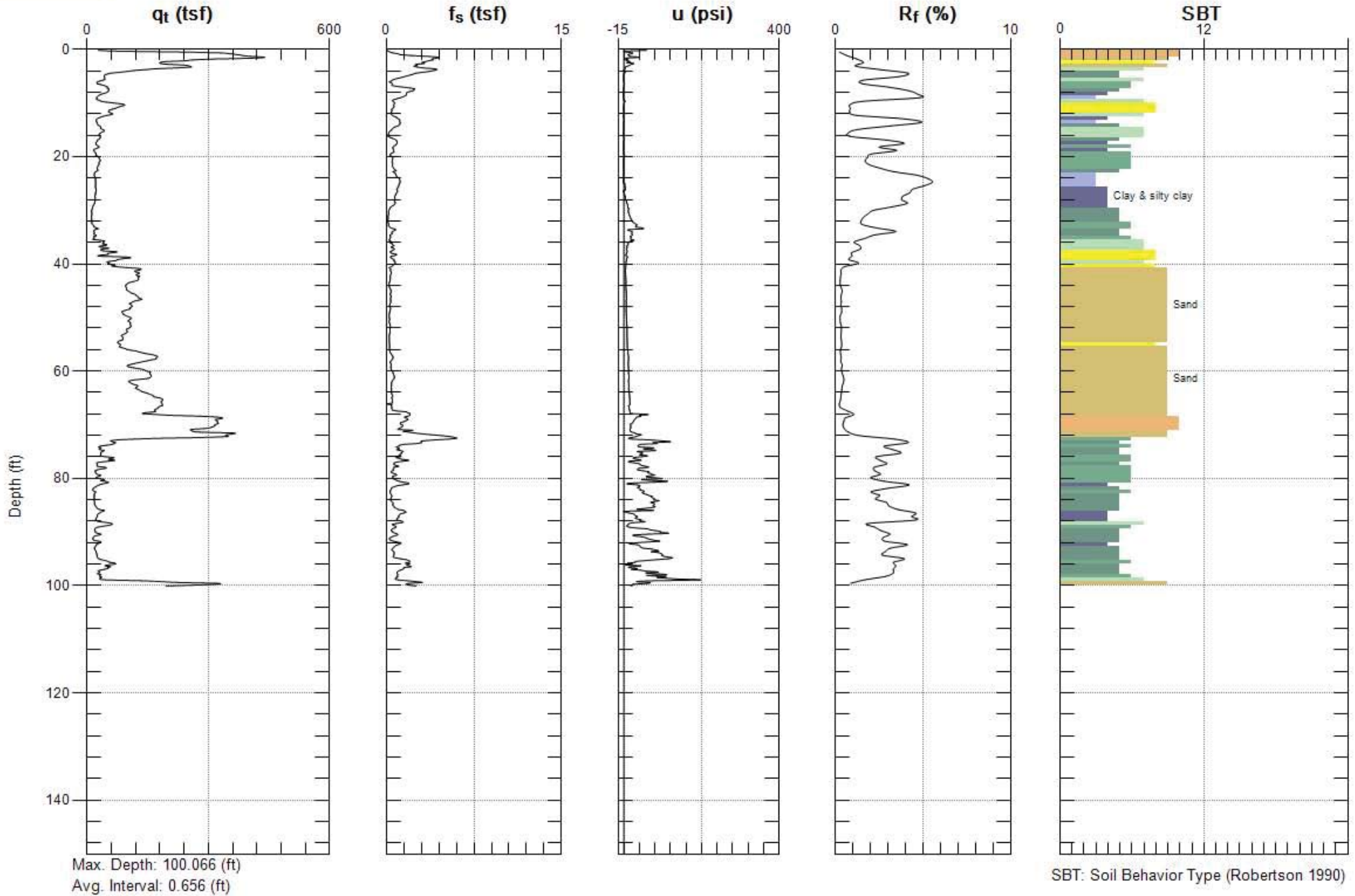


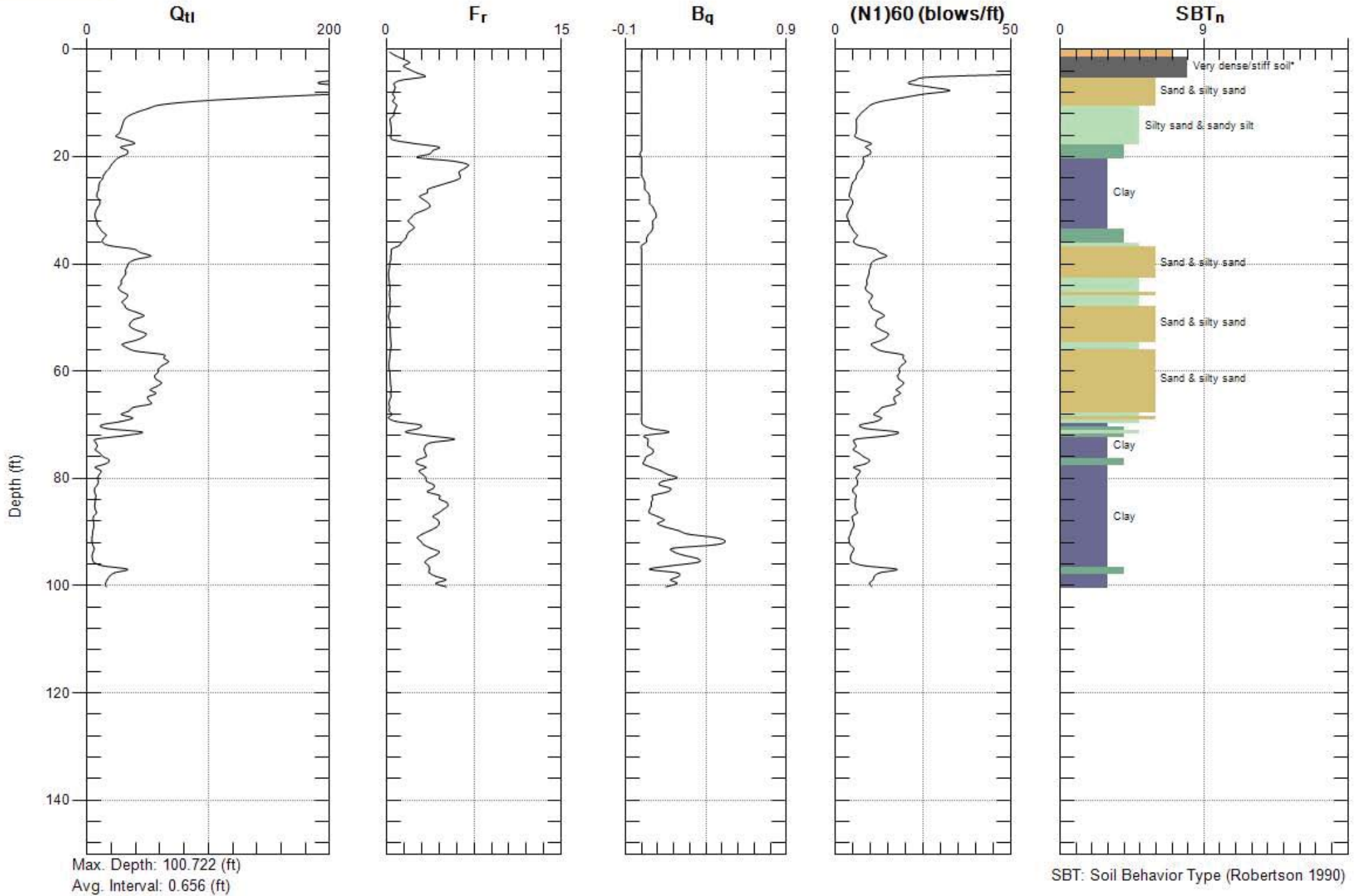


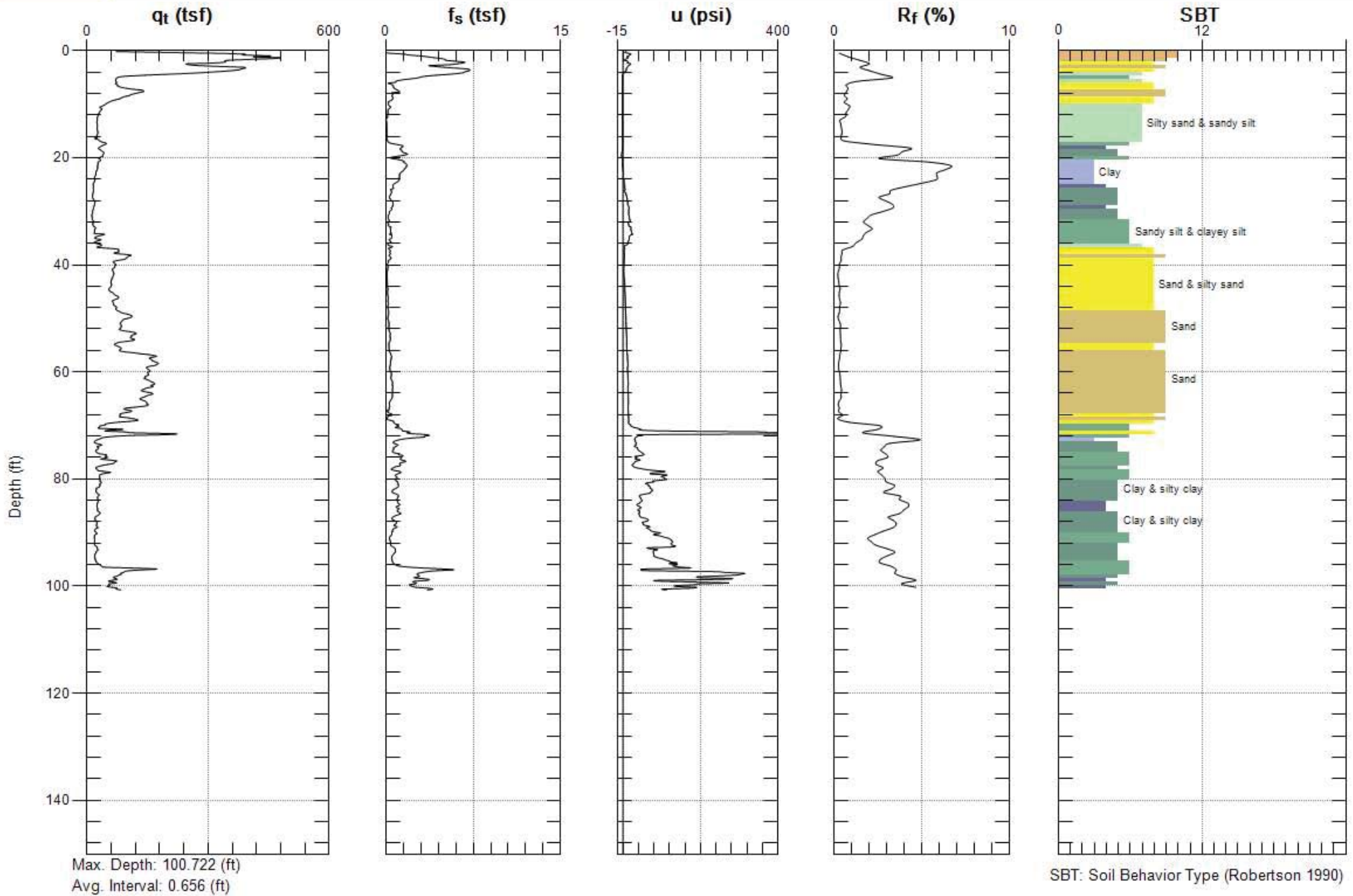


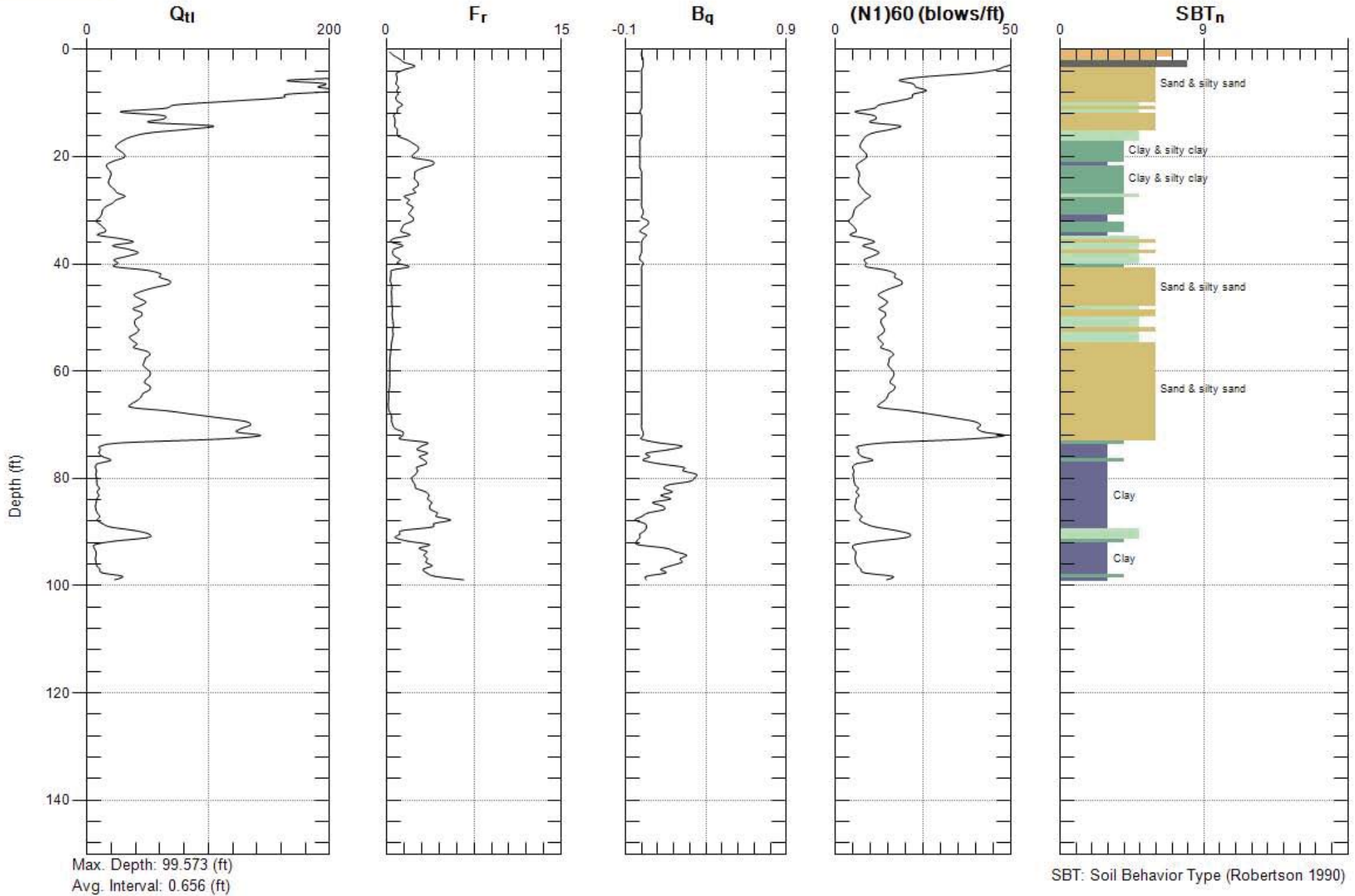


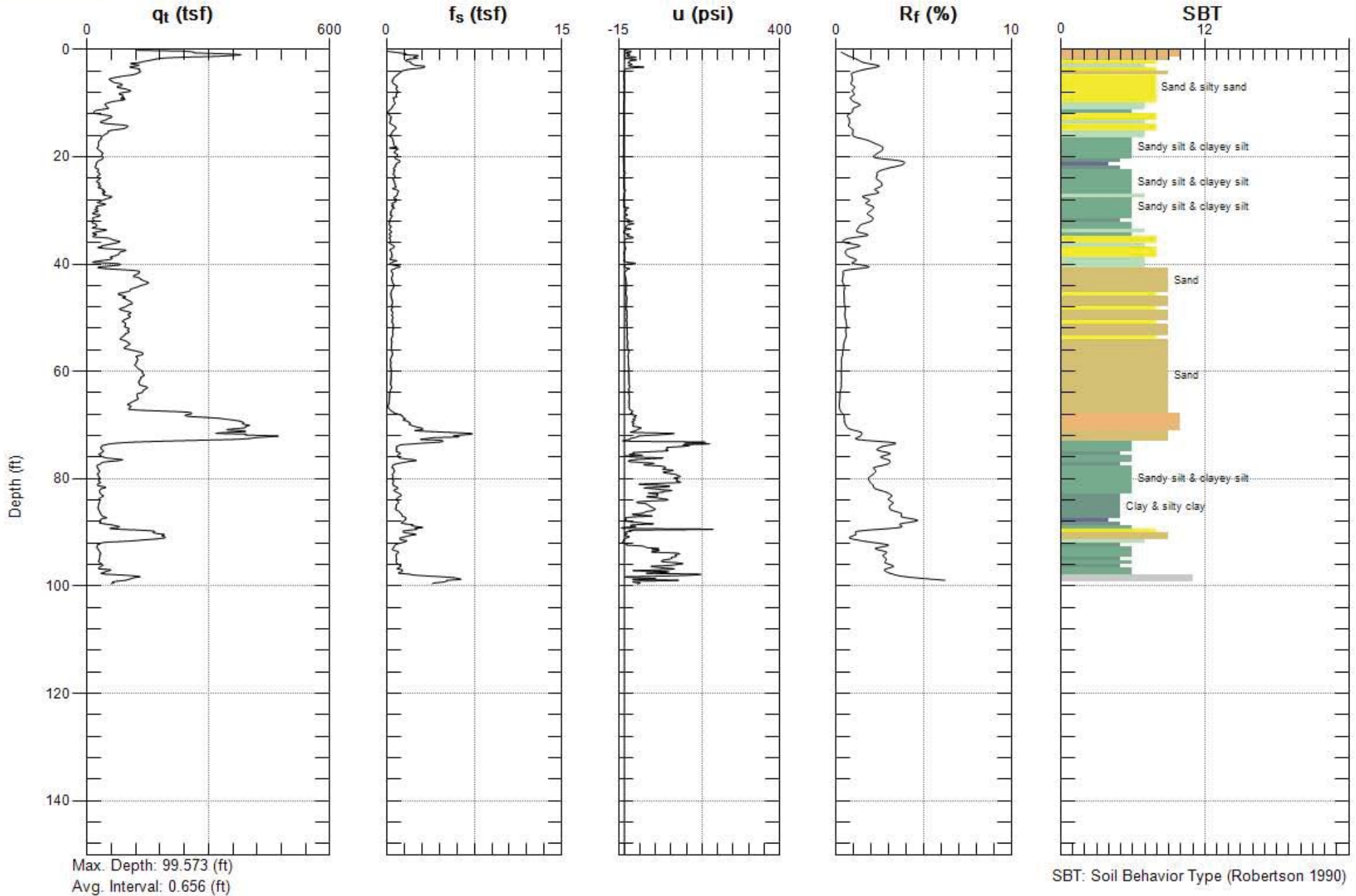


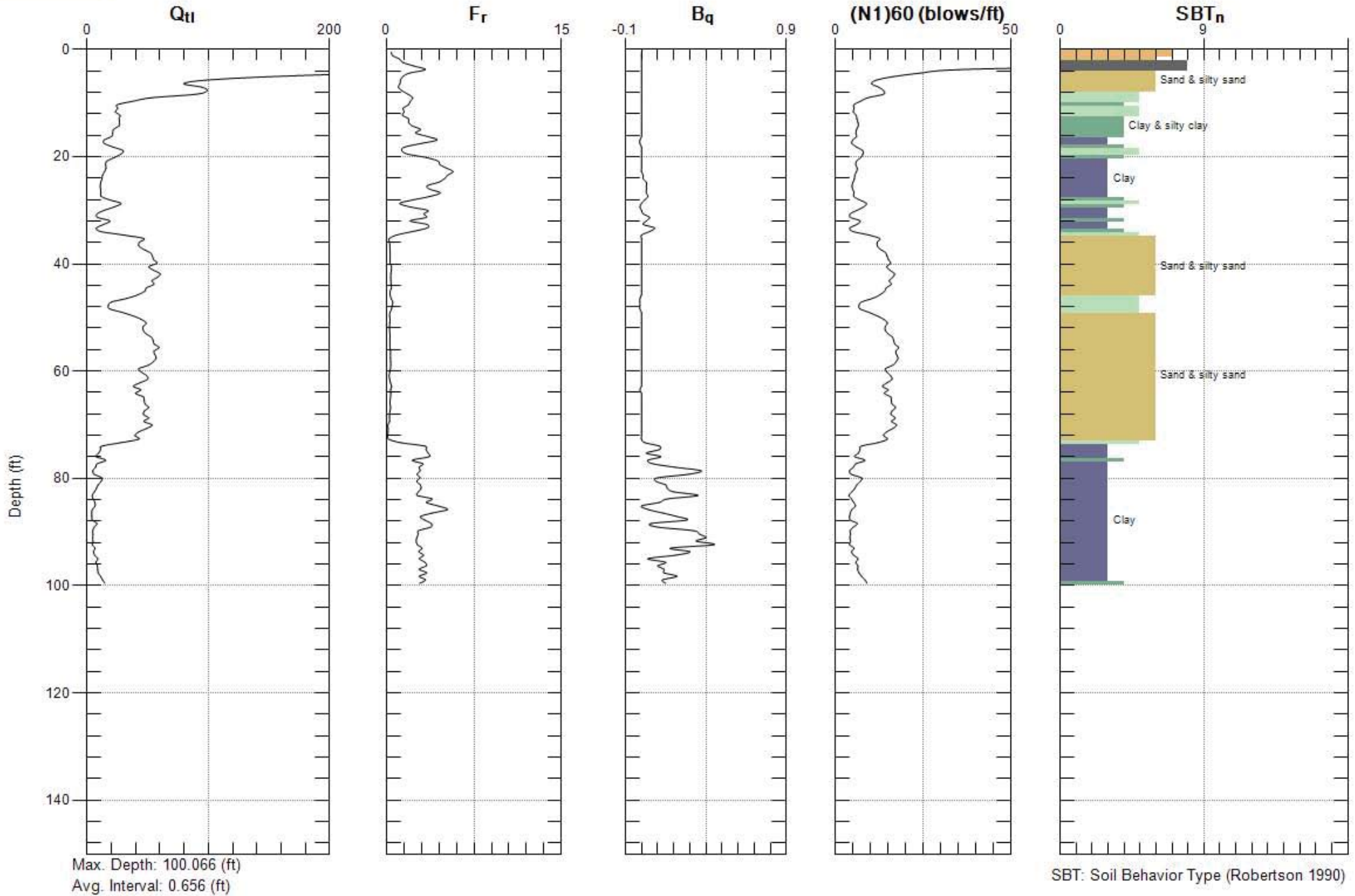


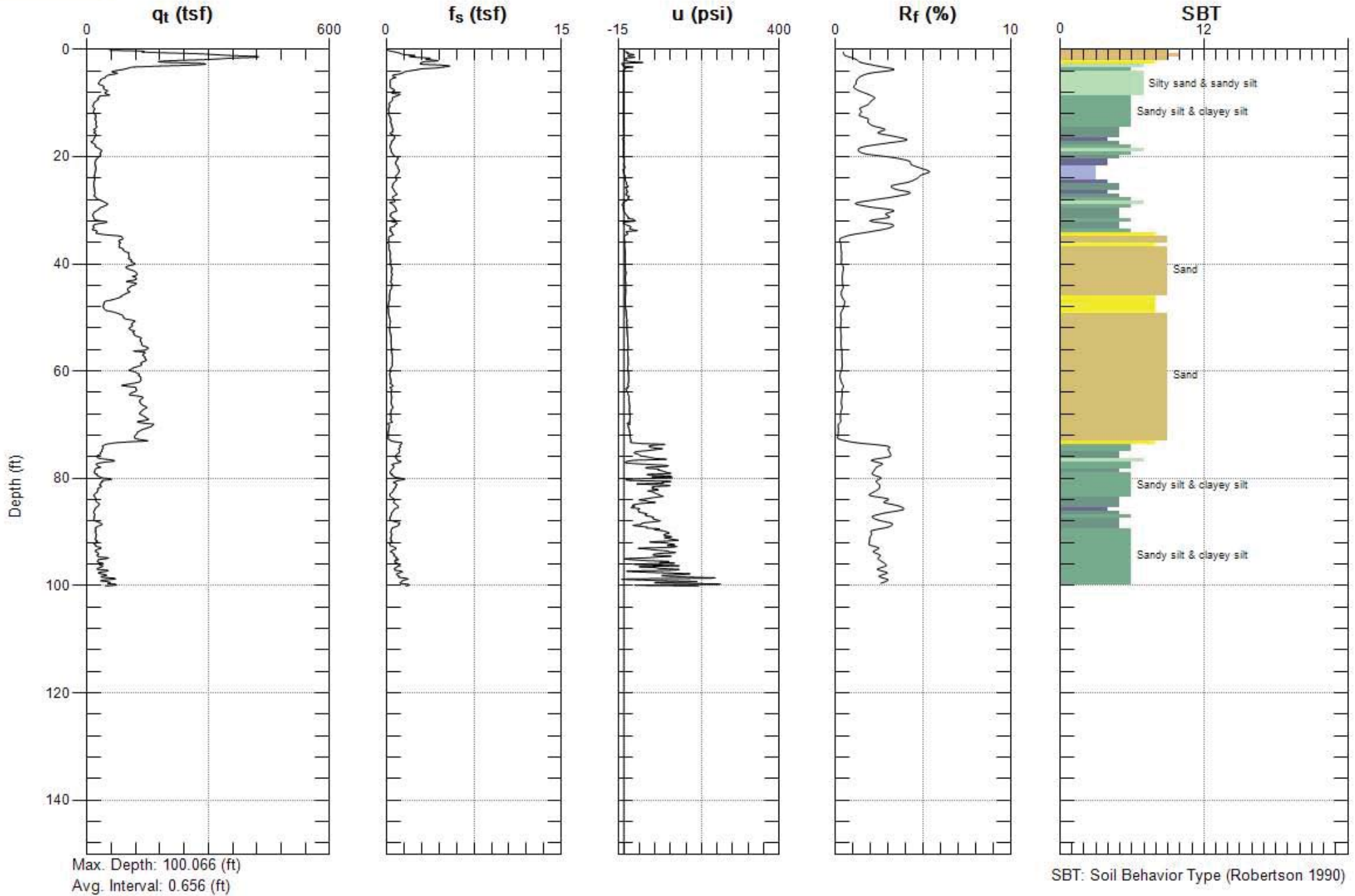


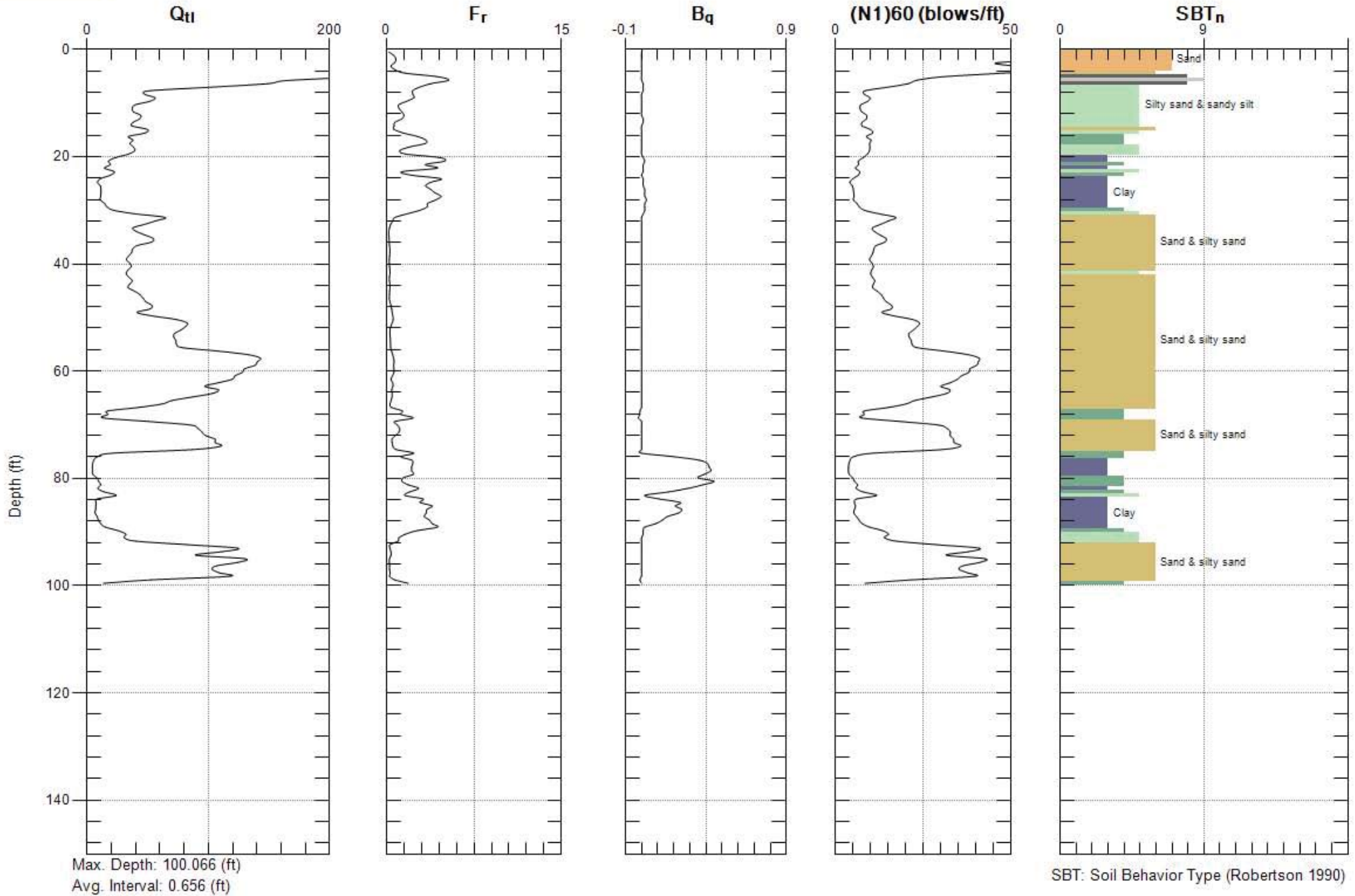


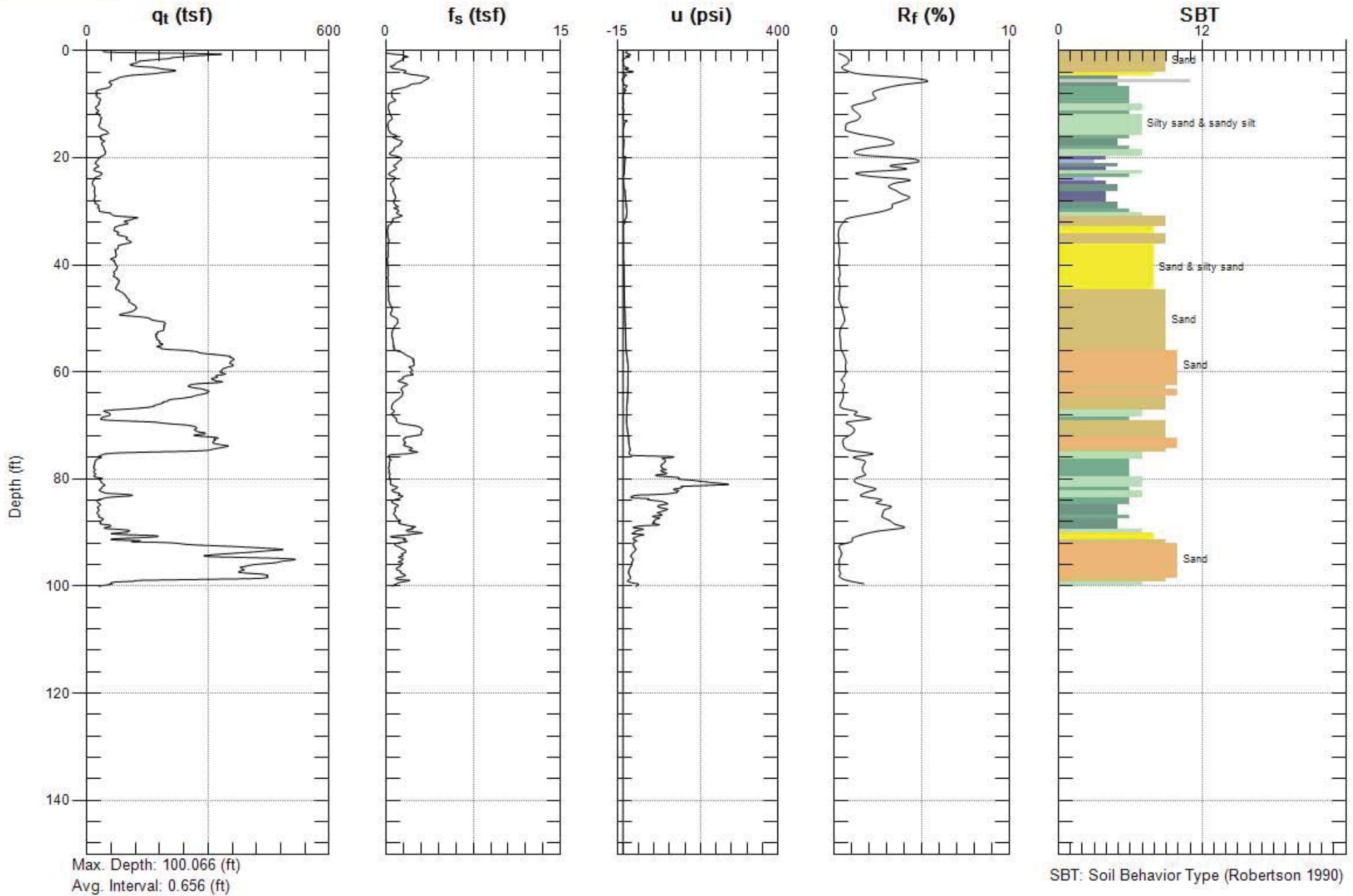


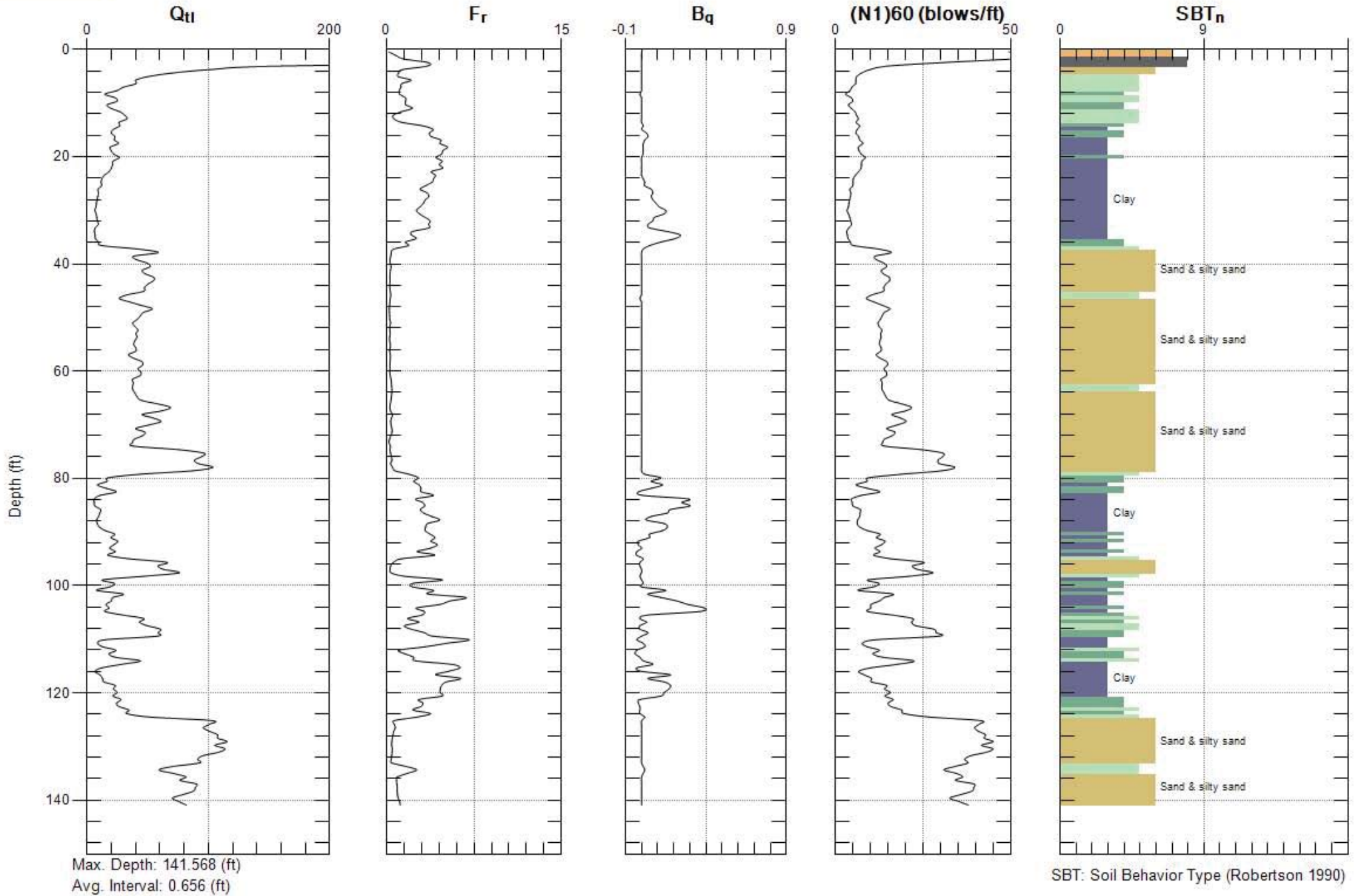


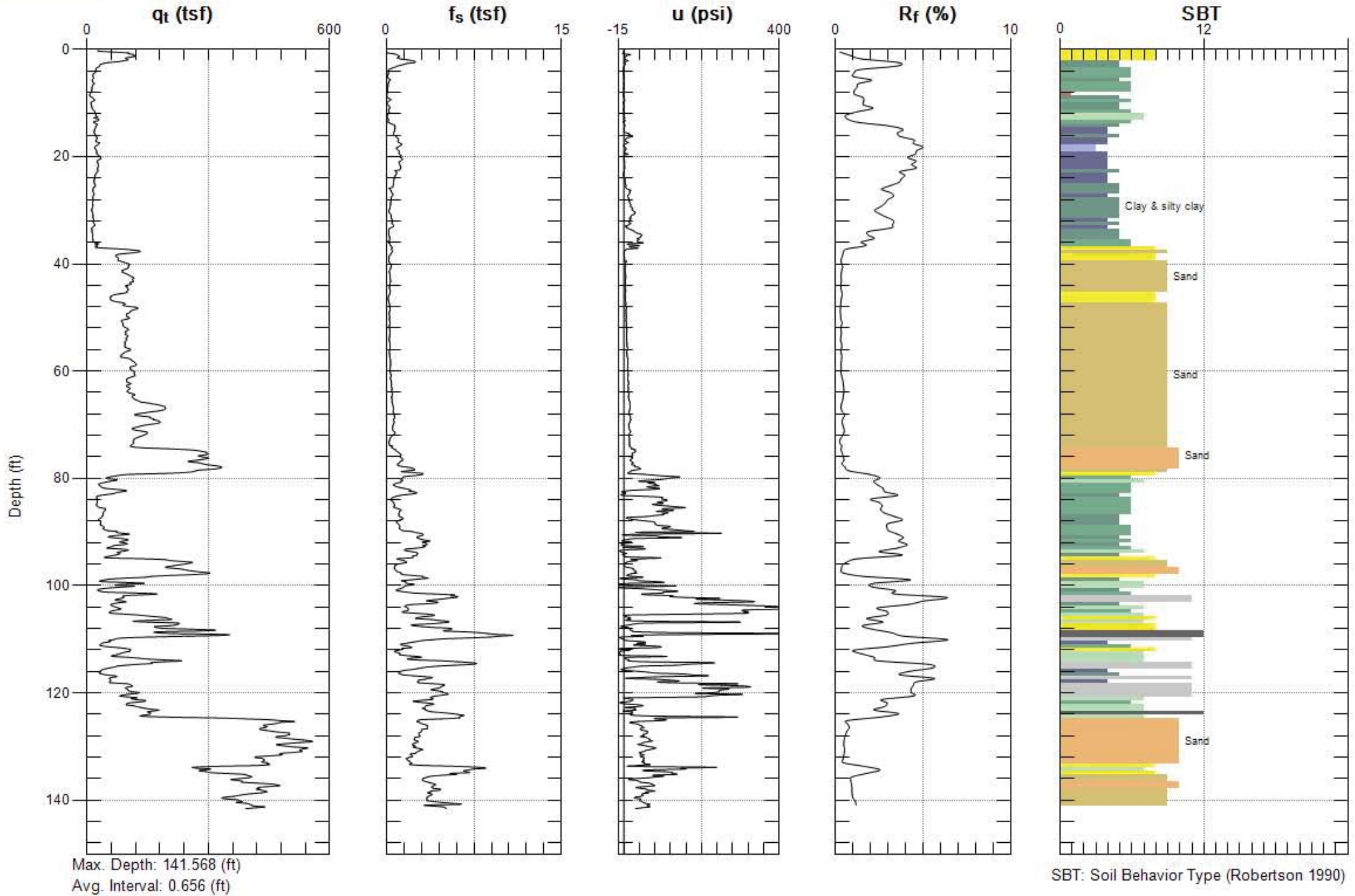


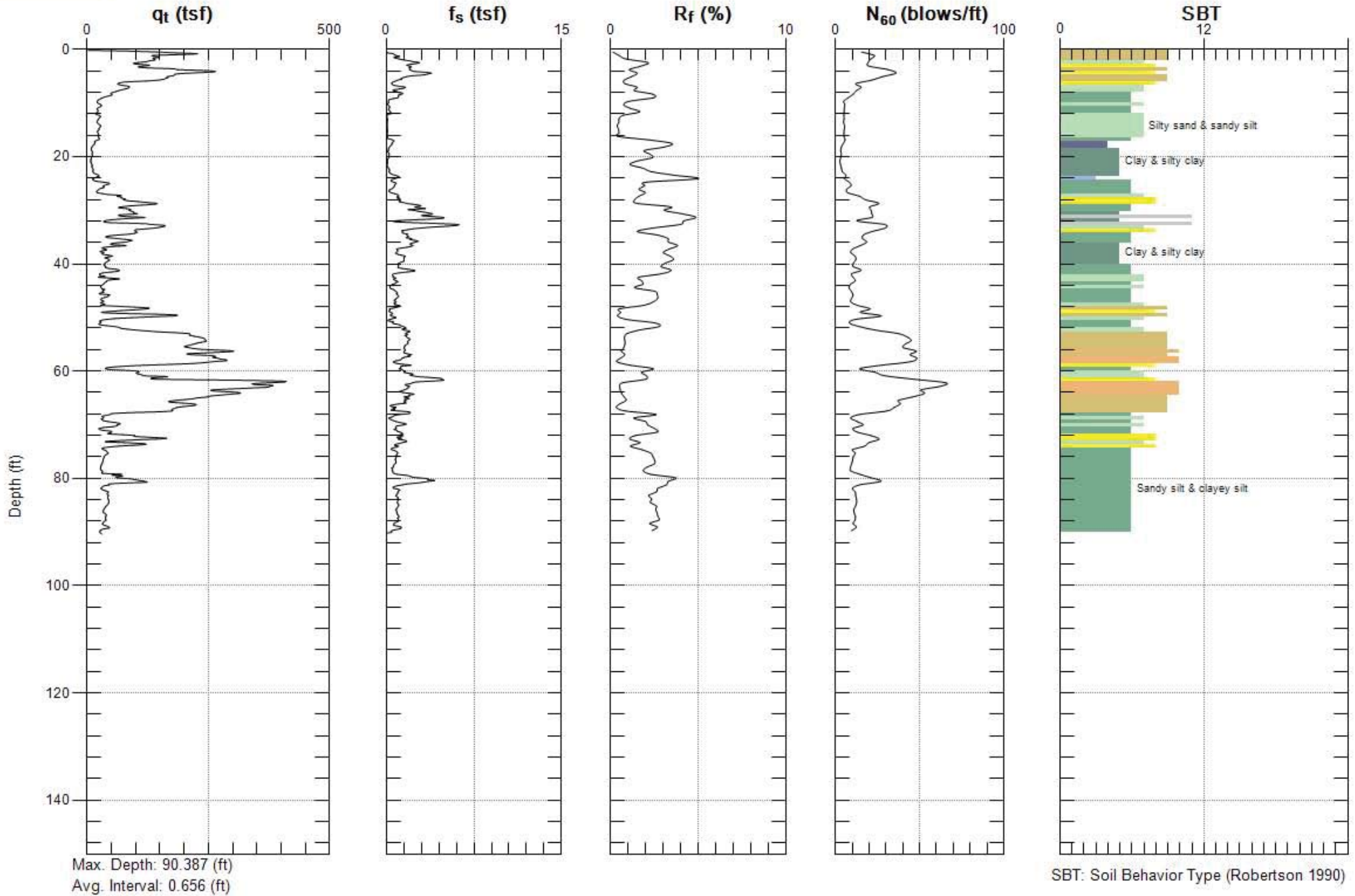


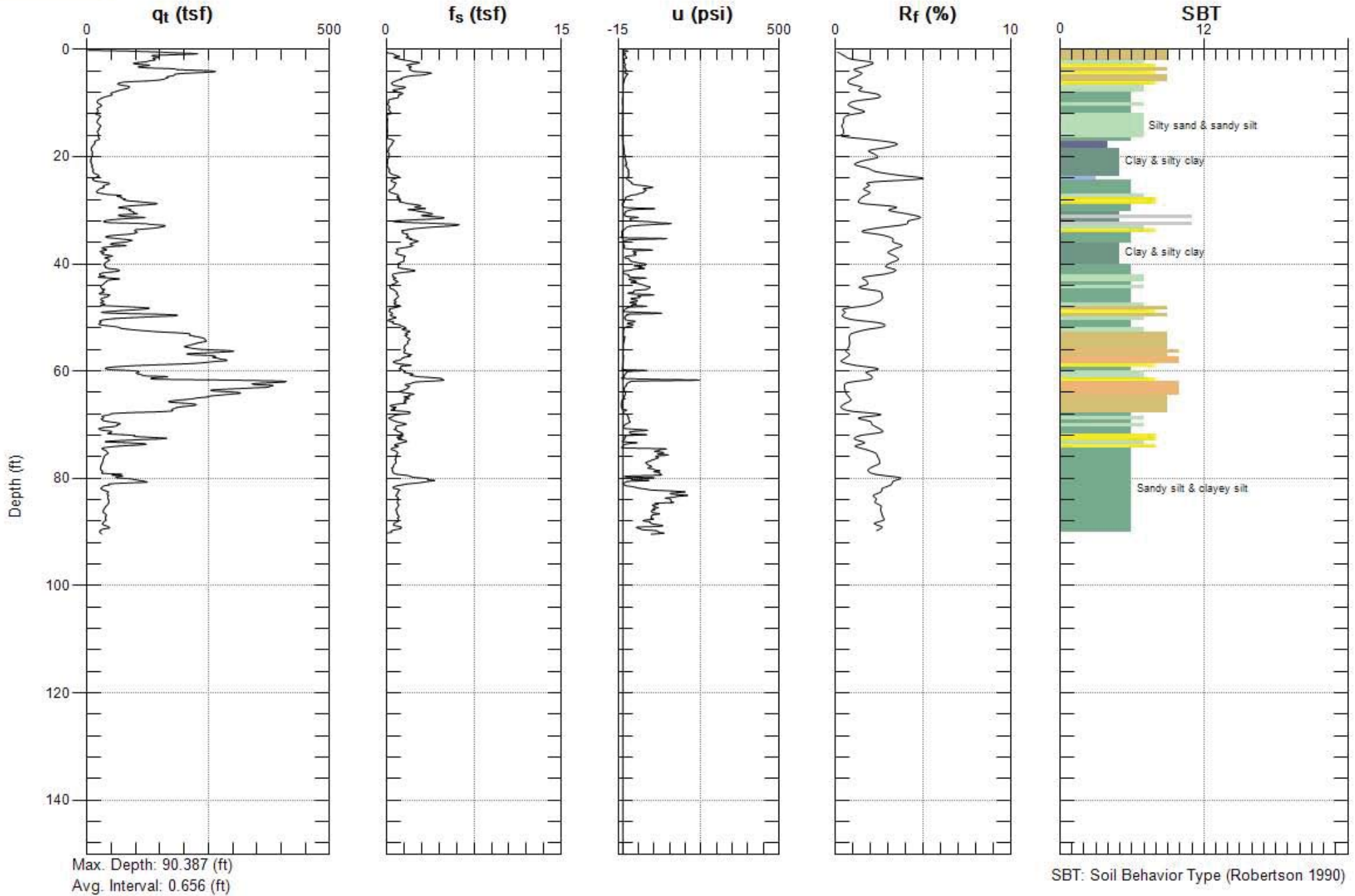


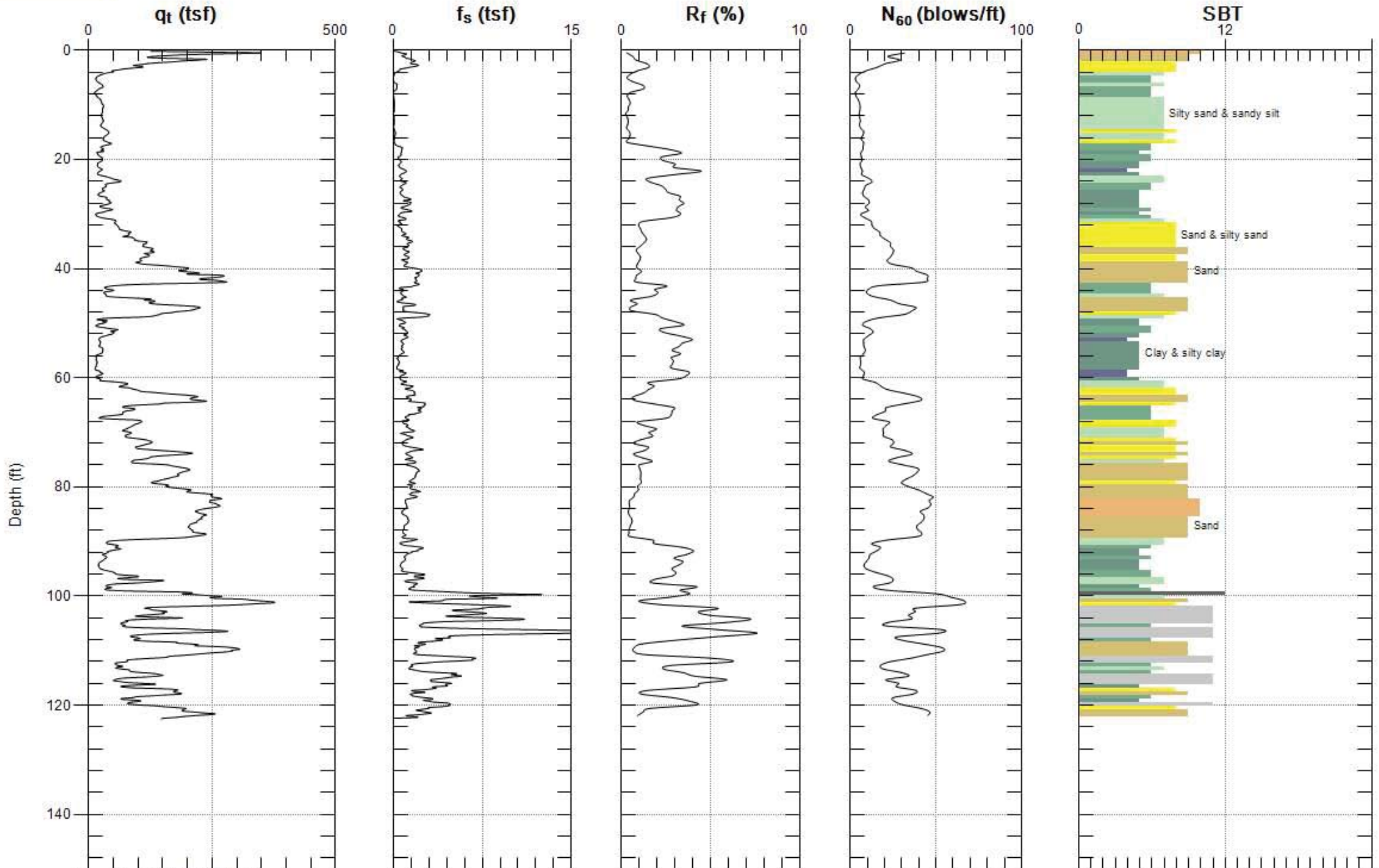






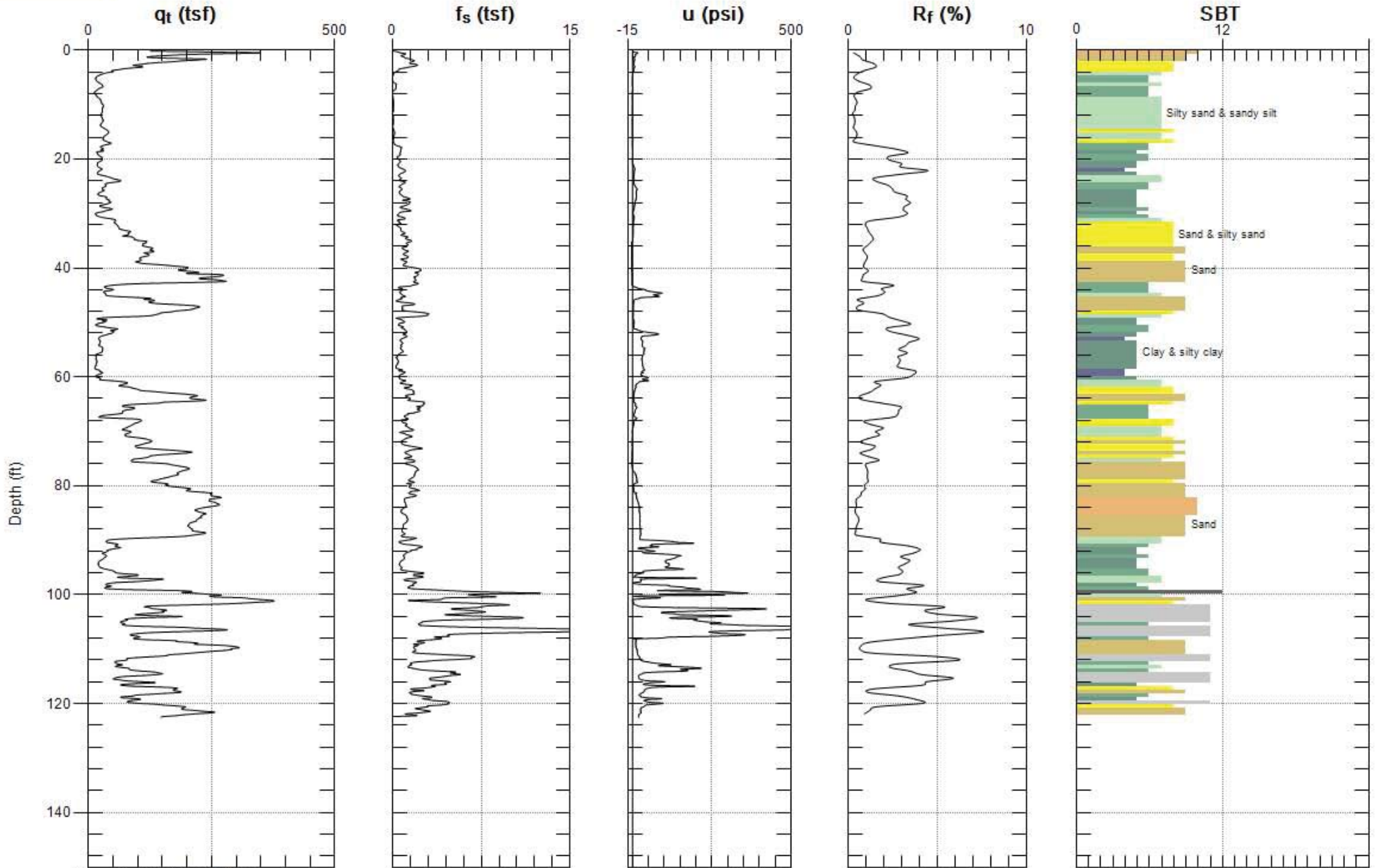






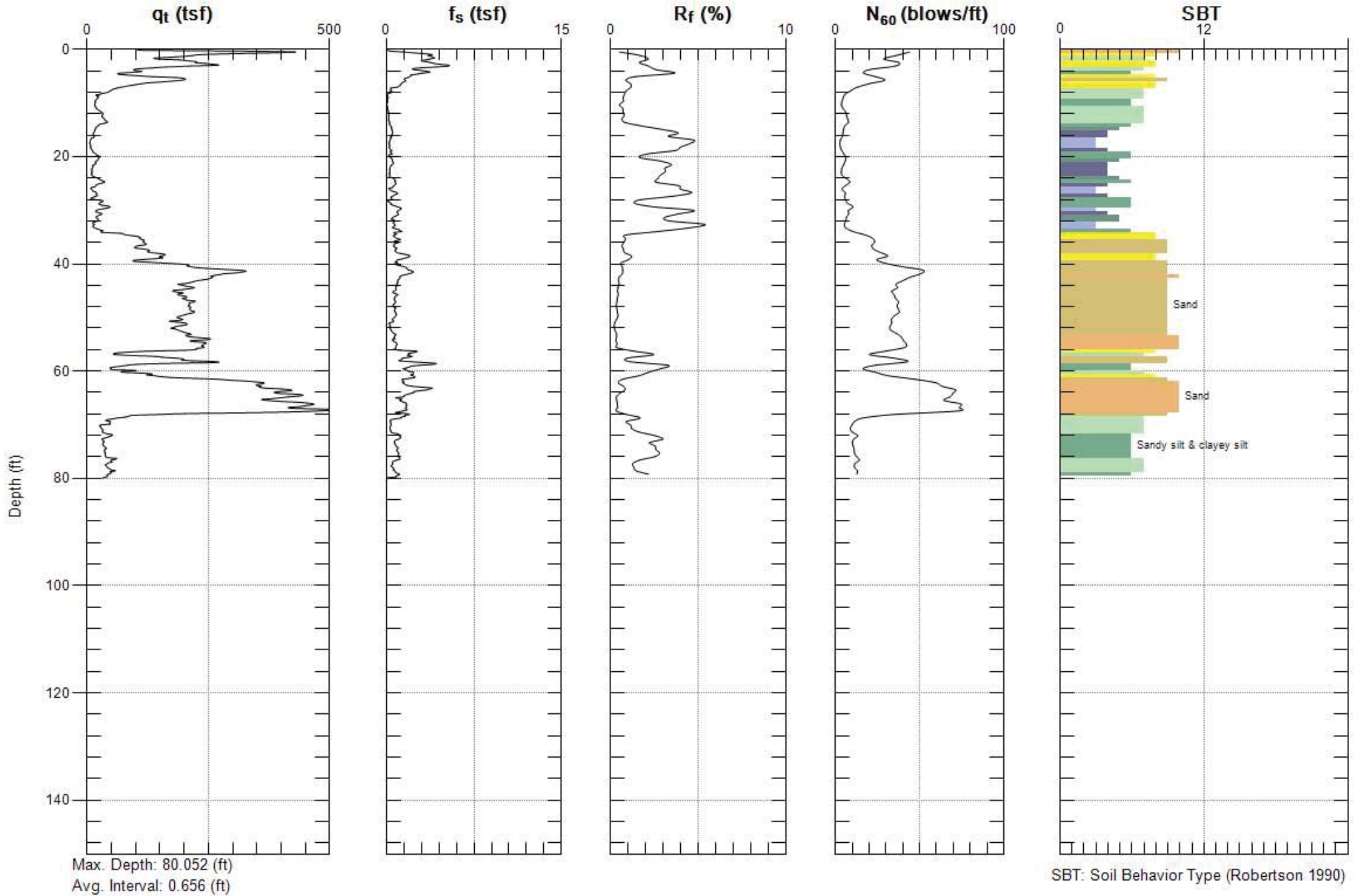
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Avg. Interval: 0.656 (ft)

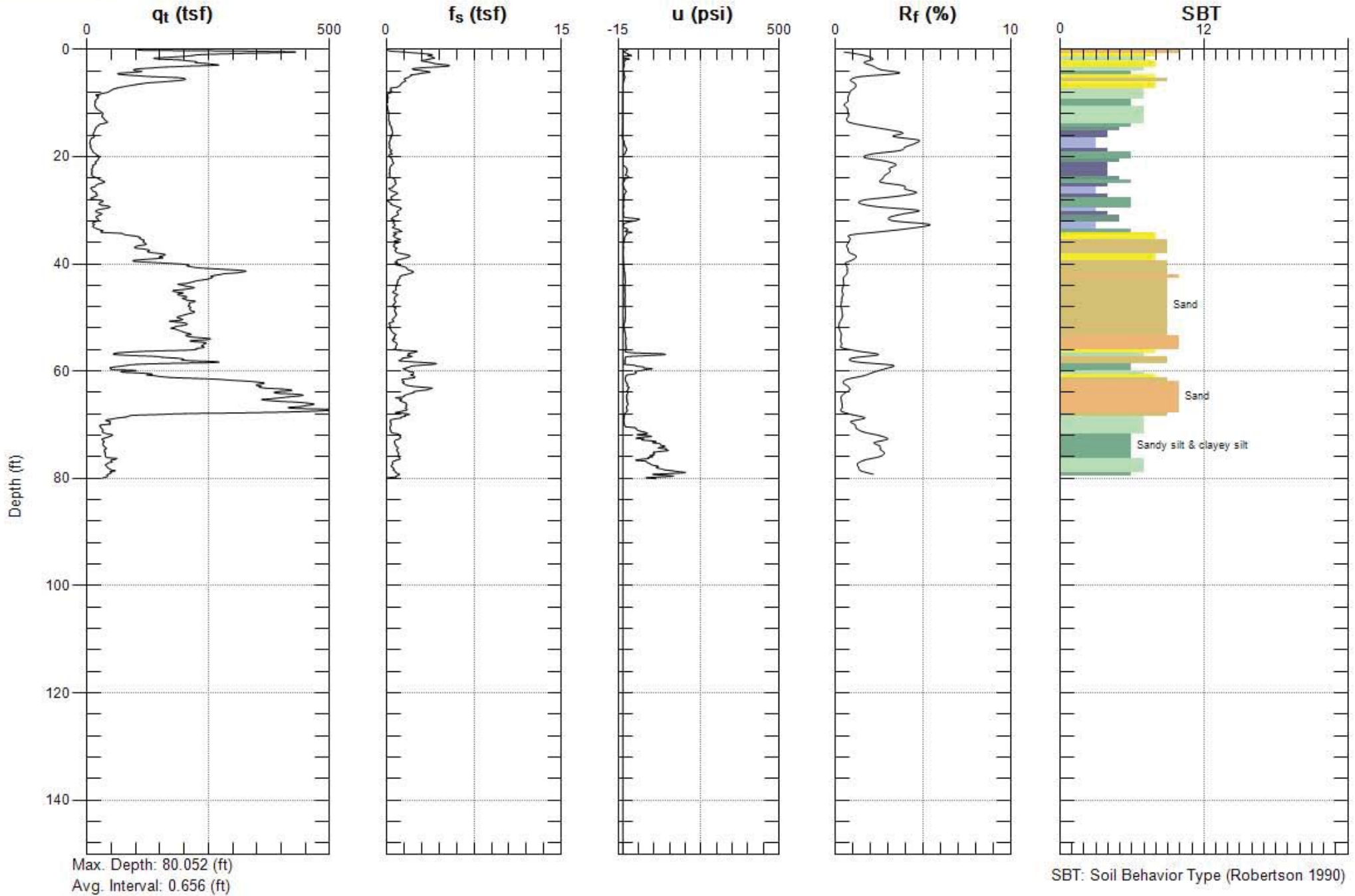
SBT: Soil Behavior Type (Robertson 1990)

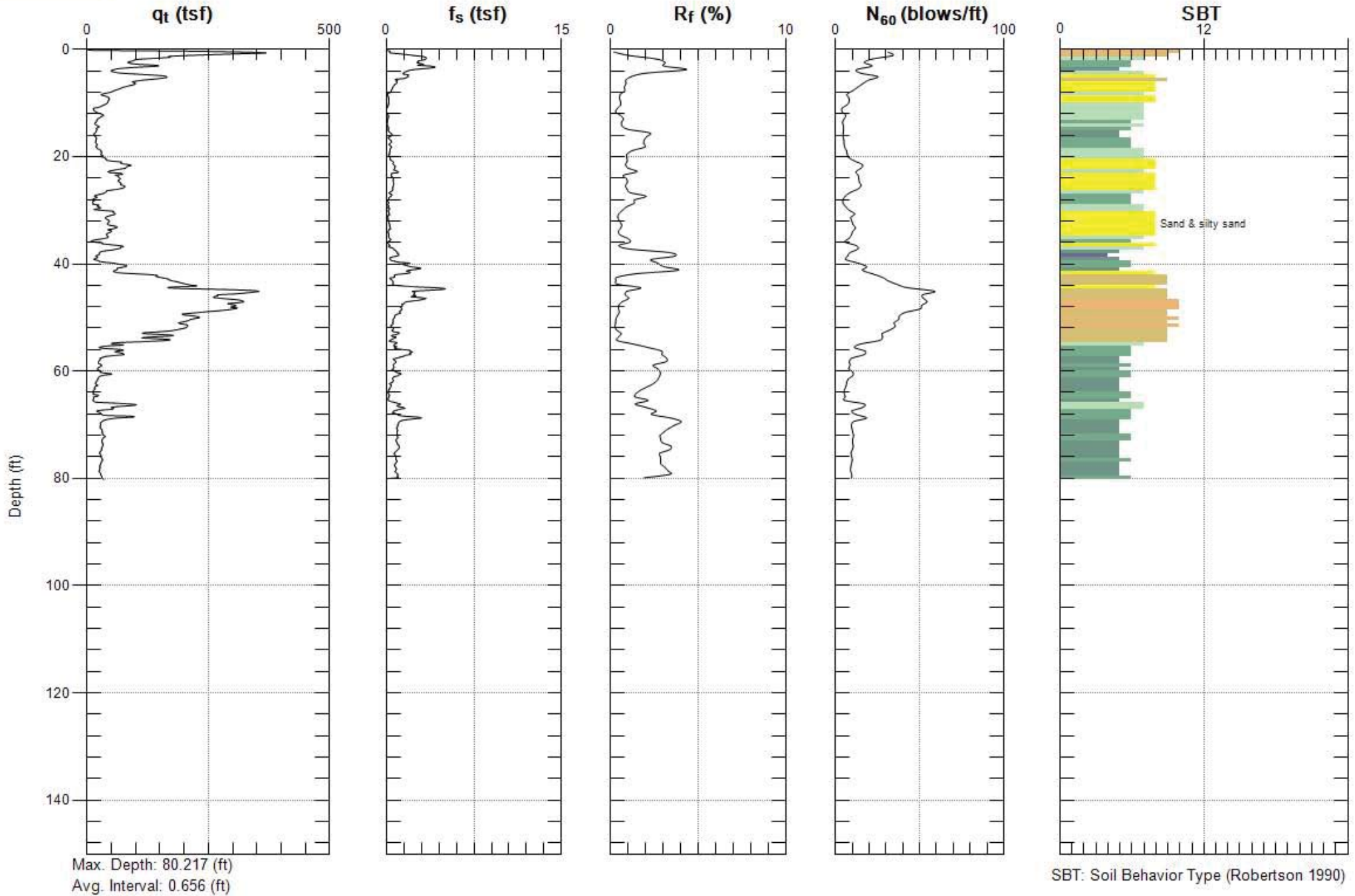


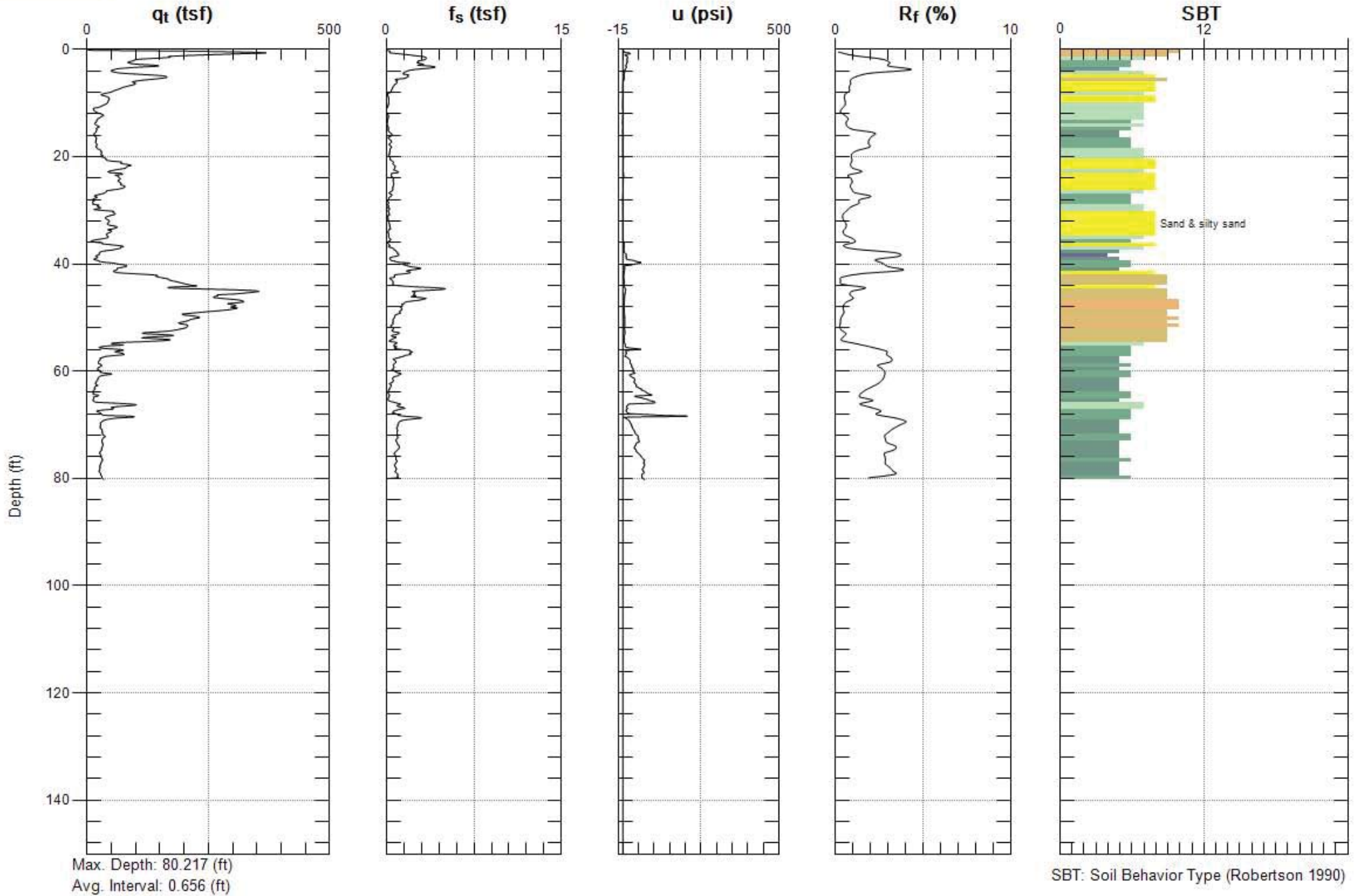
Max. Depth: 122.539 (ft)
Avg. Interval: 0.656 (ft)

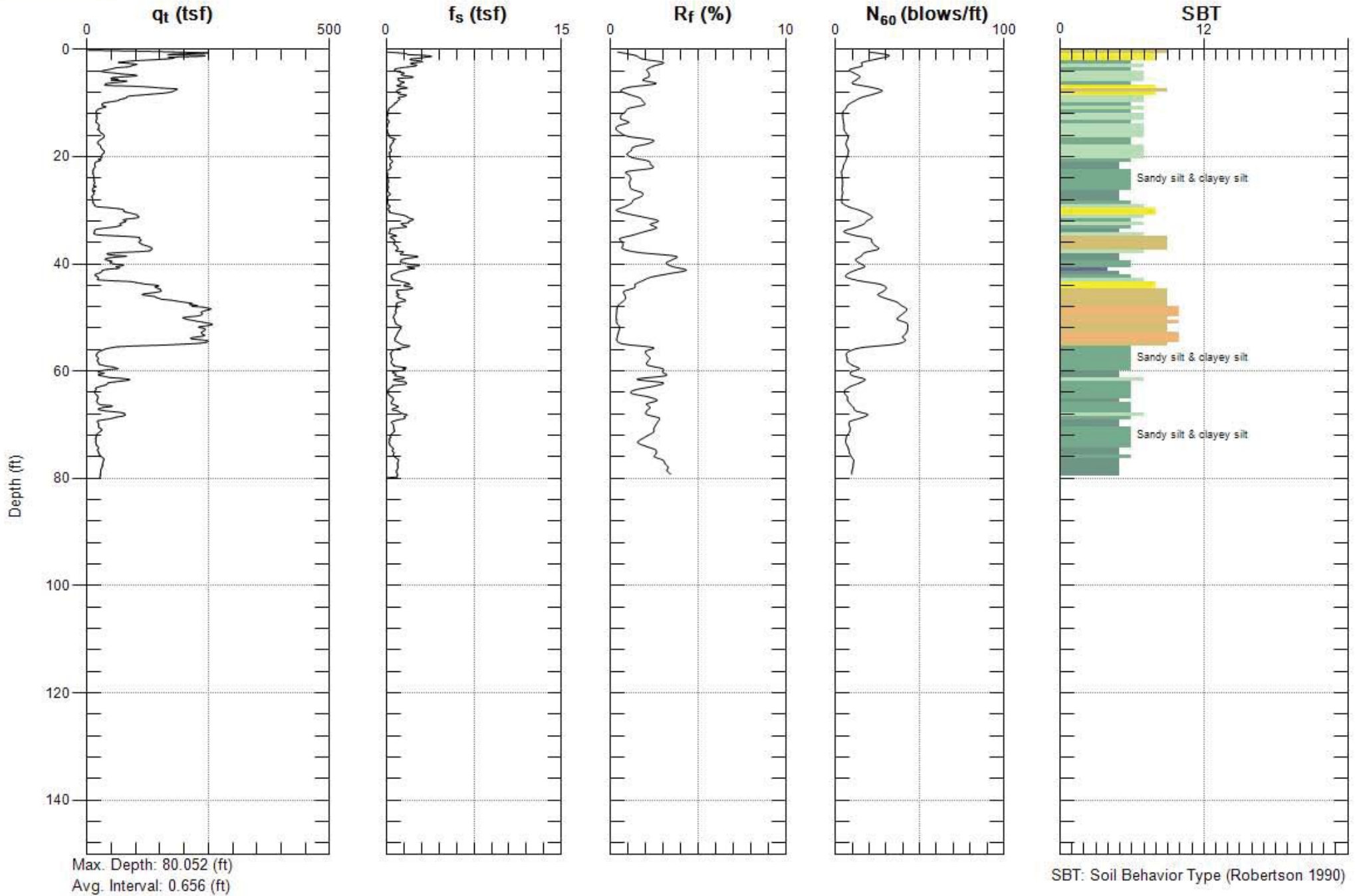
SBT: Soil Behavior Type (Robertson 1990)

