

EBA Engineering Consultants Ltd.

Civil, Geotechnical and Materials Engineers



D007807



ORIGINAL LOGS WITH STRENGTH DATA

Gulf Canada Resource Inc.
and
Indian and Northern Affairs

0306-34413

May, 1988

RECORD OF BOREHOLE BH 1

Solder
812-2102

UTM GRID ZONE 8 WAD 72

SITE NAME: Sauvrak

LOCATION CO-ORDS: N 7 754 952 E 436 726

DATUM: Sea floor

BOREHOLE TYPE: Rotary DIAMETER: 10.16 cm

BORING DATE: October 6, 1981

WATER DEPTH: 27 m

DEPTH (m)	SOIL DESCRIPTION	SAMPLE			SHEAR STRENGTH kPa		'N' VALUE Δ BLOWS PER 300 mm				WATER CONTENT				ADDITIONAL LAB TESTING
		No.	Type	Temp °C	in Situ	in Lab	20	40	60	80	W _p	W	W _L	20	
1:100															
0.0	Sea Floor														
2.4	Very soft to soft, grey, silty CLAY	1	TO			F 23 L 25									
	Stiff to hard, grey silty CLAY laminated, some clear horizontal ice lensing up to 2 mm thick (V _S) and ice-bonded regions, traces of fine sand, occasional shells	2	TO		V 87	F 89 L 69 P 72									
		4	TO	-1.0		F 147 L 102 P 108									
		5	TO	-1.1	V 165	R 93 R 88									
		6	TO	-0.5		F 144 L 78 P 120									
10.0		7	TO	-1.3		F 88 L 65 P 88									

No recovery

H
γ = 19.4 KN/m³
Consolidation
CU Triaxial (2)
P₀ = 225 kPa
C_c = 0.25

Remoulded

BORING DATE: October 6, 1981 **WATER DEPTH:** 27 m

DEPTH (m)	SOIL DESCRIPTION	SAMPLE			SHEAR STRENGTH kPa		'N' VALUE Δ BLOWS PER 300 mm	WATER CONTENT			ADDITIONAL LAB TESTING
		No.	Type	Temp °C	in Situ	in Lab		w_p	w	w_L	
1:100							20	40	60	80	
10.0	Silty CLAY (as above)	8	TO	-1.4	V 152	F 88 L 74 P 77					H $\gamma = 18.8 \text{ KN/m}^3$ Consolidation $P_c = 295 \text{ kPa}$ $C_c = 0.30$
13.1	Firm to stiff, grey silty CLAY, trace of fine sand occasional silt partings, no visible ice or ice bonding	9	TO	-1.3	V 90	F 91 F 67 L 66 P 61					H $\gamma = 18.2 \text{ KN/m}^3$ CU Triaxial
15.2	Interbedded, dense to very dense, grey to dark-grey/black SILT, and stiff, fine sandy silty CLAY, laminated some organics, ice crystals and ice bonding (V_x, N_f)	11	TO	-1.2		F > 250 P > 215					MII
20.0		12	DO	+1.8							N=50 for 275 mm
		13	DO	=0.1							

RECORD OF BOREHOLE BH 1

UTM GRID ZONE 8 WAD 72

SITE NAME: Sauvrak

LOCATION CO-ORDS: N 7 754 952 E 436 726 DATUM: Sea floor

BOREHOLE TYPE: Rotary DIAMETER: 10.16 cm BORING DATE: October 6, 1981 WATER DEPTH: 27 m

DEPTH (m) 1:100	SOIL DESCRIPTION	SAMPLE			SHEAR STRENGTH kPa		'N' VALUE △ BLOWS PER 300 mm				WATER CONTENT W _p W W _L				ADDITIONAL LAB TESTING
		No	Type	Temp °C	in Situ	in Lab	20	40	60	80	20	40	60	80	
20.0	Interbedded SILT and sandy silty CLAY (as above)	14	TO			F 92 P>215									MH
		15	DO	-0.3* -1.2											
22.6	Compact to dense, grey mottled dark-grey, fine SAND and SILT, a trace to some clay, occasional clayey layers. Field records indicate possible presence of softer layers.	16	TO												No recovery
		17	TO	-1.4											MH
		18	DO												No recovery
		19	TO	-0.5											M
		20	DO												H
		21	TO	-1.7											M
30.0															

* -0.3 °C in a silty clay layer
-1.2 °C in an ice-bonded silt layer

UTM GRID ZONE 8 WAD 72

DATUM: See floor

BORING DATE: October 6, 1981 **WATER DEPTH:** 27 m

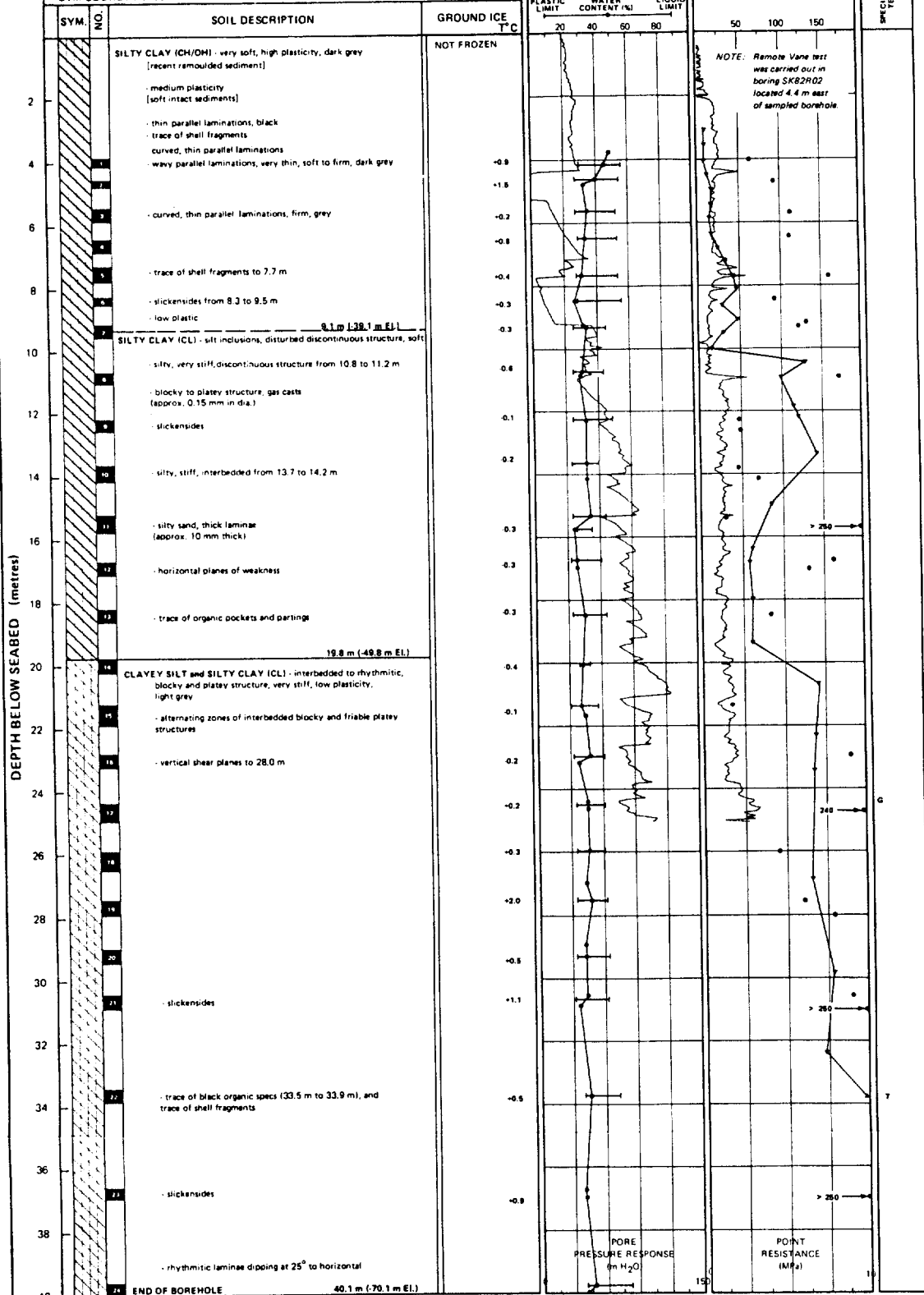
DEPTH (m) 1:100	SOIL DESCRIPTION	SAMPLE			SHEAR STRENGTH kPa		'N' VALUE Δ BLOWS PER 300 mm	WATER CONTENT			ADDITIONAL LAB TESTING	
		No.	Type	Temp °C	in Situ	in Lab		W _p	W	W _L		
30.0	as above											
31.1	Interbedded, very stiff to hard, grey, silty CLAY and fine sandy SILT, laminated, thin lenses of fine sand, organic horizons, some ice-crystals and inclined clear ice lenses up to 2mm thick (V _x , V _r). Some ice bonded regions	22	DO								H	
		23	TO	-1.8	F 240 L 108 P 185							
		24	TO	-1.3	F 173 L 102 P 168							H γ = 20.0 KN/m ³ Consolidation P _c = 900 kPa C _c = 0.26
		25	TO	-1.6								
		26	TO	-1.8	F 112 F 162 L 62 P 132 P 84							
40.0		27	TO	-1.9	F 112 L 62 P 96 R 183							

H
γ = 20.2 KN/m³
CU Triaxial Consolidation
P_c = 100 kPa
C_c = 0.13

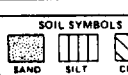
BOREHOLE TYPE: Rotary **DIAMETER:** 10-16 cm **BORING DATE:** October 6, 1981 **WATER DEPTH:** 27 m

$\gamma = 20.1 \text{ kN/m}^3$
CU Triaxial
Consolidation
 $p_c = 510 \text{ kPa}$
 $C_c = 0.20$

LOCATION: SAUVRAK
UTM COORDINATES: 7 755 655 m N. 434 750 m E. WATER DEPTH: 30.0 m



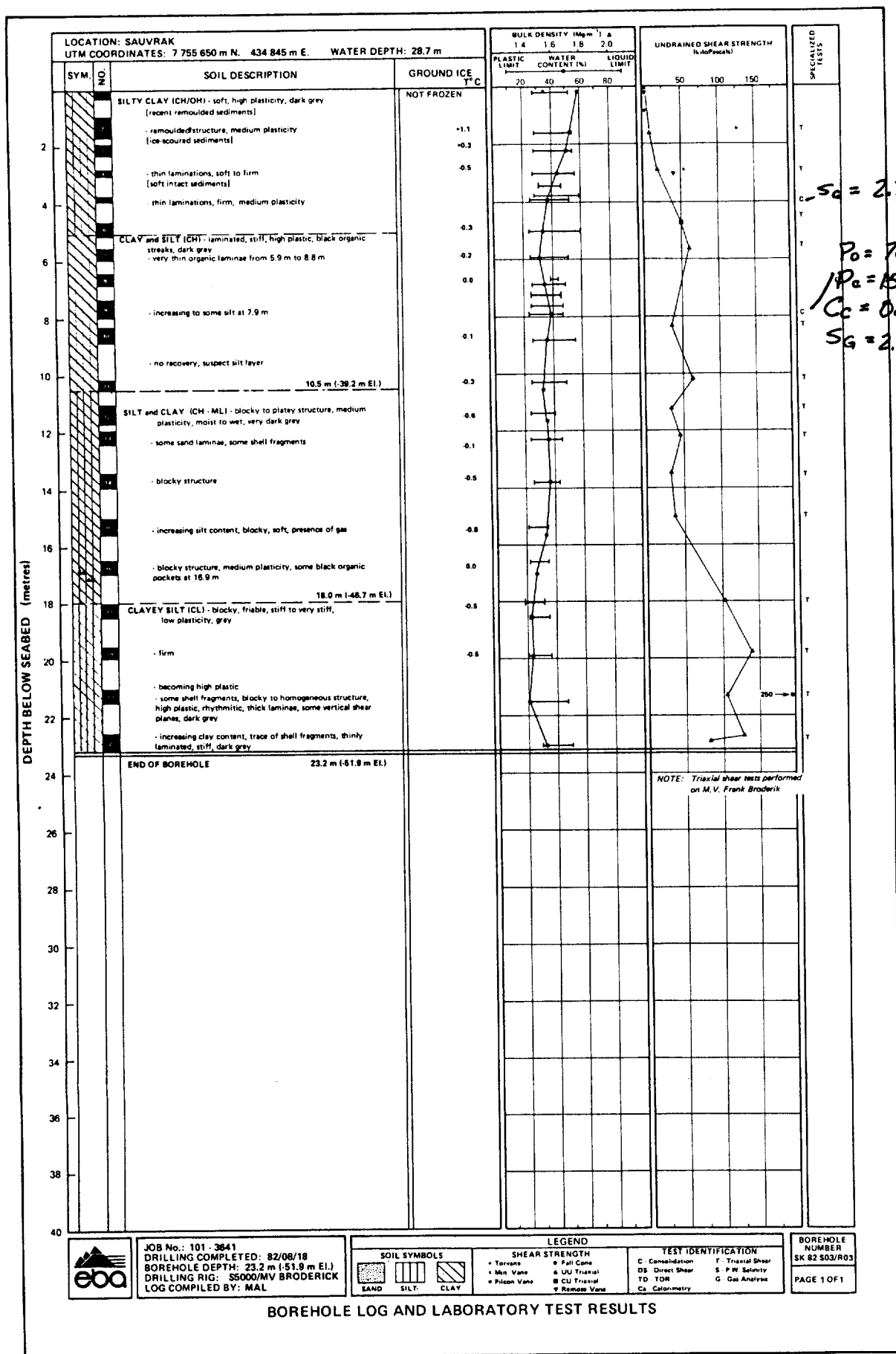
JOB No.: 101-3641
DRILLING COMPLETED: 82/07/16
BOREHOLE DEPTH: 40.1 m (-70.1 m EL)
DRILLING RIG: S5000/MV BRODERICK
LOG COMPILED BY: MAL, PGK, JPB