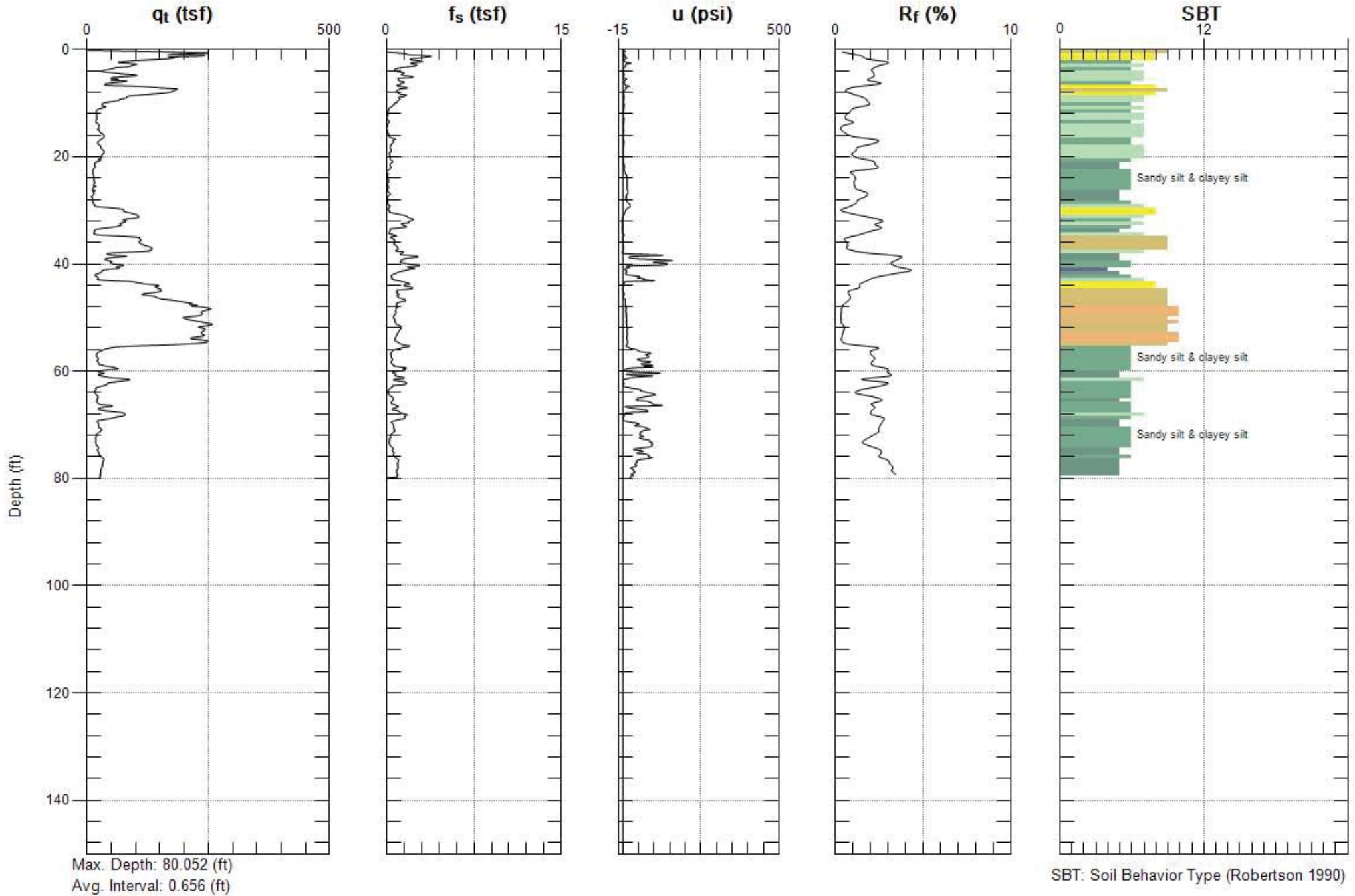


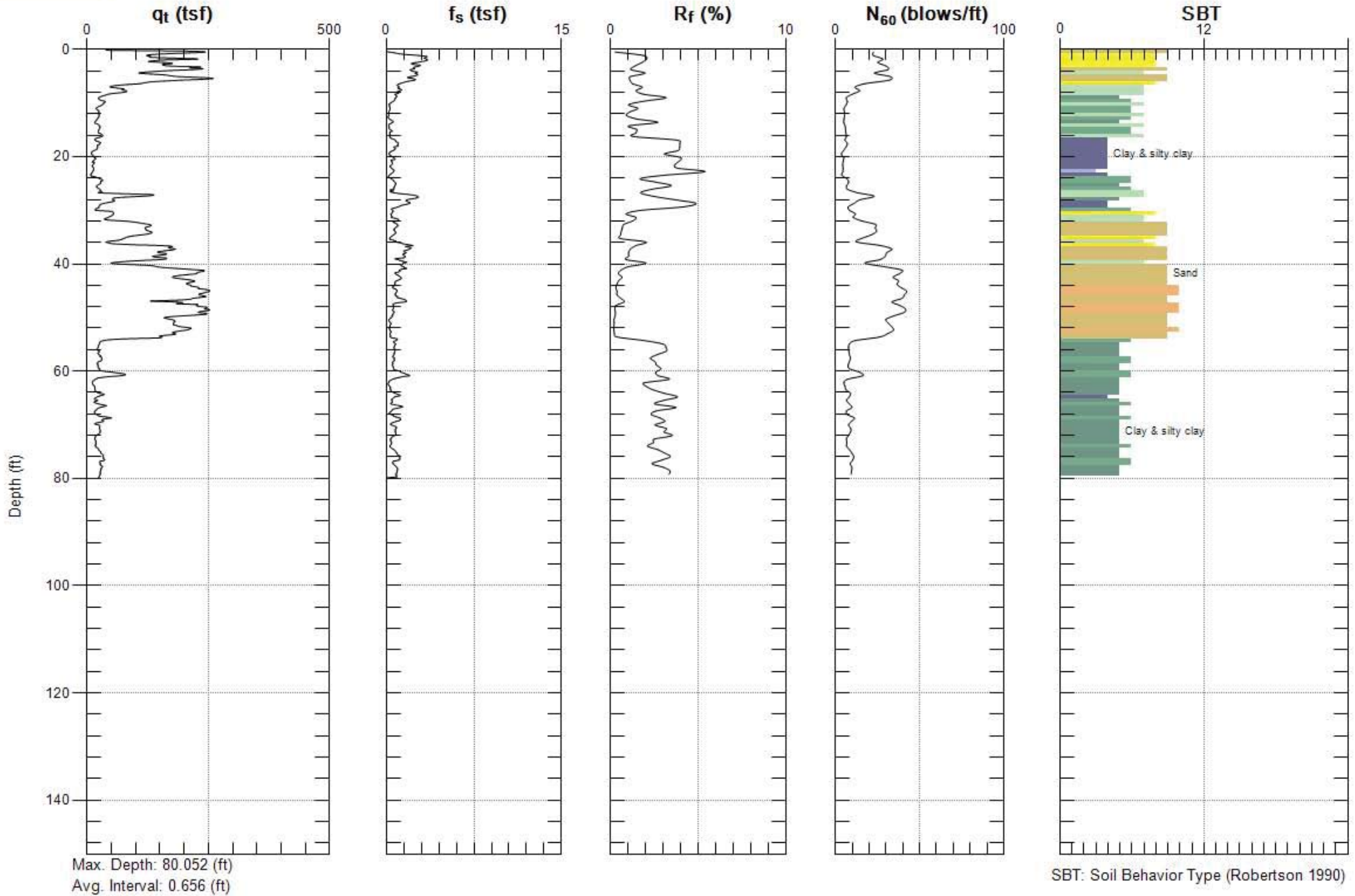


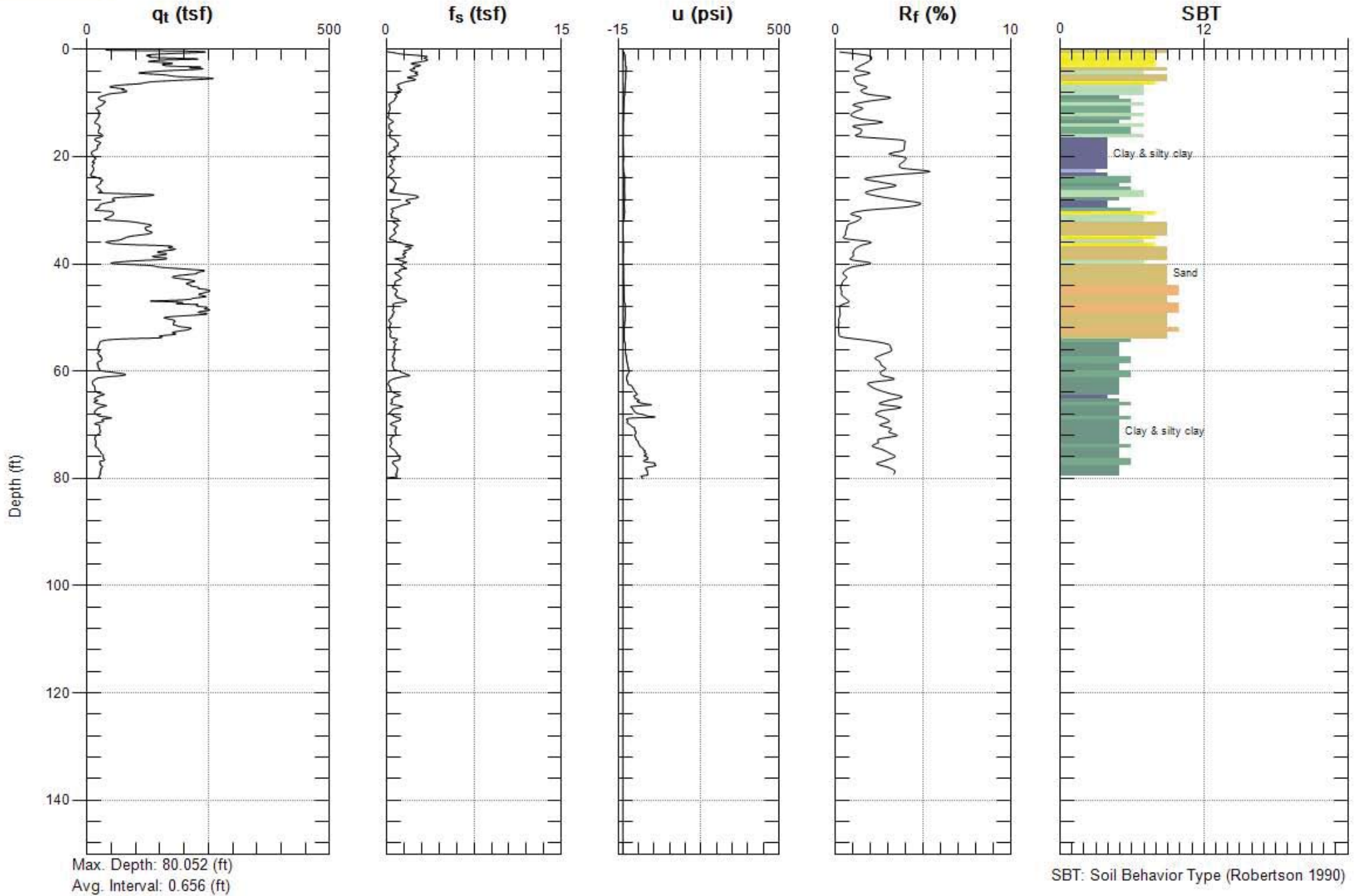


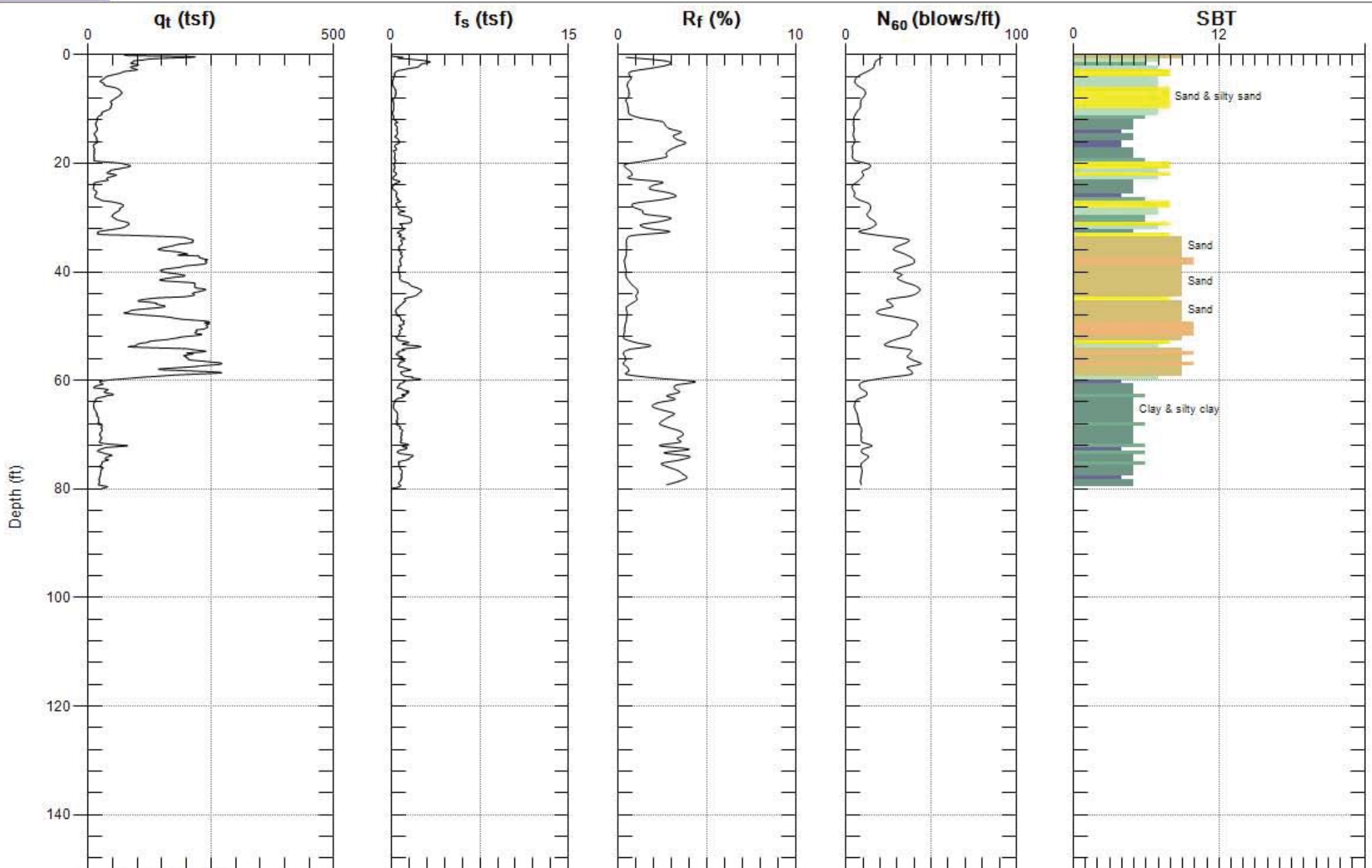






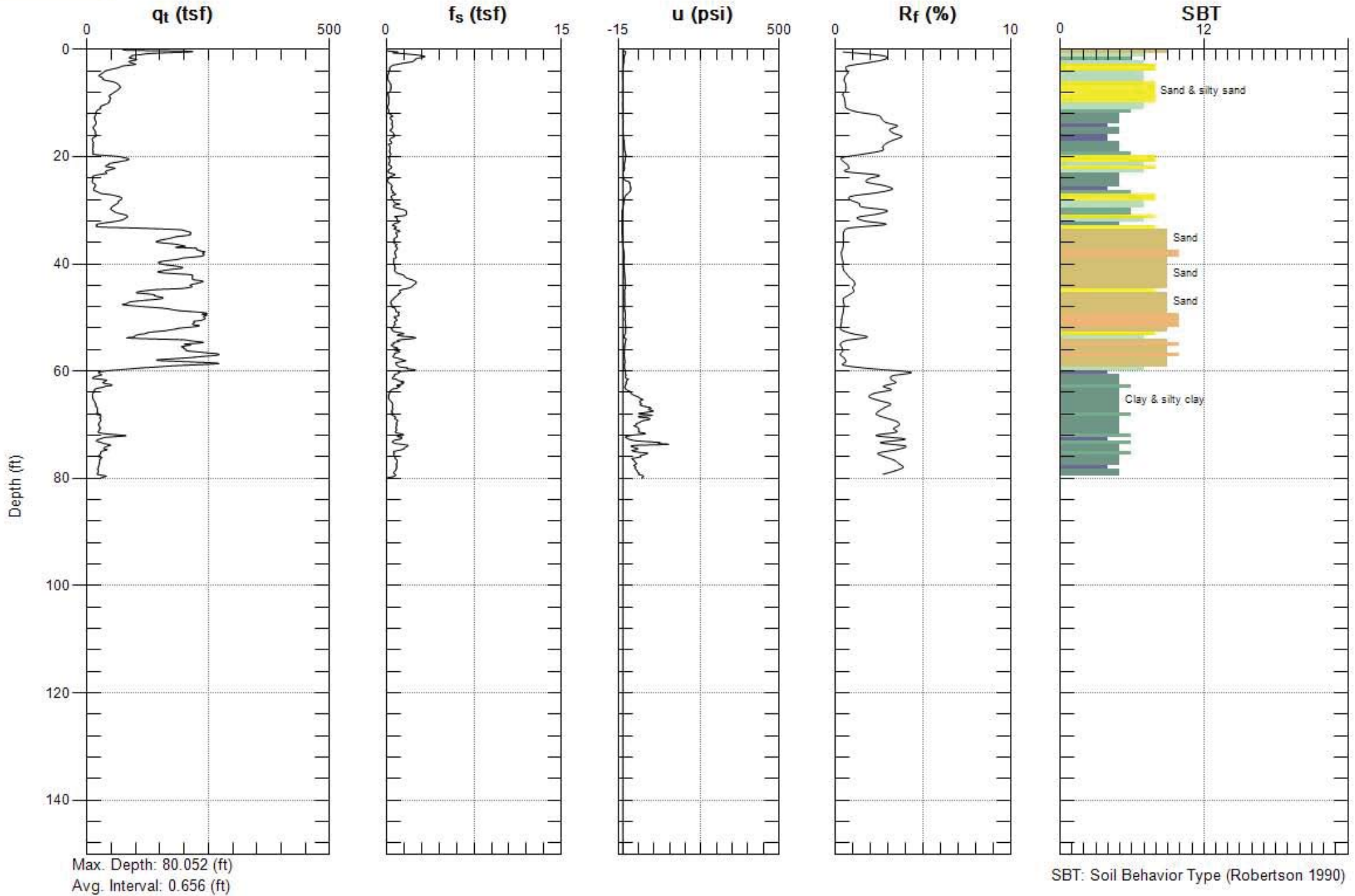


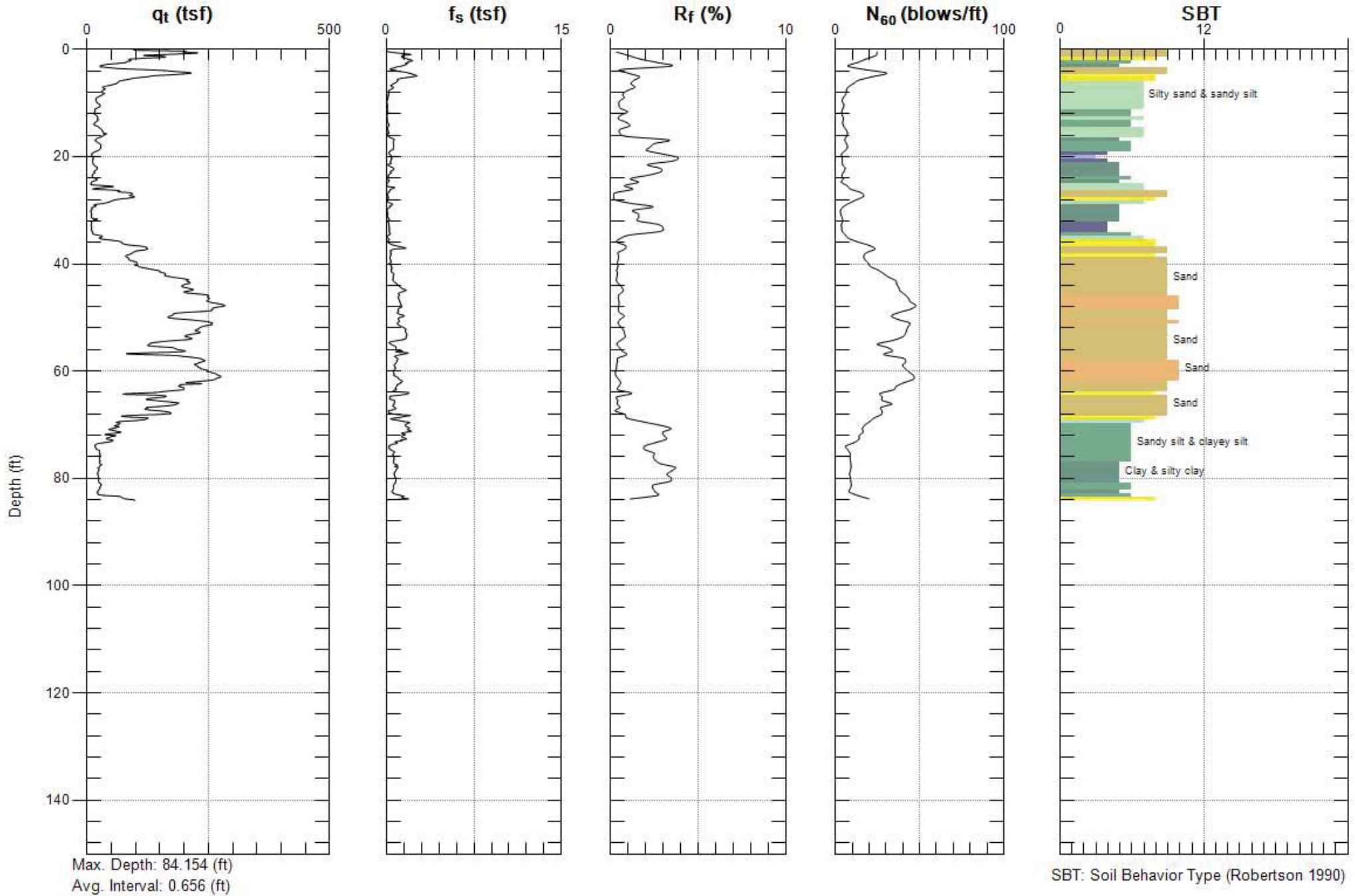


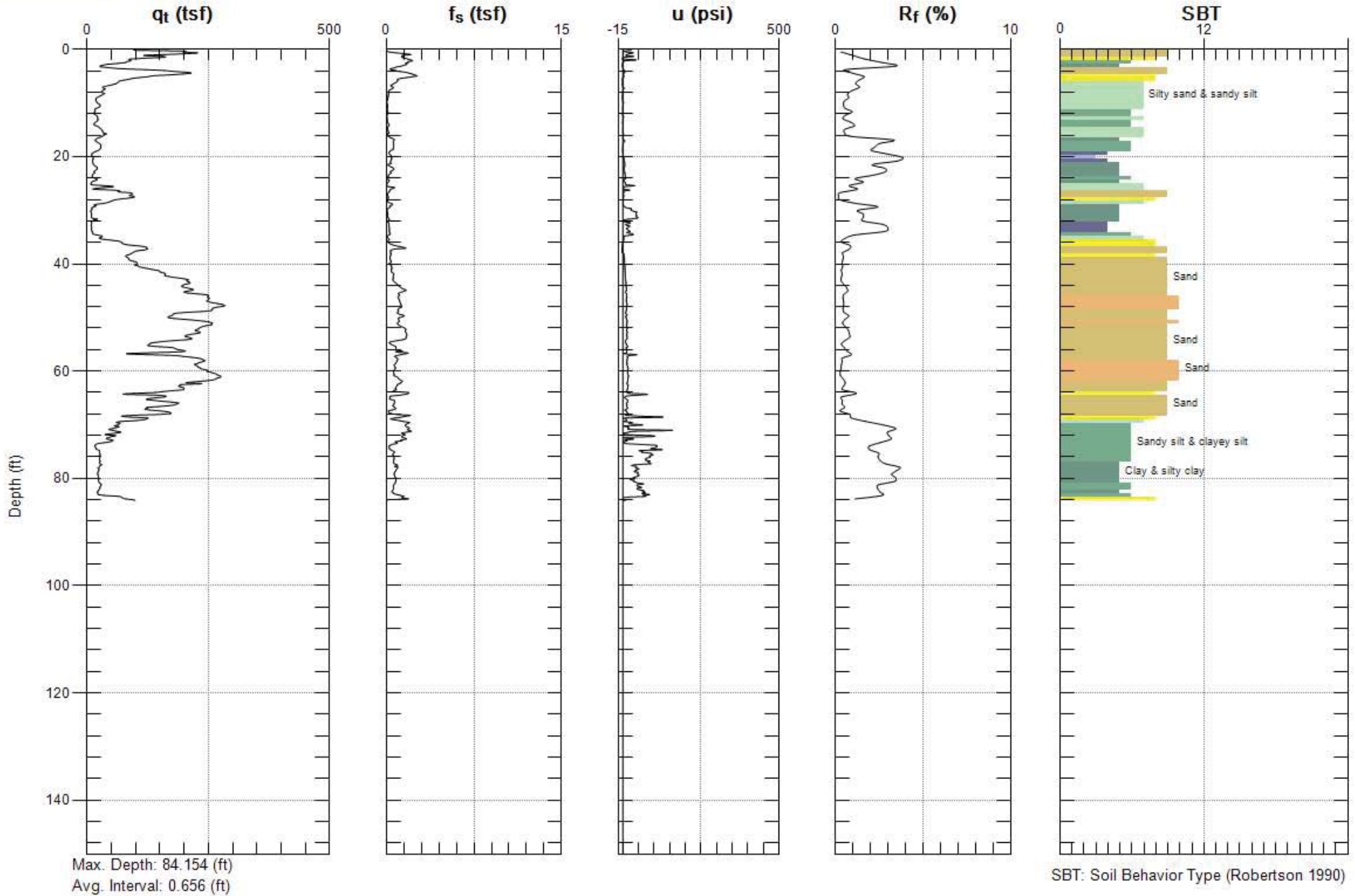


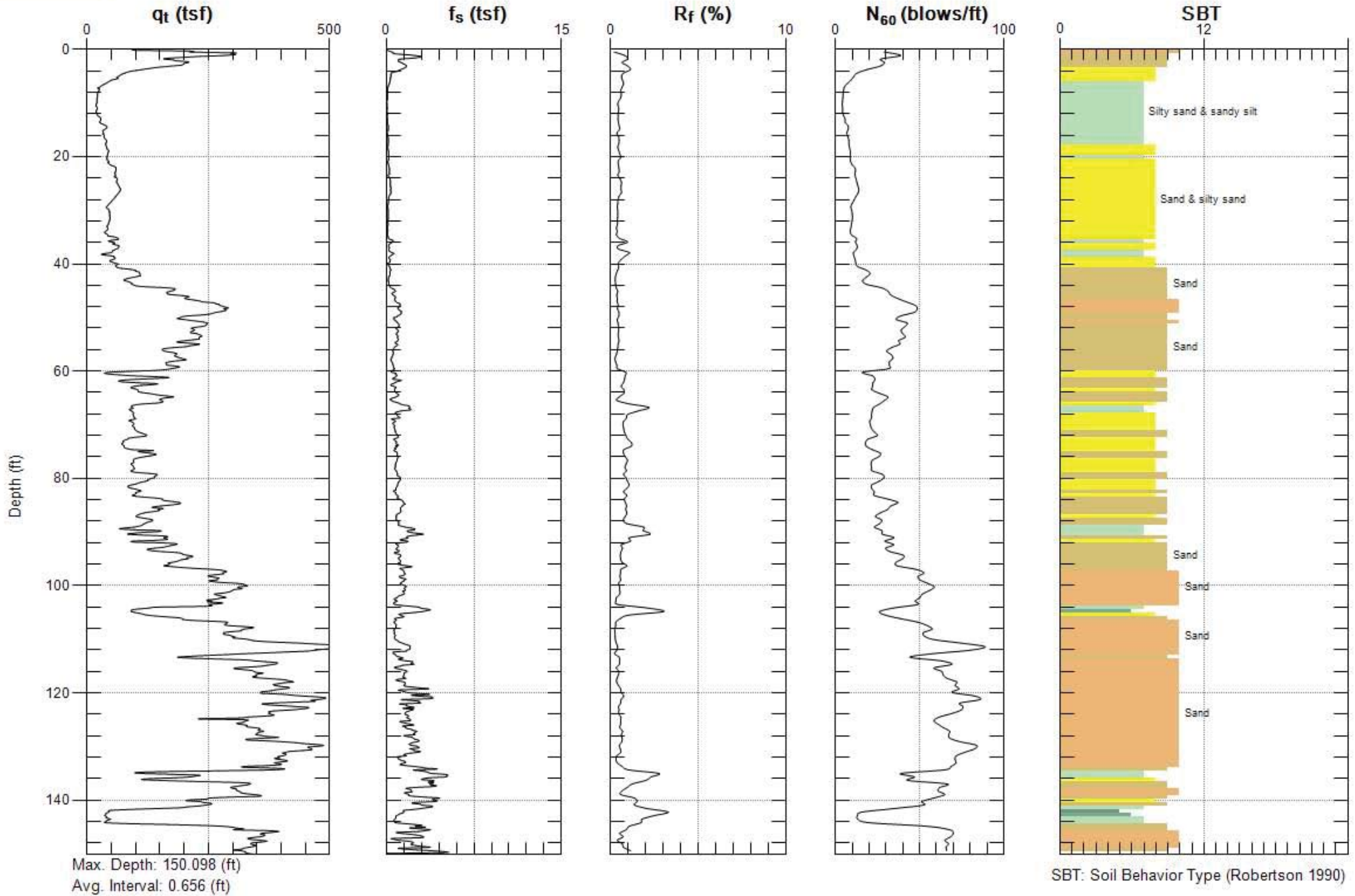
Max. Depth: 80.052 (ft)
 Avg. Interval: 0.656 (ft)

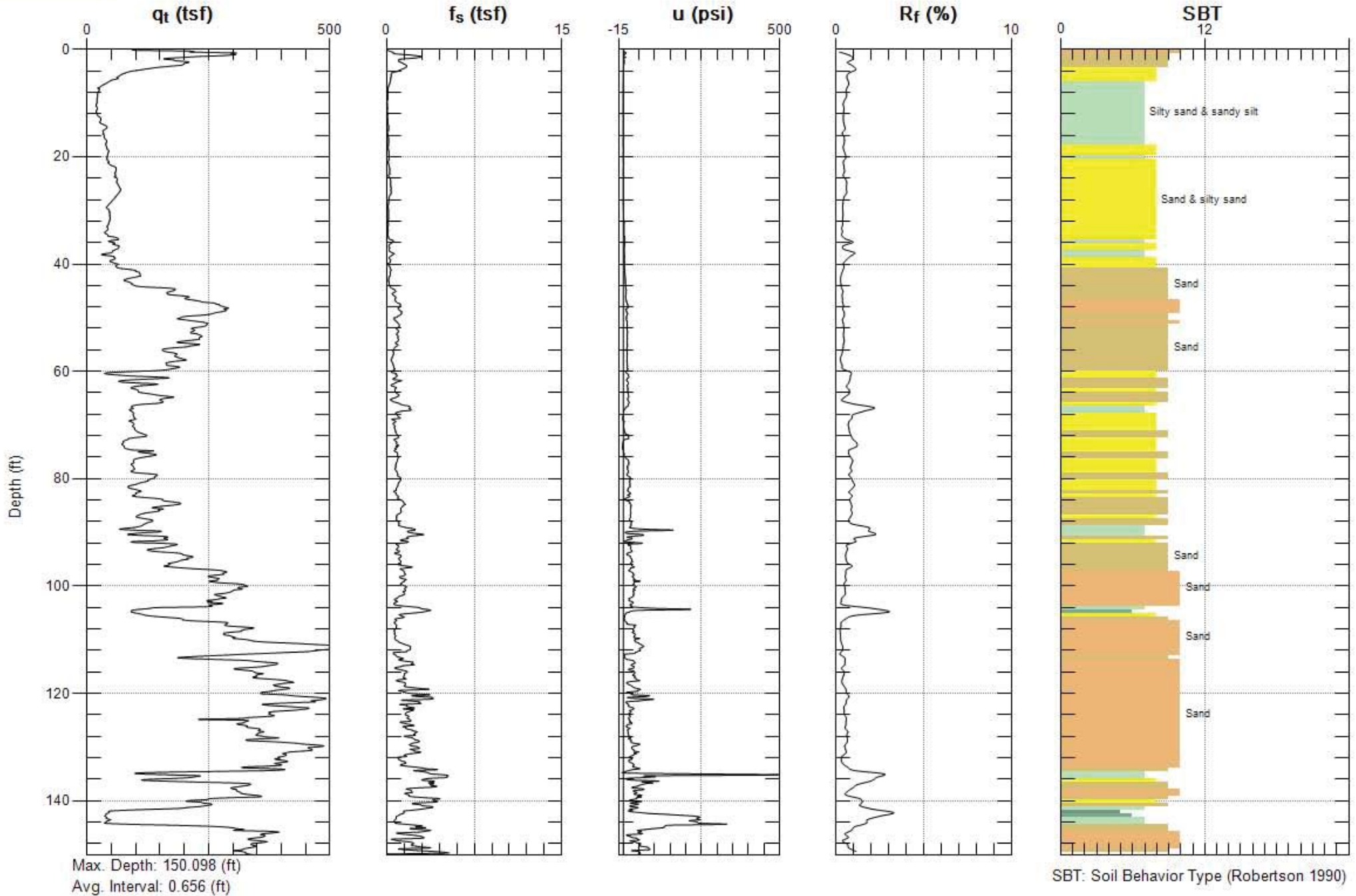
SBT: Soil Behavior Type (Robertson 1990)

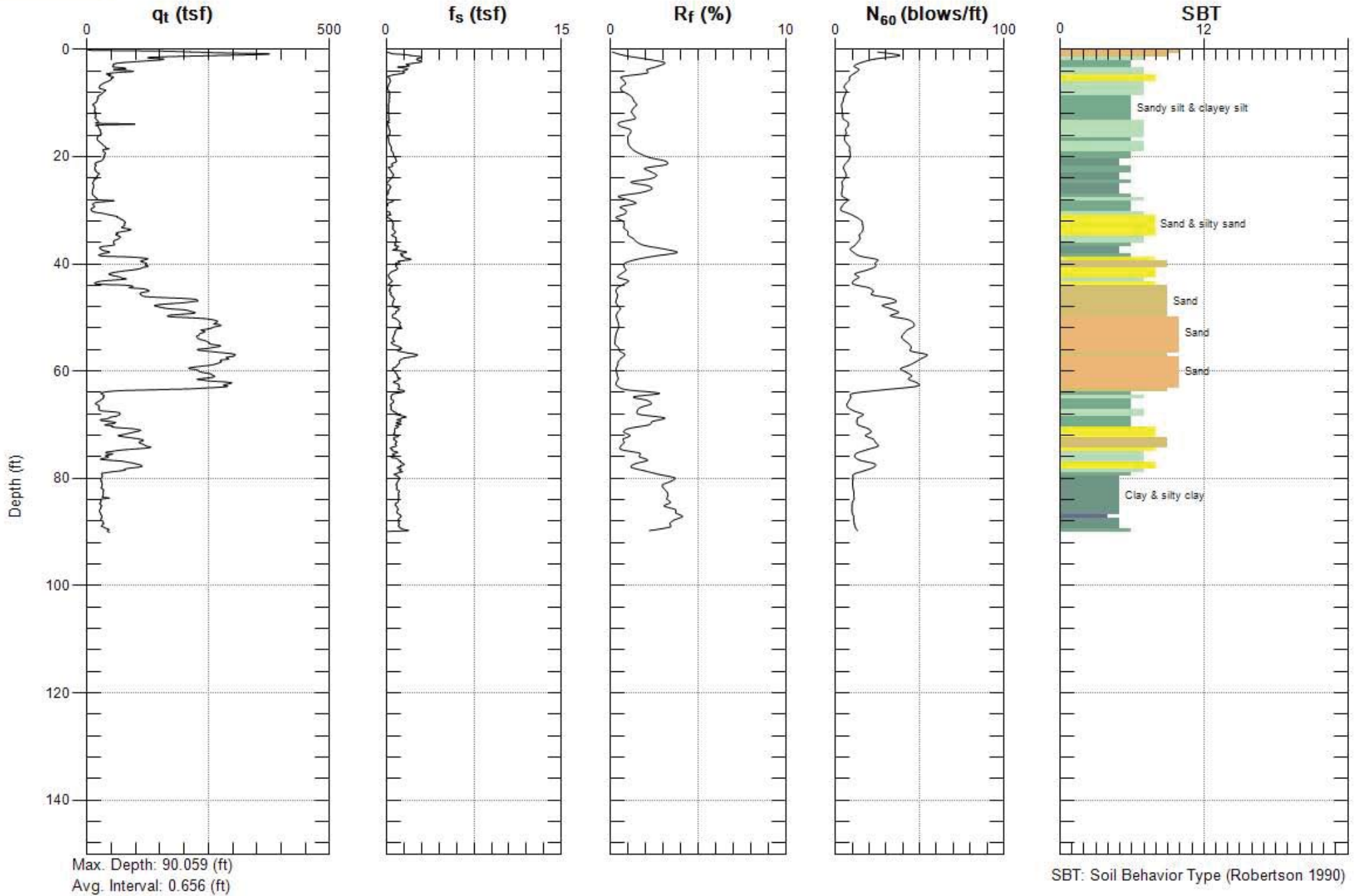


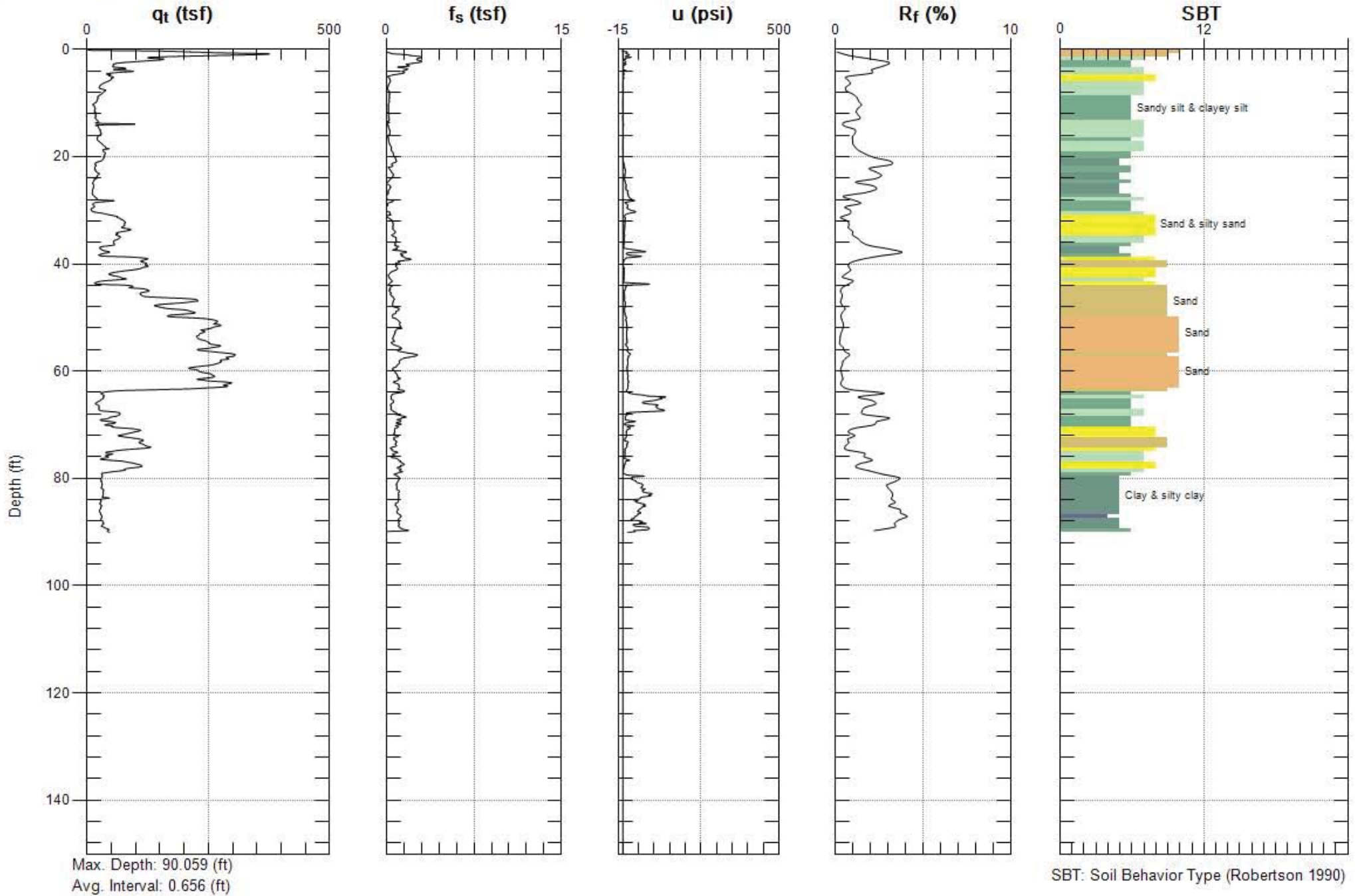


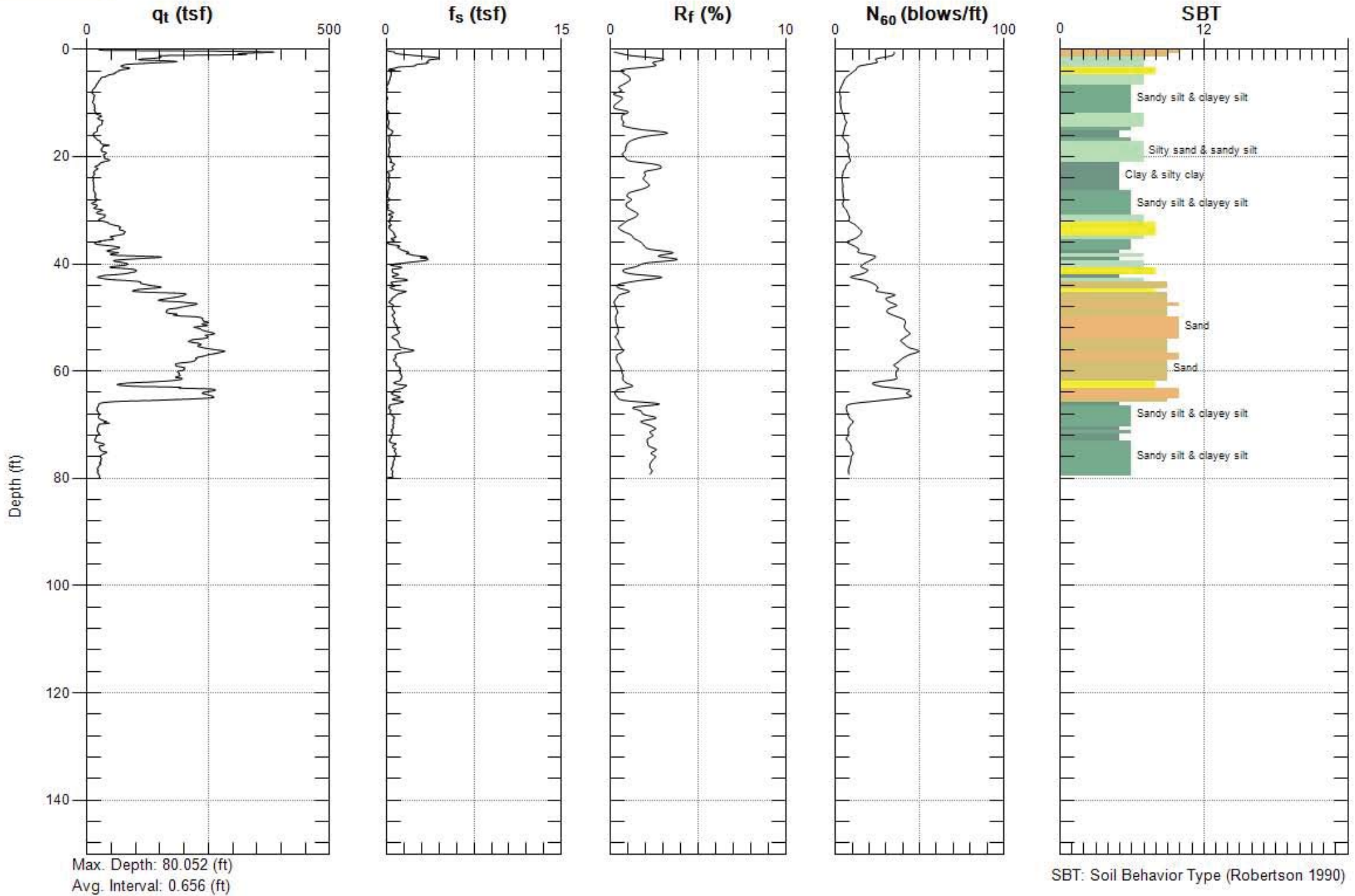


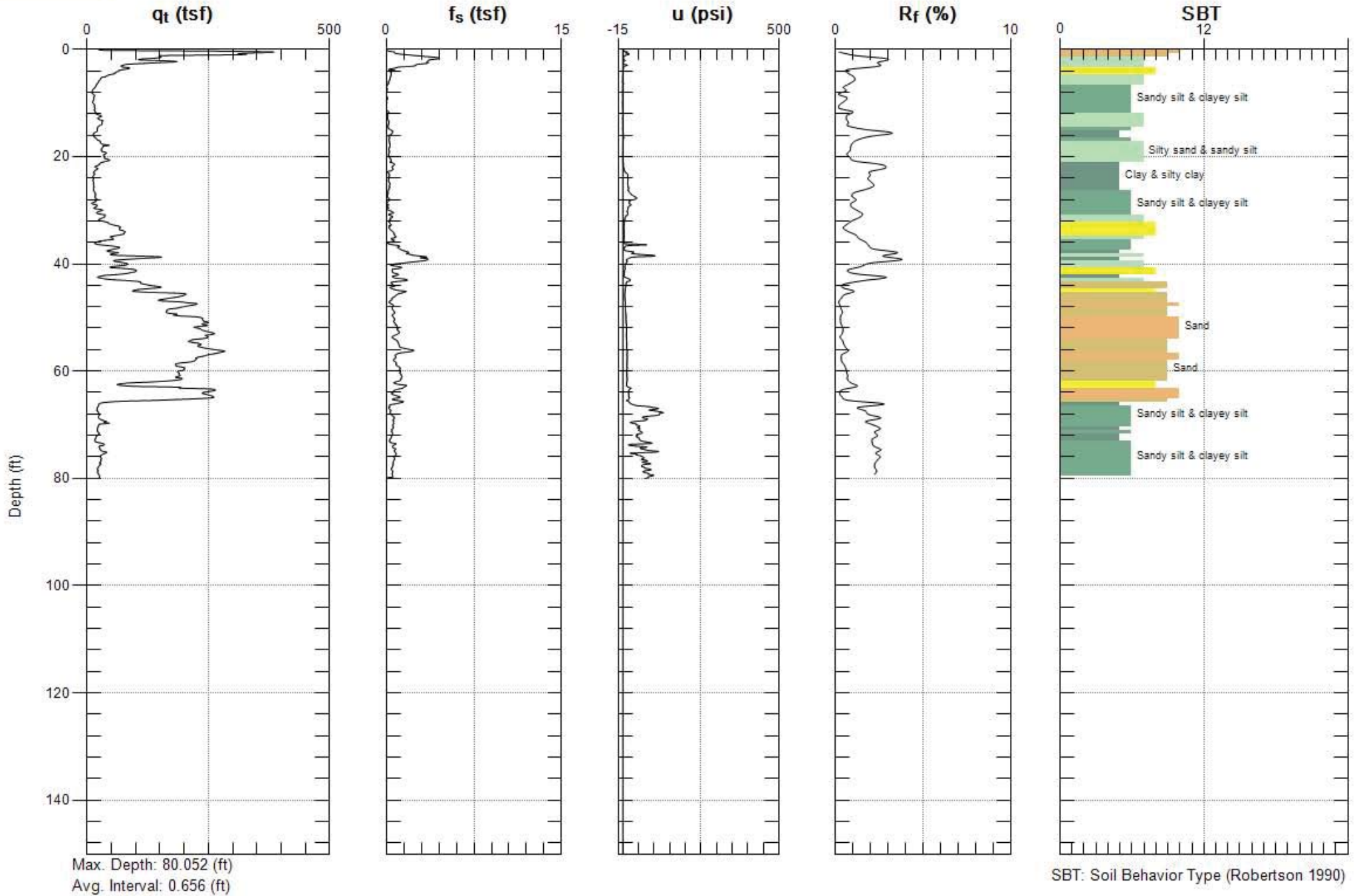


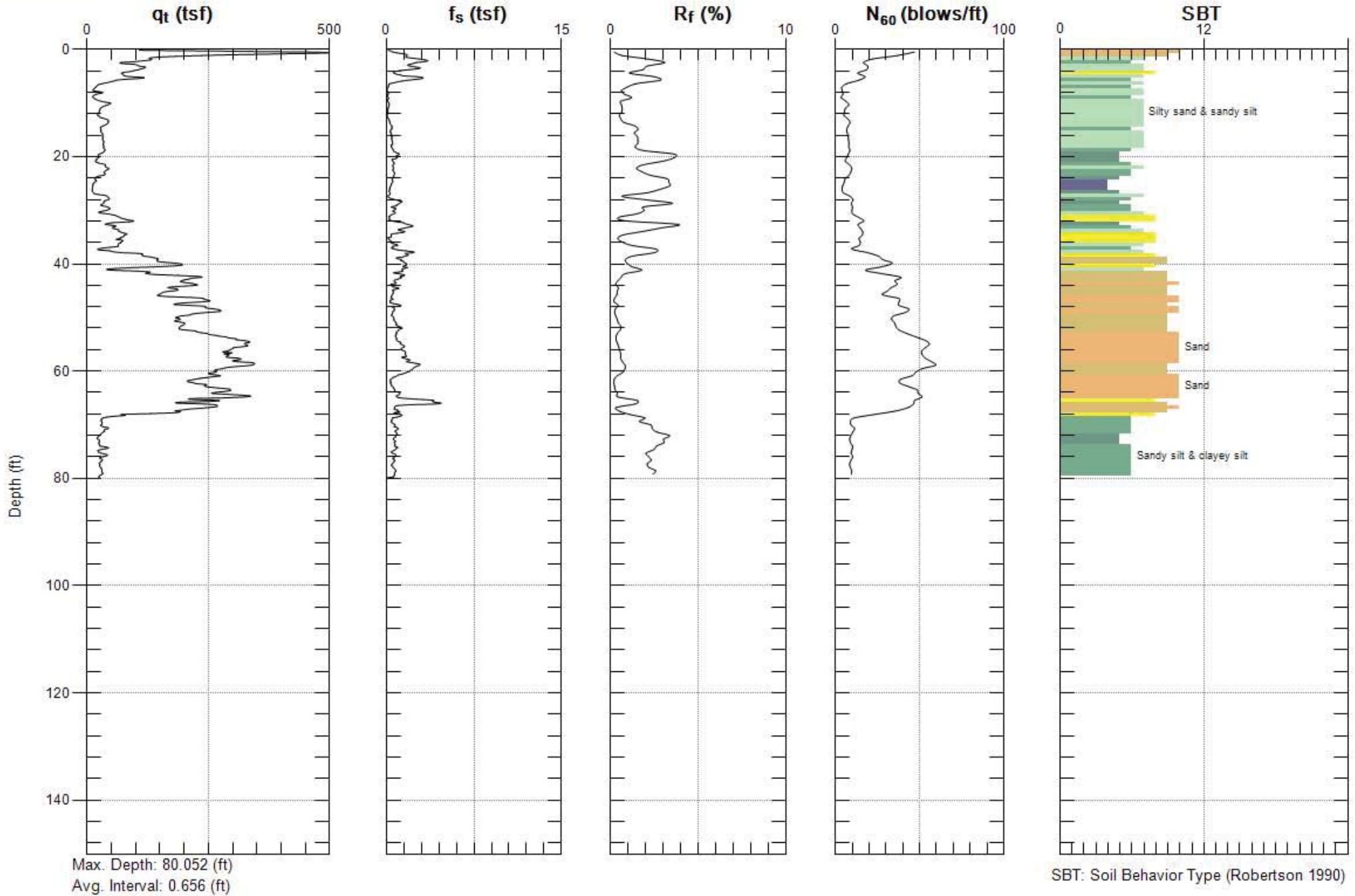


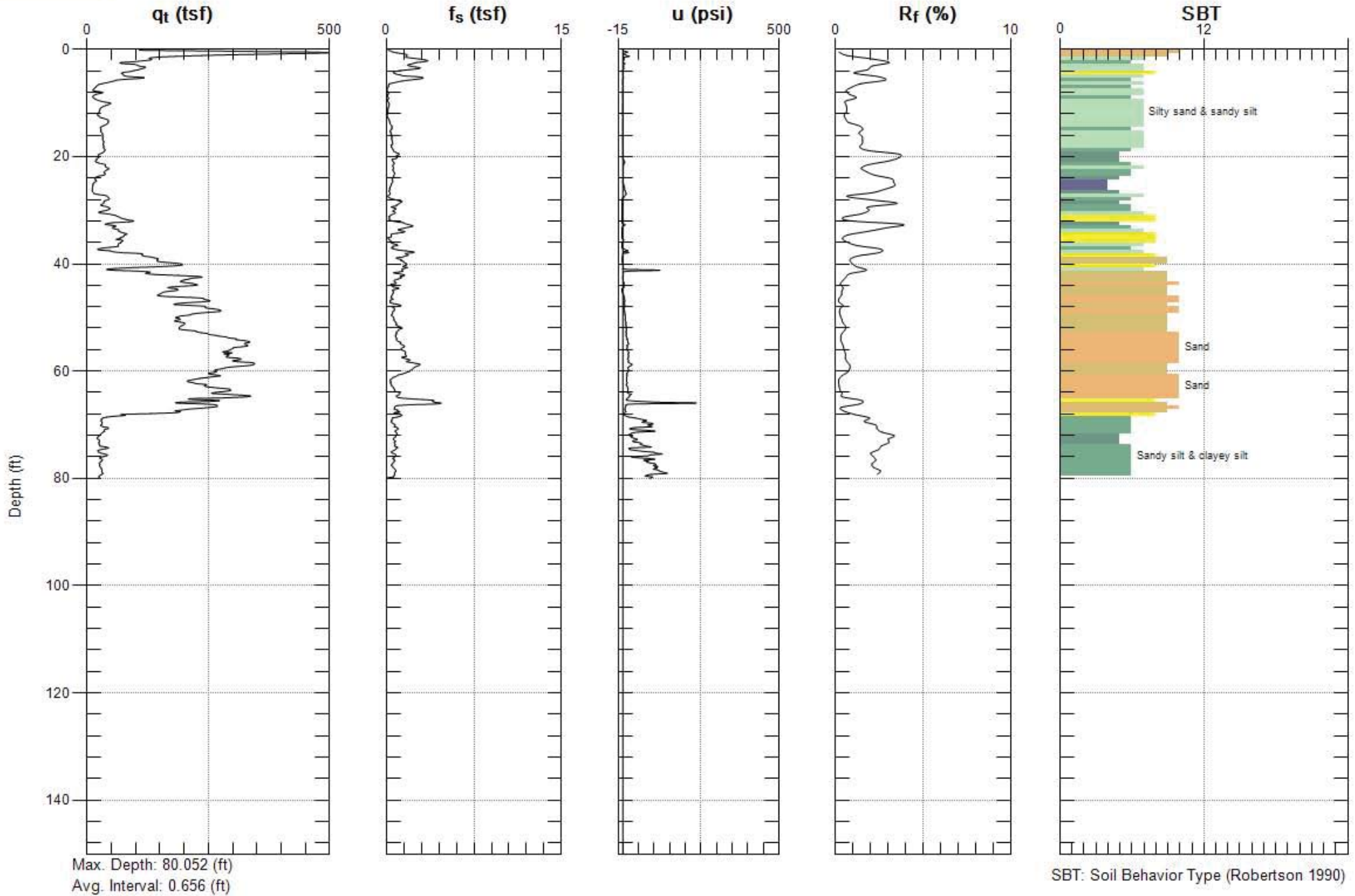


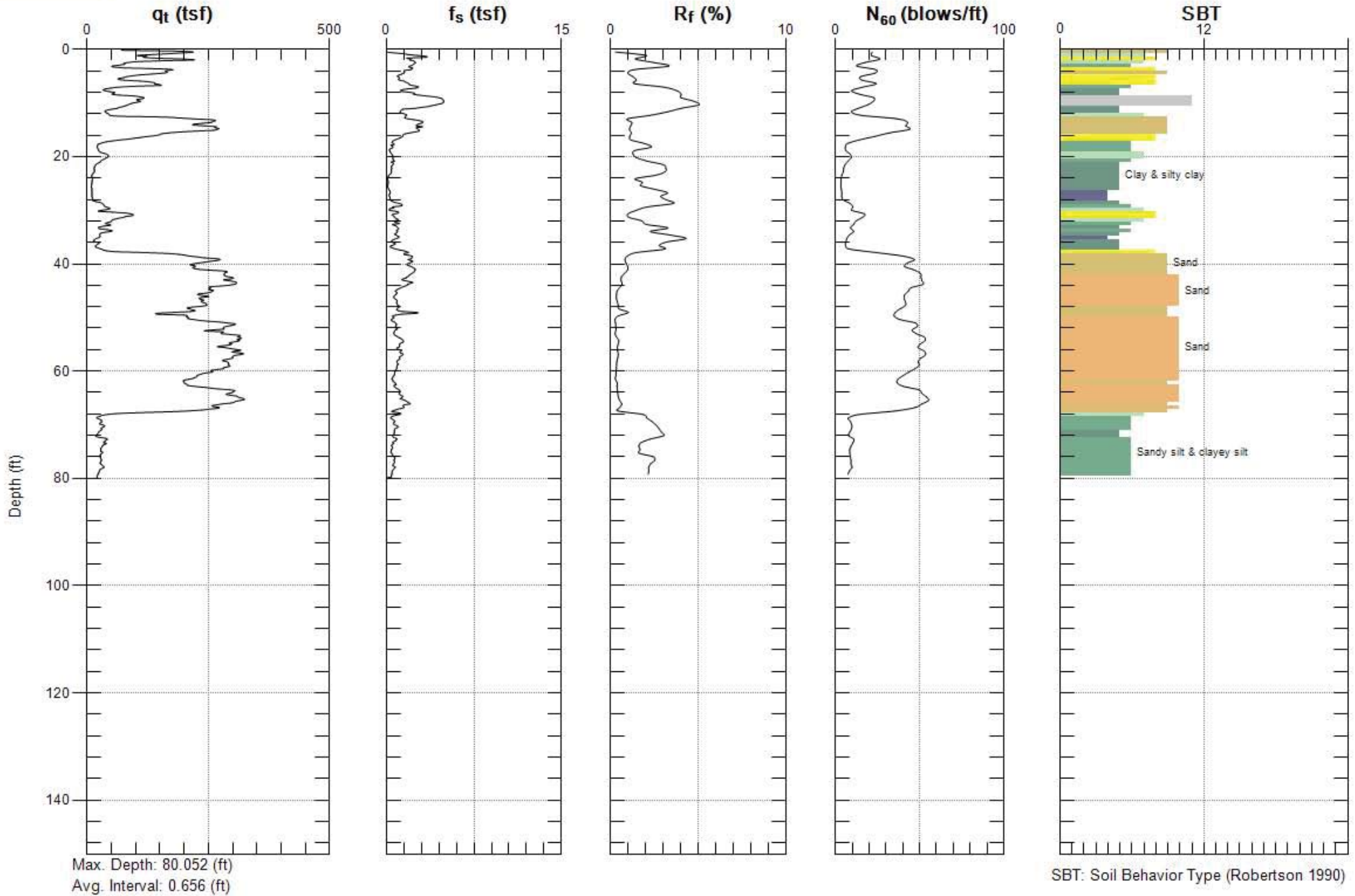


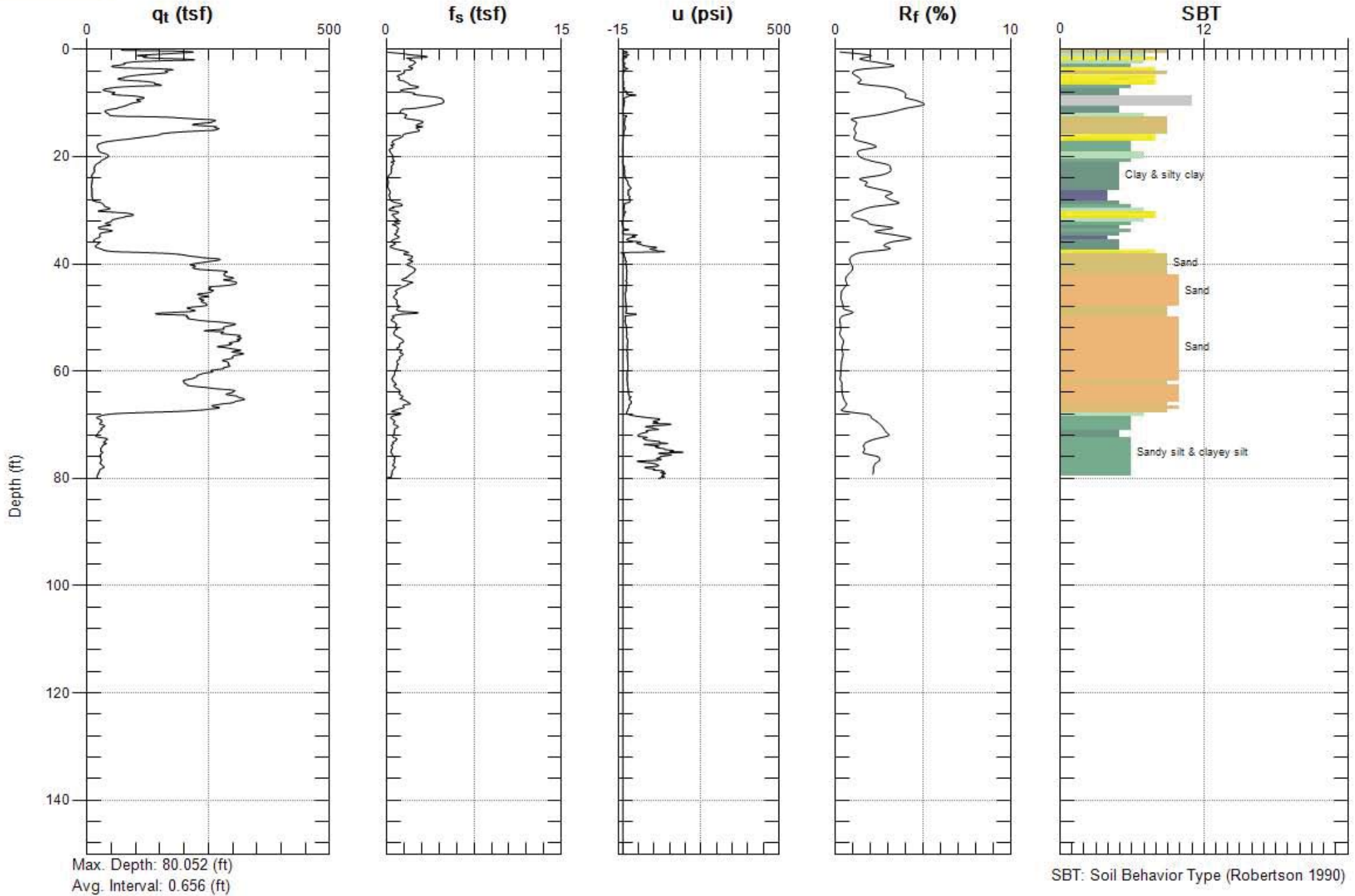


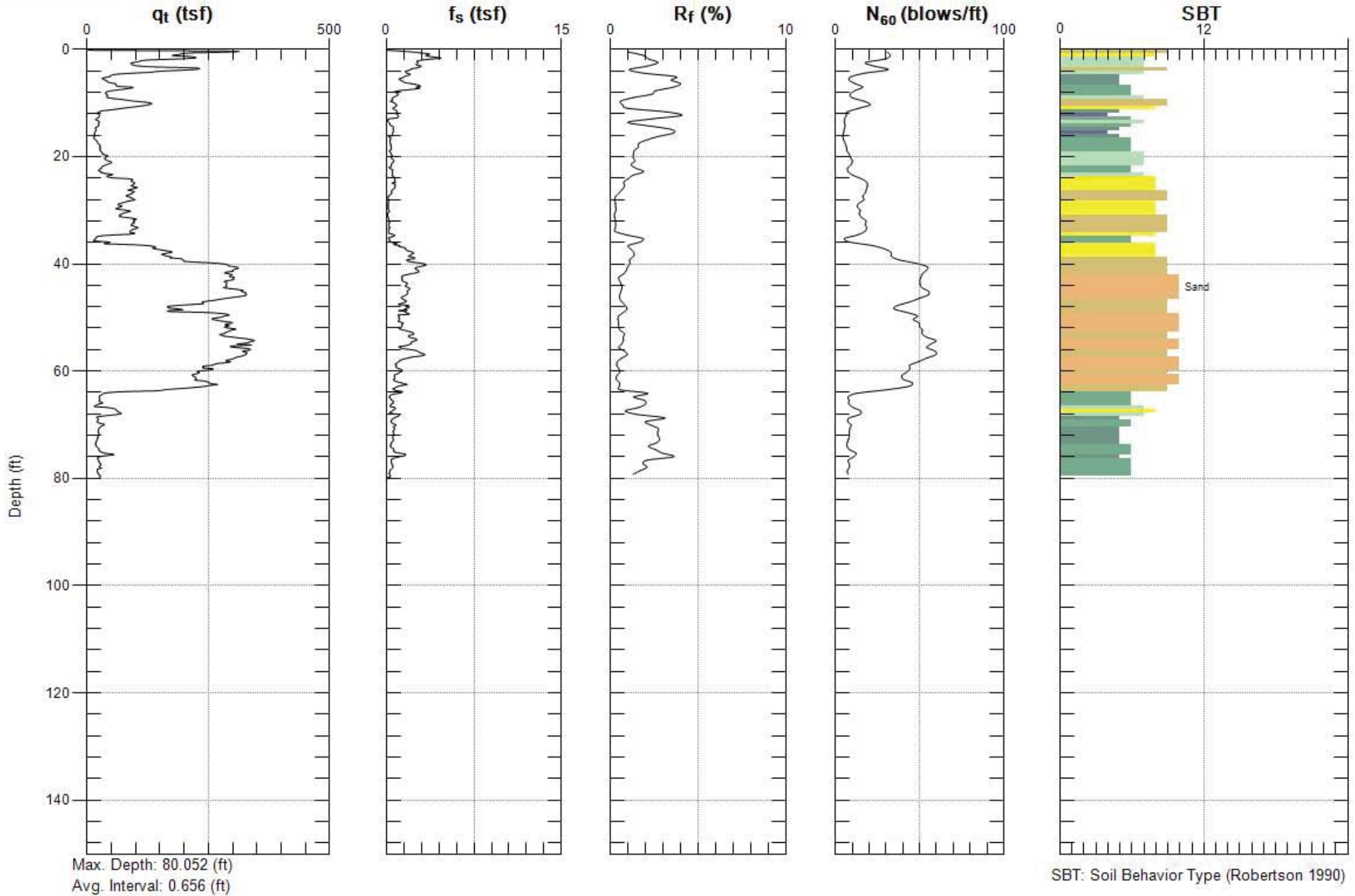


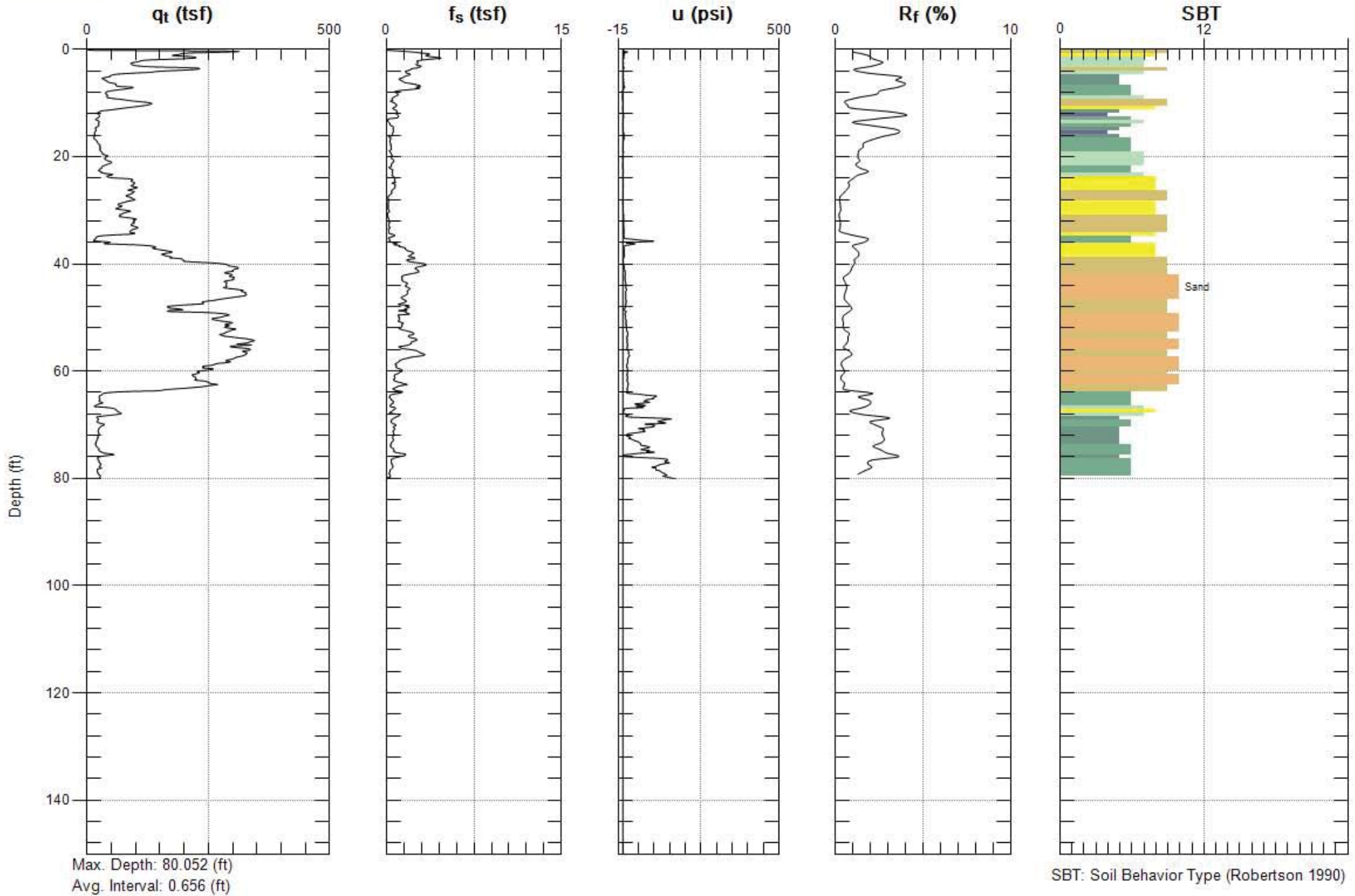


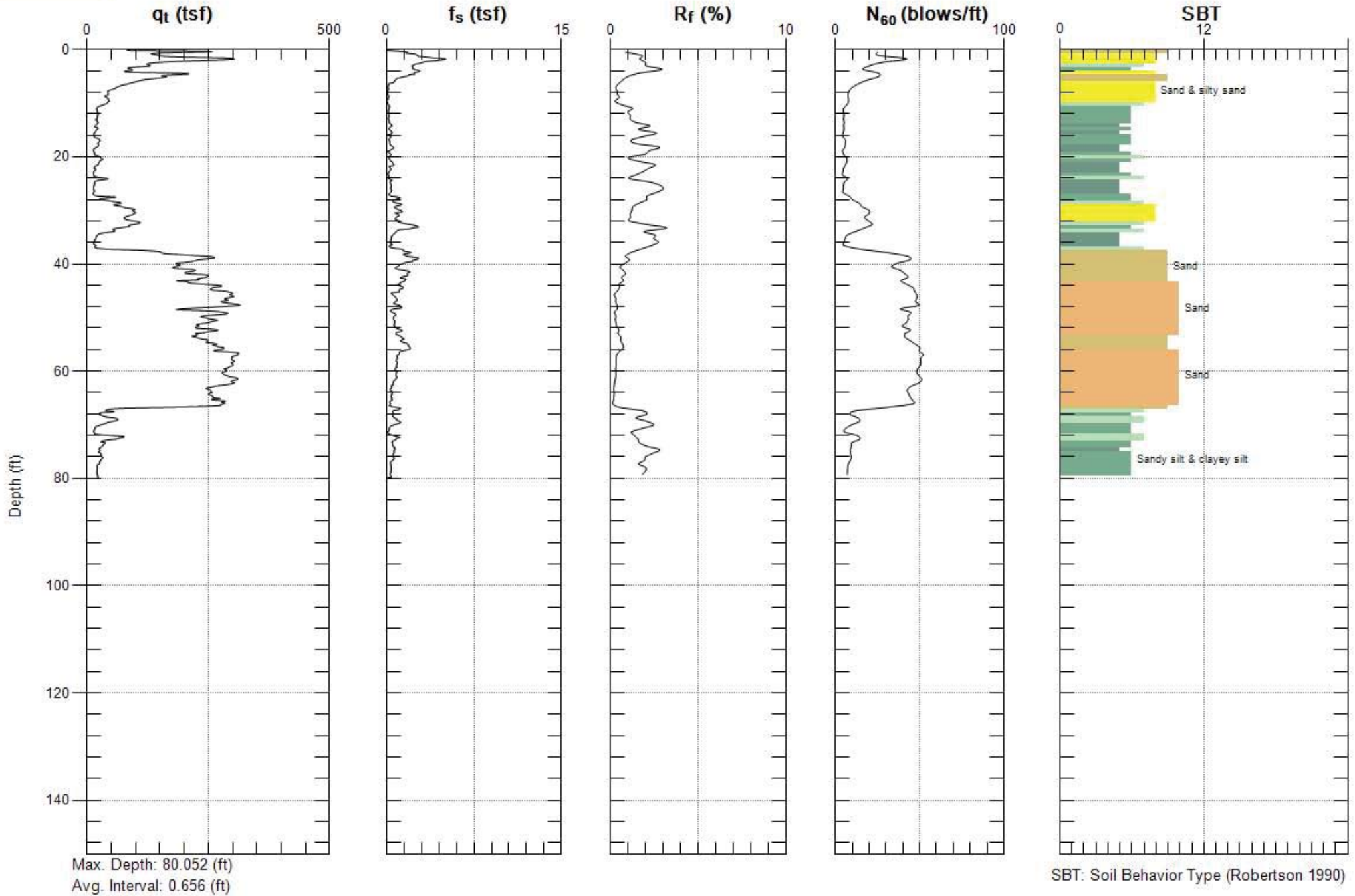


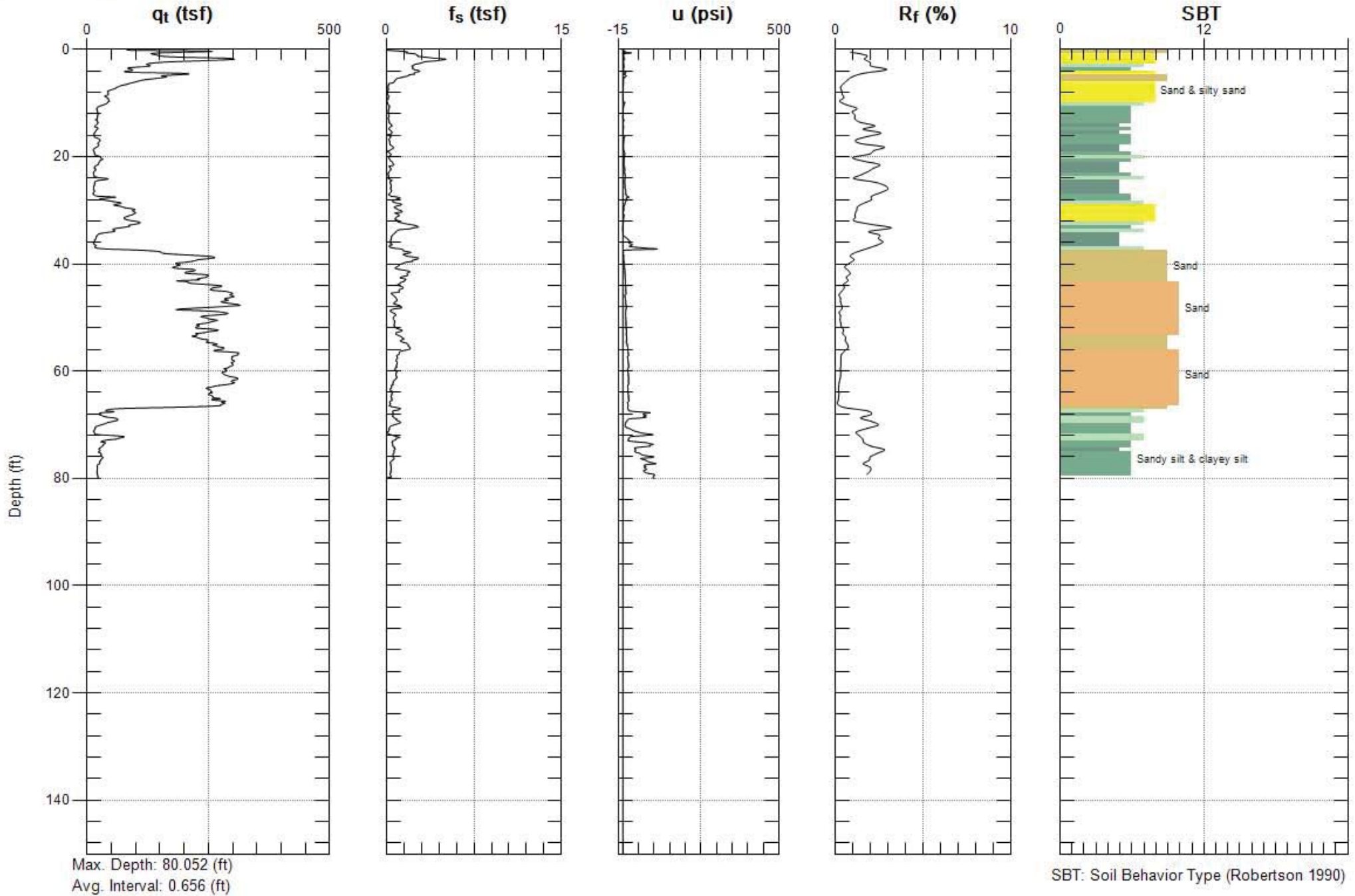


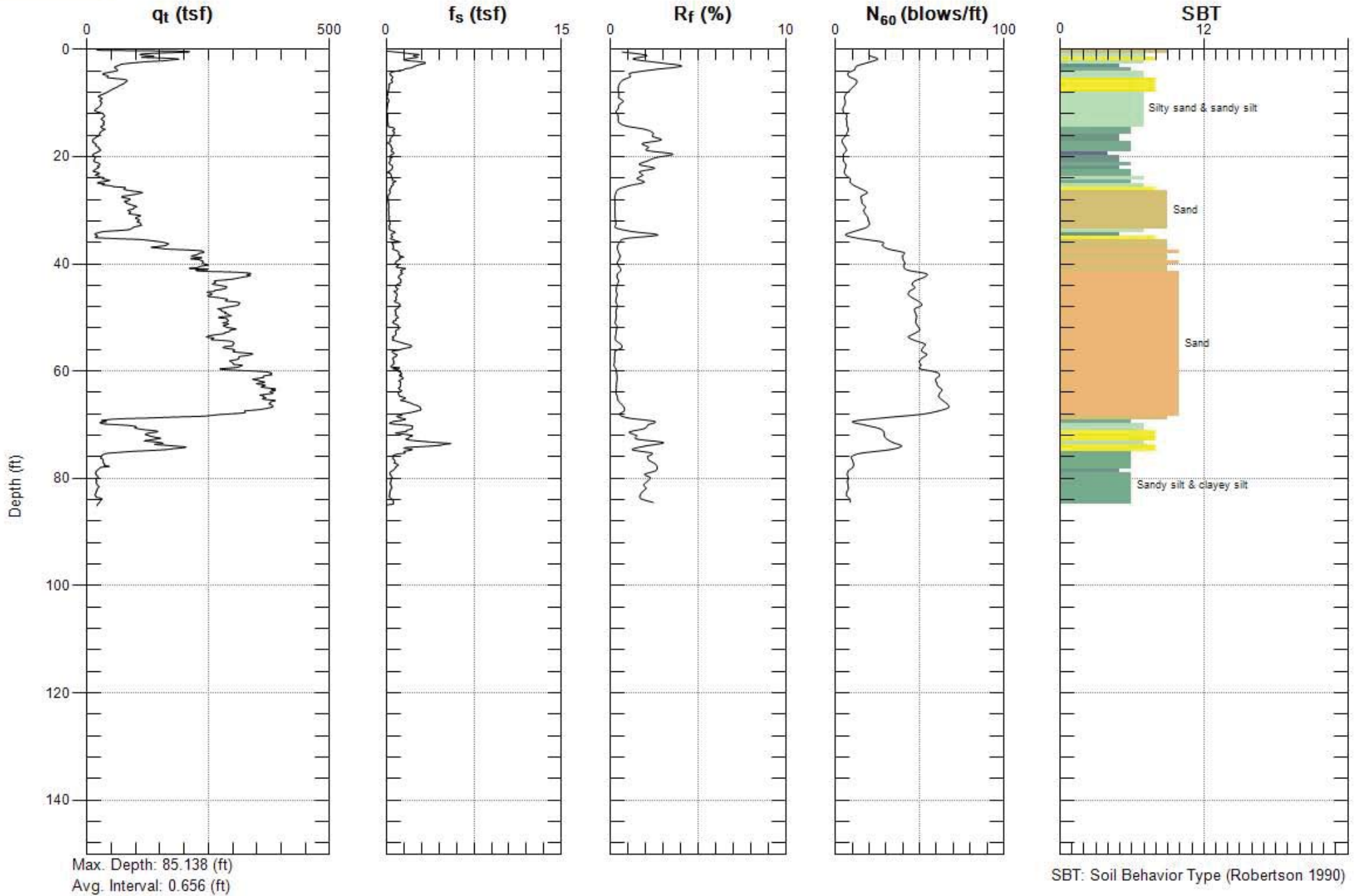


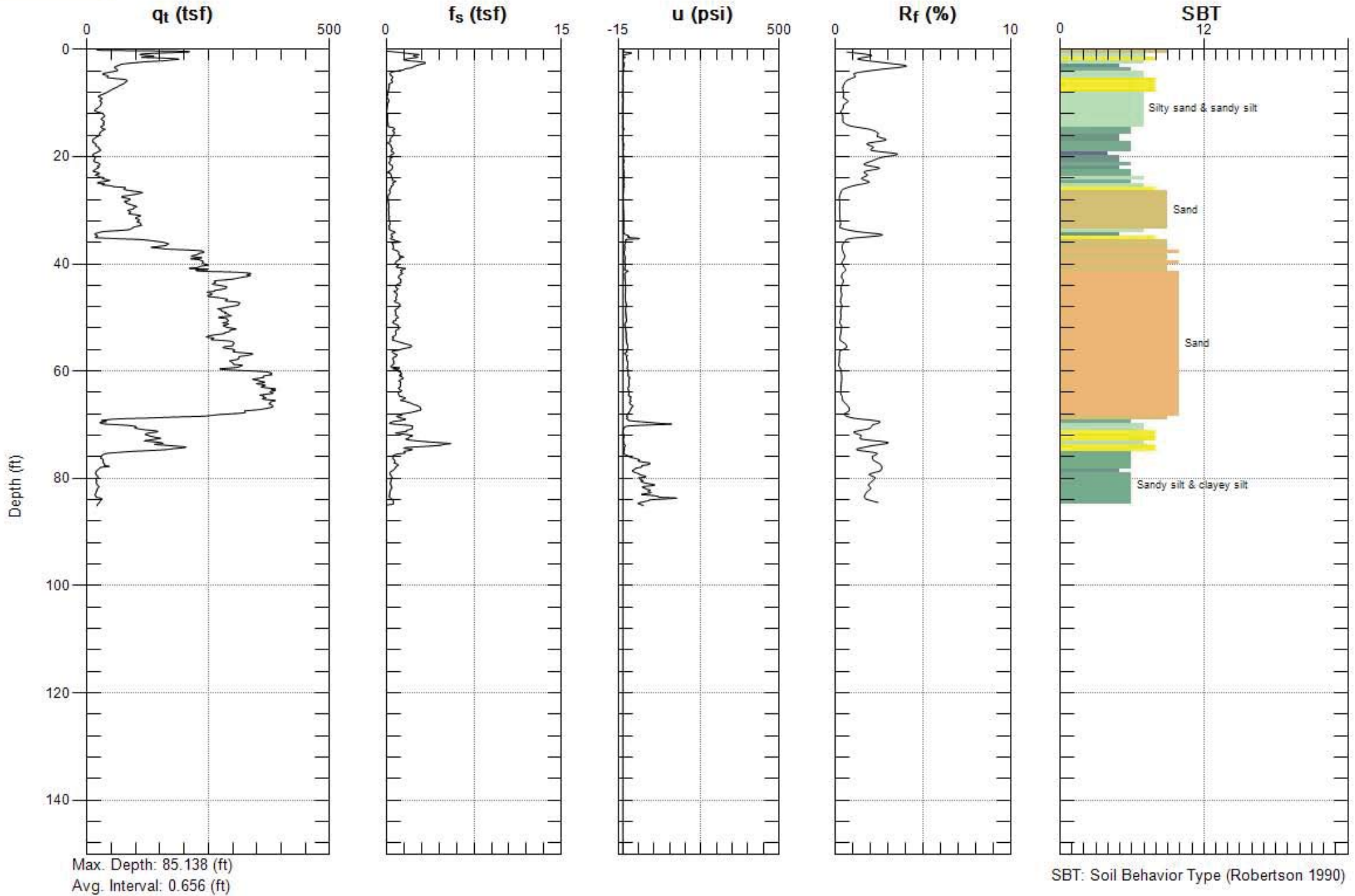


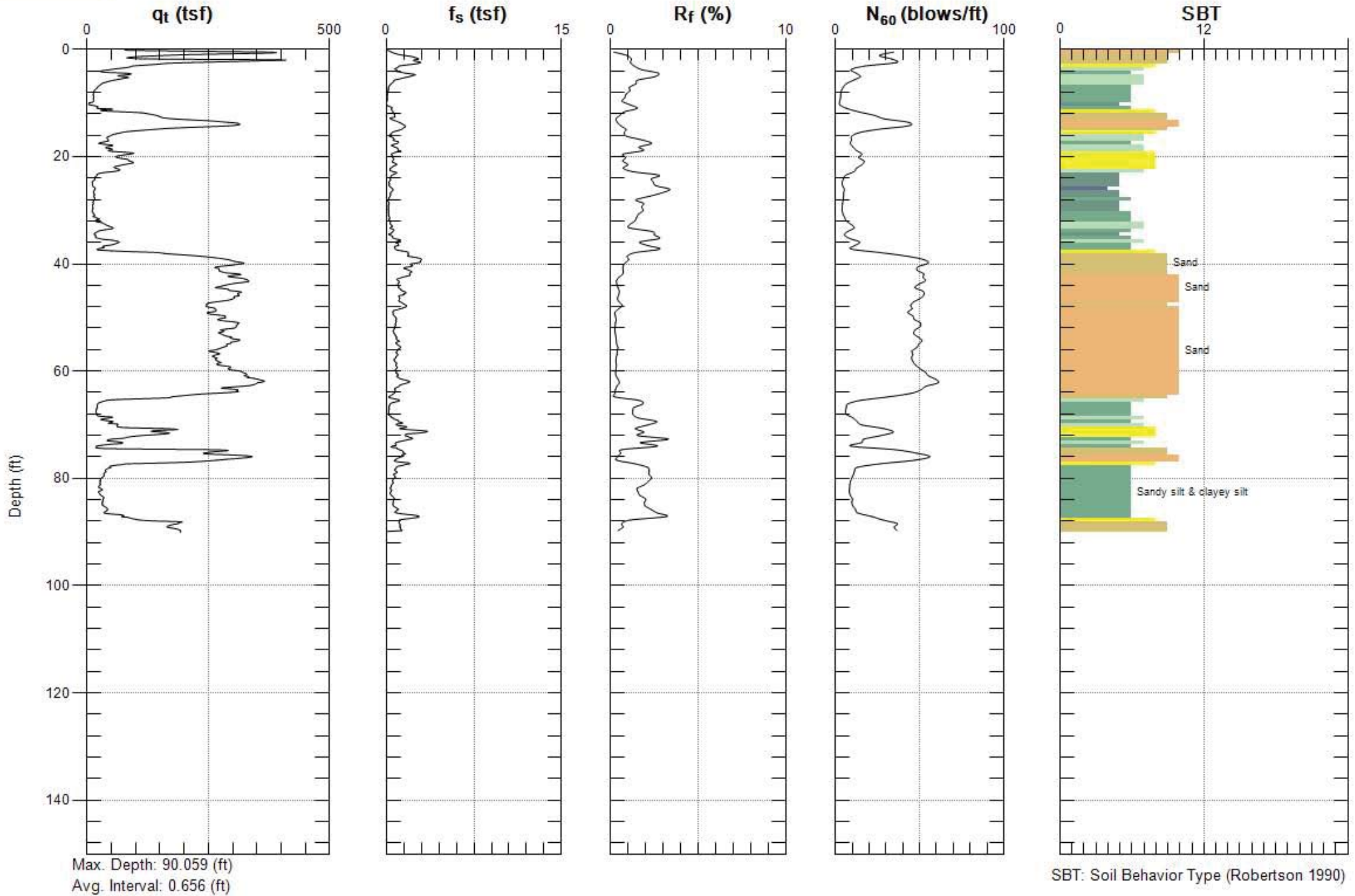


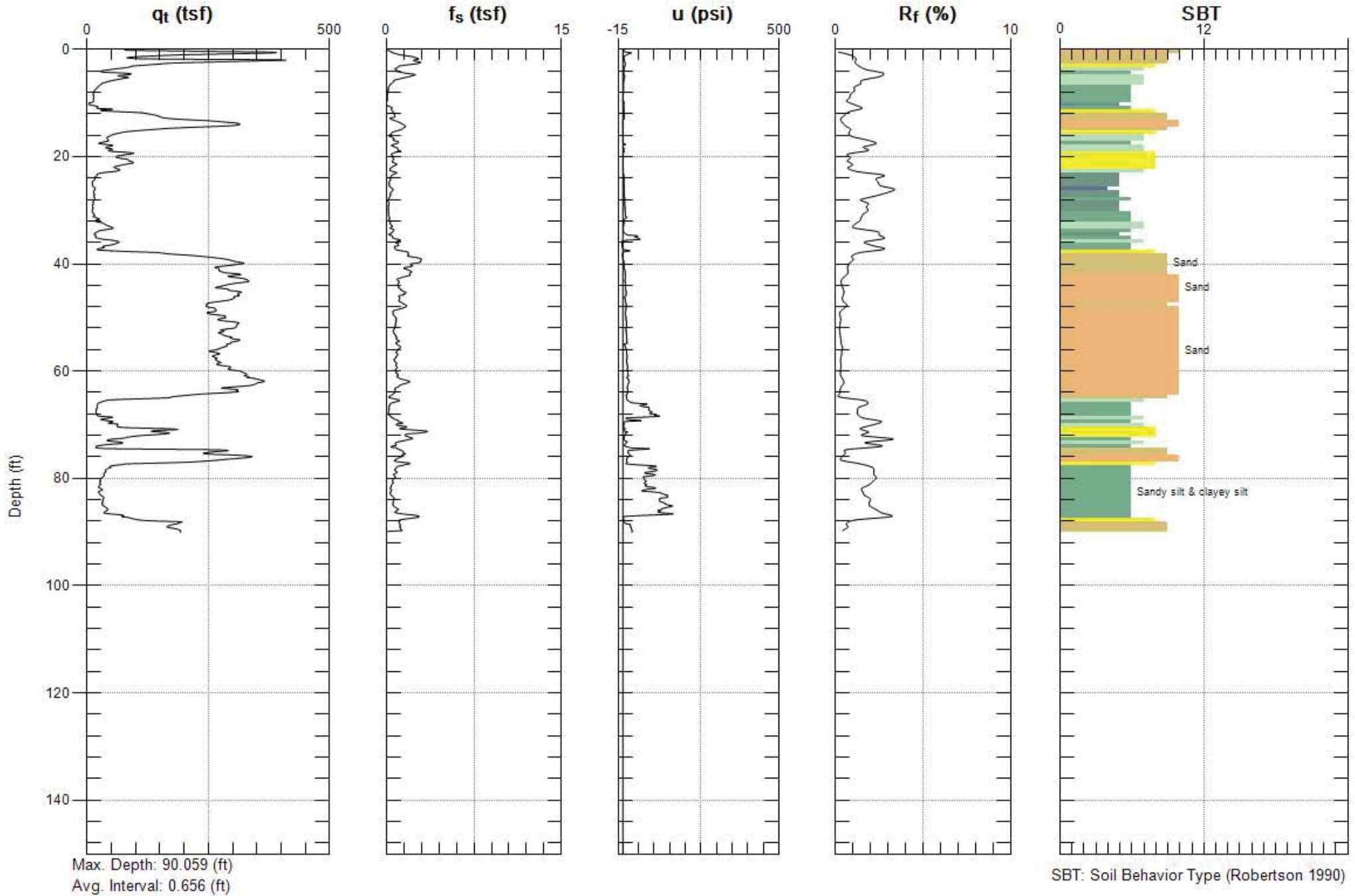


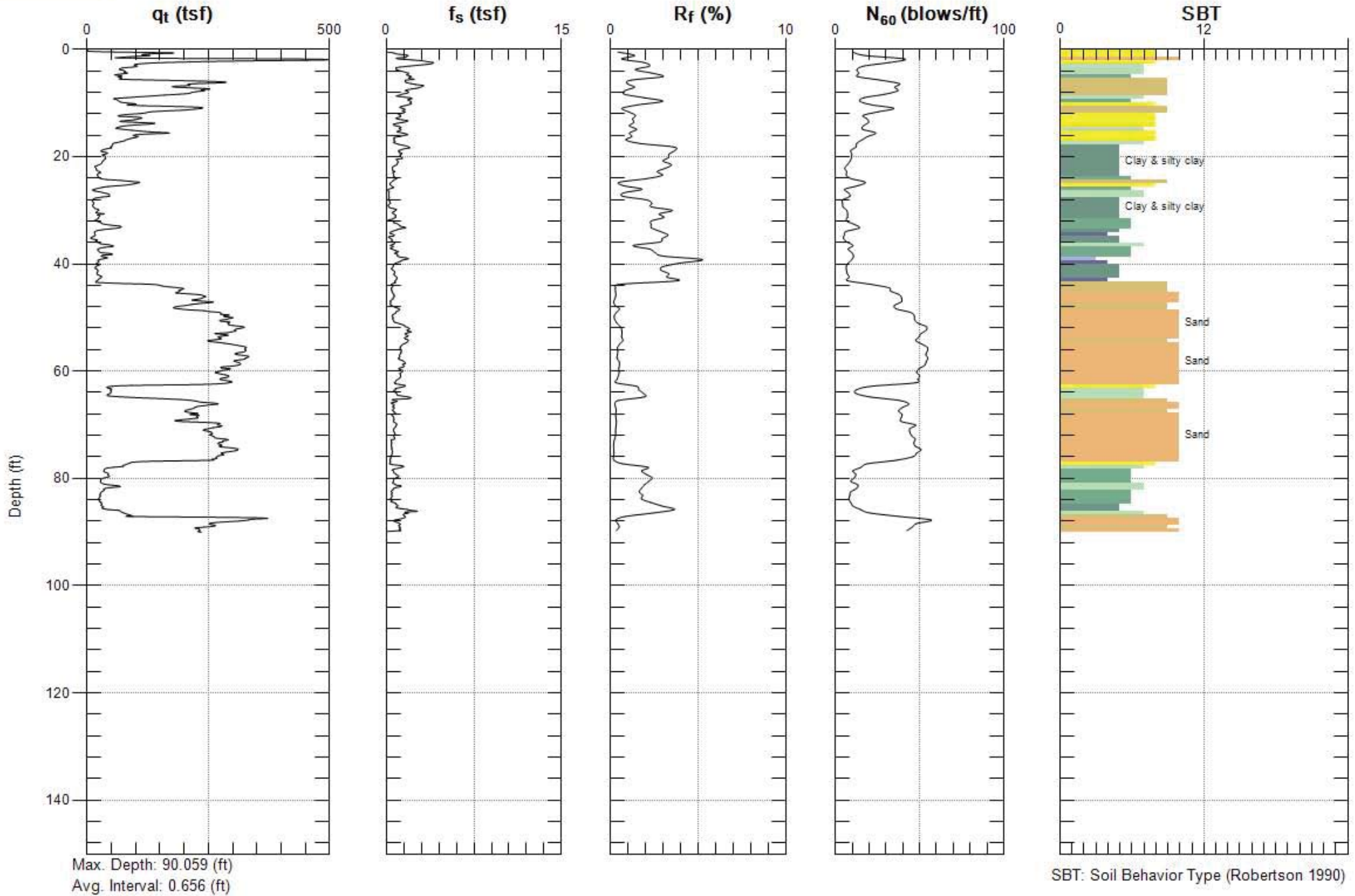


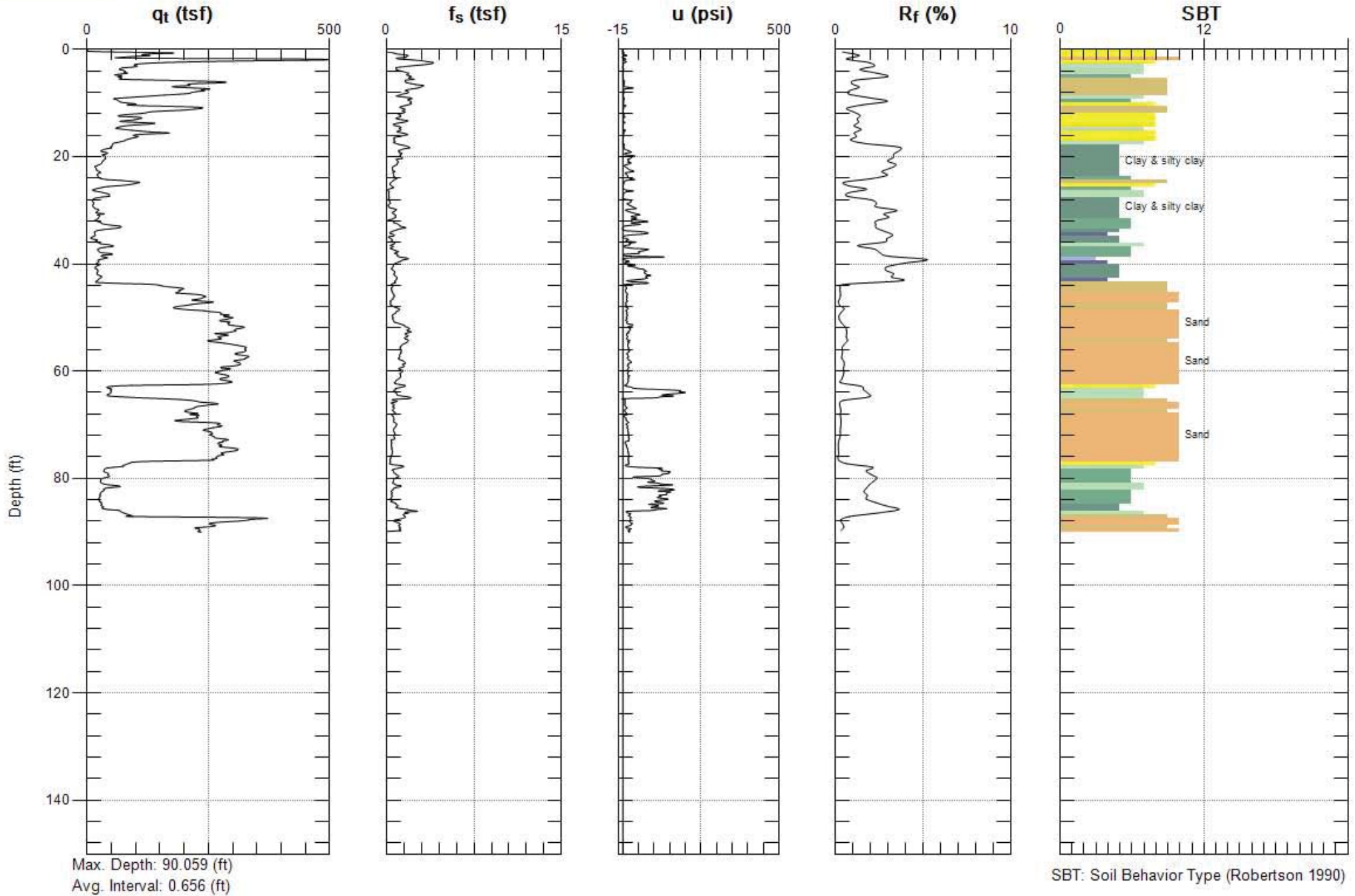


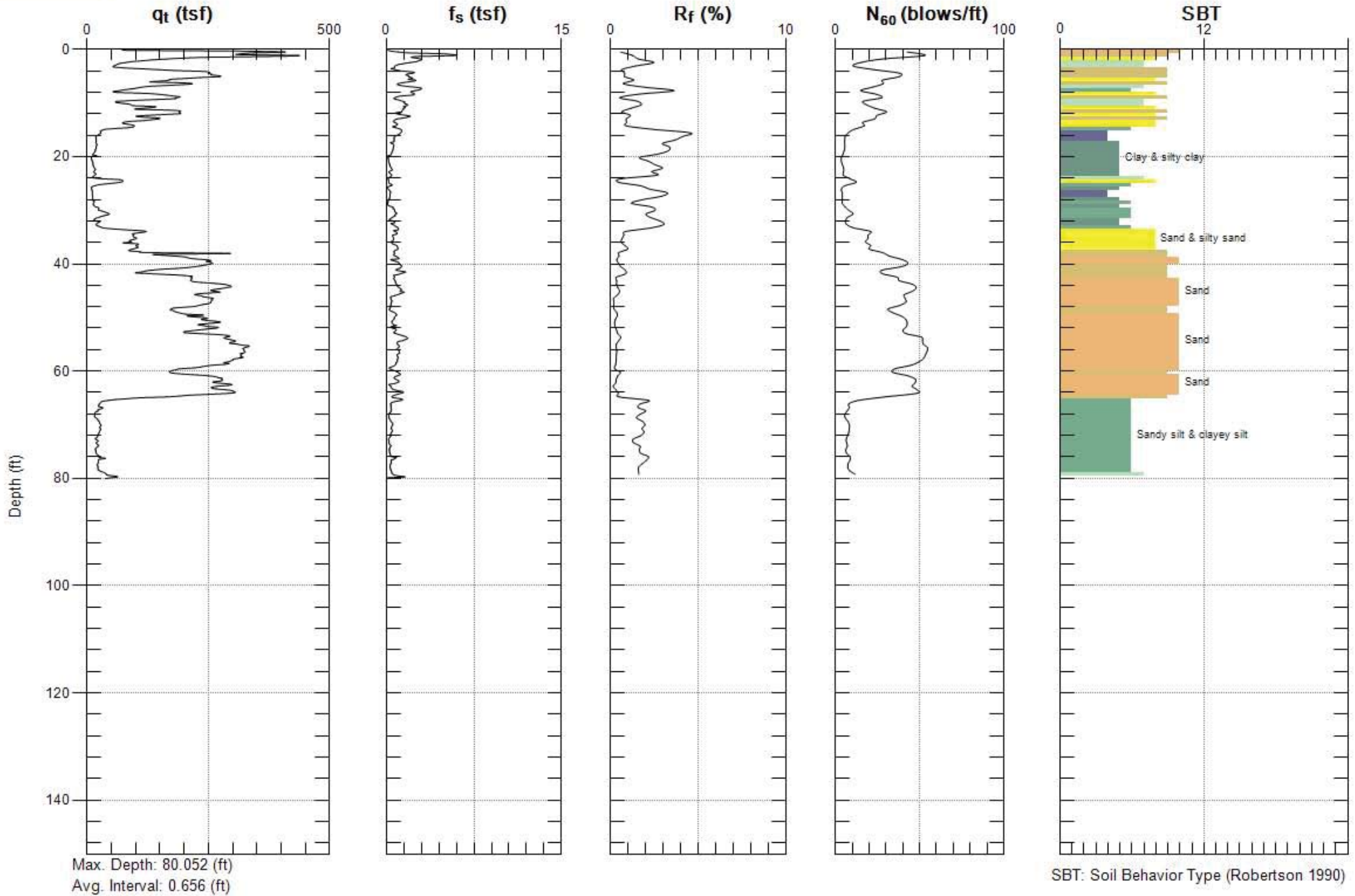


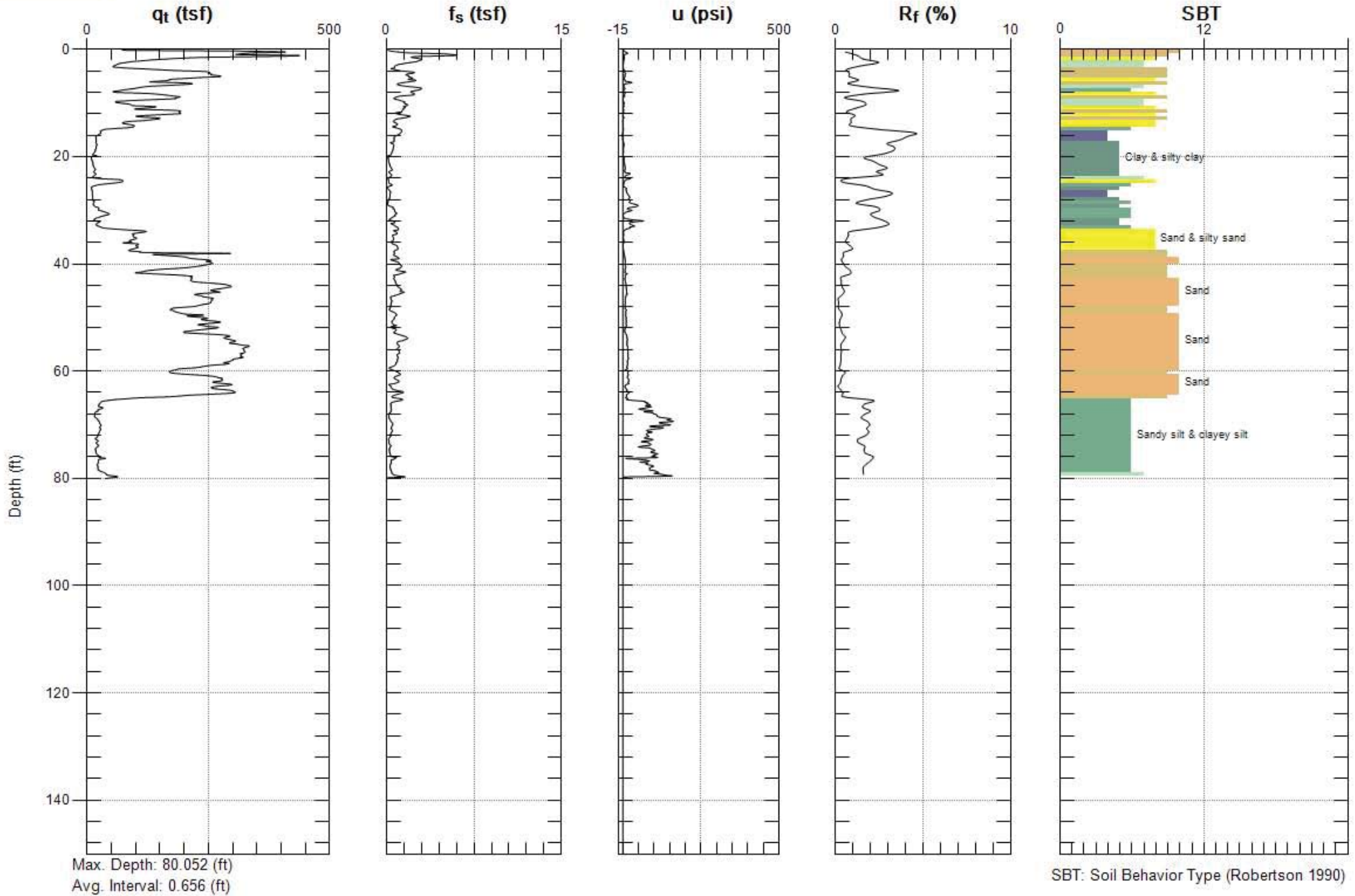


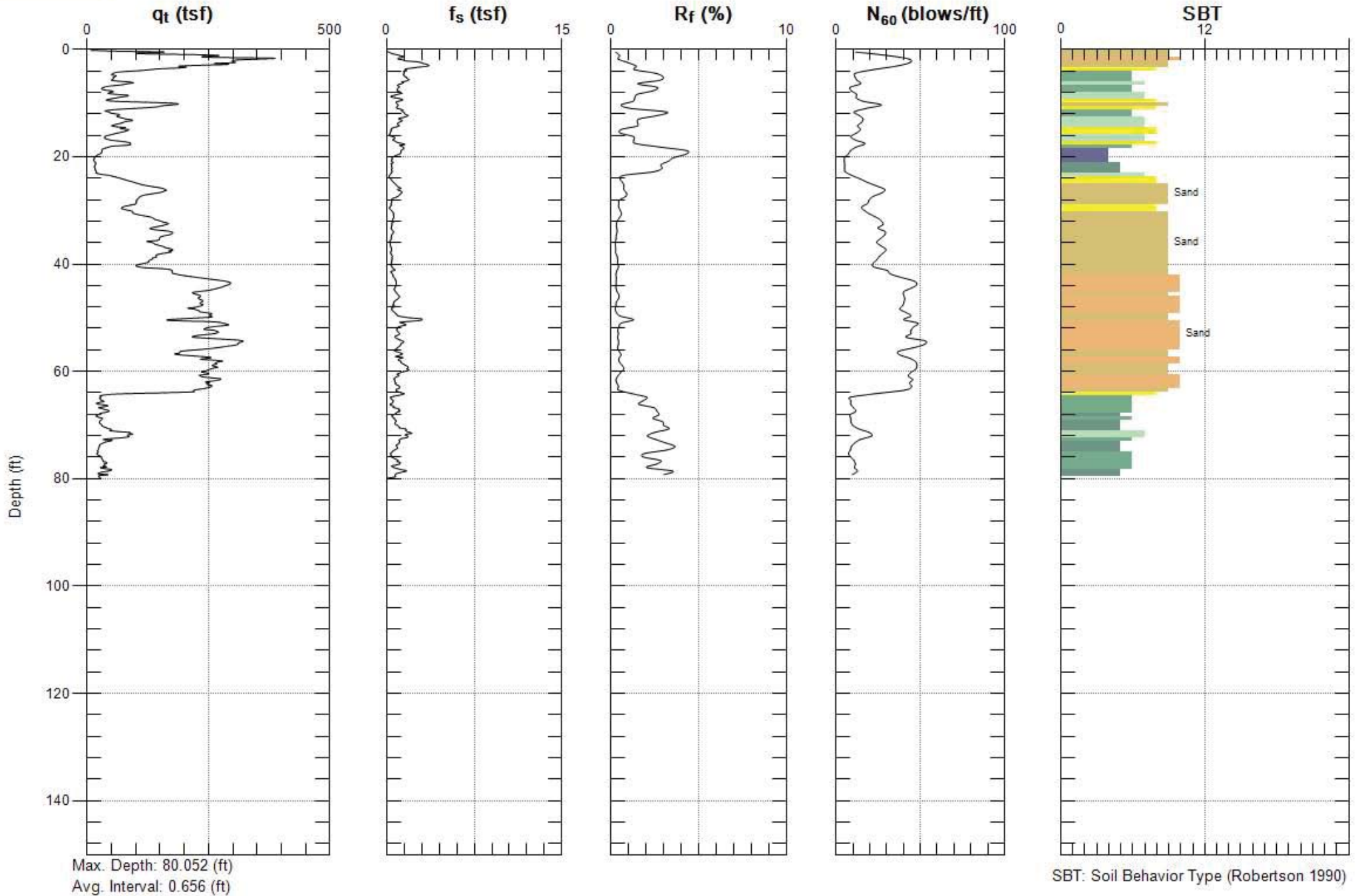


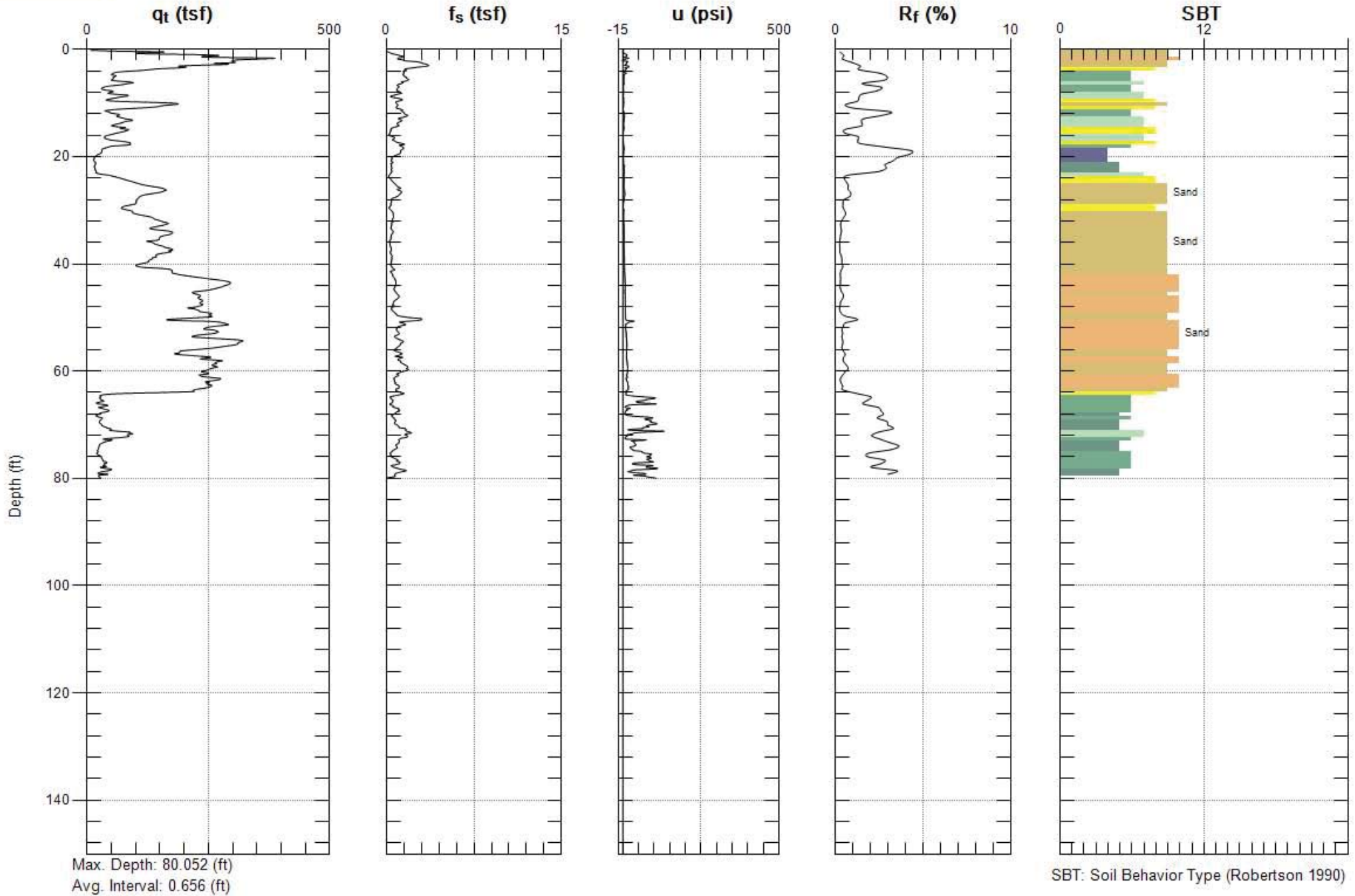


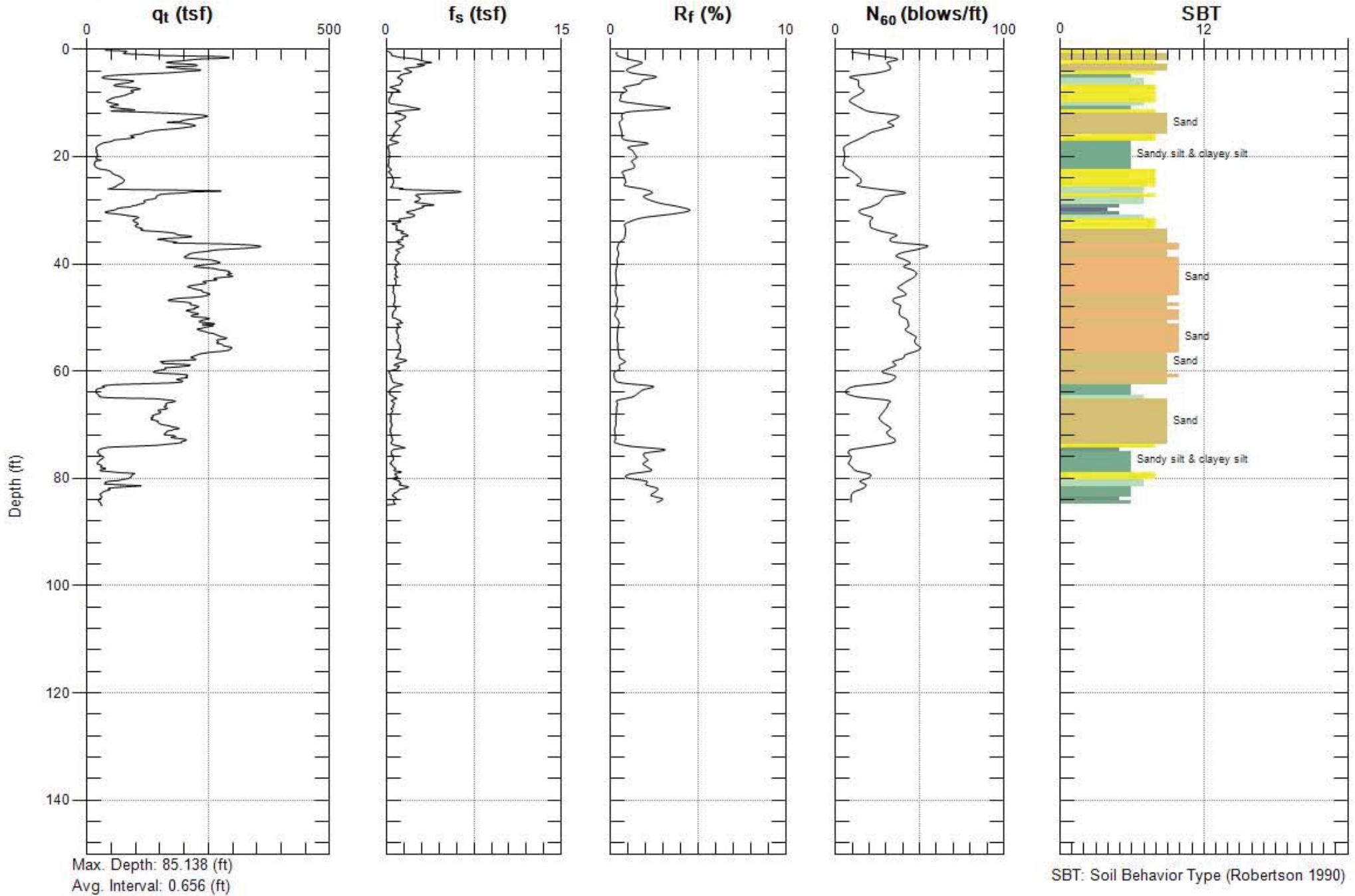


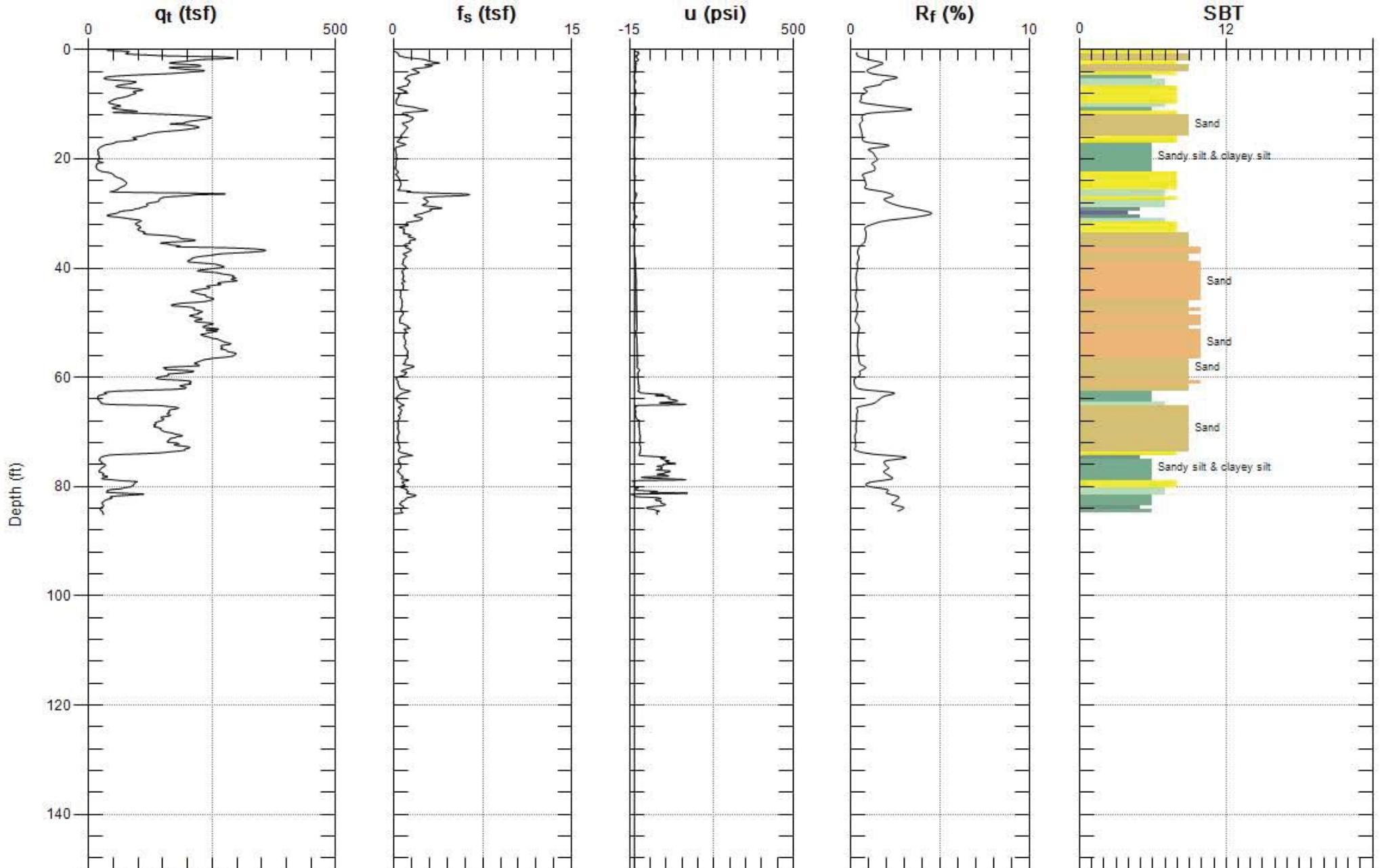






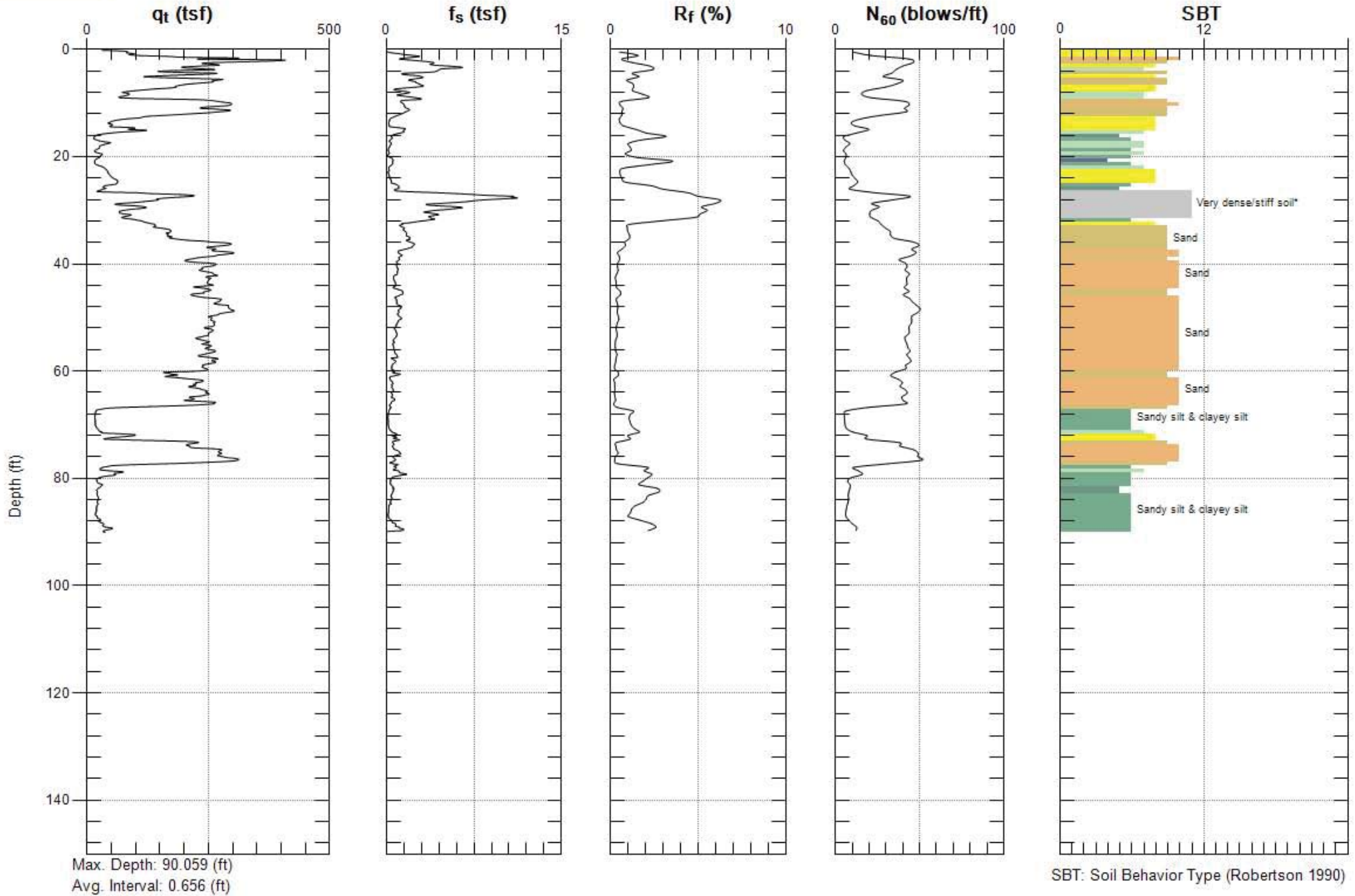


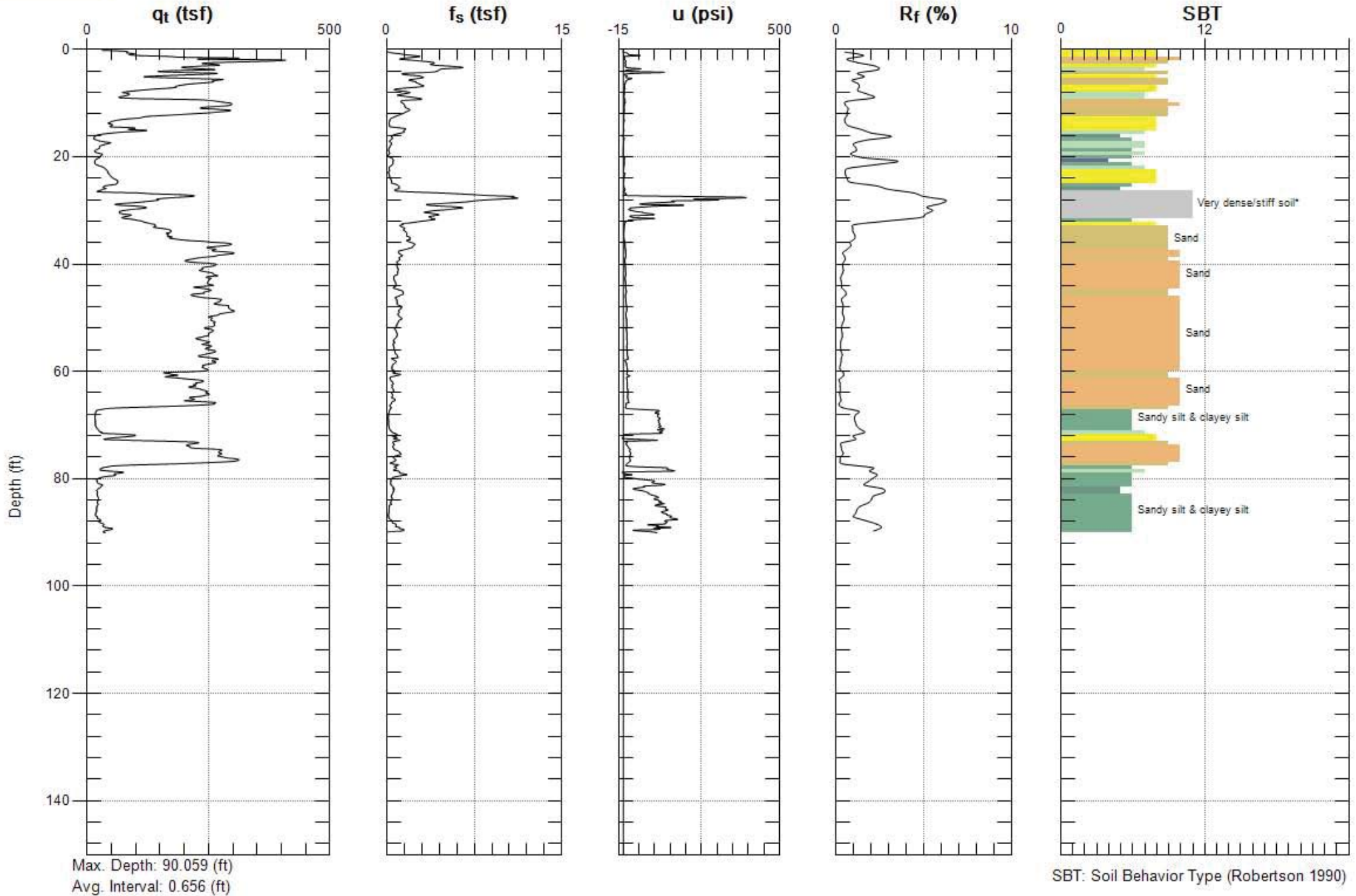


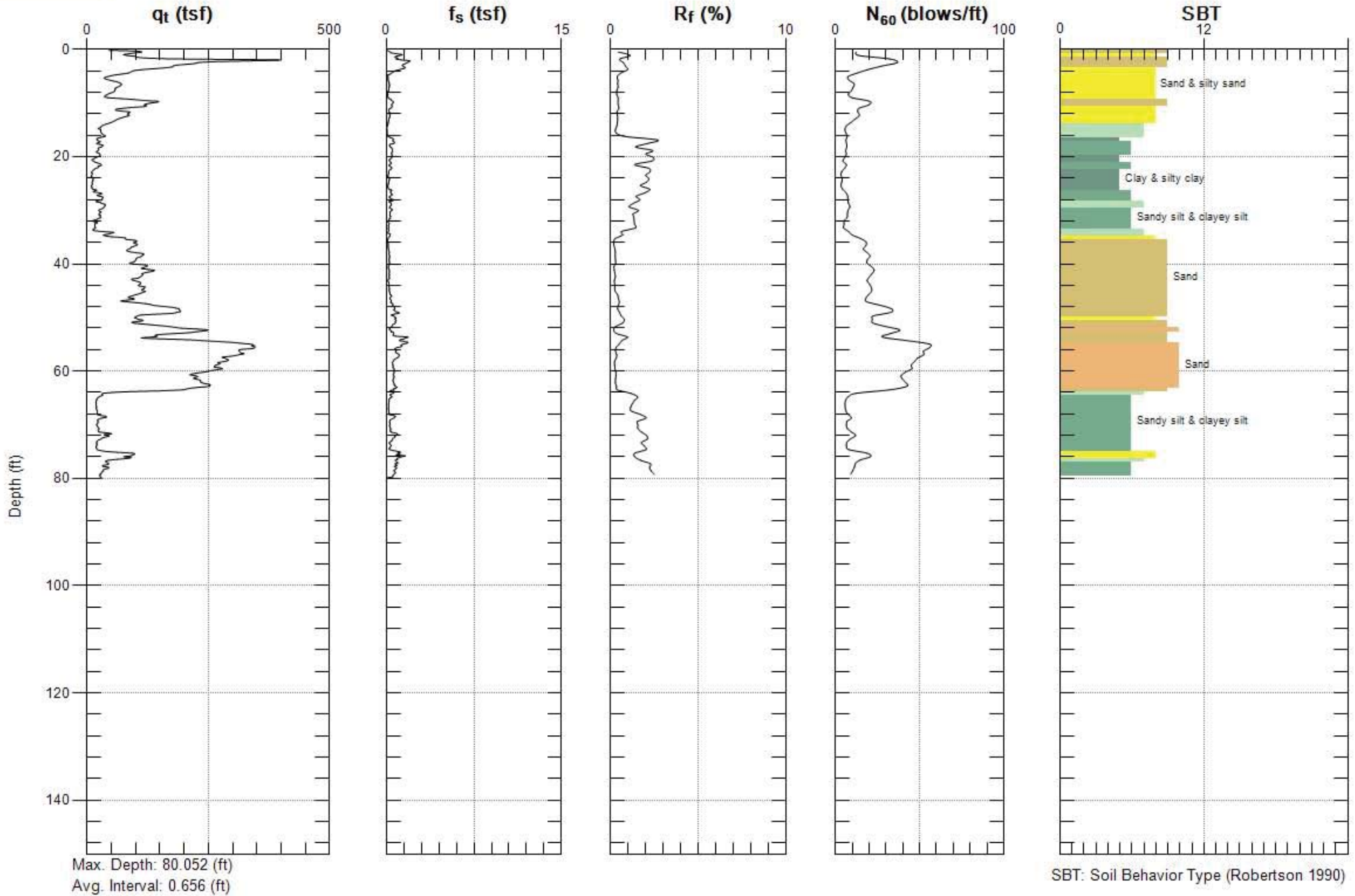


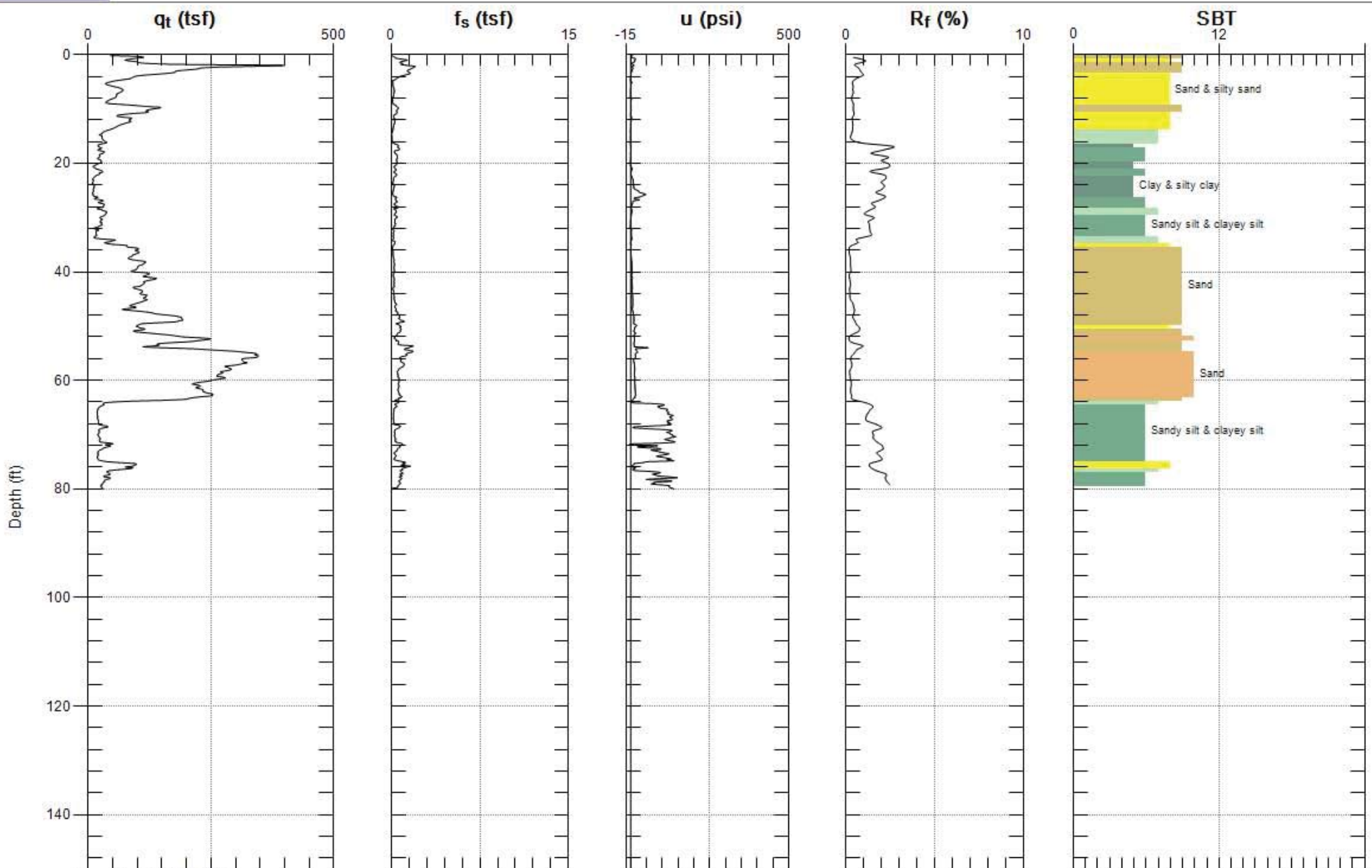
Max. Depth: 85.138 (ft)
 Avg. Interval: 0.656 (ft)

SBT: Soil Behavior Type (Robertson 1990)









Max. Depth: 80.052 (ft)
 Avg. Interval: 0.656 (ft)

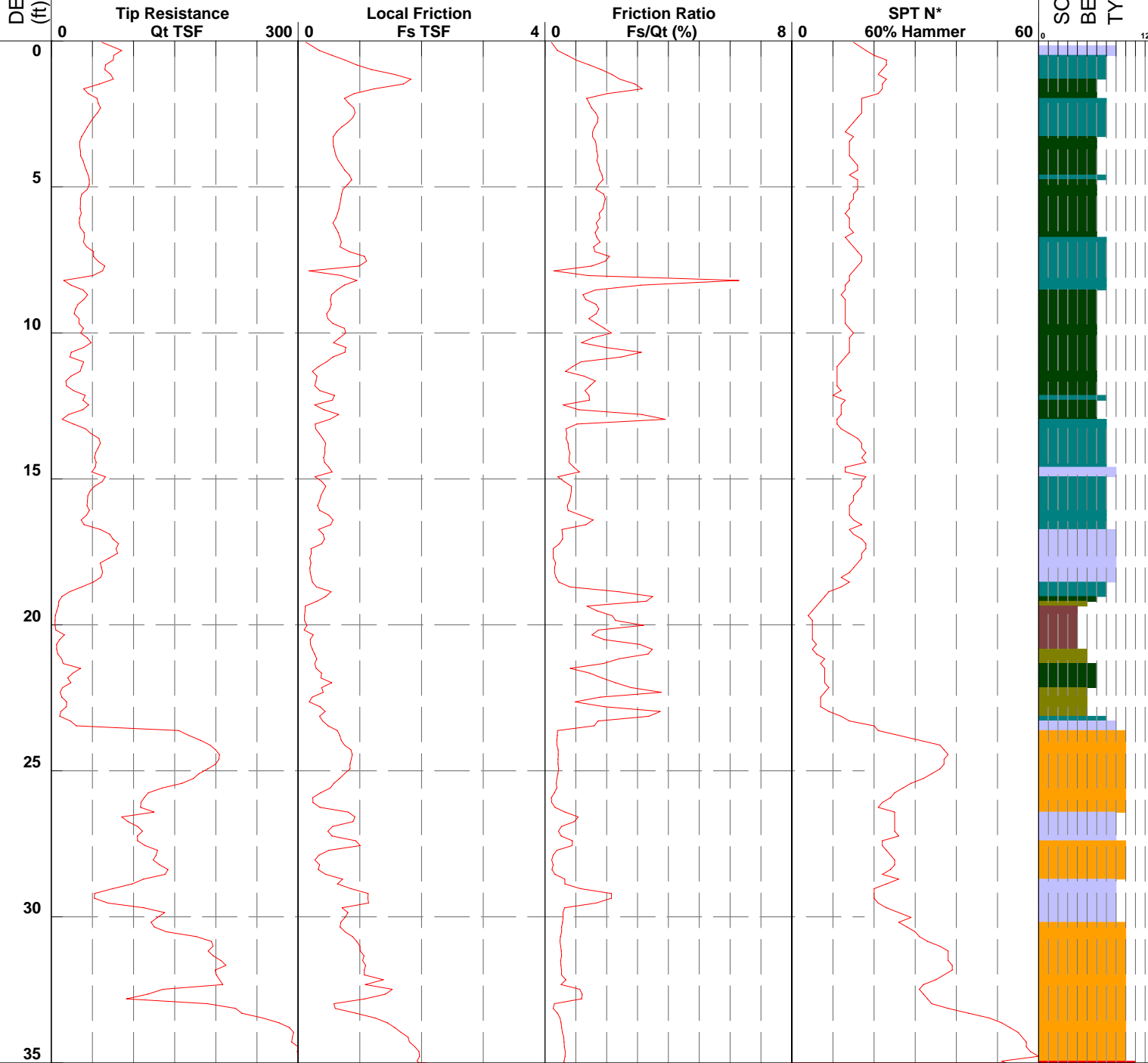
SBT: Soil Behavior Type (Robertson 1990)

ENGEO

Operator Doug Job Number 341 Cone ID DSG0369
 Date 10/30/2008 2:43:40 PM Location Quierolo Road Sounding 1-CPT-12

CPT DATA

DEPTH (ft)



- 1 - sensitive fine grained
- 4 - silty clay to clay
- 7 - silty sand to sandy silt
- 10 - gravelly sand to sand
- 2 - organic material
- 5 - clayey silt to silty clay
- 8 - sand to silty sand
- 11 - very stiff fine grained (*)
- 3 - clay
- 6 - sandy silt to clayey silt
- 9 - sand
- 12 - sand to clayey sand (*)

FIELD EXPLORATION LOGS

RIVER RUN





LOG OF BORING 2-B1

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 15 March 2006
HOLE DEPTH (FT): 60 ft.
HOLE DIAMETER: 8" / 4.25"
SURF ELEV (FT-MSL): 23 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		CLAYEY SAND (SC), brown, medium dense, moist, some sand, fine gravels. (Fill)			38			
1	1								
5	5		Dark brown to black, some medium grained sand in sample (-#200 = 30%)			39	12		4.5*
10	10		SANDY SILT (ML), light brown, medium stiff, moist, with some lenses of poorly graded sand. (Fill) (-#200 = 55%)			7			<1.0*
15	15		SILTY CLAY (CL), brown, firm, moist, with lenses of sand. (Fill) (-#200 = 71%)			10	24	95	0.9
20	20		SILTY SAND (SM), light brown, medium dense, wet, with some FeO mottling, fine grained sand (-#200 = 15%)			17	23		<1.0*
25	25		SILTY CLAY/CLAYEY SAND (CL/SC), medium stiff/loose, light brown, moist.			10	20	111	
30	30		SILTY CLAY (CL/CH), light brown, very stiff, moist, with some FeO mottling			24	30	93	1.34



LOG OF BORING 2-B1

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 15 March 2006
HOLE DEPTH (FT): 60 ft.
HOLE DIAMETER: 8"/4.25"
SURF ELEV (FT-MSL): 23 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			SILTY CLAY (As Before)						
35			Stiff in sample			26			4.0*
40						17			1.5*
45			Olive grey in sample			18			
50			POORLY GRADED SAND WITH SILT (SP/SM), light brown, medium dense, wet, non-plastic			41	23	100	
55			Olive colored in sample, dense			48			
60			Gray, dense in sample Bottom of boring at 60 feet No groundwater measured due to rotary wash method of drilling			67			

LOG OF BORING 2-B2

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 15 March 2006
HOLE DEPTH (FT): 46.5 ft.
HOLE DIAMETER: 8" / 4.25"
SURF ELEV (FT-MSL): 8 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-3"/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SANDY LEAN CLAY (CL), brown to dark brown, medium stiff, fine-grained, lenses of clayey sand (-#200 = 52%)			9	18	104.6	0.5
1									
5			Very soft to soft, brown.			2	33		<1.0*
10	3		CLAYEY SAND (SC), brown, loose, wet, slightly plastic, fine to medium grained, lense of sandy clay. (-#200 = 29%)			4			<1.0*
15			SANDY LEAN CLAY (CL), medium stiff, mottled with FeO, moderately plastic.			9	32	91	0.25
20	6		Becomes stiff with lenses of medium grained sand			14			3.25*
25			Light brown, very stiff, moist, moderately plastic, with lenses of fine grained sand.			28	23		3.25*
30	9								

LOG OF BORING 2-B2

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 15 March 2006
HOLE DEPTH (FT): 46.5 ft.
HOLE DIAMETER: 8"/4.25"
SURF ELEV (FT-MSL): 8 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-3'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30		Stiff				18			3.25*
35	11		POORLY GRADED SAND (SP), light brown, dense, wet, fine to medium grained, mottled with FeO mottling			58			
40	12		SANDY SILT/SILTY SAND (ML/SM), light brown to gray, becomes fine to course grained, medium dense. (-#200 = 80%)			40	24.1		
45	14		POORLY GRADED SAND (SP), gray to bluish green, dense.			72			
Bottom of boring at 46.5 feet No groundwater measured due to rotary wash method of drilling									



LOG OF BORING 2-B4

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 22 February 2006
HOLE DEPTH (FT): 59.5 ft.
HOLE DIAMETER: 8"4.25"
SURF ELEV (FT-MSL): 22 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY SAND (SM), brown, medium dense, moist, non - plastic (FILL)			24			
5	2		SANDY CLAY (CL), brown, very stiff, moist, moderately plastic, with some pockets of medium to coarse grained sand (FILL)			31	16		4.5+*
10	3		SILTY SAND (SM), brown, medium dense, moist, medium to coarse grained (FILL) (-#200 = 39%)			22	11		
15	4		SANDY SILT (ML), brown, stiff, moist, with some FeO mottling, fine grained sand (FILL)						
15	5		(-#200 = 62%)			14	10	86	2.5*
20	6		SANDY CLAY (CL), brown, medium stiff, moist, with some FeO mottling						
25	7		(LL = 28, PI = 14)			12	22	106	2.0*
30	9		POORLY GRADED SAND (SP), grey to olive brown, medium dense, wet, non - plastic, fine to medium grained.			26			



LOG OF BORING 2-B4

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 22 February 2006
HOLE DEPTH (FT): 59.5 ft.
HOLE DIAMETER: 8" / 4.25"
SURF ELEV (FT-MSL): 22 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			POORLY GRADED SAND (SP) As Before						
10			SANDY CLAY (CL), olive brown, very stiff, moist, with some FeO mottling			30	33		4.5+*
35			light brown to brown, with lenses of subangular gravels in sample			41			
12			POORLY GRADED SAND (SP), brown, very dense, moist, medium grained.			74/11"	19		
45			grey, dense in sample			66			
50			brown to olive brown, very dense, with coarse grained sand in sample			95			
55			very dense in sample						
18			Bottom of Boring at 59.5 feet. No groundwater measurement due to rotary wash method of drilling.			50/6"	20.5		
60									



LOG OF BORING 2-B5

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 22 February 2006
HOLE DEPTH (FT): 60 ft.
HOLE DIAMETER: 8" / 4.25"
SURF ELEV (FT-MSL): 21 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY SAND (SM), brown, medium dense, moist (FILL)			24			
5	2		FAT CLAY (CH), black, hard, moist, highly plastic (FILL)			55	21		4.5+*
10	3		SANDY CLAY (CL), light brown, medium stiff, with some fine grained sand (FILL).			16			1.5*
15	5		SILTY CLAY (CL), dark brown, medium stiff, with some FeO mottling			11	32	87	1.5*
22	7		SANDY SILT/SILTY SAND (SM/ML), black, loose/medium stiff, wet (-#200 = 49%)			10	23	106	0.6
28	8		SILTY CLAY (CL), light brown, stiff, moist, with some FeO mottling (-#200 = 96%)			16	30		
30	9								

05-05-2006 G:\Active Projects\1672016720400103\borings data\Quicklog Files\2-B5.bor



LOG OF BORING 2-B5

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 22 February 2006
HOLE DEPTH (FT): 60 ft.
HOLE DIAMETER: 8"4.25"
SURF ELEV (FT-MSL): 21 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			SILTY CLAY (As Before)						
10			SANDY CLAY (CL), light brown, stiff, moist, with some FeO mottling			18			
35			very stiff in sample			28	29		
40			stiff in sample			16			
45			POORLY GRADED SAND (SP), light brown to reddish brown, medium dense, moist, with some FeO mottling			39			
50			dense, medium to coarse grained in sample			77			
55			CLAYEY SAND (SC), light brown, medium dense, with some FeO mottling						
18			Bottom of Boring at 60 feet. No groundwater measurement due to rotary wash method of drilling.			30			
60									



LOG OF BORING 2-B10

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 24 February 2006
HOLE DEPTH (FT): 46.5 ft.
HOLE DIAMETER: 8"4.25"
SURF ELEV (FT-MSL): 7 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SANDY CLAY (CL), brown, medium stiff, moist (#200 = 65%)			8	21		1.25*
5	2		POORLY GRADED SAND (SP), reddish brown, medium dense, moist, fine to medium grained			15	29		
10	3		grey, loose, coarse grained in sample (#200 = 3%)			10	28		
15	4		SILTY SAND (SM), grey, medium dense, moist, fine grained, with lenses of sandy silt (#200 = 49%)			26	26		
20	6		SANDY CLAY (CL), olive to light brown, stiff, moist, with FeO mottling			18	26	99	1.0
25	8		POORLY GRADED SAND WITH SILT (SP/SM), light brown to reddish brown, dense to medium dense, wet, with lenses of sandy clay			45			
30	9								



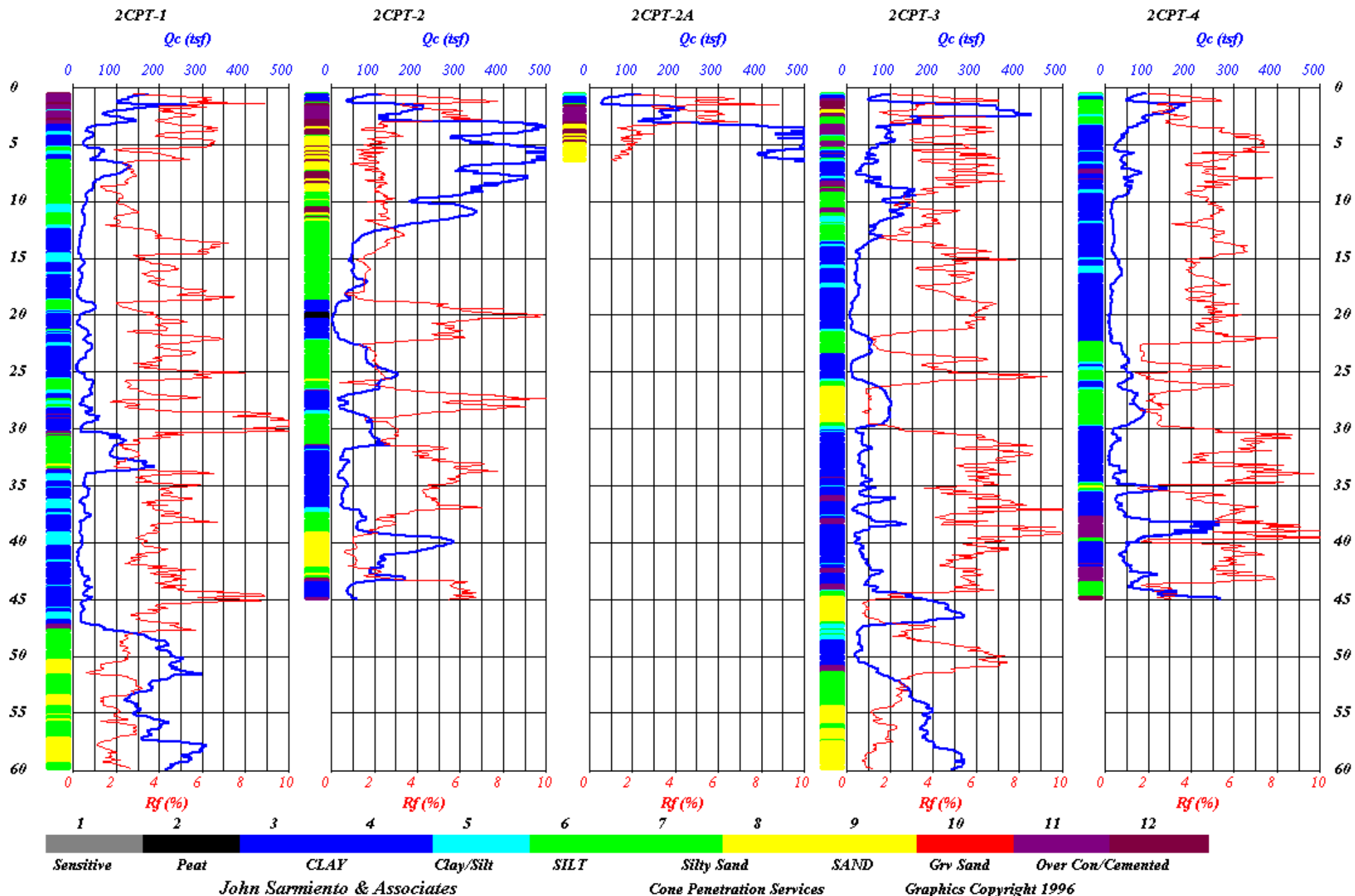
LOG OF BORING 2-B10

Levee Evaluation
River Run
Stockton, CA
6720.4.001.03

DATE DRILLED: 24 February 2006
HOLE DEPTH (FT): 46.5 ft.
HOLE DIAMETER: 8"4.25"
SURF ELEV (FT-MSL): 7 ft.

LOGGED / REVIEWED BY: Morgan Johnson/AK
DRILLING CONTRACTOR: V & W Drilling
DRILLING METHOD: Hollow St. 0-15'/Mud Rty to BOB
HAMMER TYPE: Automatic

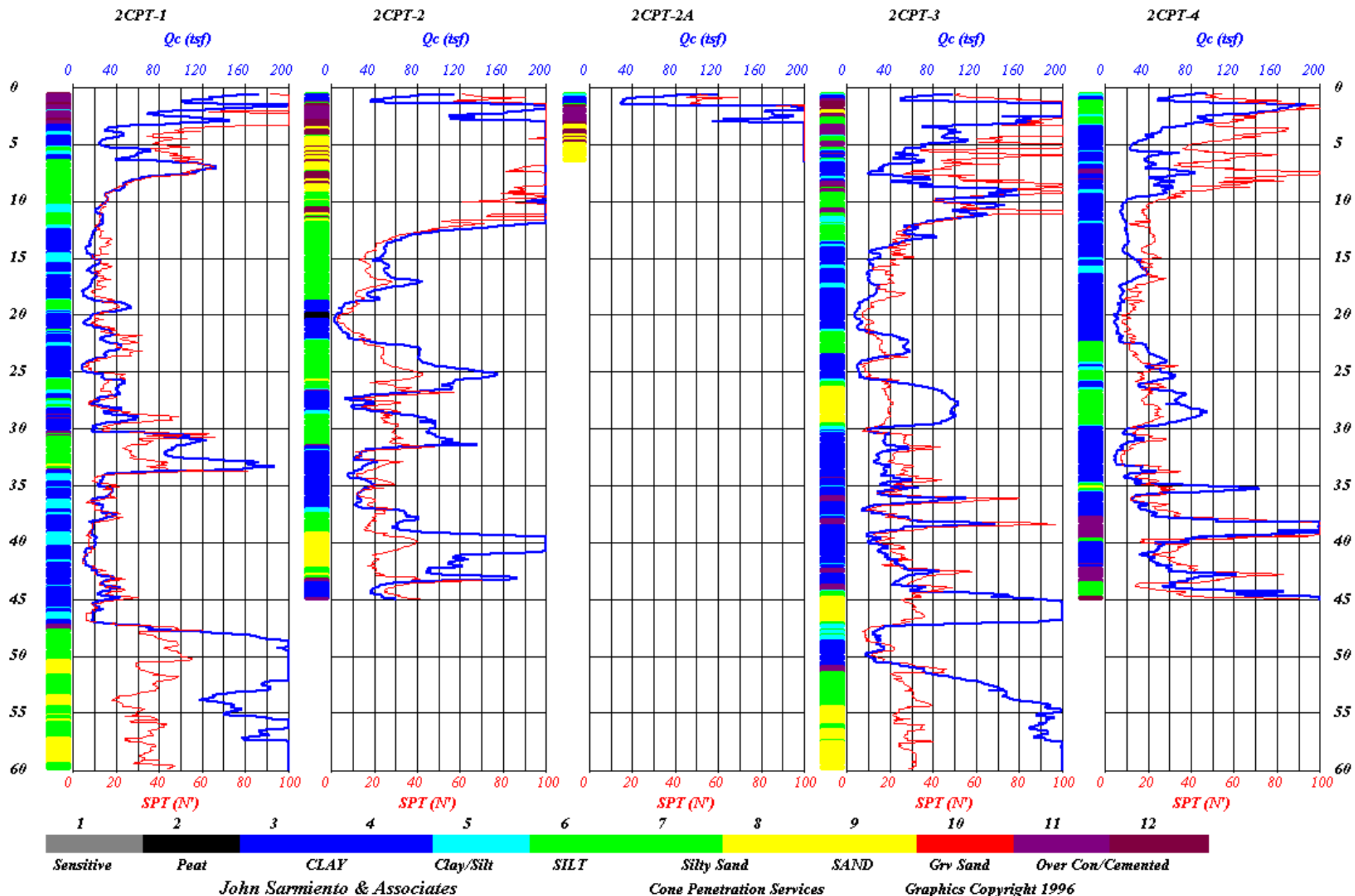
Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			POORLY GRADED SAND WITH SILT (As Before)						
			dense in sample (-#200 = 12%)			49			
10			WELL GRADED SAND (SW), light brown, dense, wet, fine to coarse grained						
35						46	22		
11									
			POORLY GRADED SAND WITH SILT (SP/SM), light brown, dense to very dense, wet, fine to medium grained						
12						78			
40									
13									
45			grey, dense in sample			52			
14									
Bottom of Boring at 46.5 feet. No groundwater measurement due to rotary wash method of drilling.									
15									
50									
16									
55									
17									
18									
60									



John Sarmiento & Associates

Cone Penetration Services

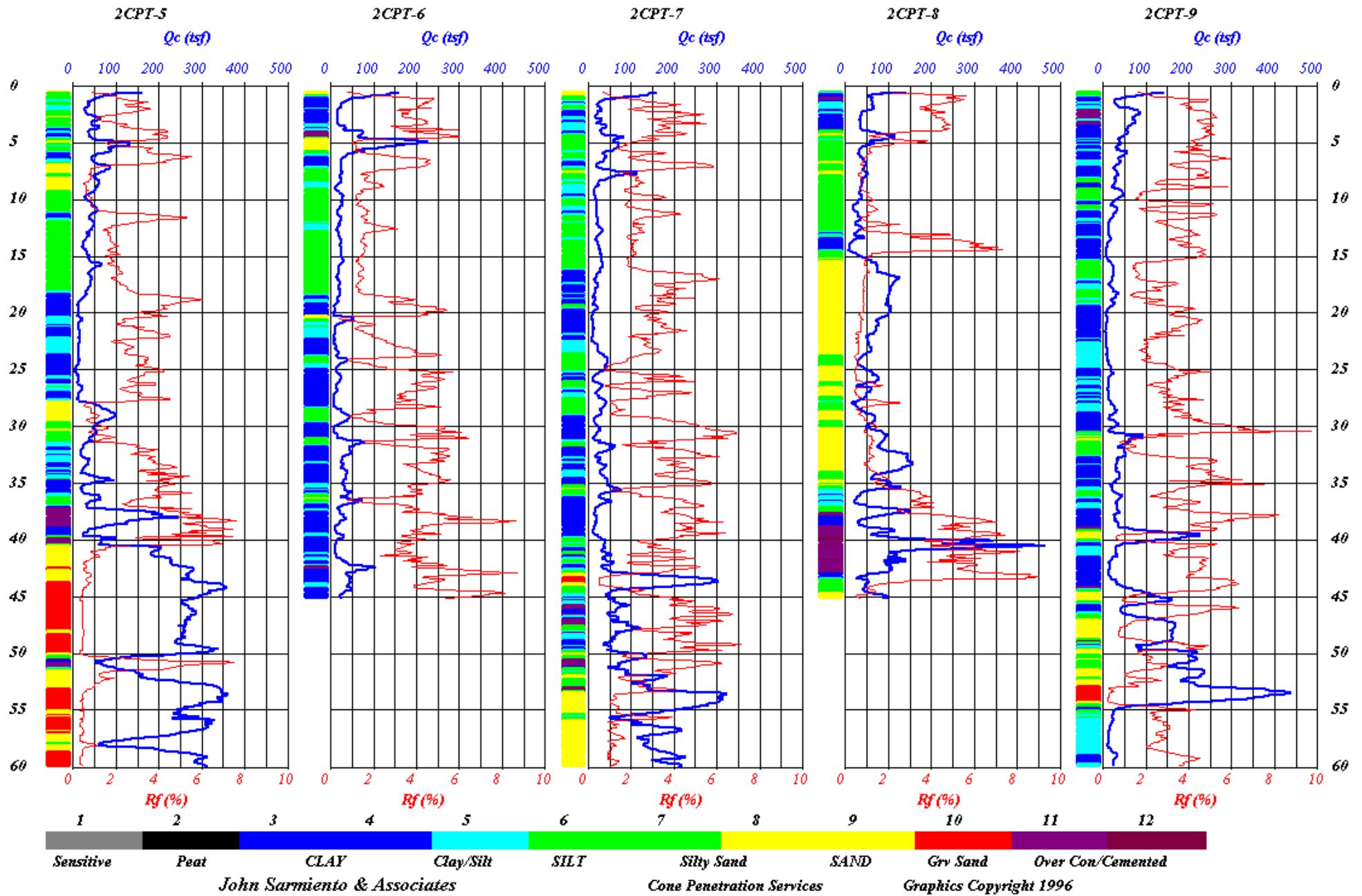
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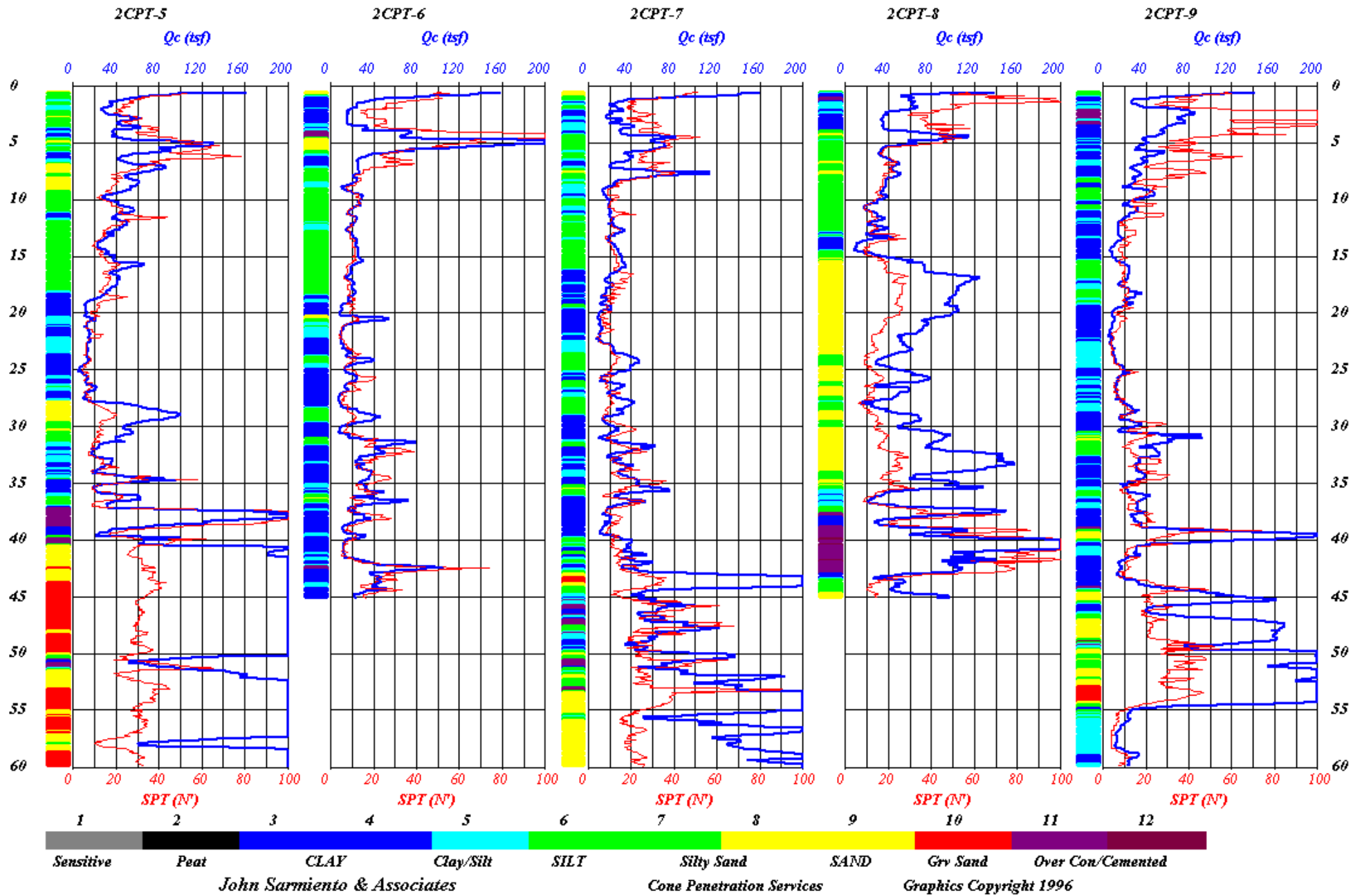


John Sarmiento & Associates

Cone Penetration Services

Graphics Copyright 1996





2CPT-10

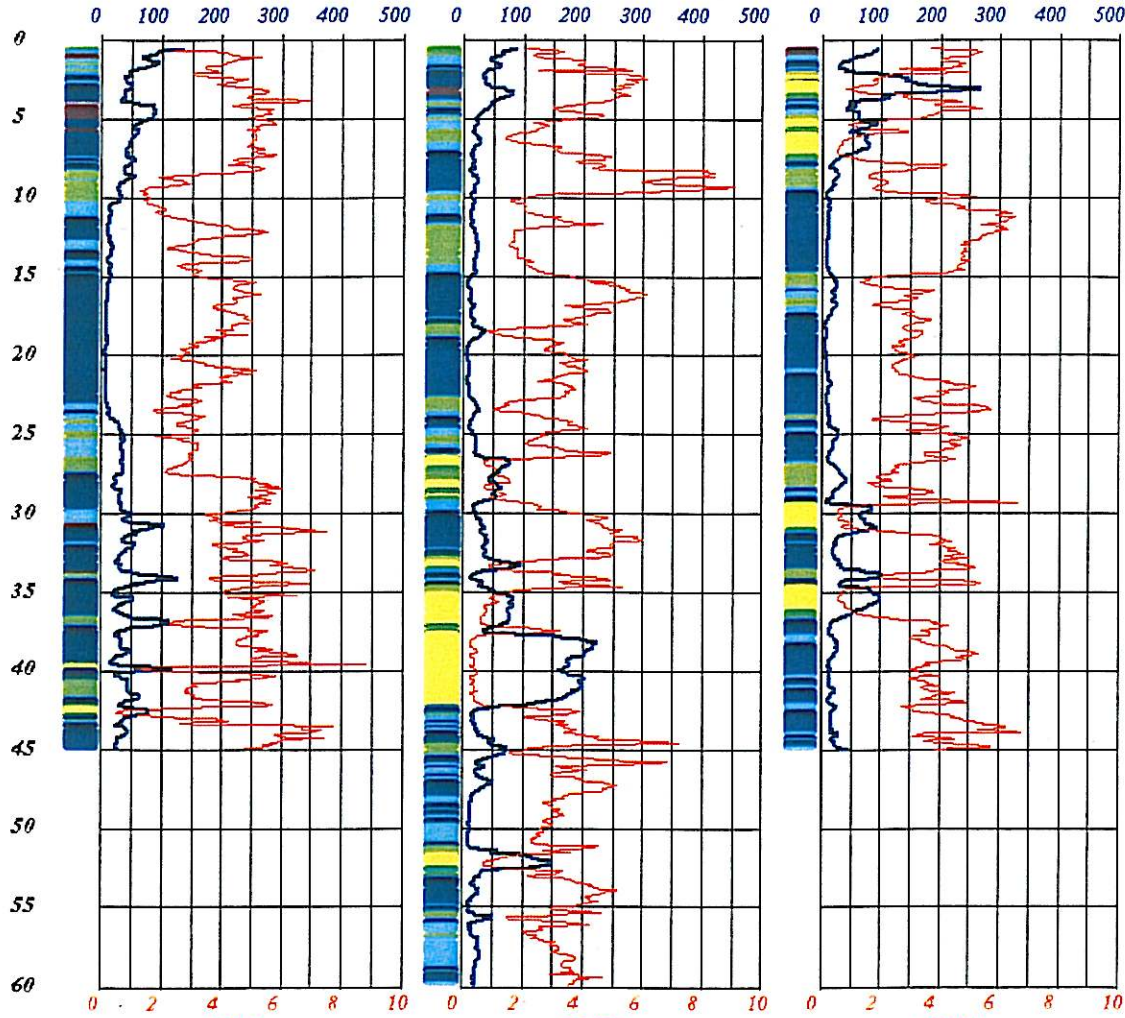
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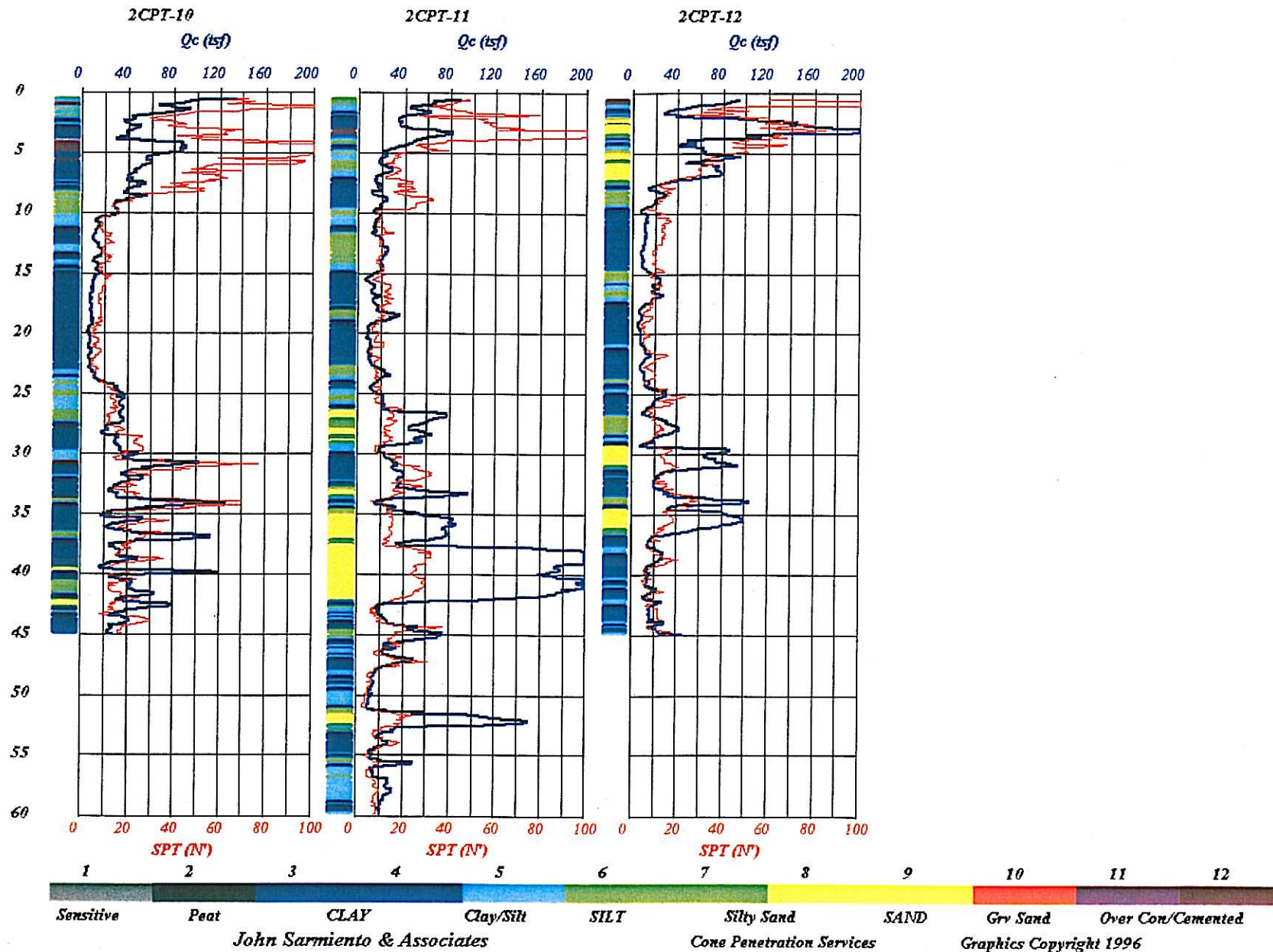
2CPT-12

Qc (tsf)

Qc (tsf)

Qc (tsf)





LOG OF BORING 1-B1

Geotechnical Exploration
 River Run
 Stockton, CA
 6720.4.001.01

DATE DRILLED: June 23, 2005
 HOLE DEPTH (FT): 41½ ft.
 HOLE DIAMETER: 4.875 in.
 SURF ELEV (FT-MSL): 6 ft.

LOGGED / REVIEWED BY: BM/RD/JT
 DRILLING CONTRACTOR: Pitcher
 DRILLING METHOD: Mud Rotary
 HAMMER TYPE: Cat-head/rope, 140#/30" drop


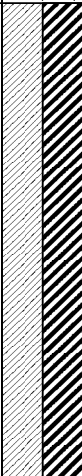
Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		CLAYEY SAND (SC), olive-brown, loose, moist, with trace of orange-brown mottling.			12			
1	1					7	16		
5	2		SANDY SILT (ML), olive-brown, medium stiff, moist, with clay. (% passing #200 = 67)			10			
10	3		SILTY CLAY (CL/CH), grey, hard, moist, with some orange-brown mottling, trace fine-grained sand.			86			
			SAND (SP), olive-brown, very dense, moist, fine-grained, with trace silt and clay.			83			
15	5		Clay cuttings @ 14.5 feet SILTY CLAY (CL/CH), brown to grey with some orange-brown mottling, very stiff, moist, trace charcoal.			38			5.0*
20	6		Some black Mn precipitate in sample			39			3.5*
25	8					42			3.0*
30	9		Sand cuttings at 28.5 feet SAND (SP), orange brown to olive brown mottled, dense, moist, fine-grained, with trace clay.						

LOG OF BORING 1-B1

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 23, 2005
HOLE DEPTH (FT): 41½ ft.
HOLE DIAMETER: 4.875 in.
SURF ELEV (FT-MSL): 6 ft.

LOGGED / REVIEWED BY: BM/RD/JT
DRILLING CONTRACTOR: Pitcher
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Cat-head/rope, 140#/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			SAND (SP), same as before.			70			
10			SILTY CLAY (CL/CH), grey, very stiff to hard, moist, with some fine mica flakes, trace fine-grained sand.						5.0*
35						47			
11									
40			Trace white calcium carbonate precipitate in sample.			41			
13			Bottom of boring at approximately 41½ feet.						
45									
14									
50									
15									
55									
16									
17									
18									
60									

LOG OF BORING 1-B2

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 23, 2005
HOLE DEPTH (FT): 39½ ft.
HOLE DIAMETER: 4.875 in.
SURF ELEV (FT-MSL): 6 ft.

LOGGED / REVIEWED BY: Bill Mallchok/JT
DRILLING CONTRACTOR: Pitcher
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Cat-head/rope, 140#/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		CLAYEY SILT (MH), olive-brown and dark grey mottled, medium stiff, moist, with dark brown silty clay inclusions, orange brown mottling (FILL). (LL = 57, PI = 20)			13	49	57	1.5*
1	1		SILTY SAND (SM), orange brown and grey mottled, loose to medium dense, moist, fine-grained. (% passing #200 = 45)			10			
2	2		SANDY CLAY (CL), olive-grey, soft, wet, with fine-grained sand, some silt and white calcium carbonate precipitate. (% passing #200 = 65)			13			
3	3		Stiffer drilling, clay cuttings @ 12 feet. (CH), SILTY CLAY (CH), grey with some orange-brown mottling, very stiff, moist. (% passing #200 = 99)			6	24	112	1.5*
4	4		sand in cuttings @ 17 feet. SAND (SP), olive brown, medium dense, moist, fine-grained. (% passing #200 = 4)			36	41	80	2.5*
5	5		SAND (SM), grey brown, medium dense, moist, fine-grained, with zones of orange-brown mottling, with silt. (% passing #200 = 24)			16	29		
6	6								
7	7								
8	8								
9	9		Dense			49			4.25*
30	30								

LOG OF BORING 1-B2

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 23, 2005
HOLE DEPTH (FT): 39½ ft.
HOLE DIAMETER: 4.875 in.
SURF ELEV (FT-MSL): 6 ft.

LOGGED / REVIEWED BY: Bill Mallchok/JT
DRILLING CONTRACTOR: Pitcher
DRILLING METHOD: Mud Rotary
HAMMER TYPE: Cat-head/rope, 140#/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			SAND (SM), same as before.						
10			SAND (SM), orange brown with olive-grey mottling, medium dense, moist, fine-grained, with some blue grey silty clay layers, with silt.			34			2.3*
35			(% passing #200 = 27)			24	26		
11									
12			SILTY CLAY (CL/CH), blue grey, hard, moist.			69			5.0*
40			Bottom of boring at approximately 39½ feet. LL = LIQUID LIMIT PI = PLASTICITY INDEX						
13									
45									
14									
50									
15									
55									
16									
17									
18									
60									

LOG OF BORING 1-B7

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 27, 2005
HOLE DEPTH (FT): 21 1/2 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 6 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Pacific Drilling Inc.
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: Downhole Trip 140#/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		CLAY (CH), dark olive grey and reddish brown mottled, stiff, moist. (LL = 58, PI = 31)			13	42.4		
5	1.5		SILTY CLAY (CL), olive greyish brown, stiff, moist to wet, with fine-grained sand.			12	21	105	0.75*
10	3.0		SILTY CLAY (CL), greyish olive brown, very stiff, moist to saturated, with trace fine grained sand.		▽	25	28.1	97	1.25*
16	4.9		Sandy from 16 to 18 feet						
20	6.1		SILTY CLAY (CL), olive, very stiff to hard, saturated.			38			3.5*
21.5	6.6		Bottom of boring at approximately 21 1/2 feet Groundwater encountered at approximately 10 feet during drilling LL = LIQUID LIMIT PI = PLASTICITY INDEX						



LOG OF BORING 1-B8

Geotechnical Exploration
 River Run
 Stockton, CA
 6720.4.001.01

DATE DRILLED: June 27, 2005
 HOLE DEPTH (FT): 13.0 ft.
 HOLE DIAMETER: 6.0 in.
 SURF ELEV (FT-MSL): 6ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
 DRILLING CONTRACTOR: Pacific Drilling Inc.
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: Downhole Trip #140/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		CLAYEY SILTY SAND (SM), olive brown, medium dense, moist, fine grained (FILL).						
1	1					21	15.3	114	
5	5		SILTY CLAY (CL), olive grey, moist, medium stiff (FILL).						
2	2		Very stiff.		▽	8			
10	10		SILTY CLAY W/ SAND (CL), olive brown, very stiff, moist to saturated, very fine to fine grained (FILL).						
4	4		SILTY SAND (SM), olive greyish brown, medium dense, saturated, fine grained, with some clay (FILL).			24			
15	15		Bottom of boring at 13' - encountered a buried utility line. Groundwater encountered at approximately 7 feet during drilling.						
5	5								
20	20								
7	7								
25	25								
8	8								
30	30								



LOG OF BORING 1-B11

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 27, 2005
HOLE DEPTH (FT): 40.0 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 7 ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
DRILLING CONTRACTOR: Pacific Drilling Inc.
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY CLAY W/ SAND (CL), olive brown, moist, fine grained.						
			SAND (SP), brownish grey, loose, moist, medium grained.						
1	1		SANDY SILT (ML), blue greyish brown, stiff, moist, very fine grained sand, with some clay.			11			1.5*
5	2		CLAY W/ SILT (CH), very dark brown, soft to medium stiff, saturated.		▽	6			0.75*
10	3		SILTY CLAY (CH), olive brown, stiff, moist.						
15	4					18			2.5*
20	5		SILTY CLAY (CL), olive brownish grey, very stiff, saturated.						
25	6		SANDY SILTY CLAY (CL), olive brownish grey, hard, saturated, fine grained sand.			68			4.5*
30	7		SILTY SAND W/ CLAY (SM), olive brown, medium dense to dense, saturated, medium fine grained.						
	8								
	9		SILTY SAND (SM), reddish brown, medium dense, saturated, fine to medium grained.						



LOG OF BORING 1-B11

Geotechnical Exploration
 River Run
 Stockton, CA
 6720.4.001.01

DATE DRILLED: June 27, 2005
 HOLE DEPTH (FT): 40.0 ft.
 HOLE DIAMETER: 6.0 in.
 SURF ELEV (FT-MSL): 7 ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
 DRILLING CONTRACTOR: Pacific Drilling Inc.
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: 140 lb/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			SILTY SAND (SM), same as before (% passing #200 = 17)			34			
35			Caving sand (no sample).						
40			Bottom of Boring at approximately 40 feet Groundwater encountered at approximately 6 feet during drilling						
45									
50									
55									
60									



LOG OF BORING 1-B12

Geotechnical Exploration
 River Run
 Stockton, CA
 6720.4.001.01

DATE DRILLED: June 27, 2005
 HOLE DEPTH (FT): 20.0 ft.
 HOLE DIAMETER: 6.0 in.
 SURF ELEV (FT-MSL): 3 ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
 DRILLING CONTRACTOR: Pacific Drilling Inc.
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: 140 lb/30" drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY SAND W/ CLAY (SM), olive brown, medium dense, moist, very fine to fine grained.			16	12		
5	2		SANDY CLAY (CL), olive brown, loose, saturated, fine grained. (% passing #200 = 56)			7	28		
10	3		SILTY CLAY W/ SAND (CL), olive brown, hard, saturated, very fine grained.			49	23	105	2.5*
15	5		SILTY CLAY (CL), olive brown, hard, saturated.			71			4.5*
Bottom of boring at approximately 20 feet. Groundwater encountered at approximately 4 feet during drilling									

LOG OF BORING 1-B13

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 27, 2005
HOLE DEPTH (FT): 21.5 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 6 ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
DRILLING CONTRACTOR: Pacific Drilling Inc.
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb/30 " drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SANDY SILTY CLAY (CL), olive brown, stiff, moist, fine grained sand.						
1	1		SILTY SAND (SM), light brown, medium dense, moist, very fine to fine grained, trace clay.			16			
5	2		SILTY SAND W/ CLAY (SM), olive brown, loose, moist to saturated, fine grained.						
			(LL = 23, PI = 22) (% passing #200 = 38)		8				
10	3		CLAY (CH), bluish grey, stiff, saturated, with some silt.						
15	4					17	45	75	2.0*
20	6		SAND (SW), brown, medium dense to dense, saturated, fine to medium grained.						
						45			
7			Bottom of boring at approximately 21.5 feet Groundwater encountered at approximately 8 feet during drilling						
			LL = LIQUID LIMIT PI = PLASTICITY INDEX						
25	8								
30	9								

LOG OF BORING 1-B14

Geotechnical Exploration
River Run
Stockton, CA
6720.4.001.01

DATE DRILLED: June 27, 2005
HOLE DEPTH (FT): 40.0 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 8 ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
DRILLING CONTRACTOR: Pacific Drilling Inc.
DRILLING METHOD: Solid Flight Auger
HAMMER TYPE: 140 lb / 30 " drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY CLAY W/ SAND (CL), light brown, medium stiff to stiff. dry to moist.						
			CLAY (CL-CH), dark greyish brown, medium stiff, moist.						
1			SANDY SILTY CLAY (CL), olive brown, stiff, moist, fine grained sand. (LL = 32, PI = 19)			14			2.5* 4.0*
5			SILTY SAND (SM), olive brown, loose, saturated, fine grained, with some clay.						
10			No sample recovered.			9			
			SILTY CLAY (CL), olive grey, stiff to very stiff, saturated.						
20			SILTY SAND W/ CLAY (SM), olive, medium dense, saturated, fine grained.			24			0.5*
25			SILTY CLAY W/ SAND (CL), olive brown, stiff, saturated, very fine to fine grained.						
30			SILTY SAND (SM), olive grey, medium dense, saturated, fine grained, with trace clay.						



LOG OF BORING 1-B14

Geotechnical Exploration
 River Run
 Stockton, CA
 6720.4.001.01

DATE DRILLED: June 27, 2005
 HOLE DEPTH (FT): 40.0 ft.
 HOLE DIAMETER: 6.0 in.
 SURF ELEV (FT-MSL): 8 ft.

LOGGED / REVIEWED BY: Z. Crawford /JT
 DRILLING CONTRACTOR: Pacific Drilling Inc.
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: 140 lb / 30 " drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30			SILTY SAND (SM), same as before (% passing #200 = 23)			22			
10									
35			Collapsing sand.						
11									
12			No Sample						
40									
13			Bottom of boring at approximately 40 feet Groundwater encountered at approximately 7 feet during drilling LL = LIQUID LIMIT PI = PLASTICITY INDEX						
45									
14									
50									
15									
55									
16									
60									
17									
18									

LOG OF BORING 1-B15

Geotechnical Exploration
 River Run
 Stockton, CA
 6720.4.001.01

DATE DRILLED: June 27, 2005
 HOLE DEPTH (FT): 20.0 ft.
 HOLE DIAMETER: 6.0 in.
 SURF ELEV (FT-MSL): 10 ft.