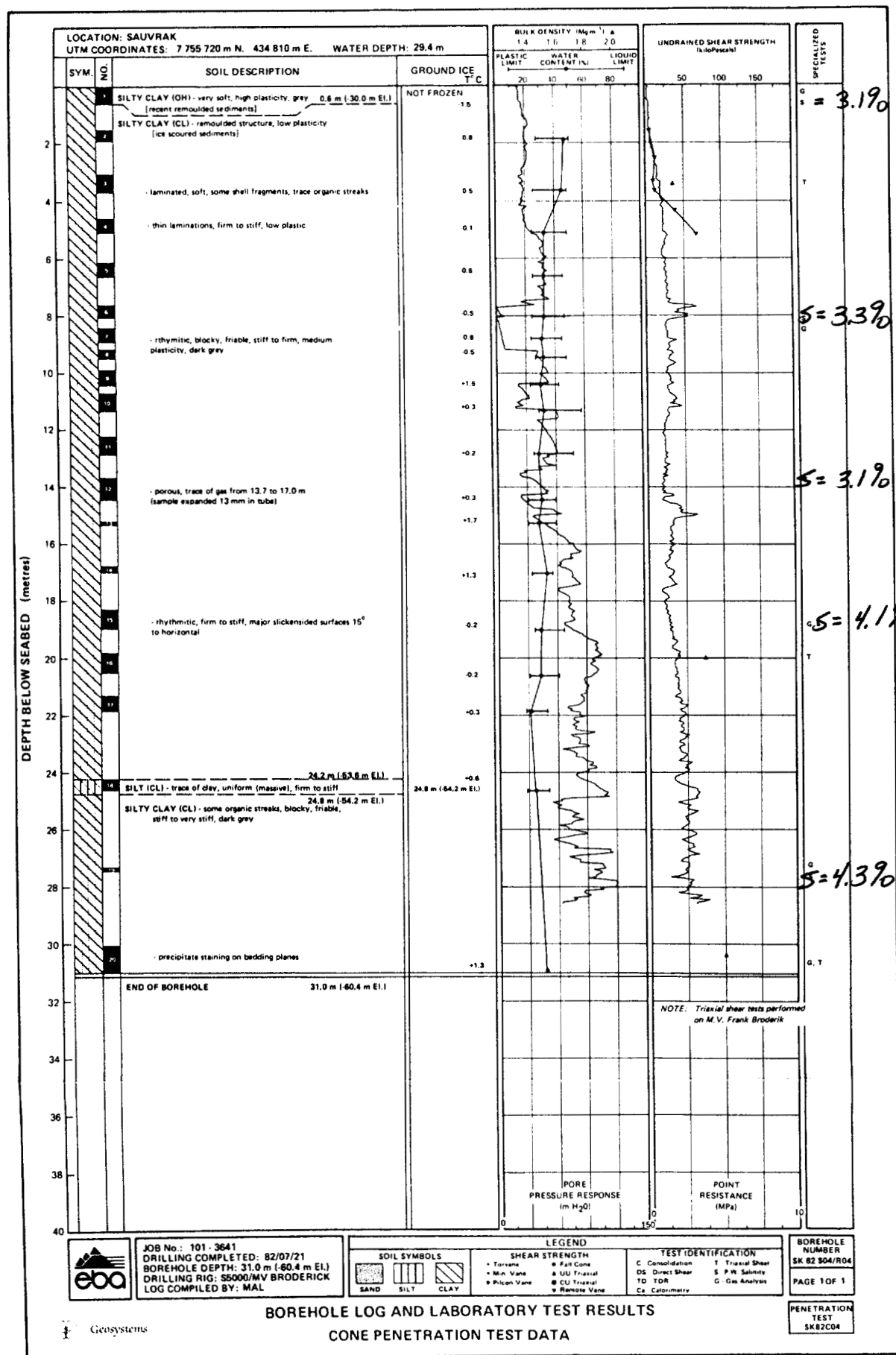


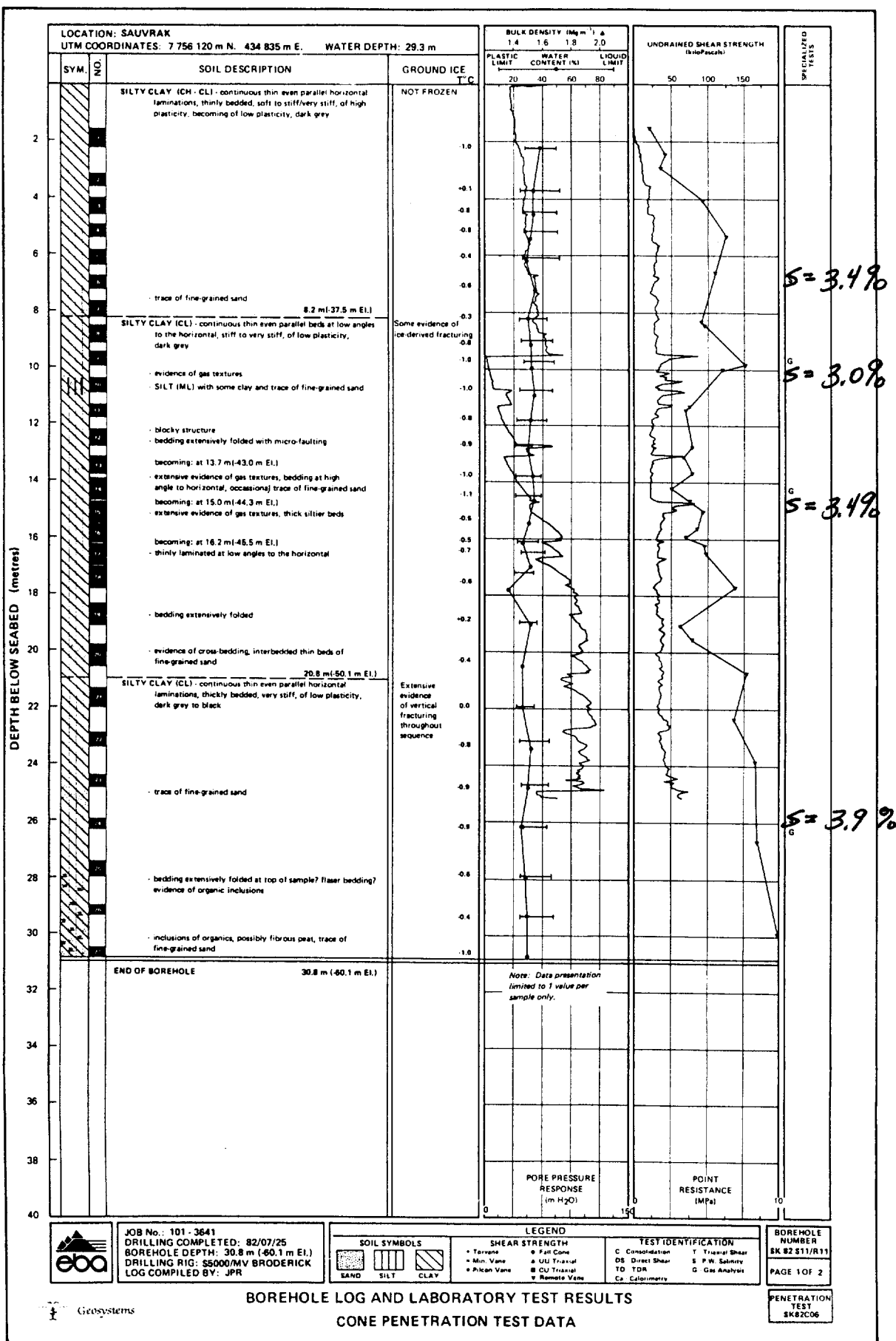
LEGEND
SHEAR STRENGTH
+ Torvane
x Min. Vane
• Pilon Vane
B Fall Cone
Δ UU Triaxial
□ CU Triaxial
▽ Remote Vane

TEST IDENTIFICATION
C Consolidation
DS Direct Shear
TD TDR
Ca Calorimetry
T Triaxial Shear
S P.W. Salinity
G Gas Analysis

BOREHOLE NUMBER
SK 82 S02/R02
PAGE 1 OF 1







LOCATION: SAUVRAK UTM COORDINATES: 7 756 120 m N. 434 835 m E. WATER DEPTH: 29.3 m				BULK DENSITY (Mg m ⁻³)				UNDRAINED SHEAR STRENGTH (kPa)			SPECIALIZED TESTS	
SYM.	NO.	SOIL DESCRIPTION	GROUND ICE T °C	1.4	1.6	1.8	2.0					
				PLASTIC LIMIT	WATER CONTENT (%)	LIQUID LIMIT						
					20	40	60	80	100	200	300	
		NOTE: see Borehole SK 82 S11 for detailed stratigraphy to 30.8 m (-60.1 m El.)	NOT FROZEN									
		30.8 m (-60.1 m El.)										
	31	CLAY and SILT (ML - CL) - trace of shell fragments, thinly laminated, blocky structure, very hard, low plasticity, dark grey	0.0									
	32	- precipitates stains on bedding planes	0.4									
	33											
	34											
	35	- occasional slickensides containing salt stains from 32.7 m to 38.7 m penetration (-62.0 m to -68.0 m El.)	-0.2									
	36											
	37		0.0									
	38											
	39											
	40											
	41											
	42	CLAY (CL) - some silt, blocky, slickensides inclined at 30° to 60° from horizontal through sample, very hard, gassy, dark grey	-0.8									TD
	43	42.6 m (-71.9 m El.)										
	44	SILTY SAND (SM) - some organics, fine-grained sand, medium laminae, gassy, dark grey										TD
	45		-0.8									
	46											
	47											
	48	- thin clay laminations containing precipitate stains and shell fragments inclined 15° to 20° from horizontal, dark grey	0.5									
	49											
	50	- trace of peat, trace of thin clay and precipitate stains on bedding planes,	0.8									TD
	51											
	52											
	53	- horizontal planes of weakness	-2.2									TD
	54											
	55											
	56											
	57	SILT and PEAT (SM/ML) - some fine sand, blocky vertical shear surface, dark grey	-2.2									
	58											
	59	some peat, trace of clay, blocky, dark grey	-2.2									TD
	60											
	61	END OF BOREHOLE										
	62	60.4 m (-89.7 m El.)										
	63											
	64											
	65											
	66											
	67											
	68											

JOB No.: 101 - 3641
DRILLING COMPLETED: 82/07/27
BOREHOLE DEPTH: 60.4 m (-89.7 m El.)
DRILLING RIG: S5000/MV BRODERICK
LOG COMPILED BY: MAL

SOIL SYMBOLS

SAND SILT CLAY

LEGEND

• Torrone
• Min. Vane
• Pilon Vane

• Fall Cone
• UU Triaxial
• CU Triaxial

TEST IDENTIFICATION

C Consolidation
DS Direct Shear
TD TDR
Ca Calorimetry

T Triaxial Shear
S P.W. Salinity
G Gas Analysis

BOREHOLE NUMBER
SK 82 S11/R1

PAGE 2 OF 2

BOREHOLE LOG AND LABORATORY TEST RESULTS

WATER DEPTH: 29.0 m

SILTY CLAY (CL) - very soft, dark grey

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NOT FROZEN

+1

+0

0.1

0.2

0.4

0.6

+1.1

-0.5

0.4

+3.1

+2.4

+2.3

+1.5

+1.4

+0.5

+1.9

+0.2

	TD
	TD
	TD

JOB No.: 101-3841
DRILLING COMPLETED: 82/09/15
BOREHOLE DEPTH: 40.3 m (-69.3 m El.)
DRILLING RIG: S5000/MV BRODERICK
LOG COMPILED BY: DCC/JGC