LOGGED / REVIEWED BY: Z. Crawford / JT
 DRILLING CONTRACTOR: Pacific Drilling Inc.
 DRILLING METHOD: Solid Flight Auger
 HAMMER TYPE: 140 lb / 30" drop

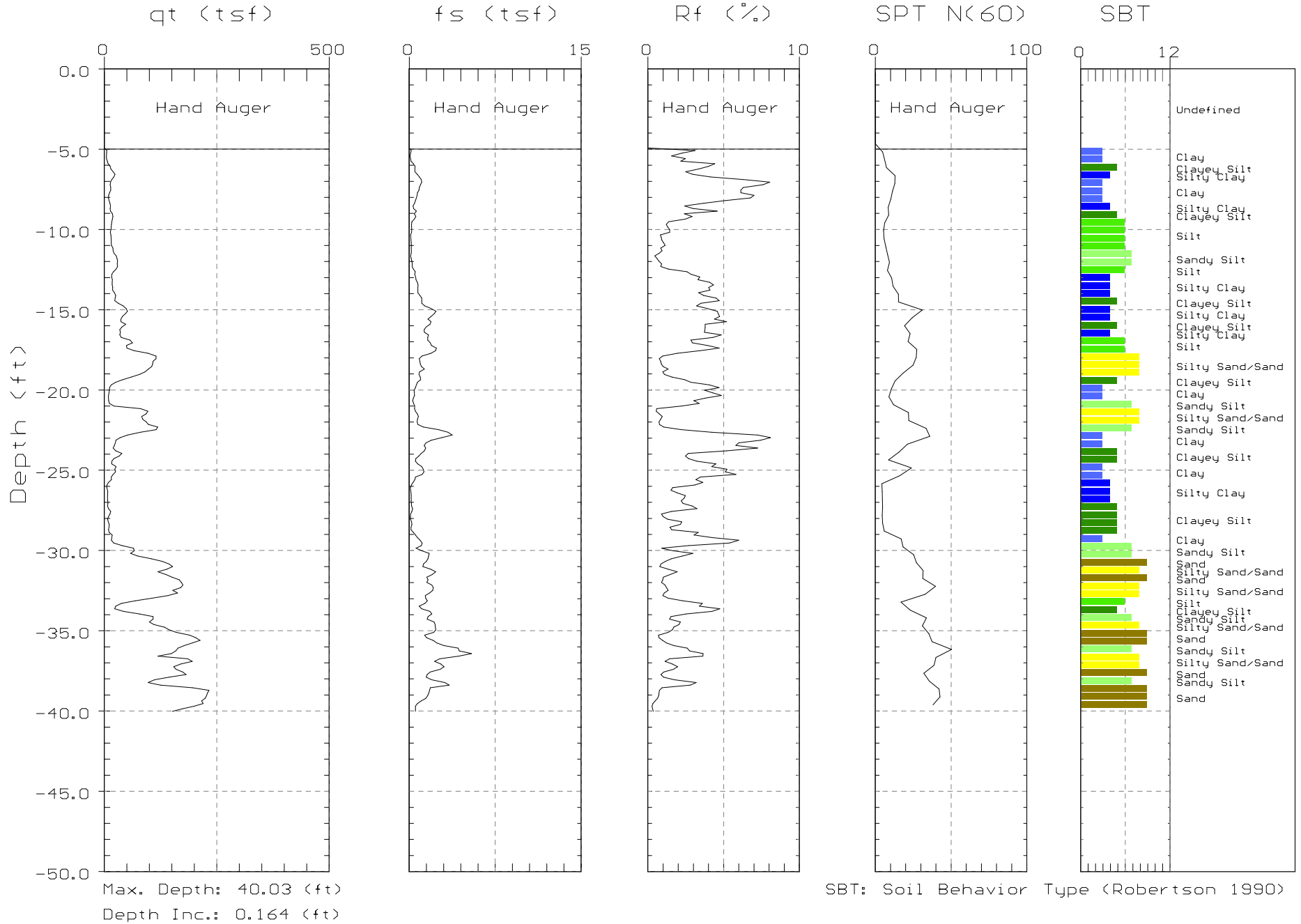
Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY SAND (SM), brown, loose, moist, fine grained, with some clay.						
			SILTY SAND (SM), olive greyish brown, loose, moist, fine grained.			11	15	97	
			SILTY CLAY (CL), olive greyish brown, stiff, moist, with trace sand.						
			CLAY (CH), very dark greyish brown, medium stiff, moist.		▼	8	62		0.7
			CLAYEY SILTY SAND (SM), olive grey, loose, saturated, very fine to fine grained.		▽	11			0.25*
			SILTY CLAY (CL), olive greyish brown, very stiff, saturated, with trace sand.						
						24			1.75*
Bottom of boring at approximately 20 feet Groundwater encountered at approximately 11 feet during drilling									



ENGEO

Site: RIVER RUN
Location: CPT-1

Engineer: S.HARRIS
Date: 06:30:05 09:07

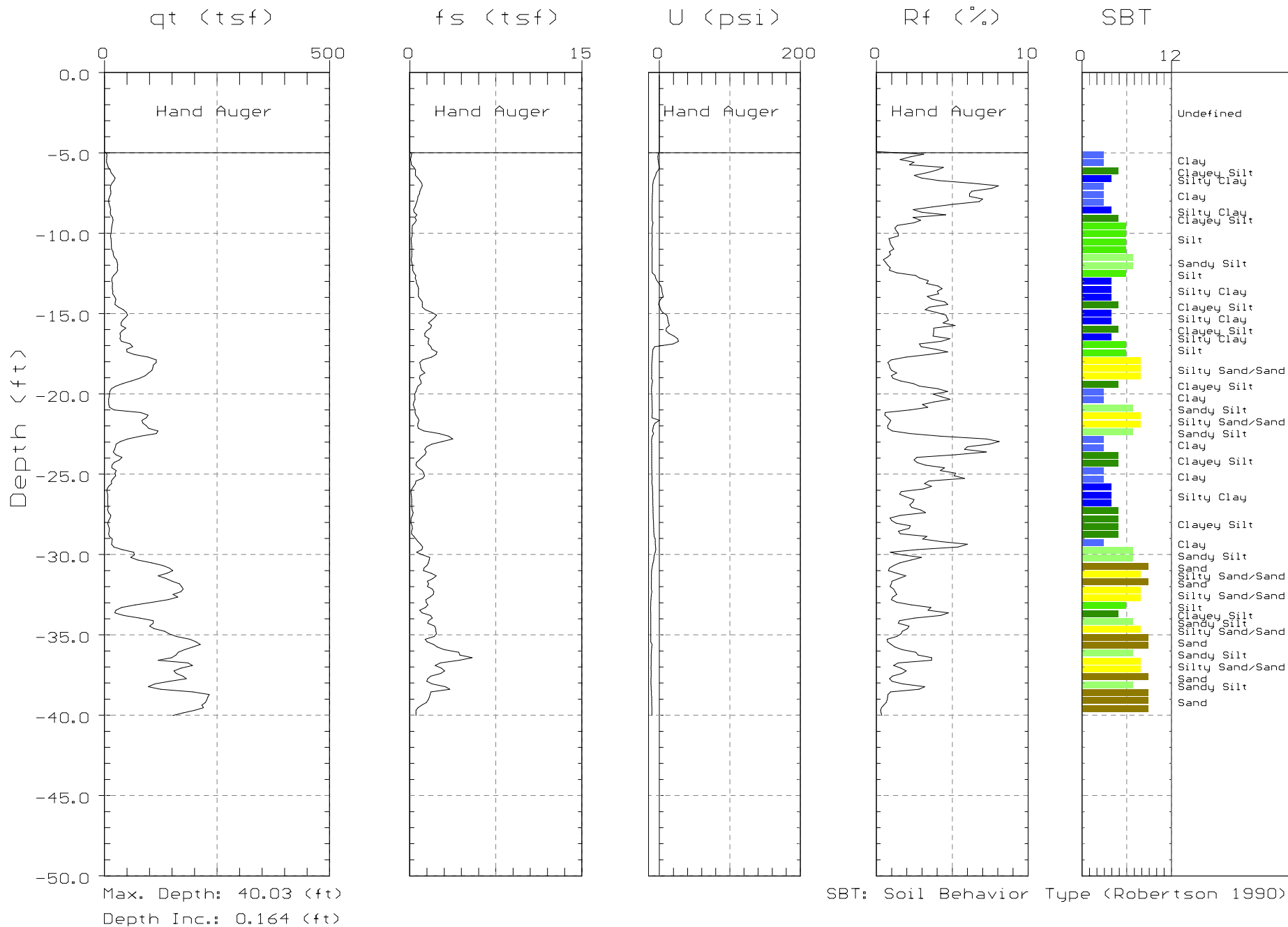




ENGEO

Site: RIVER RUN
Location: CPT-1

Engineer: S.HARRIS
Date: 06:30:05 09:07

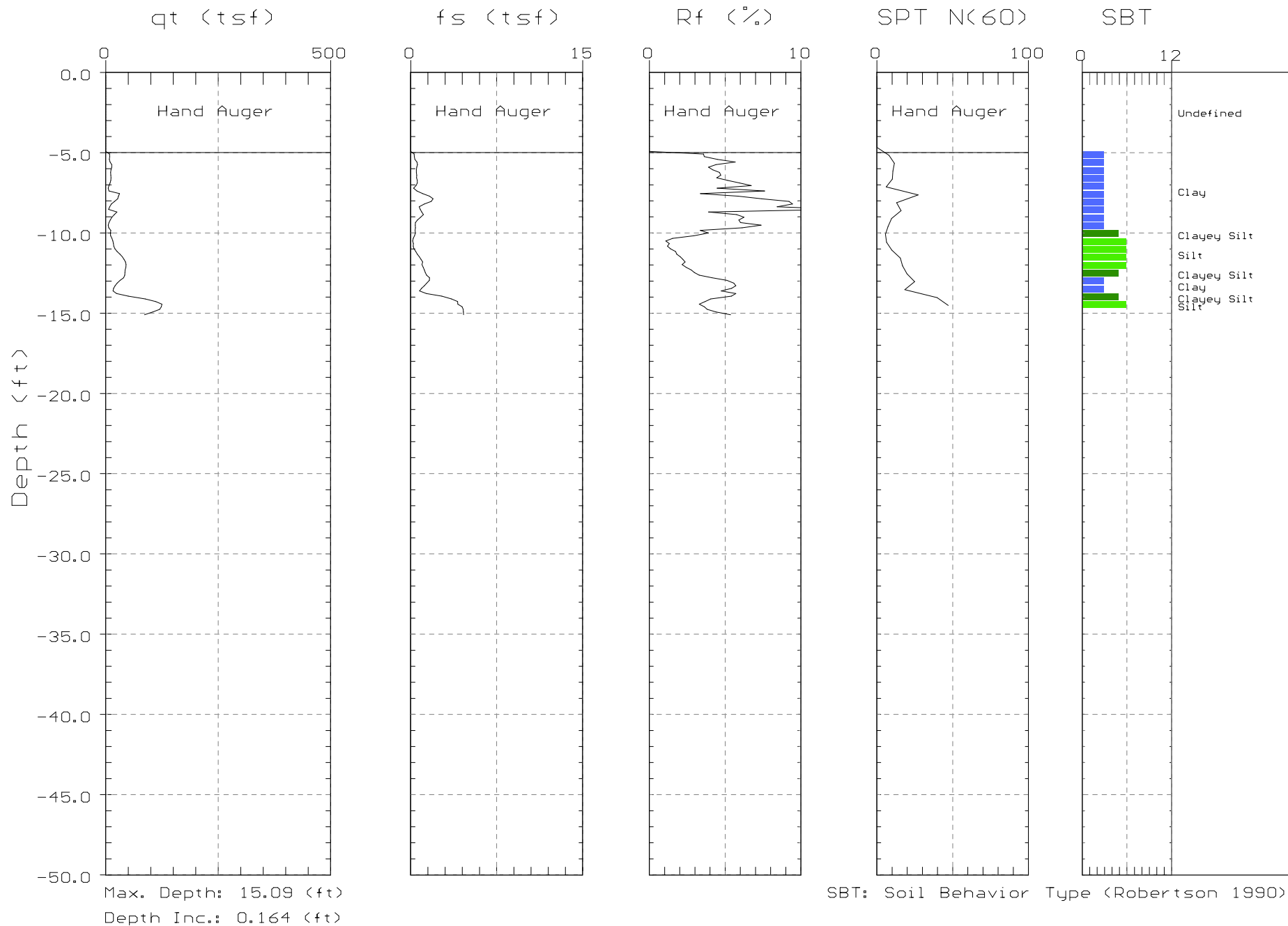




ENGEO

Site: RIVER RUN
Location: CPT-02

Engineer: S.HARRIS
Date: 06:27:05 10:28

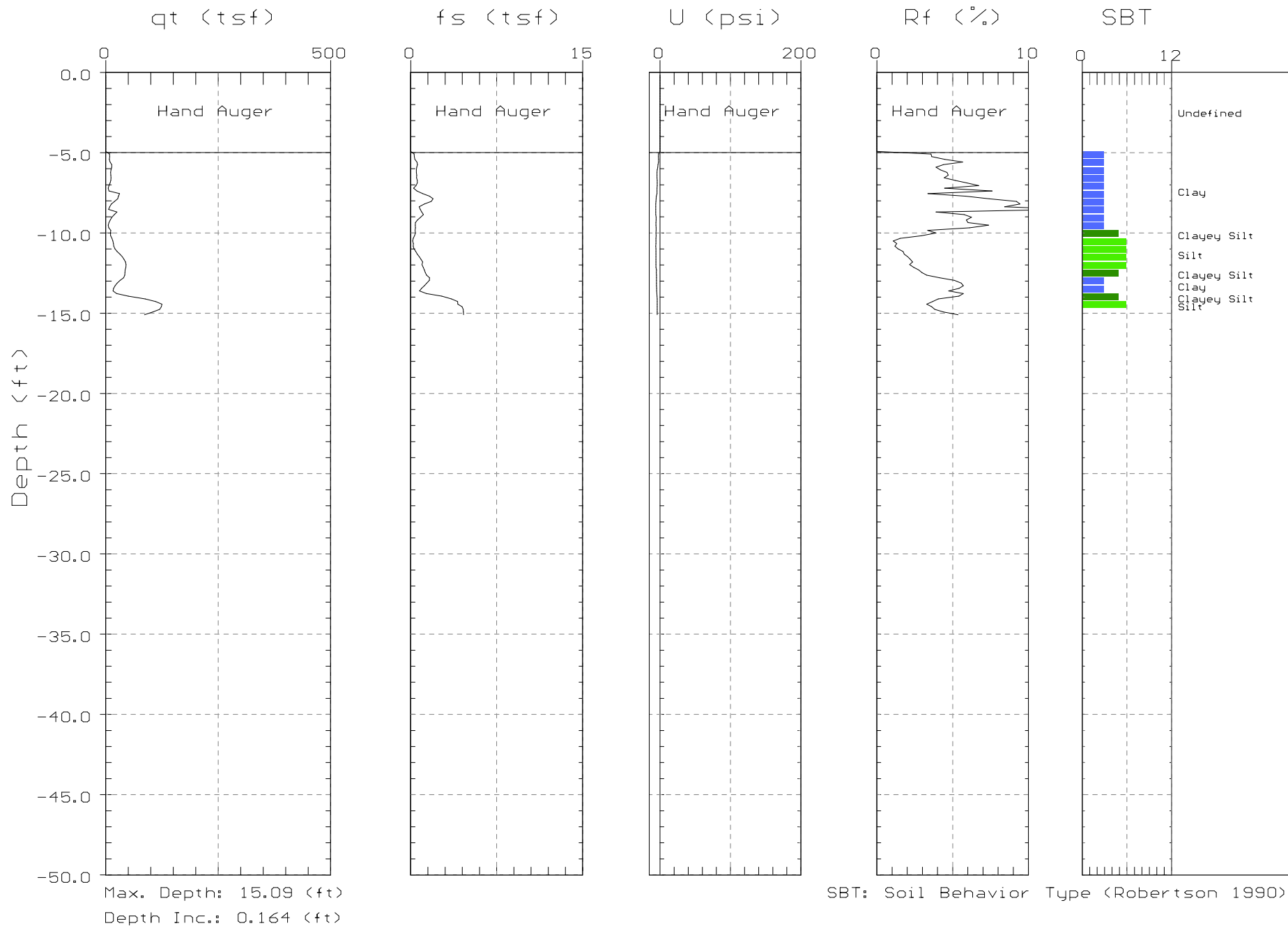




ENGEO

Site: RIVER RUN
Location: CPT-02

Engineer: S.HARRIS
Date: 06:27:05 10:28

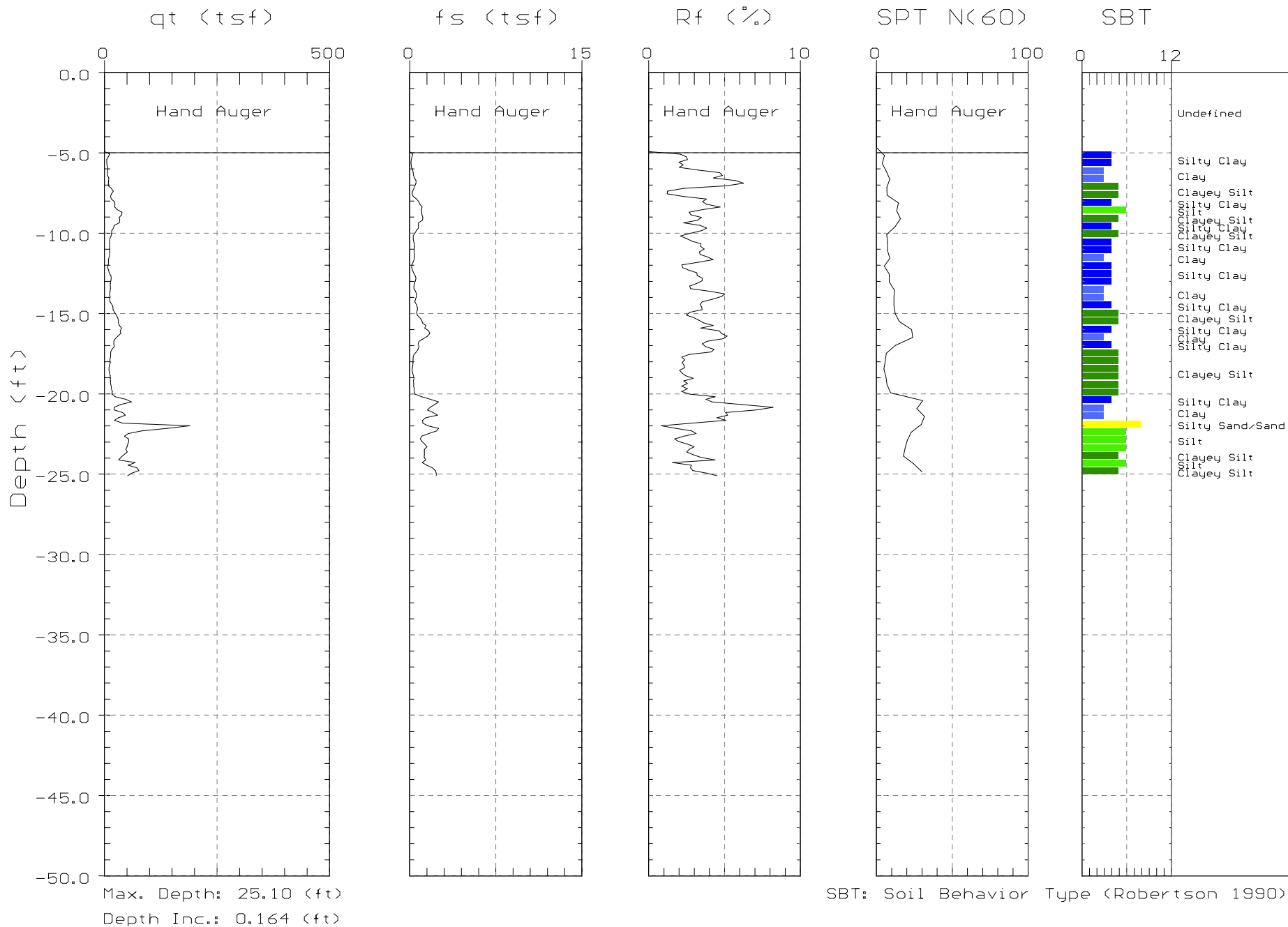




ENGEO

Site: RIVER RUN
Location: CPT-03

Engineer: S.HARRIS
Date: 06:27:05 19:11

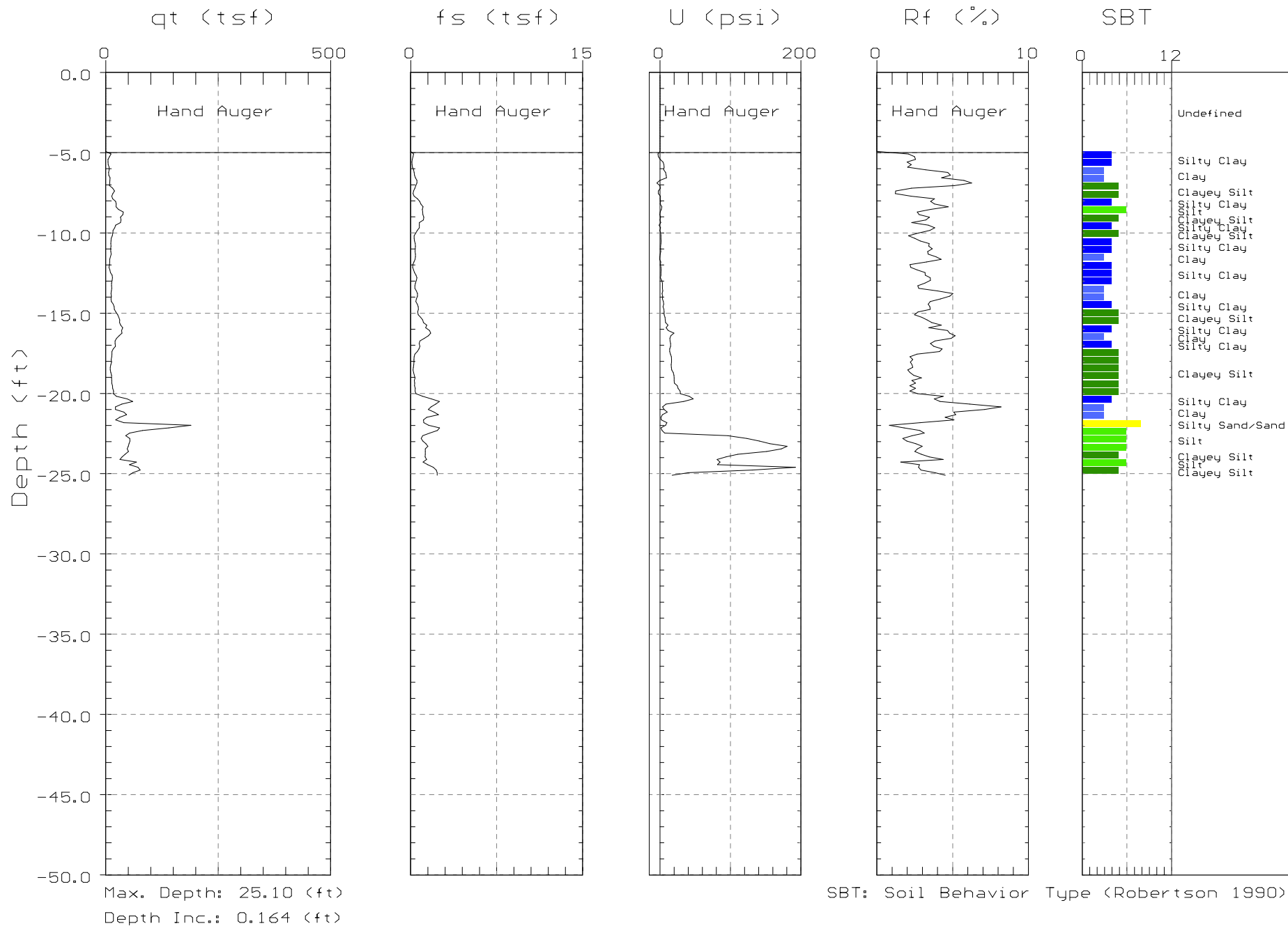


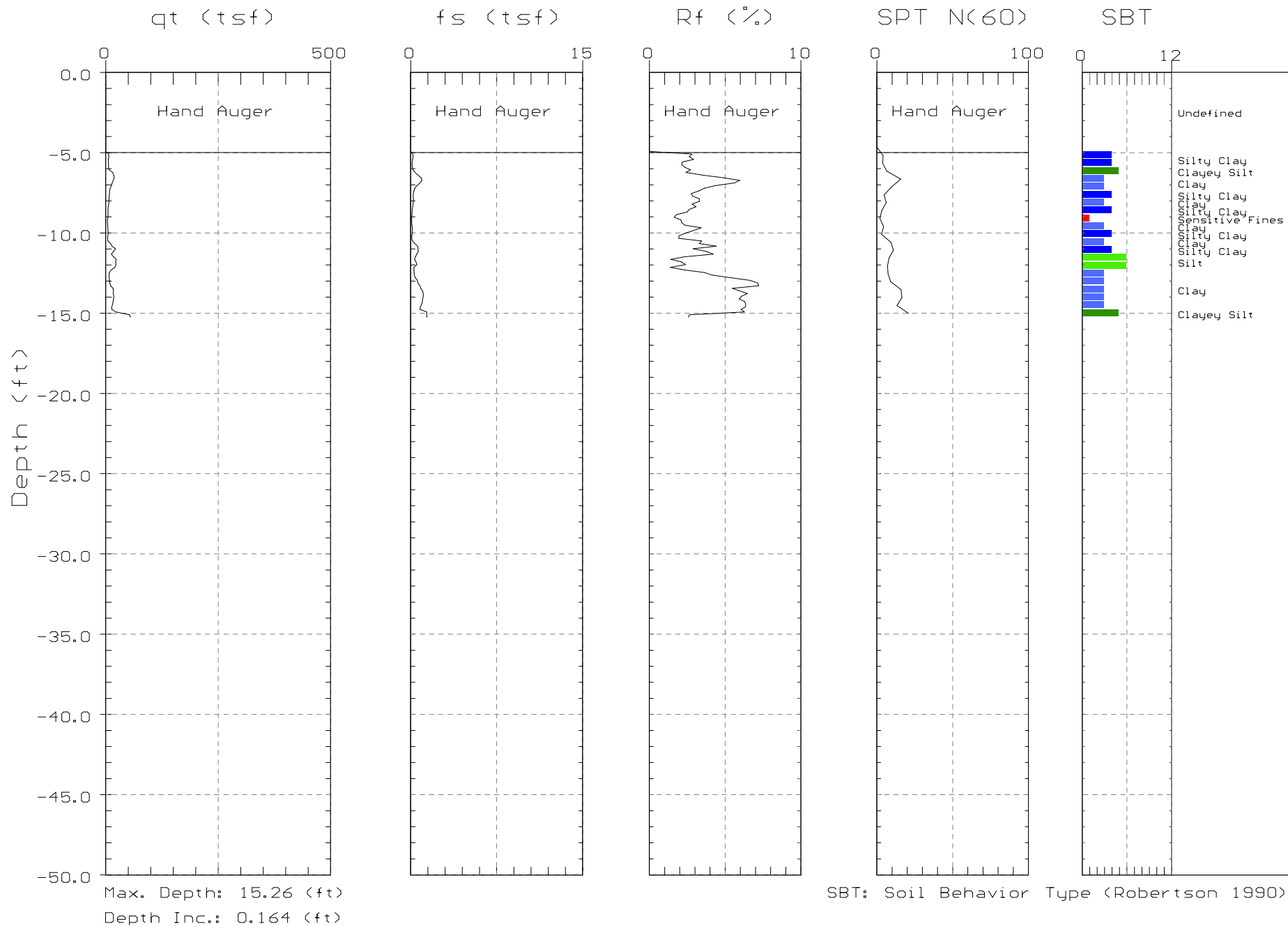


ENGEEO

Site: RIVER RUN
Location: CPT-03

Engineer: S.HARRIS
Date: 06:27:05 19:11



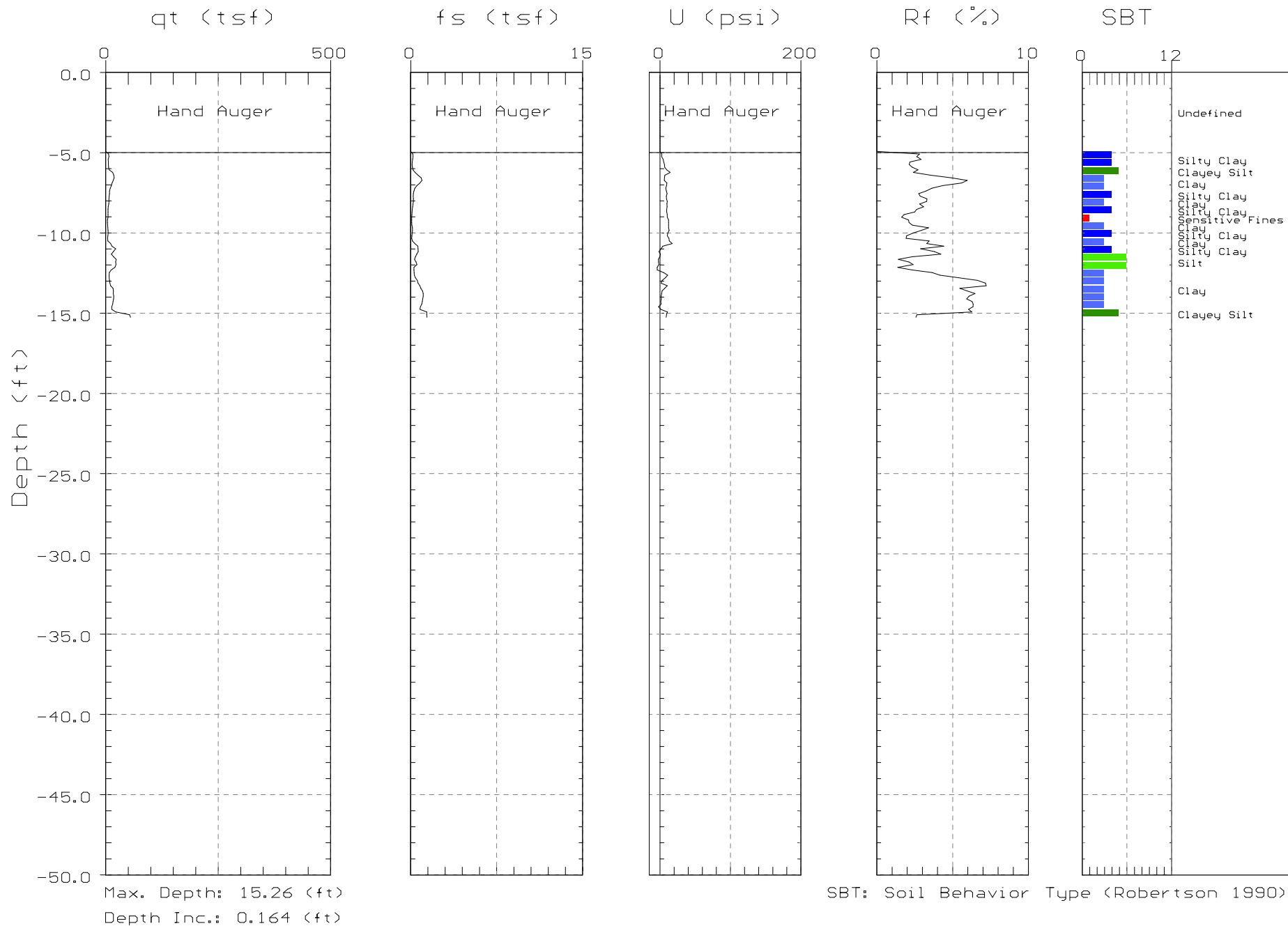




ENGEO

Site: RIVER RUN
Location: CPT-04

Engineer: S.HARRIS
Date: 06:27:05 19:40

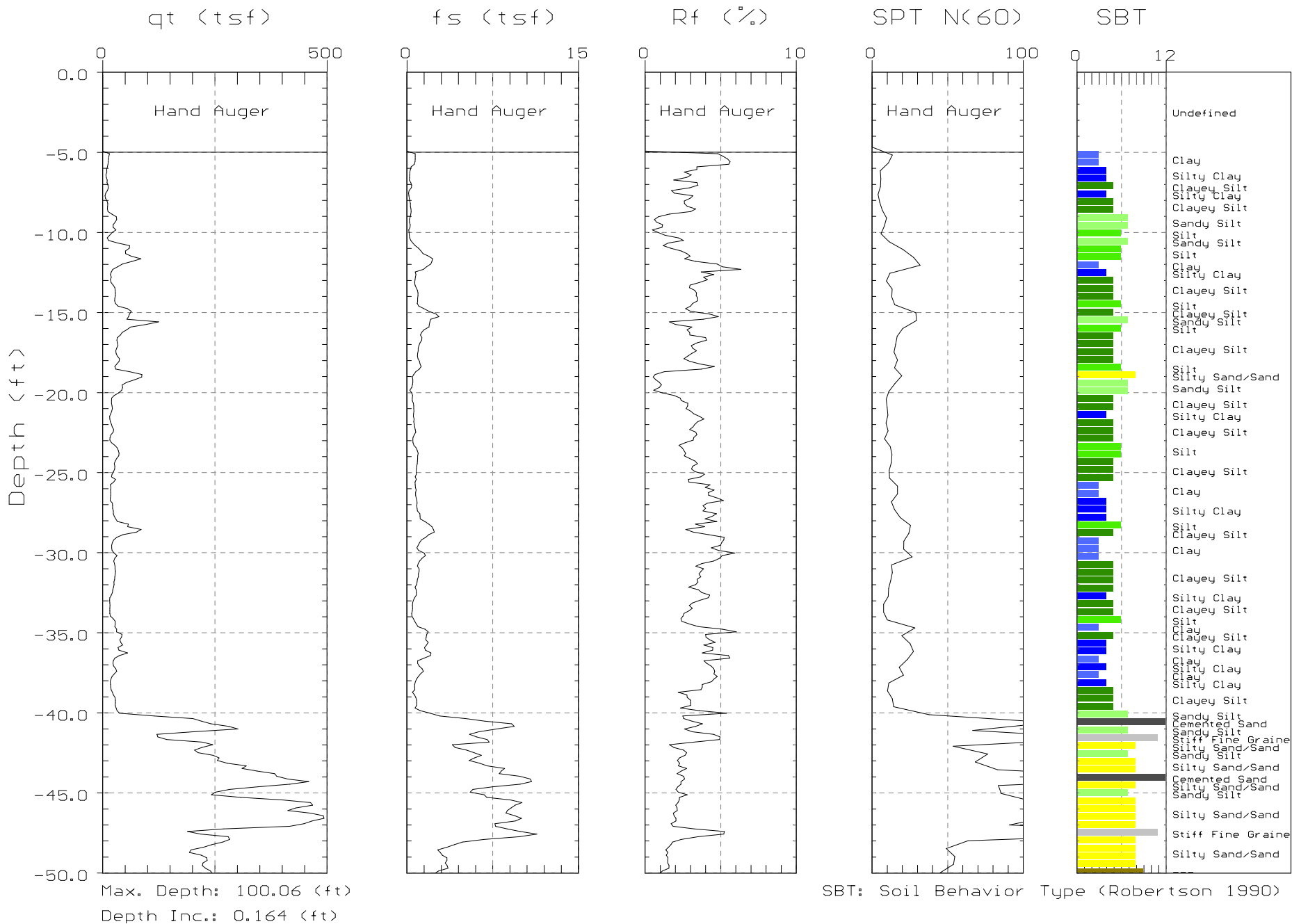




ENGEEO

Site: RIVER RUN
Location: SCPT-05B

Engineer: S.HARRIS
Date: 06:27:05 15:23

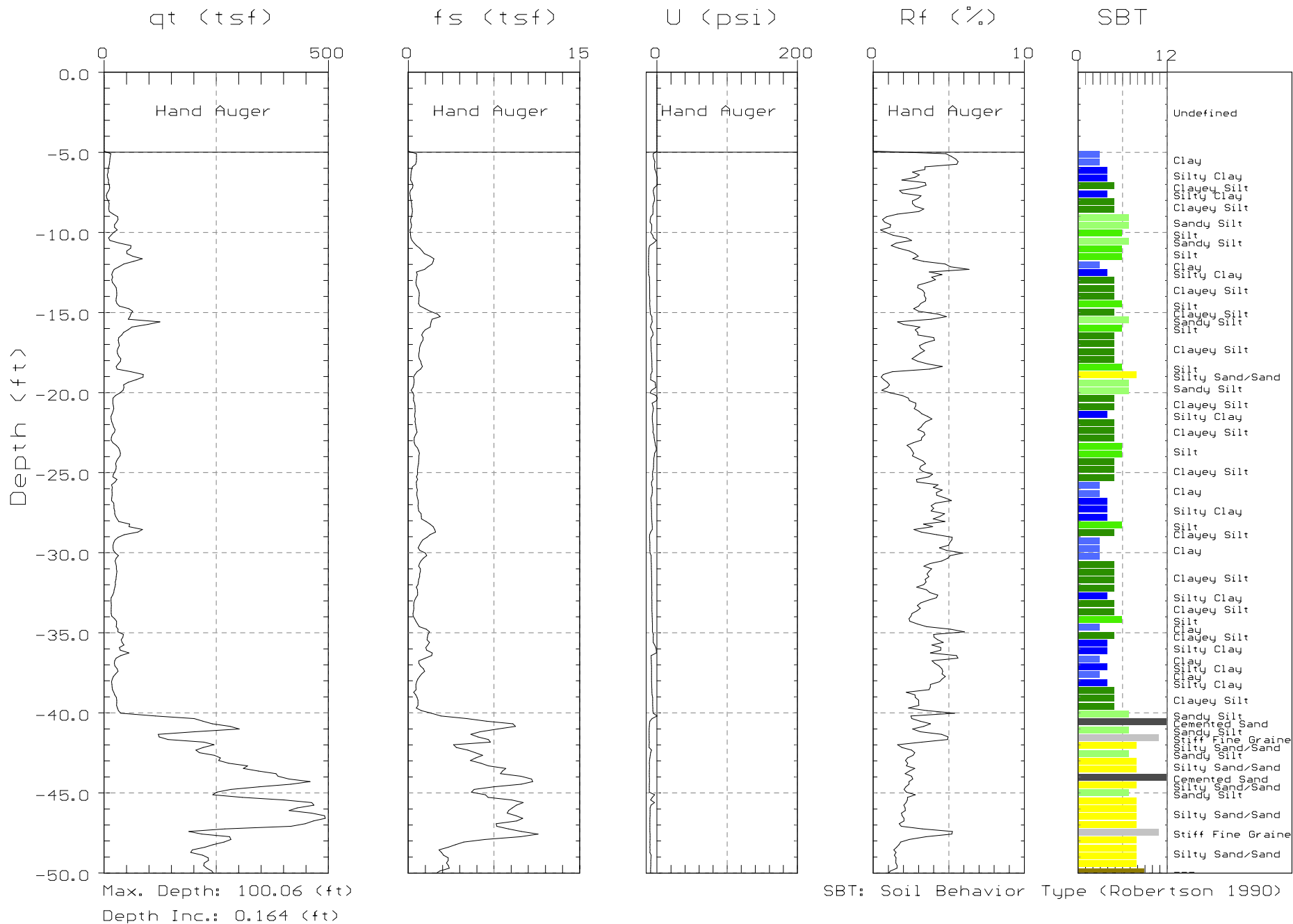




ENGEEO

Site: RIVER RUN
Location: SCPT-05B

Engineer: S.HARRIS
Date: 06:27:05 15:23

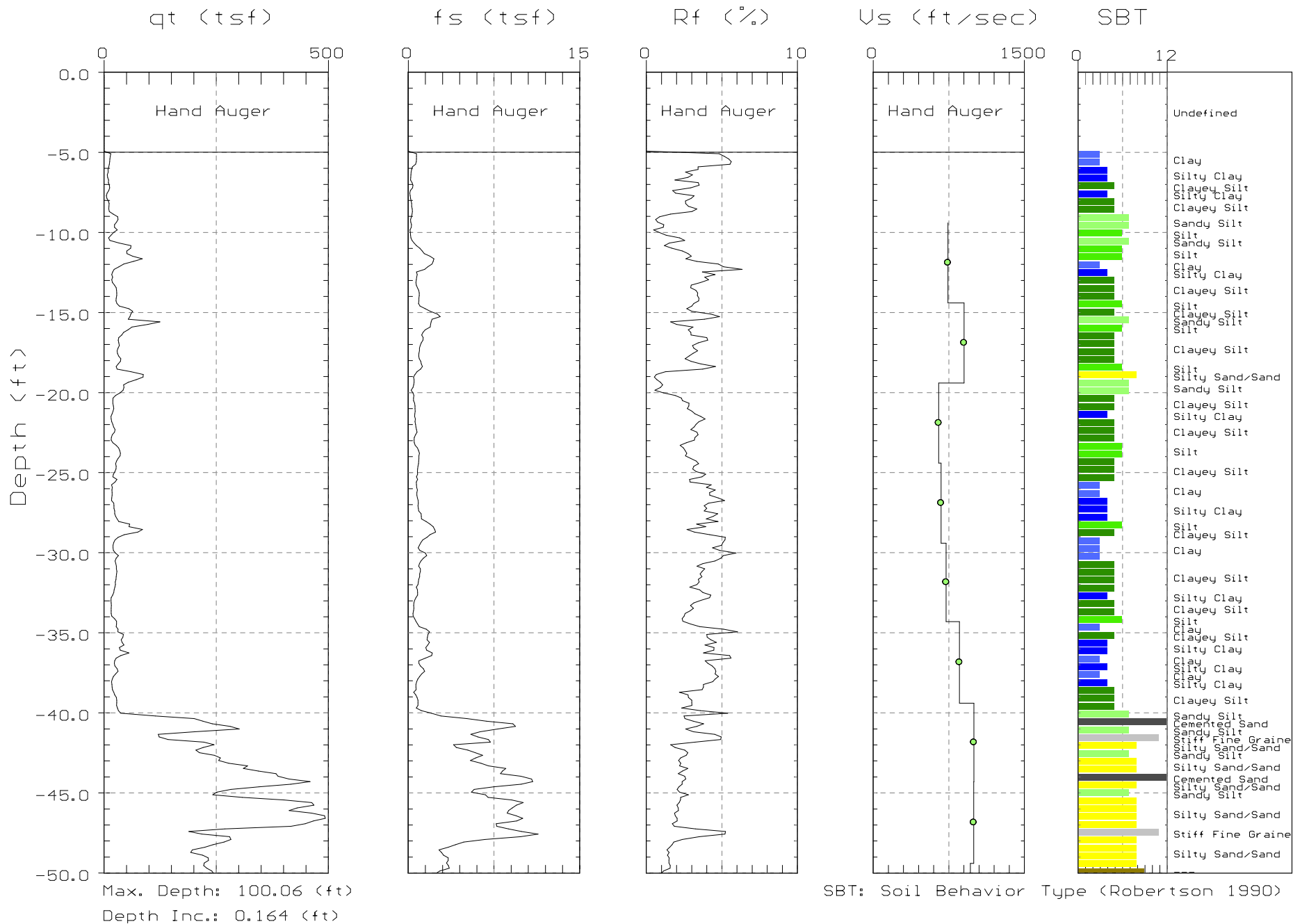




ENGEO

Site: RIVER RUN
Location: SCPT-05B

Engineer: S.HARRIS
Date: 06:27:05 15:23

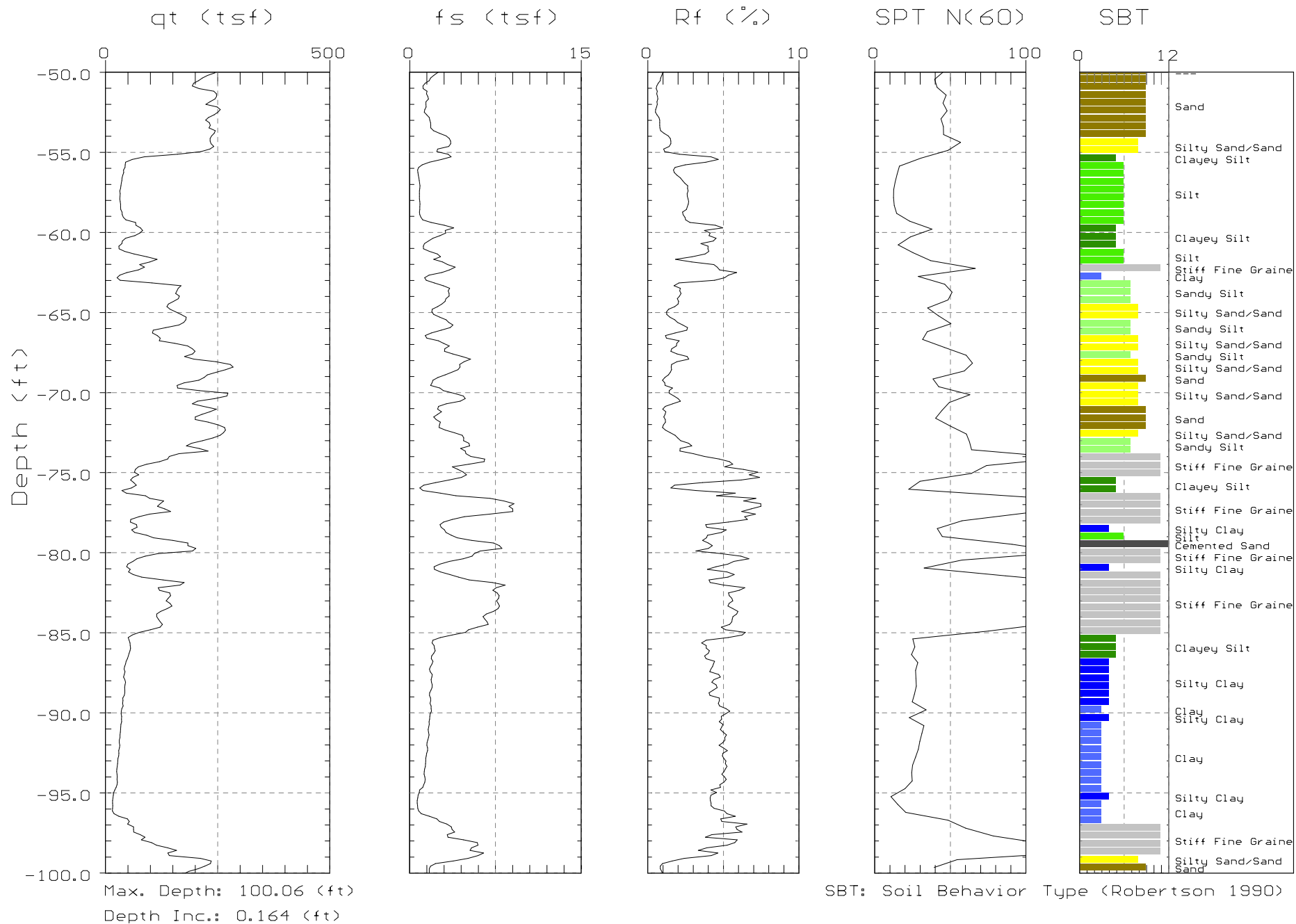




ENGEO

Site: RIVER RUN
Location: SCPT-05B

Engineer: S.HARRIS
Date: 06:27:05 15:23

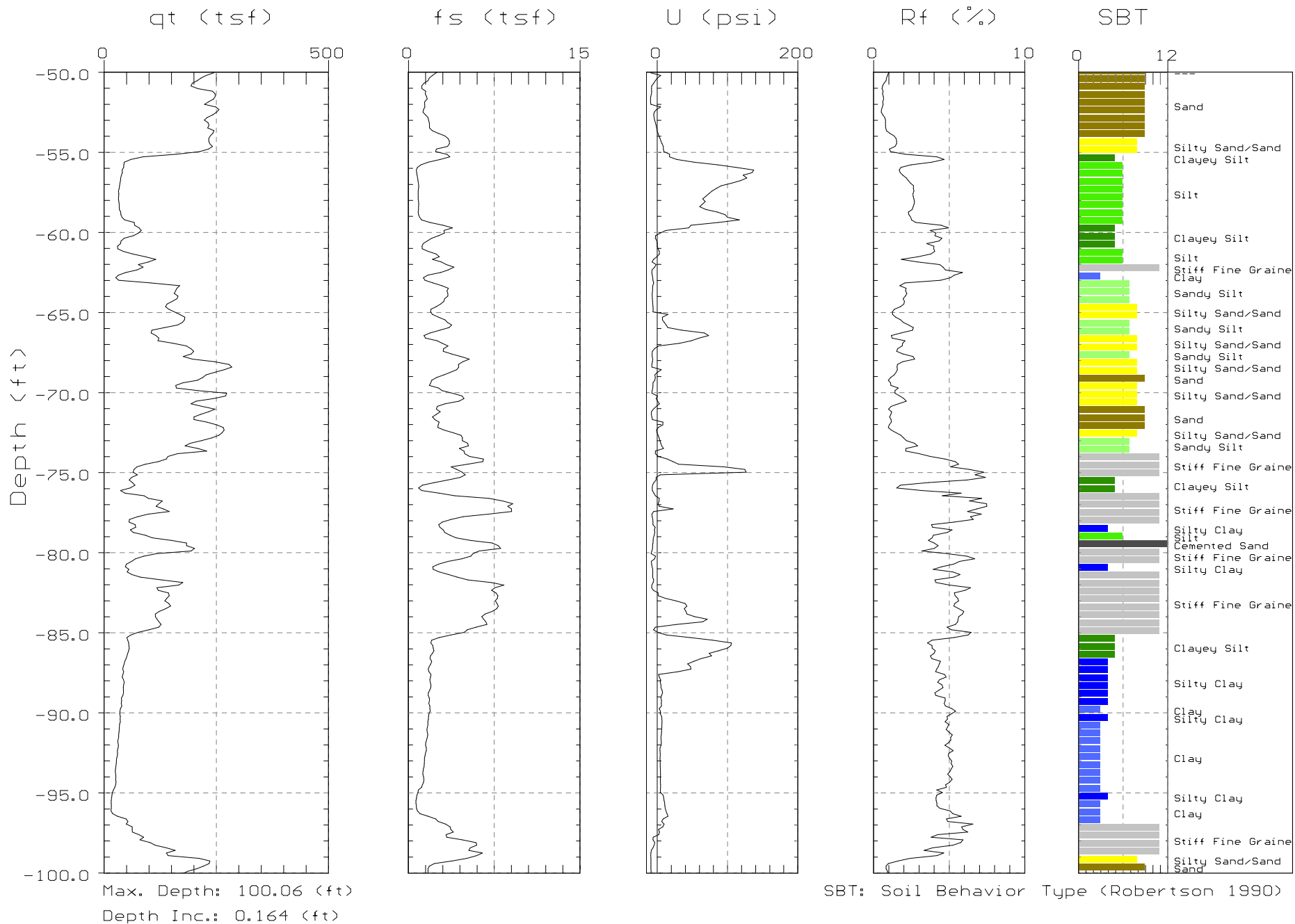




ENGEO

Site: RIVER RUN
Location: SCPT-05B

Engineer: S.HARRIS
Date: 06:27:05 15:23

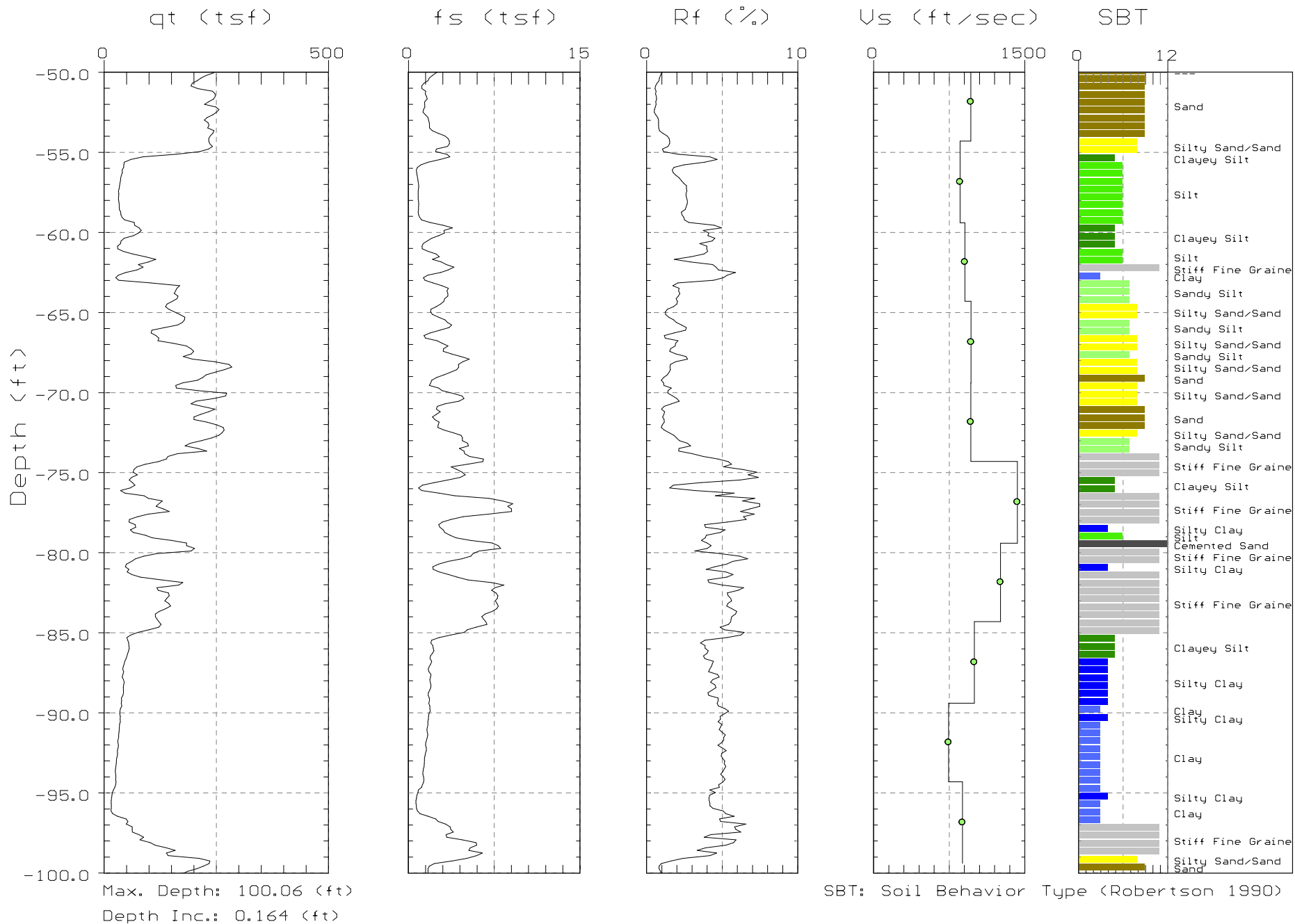




ENGEO

Site: RIVER RUN
Location: SCPT-05B

Engineer: S.HARRIS
Date: 06:27:05 15:23

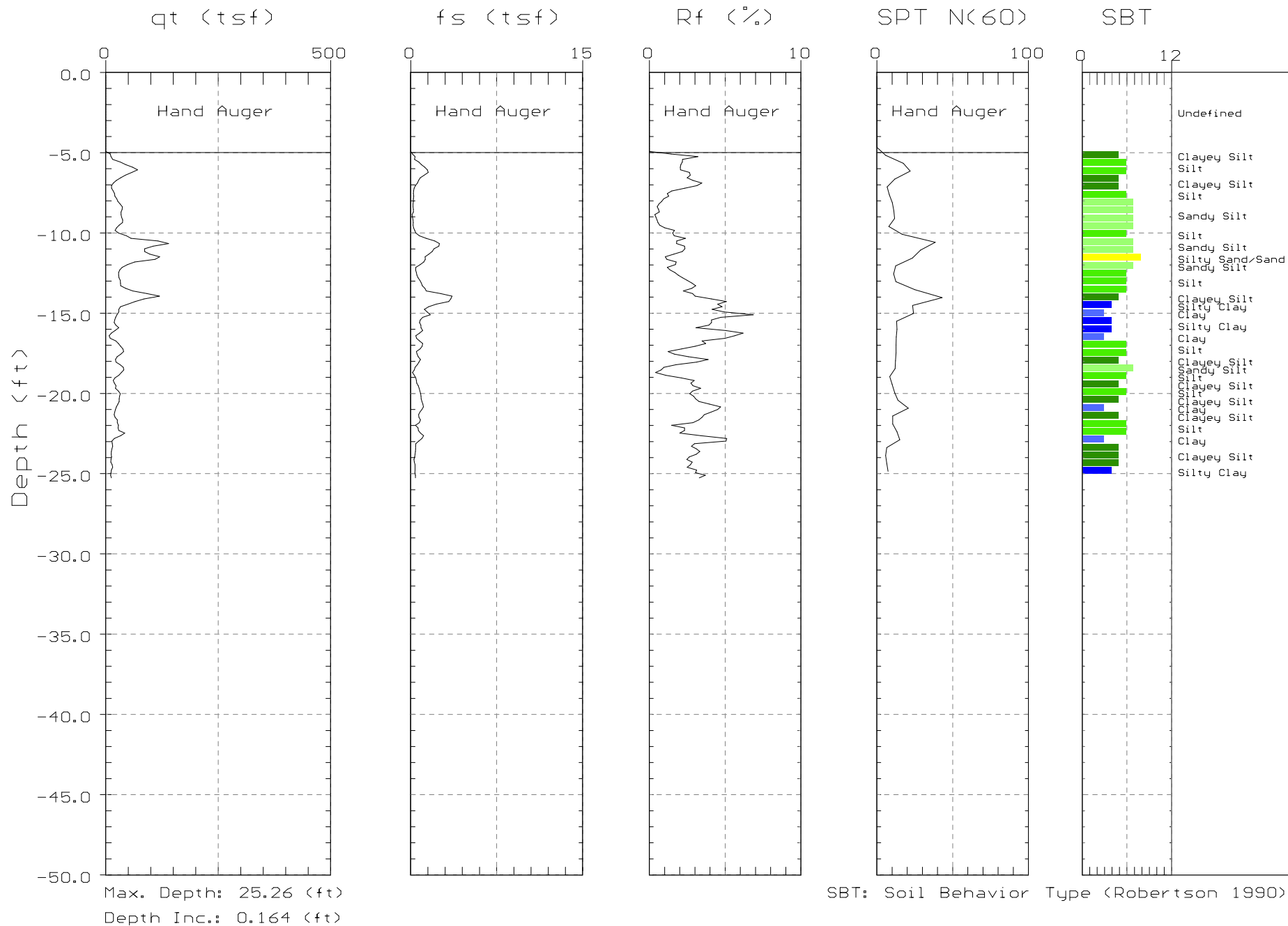




ENGEO

Site: RIVER RUN
Location: CPT-06

Engineer: S.HARRIS
Date: 06:27:05 13:22

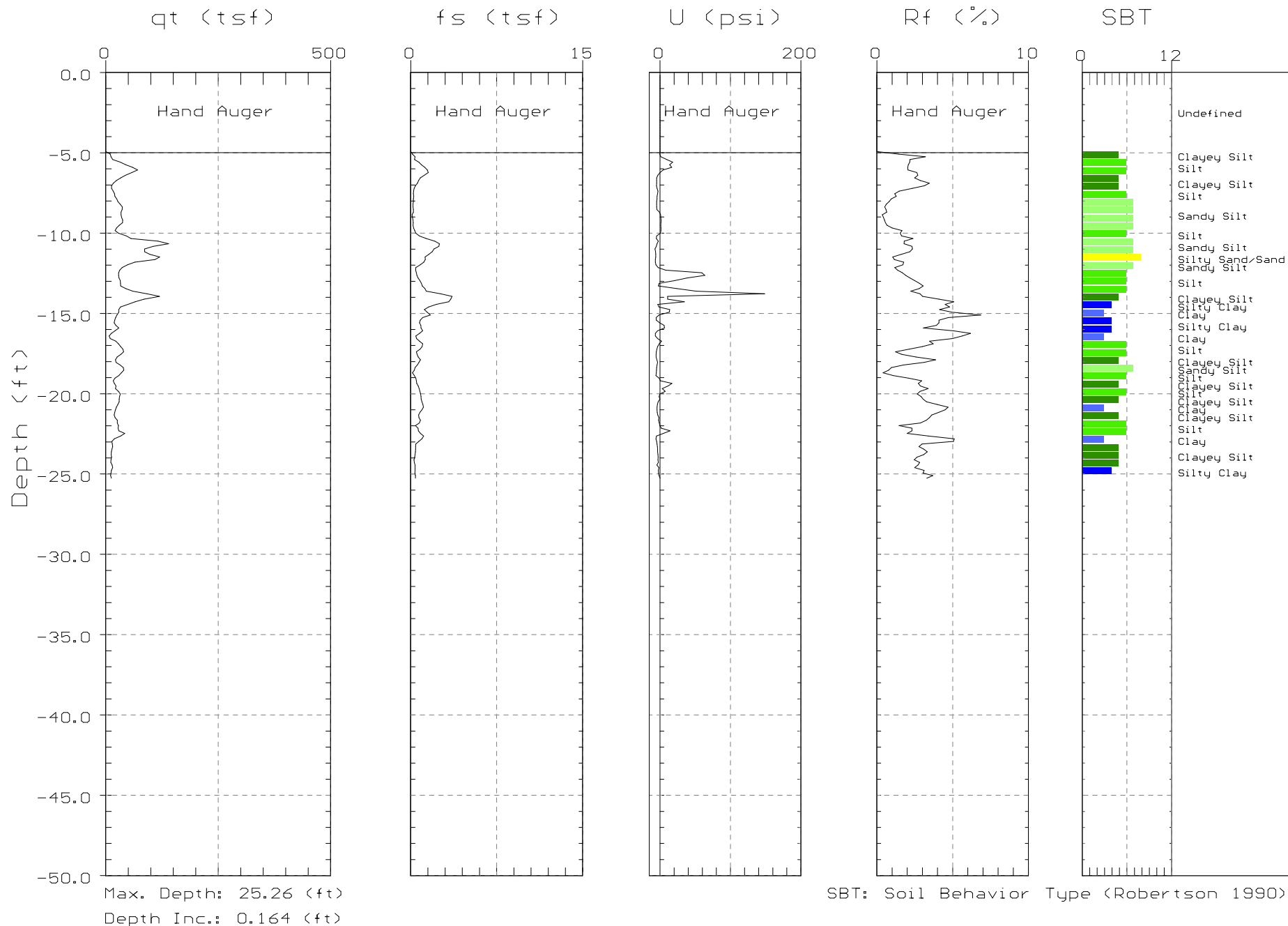




ENGEO

Site: RIVER RUN
Location: CPT-06

Engineer: S.HARRIS
Date: 06:27:05 13:22

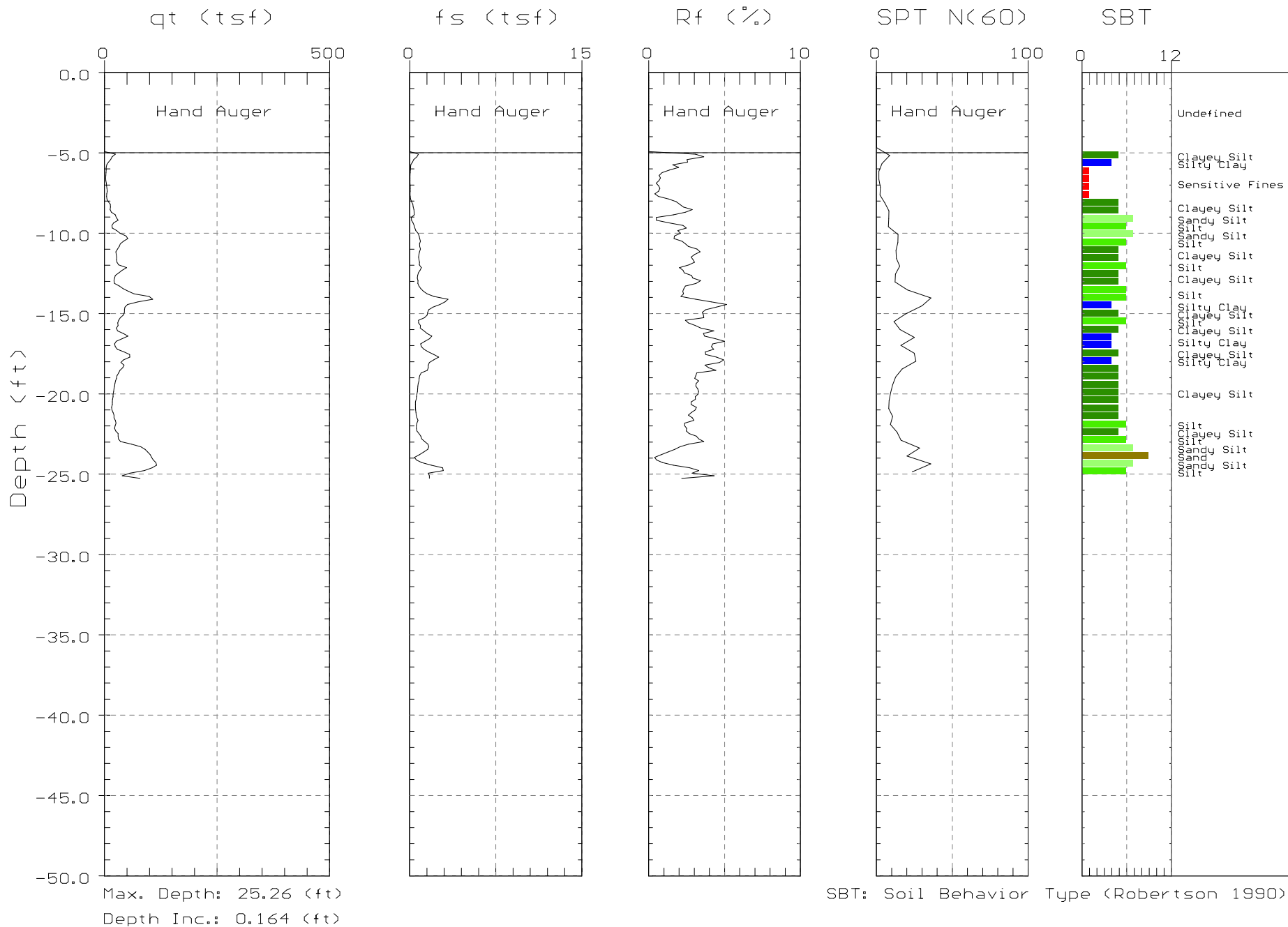




ENGEO

Site: RIVER RUN
Location: CPT-08

Engineer: S.HARRIS
Date: 06:27:05 12:19

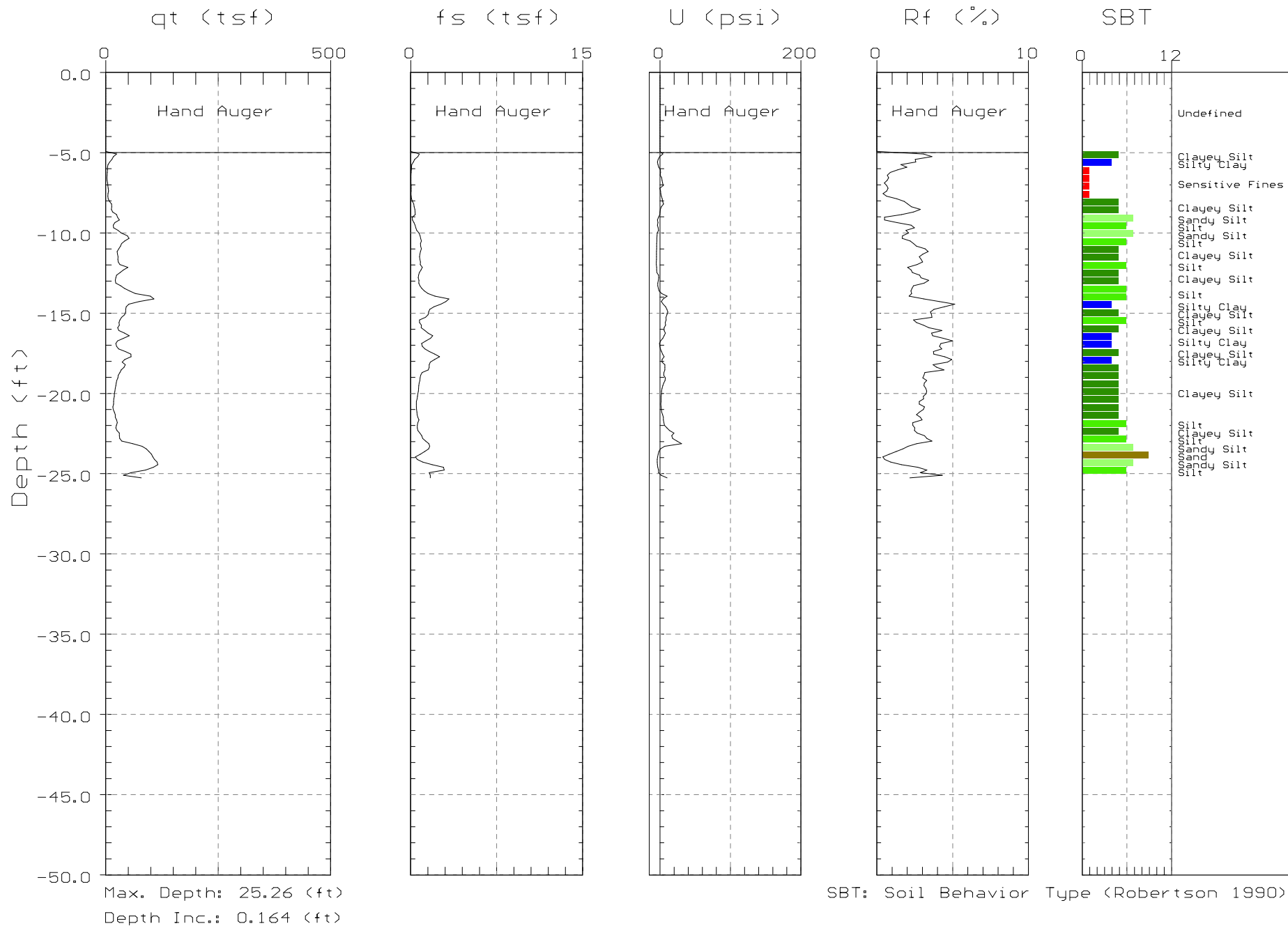




ENGEO

Site: RIVER RUN
Location: CPT-08

Engineer: S.HARRIS
Date: 06:27:05 12:19

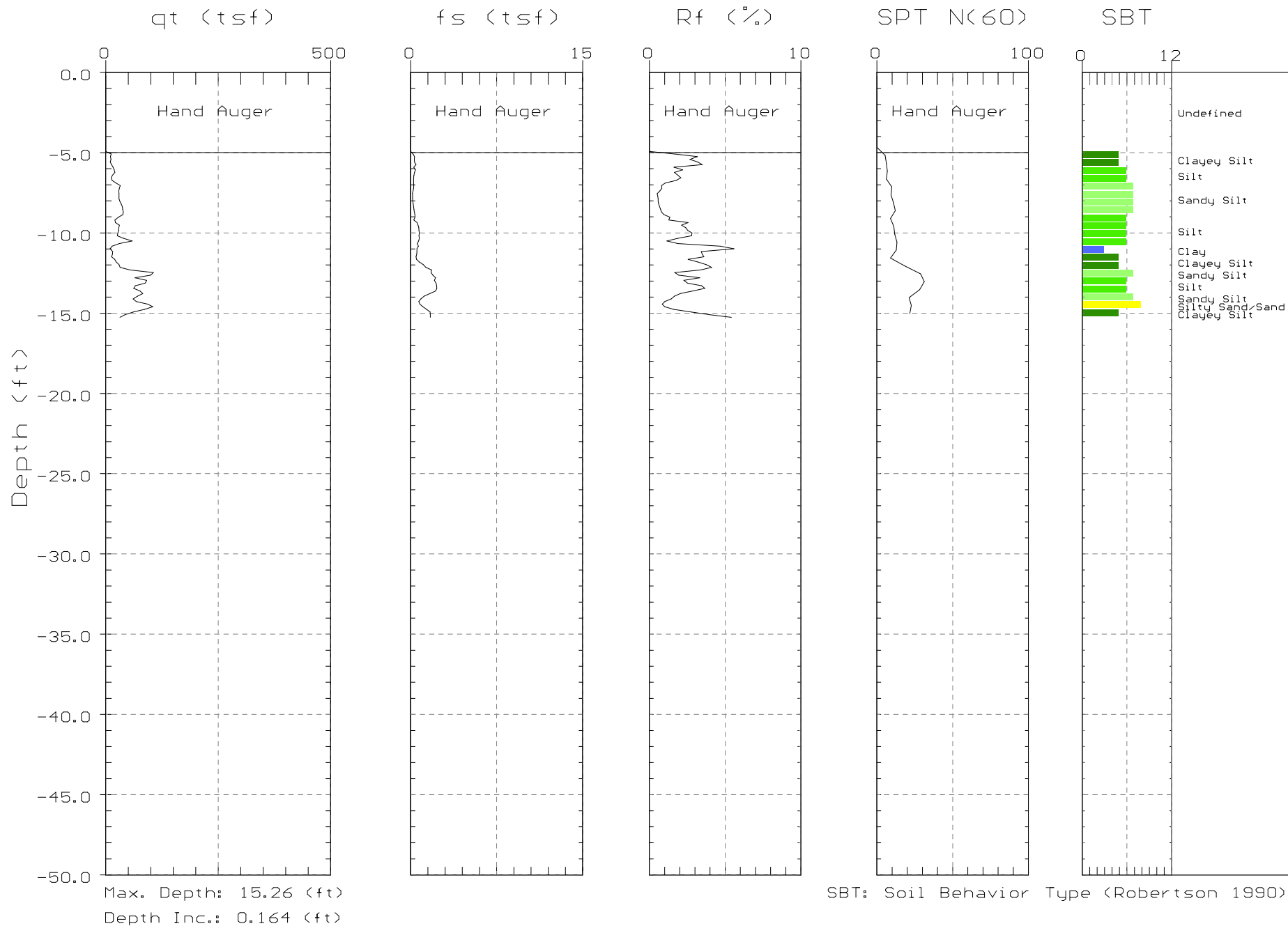




ENGEO

Site: RIVER RUN
Location: CPT-10

Engineer: S.HARRIS
Date: 06:27:05 11:37

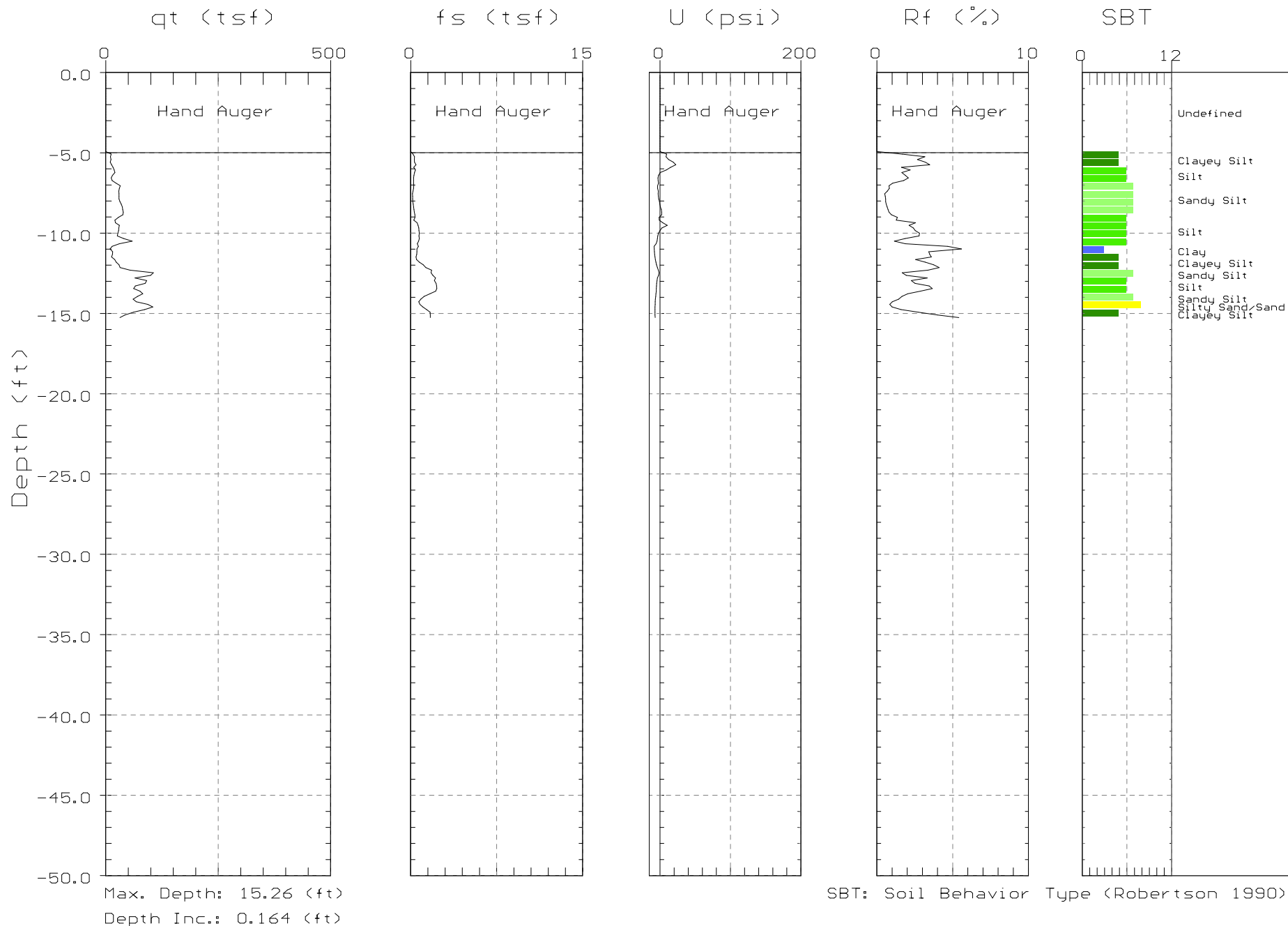




ENGEO

Site: RIVER RUN
Location: CPT-10

Engineer: S.HARRIS
Date: 06:27:05 11:37

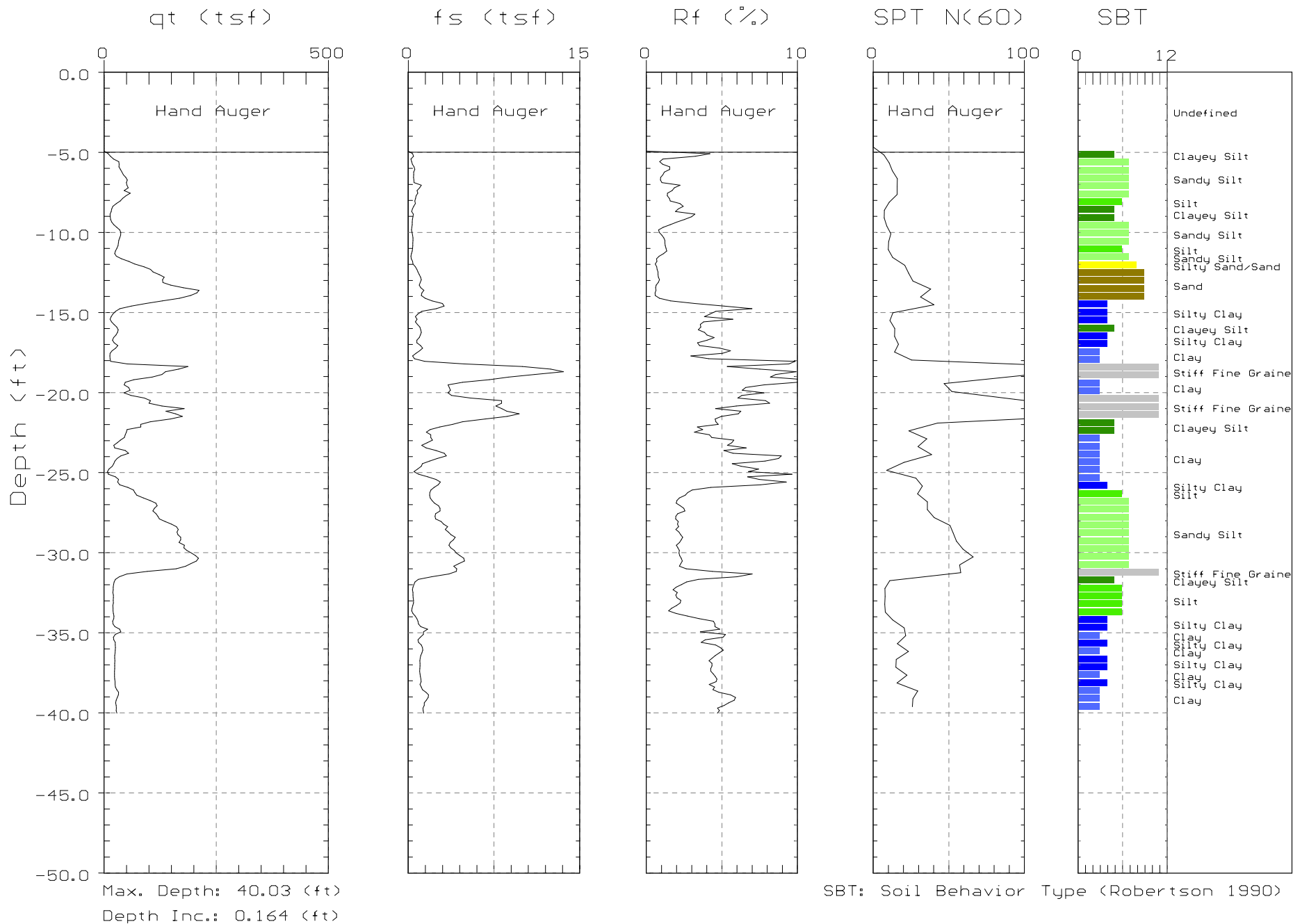




ENGEO

Site: RIVER RUN
Location: CPT-14

Engineer: S.HARRIS
Date: 06:24:05 09:58

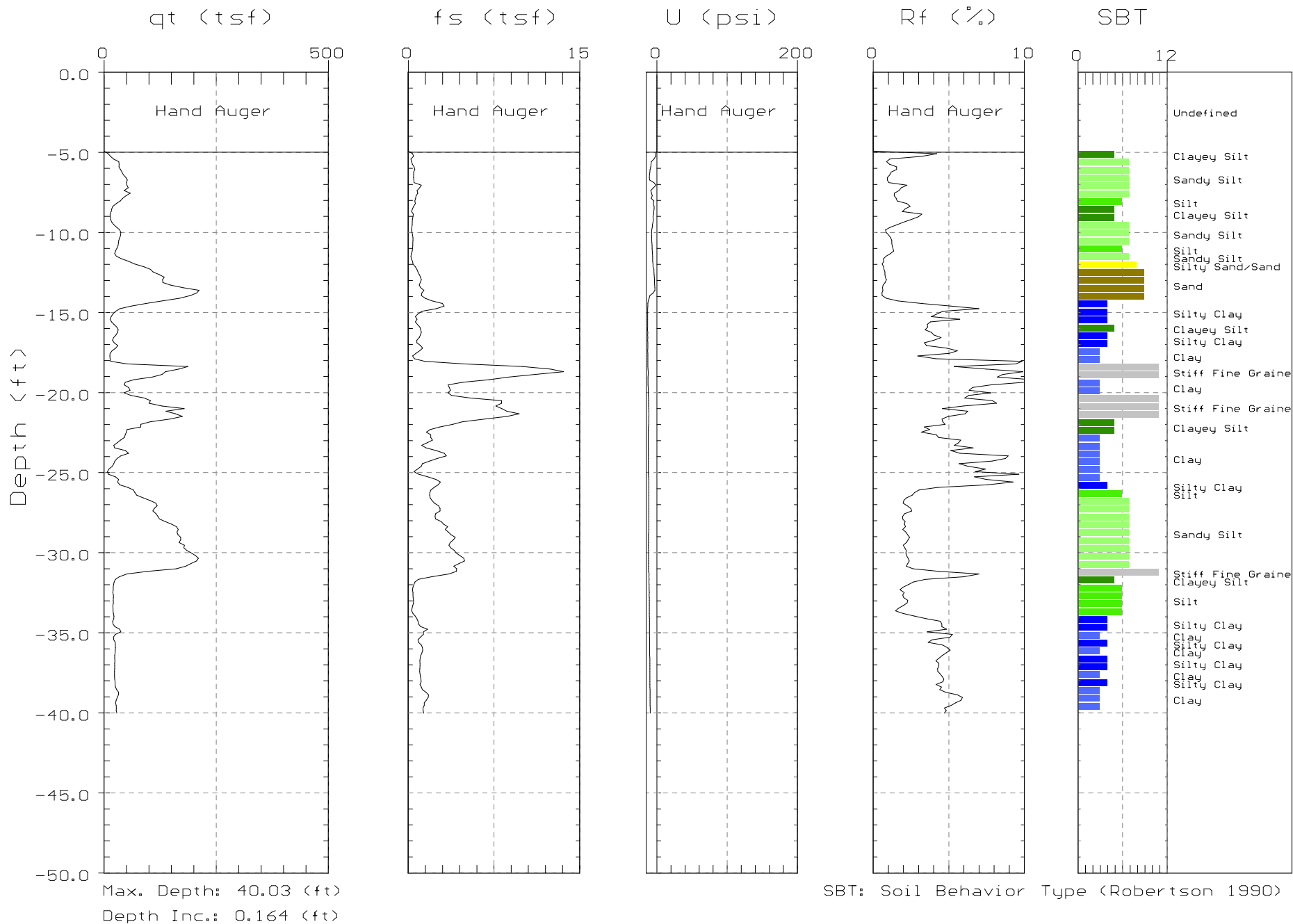




ENGEEO

Site: RIVER RUN
Location: CPT-14

Engineer: S.HARRIS
Date: 06:24:05 09:58

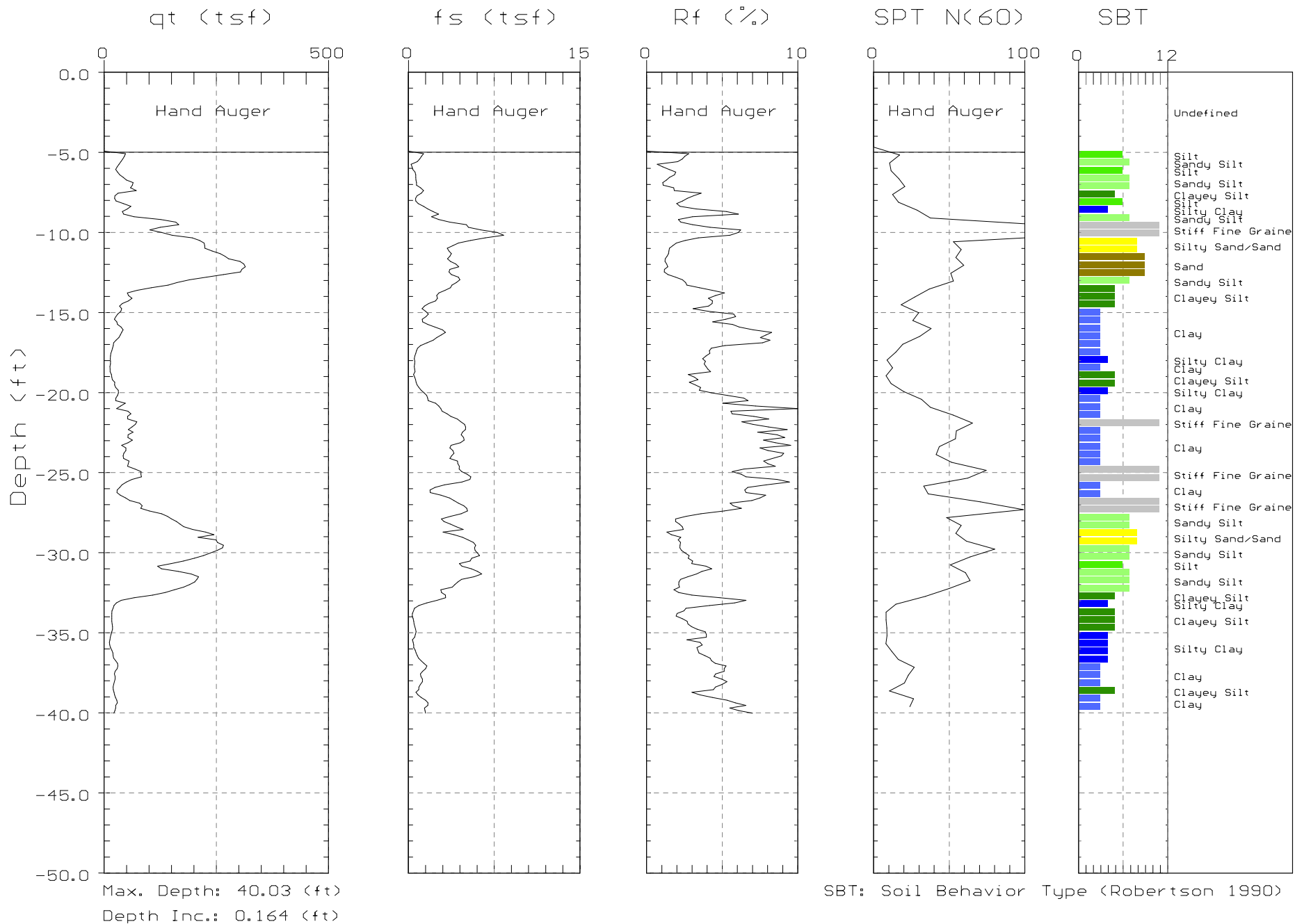




ENGEO

Site: RIVER RUN
Location: CPT-24

Engineer: S.HARRIS
Date: 06:24:05 11:59

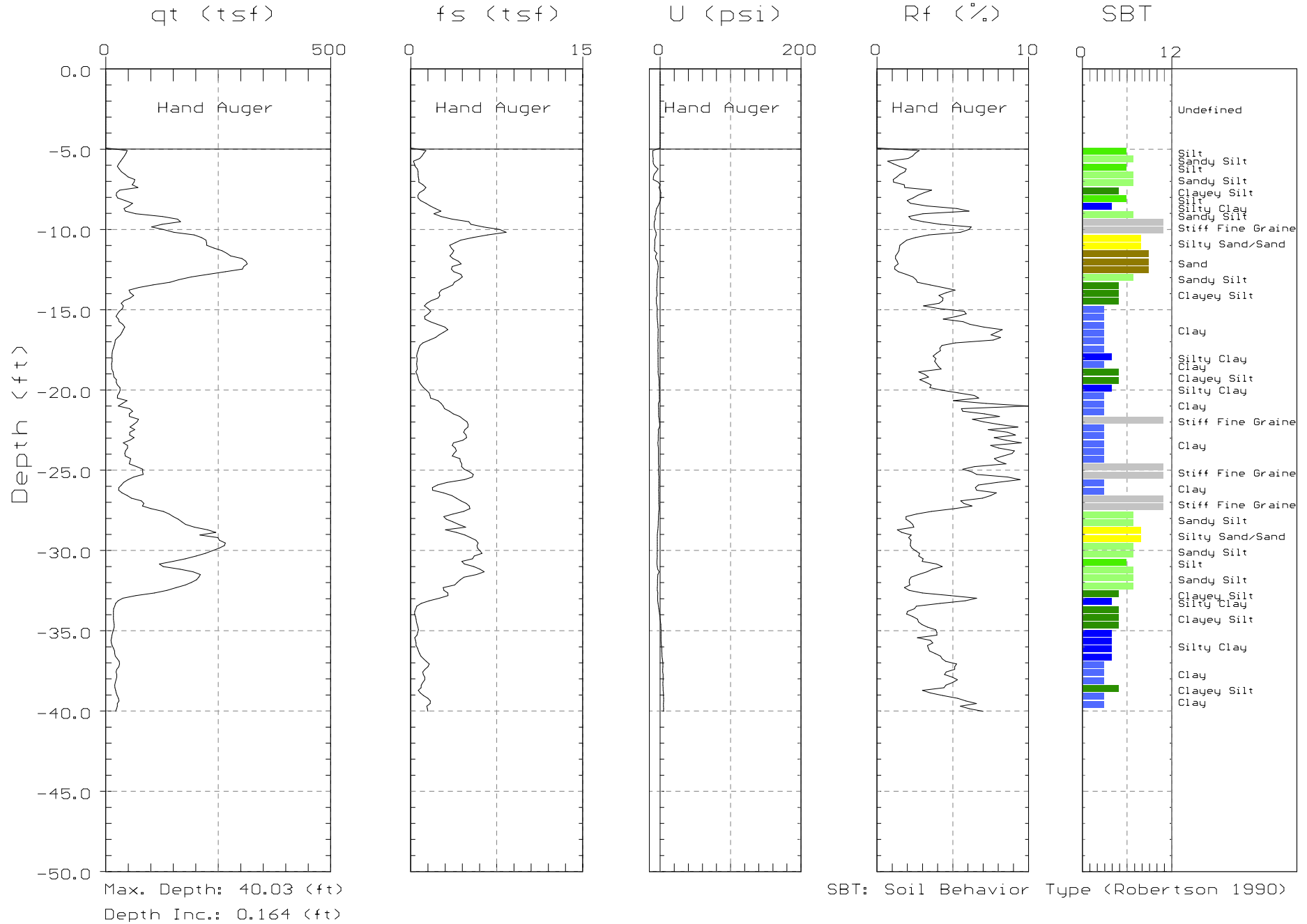




ENGEO

Site: RIVER RUN
Location: CPT-24

Engineer: S.HARRIS
Date: 06:24:05 11:59

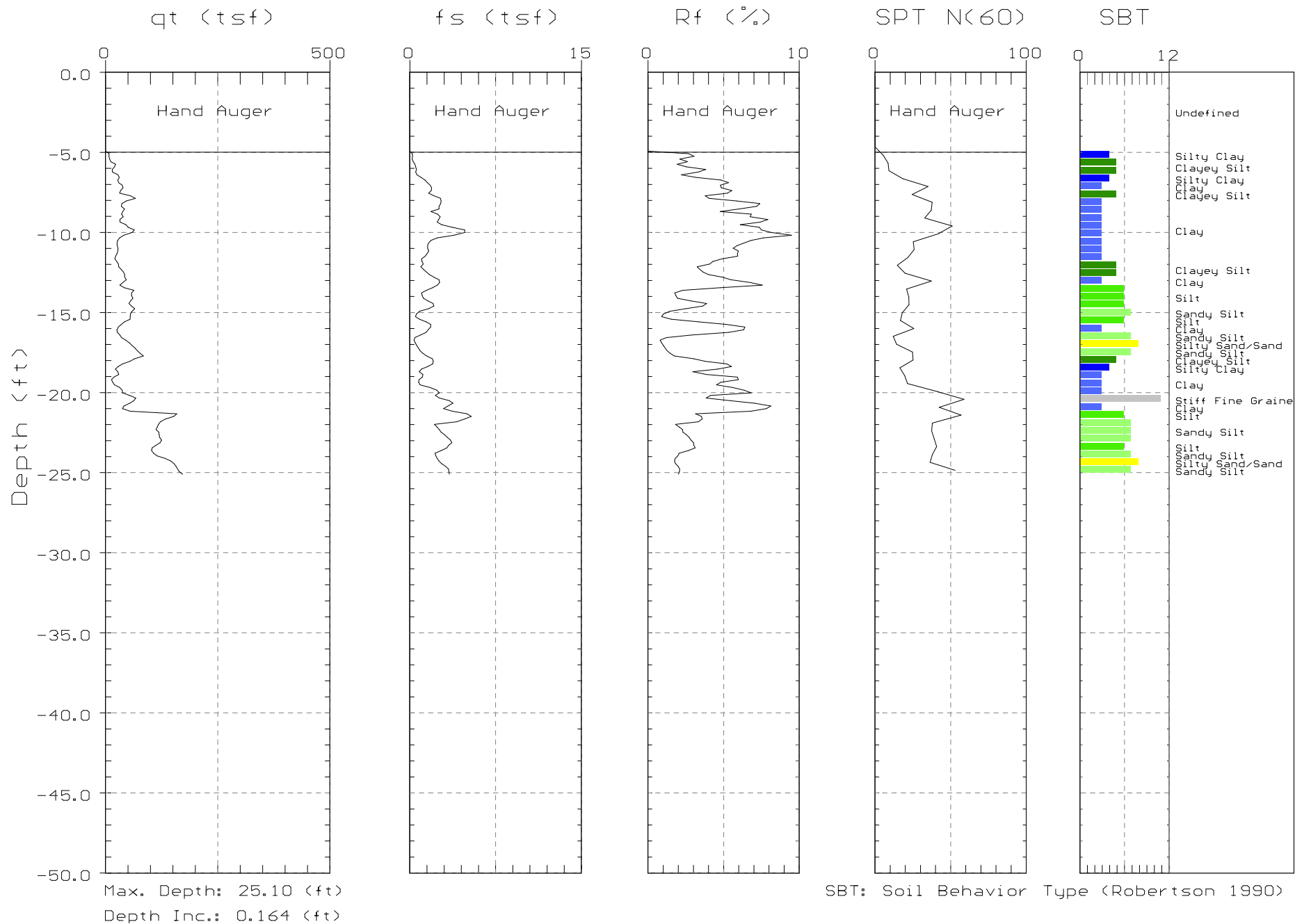




ENGEEO

Site: RIVER RUN
Location: CPT-25

Engineer: S.HARRIS
Date: 06:24:05 11:01

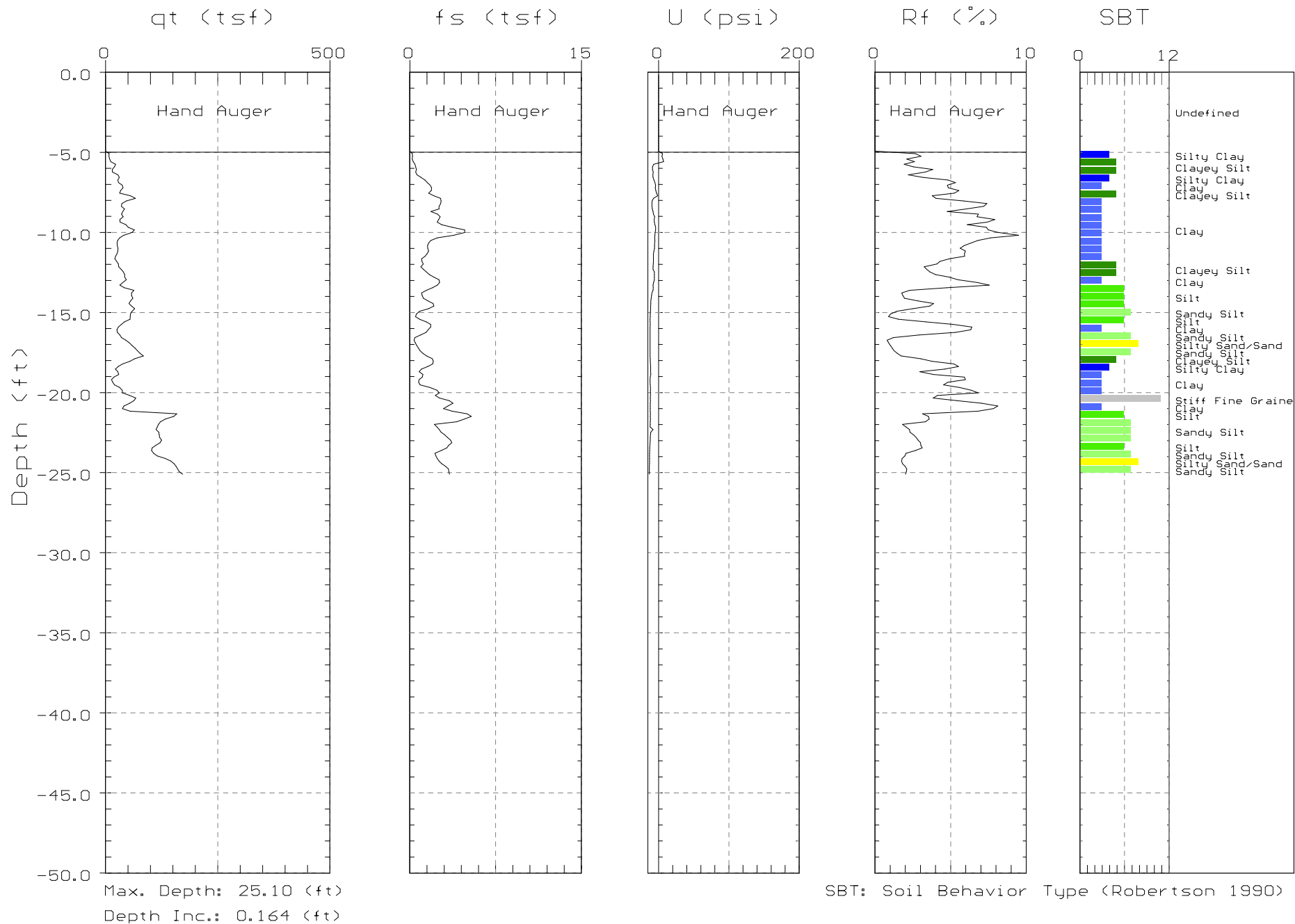




ENGEO

Site: RIVER RUN
Location: CPT-25

Engineer: S.HARRIS
Date: 06:24:05 11:01

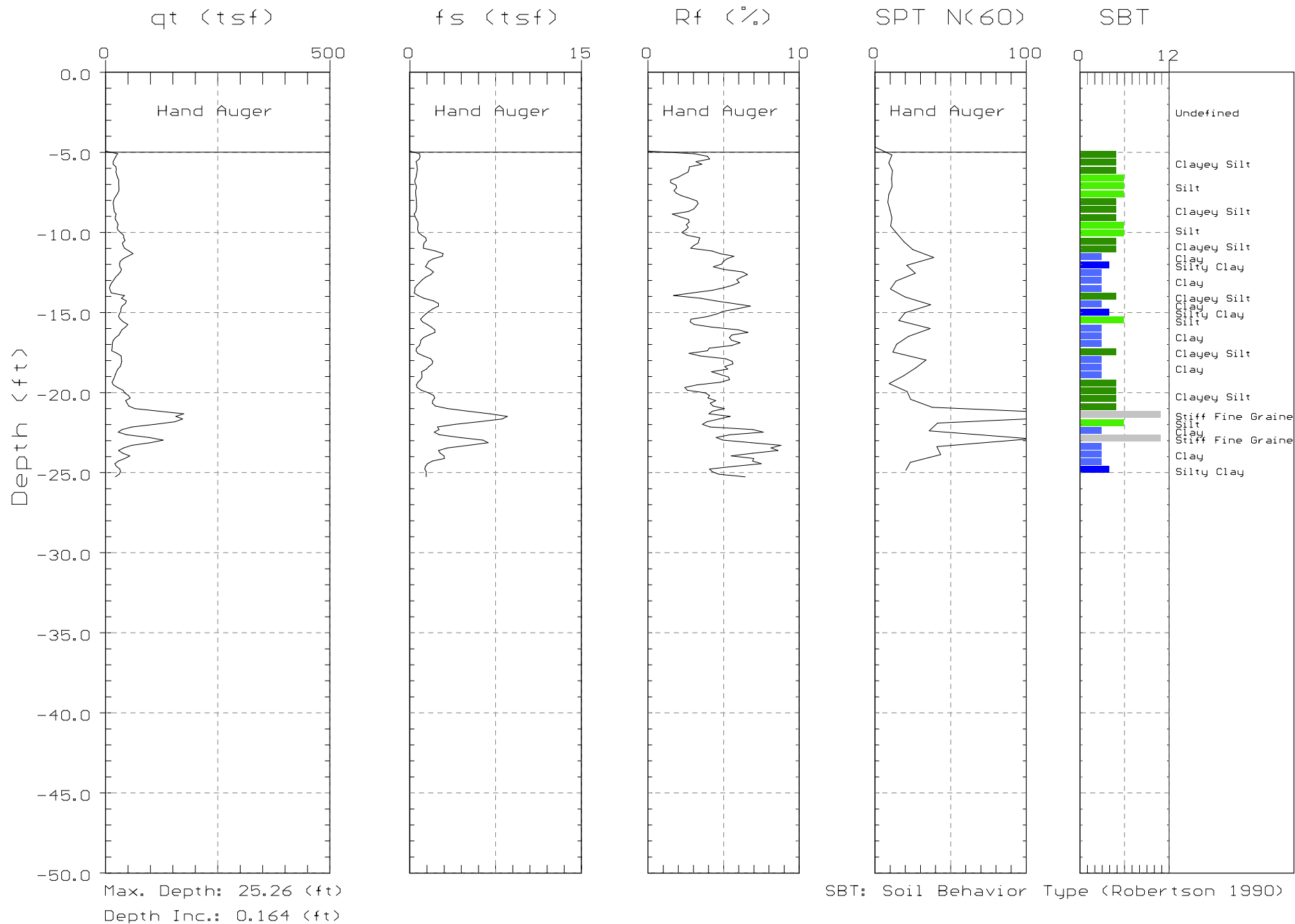




ENGEO

Site: RIVER RUN
Location: CPT-26

Engineer: S.HARRIS
Date: 06:29:05 14:03

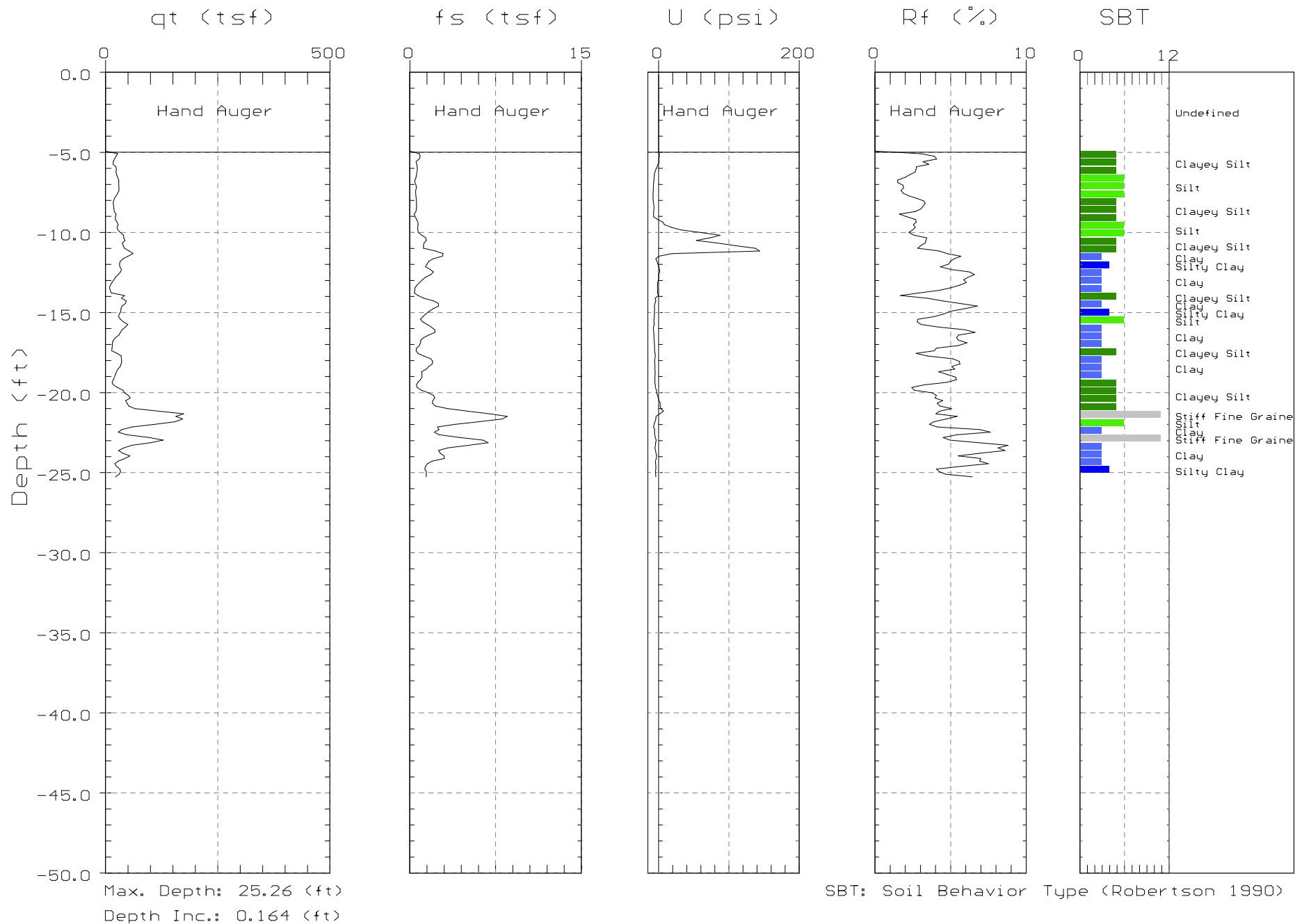




ENGEO

Site: RIVER RUN
Location: CPT-26

Engineer: S.HARRIS
Date: 06:29:05 14:03

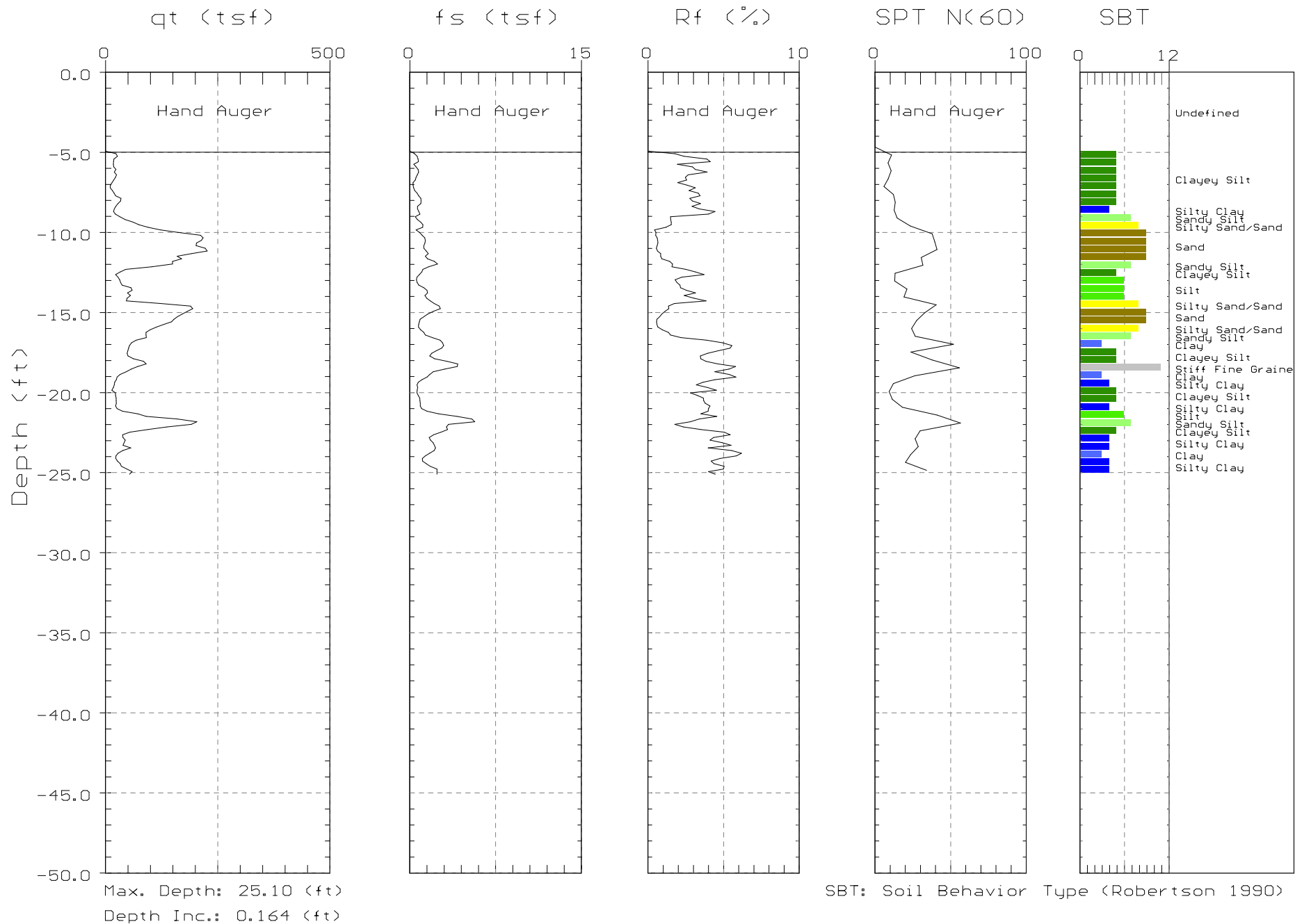




ENGEO

Site: RIVER RUN
Location: CPT-37

Engineer: S.HARRIS
Date: 07:05:05 08:27

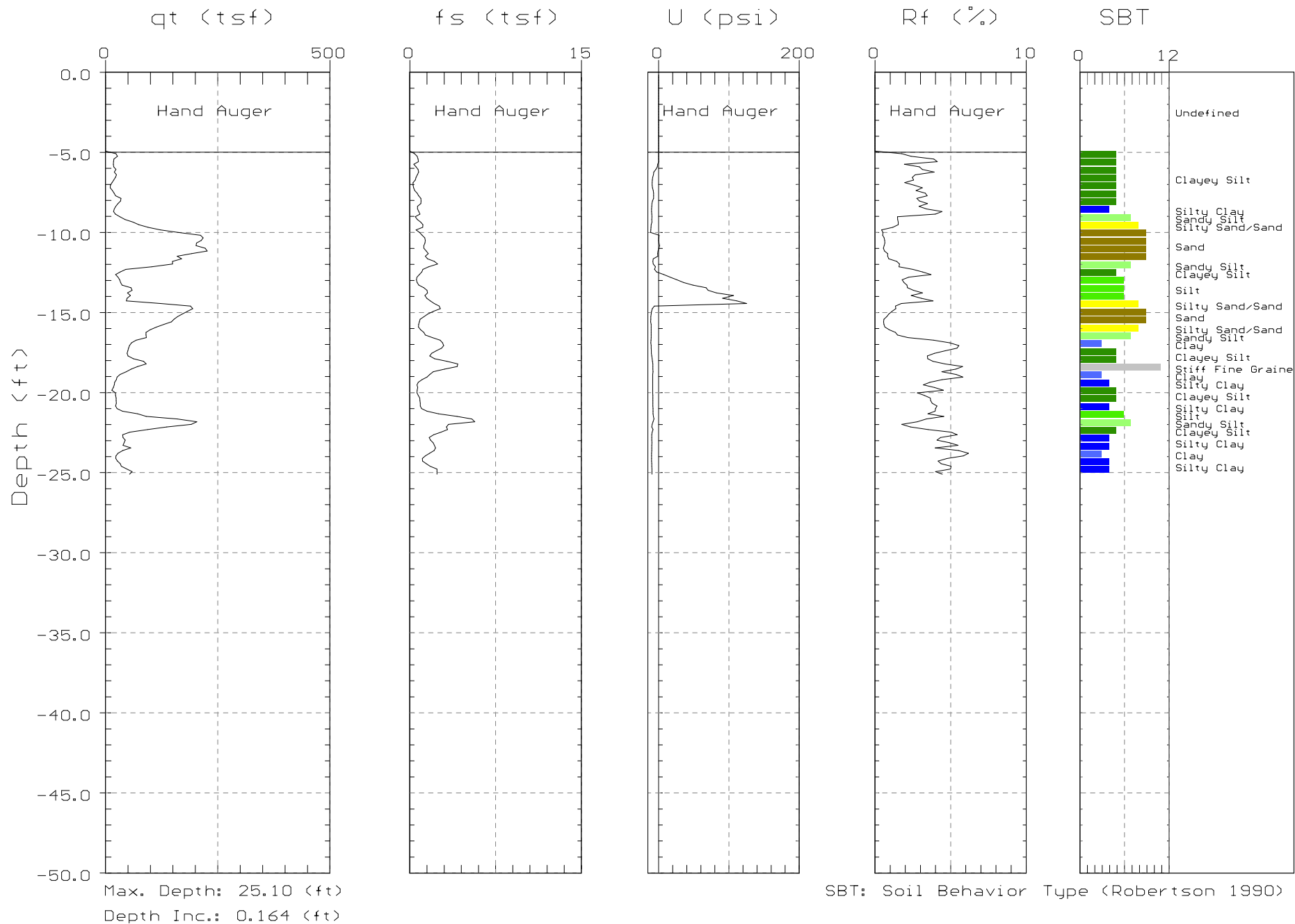




ENGEO

Site: RIVER RUN
Location: CPT-37

Engineer: S.HARRIS
Date: 07:05:05 08:27

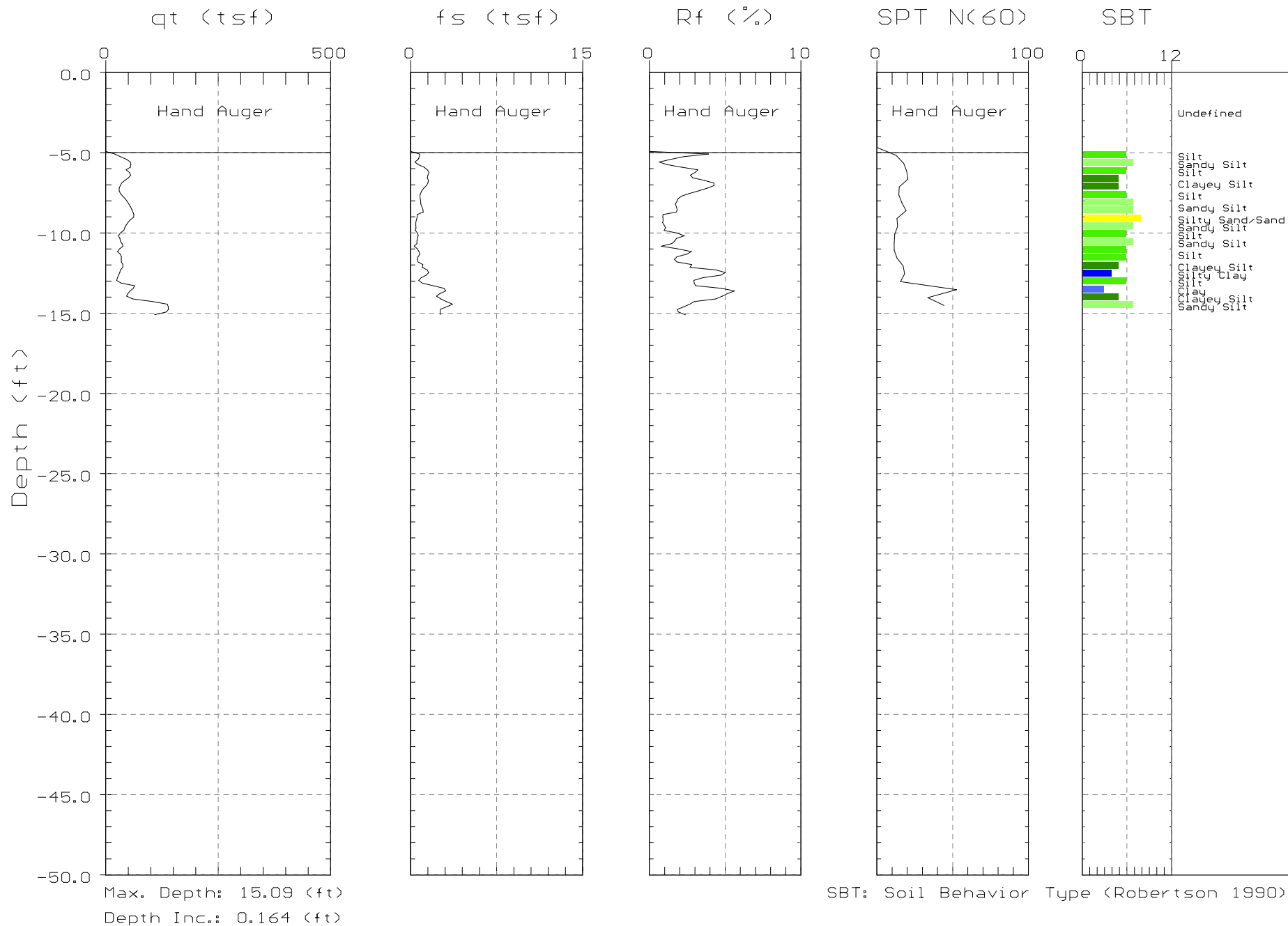




ENGEO

Site: RIVER RUN
Location: CPT-38

Engineer: S.HARRIS
Date: 06:29:05 14:41

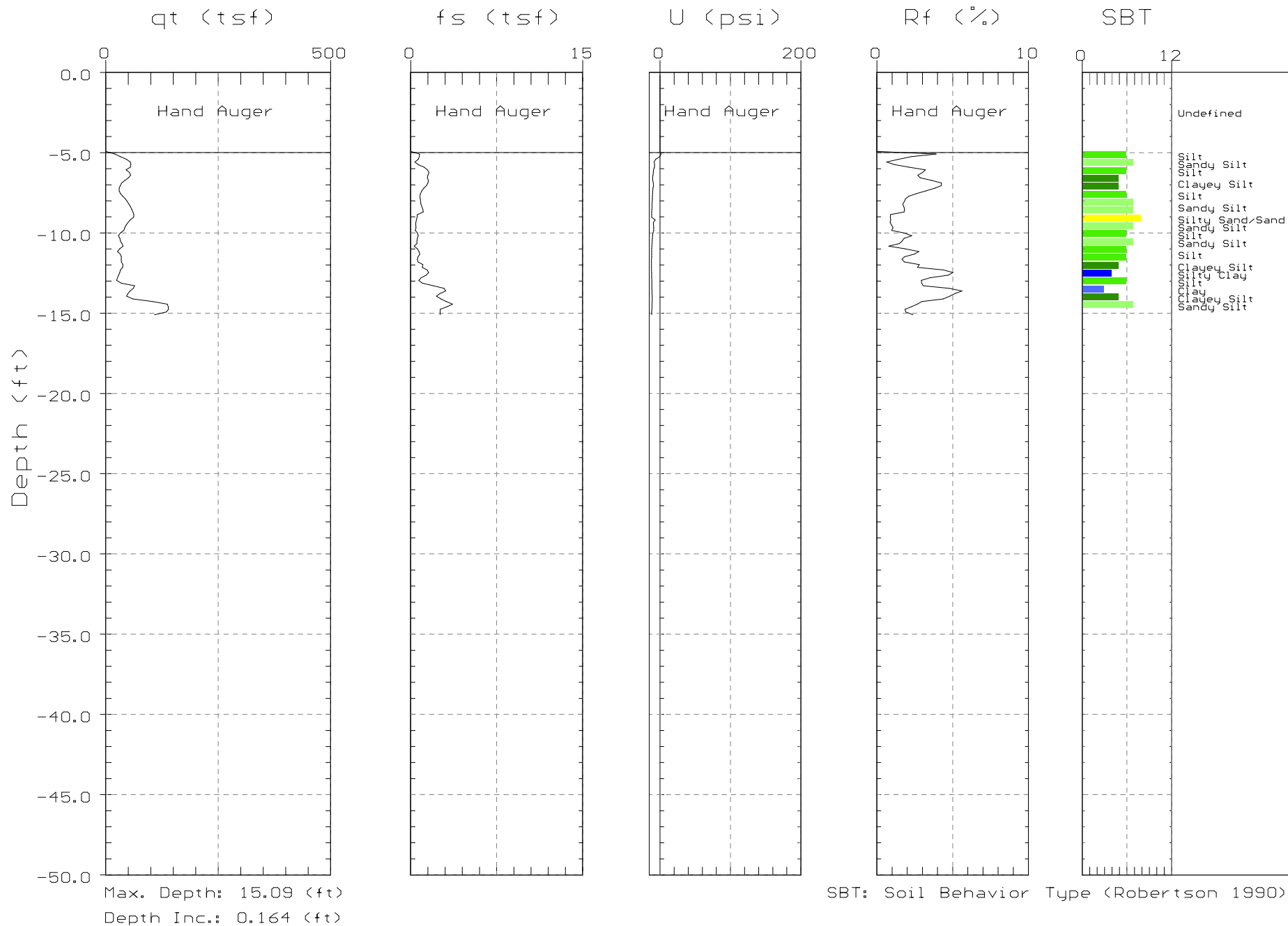


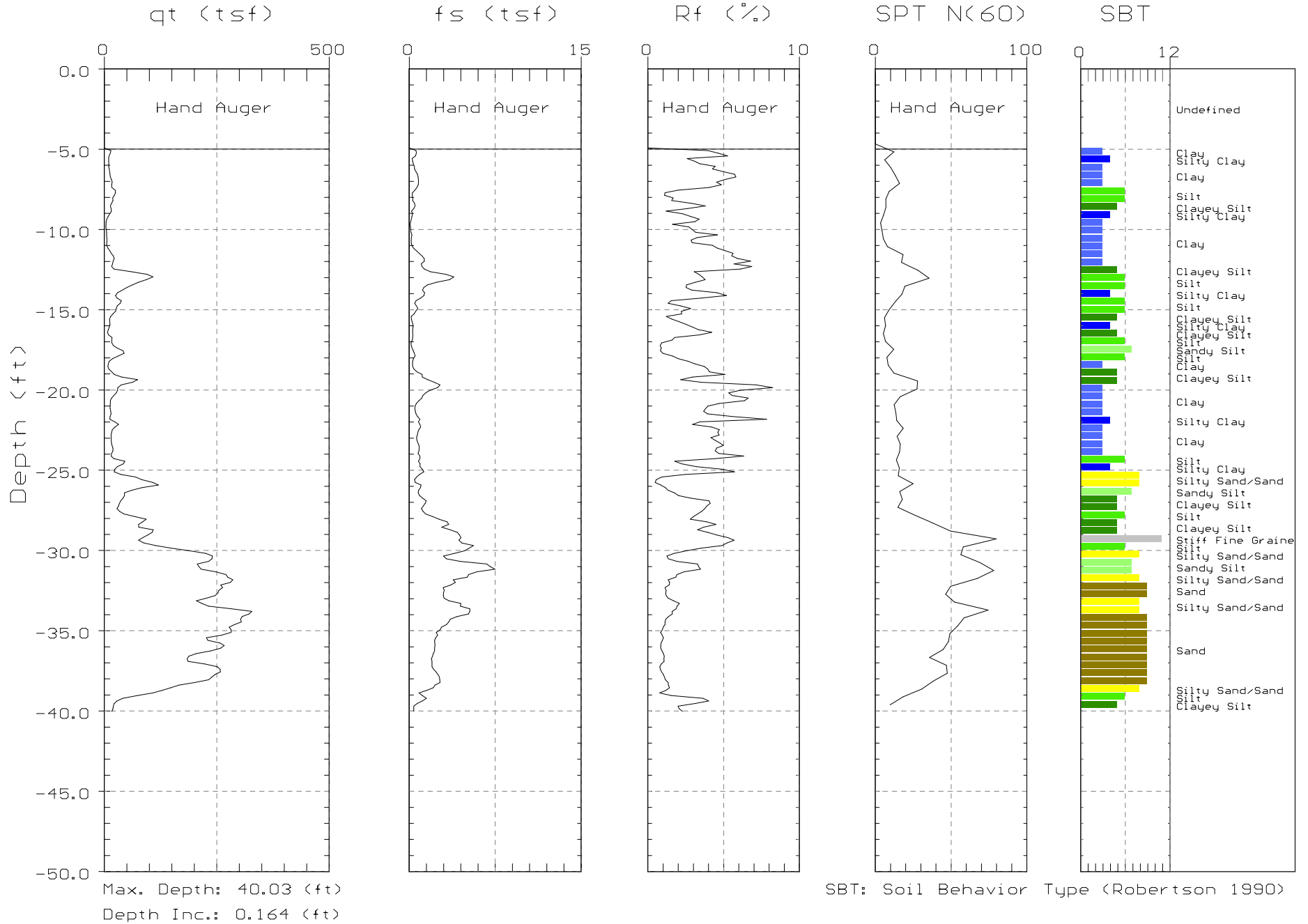


ENGEO

Site: RIVER RUN
Location: CPT-38

Engineer: S.HARRIS
Date: 06:29:05 14:41



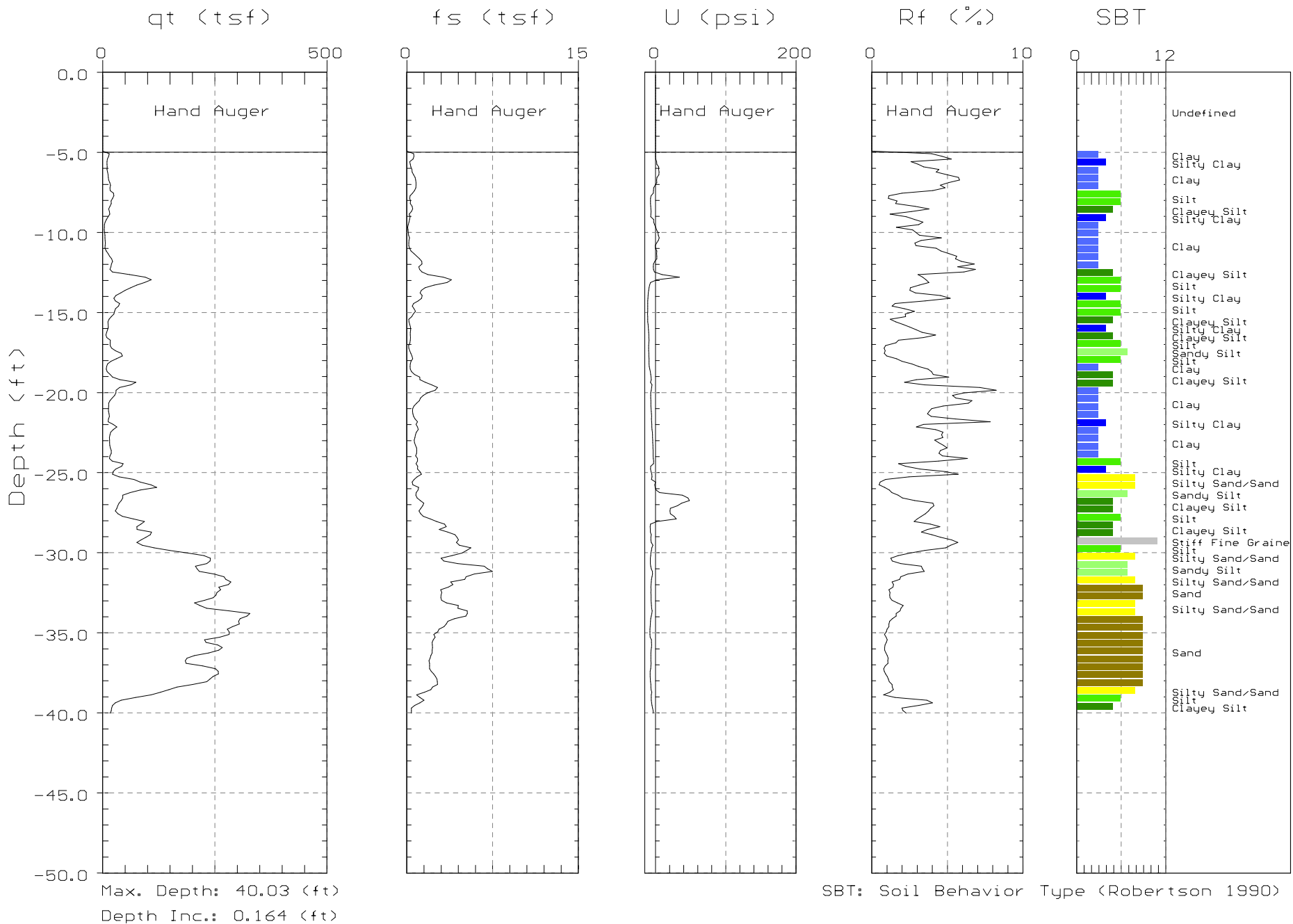




ENGEEO

Site: RIVER RUN
Location: CPT-39

Engineer: S.HARRIS
Date: 06:29:05 15:20

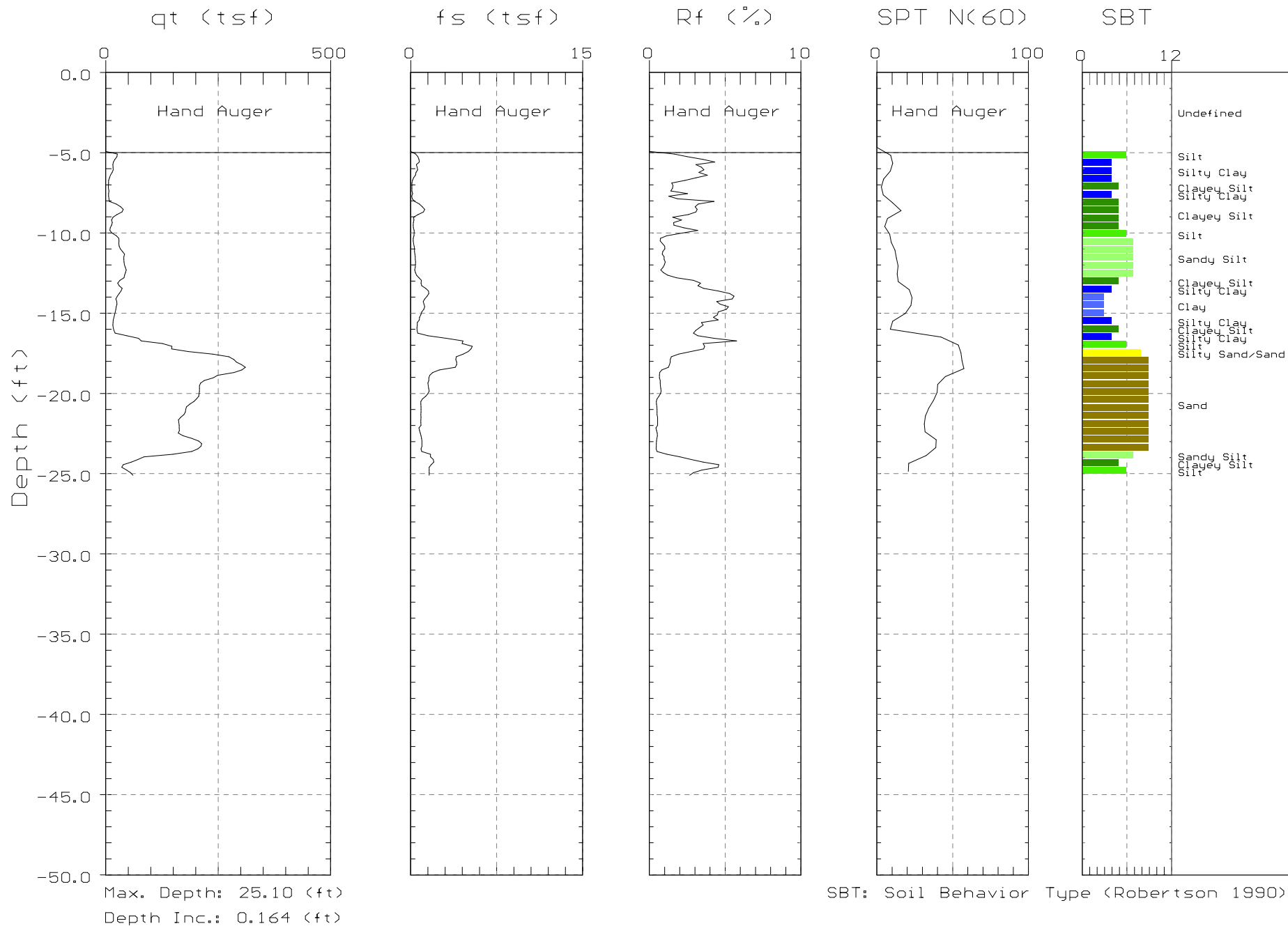




ENGEO

Site: RIVER RUN
Location: CPT-40

Engineer: S.HARRIS
Date: 06:29:05 16:07

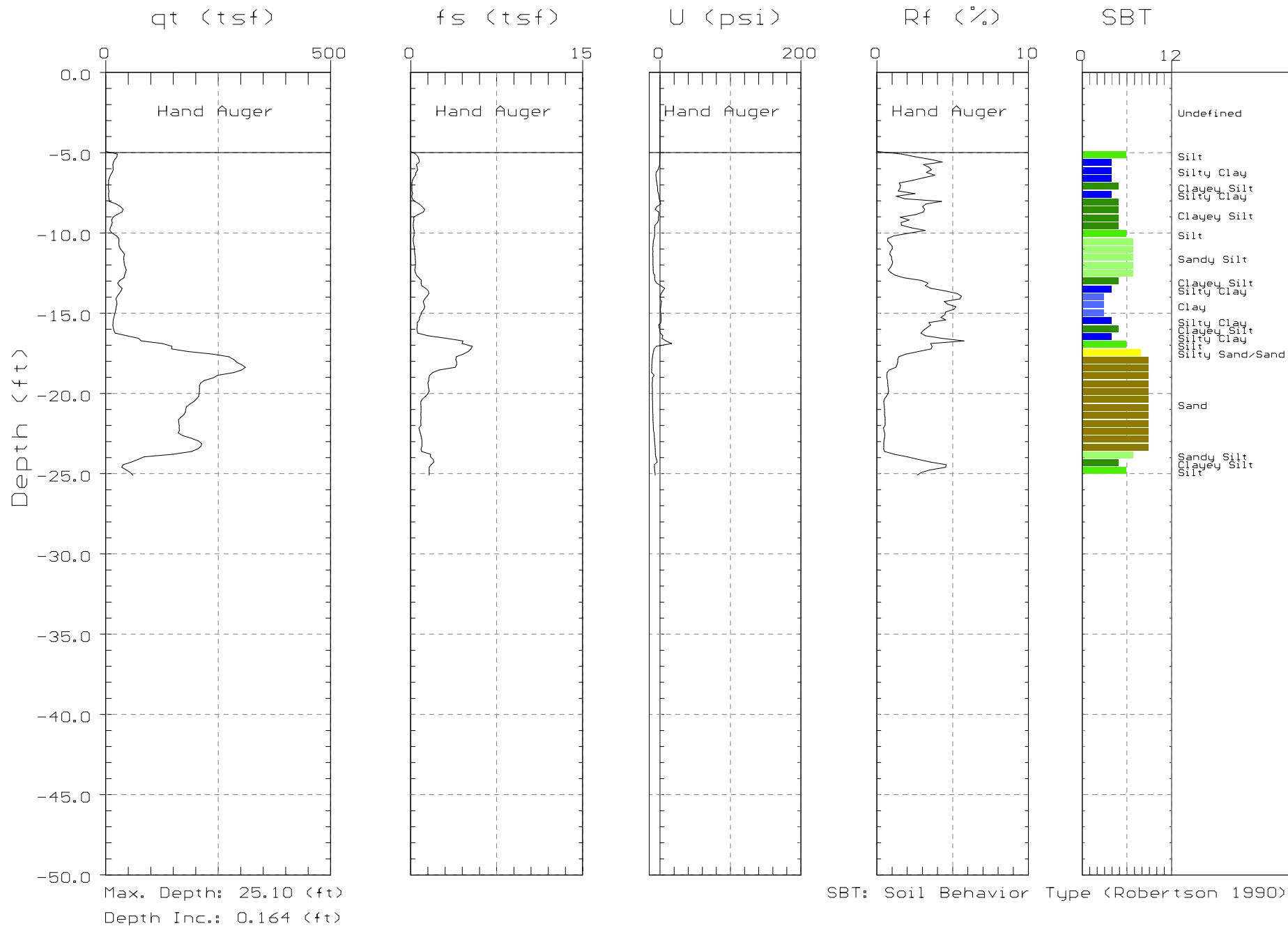




ENGEO

Site: RIVER RUN
Location: CPT-40

Engineer: S.HARRIS
Date: 06:29:05 16:07

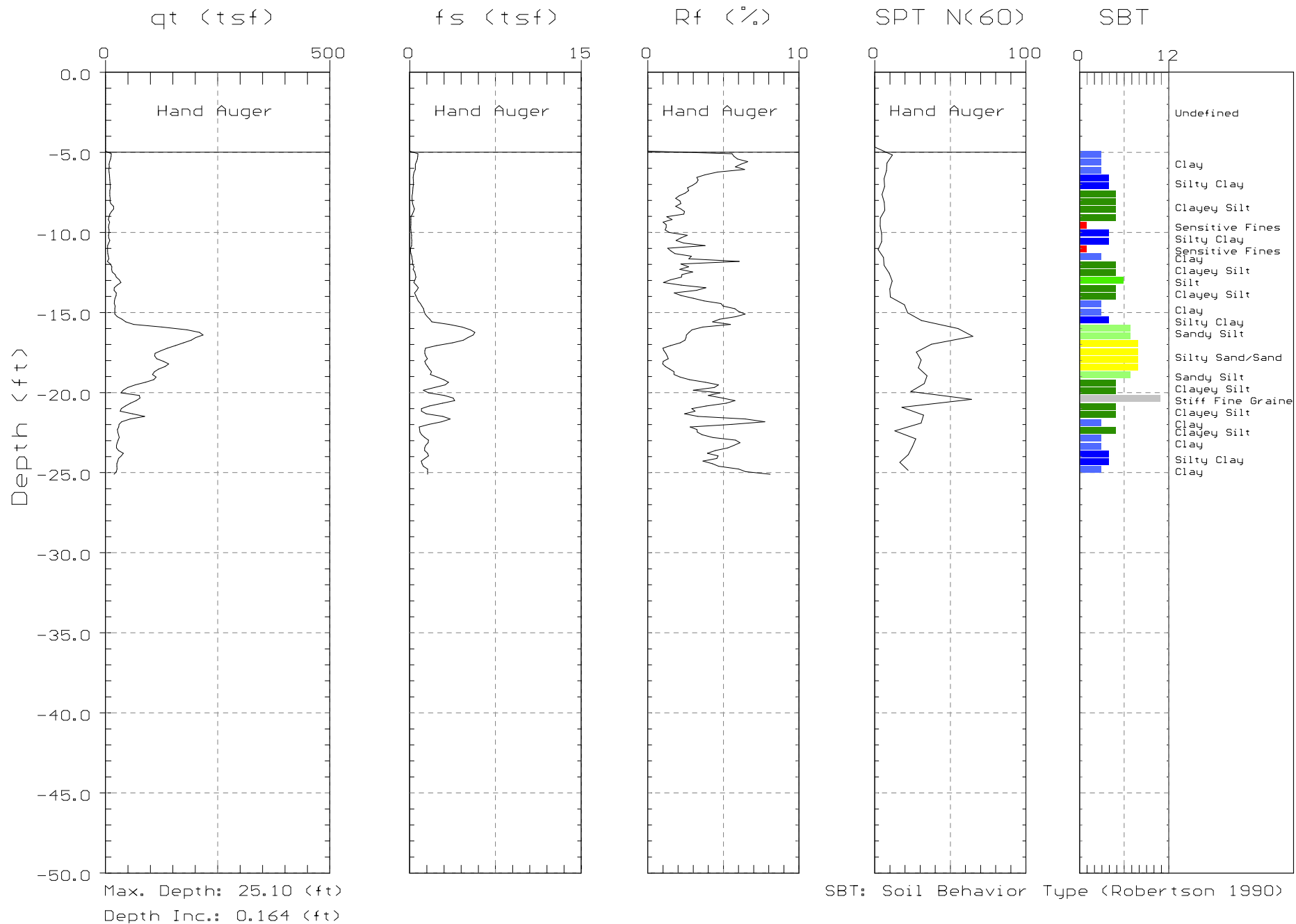