LEGEND

SHEAR STRENGTH

+ Torvane • Fall Cone
* Min. Vane ▲ UU Triaxial
• Pilcon Vane ■ CU Triaxial

TEST IDENTIFICATION	
C Consolidation	T
DS Direct Shear	S
TO TOR	G

TION adial Shear Y Salinity s Analysis	BOREHOLE NUMBER SK 82 S13
	PAGE 1 OF 1

PAGE 1 OF 1

ENET RATIO
TEST
SK02C13

BOREHOLE LOG AND LABORATORY TEST RESULTS
CONE PENETRATION TEST DATA

LOCATION: SAUVRAK
UTM COORDINATES: 7 755 405 m N. 433 325 m E. **WATER DEPTH:** 28.9 m

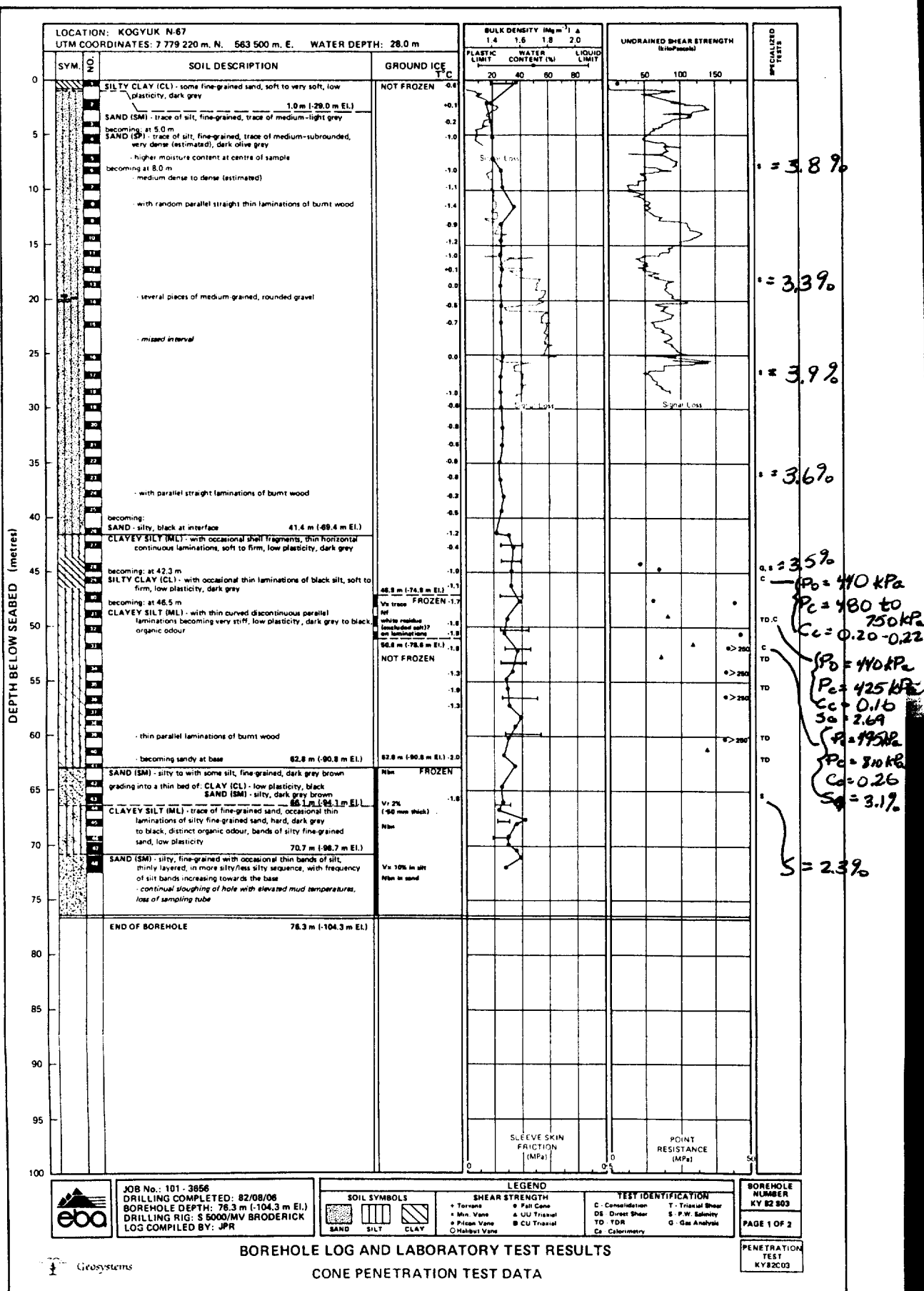
SYM.	NO.	SOIL DESCRIPTION	GROUND ICE T°C	BULK DENSITY ($Mg\ m^{-3}$)			UNDRAINED SHEAR STRENGTH (kPa)			SPECIALIZED TESTS
				PLASTIC LIMIT (%)	WATER CONTENT (%)	LIQUID LIMIT (%)	25	50	75	
	1	SILTY CLAY (CL) - soft becoming stiff with depth, low to medium plasticity, dark grey	-1.3							
	2	stiff	-1.8							
	3	hard, low plasticity	+2.3							
	4	becoming firm	+0.9							
	5	CLAYEY SILT (ML) - low plasticity, stiff, dark grey, trace of fibrous organic material	+0.6							TD
	6	11.0 m (-39.9 m El.)								
	7	SILTY CLAY (CL) - medium plasticity, soft to firm, dark grey	+3.7							
	8	14.3 m (-43.2 m El.)								
	9	silty, trace of fine sand, low plasticity, firm, trace of black organic material contained in the clay in horizontal bands	+1.8							
	10	SILT - some very fine-grained sand, slightly cohesive, dark grey, 19% sand	+0.7							
	11	21.2 m (-69.1 m El.)								
	12	trace of clay, slightly cohesive	+0.6							
	13	trace of clay, slightly cohesive	+2.4							TD
	14	30.0 m (-58.9 m El.)								
	15	SILTY CLAY (CL) - trace of fine sand, occasional thin layers of black organic clay with trace of shells, thin even parallel, horizontal laminae, stiff, dark grey	+0.7							
	16	silty, low plasticity, hard	+1.3							
	17	firm	+0.1							
	18	fissured, stiff	+0.2							
	19	END OF BOREHOLE								
	20	44.7 m (-73.6 m El.)								

DEPTH BELOW SEABED (metres): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

LEGEND

- SOIL SYMBOLS**
 - SAND: [Symbol]
 - SILT: [Symbol]
 - CLAY: [Symbol]
- SHEAR STRENGTH**
 - Terrane: [Symbol]
 - Min. Vane: [Symbol]
 - Pile-up Vane: [Symbol]
 - Fall Cone: [Symbol]
 - UU Triaxial: [Symbol]
 - CU Triaxial: [Symbol]
- TEST IDENTIFICATION**
 - C: Consolidation
 - DS: Direct Shear
 - TD: TDR
 - Ca: Calorimetry
 - T: Triaxial Shear
 - S P W: Salinity
 - G: Gas Analysis

BOREHOLE NUMBER: SK 82 514
PAGE 1 OF 1
PENETRATION TEST: SK82C14

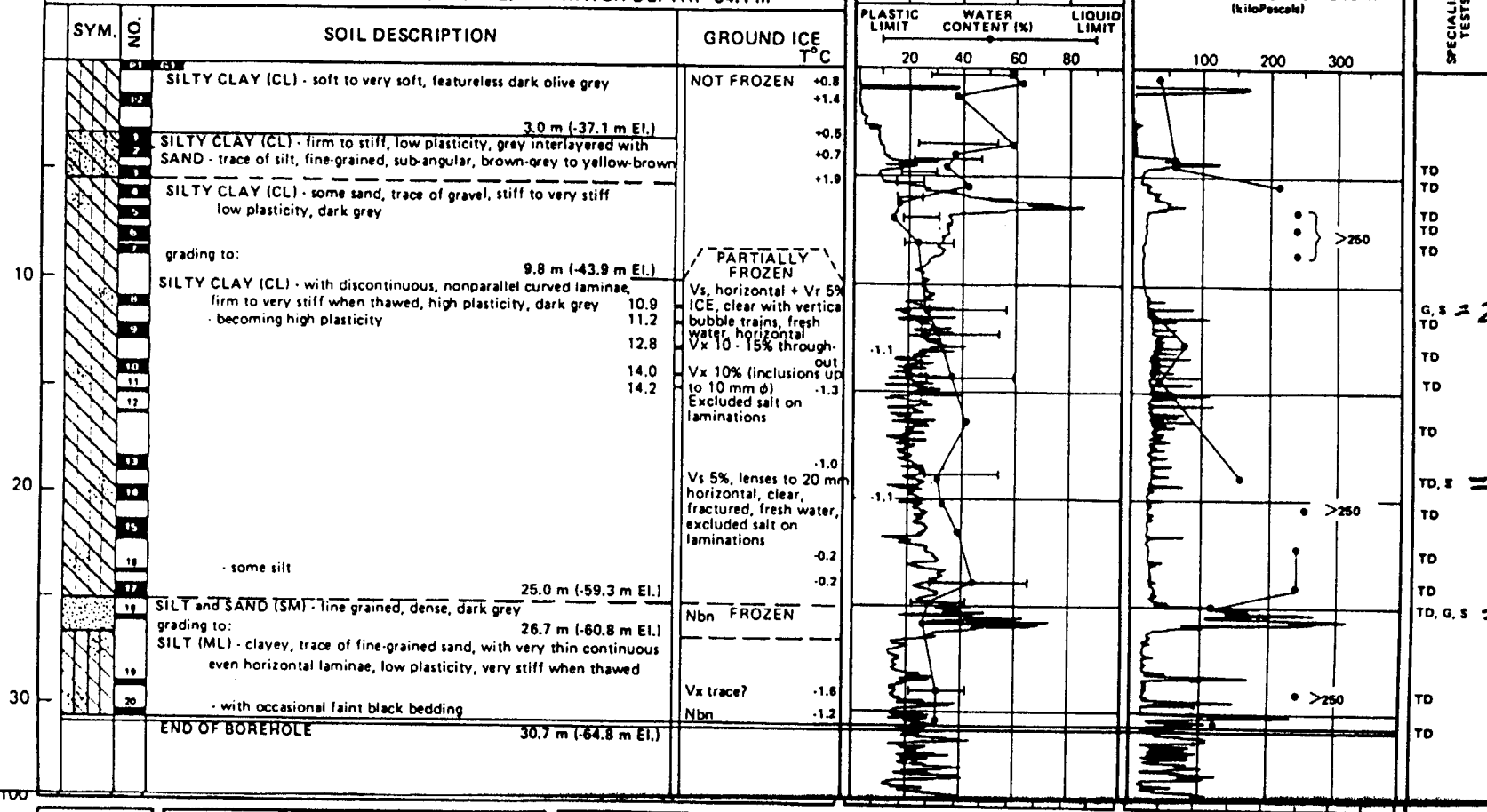


[illegible]

**PENETRATION
TEST**
KGB2C02

 Geosystems

LOCATION: KRINGALIK
UTM COORDINATES: 7 769 170 m N. 443 140 m E. WATER DEPTH: 34.1 m



JOB No.: 101 - 3658
DRILLING COMPLETED: 82/09/01
BOREHOLE DEPTH: 30.7 m (-64.8 m El.)
DRILLING RIG: S5000/MV BRODERICK
LOG COMPILED BY: JPR

SOIL SYMBOLS



LEGEND

SHEAR STRENGTH
+ Torvane
• Min. Vane
• Pilcon Vane
○ Malibu Vane
● Fall Cone
▲ UU Triaxial
■ CU Triaxial

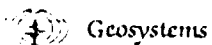
TEST IDENTIFICATION
C - Consolidation
DS - Direct Shear
TD - TOR
Ca - Calorimetry
T - Triaxial Shear
S - P.W. Salinity
G - Gas Analysis

BOREHOLE NUMBER
KR 82 S01

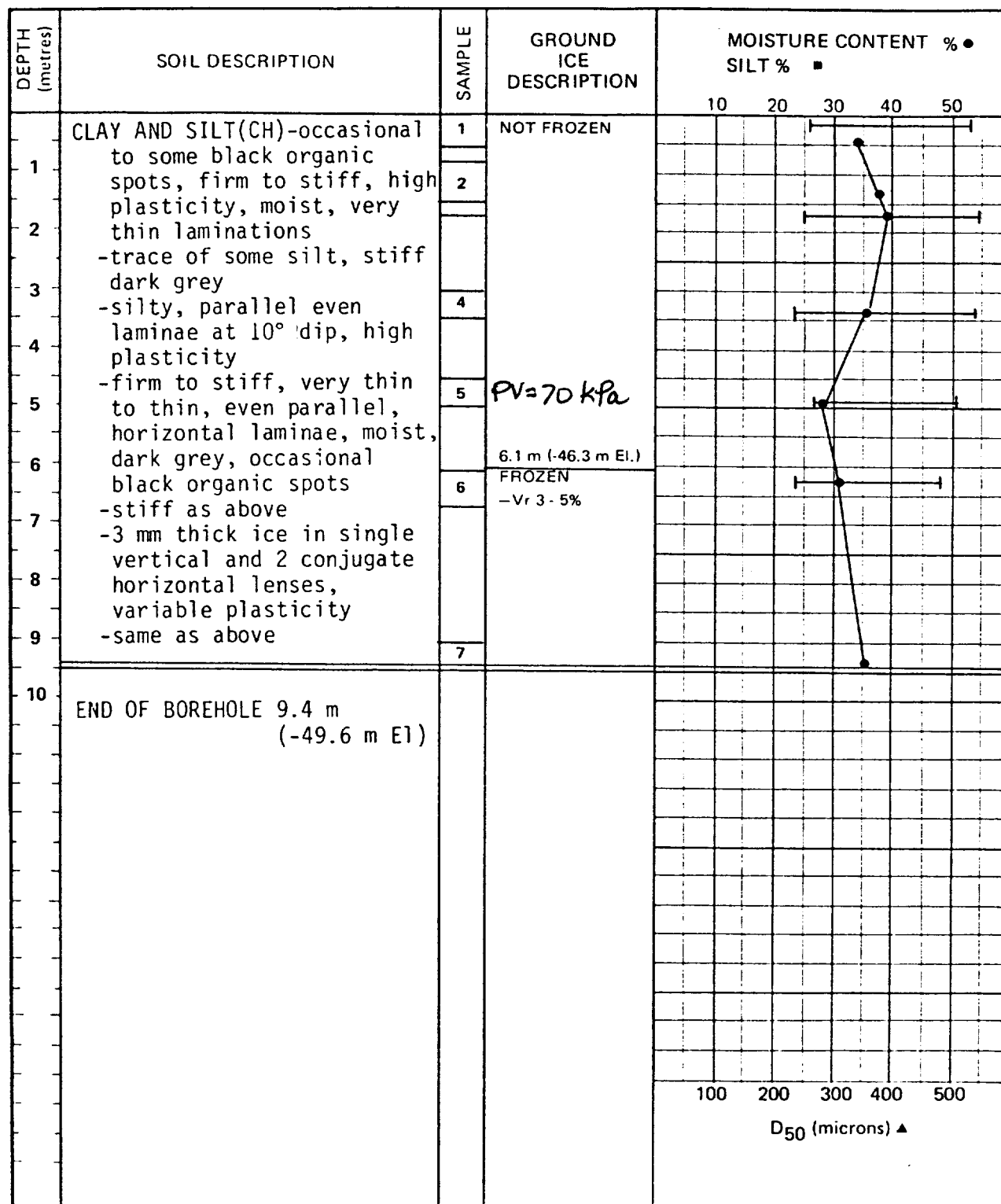
PAGE 2 OF 2

PENETRATION TEST
KR82C01

BOREHOLE LOG AND LABORATORY TEST RESULTS CONE PENETRATION TEST DATA



BOREHOLE LOG - OFFSHORE BORROW



WATER DEPTH (m) 40.2

DATE DRILLED 1982 09 29

BOREHOLE No.