ENGEO

Site: RIVER RUN
Location: CPT-41

Engineer: S.HARRIS
Date: 06:29:05 16:42

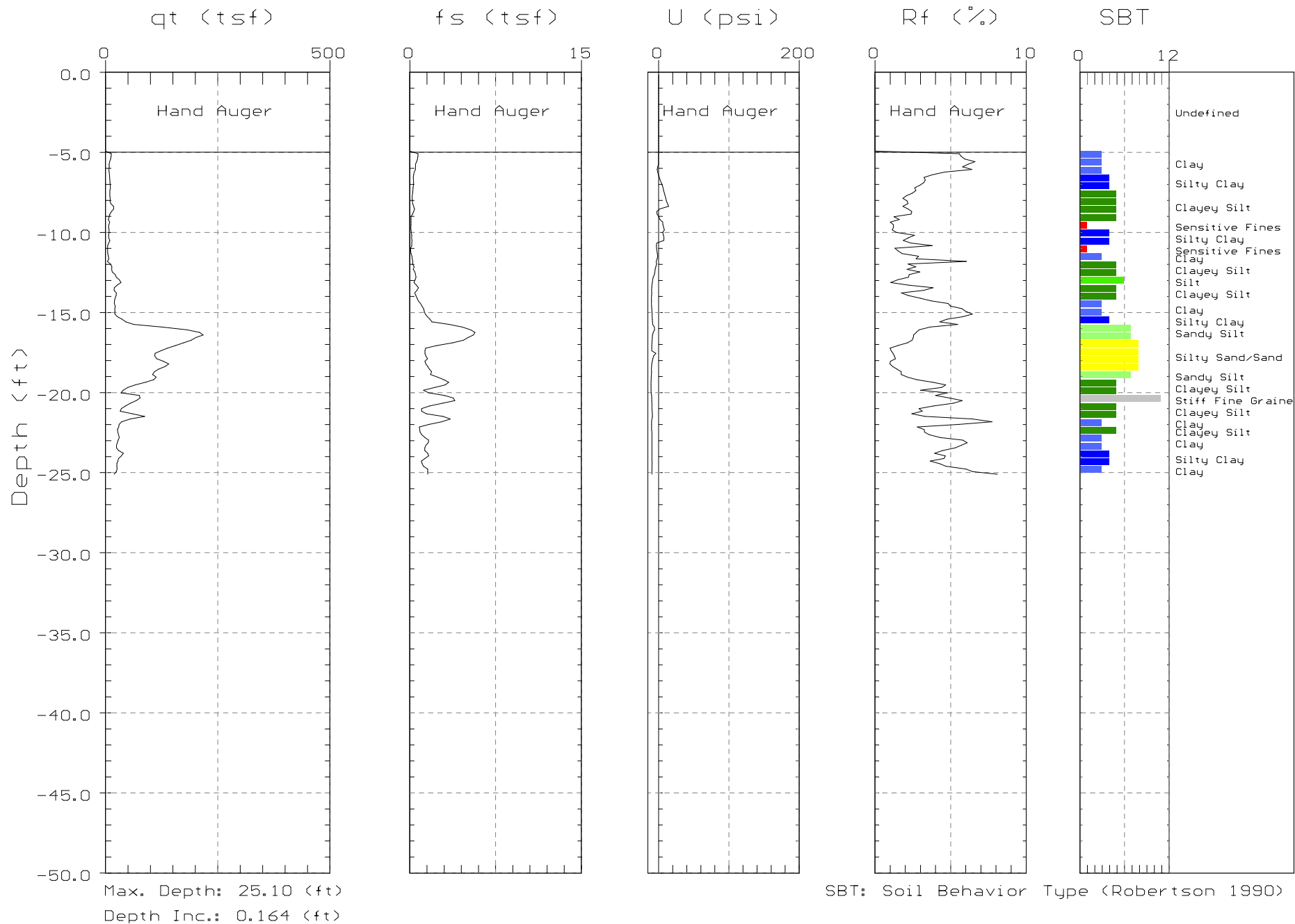




ENGEEO

Site: RIVER RUN
Location: CPT-41

Engineer: S.HARRIS
Date: 06:29:05 16:42

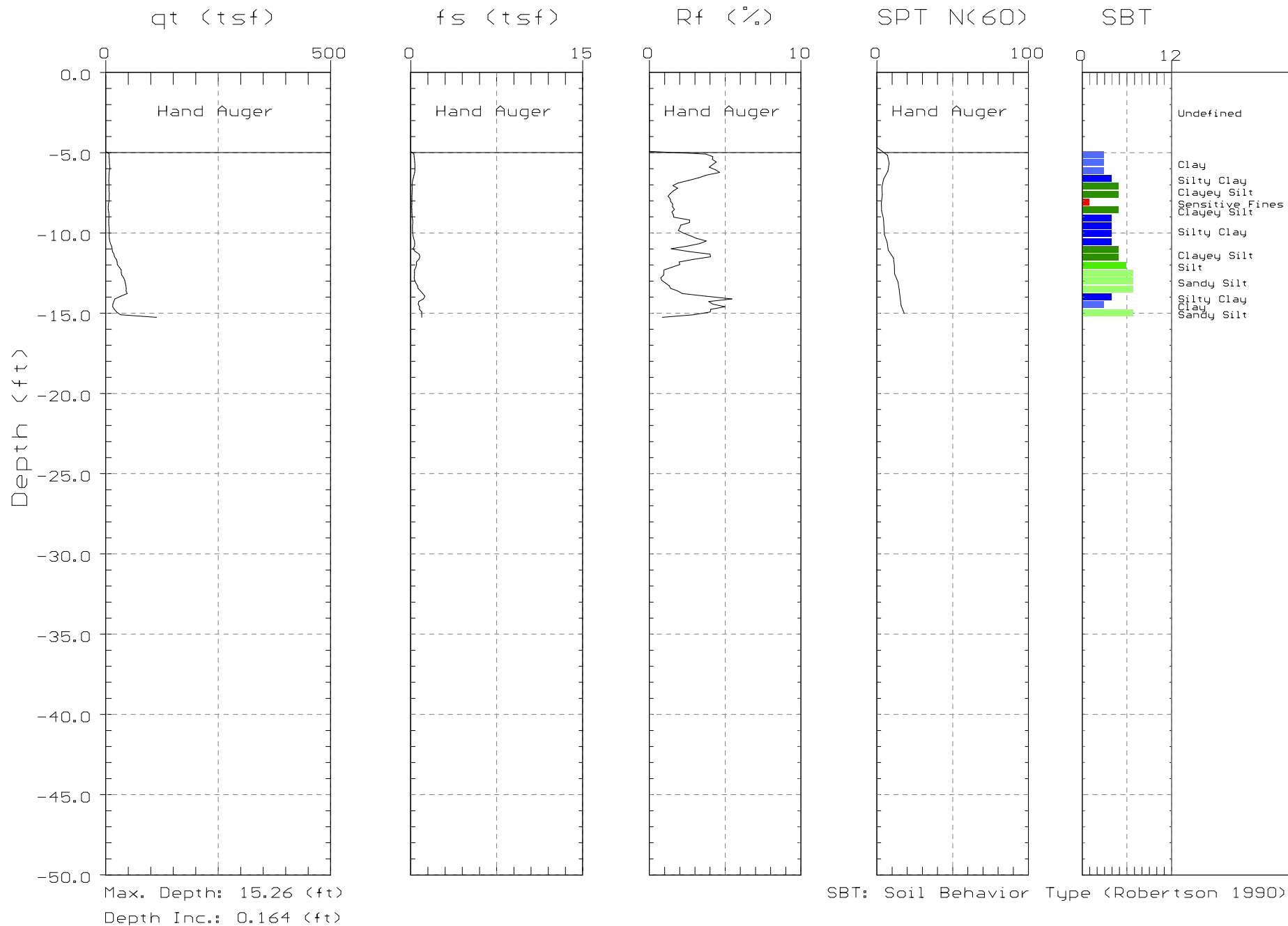




ENGEO

Site: RIVER RUN
Location: CPT-42

Engineer: S.HARRIS
Date: 06:30:05 08:19

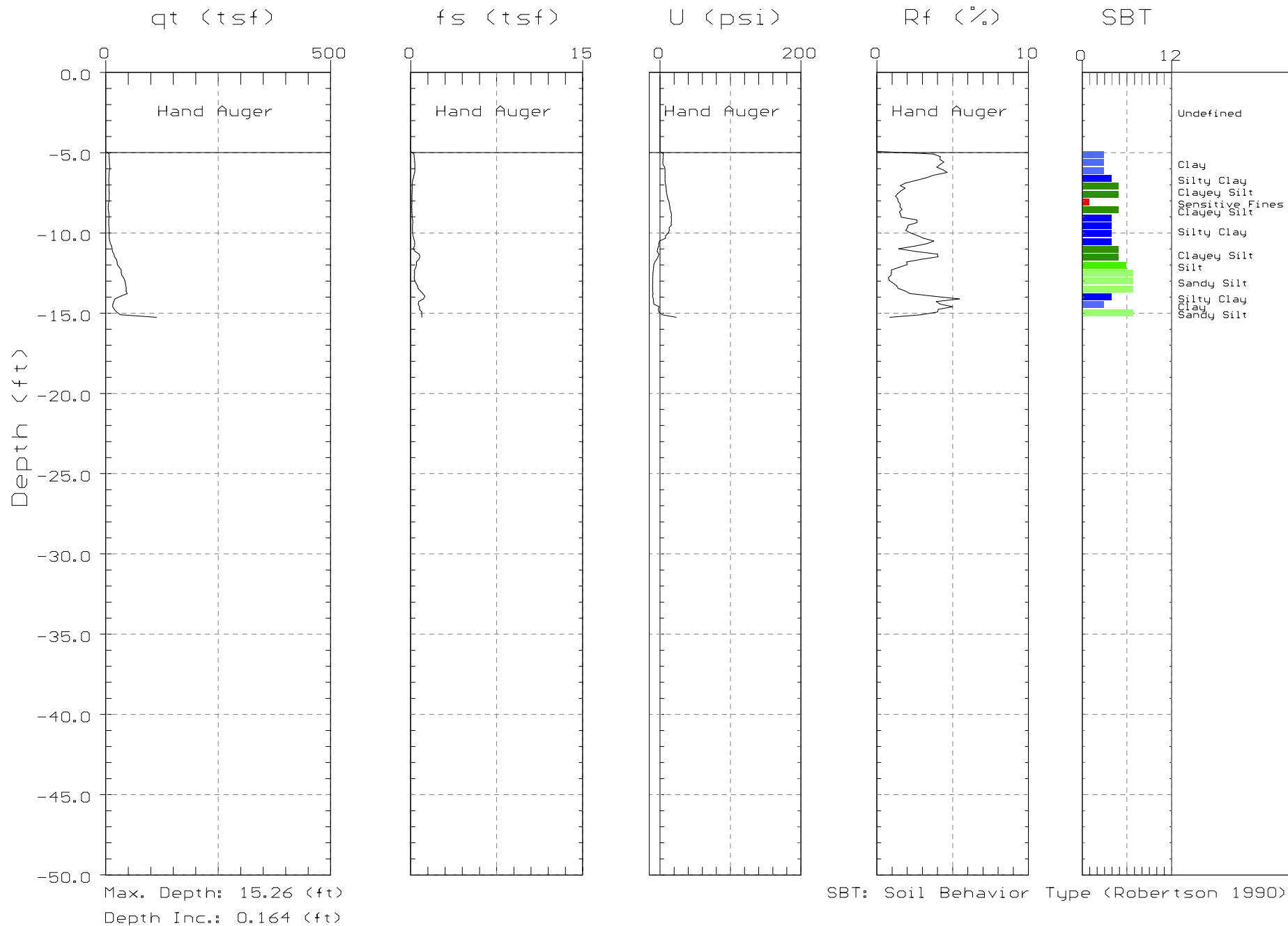




ENGEO

Site: RIVER RUN
Location: CPT-42

Engineer: S.HARRIS
Date: 06:30:05 08:19

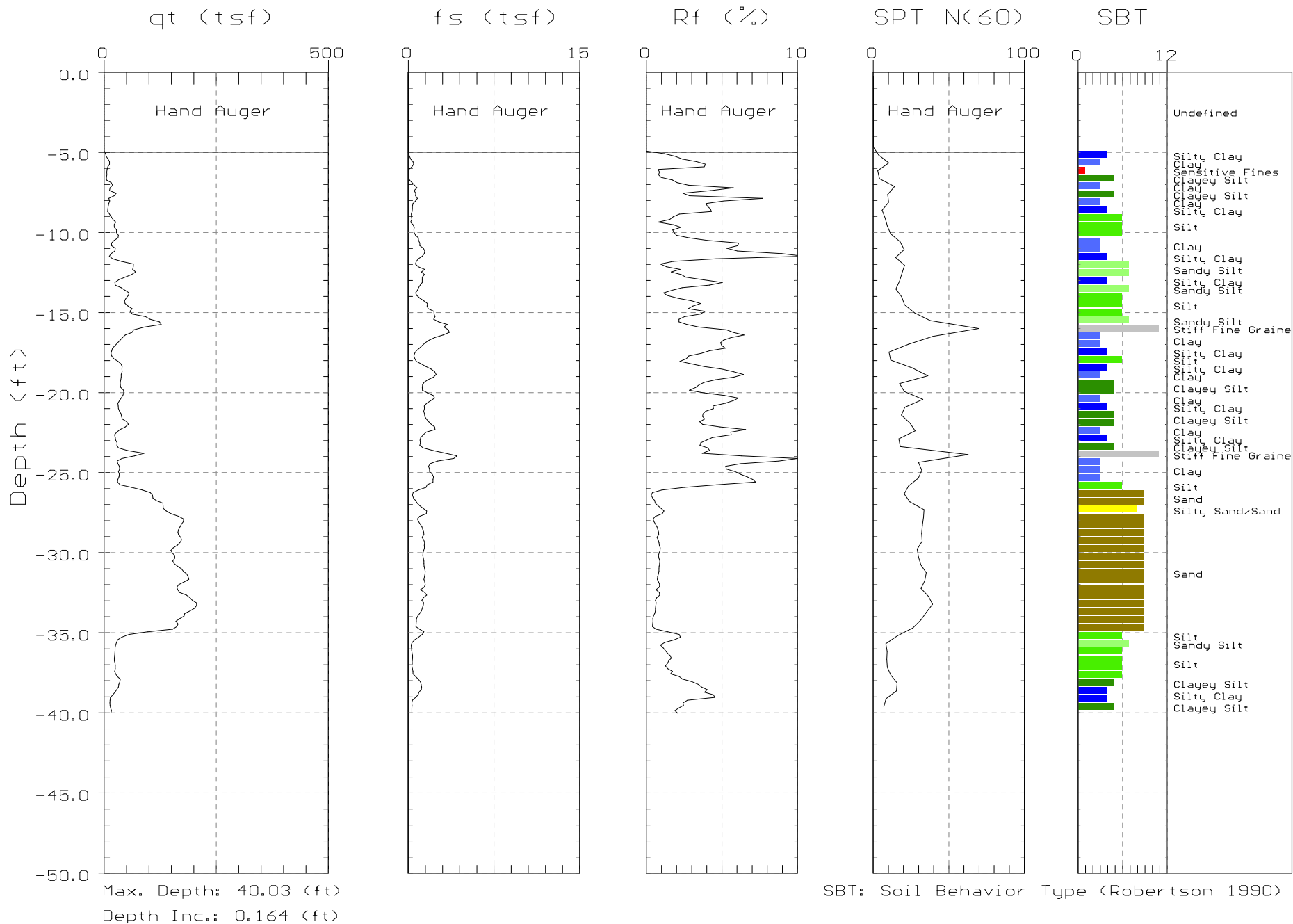




ENGEO

Site: RIVER RUN
Location: CPT-43

Engineer: S.HARRIS
Date: 06:30:05 10:56

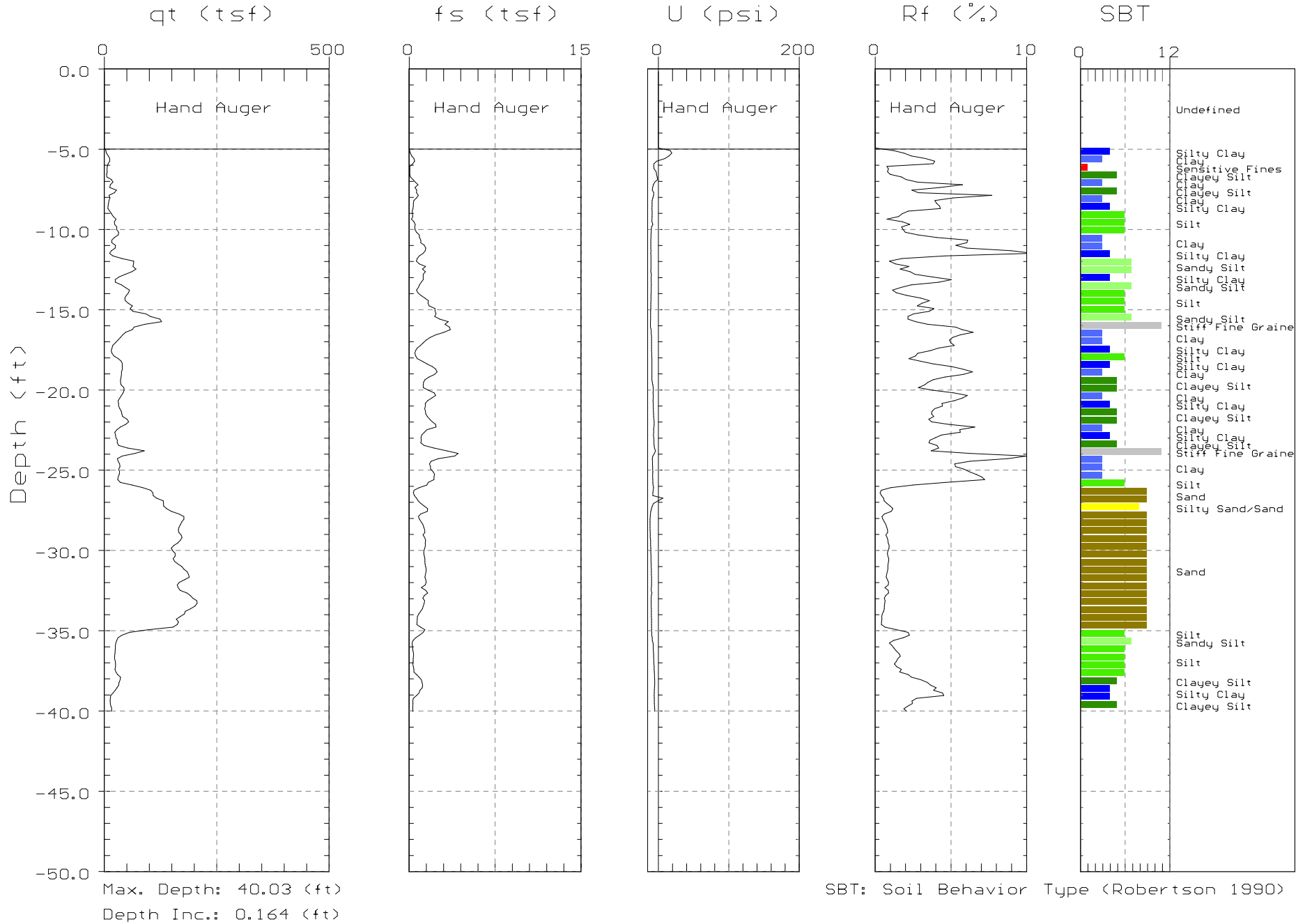




ENGEO

Site: RIVER RUN
Location: CPT-43

Engineer: S.HARRIS
Date: 06:30:05 10:56

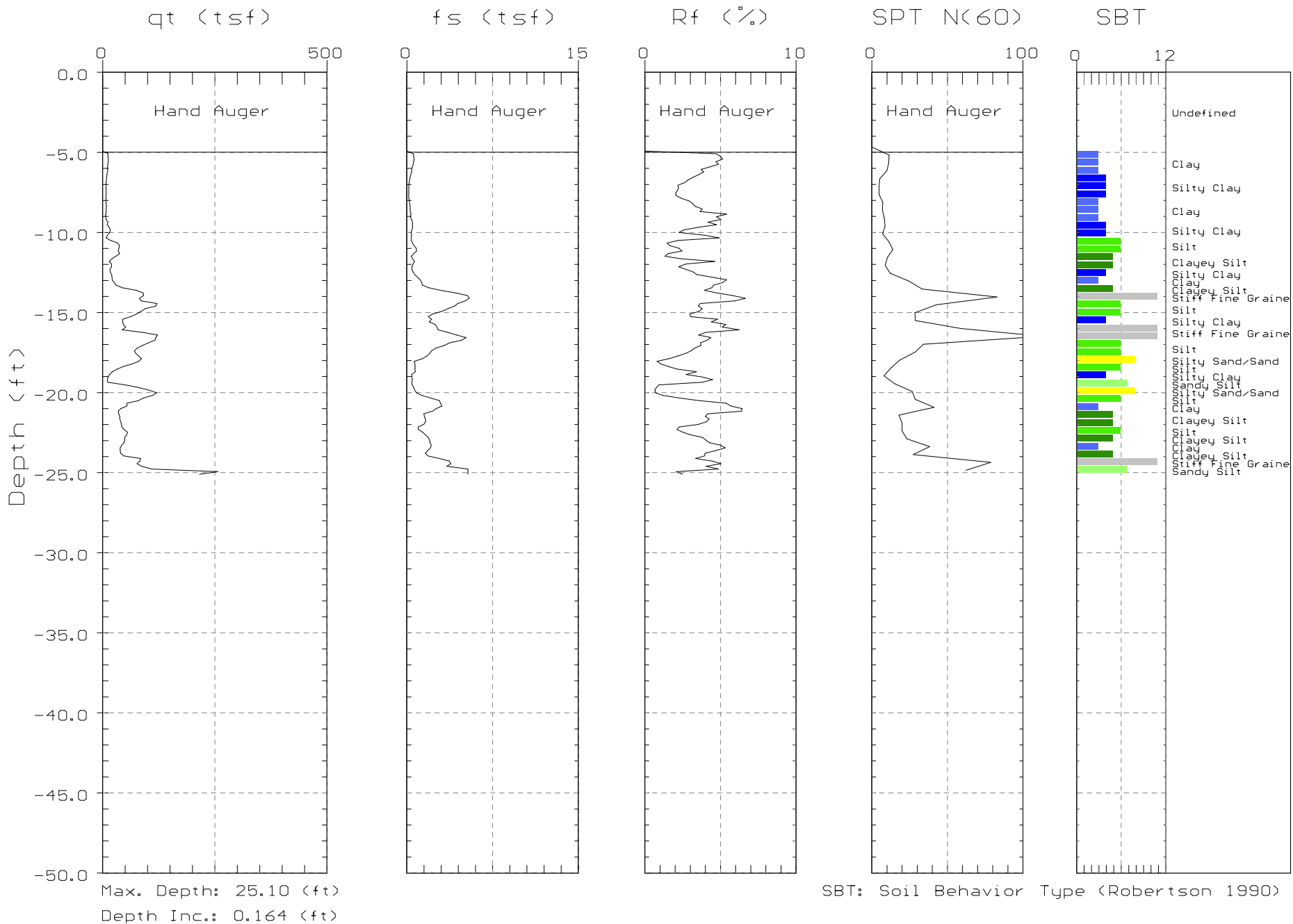




ENGEO

Site: RIVER RUN
Location: CPT-44

Engineer: S.HARRIS
Date: 06:30:05 10:12

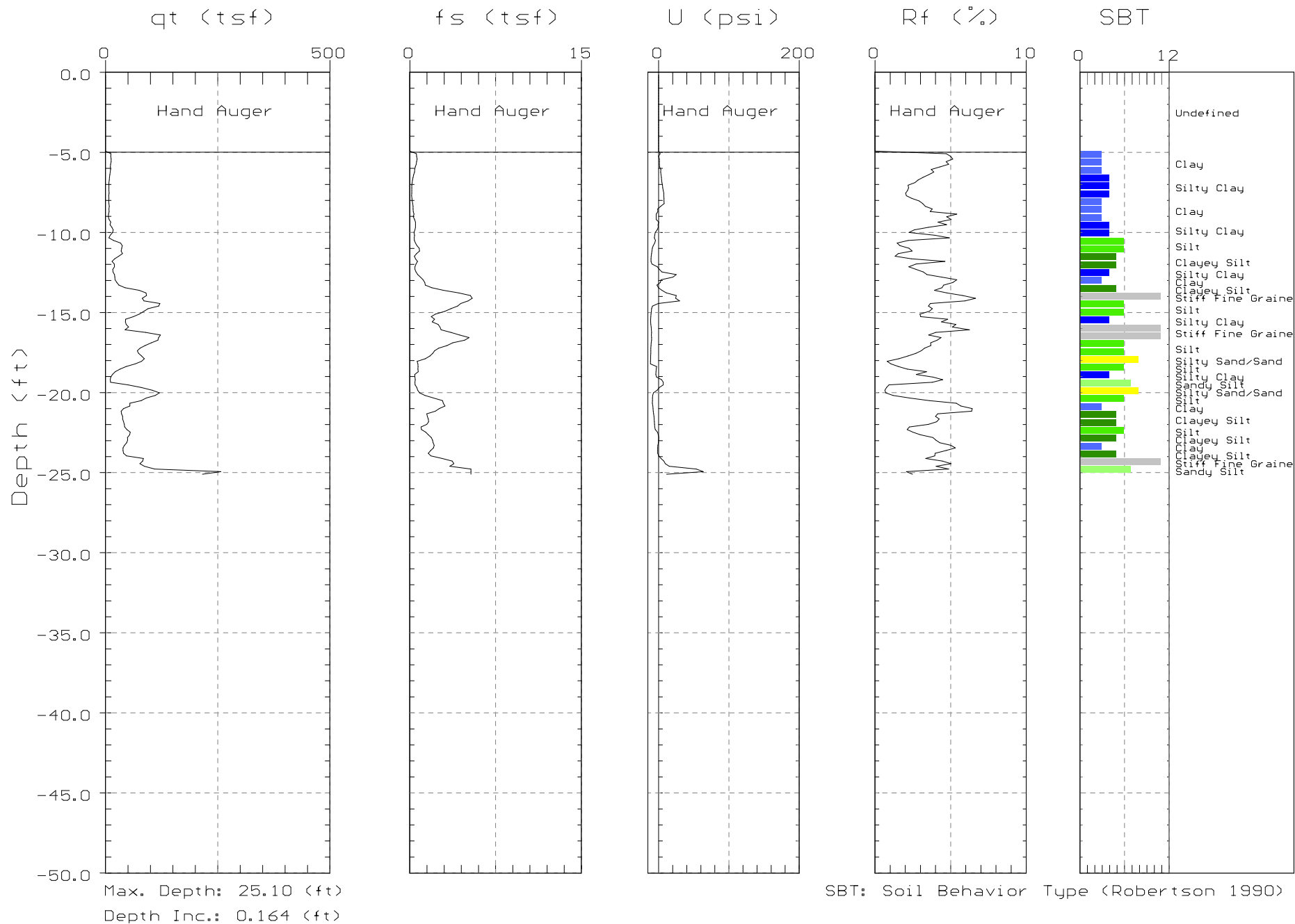




ENGEO

Site: RIVER RUN
Location: CPT-44

Engineer: S.HARRIS
Date: 06:30:05 10:12

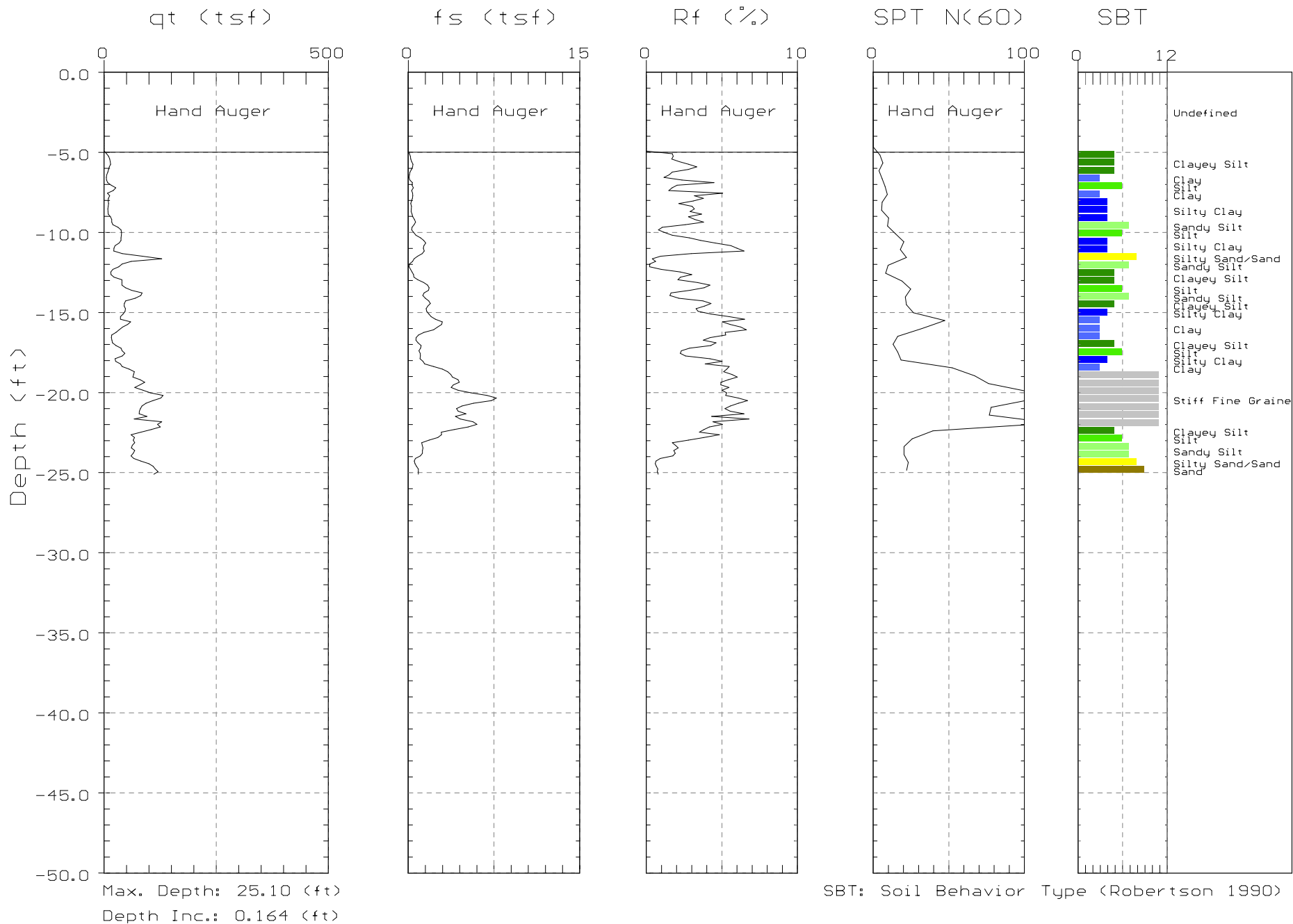




ENGEO

Site: RIVER RUN
Location: CPT-45

Engineer: S.HARRIS
Date: 06:30:05 11:43

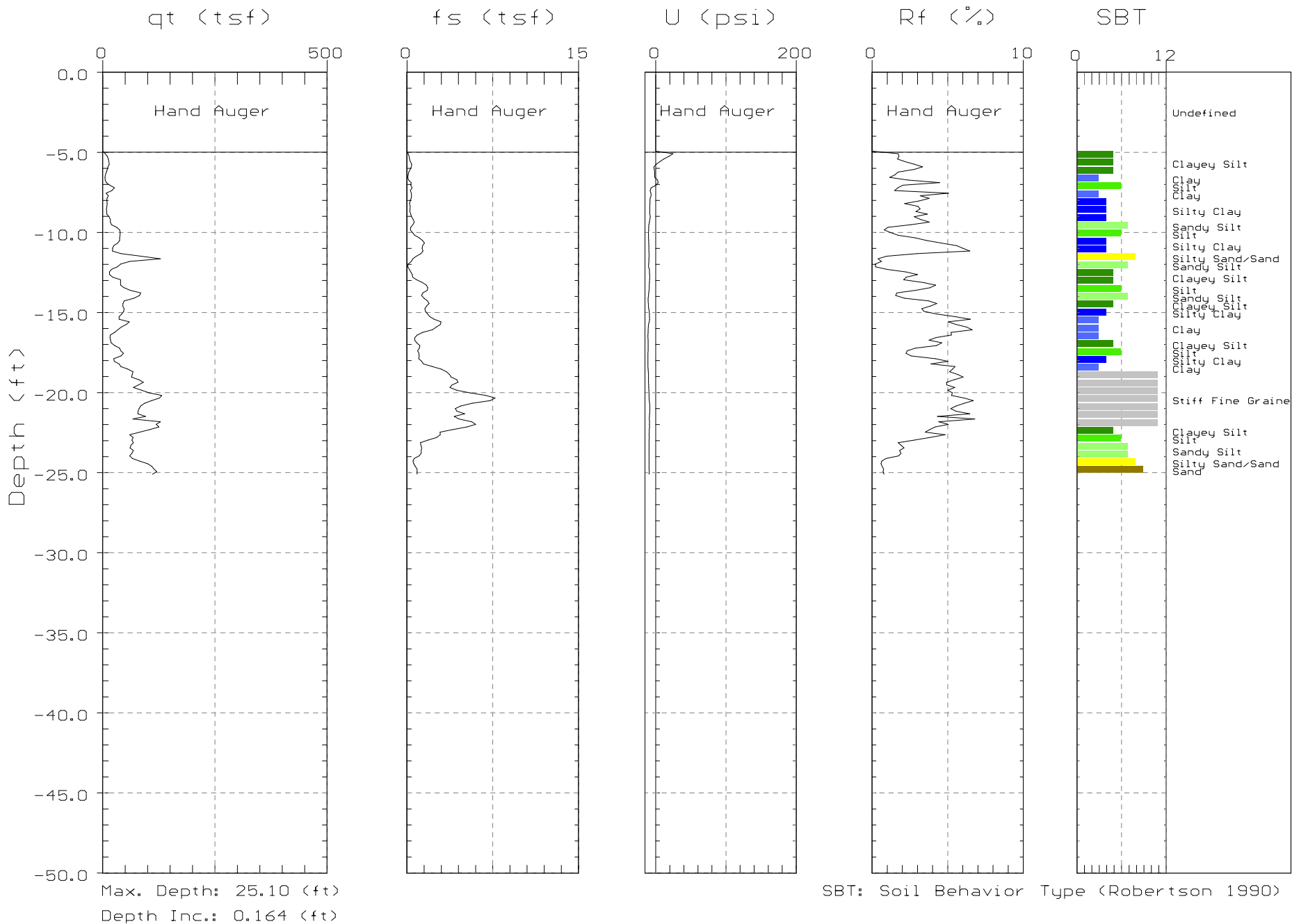


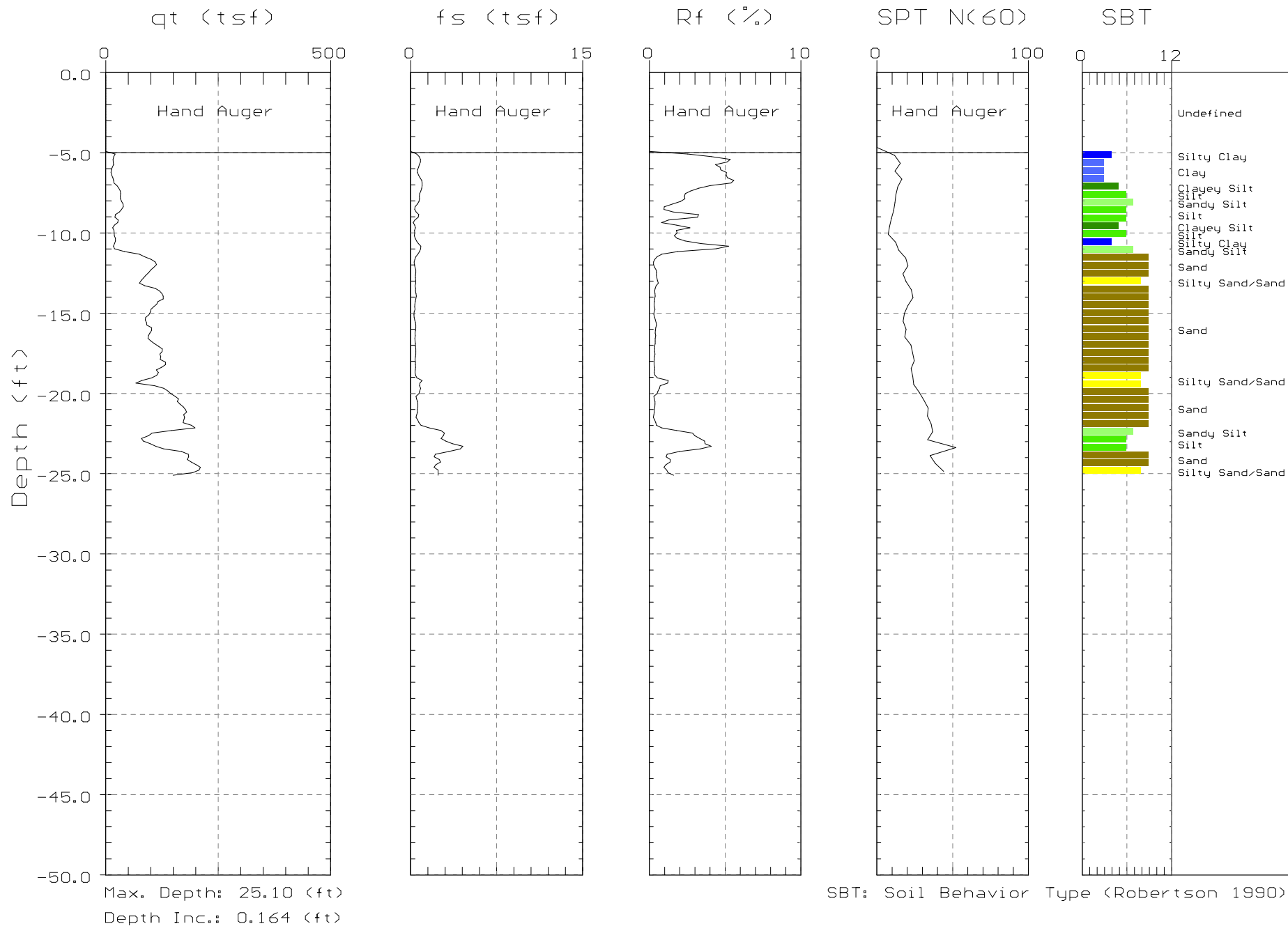


ENGEO

Site: RIVER RUN
Location: CPT-45

Engineer: S.HARRIS
Date: 06:30:05 11:43



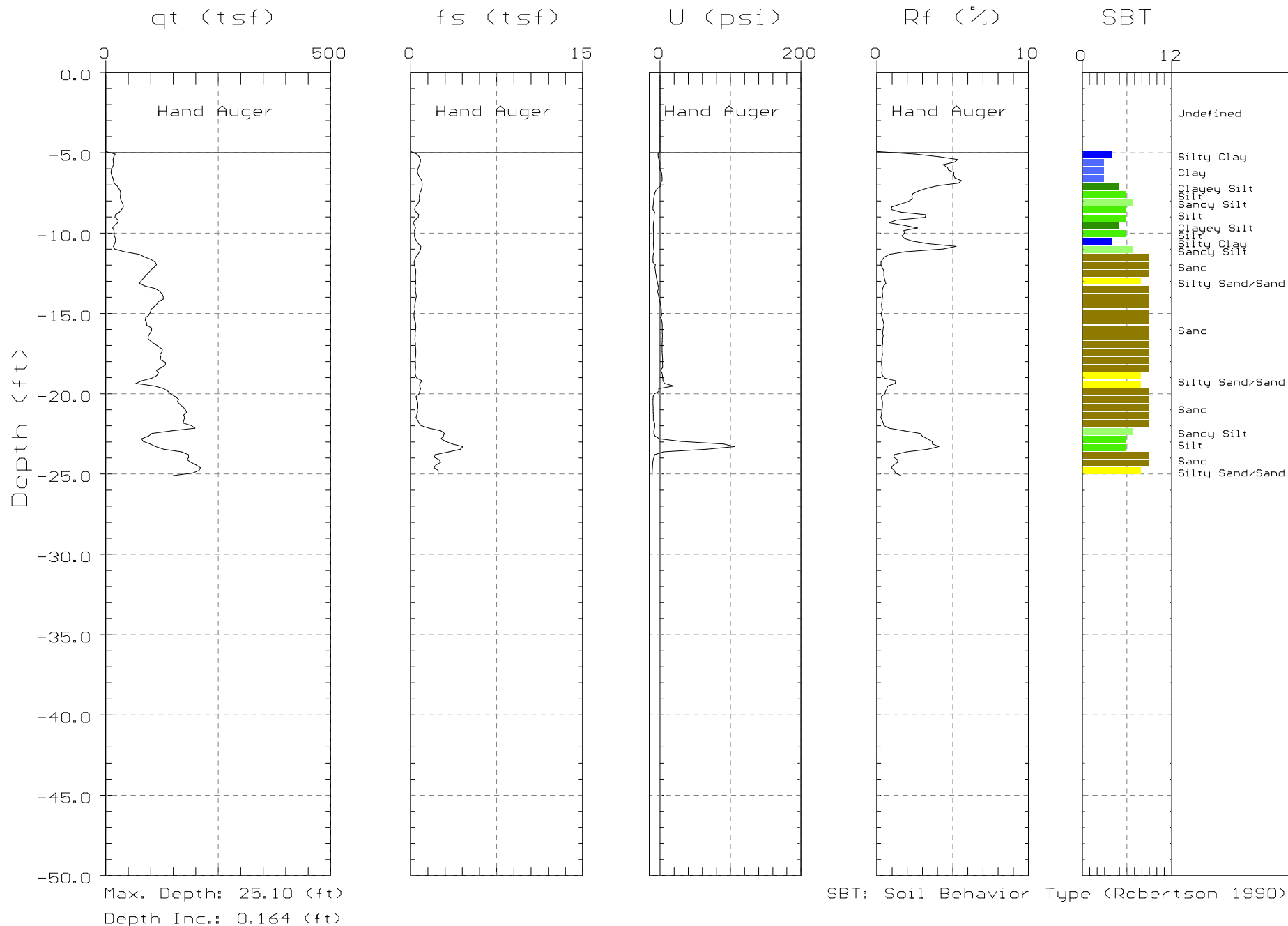




ENGEEO

Site: RIVER RUN
Location: CPT-46

Engineer: S.HARRIS
Date: 06:30:05 14:00

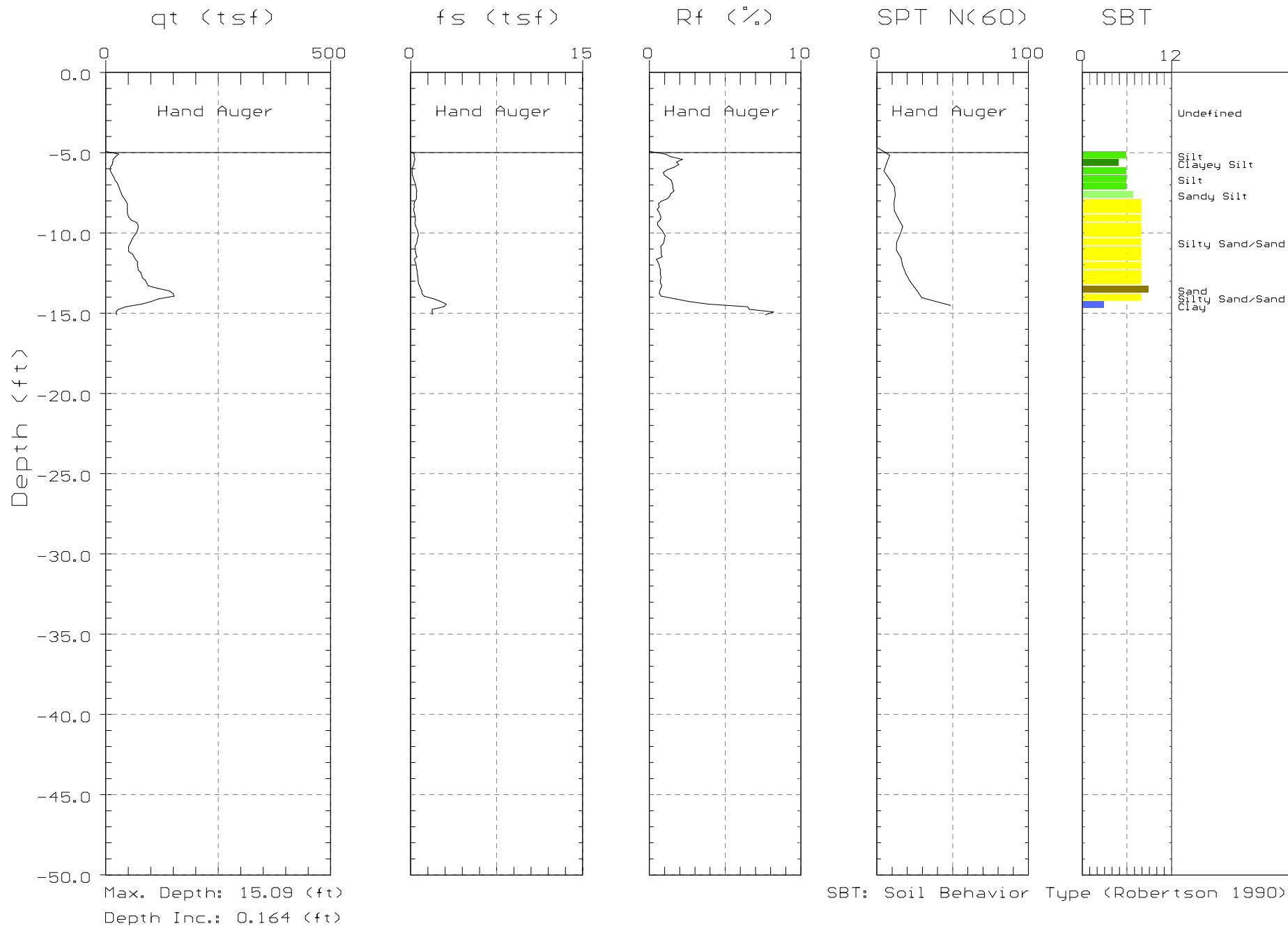




ENGEO

Site: RIVER RUN
Location: CPT-47

Engineer: S.HARRIS
Date: 06:30:05 14:37

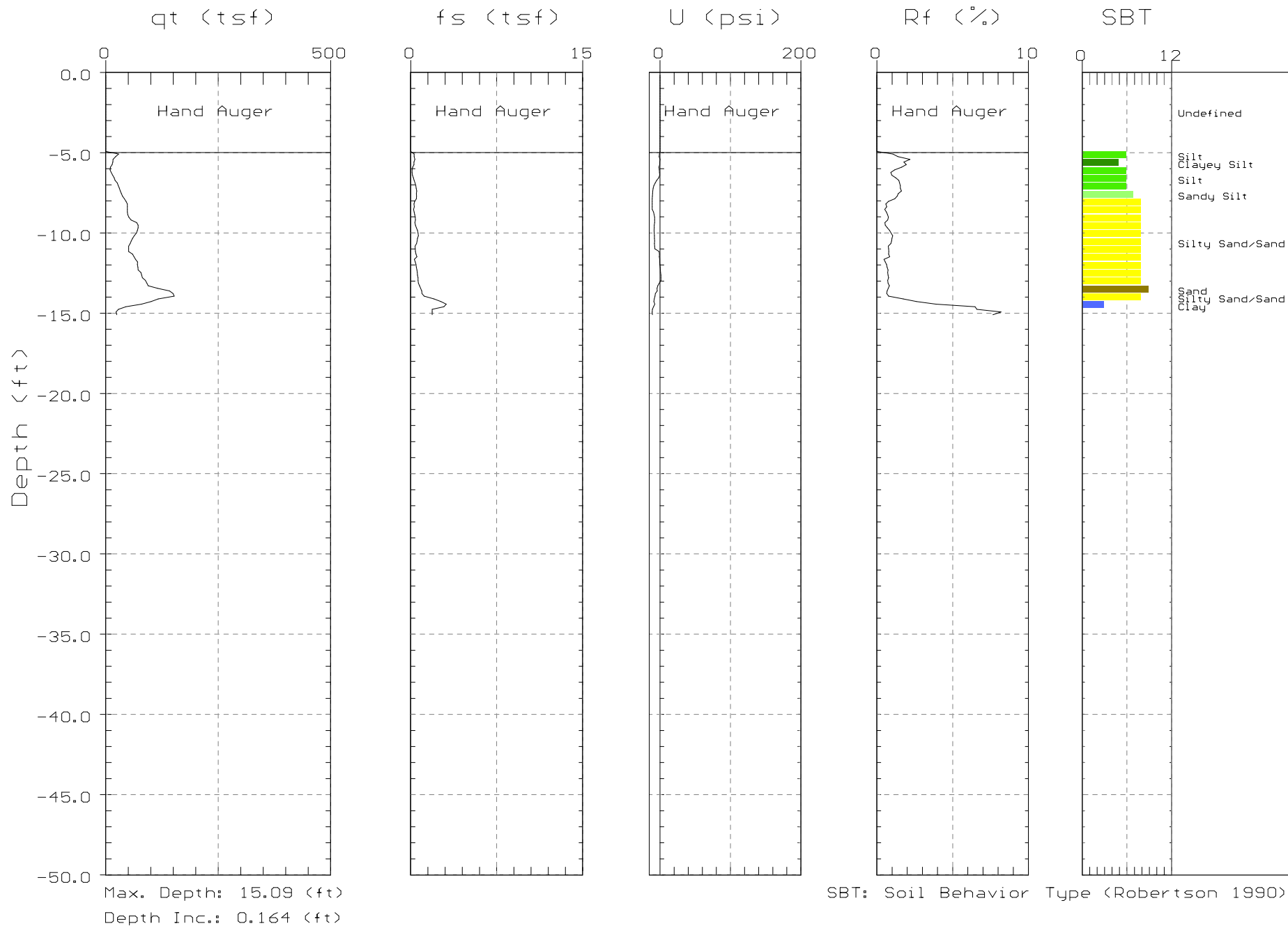




ENGEO

Site: RIVER RUN
Location: CPT-47

Engineer: S.HARRIS
Date: 06:30:05 14:37

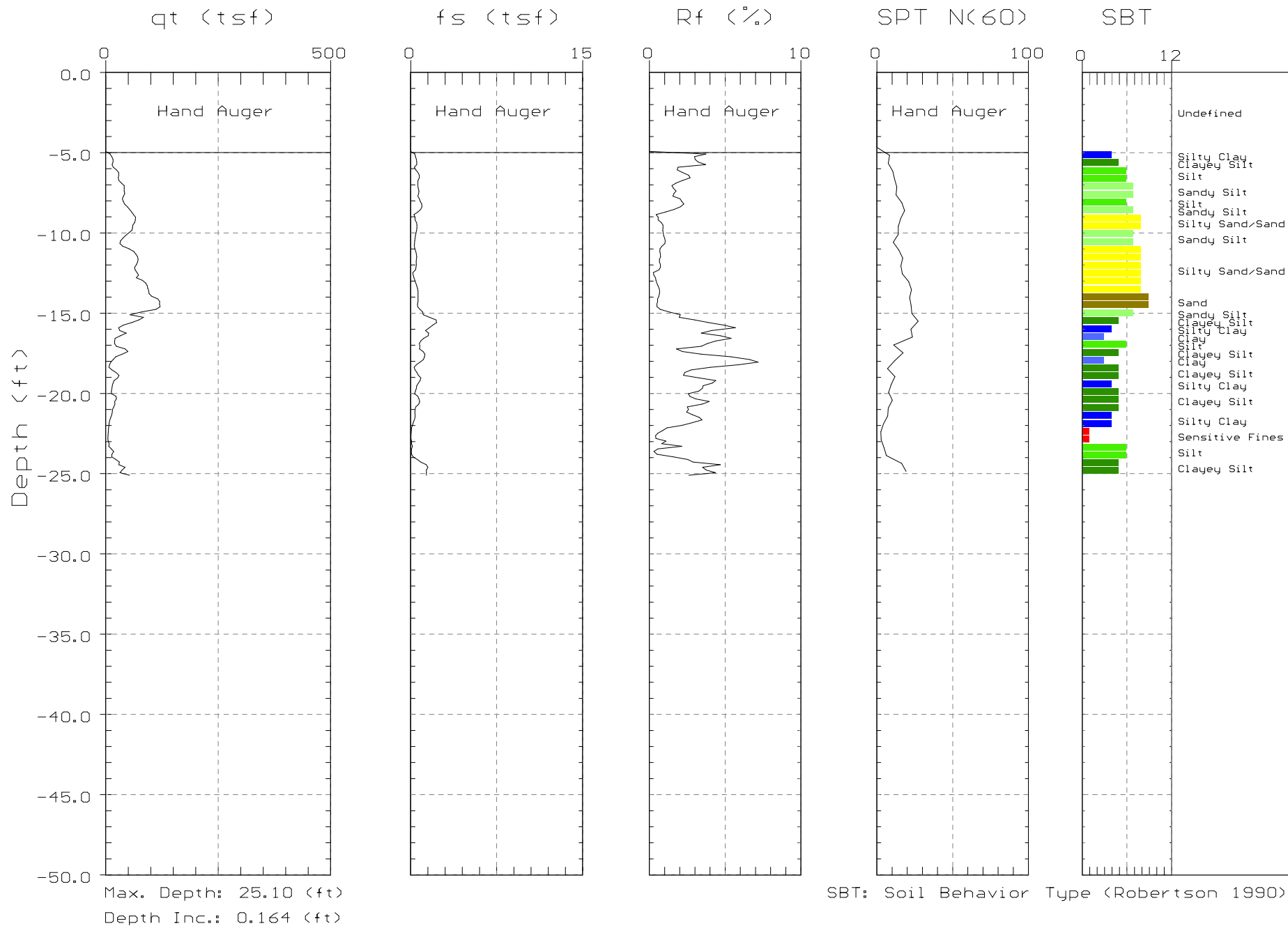




ENGEO

Site: RIVER RUN
Location: CPT-48

Engineer: S.HARRIS
Date: 06:30:05 15:13

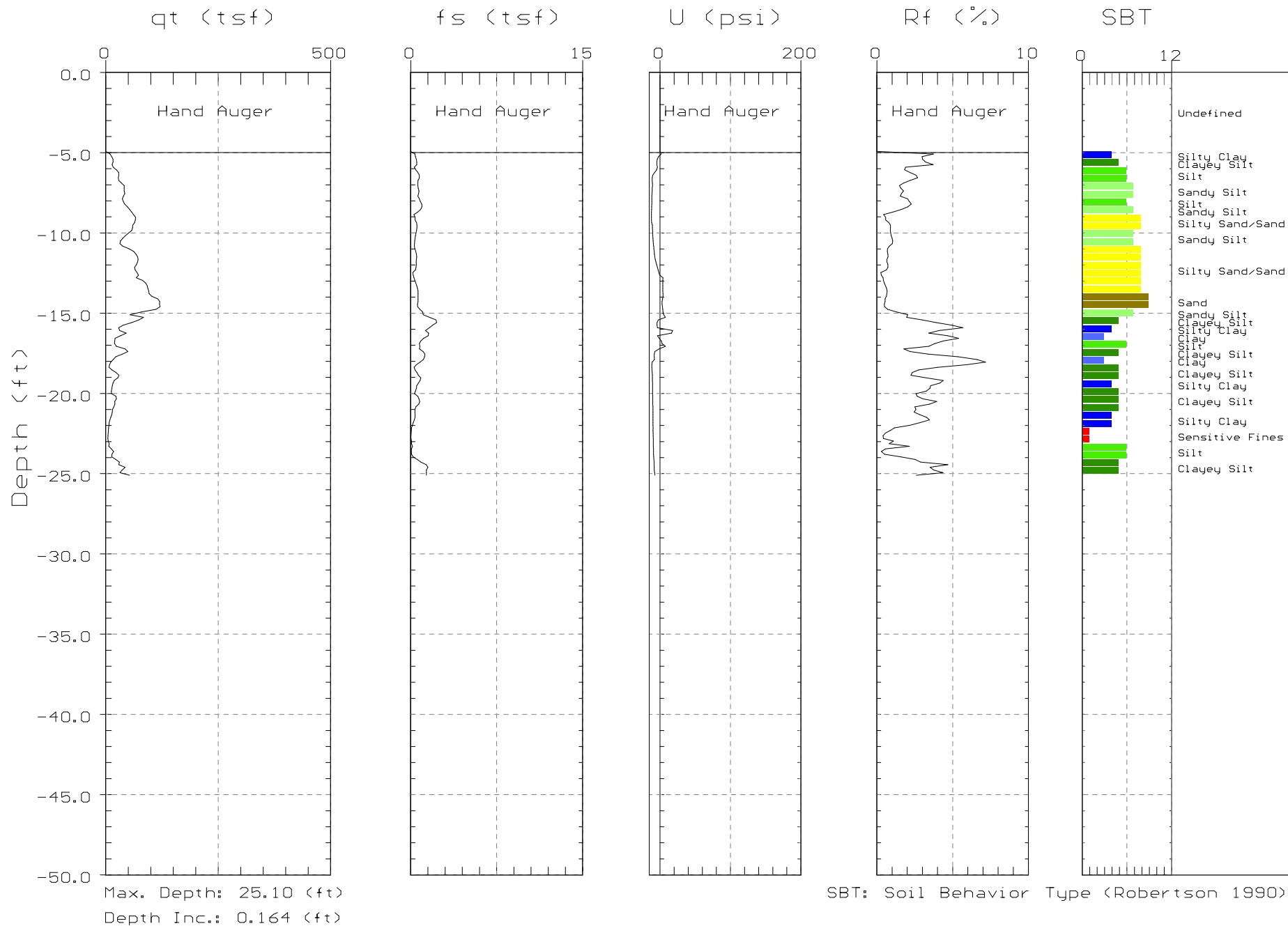




ENGEO

Site: RIVER RUN
Location: CPT-48

Engineer: S.HARRIS
Date: 06:30:05 15:13

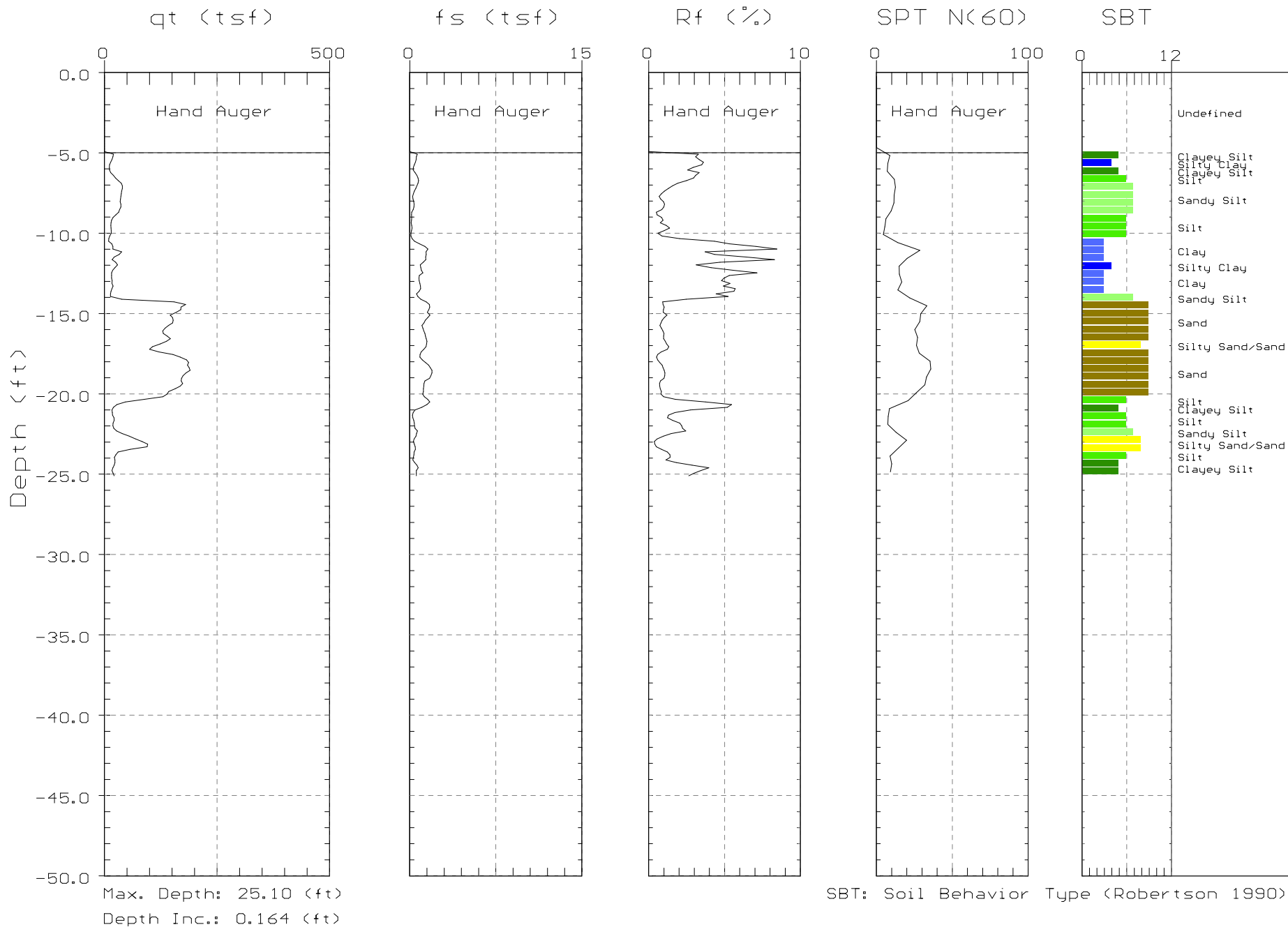




ENGEEO

Site: RIVER RUN
Location: CPT-49

Engineer: S.HARRIS
Date: 06:30:05 15:56

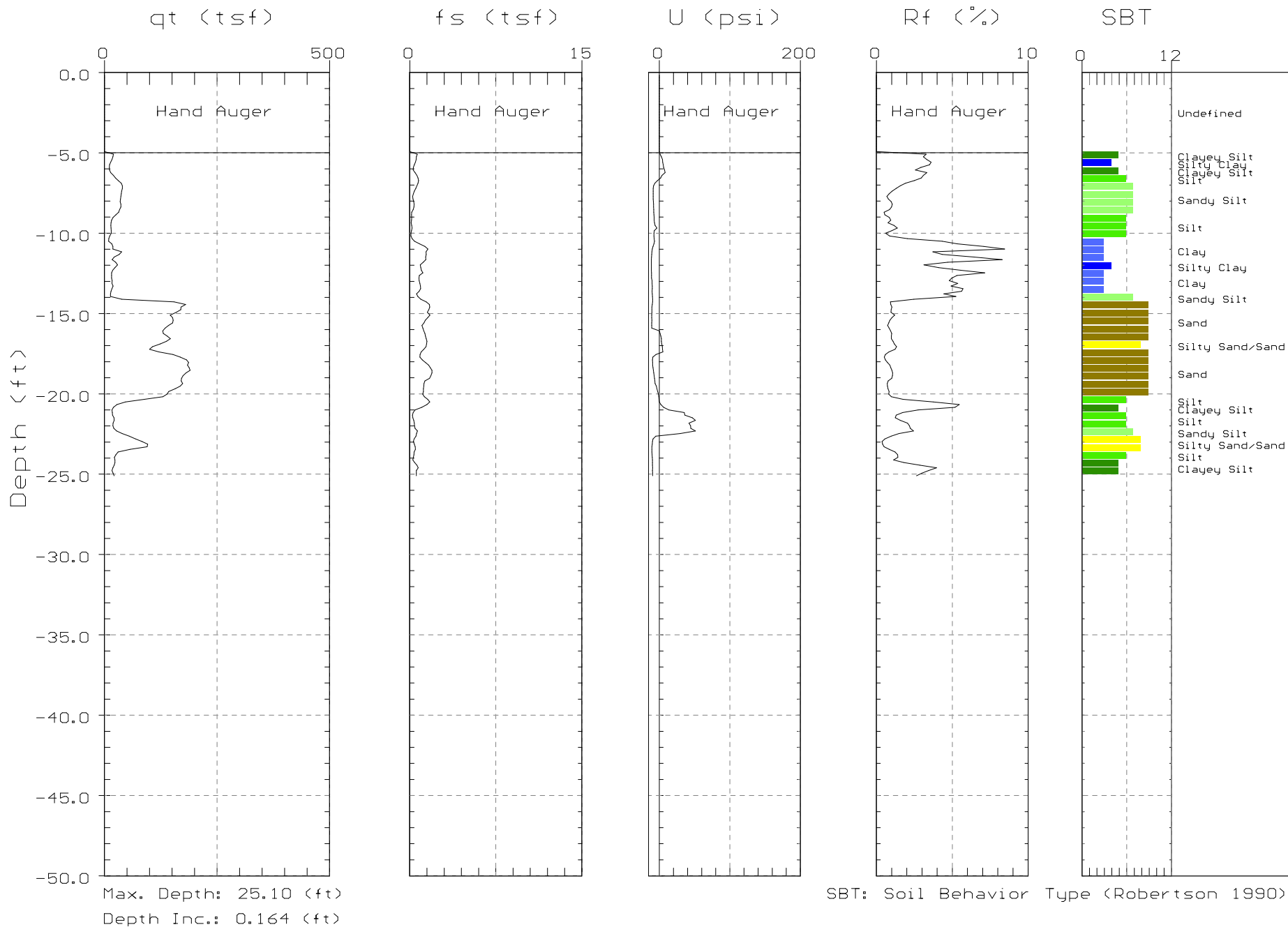




ENGEO

Site: RIVER RUN
Location: CPT-49

Engineer: S.HARRIS
Date: 06:30:05 15:56

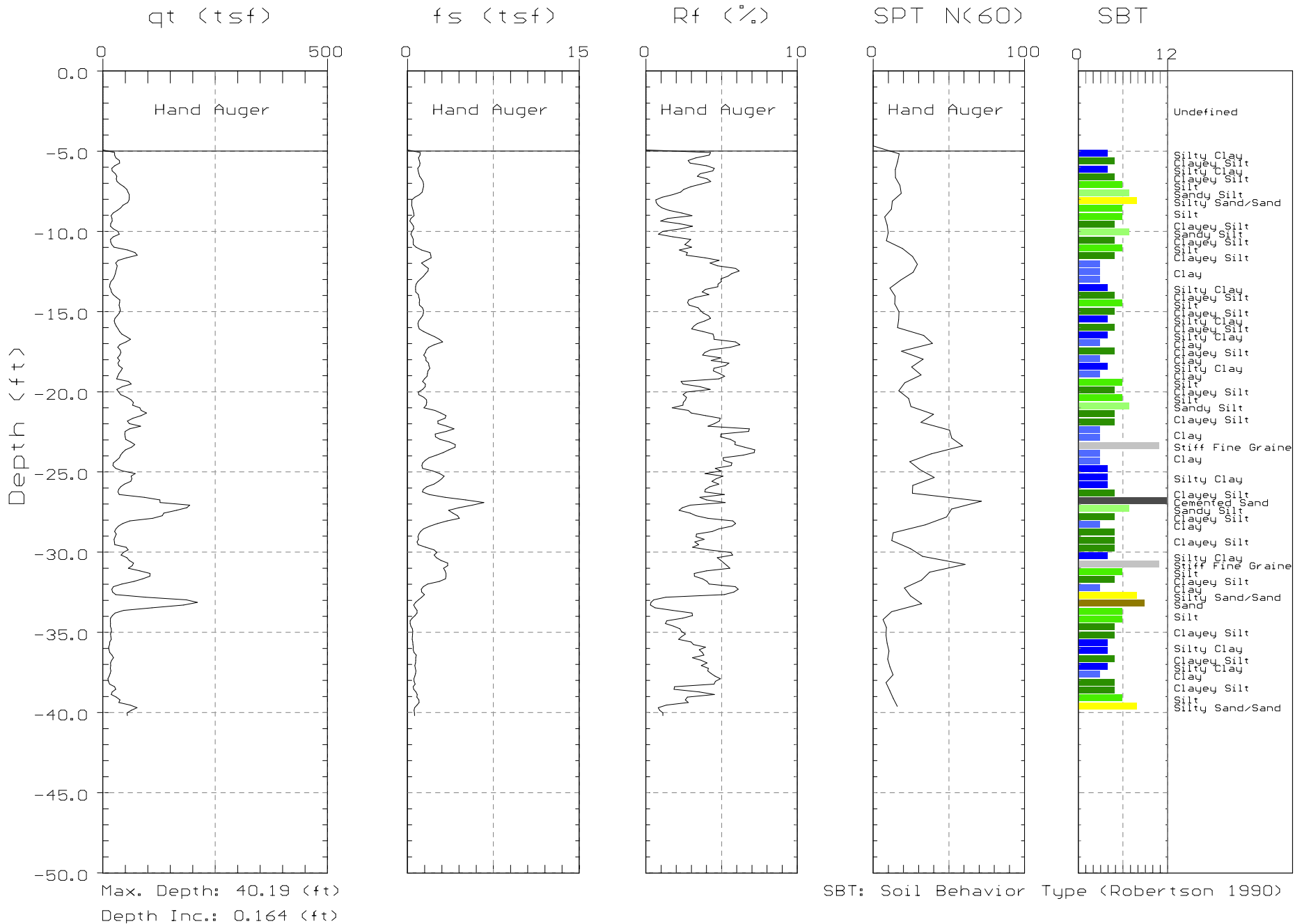




ENGEO

Site: RIVER RUN
Location: CPT-50

Engineer: S.HARRIS
Date: 07:01:05 08:06

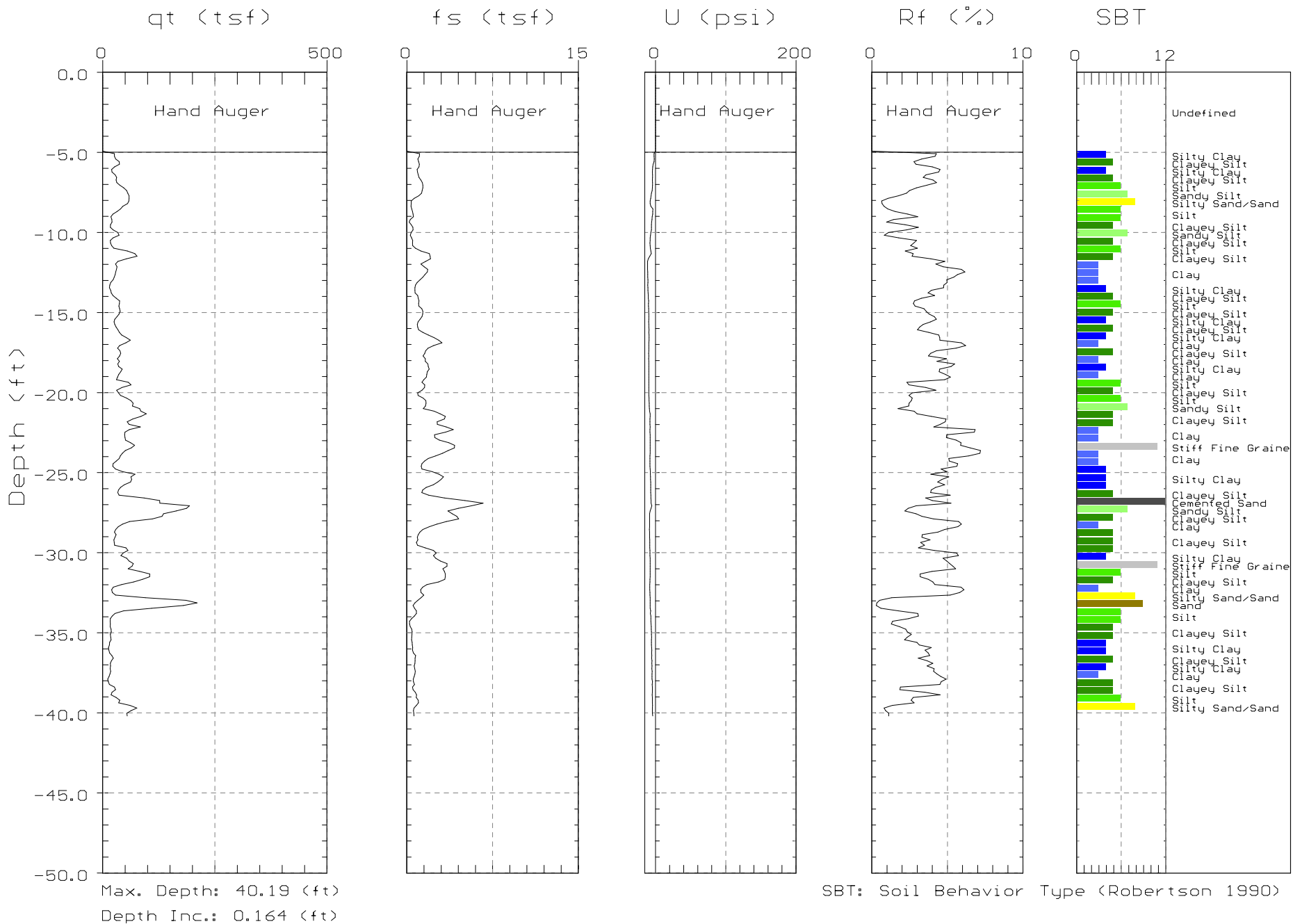




ENGEEO

Site: RIVER RUN
Location: CPT-50

Engineer: S.HARRIS
Date: 07:01:05 08:06

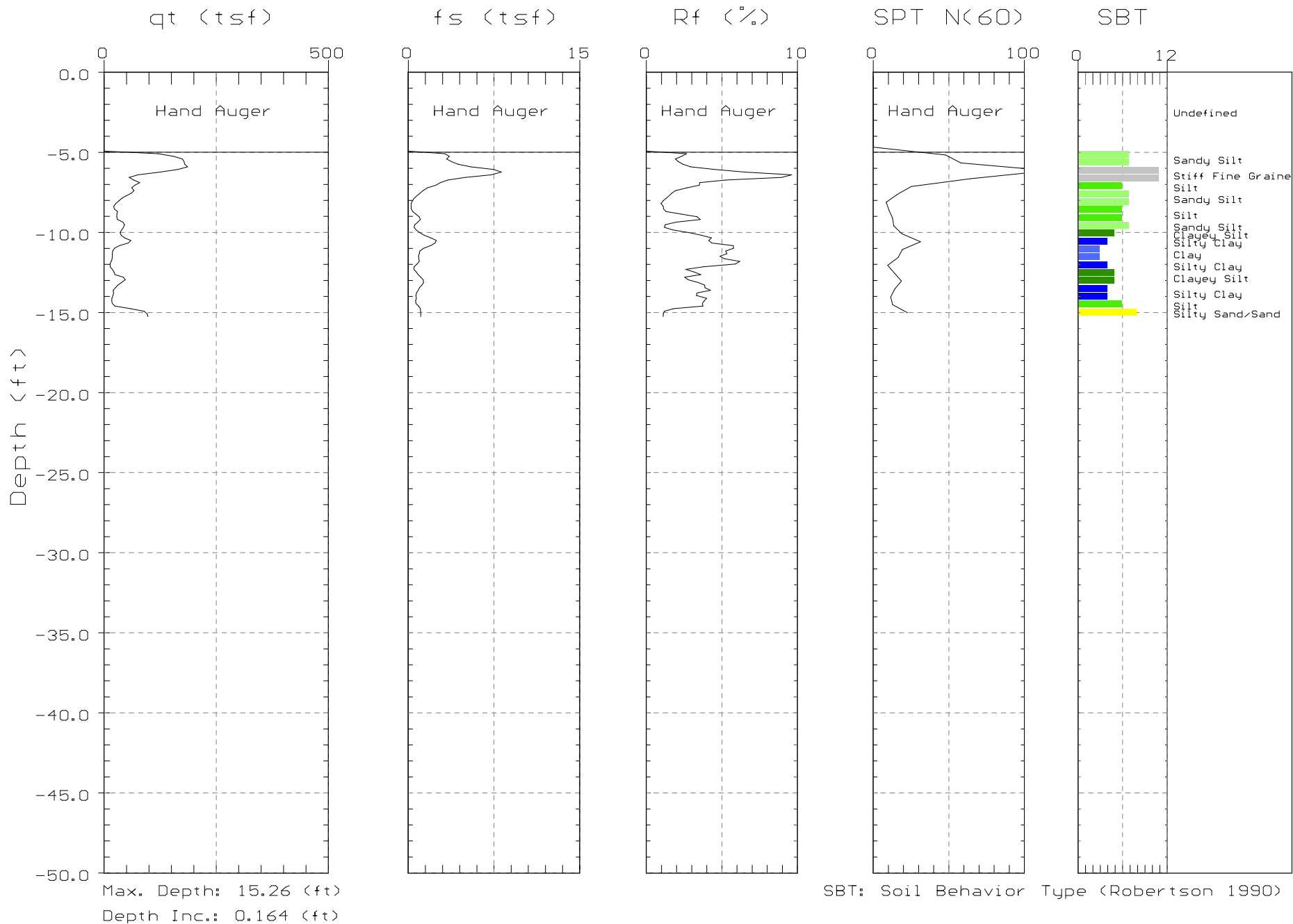




ENGEO

Site: RIVER RUN
Location: CPT-56

Engineer: S.HARRIS
Date: 07:01:05 11:10

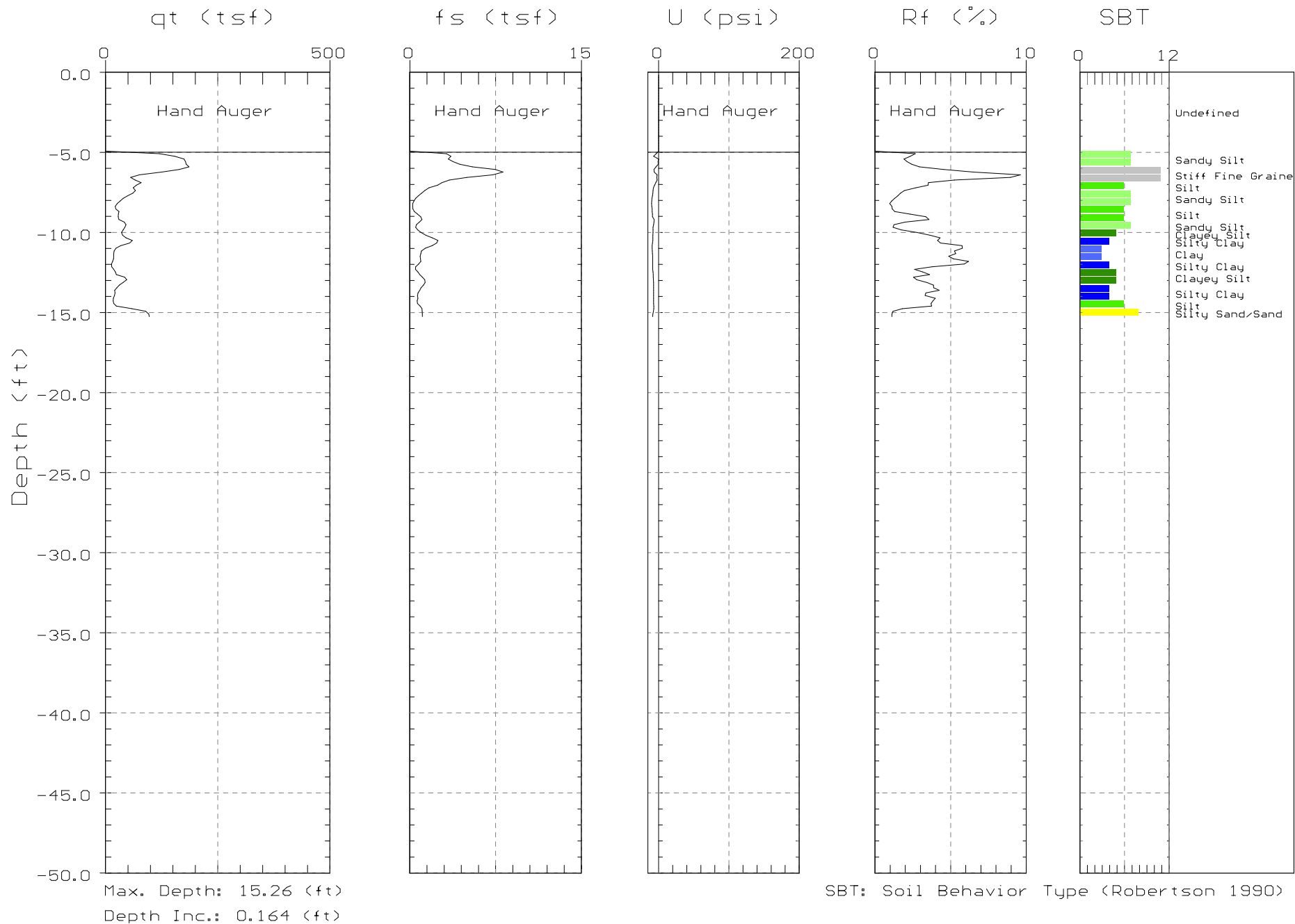




ENGEO

Site: RIVER RUN
Location: CPT-56

Engineer: S.HARRIS
Date: 07:01:05 11:10

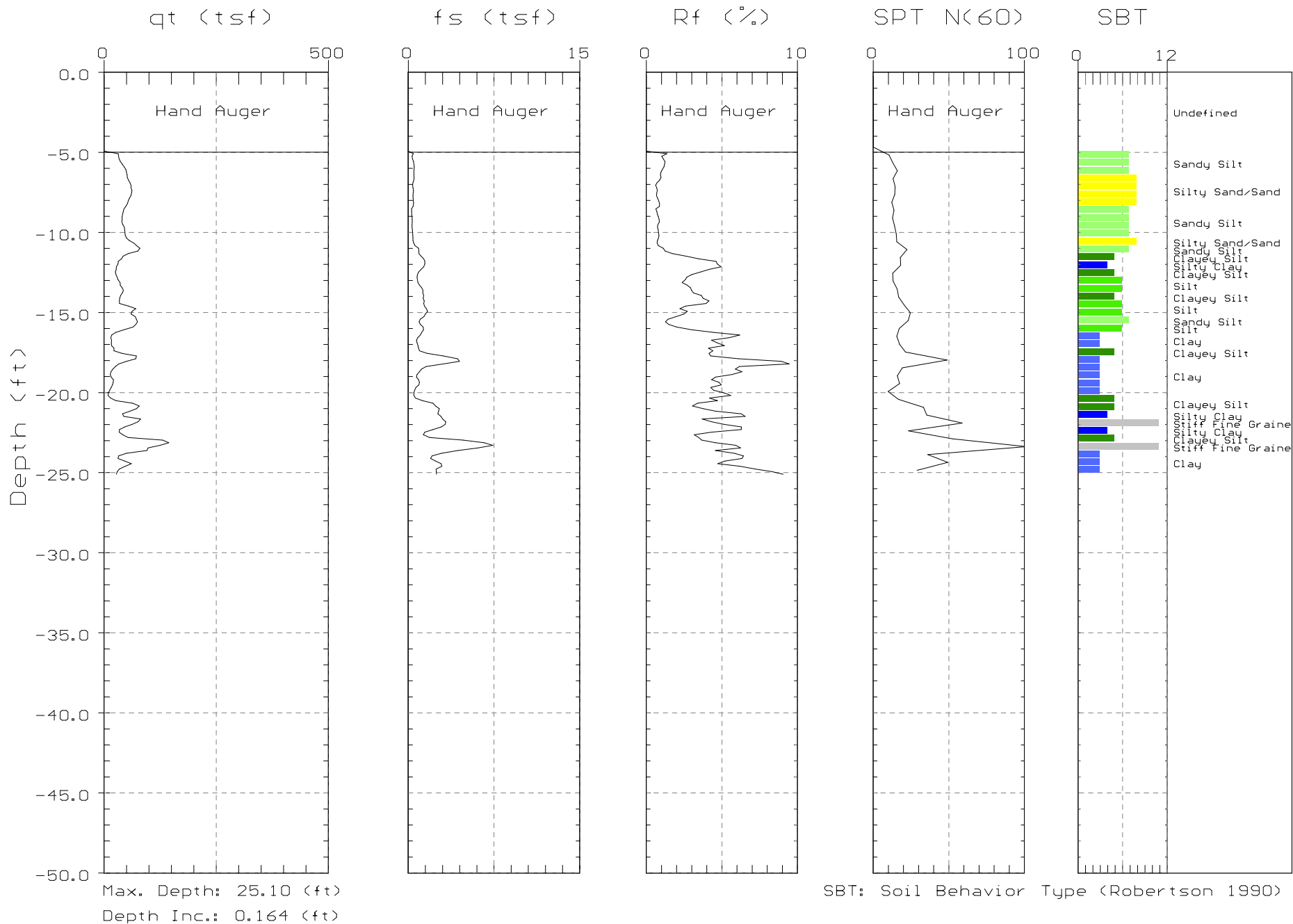




ENGEO

Site: RIVER RUN
Location: CPT-57

Engineer: S.HARRIS
Date: 07:01:05 12:54

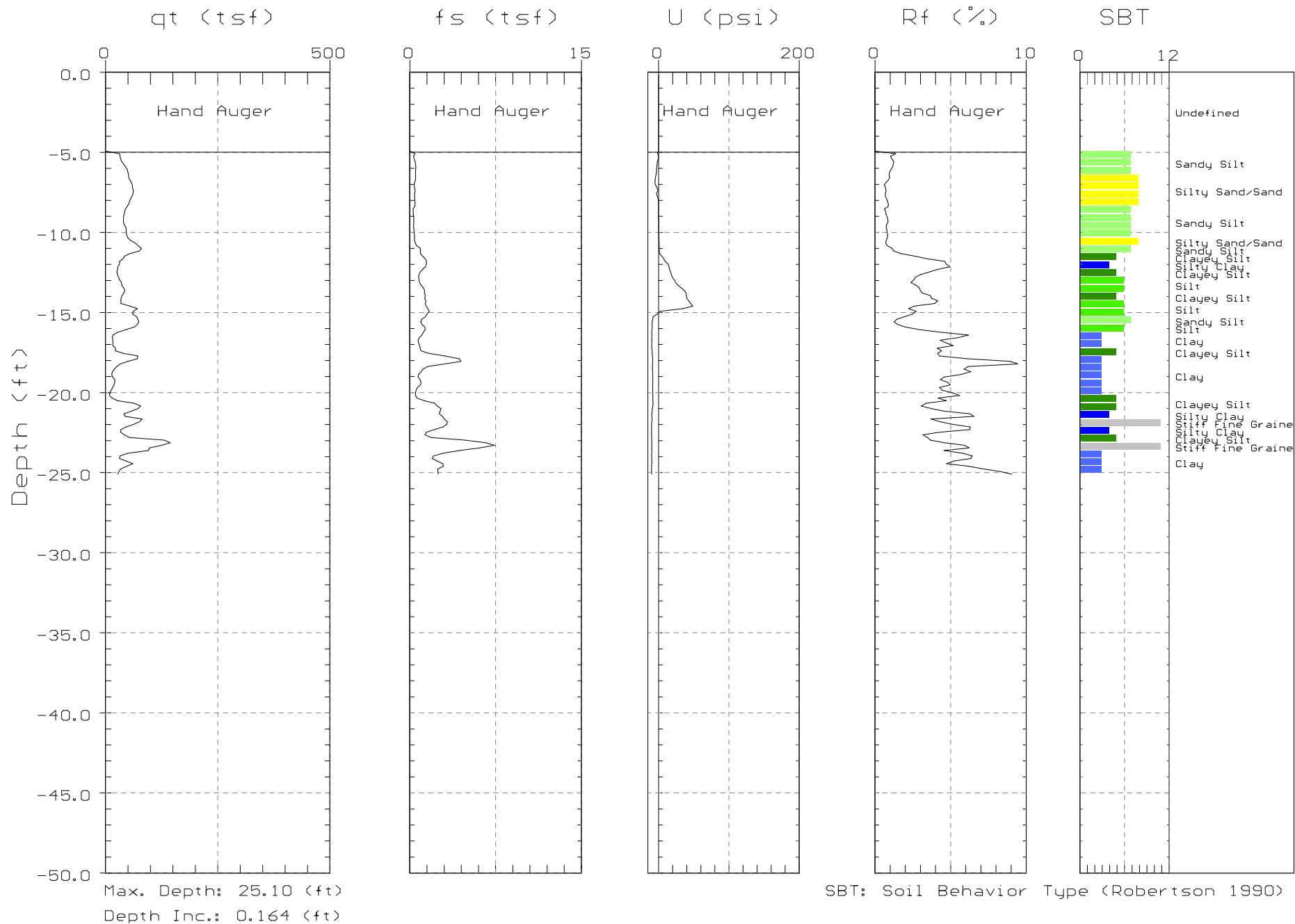




ENGEO

Site: RIVER RUN
Location: CPT-57

Engineer: S.HARRIS
Date: 07:01:05 12:54

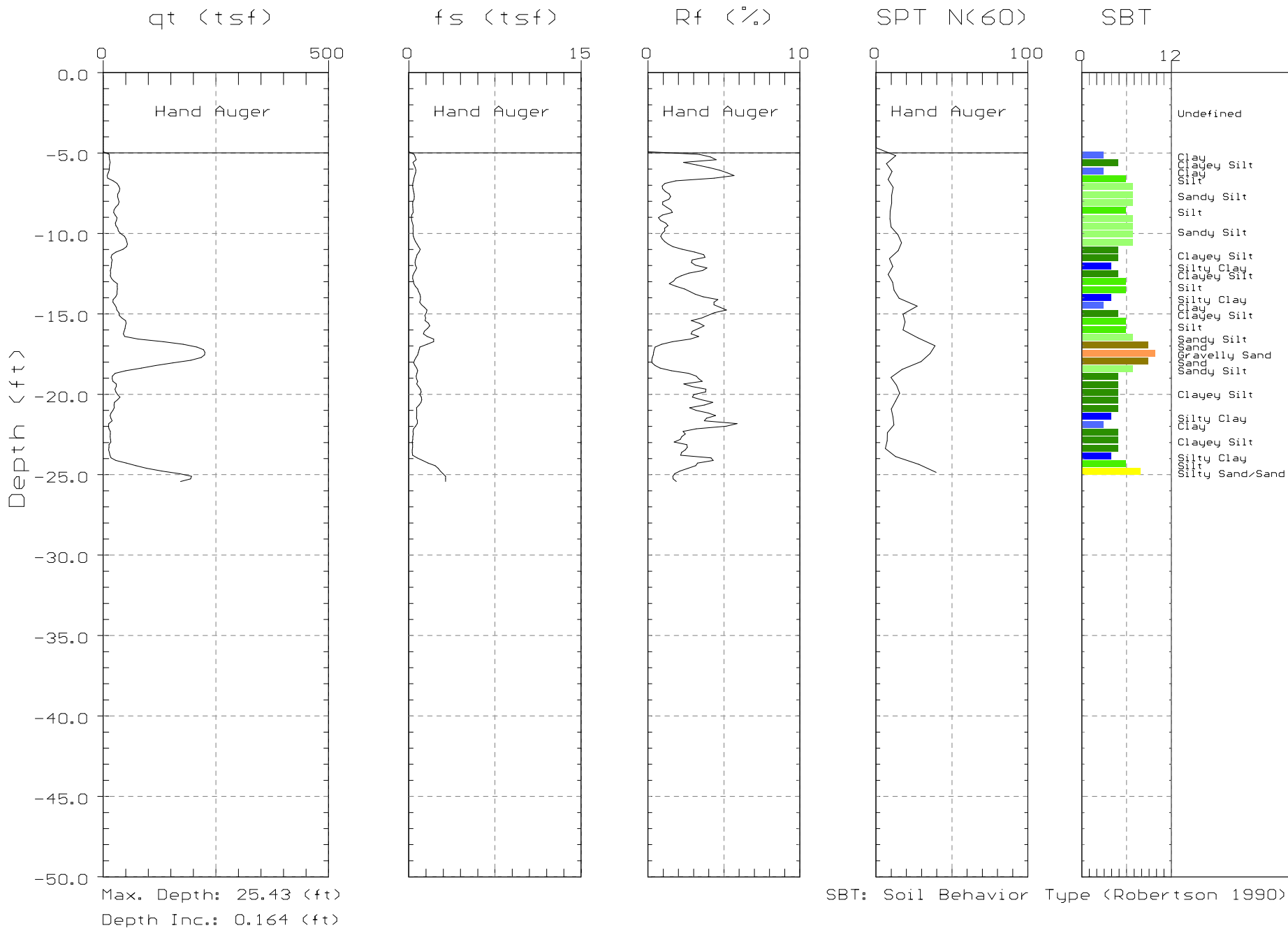




ENGEEO

Site: RIVER RUN
Location: CPT-58

Engineer: S.HARRIS
Date: 07:08:05 12:13

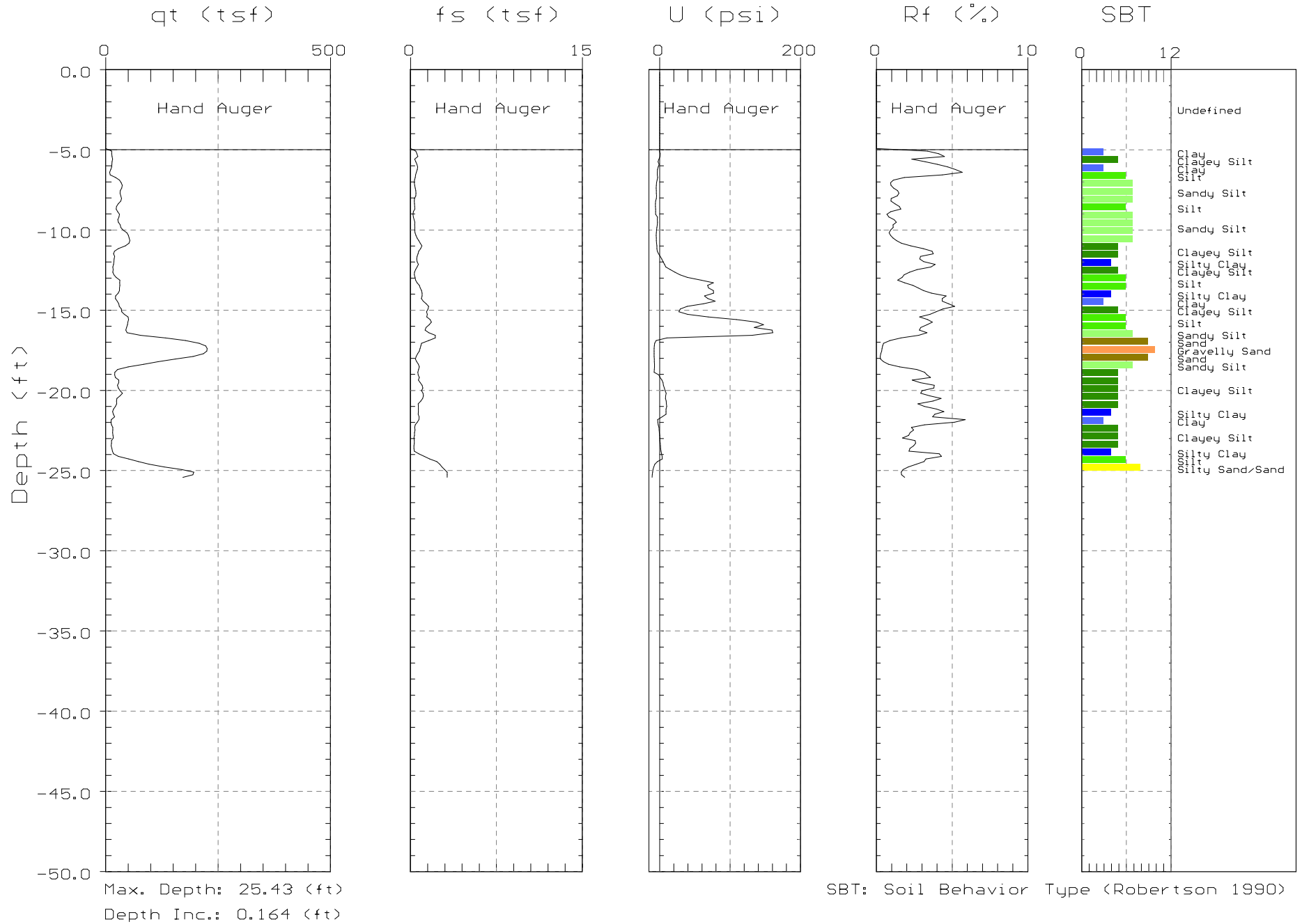




ENGEO

Site: RIVER RUN
Location: CPT-58

Engineer: S.HARRIS
Date: 07:08:05 12:13

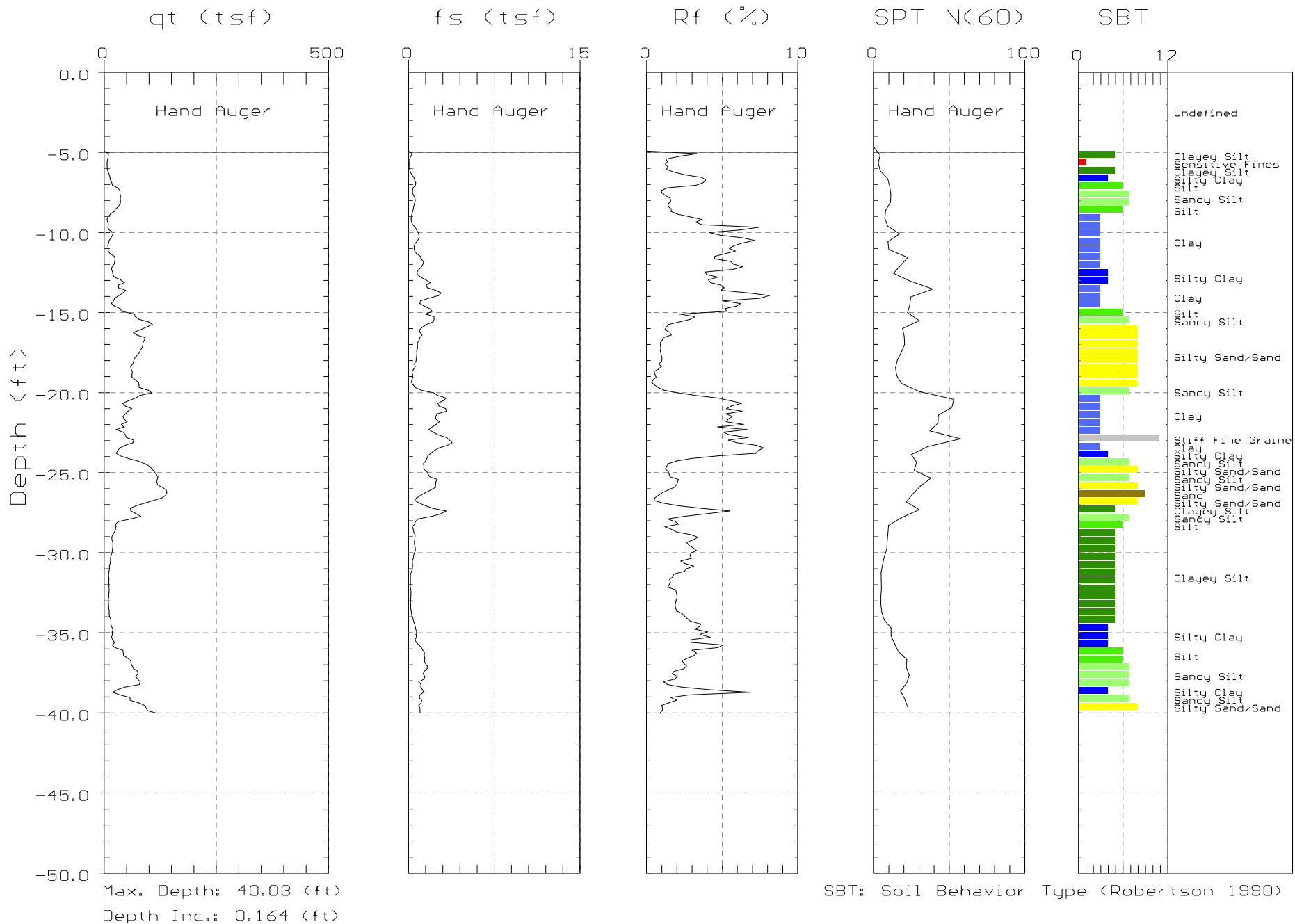




ENGEO

Site: RIVER RUN
Location: CPT-59

Engineer: S.HARRIS
Date: 07:01:05 14:01

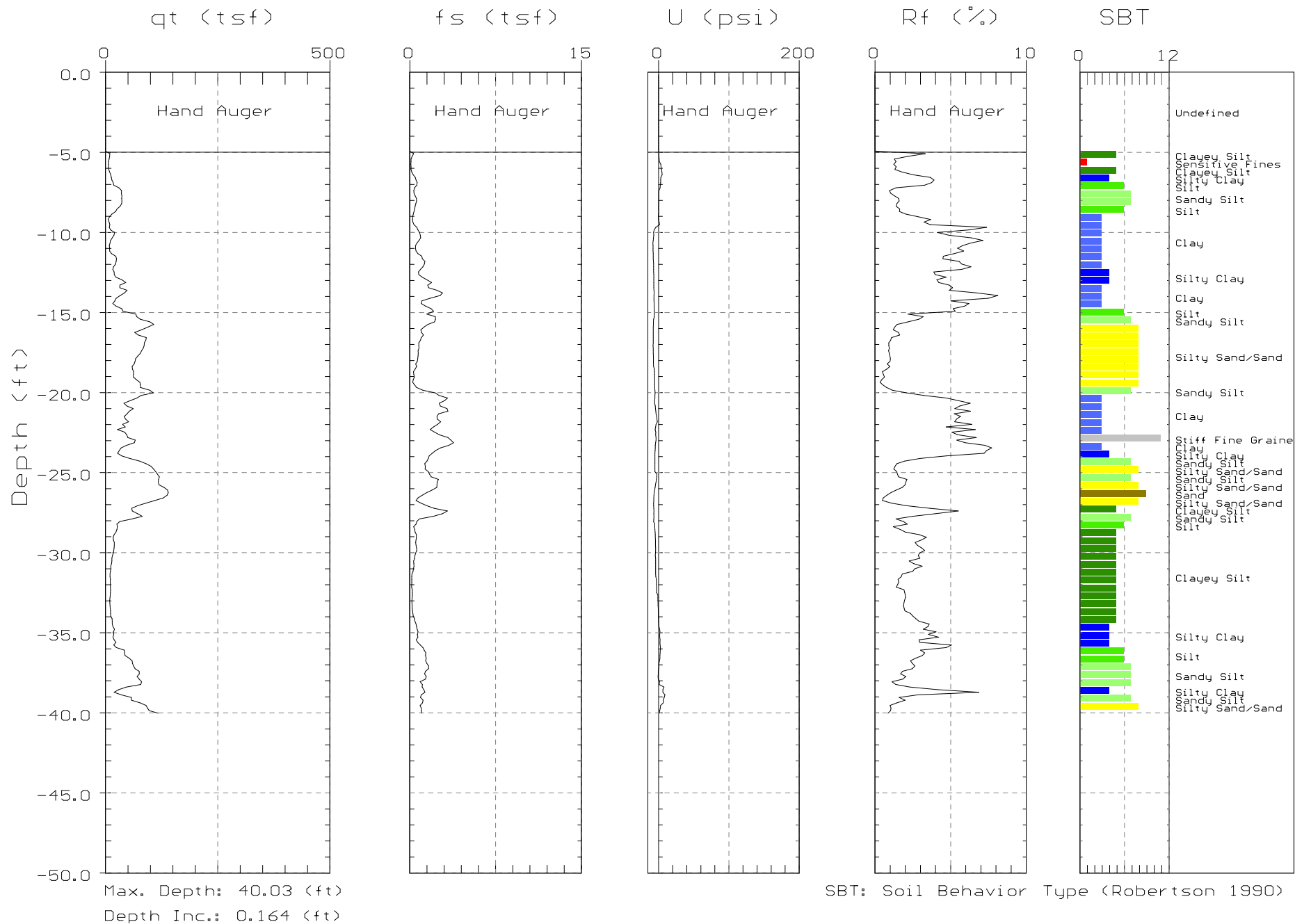




ENGEO

Site: RIVER RUN
Location: CPT-59

Engineer: S.HARRIS
Date: 07:01:05 14:01

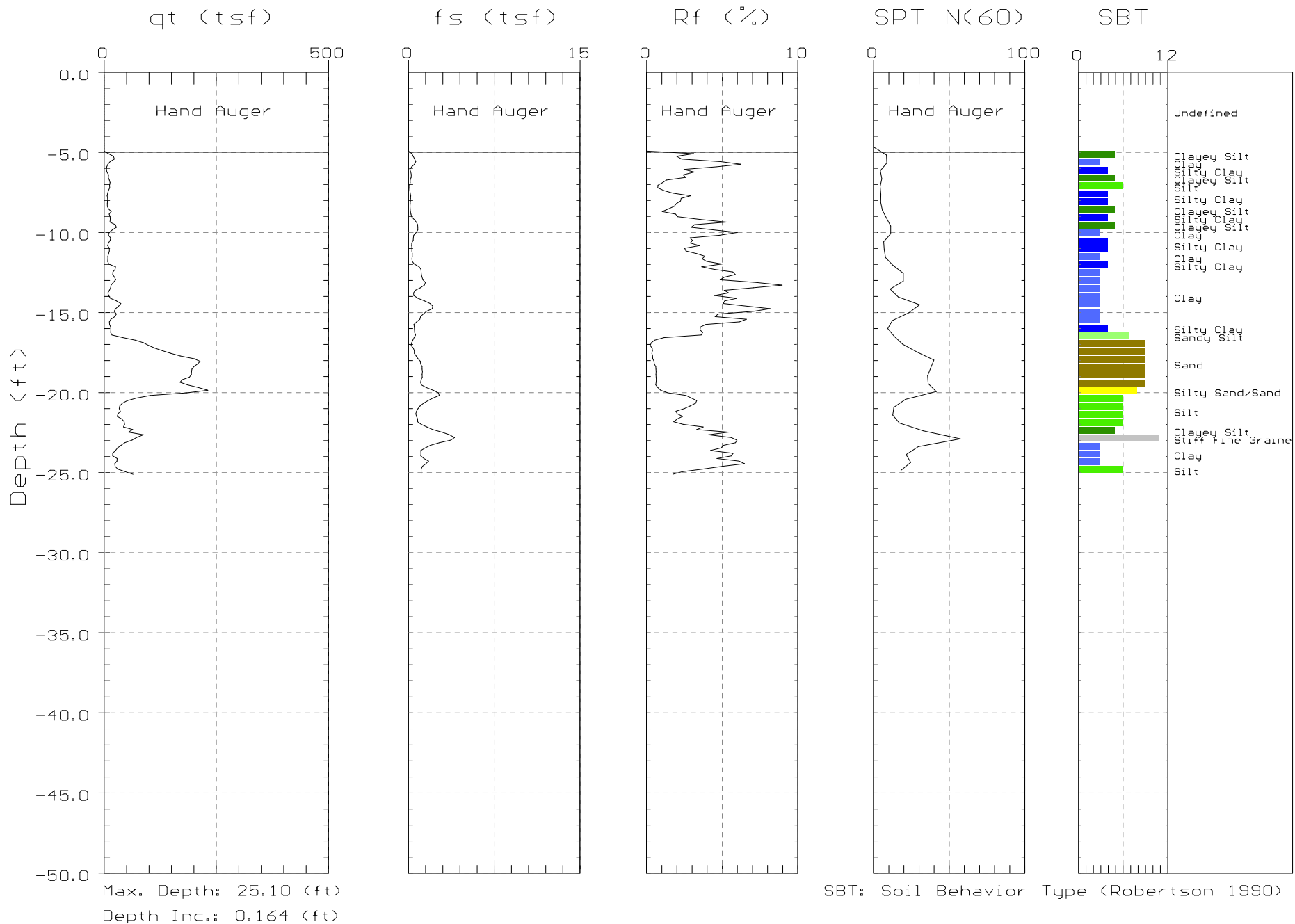




ENGEO

Site: RIVER RUN
Location: CPT-60

Engineer: S.HARRIS
Date: 07:08:05 11:40

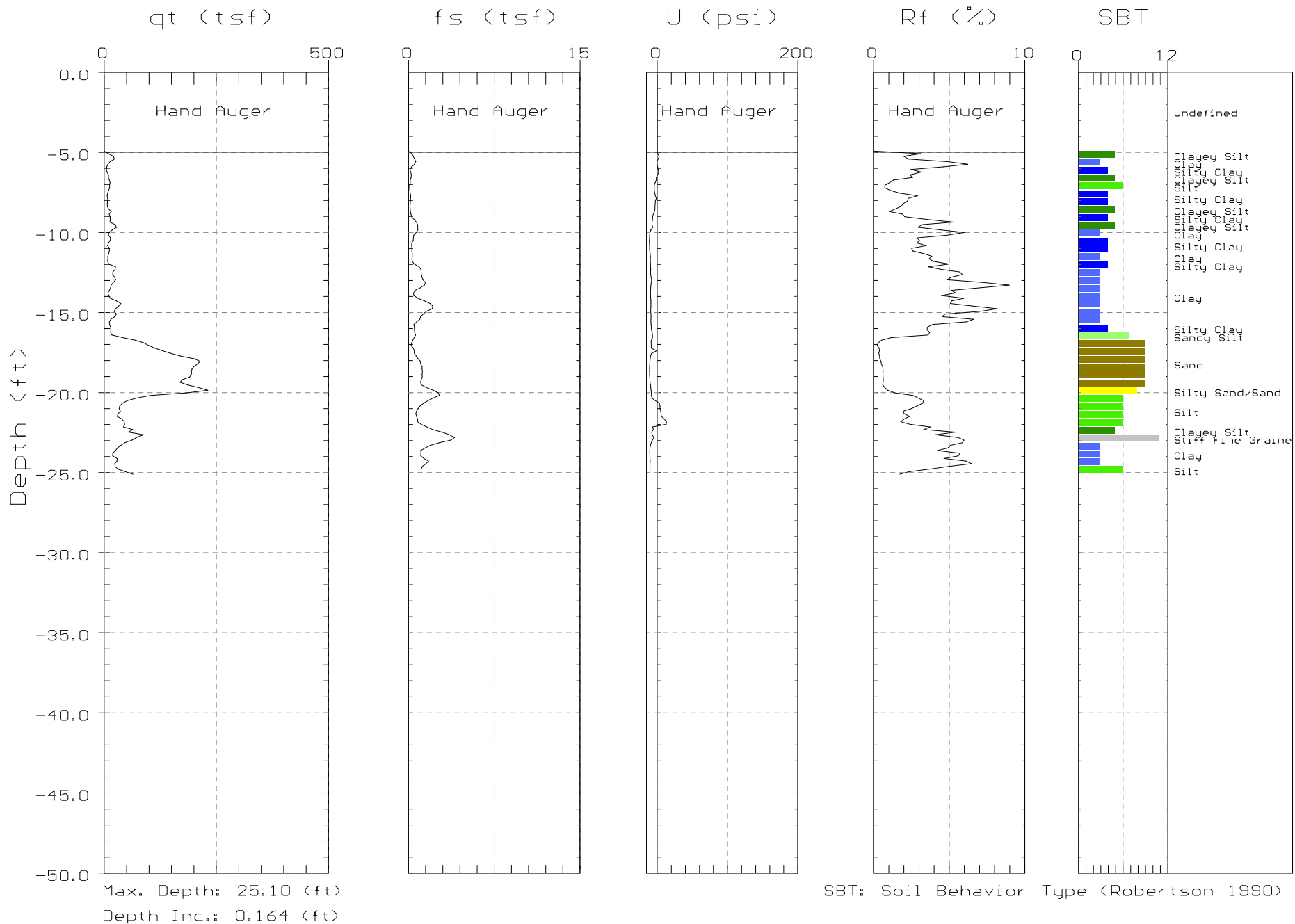




ENGEO

Site: RIVER RUN
Location: CPT-60

Engineer: S.HARRIS
Date: 07:08:05 11:40

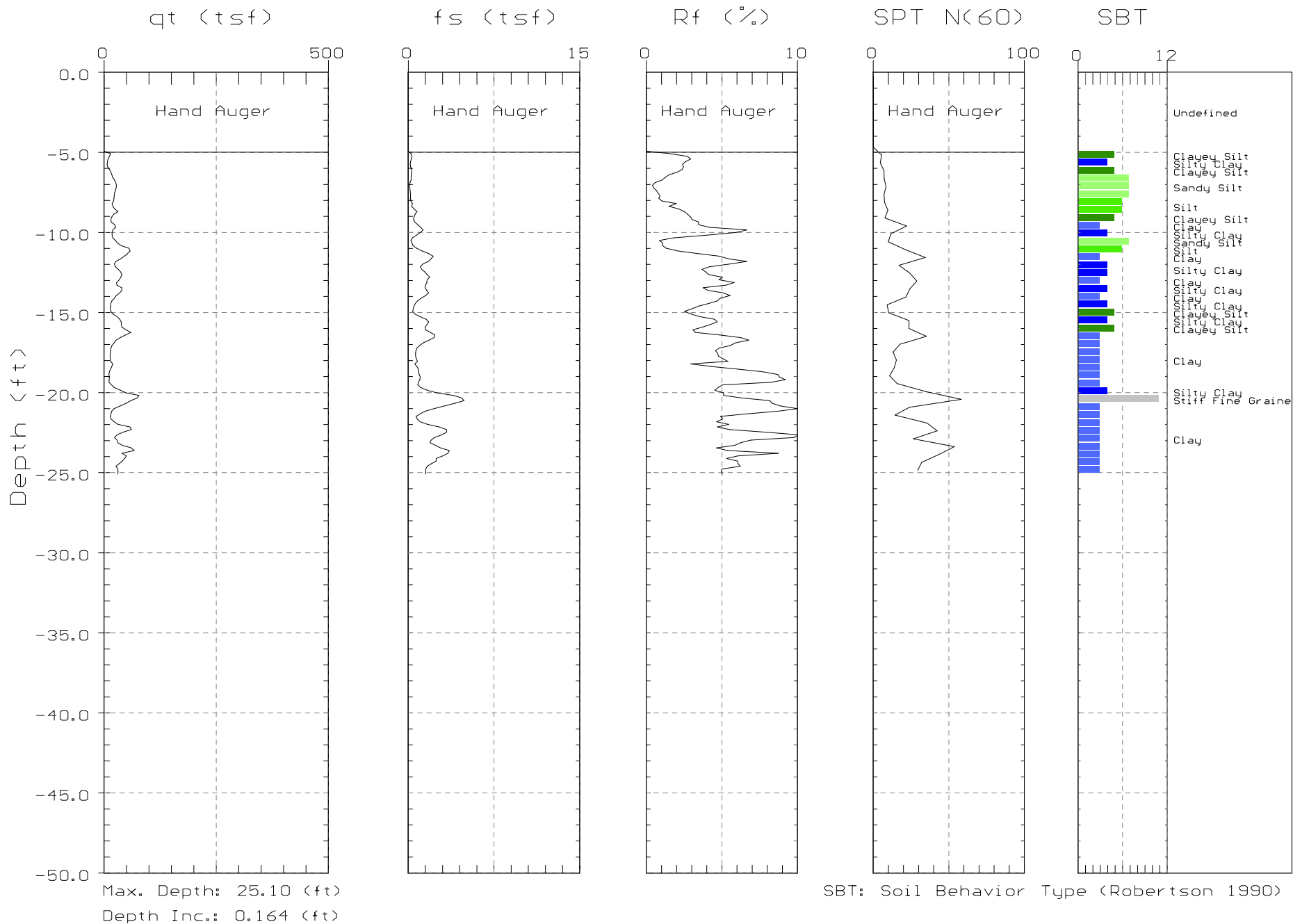


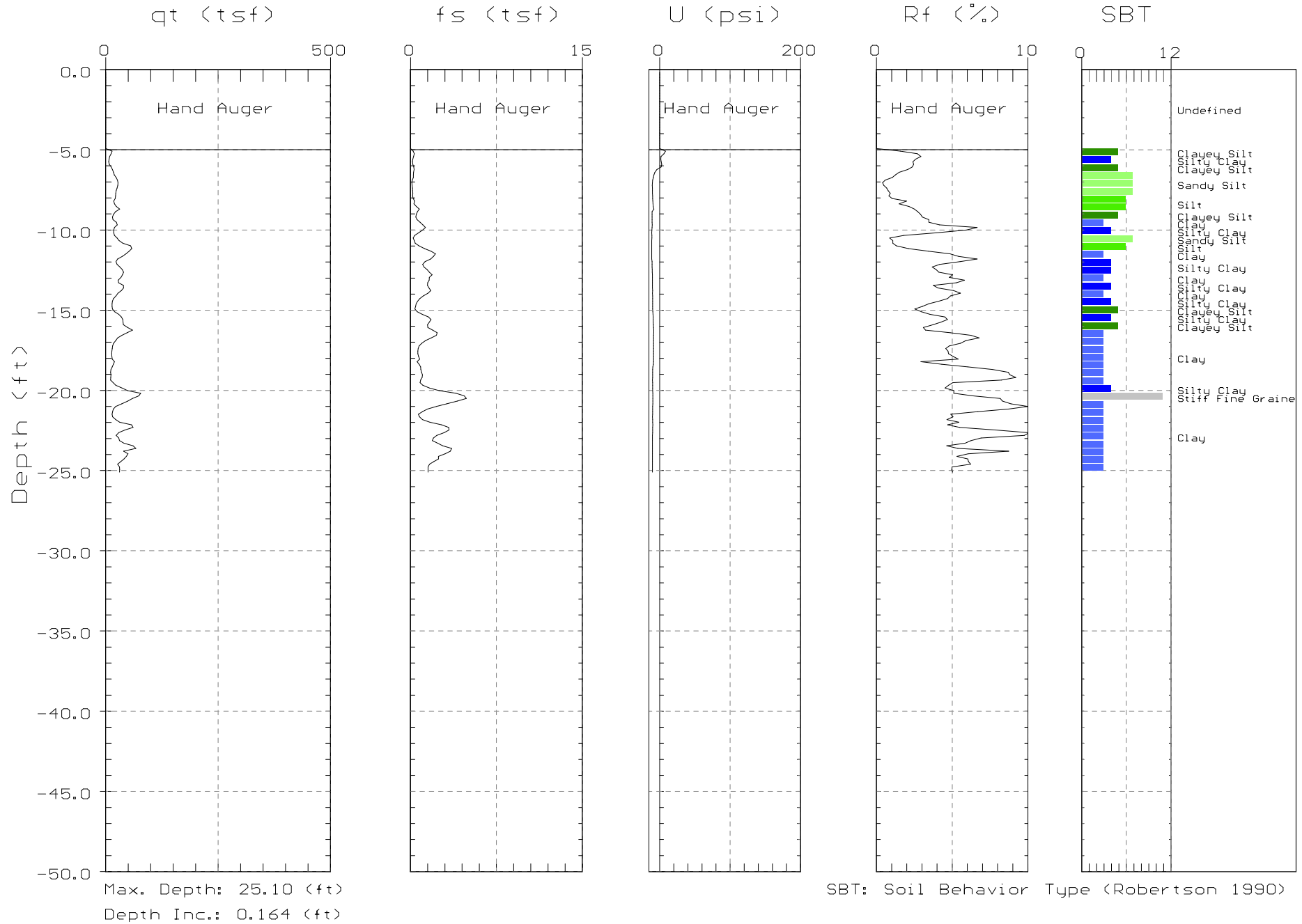


ENGEEO

Site: RIVER RUN
Location: CPT-62

Engineer: S.HARRIS
Date: 07:01:05 13:56



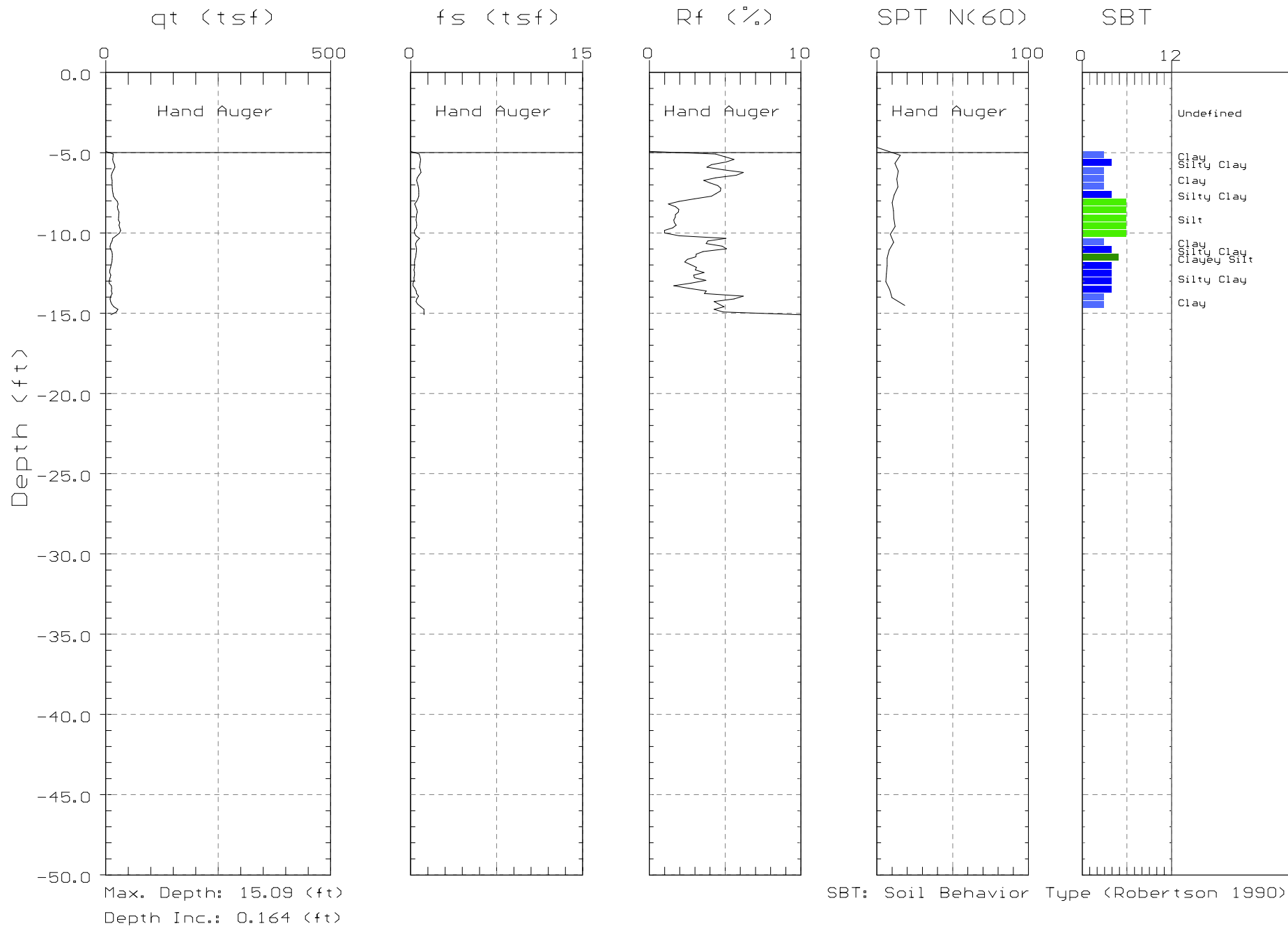




ENGEO

Site: RIVER RUN
Location: CPT-63

Engineer: S.HARRIS
Date: 07:08:05 13:42

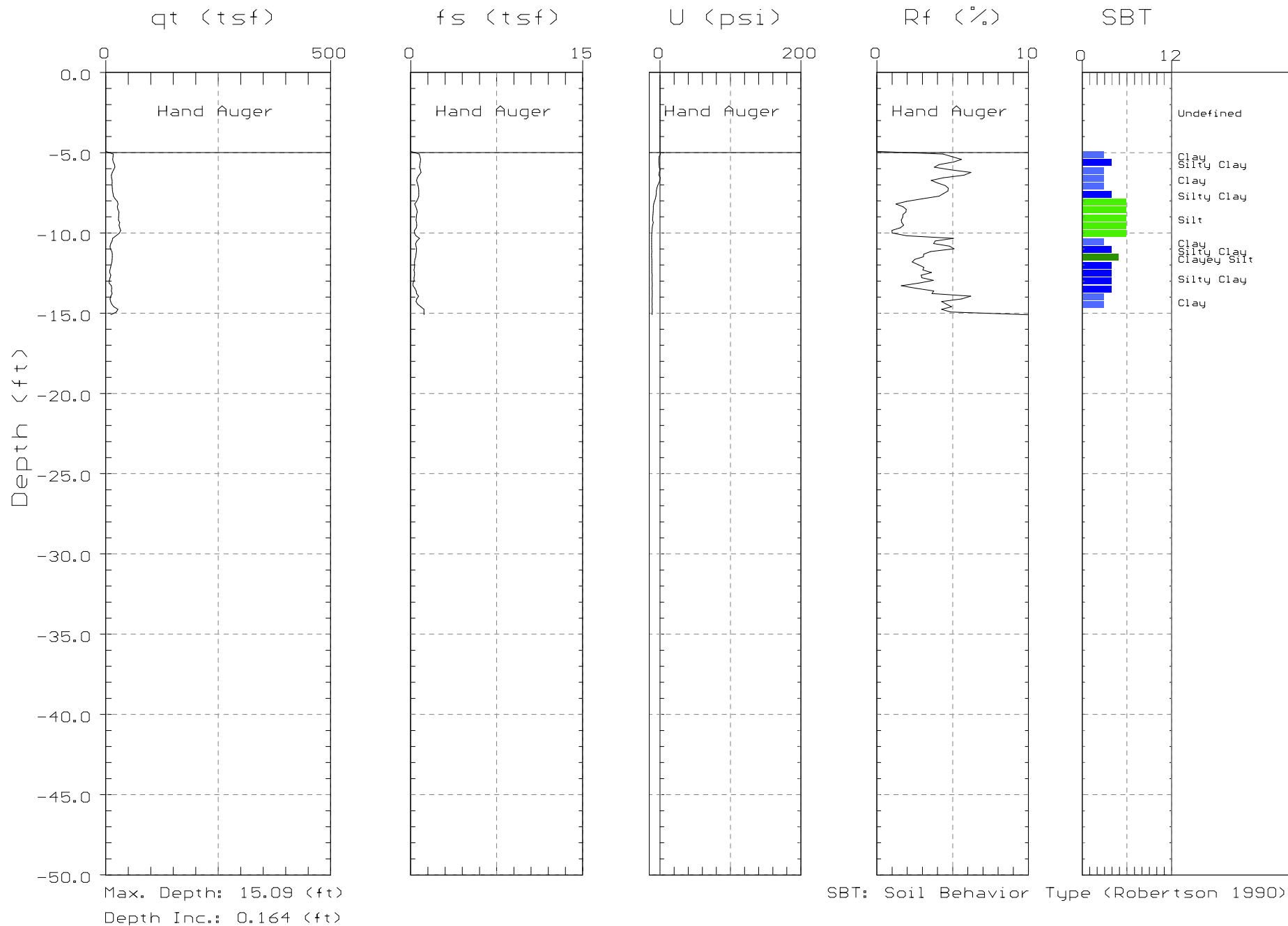




ENGEO

Site: RIVER RUN
Location: CPT-63

Engineer: S.HARRIS
Date: 07:08:05 13:42

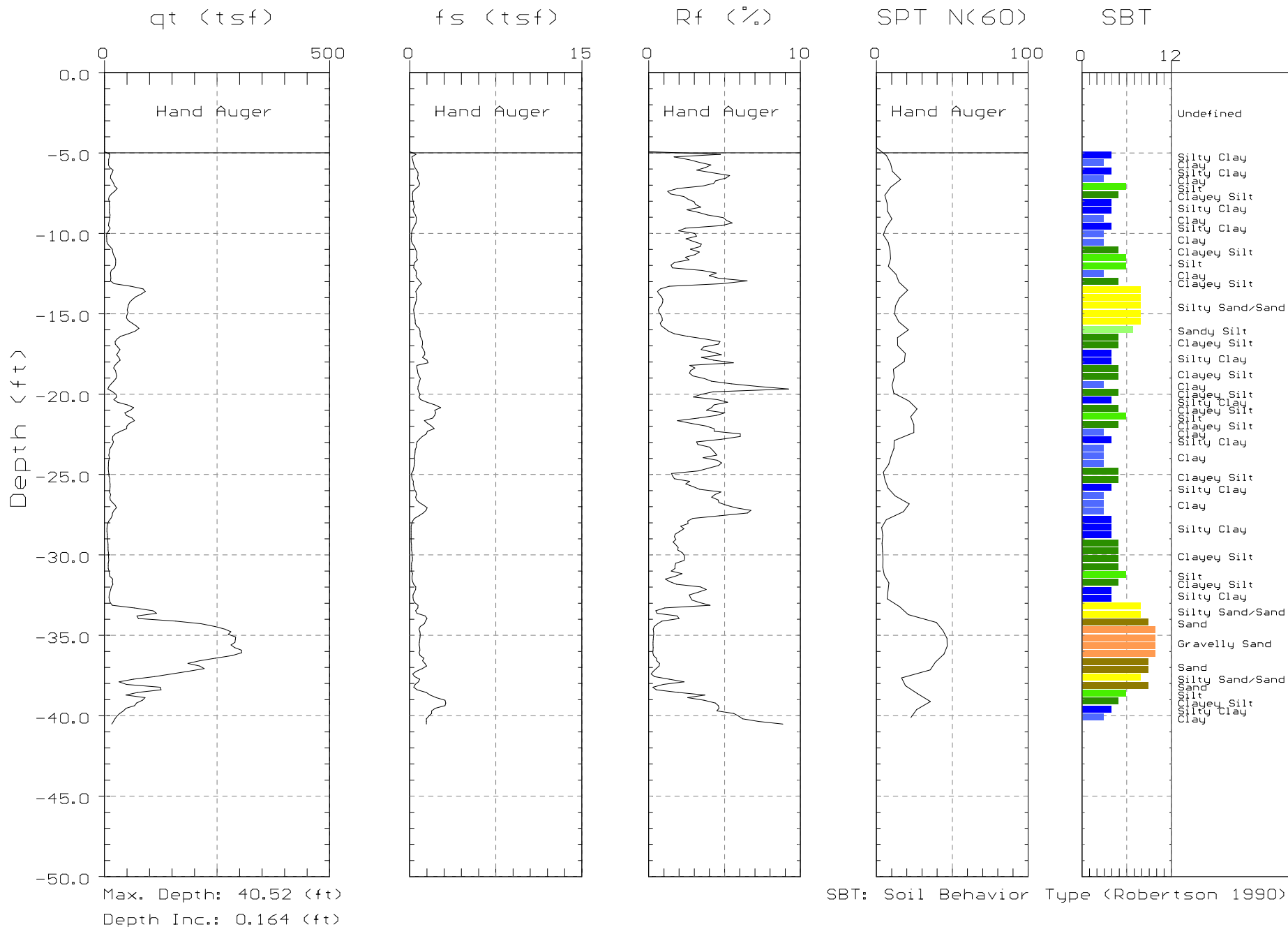




ENGEO

Site: RIVER RUN
Location: CPT-64

Engineer: S.HARRIS
Date: 07:01:05 13:03

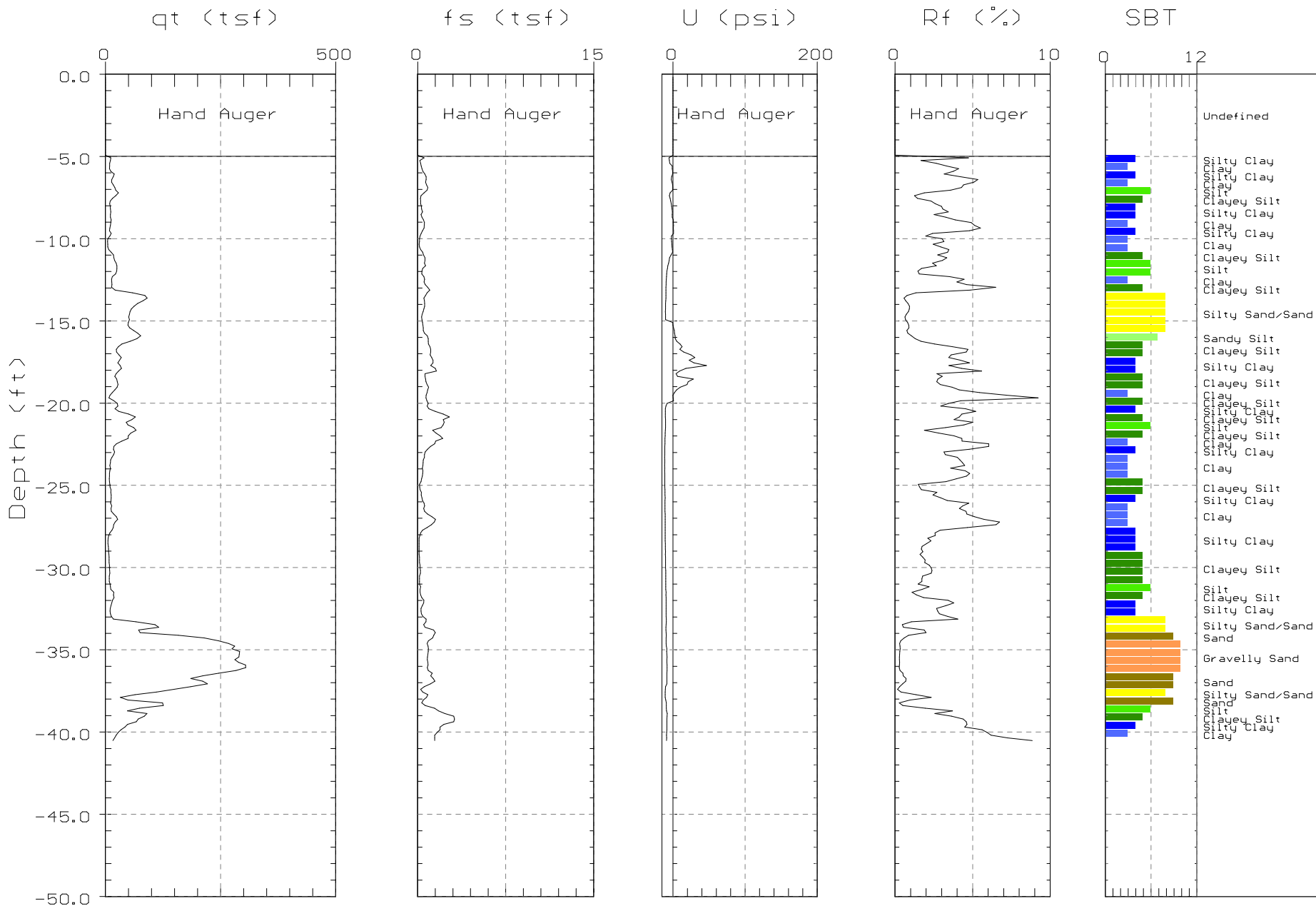




ENGEEO

Site: RIVER RUN
Location: CPT-64

Engineer: S.HARRIS
Date: 07:01:05 13:03



Max. Depth: 40.52 (ft)
Depth Inc.: 0.164 (ft)

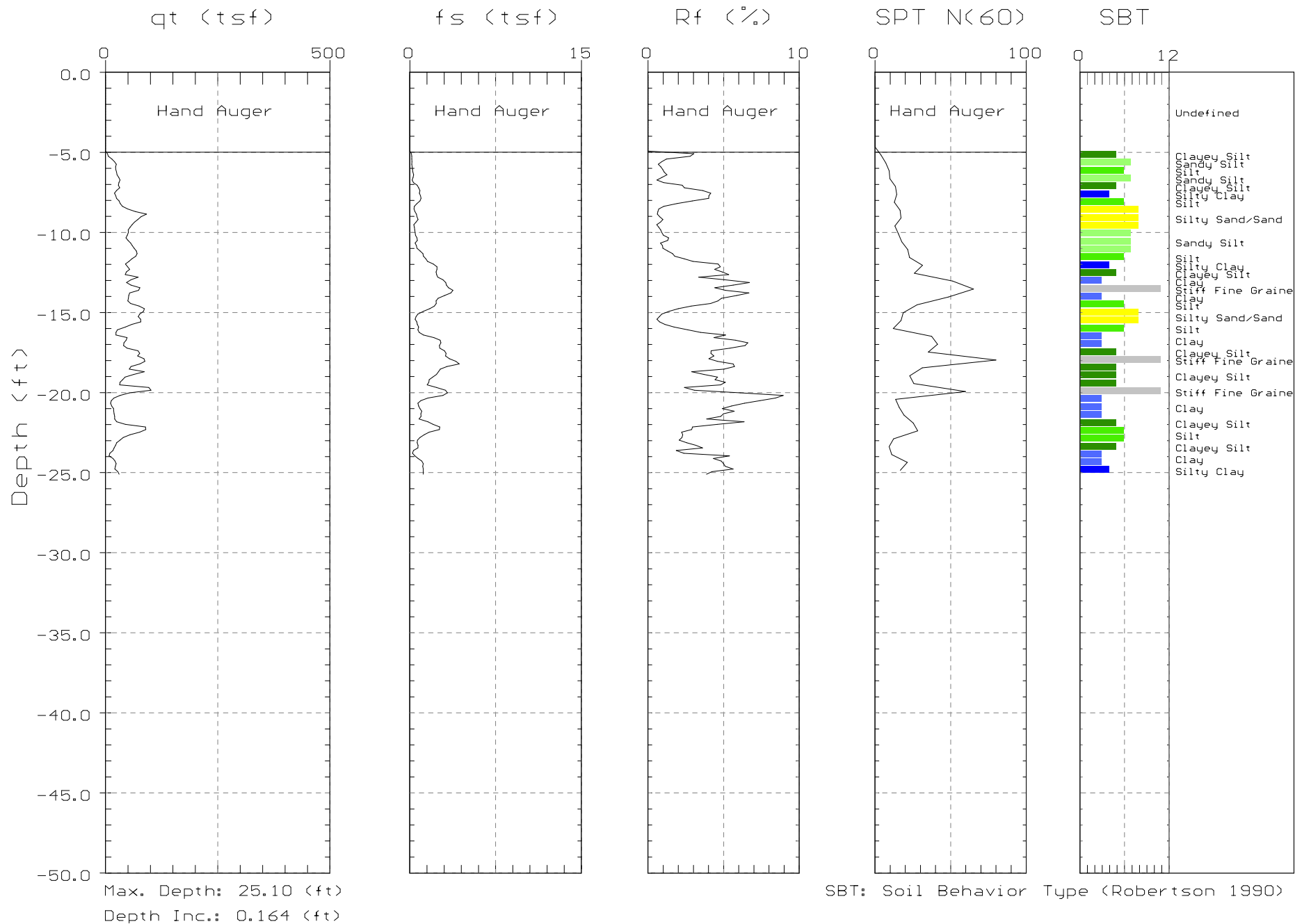
SBT: Soil Behavior Type <Robertson 1990>



ENGEO

Site: RIVER RUN
Location: CPT-65

Engineer: S.HARRIS
Date: 07:01:05 10:54

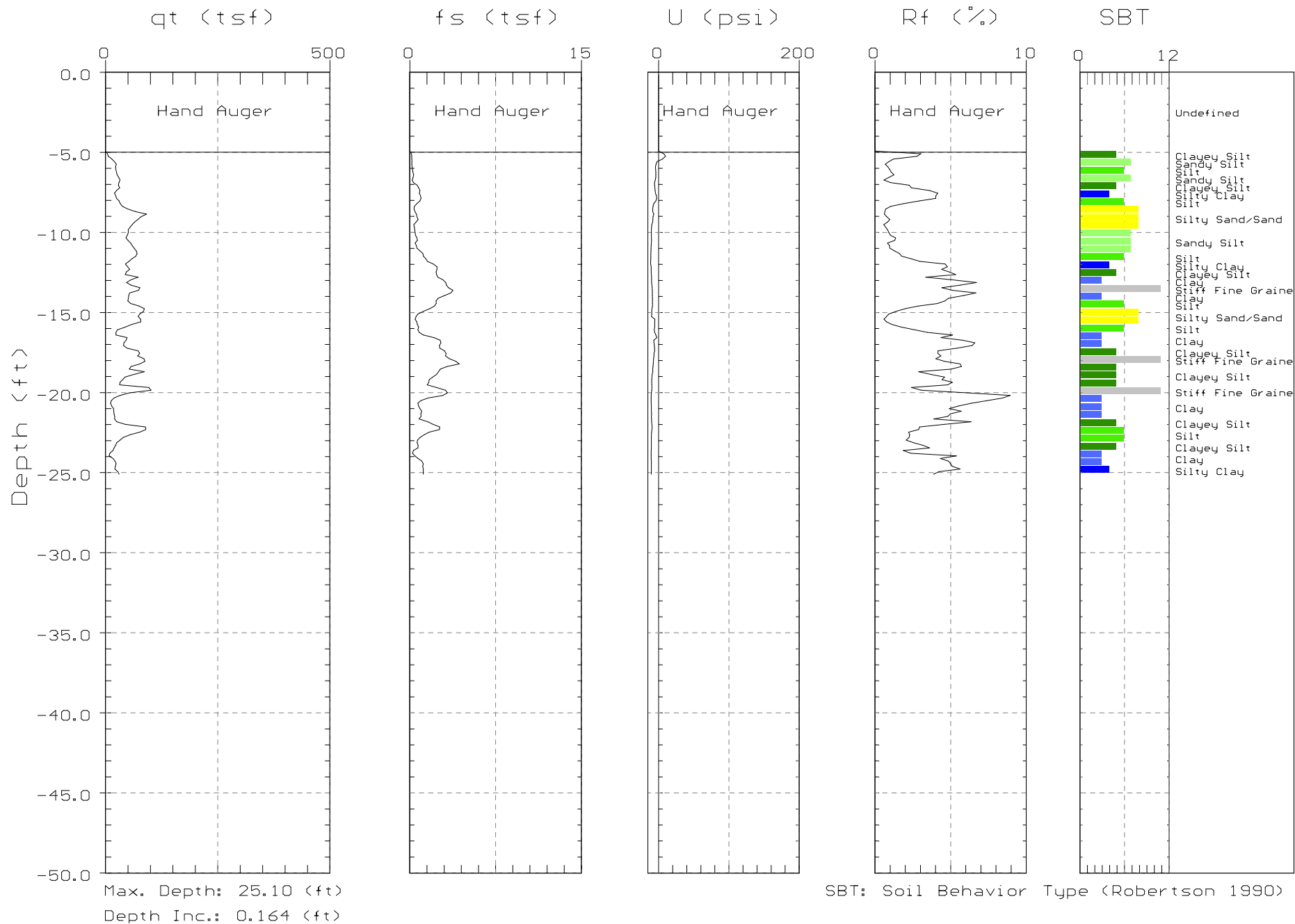




ENGEO

Site: RIVER RUN
Location: CPT-65

Engineer: S.HARRIS
Date: 07:01:05 10:54

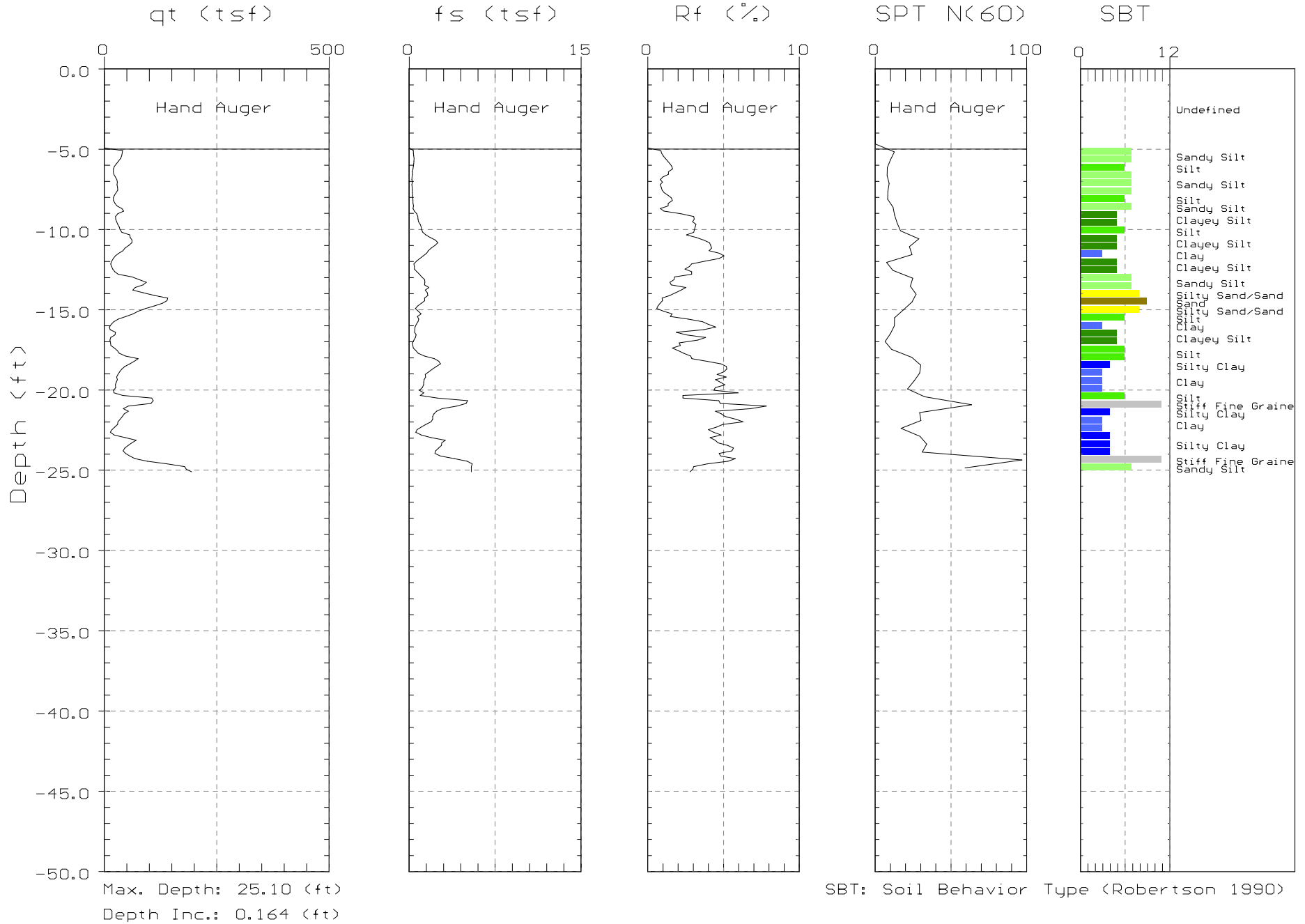




ENGEO

Site: RIVER RUN
Location: CPT-66

Engineer: S.HARRIS
Date: 07:01:05 10:23

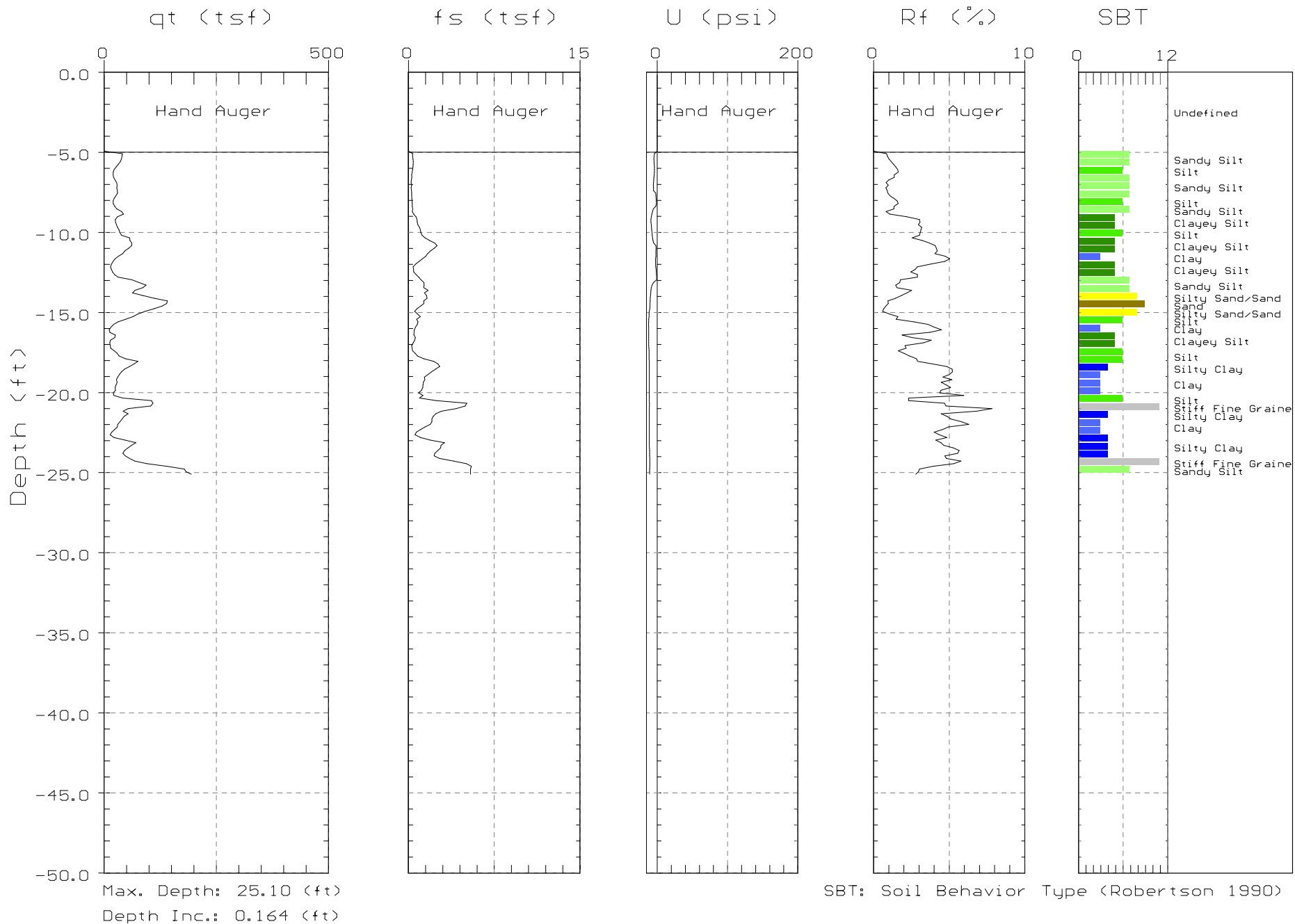




ENGEO

Site: RIVER RUN
Location: CPT-66

Engineer: S.HARRIS
Date: 07:01:05 10:23

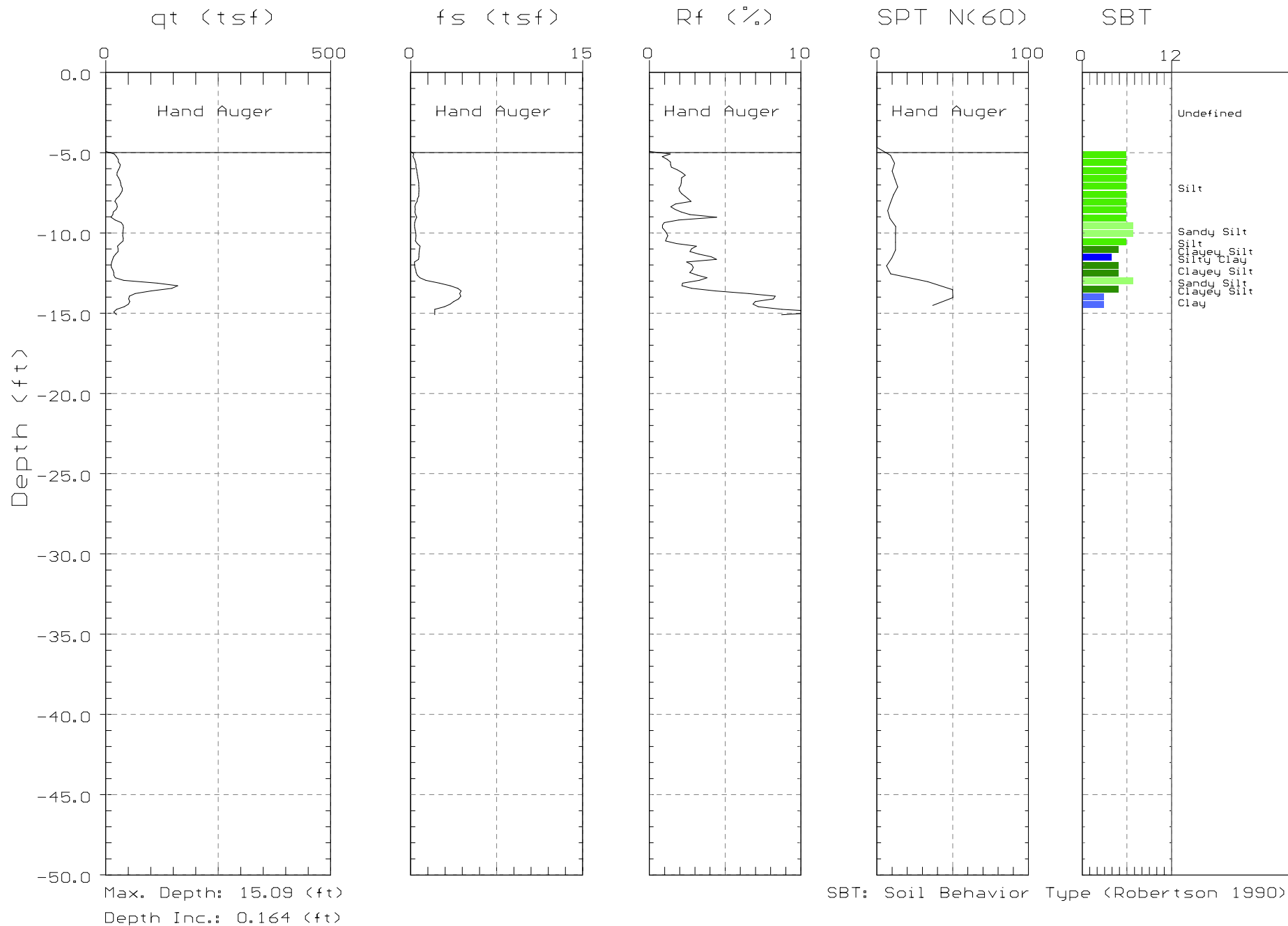




ENGEO

Site: RIVER RUN
Location: CPT-67

Engineer: S.HARRIS
Date: 07:01:05 09:39

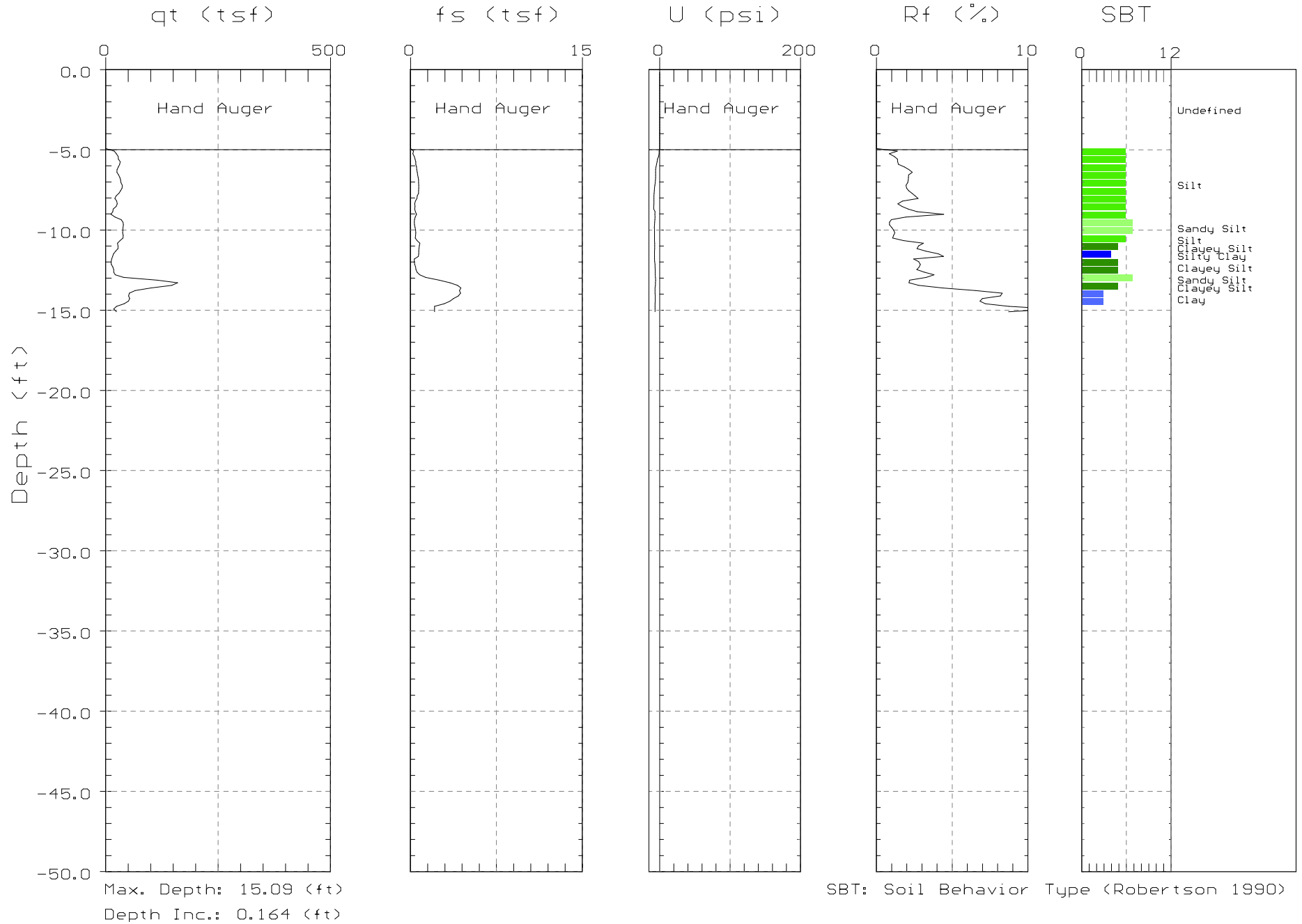




ENGEO

Site: RIVER RUN
Location: CPT-67

Engineer: S.HARRIS
Date: 07:01:05 09:39

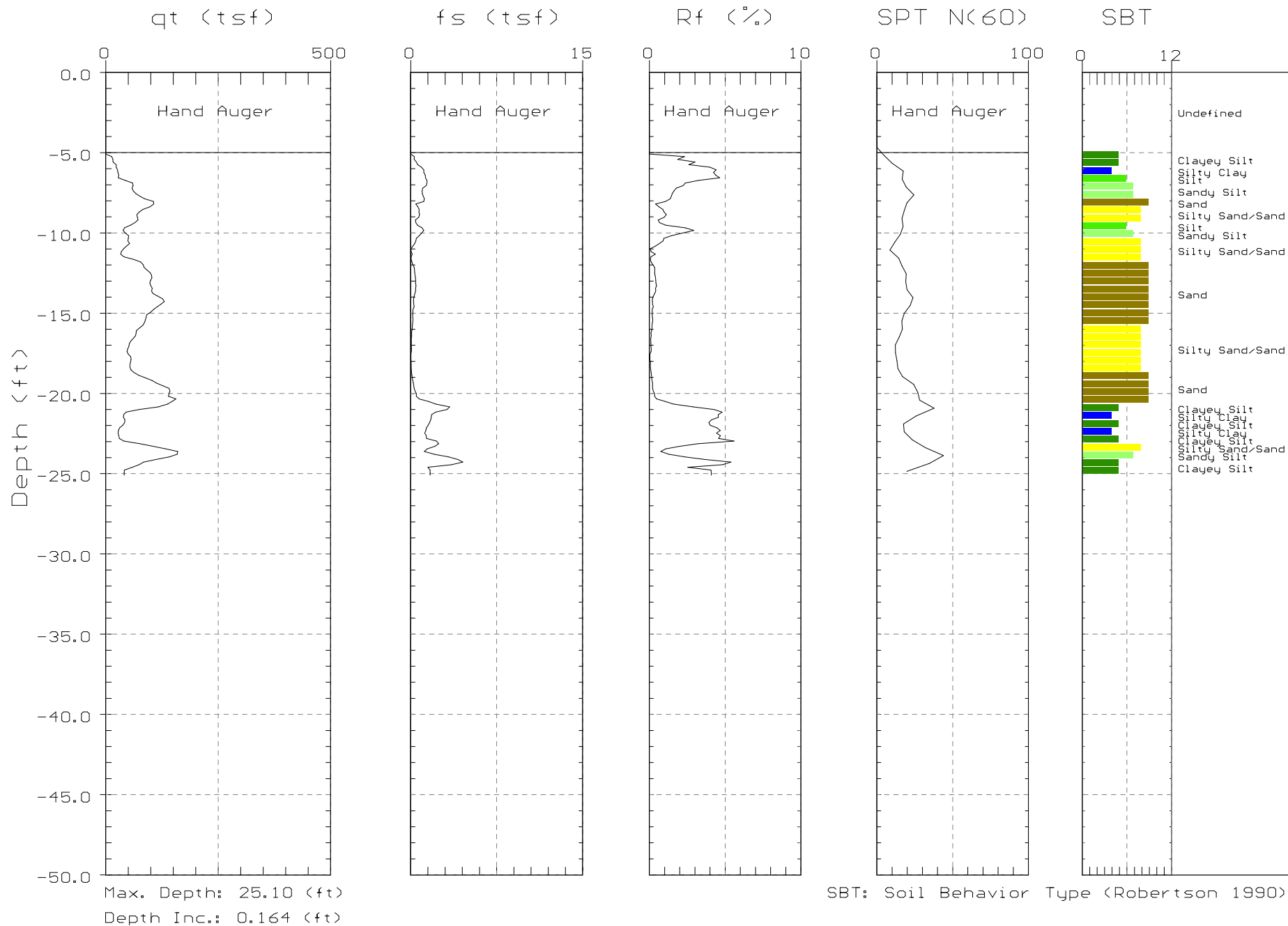




ENGEO

Site: RIVER RUN
Location: CPT-68

Engineer: S.HARRIS
Date: 07:01:05 09:01

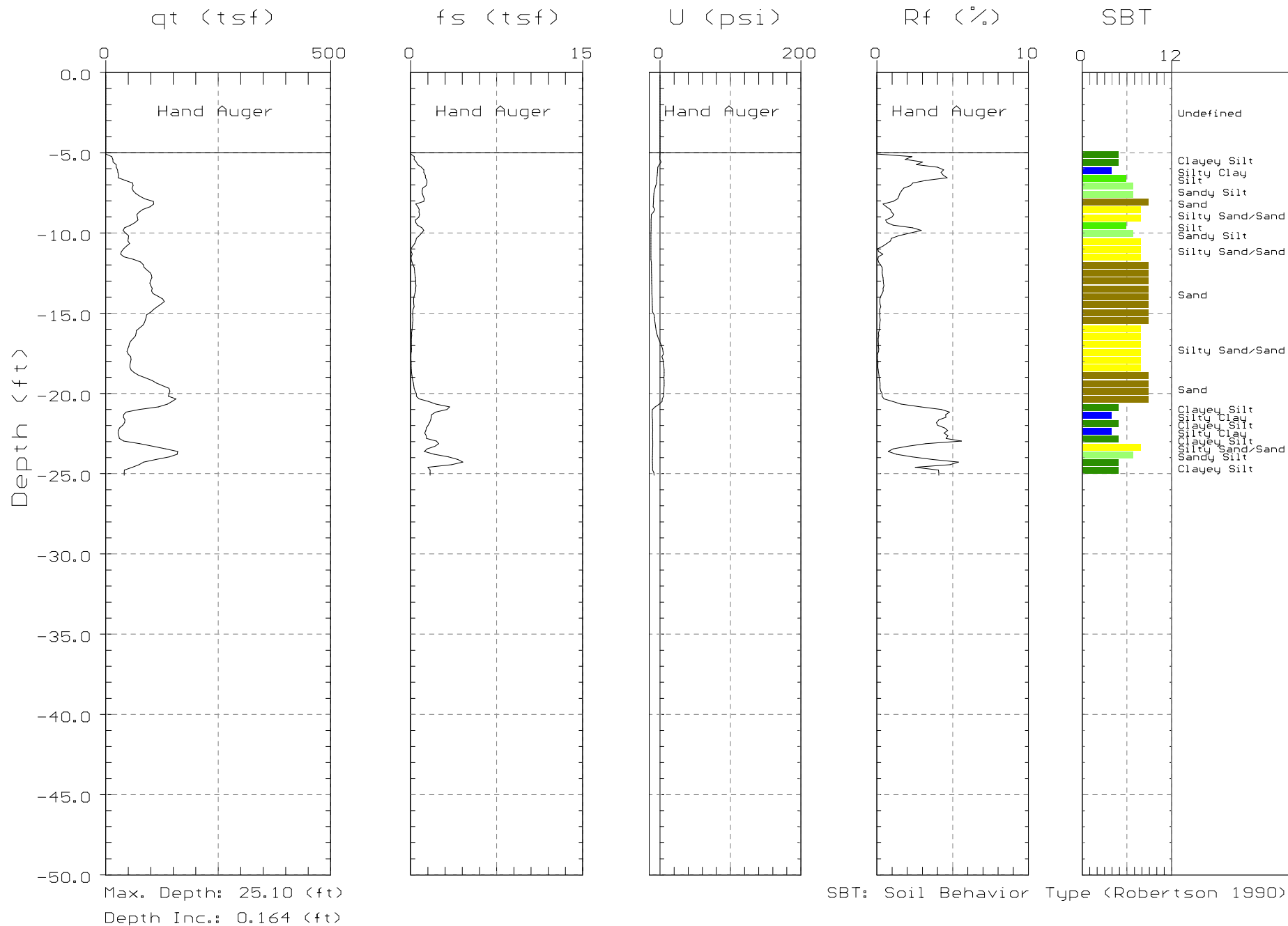




ENGEO

Site: RIVER RUN
Location: CPT-68

Engineer: S.HARRIS
Date: 07:01:05 09:01

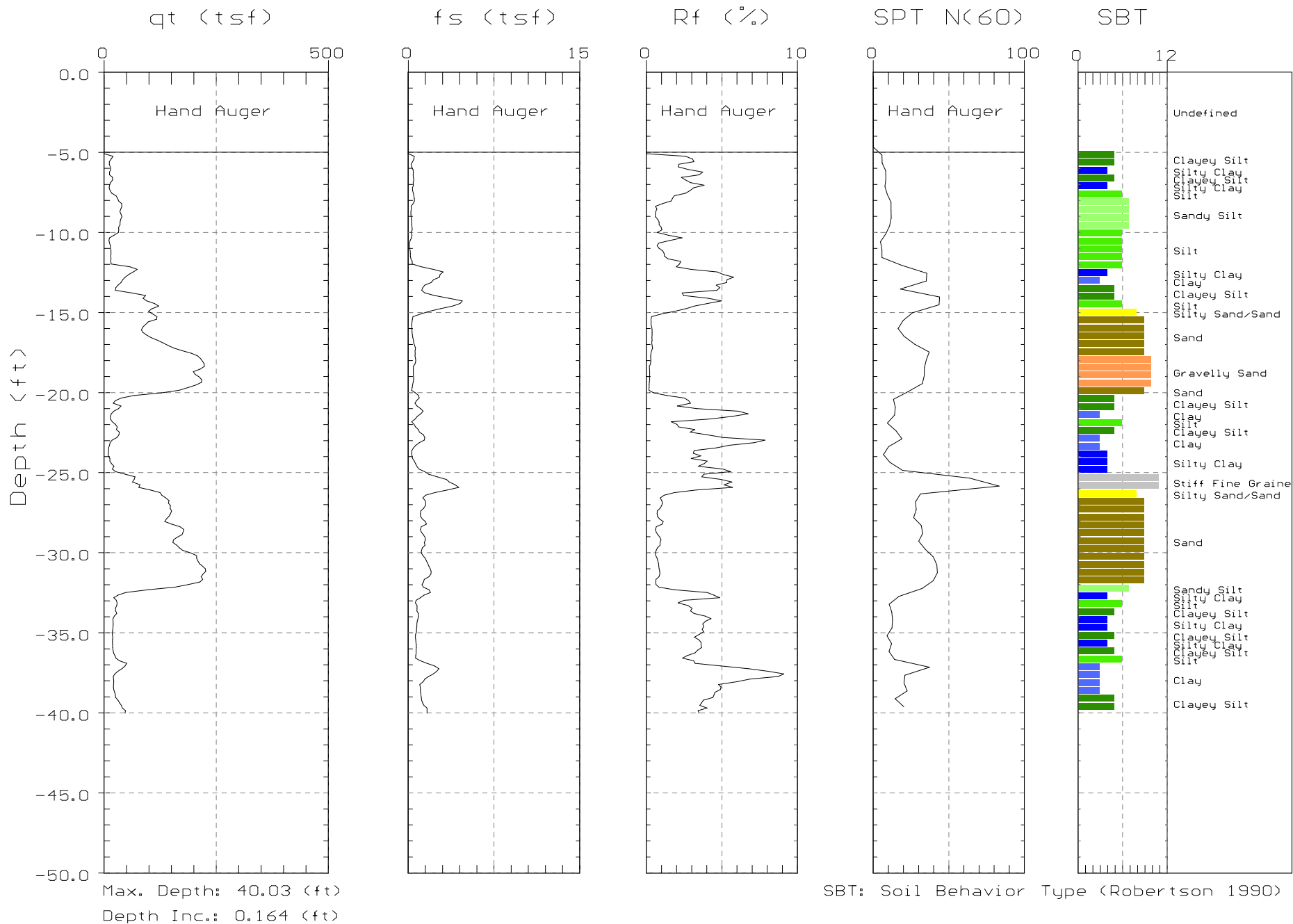




ENGEO

Site: RIVER RUN
Location: CPT-69

Engineer: S.HARRIS
Date: 07:01:05 08:15

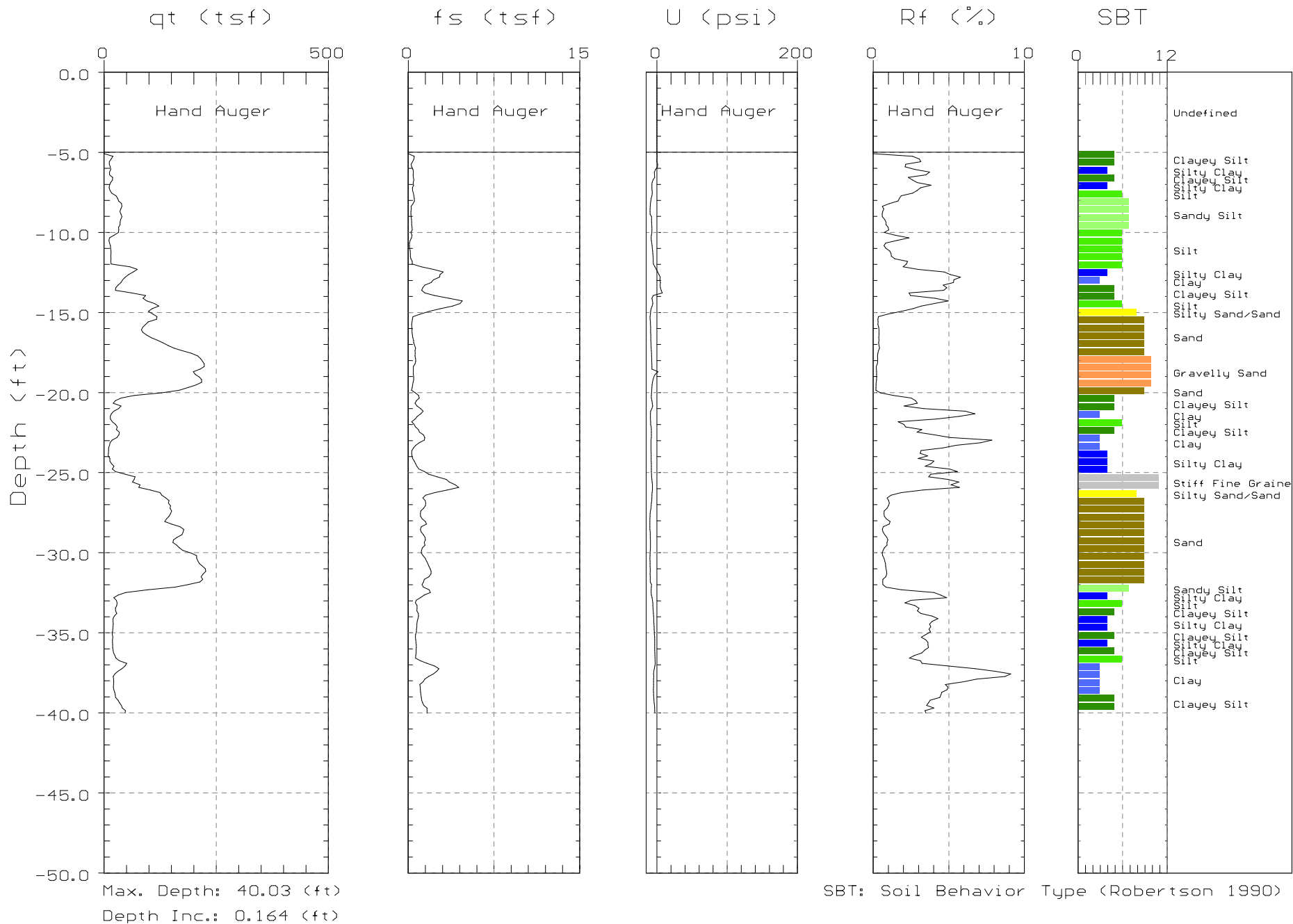




ENGEO

Site: RIVER RUN
Location: CPT-69

Engineer: S.HARRIS
Date: 07:01:05 08:15

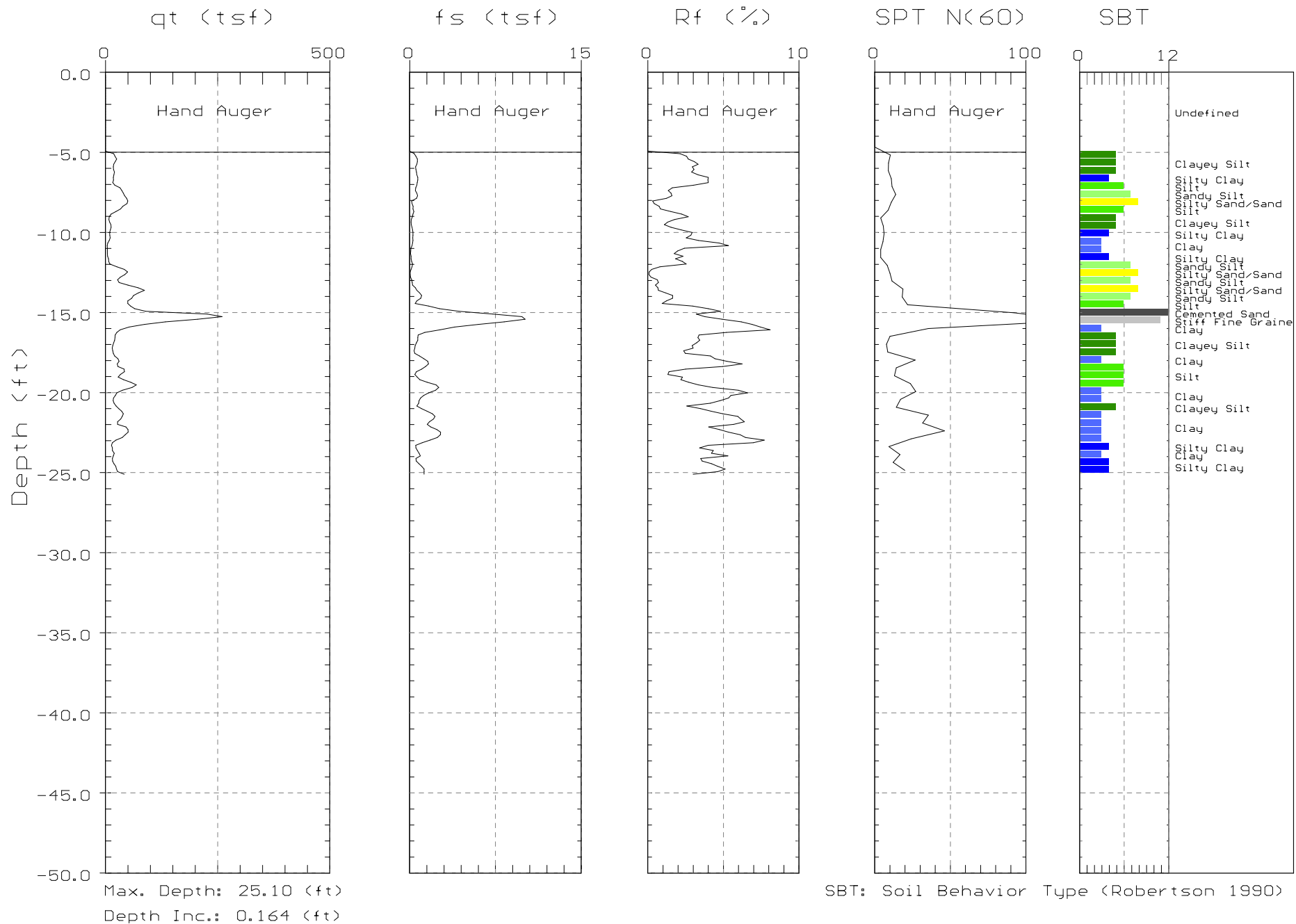




ENGEO

Site: RIVER RUN
Location: CPT-70

Engineer: S.HARRIS
Date: 06:30:05 15:32

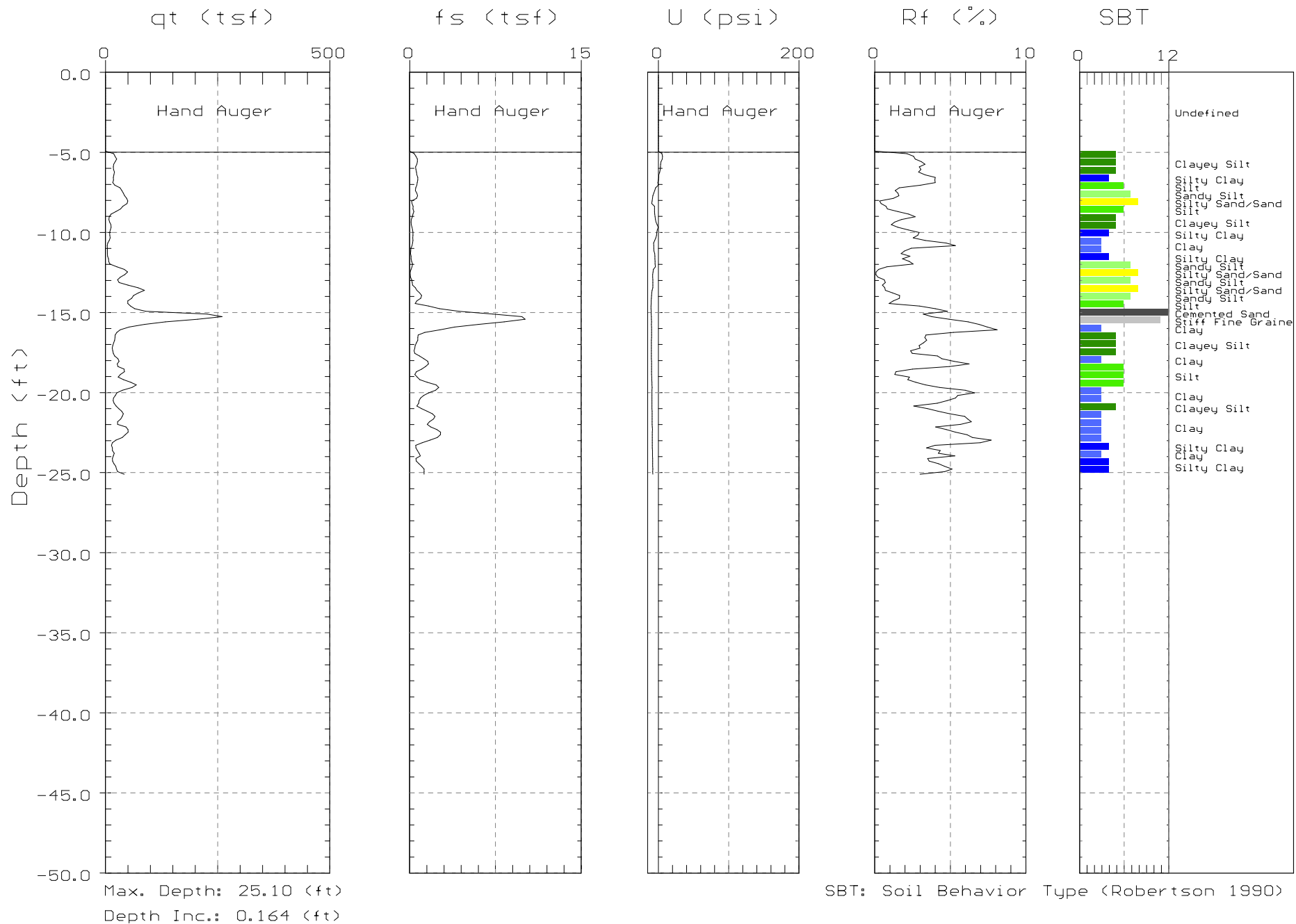




ENGEO

Site: RIVER RUN
Location: CPT-70

Engineer: S.HARRIS
Date: 06:30:05 15:32

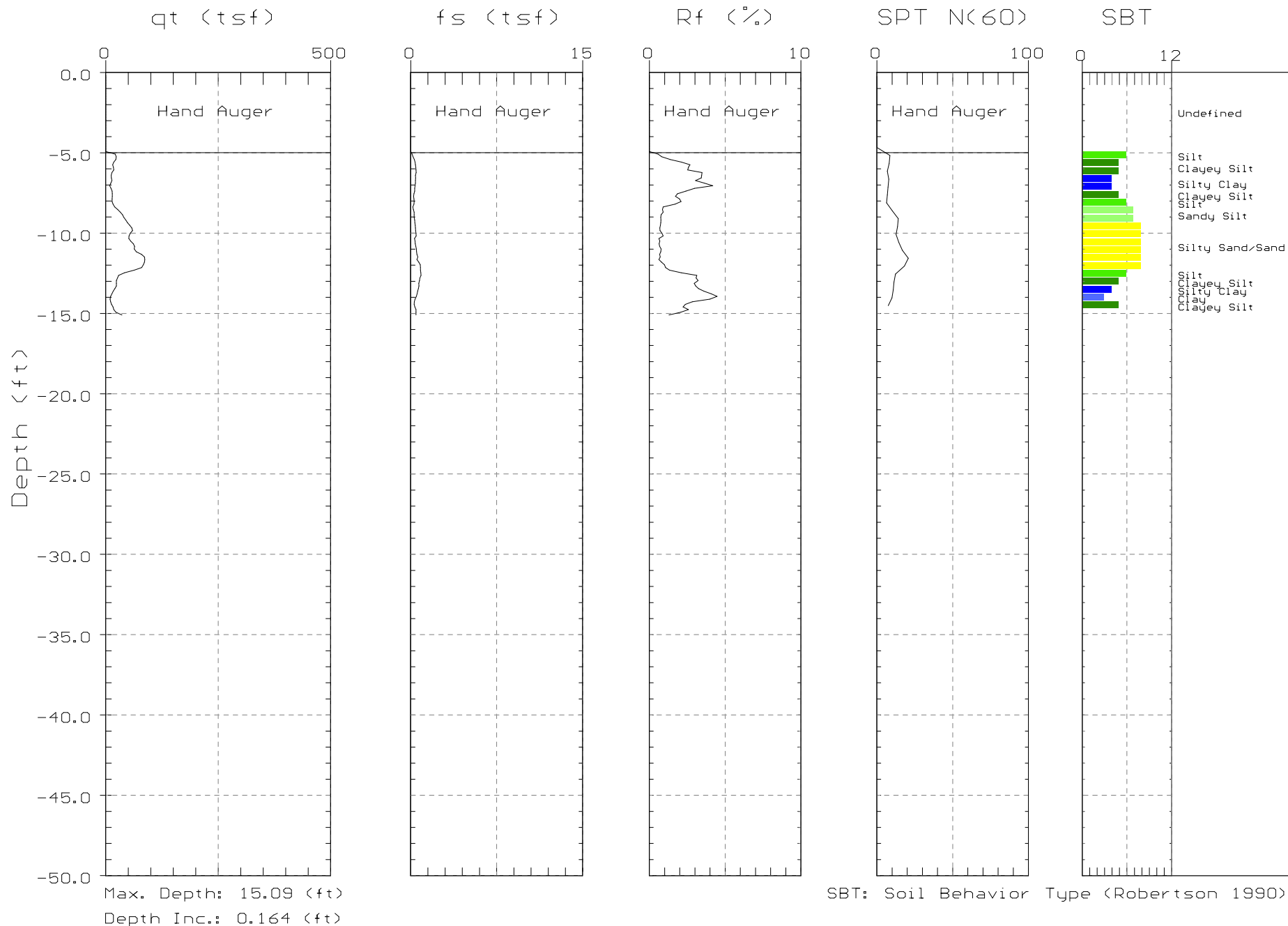


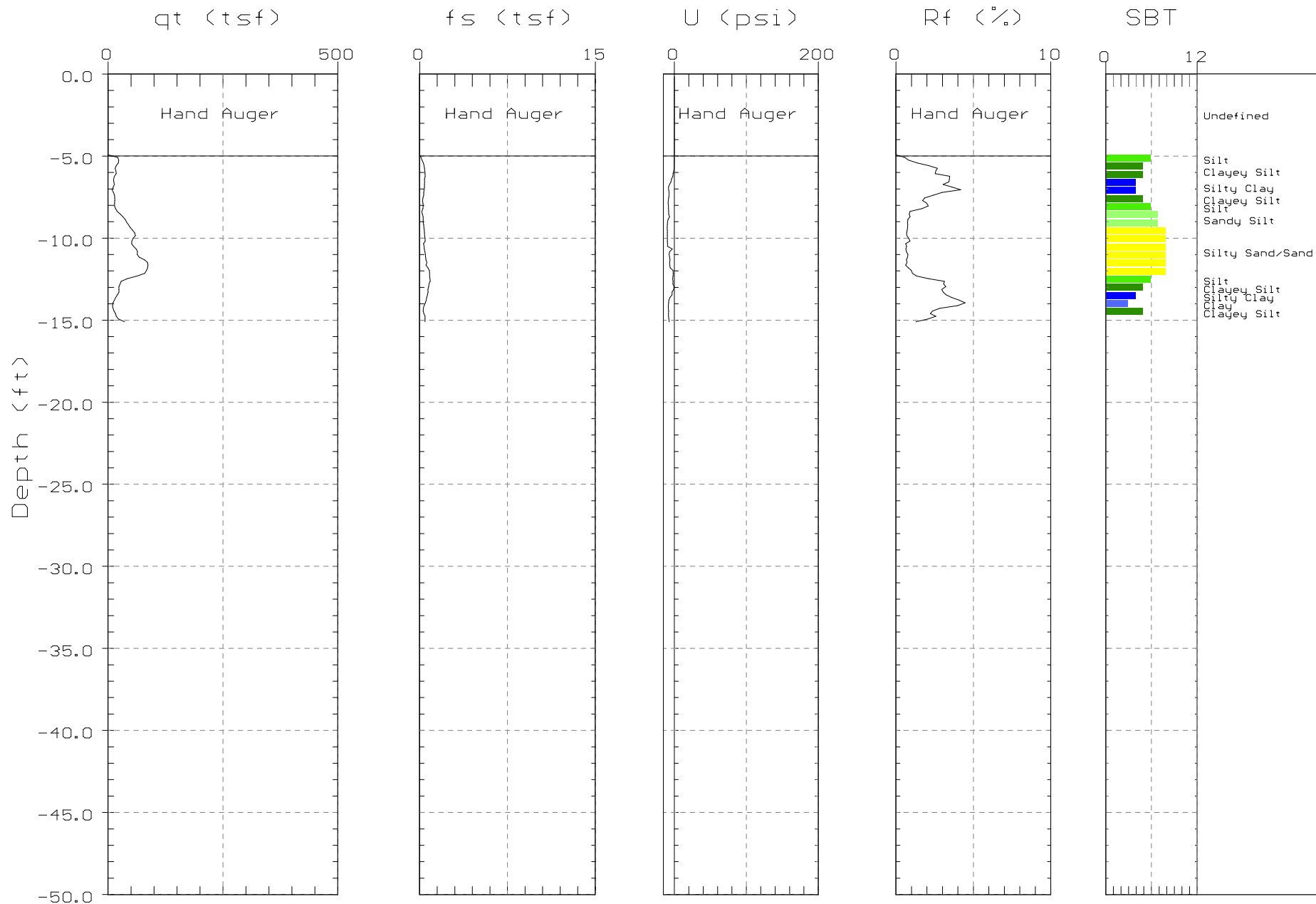


ENGEO

Site: RIVER RUN
Location: CPT-74

Engineer: S.HARRIS
Date: 07:05:05 10:35





Max. Depth: 15.09 (ft)
Depth Inc.: 0.164 (ft)

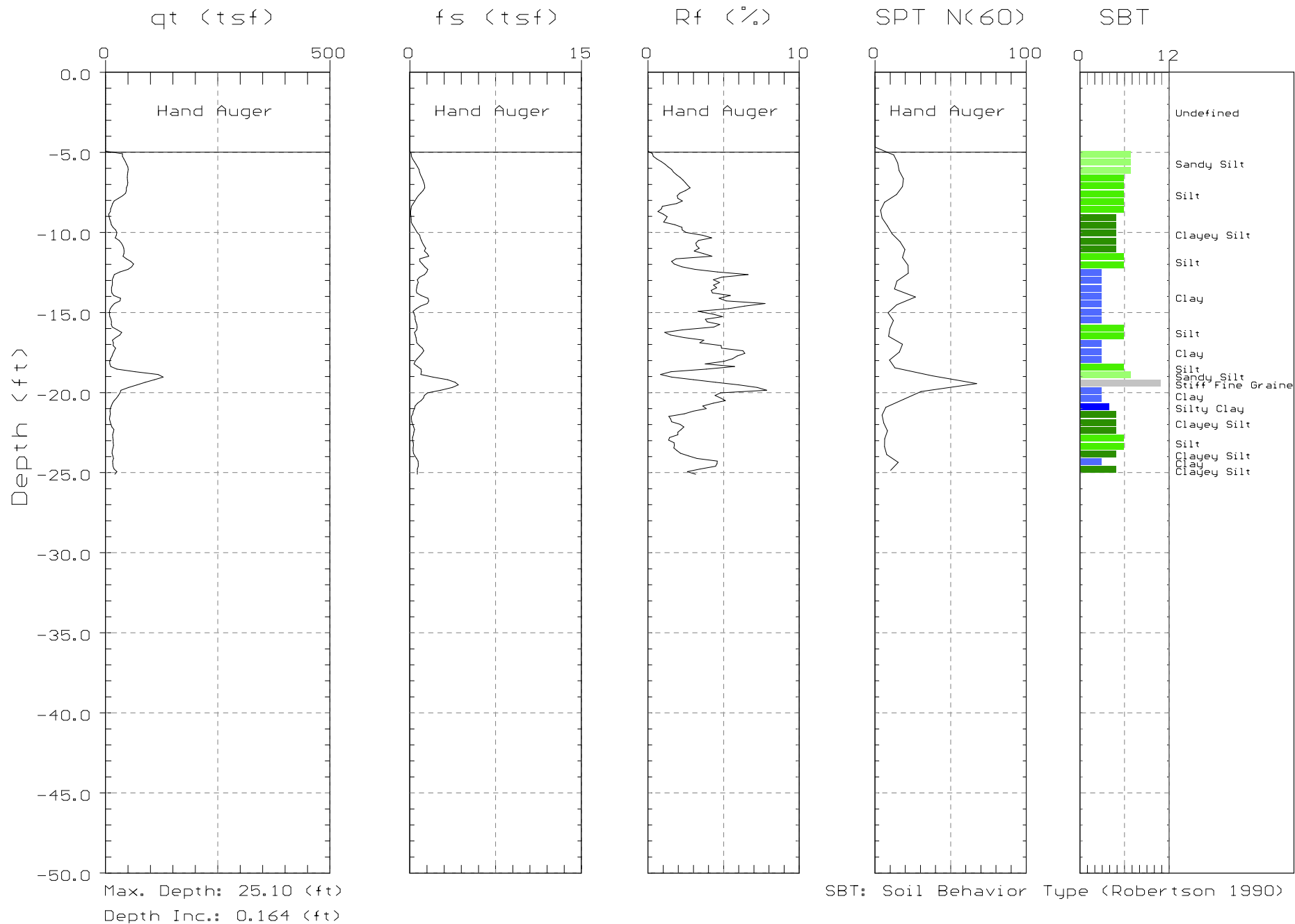
SBT: Soil Behavior Type (Robertson 1990)



ENGEO

Site: RIVER RUN
Location: CPT-75

Engineer: S.HARRIS
Date: 07:05:05 11:07

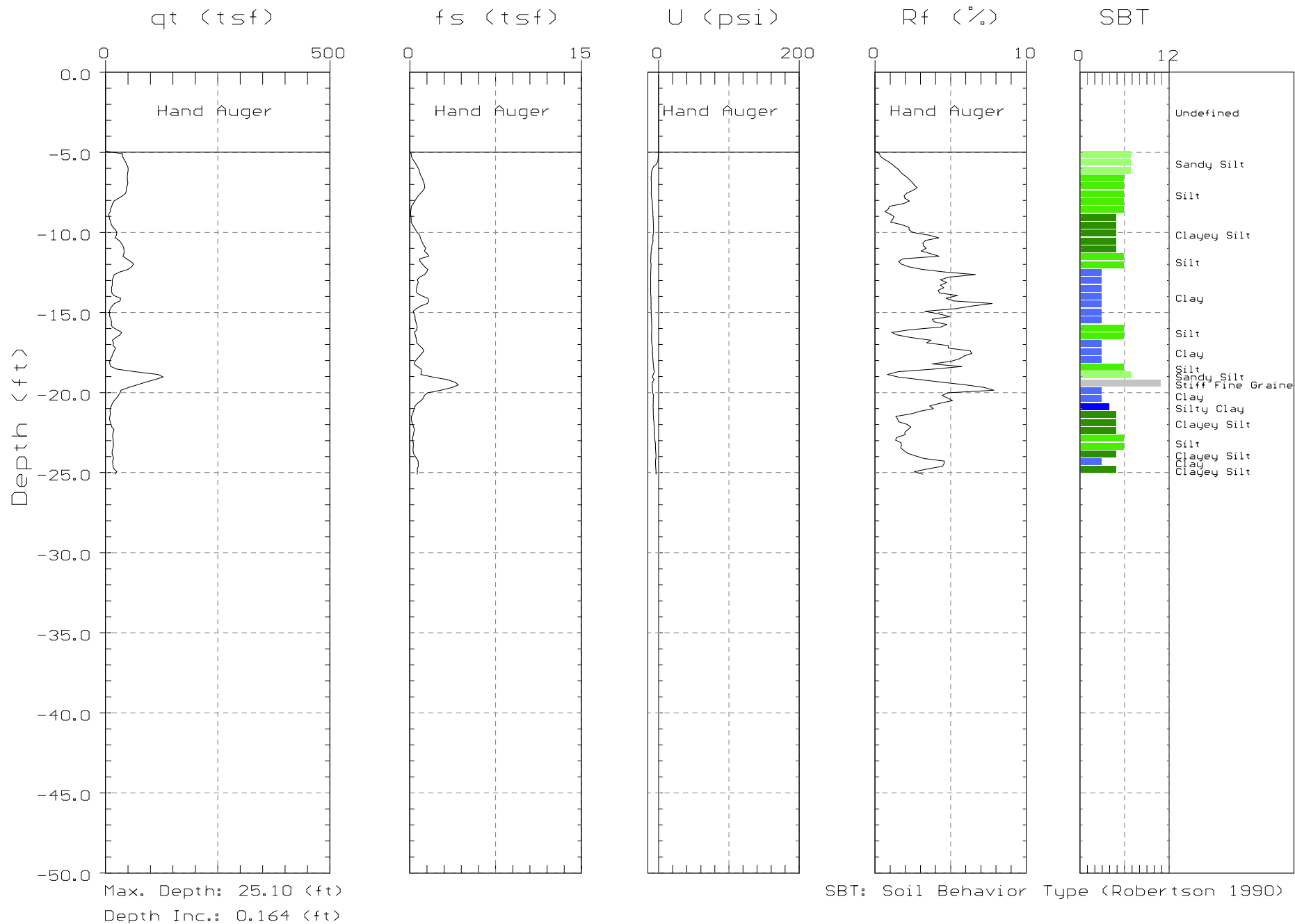




ENGEO

Site: RIVER RUN
Location: CPT-75

Engineer: S.HARRIS
Date: 07:05:05 11:07

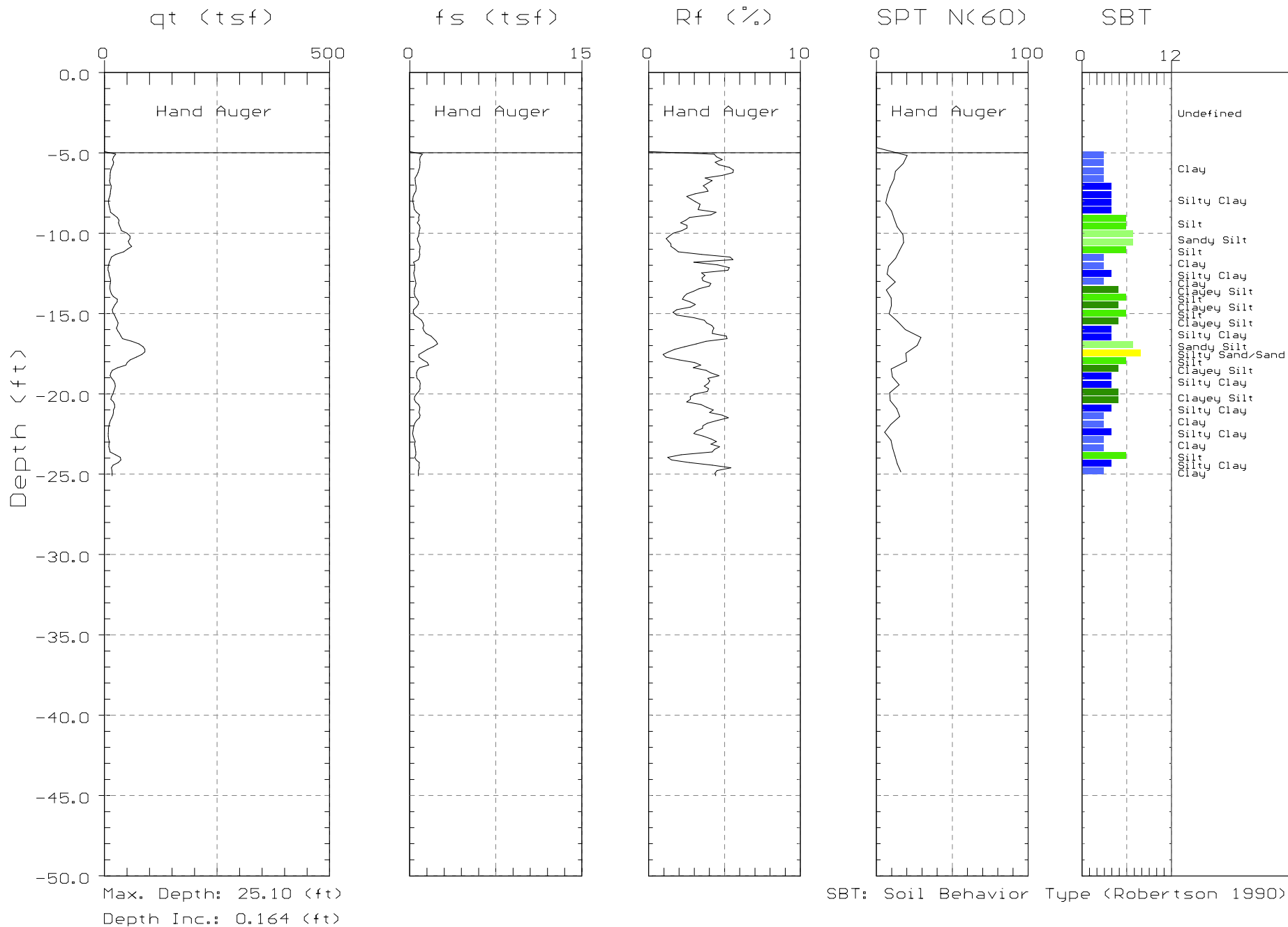




ENGEO

Site: RIVER RUN
Location: CPT-76

Engineer: S.HARRIS
Date: 07:05:05 11:55

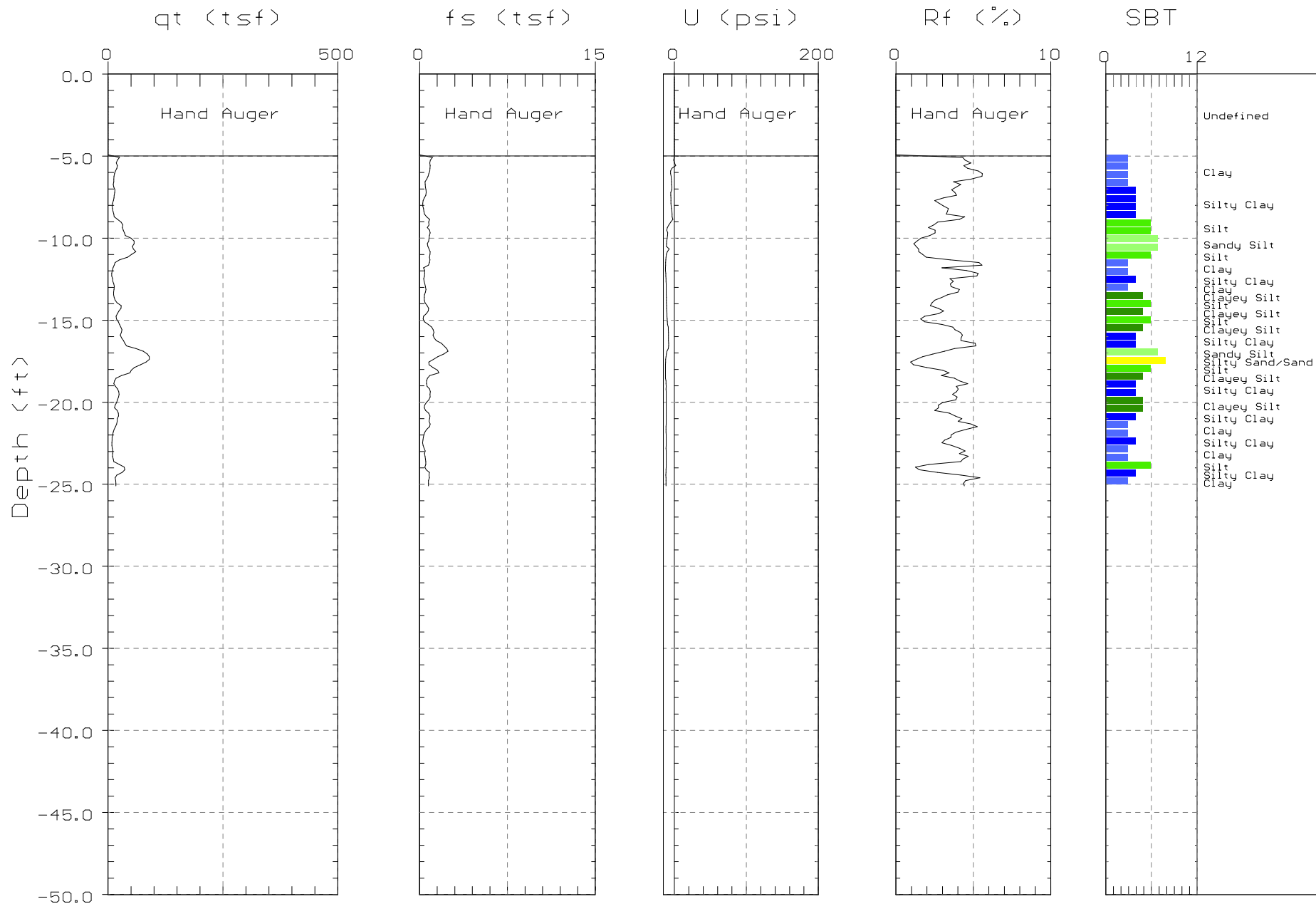




ENGEO

Site: RIVER RUN
Location: CPT-76

Engineer: S.HARRIS
Date: 07:05:05 11:55



Max. Depth: 25.10 (ft)
Depth Inc.: 0.164 (ft)

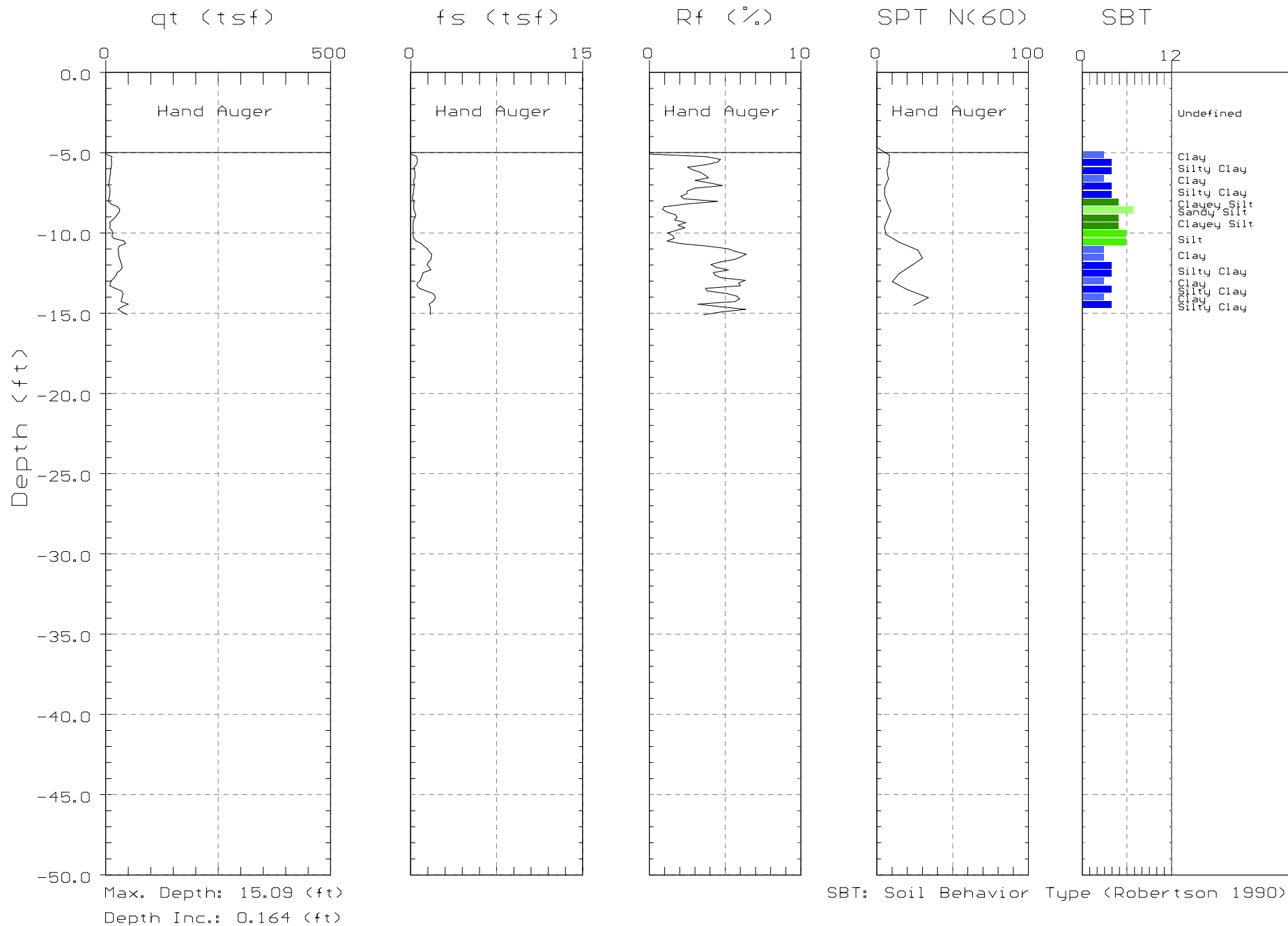
SBT: Soil Behavior Type (Robertson 1990)