COMPLETION DEPTH (m) 9.4

LOGGED BY JC

HB82S04

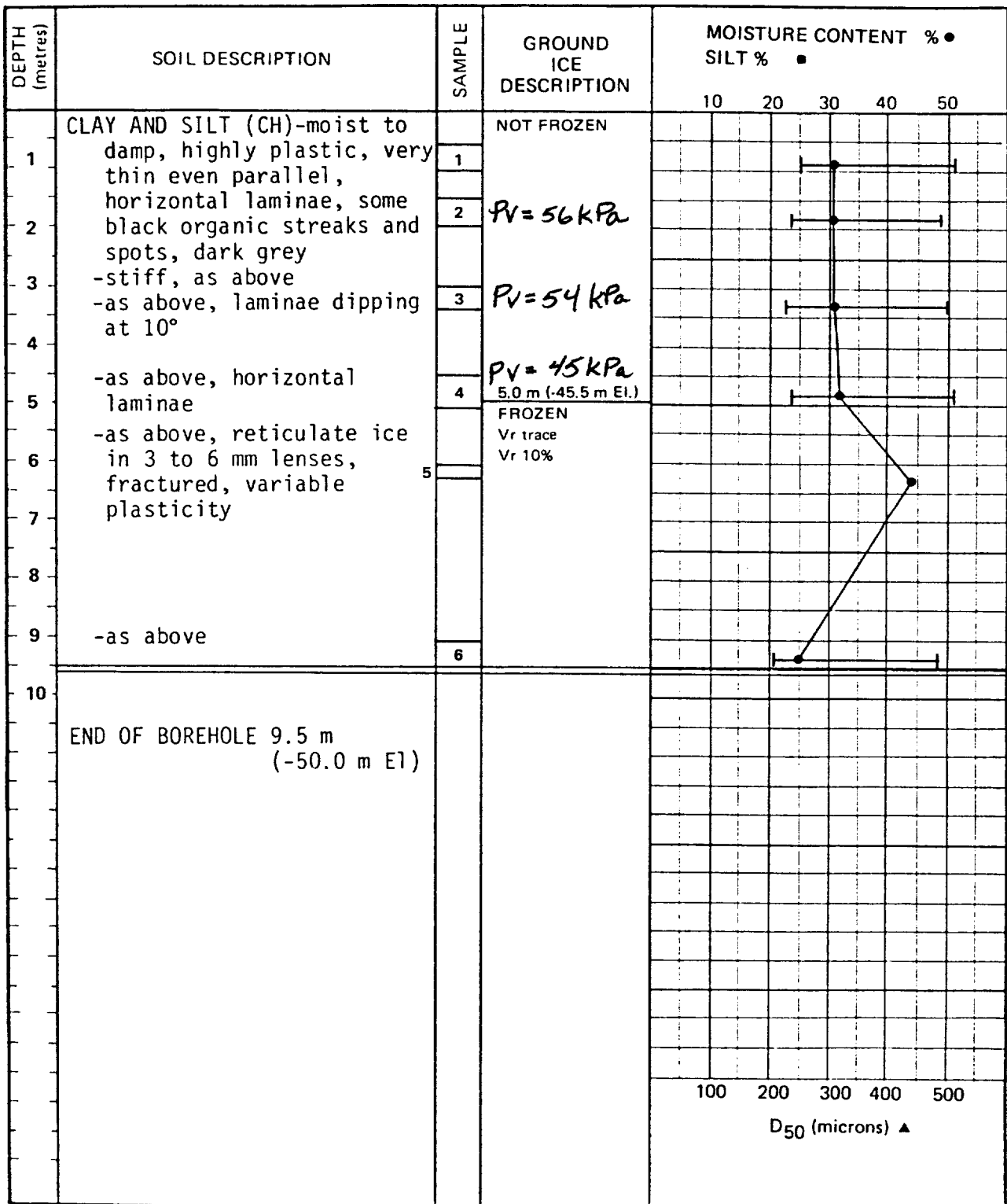
DRILLING RIG SIMCO 5000

LOCATION 7729650N 576260E

PAGE 1 OF 1

This log is a compilation of subsurface conditions and soil or rock classification obtained from the field as well as from laboratory testing of samples from the boreholes. Soil zones have been interpreted according to commonly accepted practice. The change from one zone to another, as indicated on the log, may be transitional and approximate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, geologic conditions, and construction activity.

BOREHOLE LOG – OFFSHORE BORROW



WATER DEPTH (m) 40.5

COMPLETION DEPTH (m) 9.5

DRILLING RIG SIMCO 5000

DATE DRILLED 1982 09 29/30

LOGGED BY JC

LOCATION 7729700N 576260E

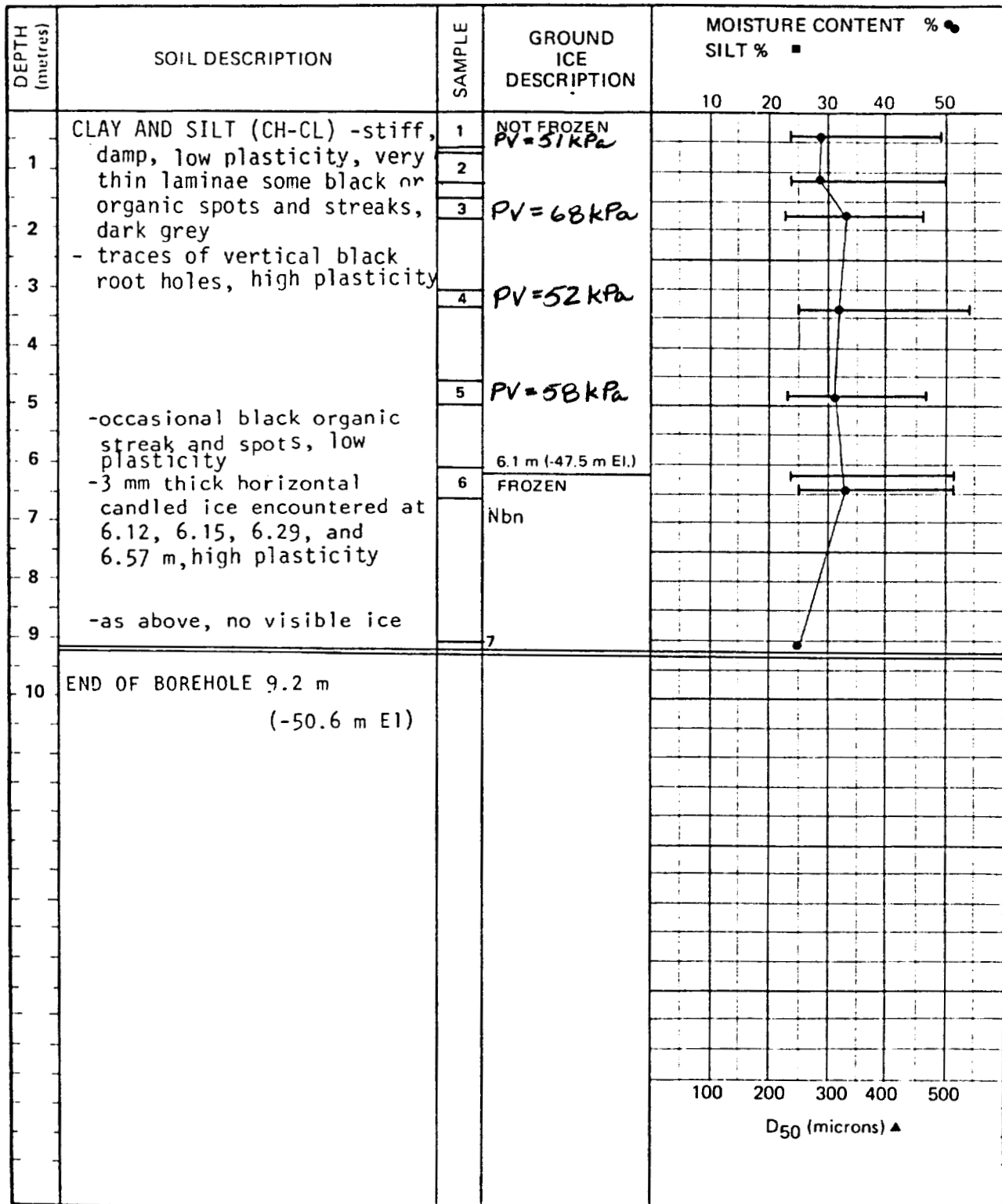
BOREHOLE No.

HB82S05

PAGE 1 OF 1

This log is a compilation of subsurface conditions and soil or rock classification obtained from the field as well as from laboratory testing of samples from the boreholes. Soil zones have been interpreted according to commonly accepted practice. The change from one zone to another, as indicated on the log, may be transitional and approximate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, geologic conditions, and construction activity.

BOREHOLE LOG – OFFSHORE BORROW



WATER DEPTH (m)	41.4	DATE DRILLED	1982 09 30
COMPLETION DEPTH (m)	9.2	LOGGED BY	JC
DRILLING RIG	SIMCO 5000	LOCATION	7729750N 576260E

BOREHOLE No.
HB82S06

PAGE 1 OF 1

This log is a compilation of subsurface conditions and soil or rock classification obtained from the field as well as from laboratory testing of samples from the boreholes. Soil zones have been interpreted according to commonly accepted practice. The change from one zone to another, as indicated on the log, may be transitional and approximate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, ground conditions, and construction activity.

BOREHOLE LOG – OFFSHORE BORROW

DEPTH (metres)	SOIL DESCRIPTION	SAMPLE	GROUND ICE DESCRIPTION	MOISTURE CONTENT %				
				SILT % ■				
				10	20	30	40	50
1	CLAY AND SILT (CL) -stiff, variable plasticity, moist, very thin even parallel horizontal laminae some black organic spots and streaks, dark grey	1	NOT FROZEN					
		2	PV = 55 kPa					
		3	PV = 58 kPa					
		4	PV = 44 kPa					
		5	PV = 48 kPa					
7	-no recovery							
8	END OF BOREHOLE 7.6 m (-48.1 m El)							

MOISTURE CONTENT %

SILT % ■

10 20 30 40 50

100 200 300 400 500

D₅₀ (microns) ▲



WATER DEPTH (m) 40.5

DATE DRILLED 1982 09 30

COMPLETION DEPTH (m) 7.6

LOGGED BY JC

DRILLING RIG SIMCO 5000

LOCATION 7729800N 576260E

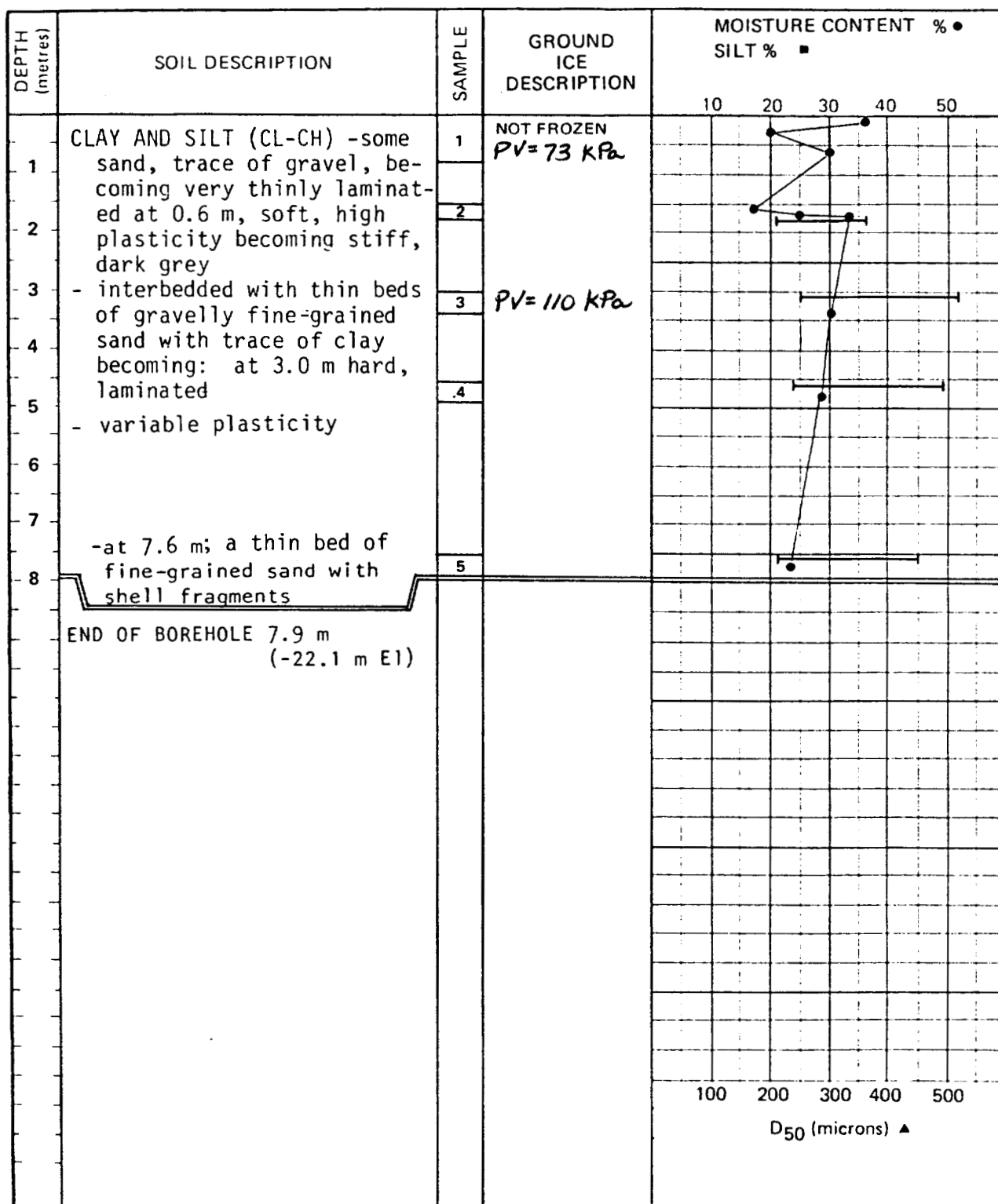
BOREHOLE No

HB82S07

PAGE 1 OF 1

This log is a compilation of subsurface conditions and soil-rock classification obtained from the field as well as from laboratory testing of samples from the bore holes. Soil zones have been integrated according to commonly accepted practice. The change from one zone to another as indicated on the log may be transitional and does not indicate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, geologic conditions, and construction activities.