ENGEO

Site: RIVER RUN
Location: CPT-77

Engineer: S.HARRIS
Date: 06:30:05 13:17

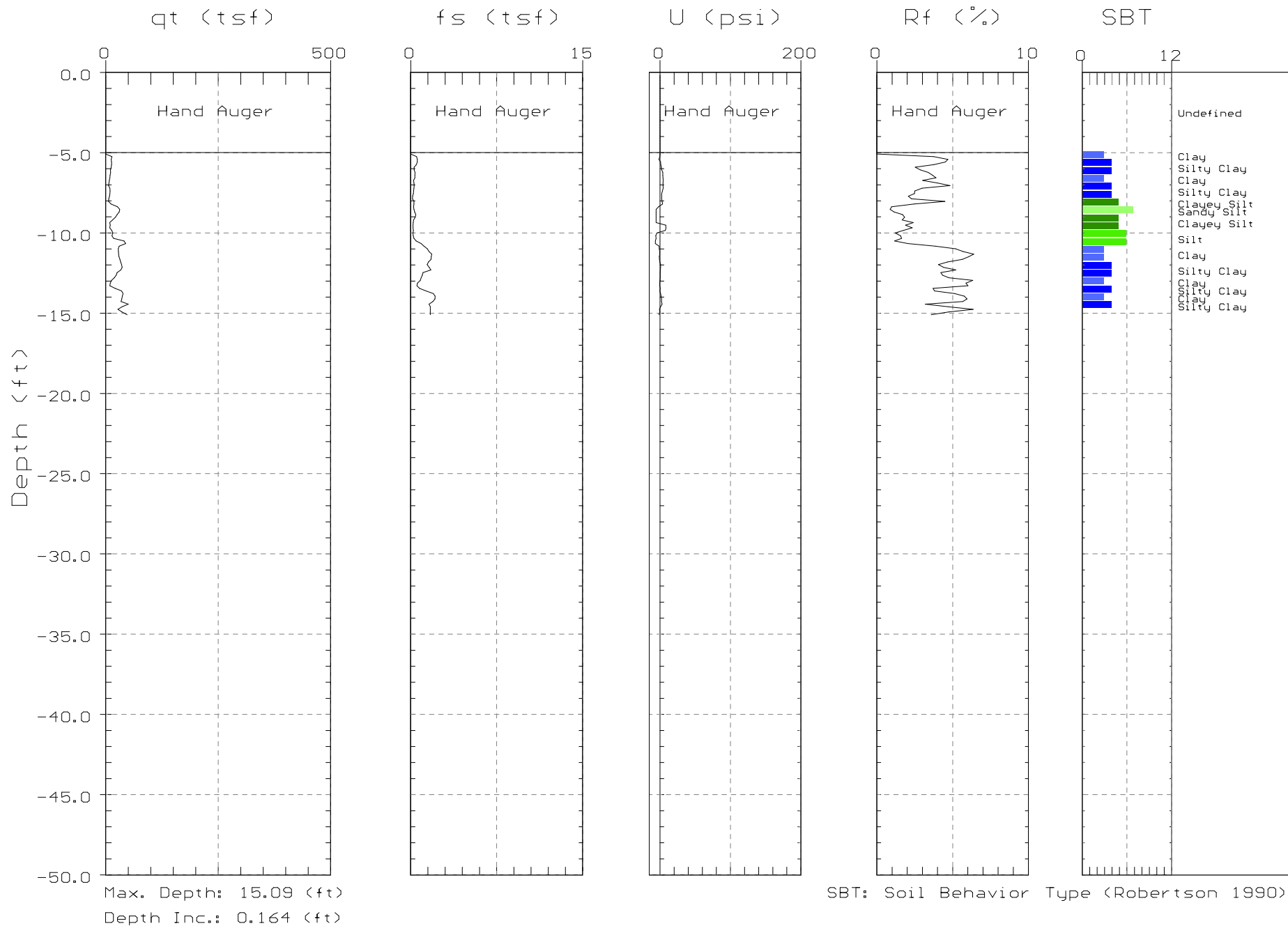




ENGEO

Site: RIVER RUN
Location: CPT-77

Engineer: S.HARRIS
Date: 06:30:05 13:17

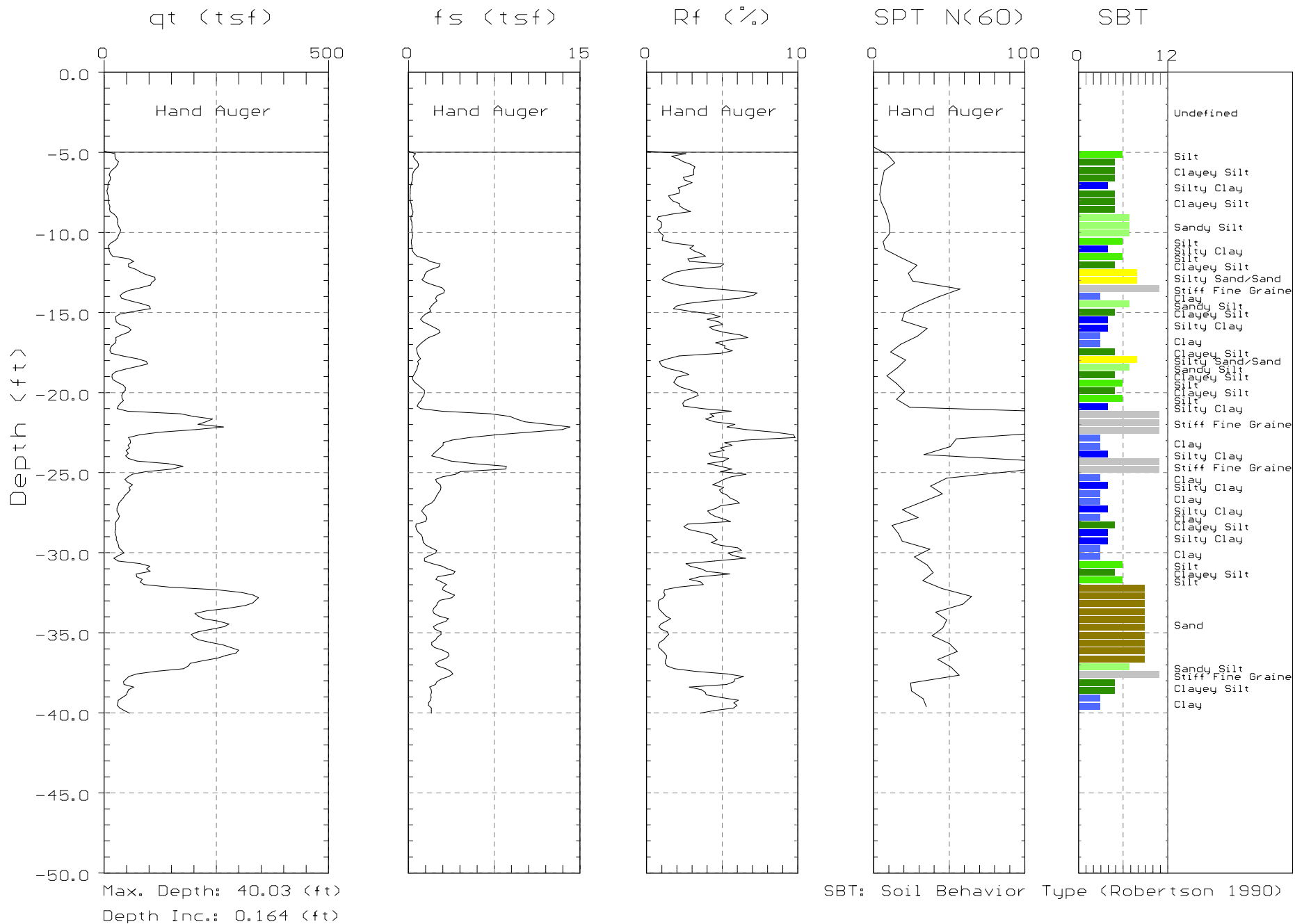




ENGEO

Site: RIVER RUN
Location: CPT-78

Engineer: S.HARRIS
Date: 07:05:05 12:36

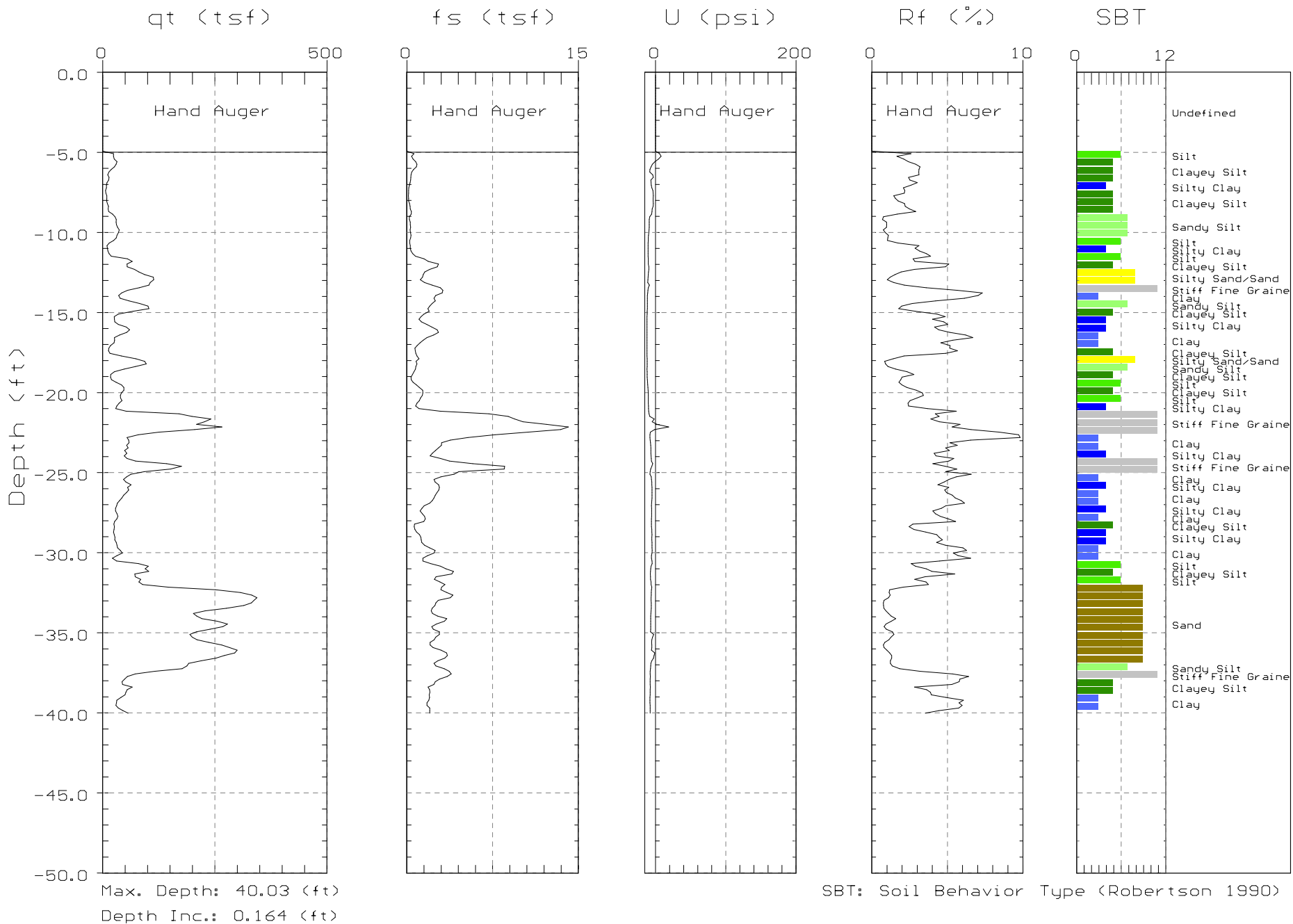




ENGEO

Site: RIVER RUN
Location: CPT-78

Engineer: S.HARRIS
Date: 07:05:05 12:36

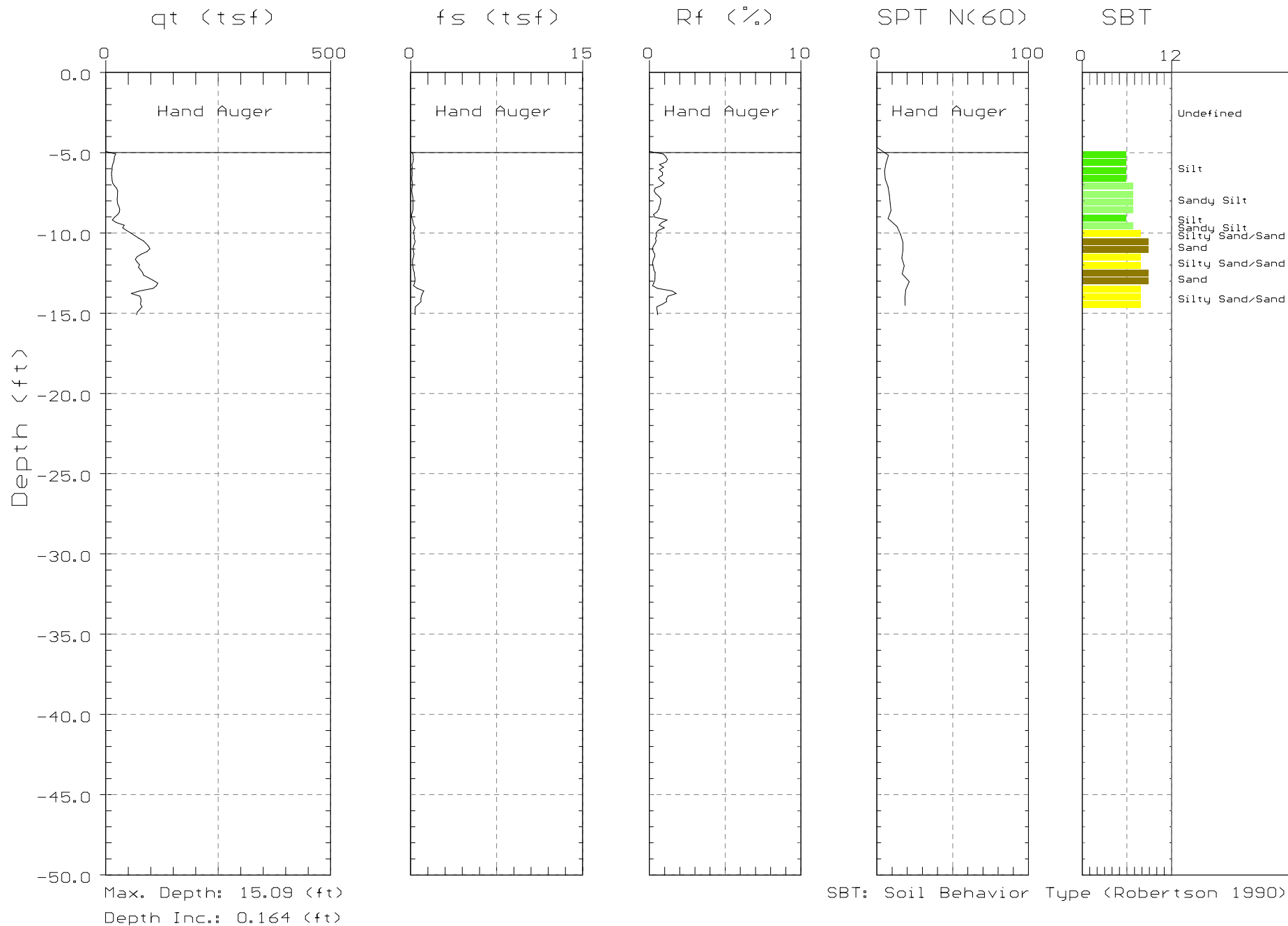


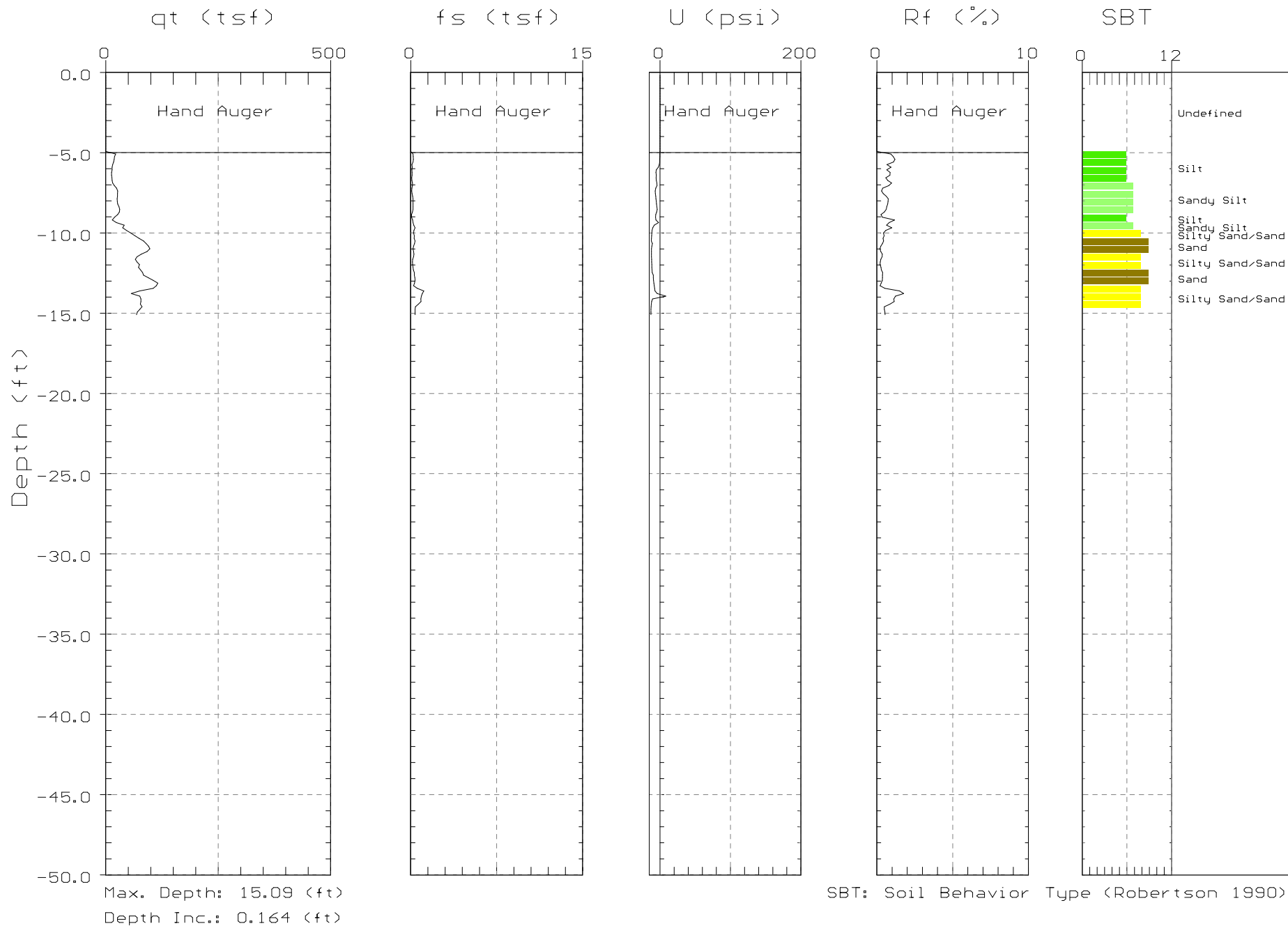


ENGEO

Site: RIVER RUN
Location: CPT-79

Engineer: S.HARRIS
Date: 07:05:05 13:33



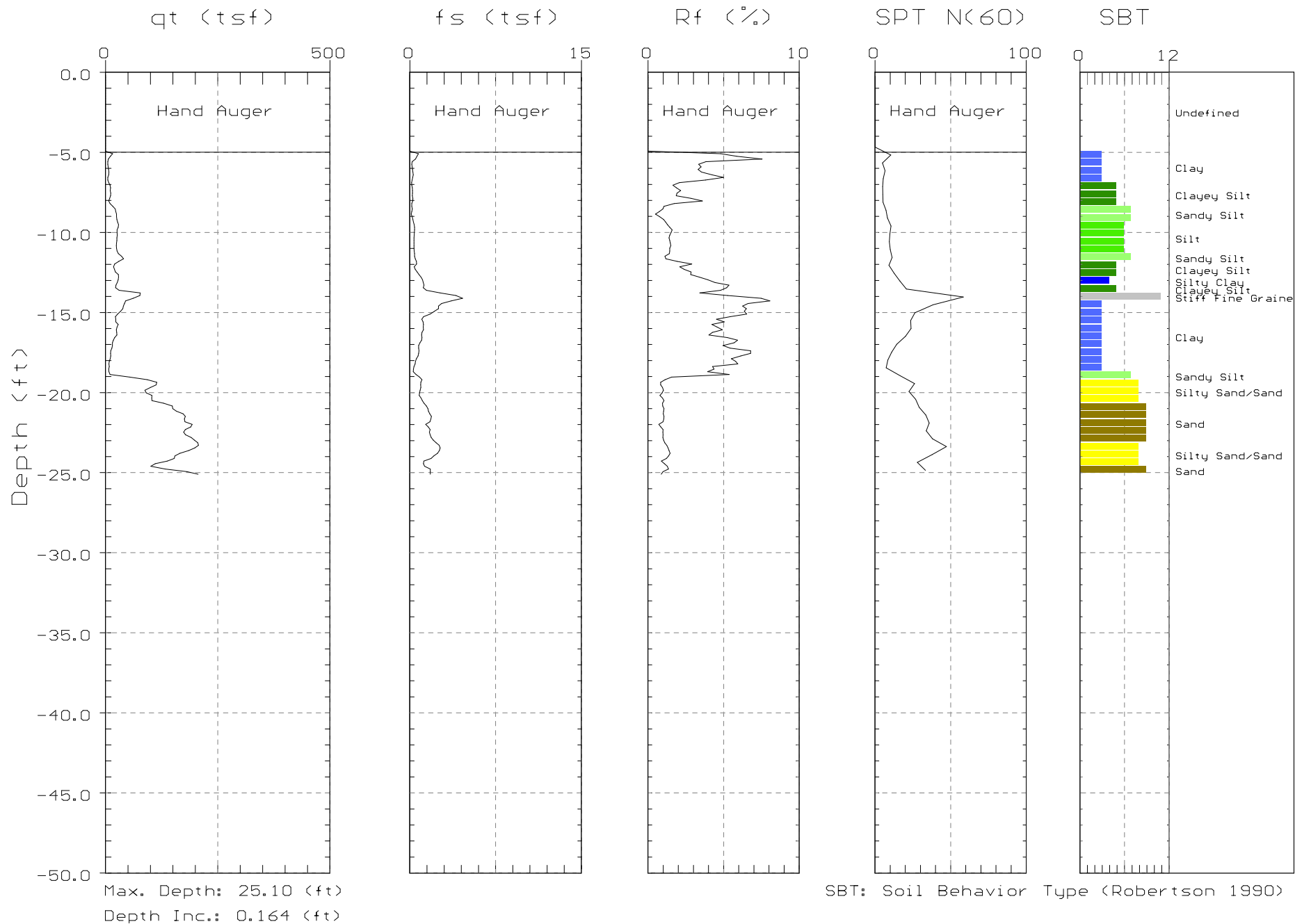




ENGEO

Site: RIVER RUN
Location: CPT-80

Engineer: S.HARRIS
Date: 07:08:05 15:50

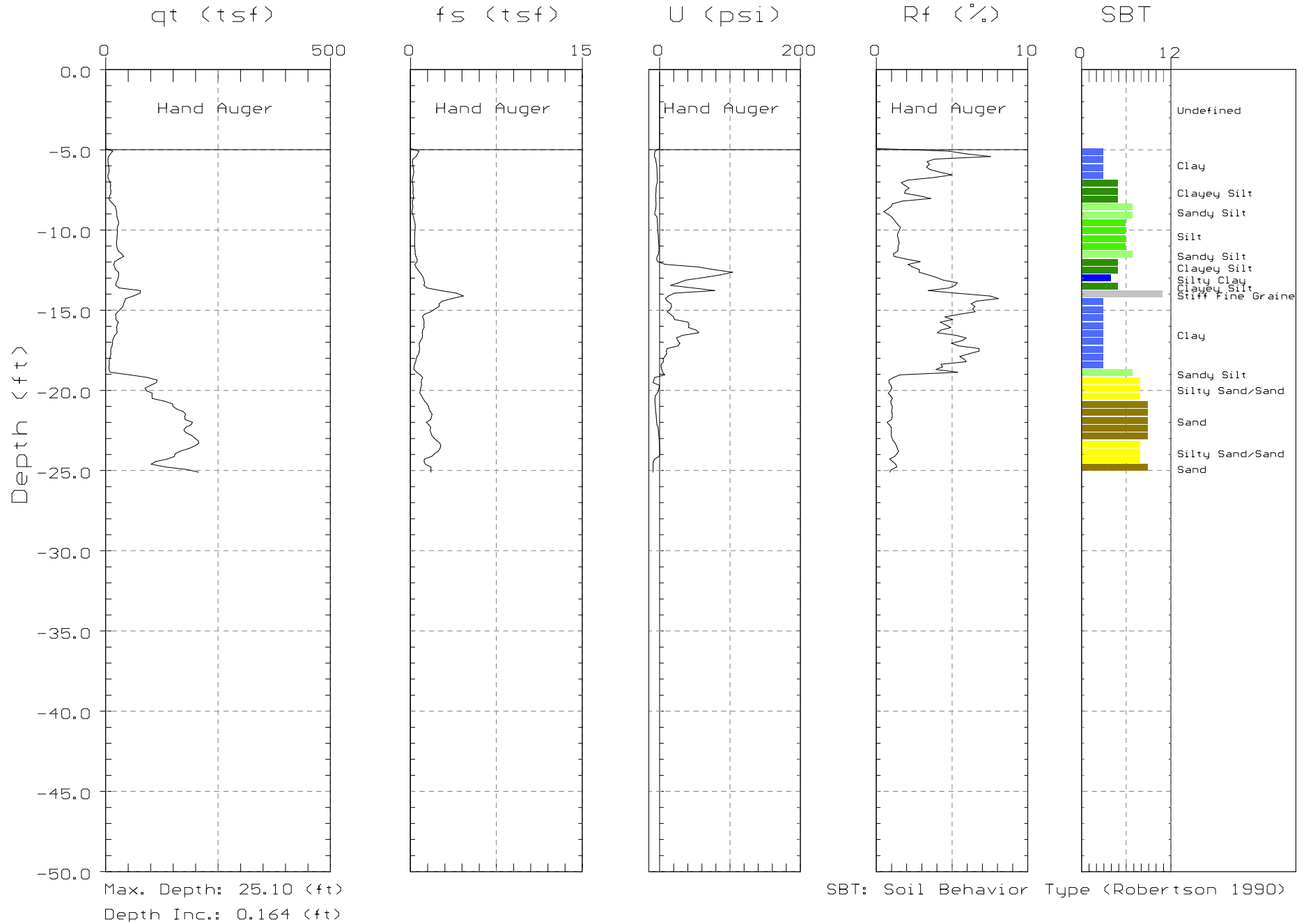




ENGEO

Site: RIVER RUN
Location: CPT-80

Engineer: S.HARRIS
Date: 07:08:05 15:50

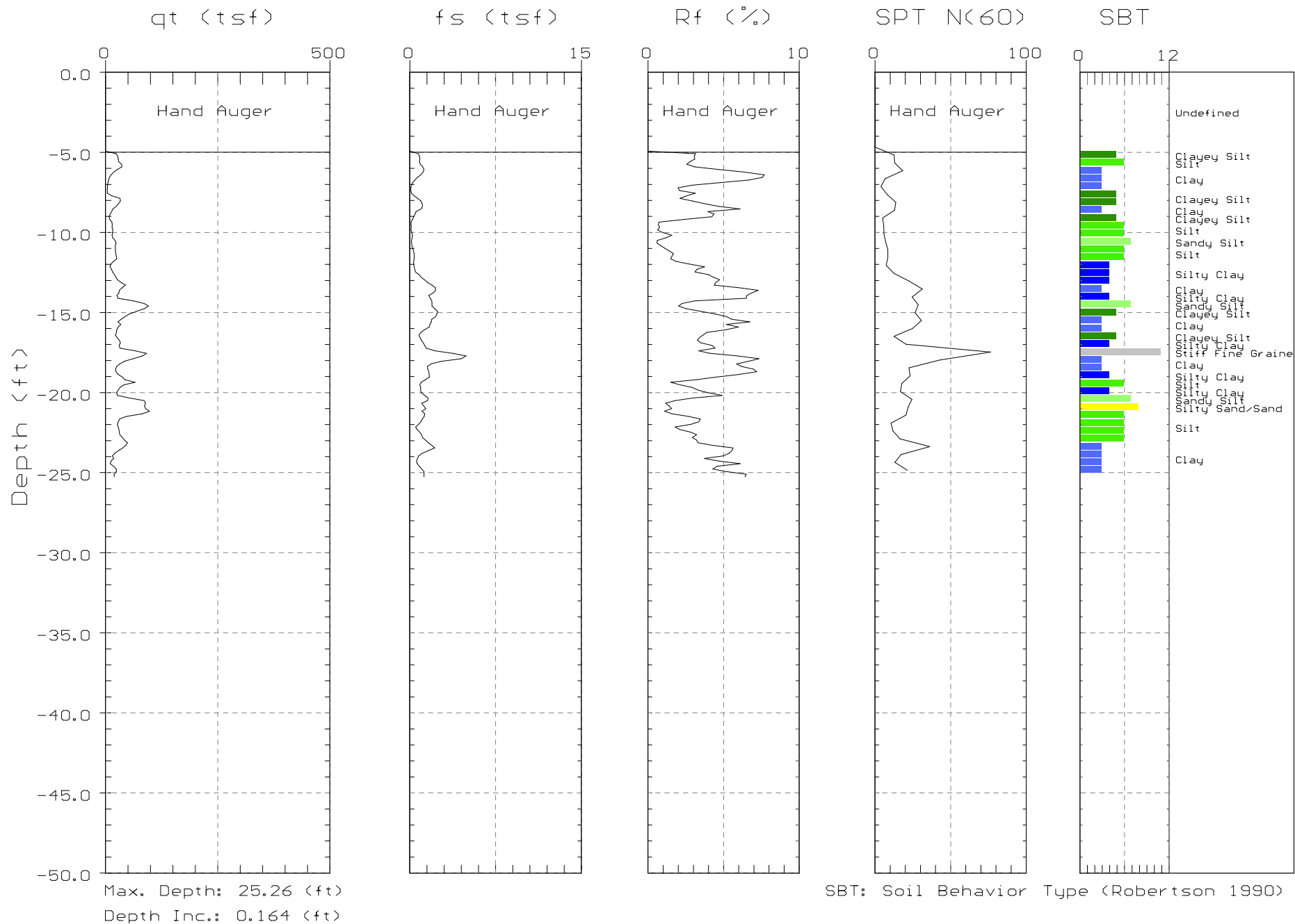




ENGEEO

Site: RIVER RUN
Location: CPT-81

Engineer: S.HARRIS
Date: 07:08:05 16:25

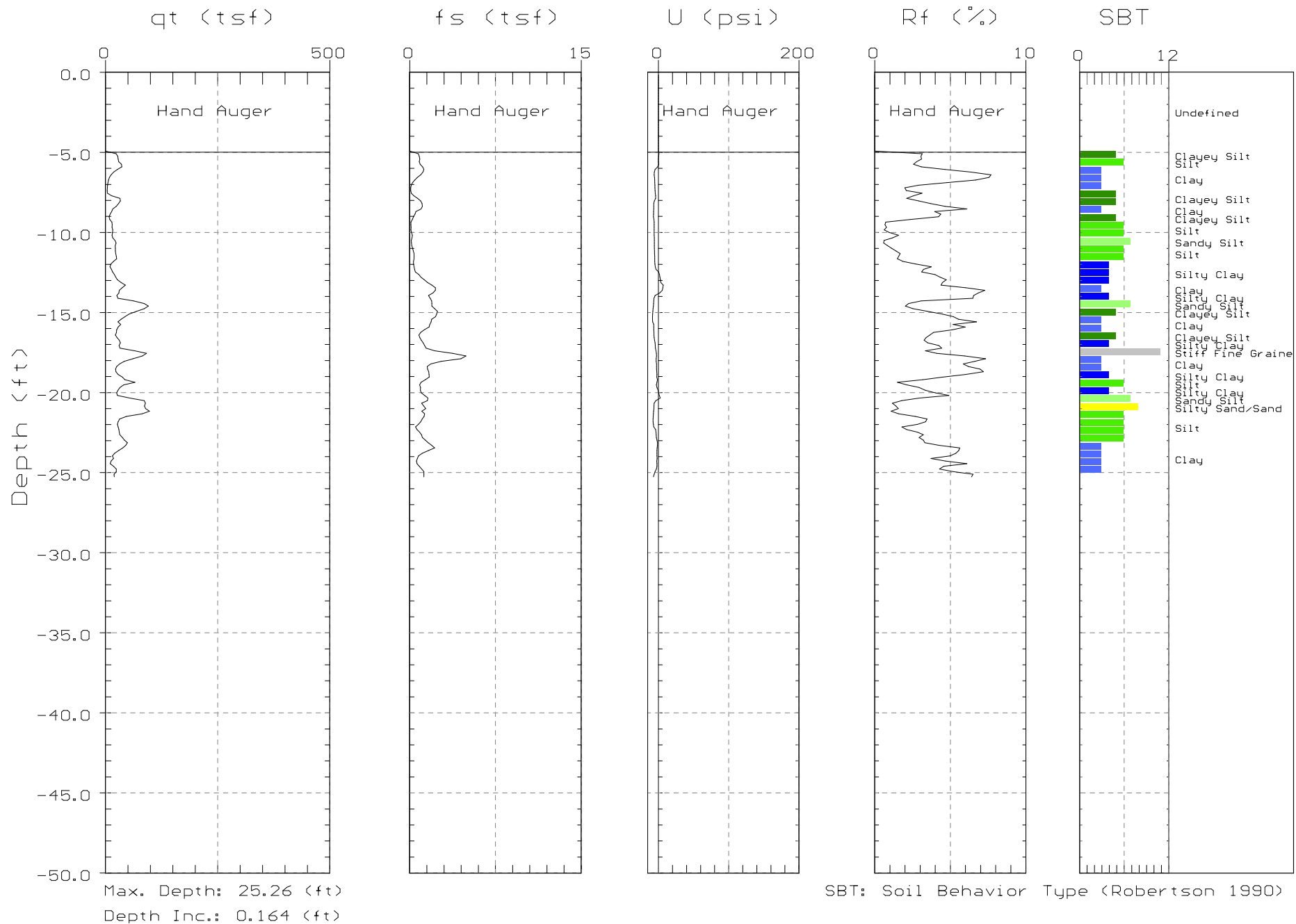




ENGEO

Site: RIVER RUN
Location: CPT-81

Engineer: S.HARRIS
Date: 07:08:05 16:25

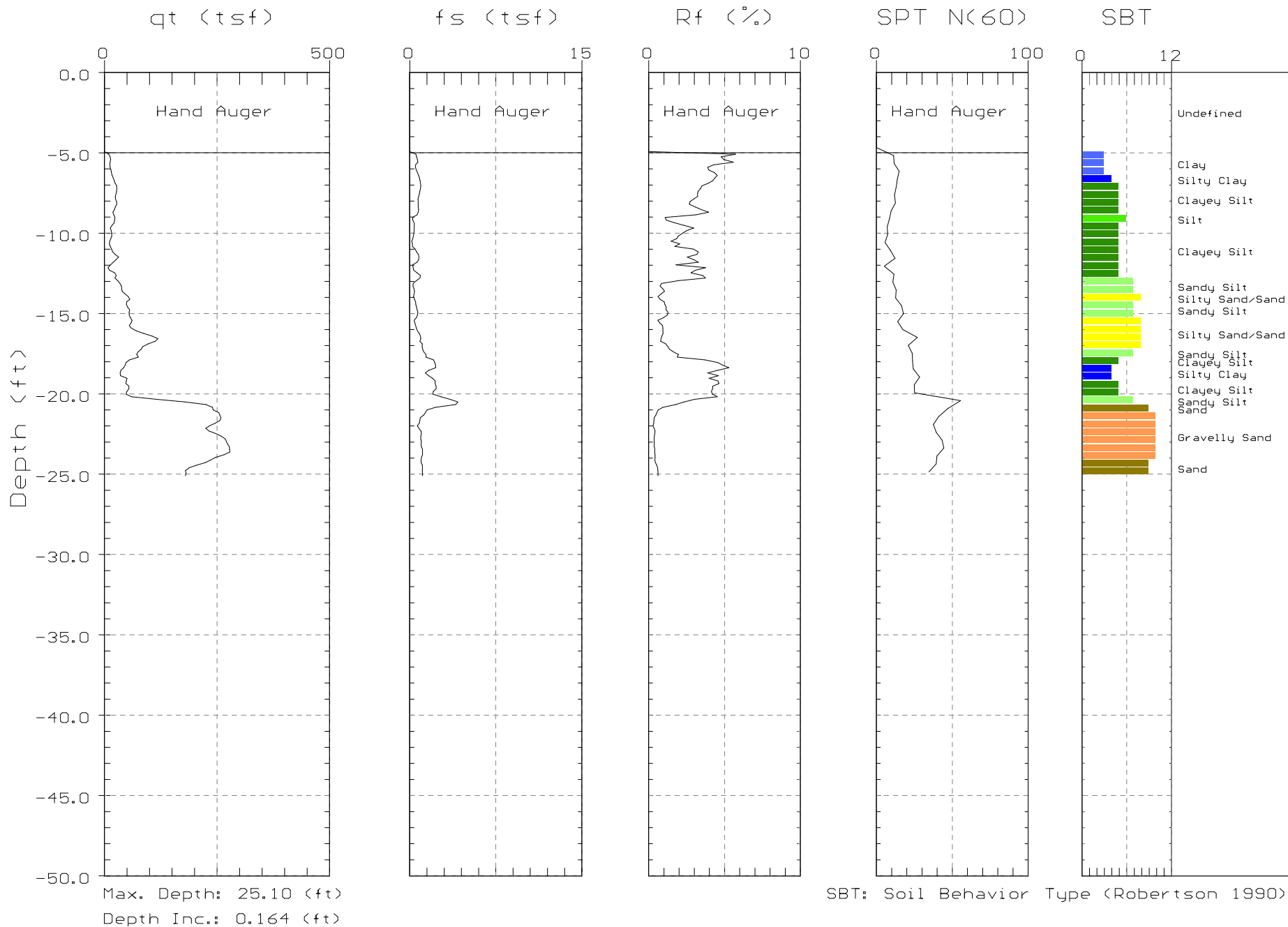




ENGEO

Site: RIVER RUN
Location: CPT-82

Engineer: S.HARRIS
Date: 07:08:05 14:49

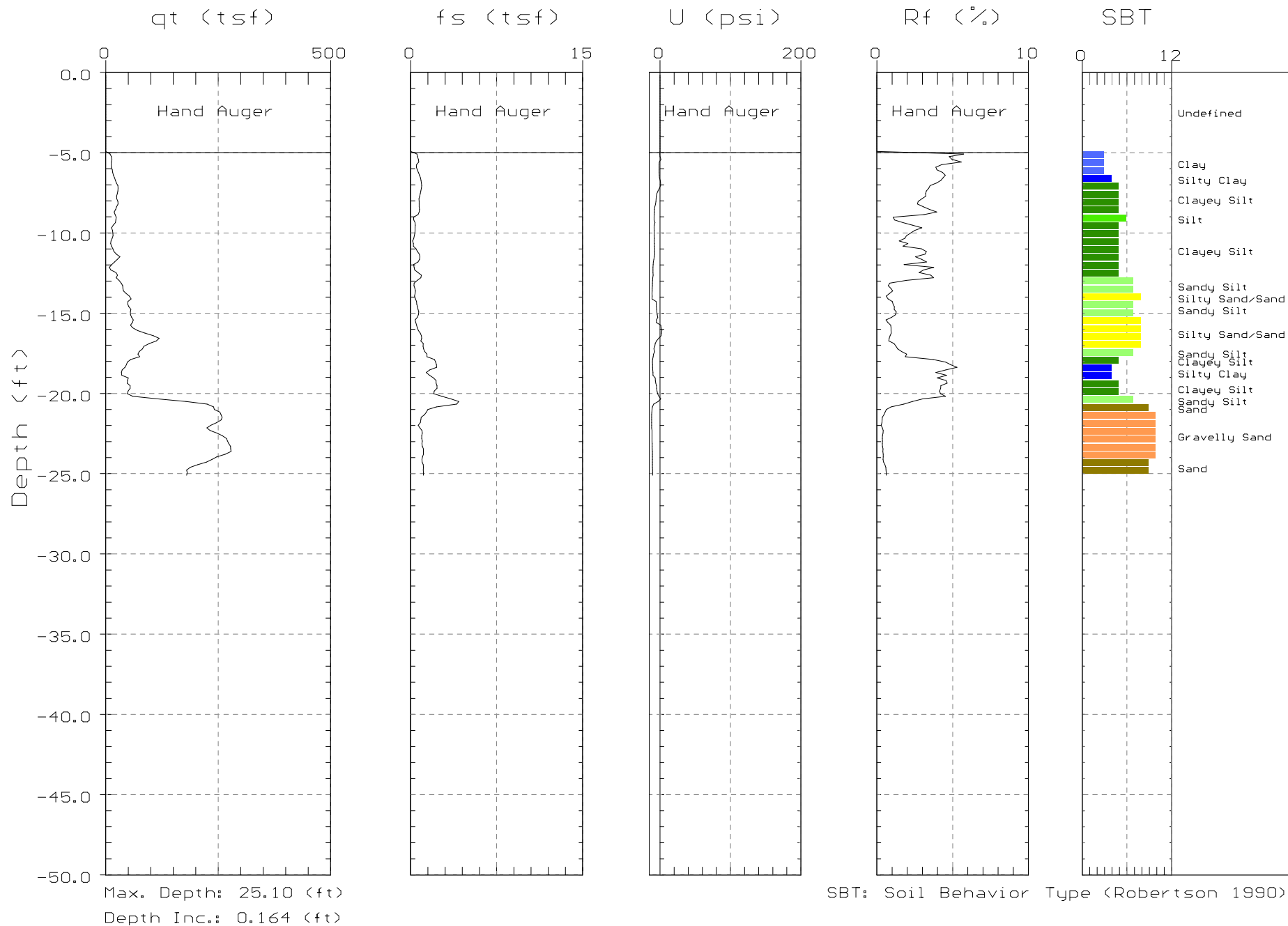




ENGEO

Site: RIVER RUN
Location: CPT-82

Engineer: S.HARRIS
Date: 07:08:05 14:49



FIELD EXPLORATION LOGS

LAND PARK



LOG OF BORING 1-B1

GEOTECHNICAL EXPLORATION
LAND PARK - WATER TANK SITE
LATHROP, CALIFORNIA
5747.4.101.01

DATE DRILLED: April 21, 2006
HOLE DEPTH (FT): 21 1/2 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 9 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: PDI
DRILLING METHOD: Solid Flight
HAMMER TYPE: 140 Lb. w/ 30 In. Drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx	
0	0		SILTY CLAY (CL/CH), dark grayish brown, medium stiff, moist, trace sand.							
0.5	0.15		SILTY CLAY (CL), grayish brown, medium stiff, moist to saturated, with fine-grained sand.			11	24.2	97		
1	0.3				▼	6				
5	1.5		SILTY SAND (SM), grayish olive brown, loose, saturated, fine-grained sand, with clay.		▽	5				
2	0.6					3				
10	3.0		SANDY SILT (ML), olive brown and reddish brown mottled, stiff, saturated, with clay.			21	26.4	100	*0.5	
4	1.2		SILTY CLAY (CL), olive brown, stiff to very stiff, saturated.							
15	4.5		SILTY SAND (SM), grayish brown, medium dense, saturated, fine to medium-grained sand.			25	24.3	103	*3.5	
20	6.0		SILTY CLAY (CL), grayish brown, hard, saturated.			66	25.5	100	*4.5	
7	2.1		Bottom of boring at approximately 21 1/2 feet.							
			Groundwater encountered at 5 feet during drilling.							
			Stabilized groundwater measured at 3 feet.							
25	7.6									
8	2.4									
30	9.1									

LOG OF BORING 1-B2

GEOTECHNICAL EXPLORATION
LAND PARK - WATER TANK SITE
LATHROP, CALIFORNIA
5747.4.101.01

DATE DRILLED: April 21, 2006
HOLE DEPTH (FT): 26 1/2 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 9 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: PDI
DRILLING METHOD: Solid Flight
HAMMER TYPE: 140 Lb. w/ 30 In. Drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY CLAY (CL/CH), dark grayish brown, medium stiff, moist, trace sand.						
1	1		SILTY CLAY (CL), dark grayish brown, medium stiff, moist to saturated, fine-grained sand, with clay, trace organics.			10			
5	5		SANDY SILT (ML), olive brown, medium stiff, wet to saturated, fine-grained sand, with clay.			6			
2	2		SILTY CLAY (CL), grayish brown, stiff to very stiff, saturated.			11			
10	3		SILTY CLAY (CL), grayish brown, stiff to very stiff, saturated.			42			*2.25
15	4		SANDY CLAY (CL), olive gray, stiff, saturated, fine to medium-grained sand, with silt.			22			*3.0
20	6		SILTY SAND (SM), brown, medium dense, saturated, fine to medium-grained sand.						
25	7		SILTY CLAY (CL), grayish brown, very stiff, saturated.						
8	8					32			
			Bottom of boring at approximately 26 1/2 feet.						
			Groundwater encountered at 5 1/2 feet during drilling.						
			Stabilized groundwater measured at 4 feet.						
30	9								

LOG OF BORING 1-B3

GEOTECHNICAL EXPLORATION
LAND PARK - WATER TANK SITE
LATHROP, CALIFORNIA
5747.4.101.01

DATE DRILLED: April 21, 2006
HOLE DEPTH (FT): 16 1/2 ft.
HOLE DIAMETER: 6.0 in.
SURF ELEV (FT-MSL): 9 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: PDI
DRILLING METHOD: Solid Flight
HAMMER TYPE: 140 Lb. w/ 30 In. Drop

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY CLAY (CL/CH), dark grayish brown, medium stiff, moist, trace sand.						
1	1		SILTY SAND (SM), brown, loose, moist to saturated, fine to medium-grained sand, with clay.						
5	5		SILTY CLAY (CL), grayish brown, stiff, saturated, trace sand.			9			
2	2		SILTY CLAY (CL), grayish brown, stiff, saturated, with fine-grained sand.			14			
10	10					27			*2.5
15	15		CLAYEY SILT to SILTY CLAY (ML/CL), olive brown and grayish brown, stiff, saturated.			25			*4.5
<p>Bottom of boring at approximately 16 1/2 feet.</p> <p>Groundwater encountered at 4 feet during drilling.</p> <p>Stabilized groundwater measured at 2 1/2 feet.</p>									

FIELD EXPLORATION LOGS

BRADSHAW'S CROSSING



LOG OF BORING B-A3

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.5.001.01

DATE DRILLED: February 8, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY SAND (SM), with clay, olive brown, loose, moist, medium to fine-grained sand, trace gravel.						
			49.8% Passing #200			5	13.4		
1			SILTY SAND (SM), olive brown, loose, moist, fine-grained sand, some clay.			4	12.6		
5			44.7% Passing #200			7	14.4		
			47% Passing #200						
2			SILTY CLAY (CL), with sand, grayish olive brown, stiff, moist, fine-grained sand.						
			SILTY SAND (SM), grayish olive brown, loose to medium dense, moist, fine-grained sand.						
10	3		25.7% Passing #200			9	8.5		
			SAND (SW), yellowish brown, loose, moist, medium to fine-grained sand.						
15	5		SILTY CLAY-CLAYEY SILT (CL-ML), olive brown, medium stiff, moist, some fine-grained sand.			6	19.4		
			61.1% Passing #200						
			SILTY CLAY (CL), poorly graded gravel, olive brown and reddish brown mottled, stiff, moist, with fine-grained sand.						
20	6		55.4% Passing #200 23.3% Passing #200			16	20.5 19.0		*1.5 *2.0
25	8		PI = 6 CLAY (CL) with silt, light gray, hard, saturated.			52			*4.5+
			SILTY CLAY (CL), gray and reddish brown, very stiff, saturated, trace fine-grained sand.						
30	9								

LOG OF BORING B-A3

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.5.001.01

DATE DRILLED: February 8, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30						37	29.9	94.9	2.93
			Grades to SILTY SAND						
10			SILTY SAND (SM), olive brown, medium dense, saturated, fine-grained sand.						
35						27	30.7		
			Grades to SAND						
12			SAND (SW), olive gray, dense to very dense, saturated, medium to fine-grained sand, trace silt.						
40			5.4% Passing #200			54			
13									
45			4.7% Passing #200			33			
14									
15			SAND (SW), gray, saturated, medium to fine-grained sand, trace silt.						
50			6.6% Passing #200			58			
16									
55									
17									
18									
60									

LOG OF BORING B-A3

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.5.001.01

DATE DRILLED: February 8, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
60									
19			Some gravel						
65			SILTY CLAY (CL), hard, saturated.			74	21.9		
20									
21			SAND (SW), gray, dense, saturated, medium to fine-grained sand, trace silt.						
70									
22						41	24.5		
75			SILTY CLAY (CL), olive gray and brown, very stiff to hard, saturated.						
23									
24									
80									
25						42			2.29
26									
85									
27			CLAYEY SILT (ML), olive brown, very stiff, saturated, trace fine-grained sand.						
90									

LOG OF BORING B-A3

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.5.001.01

DATE DRILLED: February 8, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
90									
28						16	29.3		
95			SAND (SW), gray, very dense, saturated, medium to fine-grained sand, trace silt.						
29									
30									
100						78	22.2		
31									
105									
32									
33									
110									
34			8.4% Passing #200			83	18.8		
115			SILT (ML), olive gray, hard, saturated, trace clay, trace fine-grained sand.						
35									
36									
120									



LOG OF BORING B-A3

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.5.001.01

DATE DRILLED: February 8, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
120									
37									
125			SANDY SILT to SILTY SAND (ML-SM), olive gray, hard / very dense, saturated, fine-grained sand, trace clay.			50/4"	30.2		
39									
130									
40			Grades to SAND			63	33.7		
41			SAND (SW), olive gray, very dense, saturated, medium to fine-grained sand, trace silt.						
135									
42									
140									
43						50/6"	25.5		
44									
145									
45									
150									



LOG OF BORING B-A3

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.5.001.01

DATE DRILLED: February 8, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
150	46					50/5"	23.7		
155	47								
160	49					50/6"	27.1		
<p>Bottom of boring at approximately 161 feet.</p> <p>Groundwater encountered at 23 feet during drilling.</p>									
165	50								
170	52								
175	53								
180	54								

LOG OF BORING B-A4

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.4.014.01

DATE DRILLED: February 9, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SILTY SAND (SM), with clay, grayish olive brown, loose to medium dense, moist, fine-grained sand.						
1			44.2% Passing #200			25			*3.0
5			52.7% Passing #200						
2			SANDY SILTY CLAY (CL), grayish brown, stiff, moist, fine-grained sand.			18			*4.5
10			CLAYEY SILT to SILTY CLAY (ML-CL), with sand, olive brown and brown, stiff, moist, fine-grained sand.						
3			62.3% Passing # 200 65.8% Passing #200			16			*2.75 *3.0
15			SILTY SAND (SM), dark brown, medium dense to dense, moist, medium to fine-grained sand, some clay.						
5			35.7% Passing #200			59			
20			SILTY SAND (SM), grayish olive brown, loose to medium dense, moist, medium to fine-grained sand, trace clay.						
6			31.5% Passing #200			17			
7			SILTY CLAY (CL), olive gray, very stiff, moist to saturated.						
25			PI = 10						
8						24			
9			CLAYEY SILT (ML), olive gray and reddish brown, very stiff to hard, saturated.						

LOG OF BORING B-A4

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.4.014.01

DATE DRILLED: February 9, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
30						44			*4.5+
			Grades to SILTY SAND						
10			SILTY SAND (SM), yellowish olive brown, dense, saturated, fine-grained sand.						
35			10.4% Passing #200			32	26.4		
			Grades to SAND						
12			SAND (SW), olive gray, dense, saturated, medium to fine-grained sand, some silt.						
40			4.0% Passing #200			38	22.4		
13									
45			Trace silt			34	20.9		
			3.9% Passing #200						
15			SAND (SW), gray, very dense, saturated, medium to fine-grained sand.						
50						56	21.3		
16									
55			SAND (SW), gray, very dense, coarse to fine-grained sand, saturated.						
17									
18									
60									

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LOG OF BORING B-A4

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.4.014.01

DATE DRILLED: February 9, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
60						63	12.5		
19			SILTY CLAY (CL), gray and reddish brown mottled, stiff, saturated, trace fine-grained sand.						
65									
20									
21									
70						31	29.2	95.5	*3.25
22			SILTY SAND (SM), dark gray, medium dense, saturated, fine-grained sand, trace clay.				27.5	99.0	
75									
23			SILTY CLAY-CLAYEY SILT (CL-ML), dark olive gray, very moist, stiff to very stiff, saturated.						
24									
80									
25			PI = 18			29			1.53 *1.75
85									
26									
27			SILTY CLAY (CL), yellowish olive brown, stiff, saturated.						
90									

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LOG OF BORING B-A4

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.4.014.01

DATE DRILLED: February 9, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
90						14	30.1		
28									
95									
29			SAND (SW) with silt, grayish olive brown, very dense, saturated, medium to fine-grained sand.						
30									
100						56	21.5		
31			SAND (SW), gray, very dense, saturated, medium to fine-grained sand.						
105									
32									
33									
110						50/6"			
34									
115			SILT (ML), olive gray, hard, saturated, trace clay, trace fine-grained sand.						
35									
36									
120									

LOG OF BORING B-A4

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.4.014.01

DATE DRILLED: February 9, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
120									
37						50/4"	29.1		
125			SILTY CLAY to CLAYEY SILT (CL-ML), olive gray, very stiff, saturated.						
38									
39									
130						26	31.1		
40									
135			SAND (SW), gray, very dense, saturated, medium to fine-grained sand, trace silt.						
41									
42									
140						50/4"	20.3		
43									
44									
145									
45									
150									



LOG OF BORING B-A4

FOUNDATION EXPLORATION
BRADSHAW'S CROSSING
LATHROP, CALIFORNIA
5044.4.014.01

DATE DRILLED: February 9, 2006
HOLE DEPTH (FT): 161 ft.
HOLE DIAMETER: 4.4 in.
SURF ELEV (FT-MSL): 32 ft.

LOGGED / REVIEWED BY: Z. Crawford / J.T.
DRILLING CONTRACTOR: Tabor Consultants
DRILLING METHOD: Rotary Wash
HAMMER TYPE: Automatic

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
150									
46						50/3"	23.3		
155									
47									
160						50/6"	22.8		
49									
50			Bottom of boring at approximately 161 feet.						
51			Groundwater encountered at 26 feet during drilling.						
165									
52									
170									
53									
175									
54									
180									

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FIELD EXPLORATION LOGS
NORTHERN LATHROP PROPERTIES

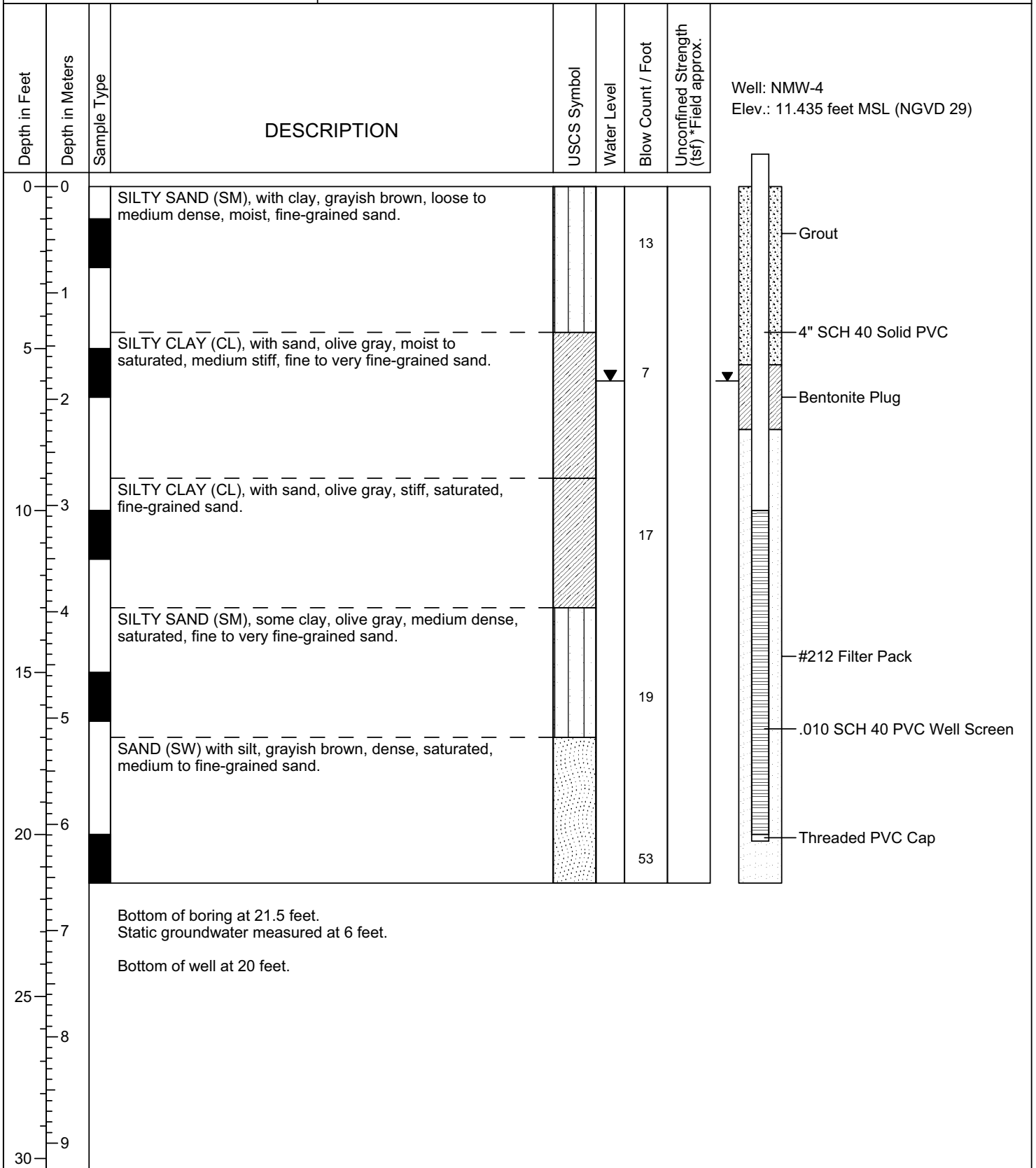


LOG OF BORING NMW-4

WELL INSTALLATION
N. LATHROP PROPERTIES
LATHROP, CALIFORNIA
6793.4.001.01

DATE DRILLED: July 13, 2005
HOLE DEPTH (FT): 21.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (FT-MSL): 8.515 ft.

LOGGED / REVIEWED BY: Z. Crawford / D.R.H.
DRILLING CONTRACTOR: Spectrum Exploration
DRILLING METHOD: Hollow-Stem Auger
HAMMER TYPE: Automatic Hammer

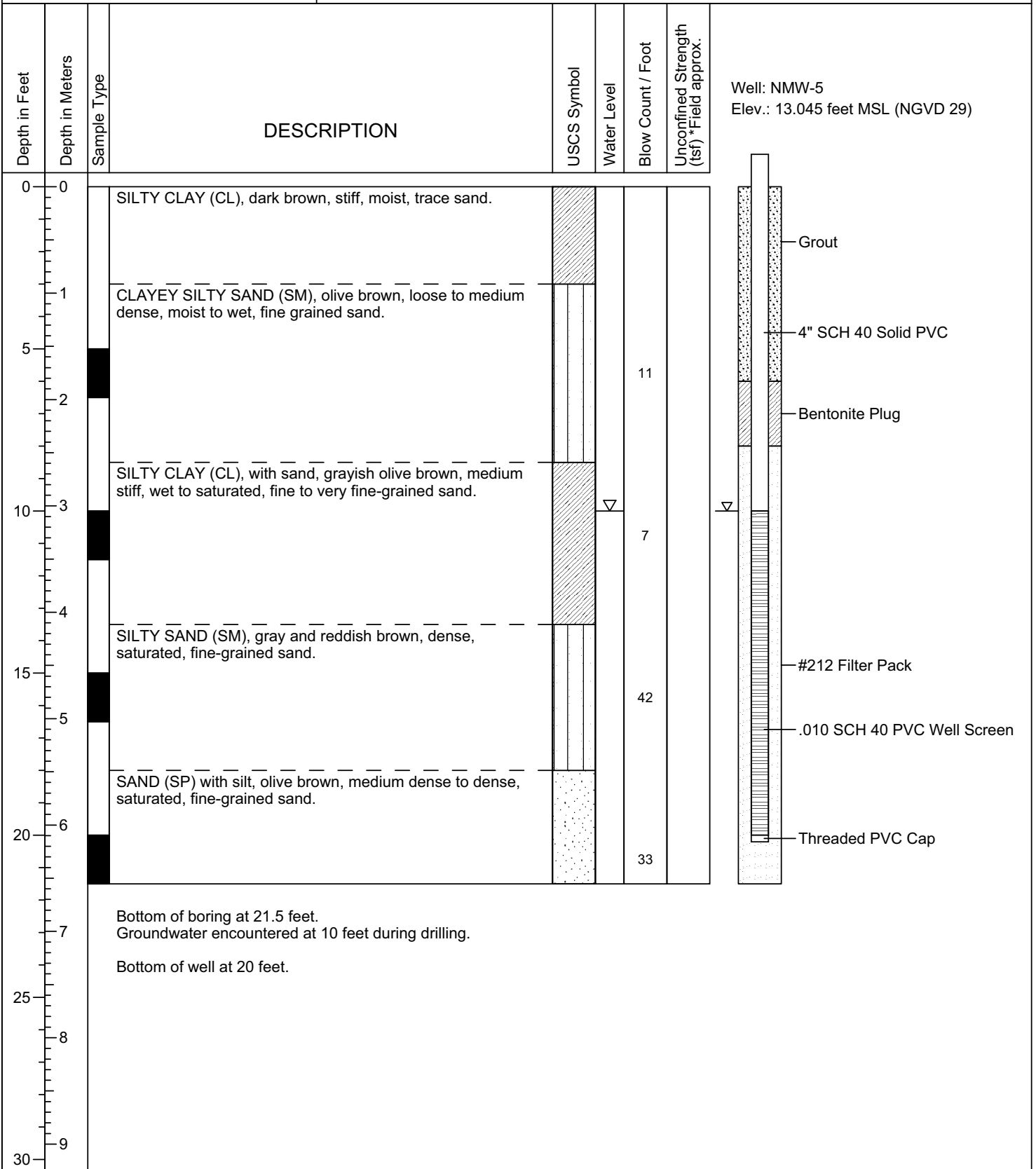


LOG OF BORING NMW-5

WELL INSTALLATION
N. LATHROP PROPERTIES
LATHROP, CALIFORNIA
6793.4.001.01

DATE DRILLED: July 13, 2005
HOLE DEPTH (FT): 21.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (FT-MSL): 9.695 ft.

LOGGED / REVIEWED BY: Z. Crawford / D.R.H.
DRILLING CONTRACTOR: Spectrum Exploration
DRILLING METHOD: Hollow-Stem Auger
HAMMER TYPE: Automatic Hammer



FIELD EXPLORATION LOGS
CENTRAL LATHROP SPECIFIC PLAN



ENGEORELOG 5747500301 LATHROP PARK INFRASTRUCTURE-PHASE I.GPJ 12/18/03

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 13, 2003		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 12 feet (4 meters)				DRY UNIT WEIGHT	MOIST. CONTENT
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT			
0		1A 1B		SILTY SAND (SM), dark brown, loose to medium dense, moist, fine- to medium-grained sand, minor roots.		16	93	13.0	
1		2		Grades to wet, poorly sorted, medium-grained sand.		16			
5		3		Poorly-graded SAND (SP), brown, medium dense, wet.		26			
2		4		Grades to dense, more fine- to medium-grained sand.		35			
10		5		Grades to medium dense.		22			
4		6		CLAYEY SAND (SC), olive brown, wet, medium dense, fine-grained sand.		23		31.0	
15				Bottom of boring at approximately 15 1/2 feet. Groundwater encountered at 8 feet during drilling.					



LATHROP PARK INFRASTRUCTURE - PHASE I
LATHROP, CALIFORNIA

BORING NO.: B-1

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.003.01

CHECKED BY:

FIGURE NO.

A1

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 13, 2003	BLOWS/FT.	qu	IN PLACE	
				SURFACE ELEVATION: Approx. 8 feet (2 meters)		UNCON STRENGTH (TSF)	DRY UNIT WEIGHT	MOIST. CONTENT
DESCRIPTION				*FIELD PENET. APPROX.		(PCF)	% DRY WEIGHT	
0		1A		CLAYEY SAND with silt (SC), dark brown, moist, loose to medium dense.				
		1B						
-1		2A		Poorly-graded sand (SP), light gray with red brown mottling, medium dense, iron oxide.	17		93	14.0
		2B						
-5		3		SANDY CLAY (CL), dark gray brown, stiff, moist, moderate plasticity, fine-grained sand.	9		85	25.0
		3						
-2		4		CLAYEY SAND (SC), olive brown, moist to wet, medium dense, fine-grained sand.	9			
		4						
-3		5		Grades to wet, silt increasing.	6			
		5						
-10		6		SANDY CLAY (CL), gray, with orange brown mottling, stiff, very moist to wet, fine-grained sand.	17			27.0
		6						
-15				CLAYEY SAND (SC), gray, dark gray with black mottling, wet, medium dense, fine-grained sand.	15			
-5				Bottom of boring at approximately 15 1/2 feet. Groundwater encountered at 7 1/2 feet during drilling.				

ENGEORELOG 5747500301 LATHROP PARK INFRASTRUCTURE-PHASE I.GPJ 12/18/03



LATHROP PARK INFRASTRUCTURE - PHASE I
LATHROP, CALIFORNIA

BORING NO.: B-2
LOGGED BY: J. Ollerton
PROJ. NO.: 5747.5.003.01

FIGURE NO.
A2

CHECKED BY

ENGEO BORELOG 5747500301 LATHROP PARK INFRASTRUCTURE-PHASE I GPI 12/18/03

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 13, 2003		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT	MOIST. CONTENT
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT			
0		1A 1B		Fine CLAYEY SAND (SC), dark brown, loose, moist, minor roots.		8			
1		2A 2B		SILTY SAND (SM), olive gray, medium dense, moist, fine-grained sand.		21	104	20.0	
5				Switch to hollow stem auger.		9			
10		3		Grades to loose Grades to olive brown to olive gray, loose to medium dense, moist.		7 13			
10				CLAYEY SAND (SC), gray, medium dense, moist, fine-grained sand.					
15		4		Clay lense above 14 feet, gray, wet. Poorly-graded SAND (SP), olive brown, dense, wet, interbedded fine- to coarse-grained sand.		25			
15				SILTY CLAY (CL), gray, very stiff, wet, minor fine-grained sand.					
20		5		CLAYEY SAND (SC), olive brown, dense to very dense, wet, finer sand toward top, fine- to coarse-grained sand near bottom.		50			
20				Bottom of boring at approximately 20 1/2 feet. Groundwater encountered at 8 1/2 feet during drilling.					



LATHROP PARK INFRASTRUCTURE - PHASE I
LATHROP, CALIFORNIA

BORING NO.: B-3
LOGGED BY: J. Ollerton
PROJ. NO.: 5747.5.003.01

FIGURE NO.
A3

CHECKED BY

ENGEBORELOG 5747500301 LATHROP PARK INFRASTRUCTURE-PHASE I.GPJ 12/18/03

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 13, 2003		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT	MOIST. CONTENT
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT			
0		1A 1B		SILTY SAND (SM), brown, medium dense, dry, damp, weakly cemented.		28			
1		2A 2B		Grades to damp to moist, non to weakly cemented, fine- to medium-grained sand.		21	115	8.0	
5		3		Grades to very moist.		14			
2									
4		4		Poorly-graded SAND with SILT (SP), brown, loose, wet, fine-grained sand.		28			
10		5		CLAYEY SAND (CL), olive brown, very stiff, moist, with minor oxidation mottling, fine-grained sand.		28			
4		6		CLAY with SAND (CL), olive brown, very stiff, moist.		39			
15				Poorly-graded SAND with SILT (SP), brown, medium dense to dense, wet, fine- to medium-grained sand.					
5				Bottom of boring at approximately 15 1/2 feet. Groundwater encountered at 7 feet during drilling.					
20		6		CLAY with SAND (CL), olive brown, very stiff, moist.					
7									
25									
8									
9									
30									



LATHROP PARK INFRASTRUCTURE - PHASE I

LATHROP, CALIFORNIA

BORING NO.: B-5

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.003.01

CHECKED BY:

FIGURE NO.

A5

ENGEBORELOG 5747500301 LATHROP LIQUEFACTION STUDY.GPJ 3/31/04

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: March 3, 2004		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE		
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT	MOIST. CONTENT	
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT				
0				Boring was completed from ground surface to maximum depth with mud rotary drilling method using a 4-inch diameter spade bit. CLAYEY SAND with silt (SC), dark brown to brown, loose, moist, mostly fine-grained sand.						
5		1		CLAYEY SILT (ML), brown, medium stiff, moist, non-plastic to low plasticity fines, some fine-grained sand. SANDY SILT (ML), brown, loose, wet, fine-grained sand.		5				
10		2		Grades to CLAYEY SILT (ML), brown to olive gray, medium stiff, with black oxide mottling, moist, non-plastic to low plasticity.		7				
15		3		Grades to olive brown, with some fine-grained sand, less black oxides.		7				
20		4		SILTY CLAY (CL), olive brown, stiff, moist, low to moderate plasticity, with some orange brown mottling.		14				
25		5		SILTY SAND (SM), brown, loose, wet, with fine- to medium-grained sand, low plasticity.		8				
30		6		SILTY CLAY (CL), orange brown and olive brown mottled, moist, low to moderate plasticity, with some fine- to medium-grained sand		13				



LATHROP LIQUEFACTION STUDY
LATHROP, CALIFORNIA

BORING NO.: B-7
 LOGGED BY: J. Ollerton
 PROJ. NO.: 5747.5.003.01

FIGURE NO.
A11

CHECKED BY
[Signature]

ENGEBORELOG 5747500301 LATHROPLIQUIFICATIONSTUDY.GPJ 3/31/04

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: March 3, 2004		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT (PCF)	MOIST. CONTENT % DRY WEIGHT
DESCRIPTION									
				SILTY SAND (SM), orange brown, medium dense, wet, with fine-grained sand.					
		7		Poorly graded SAND with SILT (SP-SM), dark gray to gray, medium dense, wet, with less fines below 36 feet.		20			
		8		Grades to grey with fine- to medium-grained sand, dense.		38			
		9		Poorly-graded SAND (SP), gray, medium dense, wet, fine- to medium-grained sand, little to no fines observed.		20			
				SILTY SAND (SM), orange brown, medium dense, wet, fine-grained sand.					
				Bottom of boring at approximately 41 1/2 feet. Groundwater encountered at approximately 6 feet during drilling.					



LATHROP LIQUEFACTION STUDY
LATHROP, CALIFORNIA

BORING NO.: B-7

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.003.01

CHECKED BY: *[Signature]*

FIGURE NO.

A11

ENGEBORELOG 5747500301.LATHROP LIQUEFACTION STUDY.GPJ 3/31/04

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: March 3, 2004		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE		
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT	MOIST. CONTENT	
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT				
0				Boring was completed from ground surface to maximum depth with mud rotary drilling method using a 4-inch diameter spade bit. SILTY SAND (SM), dark brown, loose, moist, fine-grained sand.						
		1		Grades to mostly fine-grained sand.		8				
		2		Grades fine- to medium-grained sand.		9				
		3		Poorly graded SAND (SP), gray, loose, wet, with fine to coarse-grained sand, little to no fines observed.		8				
		4		SILTY CLAY (CL), olive brown, medium stiff, moist, with some fine-grained sand, moderate plasticity.						
		4		Grades to SILTY CLAY as above, with some orange brown oxide mottling, stiff.		15				
		5		CLAYEY SAND (SC), olive brown, medium dense, wet, fine-grained sand.						
		5		SILTY CLAY with sand (CL), light olive brown, very stiff, moist, with calcium carbonates concretions, moderate plasticity.		22				
		6		Grades to light olive brown with orange brown oxide mottling, hard.		31				
		7		SILTY SAND (SM), orange brown, dense, moist, fine-grained sand.						
		7		Poorly graded SAND (SP), gray brown, dense, wet, fine-grained sand.		35				



LATHROP LIQUEFACTION STUDY
LATHROP, CALIFORNIA

BORING NO.: B-9
LOGGED BY: J. Ollerton
PROJ. NO.: 5747.5.003.01

FIGURE NO.
A13

ENGEORELOG 5747500301 LATHROP LIQUEFACTION STUDY.GPJ 3/31/04

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: March 3, 2004		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT (PCF)	MOIST. CONTENT % DRY WEIGHT
DESCRIPTION				*FIELD PENET. APPROX.					
			8	SILTY CLAY (CL), olive brown, medium stiff, moist, with dark brown to black oxide mottling, moderate plasticity.		12			
			9	Grades to gray, at 36 feet, no oxides.		12			
			10	Grades to CLAY with SILT (CL), gray, stiff, moist to wet, moderate plasticity.		15			
				Bottom of boring at approximately 41 1/2 feet. Groundwater was encountered but the depth uncertain.					



LATHROP LIQUEFACTION STUDY
LATHROP, CALIFORNIA

BORING NO.: B-9



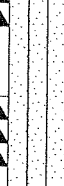

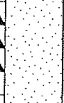





LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.003.01

CHECKED BY: *[Signature]*

FIGURE NO.

A13

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: March 5, 2004	BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 10 feet (3 meters)			DRY UNIT WEIGHT (PCF)	MOIST. CONTENT % DRY WEIGHT
DESCRIPTION				*FIELD PENET. APPROX.				
0				Boring was completed from ground surface to maximum depth with mud rotary drilling method using a 4-inch diameter spade bit. CLAYEY SAND (SC), dark brown, moist.				
1		1		SILTY SAND (SM), brown, loose, moist, fine- to medium-grained sand.	6			
5		2		Grades to silty sand with minor lens of clayey fine-grained sand with calcium carbonates, medium dense.	12			
10		3		Poorly-graded SAND (SP), brown to gray, loose, wet, mostly fine- to medium-grained sand, with minor coarse-grained sand.	9			
15		4			7			
20		5		Grades to medium dense.	12			
25		6			15			
30		7		Grades to gray. Grades to medium dense, wet, with little to no fines observed.	26			
35		8		SILTY SAND (SM), brown, medium dense, wet, with mostly fine- to medium-grained sand.	24			
30		9		Grades to brown to orange brown, fine-grained sand.	17			

ENGEO BORELOG 5747500301 LATHROP LIQUEFACTION STUDY.GPJ 3/3/04



LATHROP LIQUEFACTION STUDY
LATHROP, CALIFORNIA

BORING NO.: B-10
LOGGED BY: J. Ollerton
PROJ. NO.: 5747.5.003.01

CHECKED BY: 

FIGURE NO.
A14

ENGEBORELOG 5747500301 LATHROPLIQUIFICATIONSTUDY.GPJ 3/31/04

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: March 5, 2004		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE		
				SURFACE ELEVATION: Approx. 10 feet (3 meters)				DRY UNIT WEIGHT	MOIST. CONTENT	
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT				
-10										
-35		10		Grades to gray to orange brown, (gray variations has more fines).		17				
-11										
-12				Grades to brown to orange brown, dense.						
-40		11				36				
-13				Bottom of boring at approximately 41 1/2 feet. Groundwater was encountered but the depth is uncertain.						
-45										
-14										
-15										
-50										
-16										
-55										
-17										
-18										
-60										



LATHROP LIQUEFACTION STUDY
LATHROP, CALIFORNIA

BORING NO.: B-10
 LOGGED BY: J. Ollerton
 PROJ. NO.: 5747.5.003.01
 CHECKED BY: [Signature]

FIGURE NO.
A14



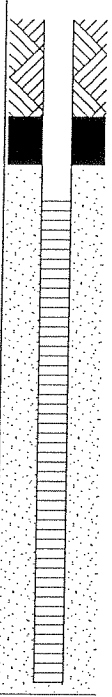

LOG OF BORING B18

Geotechnical Exploration
 CLSP Phase 1 Infrastructure
 Lathrop, CA
 5747.5.003.02

DATE DRILLED: April 18, 2005
 HOLE DEPTH (FT): 40 ft.
 HOLE DIAMETER: 6 in.
 SURF ELEV (FT-MSL): 10 ft.

LOGGED / REVIEWED BY: J. Bariel
 DRILLING CONTRACTOR: V&W Drilling
 DRILLING METHOD: Mud Rotary
 HAMMER TYPE: Autotrip

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Unconfined Strength (tsf) *field approx
0	0		SANDY CLAY (CL), dark grayish brown, stiff, moist, low to moderate plasticity, fine-grained sand.			10			
1	1		CLAYEY SILT (ML), grayish brown and reddish brown mottled, medium stiff, moist, non-plastic, fine-grained sand.			7			
5	2		Grades to sandy silt, brown, stiff, trace mica.			10	27	95	
10	3		Grades to clayey silt, grayish brown and reddish brown mottled, very stiff, low to moderate plasticity.			21			
15	5					22			
20	6		Grades to sandy silt, reddish brown, very stiff, moist, non-plastic, fine-grained sand, trace mica.			34			
25	8					31			
30	9		SILTY SAND (SM), reddish brown and grayish brown mottled, dense, moist, fine-grained sand.			31			

DEPTH (FEET)	WELL CONSTRUCTION	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: January 22, 2003	N S.P.T. BLOWS/FT *MODIFIED FOR 3" O.D. SAMPLER	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE	
			SURFACE ELEVATION: Approx. 10.9 feet			DRY UNIT WEIGHT	MOIST. CONTENT
			DESCRIPTION			(PCF)	% DRY WEIGHT
0			CLAYEY SAND (SC), dark brown 7.5YR 3/3, wet, loose, ~30% clay to silt fines	7			
5			SANDY CLAY (CL), olive brown 2.5Y 4/4, moist, moderately stiff	12			
10			WELL GRADED SAND (SW), olive brown 2.5Y 4/4, saturated, moderately dense, fine to mostly coarse sand, subangular to rounded grains, muscovite to 0.5mm, subrounded gravels to 5%	21			
16.5			Bottom of boring at 16.5 feet				

L: 5747.5.002.01 ROBINSON PROPERTY.GPJ 12/18/03

ENGEO
INCORPORATED

ROBINSON PROPERTY

WELL NO.: MW-1

DATE: December 2003

FIGURE
NO.

MW 1

DEPTH (FEET)	WELL CONSTRUCTION	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: January 22, 2003	N S.P.T. BLOWS/FT *MODIFIED FOR 3" O.D. SAMPLER	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE	
			SURFACE ELEVATION: Approx. 12.9 feet			DRY UNIT WEIGHT	MOIST. CONTENT
			DESCRIPTION			(PCF)	% DRY WEIGHT
0			TOPSOIL				
			SANDY CLAY (CL), with angular and rounded white to gray gravels, fill material	35			
			ORGANIC CLAY (OL), dark brown 7.5 YR 3/3, soft, damp, homogenous texture and color	13			
5							
			SANDY CLAY (CL), olive brown 2.5Y 4/4, soft, very fine grained sand ~15%, mottled yellowish brown 10YR 4/6, wet	11			
10							
			CLAYEY SAND (SC), olive brown 2.5Y 4/4, moderate dense, saturated, very fine to fine grained sand	20			
15							
			Very fine to fine grained sand occurs as 2 cm thick lenses with reddish brown 2.5YR 5/4 oxidation selvages to 1mm. Bottom of boring at 19.5 feet, no ground water encountered	52			
20							
25							
30							

L-5747,5.002-01 ROBINSON PROPERTY.GPJ 12/18/03

ENGEO
INCORPORATED

ROBINSON PROPERTY

WELL NO.: MW-3

DATE: December 2003

FIGURE NO.

MW 2

DEPTH (FEET)	WELL CONSTRUCTION	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: January 22, 2003	N S.P.T. BLOWS/FT	qu UNCON. COMP. STRENGTH (TSF)	IN PLACE	
			SURFACE ELEVATION: Approx. 13.3 feet			DRY UNIT WEIGHT (PCF)	MOIST. CONTENT % DRY WEIGHT
			DESCRIPTION	*MODIFIED FOR 3" O.D. SAMPLER	*FIELD PENET. APPROX.		
0			ORGANIC SILT (OL), dark brown 7.5 YR 3/3, damp, soft, mottled with distinct rounded contacts to olive colored patches to 3 cm in diameter	9			
			CLAYEY SAND (SC), olive brown 2.5Y 4/4, moist, very fine grained sand, moderately dense - loose	6			
5			CLAYEY SAND (SC), olive brown 2.5Y 4/4, moist, very fine grained to silt sized grains, trace root casts to 0.25 mm in diameter				
10			POORLY GRADED SAND (SP), olive brown 2.5Y 4/4, medium grained sand, saturated, moderately dense, sand is subangular to rounded, trace muscovite grains to 2 mm in diameter, <5% clay/silt fines	15			
15			Becomes very fine grained clay silt fines, ~30% in the sample.	28			
			SILTY SAND (SM), olive brown 2.5Y 4/4, very fine grained, saturated Bottom of boring at 16.5 feet				
20							
25							
30							

L 5747.5.002.01 ROBINSON PROPERTY.GPJ 12/18/03

ENGE
INCORPORATED

ROBINSON PROPERTY
LATHROP, GA

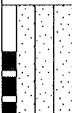
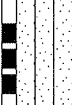

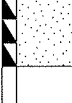
WELL NO.: MW-4
DATE: December 2003

FIGURE NO.
MW 4

DEPTH (FEET)	WELL CONSTRUCTION	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: January 22, 2003	N S.P.T. BLOWS/FT	qu UNCON. COMP. STRENGTH (TSF)	IN PLACE	
			SURFACE ELEVATION: Approx. 12.7 feet			DRY UNIT WEIGHT (PCF)	MOIST. CONTENT % DRY WEIGHT
			DESCRIPTION	*MODIFIED FOR 3" O.D. SAMPLER	*FIELD PENET. APPROX.		
0			Road - Packed Soil				
			SILTY SAND (SM), dark brown 7.5 YR 3/3, ~35% silt, moist, fine grained sand, very loose	11			
			SILTY SAND (SM), dark yellowish brown 10YR 5/6, ~35% silt, fine grained sand, moist, very loose	7			
5			SILTY SAND (SM), olive brown 2.5Y 4/4, wet, 20% silt, fine grained sand, loose	13			
10			POORLY GRADED SAND (SP), medium grained, saturated, <5% fines, very loose, light olive brown 2.5Y 5/4, rounded to subangular sand	14			
15			SILTY SAND (SM), light olive brown 2.5Y 5/4, grades from medium to fine grained at 16.0 feet, ~20% fines, saturated	29			
			SANDY CLAY (CL), fine to very fine grained sand, moderately stiff, wet to moist, light olive brown 2.5YR 5/4				
			Bottom of boring at 16.5 feet				
20							
25							
30							

L 5747.5 002.01 ROBINSON PROPERTY.GPJ 12/18/03

ENGEО BORELOG 5747500302 LATHROPARK.GPJ 10/24/05

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 14, 2003		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 9 feet (3 meters)				DRY UNIT WEIGHT	MOIST. CONTENT
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT			
0		1A 1B		SILTY SAND (SM), dark brown to olive brown, loose, moist, fine- to medium-grained sand.		7			
5		2A 2B		Grades to decreasing silt, wet		6			
10		3		SAND (SP), gray brown, medium dense, wet, trace fine gravel.		16			18.0
15		4		Grades to gray brown to olive brown, dense, no gravel.		35			
Bottom of boring at approximately 16 1/2 feet. Groundwater first encountered at 5 feet.									

DEPTH (FEET) DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 14, 2003	BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
			SURFACE ELEVATION: Approx. 9 feet (3 meters)			DRY UNIT WEIGHT (PCF)	MOIST. CONTENT % DRY WEIGHT
DESCRIPTION			*FIELD PENET. APPROX.				
0	1A 1B		SILTY SAND (SM), mottled orange and olive brown, more dark brown toward top, loose, moist, fine-grained sand.	18			13.0
5	2A 2B		SANDY SILT (ML), olive brown, stiff, moist, fine-grained sand.	19		91	28.0
10	3A 3B		SILTY CLAY (CL), olive brown to olive gray, stiff, wet, some fine-grained sand, low to moderate plasticity.	17		87	34.0 33.0
15	4A 4B		CLAYEY SAND (SC), olive brown, loose, wet, some coarse-grained sand at 15 1/2 to 16 1/2 feet.	13			
16.5			Bottom of boring at approximately 16 1/2 feet. Groundwater first encountered at 7 feet.				

ENGEBORELOG 5747500302 LATHROP PARK.GPJ 10/24/05



LATHROP PARK
LATHROP, CALIFORNIA

BORING NO.: MW-7

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.002.02

FIGURE NO.

A7

CHECKED BY

ENGEBORELOG 5747500302_LATHROP.PARK.GPJ 10/24/05

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 14, 2003		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE	
				SURFACE ELEVATION: Approx. 8 feet (2 meters)				DRY UNIT WEIGHT	MOIST. CONTENT
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT			
0				SANDY CLAY with silt (CL), dark brown, very loose, moist, low to moderate plasticity, with roots, mostly fine-grained sand. Grades to wet.		4			
-1		1		No recovery from sampler.					
-5				Grades to CLAY with SILT (CL), olive brown with black oxide mottling, wet, medium stiff.		3			
-10		2a 2b		Grades to CLAY with SILT (CL), olive brown with black oxide mottling, wet, medium stiff.		7			34.0
-15				Grades to olive gray, stiff, wet, with fine-grained sand.					
-5		3		CLAYEY SAND (SC), olive brown, loose, wet, fine-grained sand.		13			
				Bottom of boring at approximately 16 1/2 feet. Groundwater encountered at 8 1/2 feet during drilling.					
-20									
-25									
-30									



LATHROP PARK
LATHROP, CALIFORNIA

BORING NO.: MW-8
LOGGED BY: J. Ollerton
PROJ. NO.: 5747.5.002.02

FIGURE NO.
A8

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF BORING: November 17, 2003		BLOWS/FT.	qu UNCON STRENGTH (TSF)	IN PLACE		
				SURFACE ELEVATION: Approx. 8 feet (2 meters)				DRY UNIT WEIGHT	MOIST. CONTENT	
DESCRIPTION				*FIELD PENET. APPROX.	(PCF)	% DRY WEIGHT				
0				SANDY SILT (ML), dark brown, soft, moist, non to low plasticity, fine-grained sand.		4				
		1A 1B		SILTY SAND (SM), dark brown and olive gray mottled, loose, moist, fine-grained sand.						
5				No recovery from sampler.		19				
				CLAYEY SAND (SC), brown, moist to wet, loose ▽ (Logged from cuttings)						
10				CLAY WITH SILT (CL), olive brown, stiff, wet.		11				
				Grades to clayey silt with interbedded clayey sand.						
15				Bottom of boring at approximately 16 1/2 feet. Groundwater encountered at 8 feet during drilling.		12				
20										
25										
30										

ENGEО BORELOG 5747500302_LATHROP PARK.GPJ 10/24/05



LATHROP PARK
LATHROP, CALIFORNIA

BORING NO.: MW-9

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.002.02

CHECKED BY

FIGURE NO.

A9

LATHROP PARK INFRASTRUCTURE – PHASE I
LATHROP, CALIFORNIA

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP-1	0 - 4	<p>SANDY SILT WITH CLAY (MH), brown, soft, moist to wet, moderate to high plasticity, fine-grained sand.</p> <p>At 0 feet, moisture content 22%</p> <p>At 2 feet, grades to medium stiff, moist; moisture content 22%.</p> <p>At 3 feet, grades to light gray, moisture content 28%.</p> <p>At 4 feet, moisture content 27%.</p> <p>Test Pit at Elevation 9 feet. Bottom of test pit at 4 feet. No free groundwater encountered.</p>
TP-2	0 - 4	<p>SILTY SAND (SM), brown, loose, moist, fine- to medium-grained sand.</p> <p>At ½ feet, moisture content 11%.</p> <p>At 2 feet, grades to medium dense; moisture content 10%.</p> <p>At 3 feet, grades to light brown with clay; moisture content 14%.</p> <p>At 3 ½ feet, grades to moderately cemented.</p>
	4-5	<p>SANDY CLAY (CL), light brown, medium stiff, moist, moderate plasticity, fine- to medium-grained sand.</p> <p>At 4 feet, moisture content 17%</p> <p>Test Pit at Elevation 11 feet. Bottom of test pit at 5 feet. No free groundwater encountered</p>

FIELD EXPLORATION LOGS
SOUTH LATHROP SPECIFIC PLAN



Geotechnical Exploration 220-Acre Mixed Use Development Lathrop, California 6282.5.002.01	DATE DRILLED : October 27, 2004 HOLE DEPTH (FT) : Approx. 39 1/2 SURF ELEV (FT-MSL) : 12 LATITUDE (NAD83) : N/A LONGITUDE (NAD83) : N/A	LOGGED/REVIEWED BY : K. Bickler/ZAC DRILLING CONTRACTOR : V&W Drilling DRILLING METHOD : Rotary Wash HAMMER TYPE : Automatic HOLE DIAMETER : 6.0
--	---	--

Depth in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (tsf) *field approx.
0		LEAN CLAY (CL), dark brown, moist, with silt				35	15				
5		SANDY SILT (ML), brown, medium dense, moist, with fine-grained sand			11						
10		POORLY GRADED SAND WITH SILT (SP-SM), light brown, medium dense, moist, fine- to medium-grained sand			14			5.1			
15		POORLY GRADED SAND (SP), light brownish gray, wet, fine grained sand			16			4.5			
20					18			4.3			
25		Grades to medium to course grained sand			23						

Geotechnical Exploration 220-Acre Mixed Use Development Lathrop, California 6282.5.002.01	Date Drilled : October 27, 2004 Hole Depth (ft) : 39 1/2 Surface Elev (ft-msl) : 12 Latitude (NAD83) : N/A Longitude (NAD83) : N/A	Logged/Reviewed By: K. Bickler/ZAC Drilling Contractor : N/A Drilling Method : Rotary Wash Hammer Type : Automatic Hole Diameter (in) : 6.0
--	--	---

Depth in Feet	Sample Type	DESCRIPTION	Log Symbol	Water Level	Blow Count / Foot	Liquid Limit	Plastic Limit	Plasticity Index	Fines Content (% passing #200)	Moisture Content (% dry weight)	Dry Unit Weight (pcf)	Shear Strength (tsf) *field approx
0		CLAYEY SILT TO SILTY CLAY (CL/ML), dark brown, stiff, moist, with silt				48	27	21				
5		CLAYEY SILT (ML), brown, very stiff, moist, trace sand			10	45	18	27				3.5*
10		POORLY GRADED SAND WITH SILT (SM), brown, medium dense, moist, fine- to medium-grained sand			24					13	121	4.5*
15		POORLY GRADED SAND WITH SILT (SP-SM), light grayish brown, medium dense, wet, fine to medium grained sand, some silt			28				6.3			
20		(grades to dense)			30				8.0			
25		SAND (SM), light grayish brown, medium dense, wet, with silt			25				14.2			