BOREHOLE LOG – OFFSHORE BORROW



WATER DEPTH (m) 14.2

DATE DRILLED 1982 09 30

COMPLETION DEPTH (m) 7.9

LOGGED BY JPR/MJ

DRILLING RIG SIMCO 5000

LOCATION 7717920N 585250E

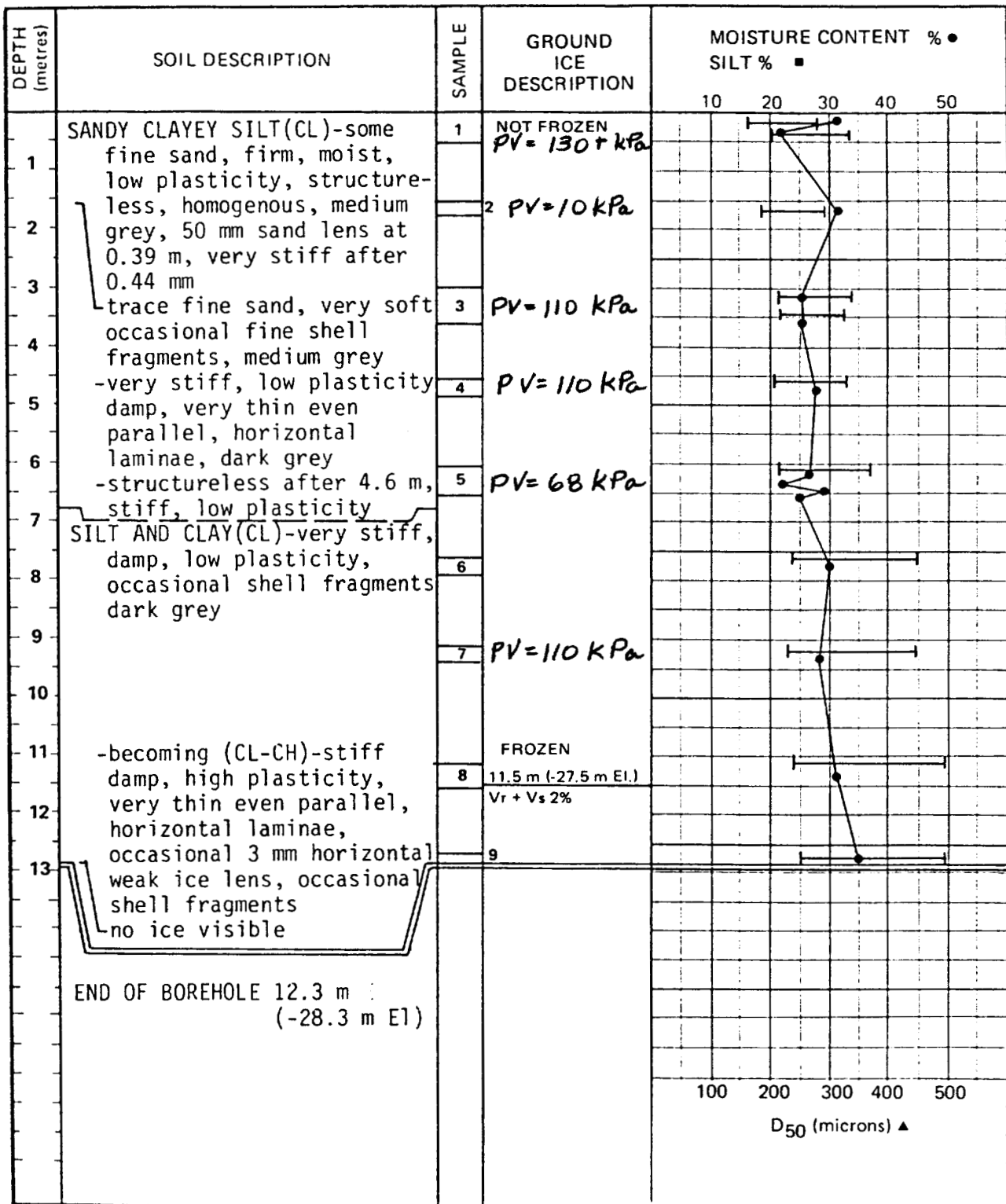
BOREHOLE No.

HB82S08

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This log is a compilation of subsurface conditions and soil or rock classification obtained from the field as well as from laboratory testing of samples from the boreholes. Soil values have been interpreted according to commonly accepted practice. The change from one value to another is indicated on the log, may be transitional and approximate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, seasonal conditions and construction activity.

BOREHOLE LOG – OFFSHORE BORROW

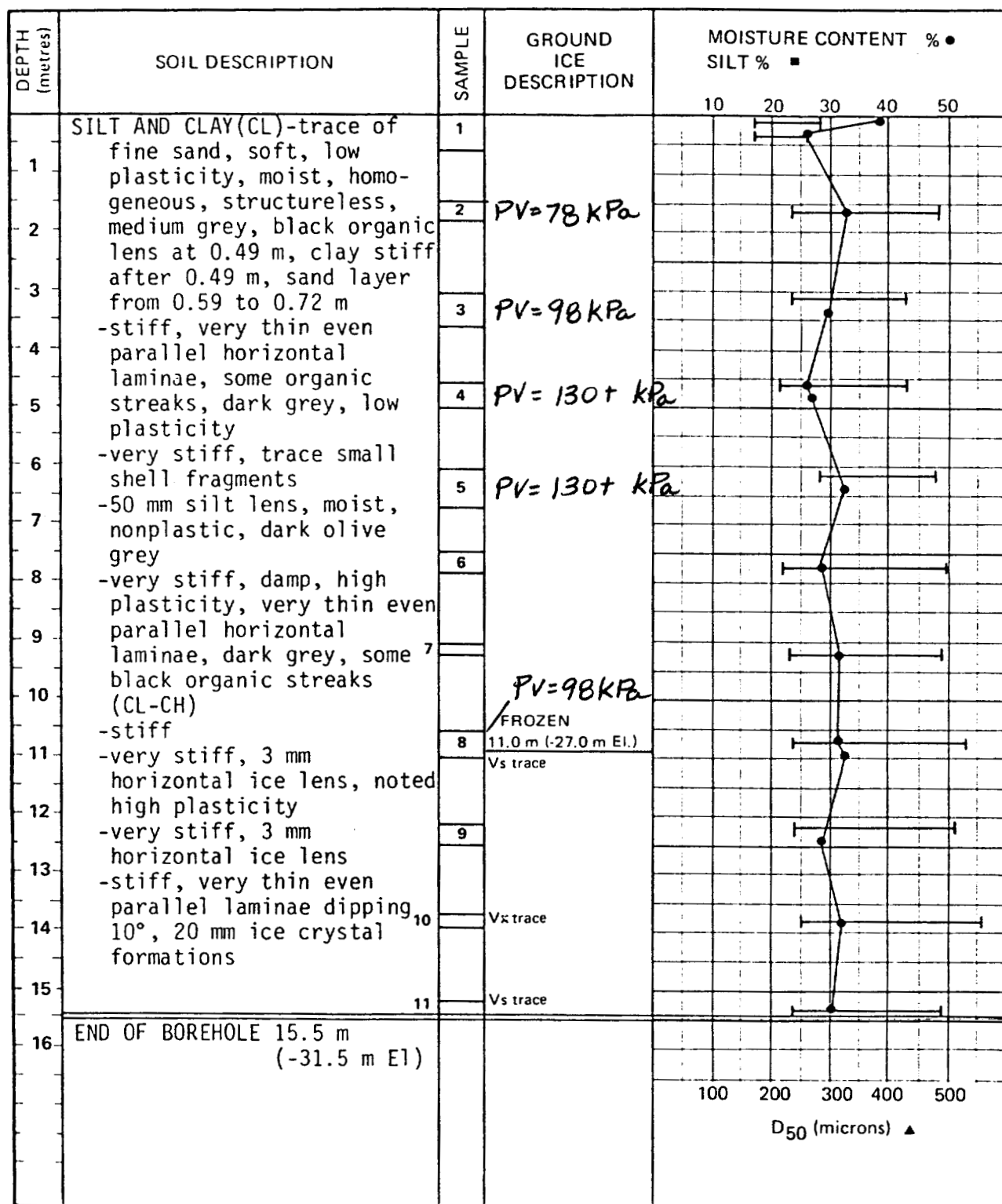


WATER DEPTH (m)	16.0	DATE DRILLED	1982 09 30
COMPLETION DEPTH (m)	12.3	LOGGED BY	JCC
DRILLING RIG	SIMCO 5000	LOCATION	7714770N 5885338E

BOREHOLE No.	HB82S09
PAGE 1 OF 1	

This log is a compilation of subsurface conditions and soil or rock classification obtained from the field as well as from laboratory testing of samples from the boreholes. Soil zones have been interpreted according to commonly accepted practice. The change from one zone to another, as indicated on the log, may be transitional and approximate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, geologic conditions, and construction activity.

BOREHOLE LOG – OFFSHORE BORROW



WATER DEPTH (m) 16.0

DATE DRILLED 1982 10 01

BOREHOLE No

COMPLETION DEPTH (m) 15.5

LOGGED BY JCC

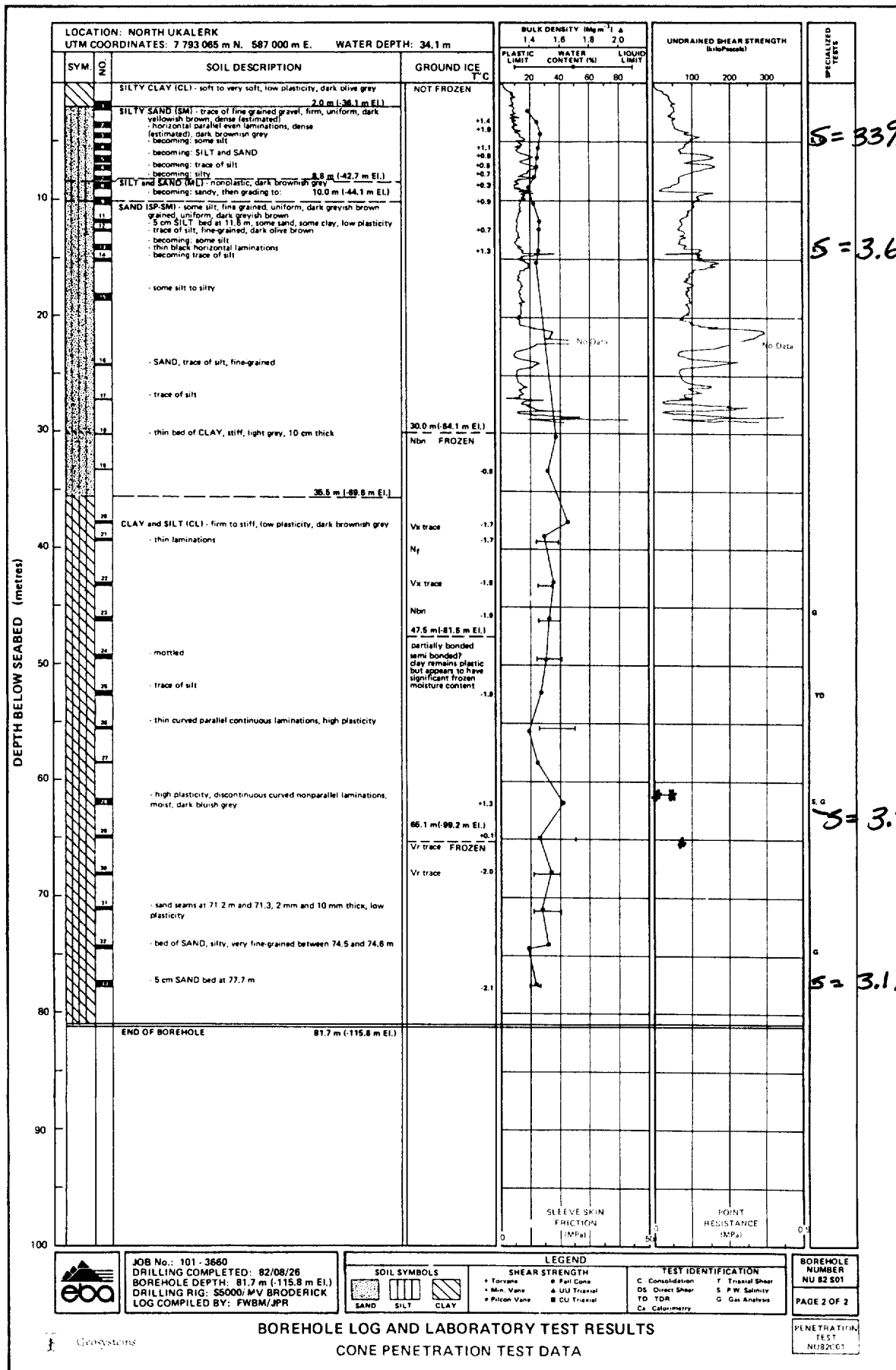
HB82S10

DRILLING RIG SIMCO 5000

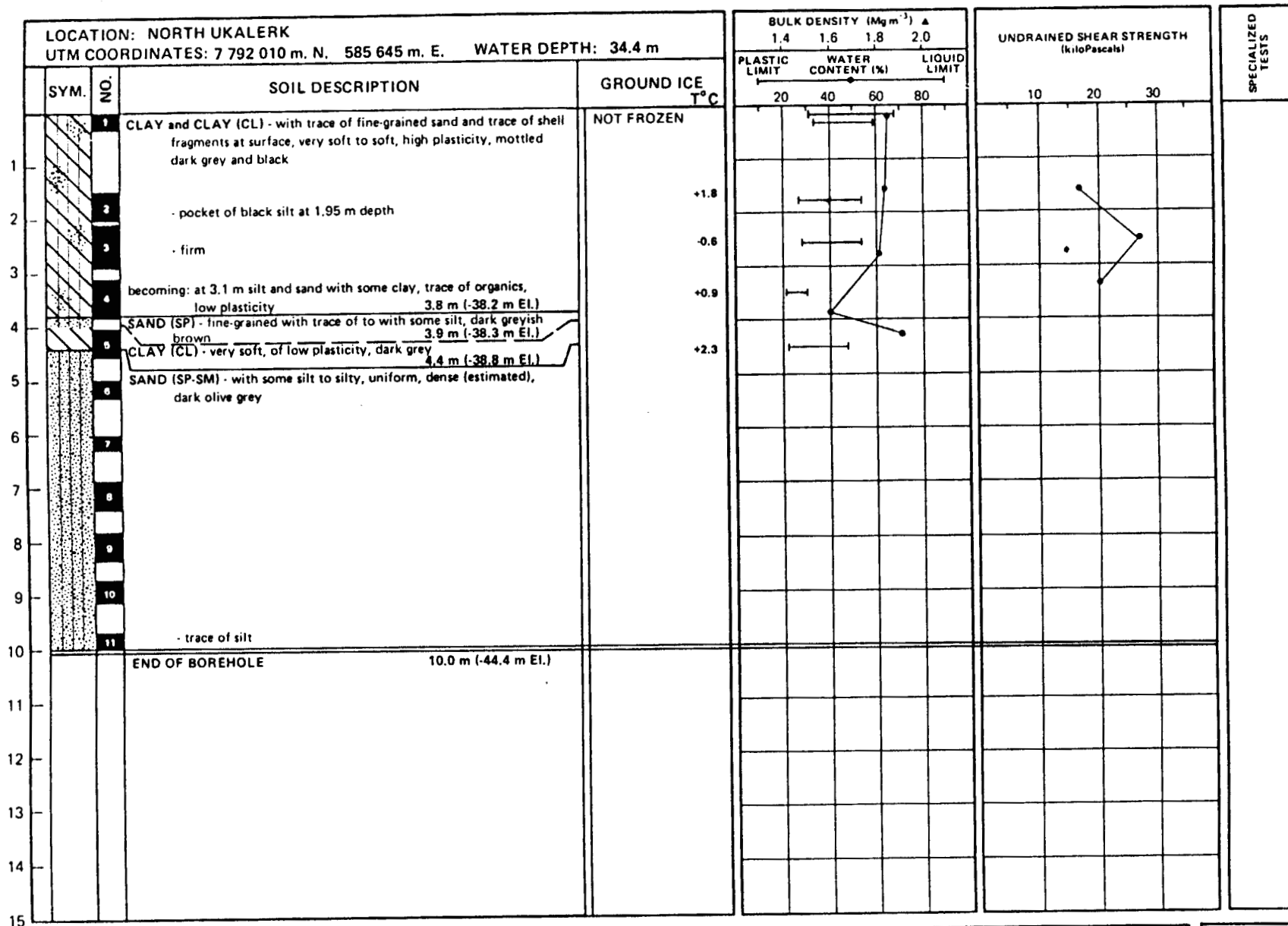
LOCATION 7714690N 588475E

PAGE 1 OF 1

This log is a compilation of subsurface conditions and soil or rock classification obtained from the field as well as from laboratory testing of samples from the boreholes. Soil zones have been interpreted according to commonly accepted practice. The change from one soil to another as indicated on the log, may be transitional and approximate in nature. Groundwater conditions refer only to those observed at the times and places indicated and that may vary with time, geologic conditions, and construction activity.



DEPTH BELOW SEABED (metres)



JOB No.: 101 - 3660
 DRILLING COMPLETED: 82/09/02
 BOREHOLE DEPTH: 10.0 m (-44.4 m El.)
 DRILLING RIG: S5000/MV BRODERICK
 LOG COMPILED BY: JPR

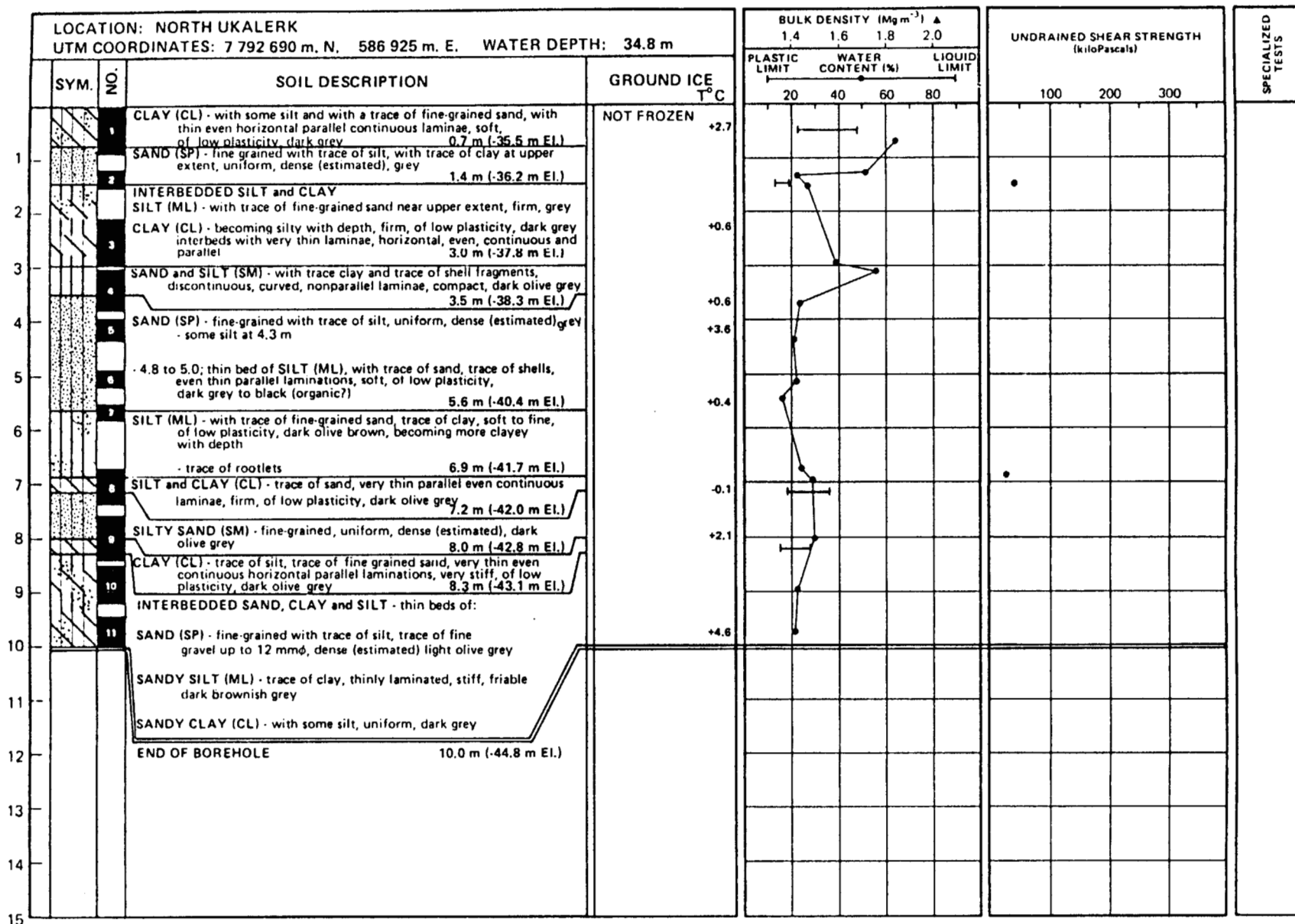
LEGEND			
SOIL SYMBOLS		SHEAR STRENGTH	
	SAND		Fall Cone
	SILT		UU Triaxial
	CLAY		CU Triaxial
	Torvane		Direct Shear
	Min. Vane		TD
	Pilcon Vane		Ca

TEST IDENTIFICATION	
C	Consolidation
DS	Direct Shear
TD	TDR
Ca	Calorimetry
T	Triaxial Shear
S	P.W. Salinity
G	Gas Analysis

BOREHOLE NUMBER
 NU 82 S02
 PAGE 1 OF 1

BOREHOLE LOG AND LABORATORY TEST RESULTS

DEPTH BELOW SEABED (metres)



JOB No.: 101 - 3660
DRILLING COMPLETED: 82/08/03
BOREHOLE DEPTH: 10.0 m (-44.2 m El.)
DRILLING RIG: S5000/MV BRODERICK
LOG COMPILED BY: JPR/MJRW

SOIL SYMBOLS



LEGEND

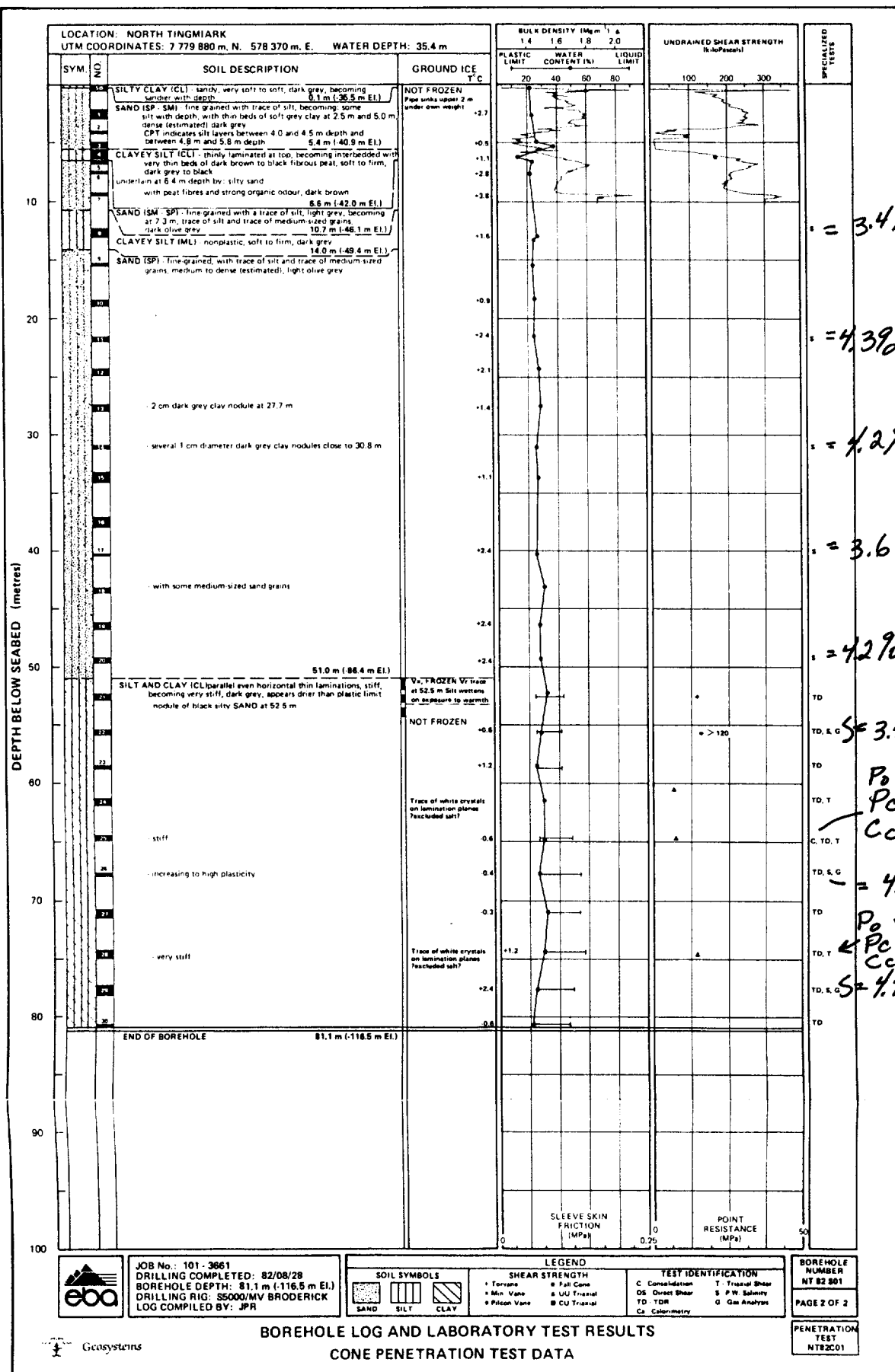
SHEAR STRENGTH
+ Torvane
x Min. Vane
• Pilcon Vane
● Fall Cone
● UU Triaxial
■ CU Triaxial

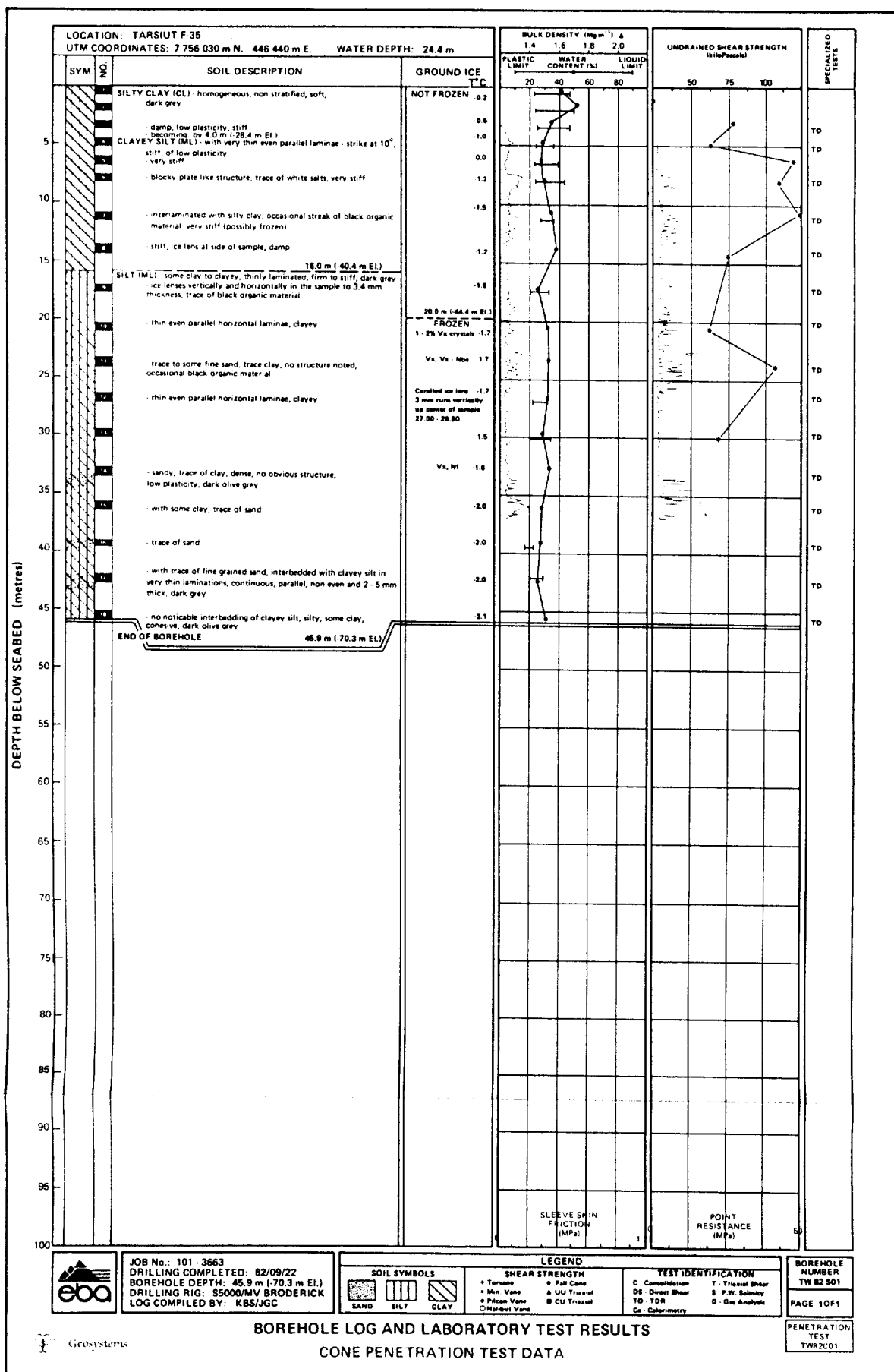
TEST IDENTIFICATION
C Consolidation
DS Direct Shear
TD TOR
Ca Calorimetry
T Triaxial Shear
S P.W. Salinity
G Gas Analysis

BOREHOLE NUMBER
NU 82 S03

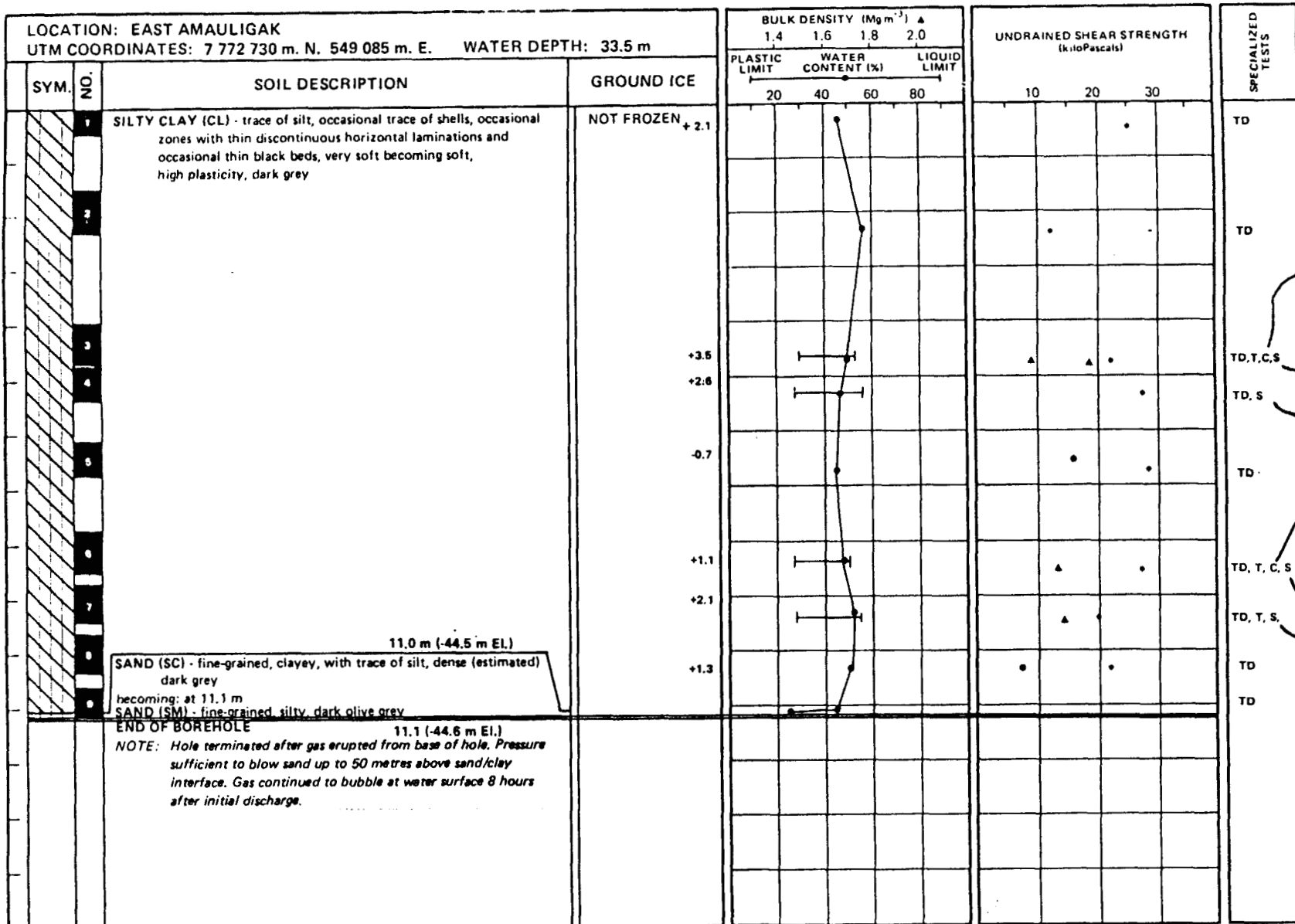
PAGE 1 OF 1

BOREHOLE LOG AND LABORATORY TEST RESULTS





DEPTH BELOW SEABED (metres)

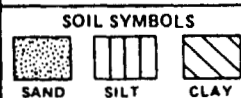


$P_0 = 35 \text{ kPa}$
 $P_c = 35 \text{ kPa}$
 $C_c = 0.27$
 $S_a = 2.74$
 $S = 3.29\%$
 $S = 3.39\%$

$P_0 = 75 \text{ kPa}$
 $P_c = 80 \text{ kPa}$
 $C_c = 0.25$
 $S_a = 2.69$
 $S = 3.49\%$
 $S = 3.29\%$



JOB No.: 101 - 3685
 DRILLING COMPLETED: 82/09/05
 BOREHOLE DEPTH: 11.1 (-44.6 m EL.)
 DRILLING RIG: S/5000 MV/BRODERICK
 LOG COMPILED BY: JPR



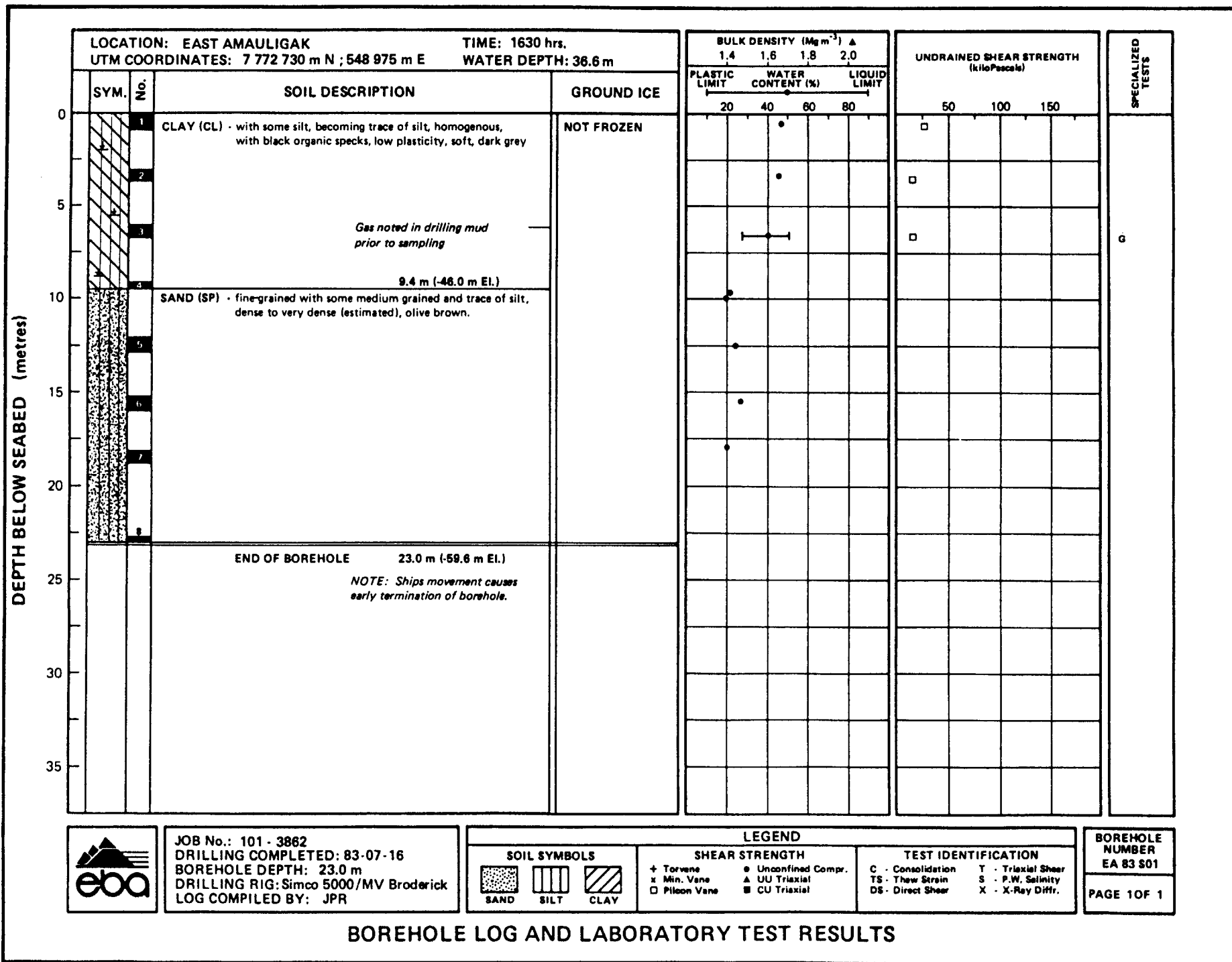
LEGEND
SHEAR STRENGTH
 + Torvane ● Fall Cone
 x Min. Vane ▲ UU Triaxial
 e Pilcon Vane ■ CU Triaxial
 ○ Halibut Vane

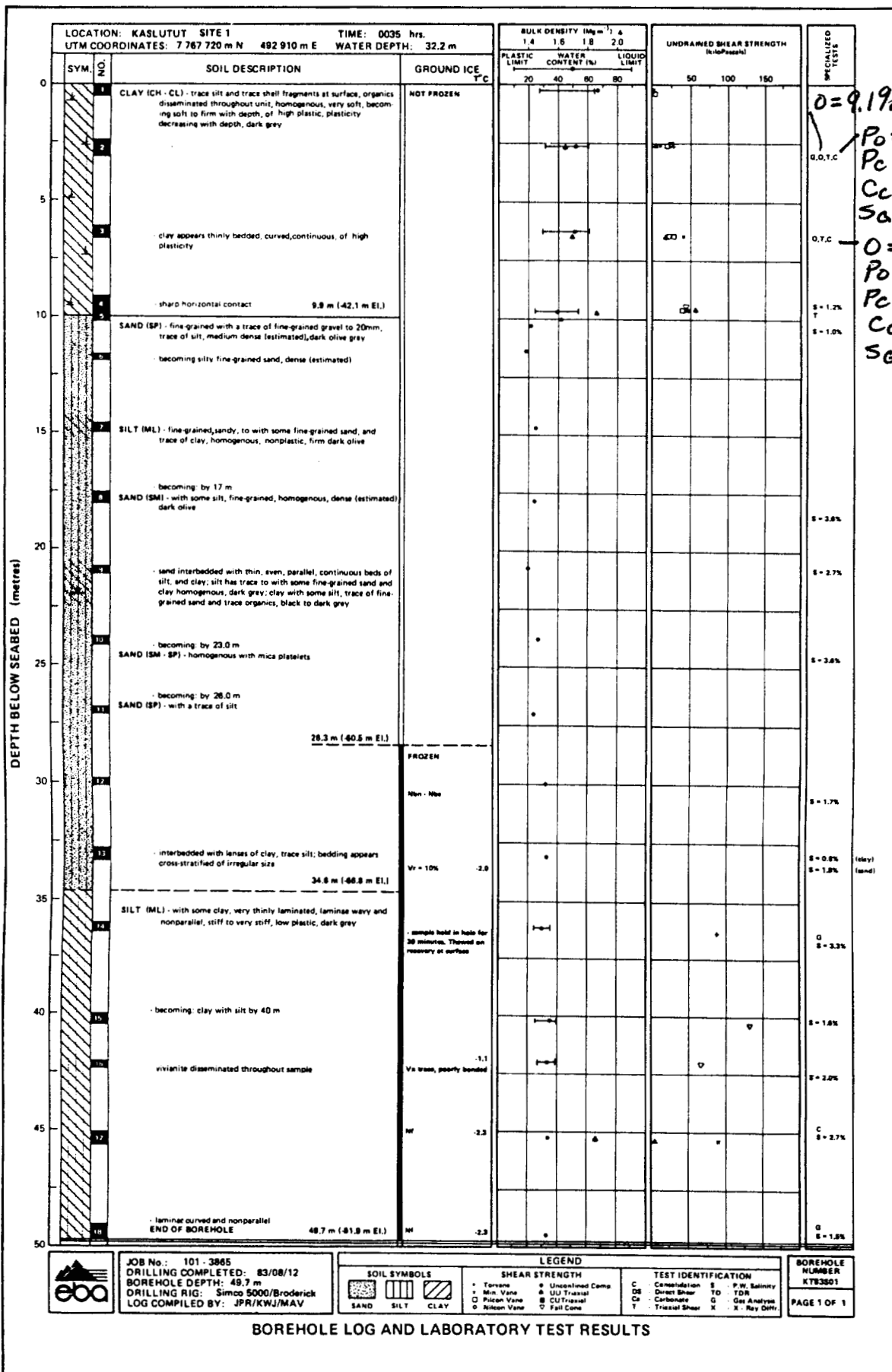
TEST IDENTIFICATION
 C - Consolidation T - Triaxial Shear
 DS - Direct Shear S - P.W. Salinity
 TD - TDR G - Gas Analysis
 Ca - Calorimetry

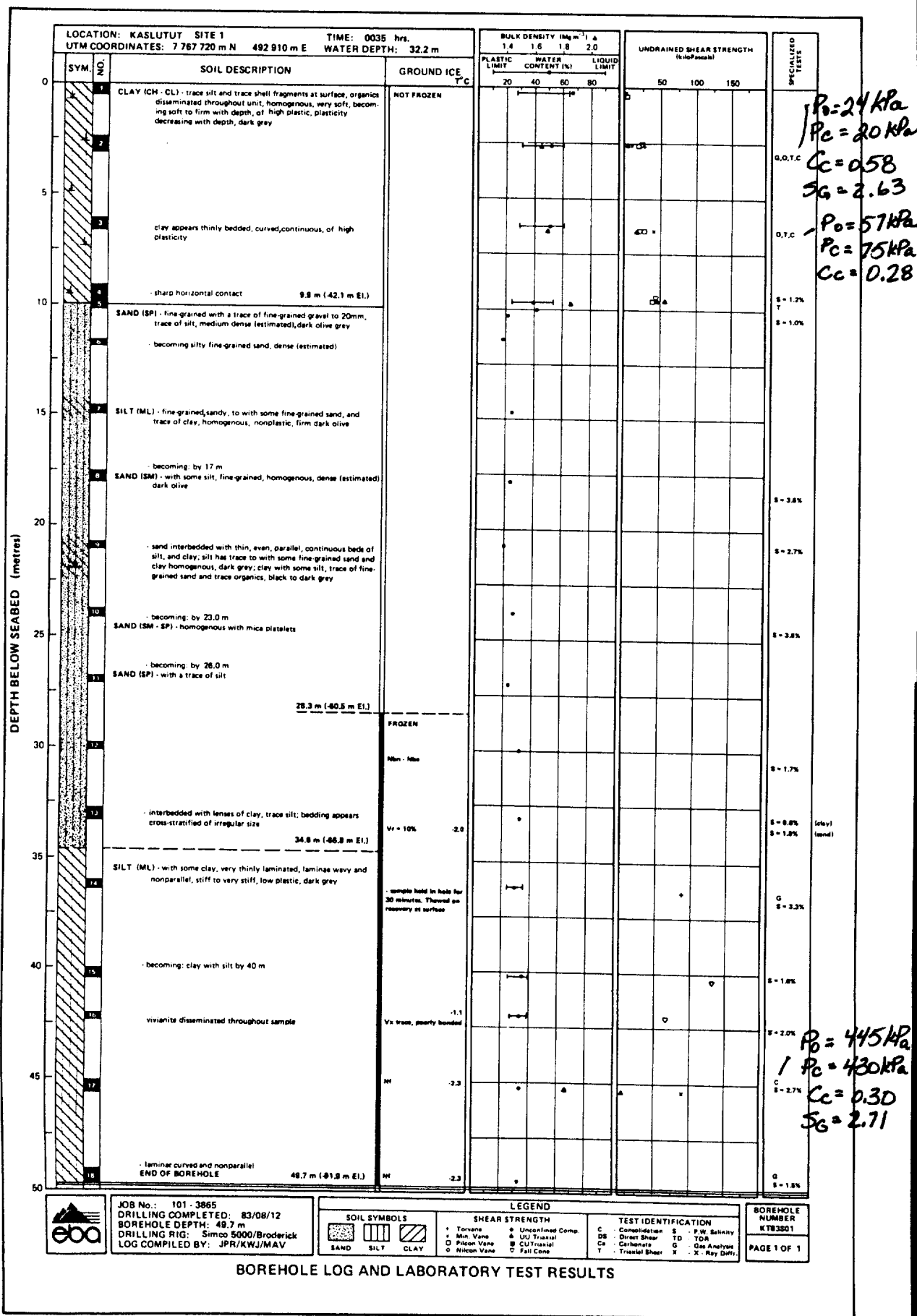
BOREHOLE NUMBER
 EA 82 S01

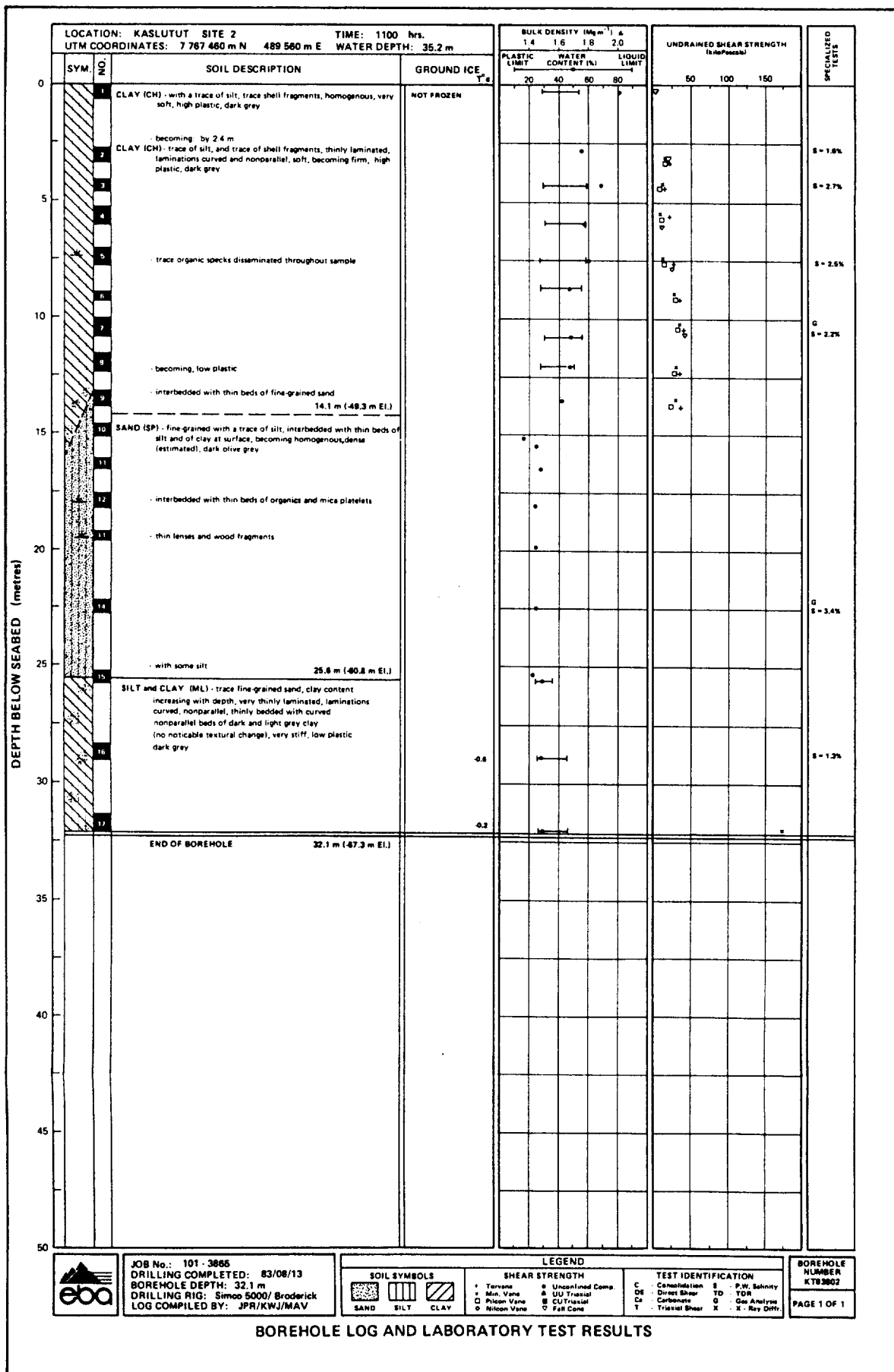
PAGE 1 OF 1

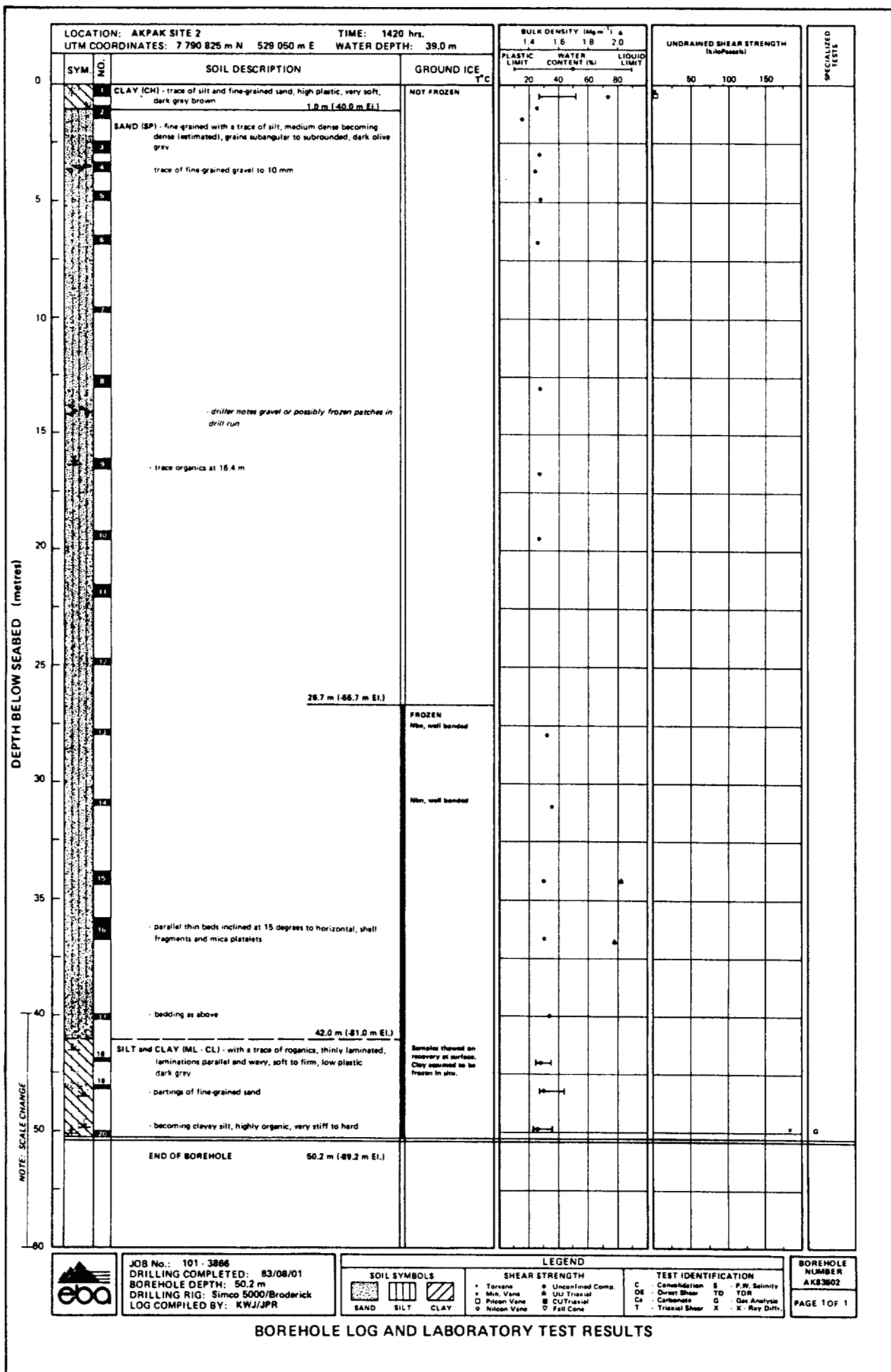
BOREHOLE LOG AND LABORATORY TEST RESULTS

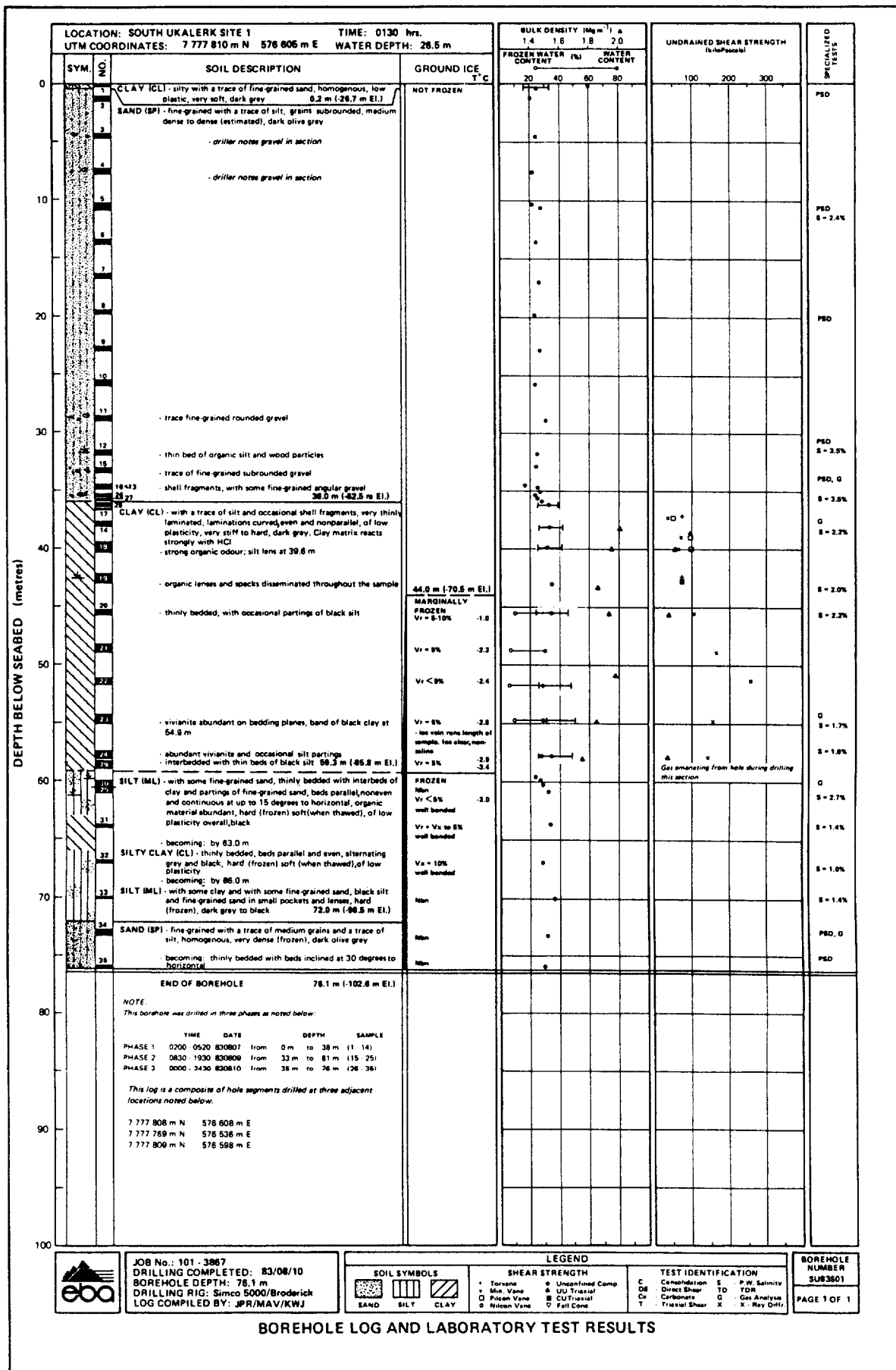


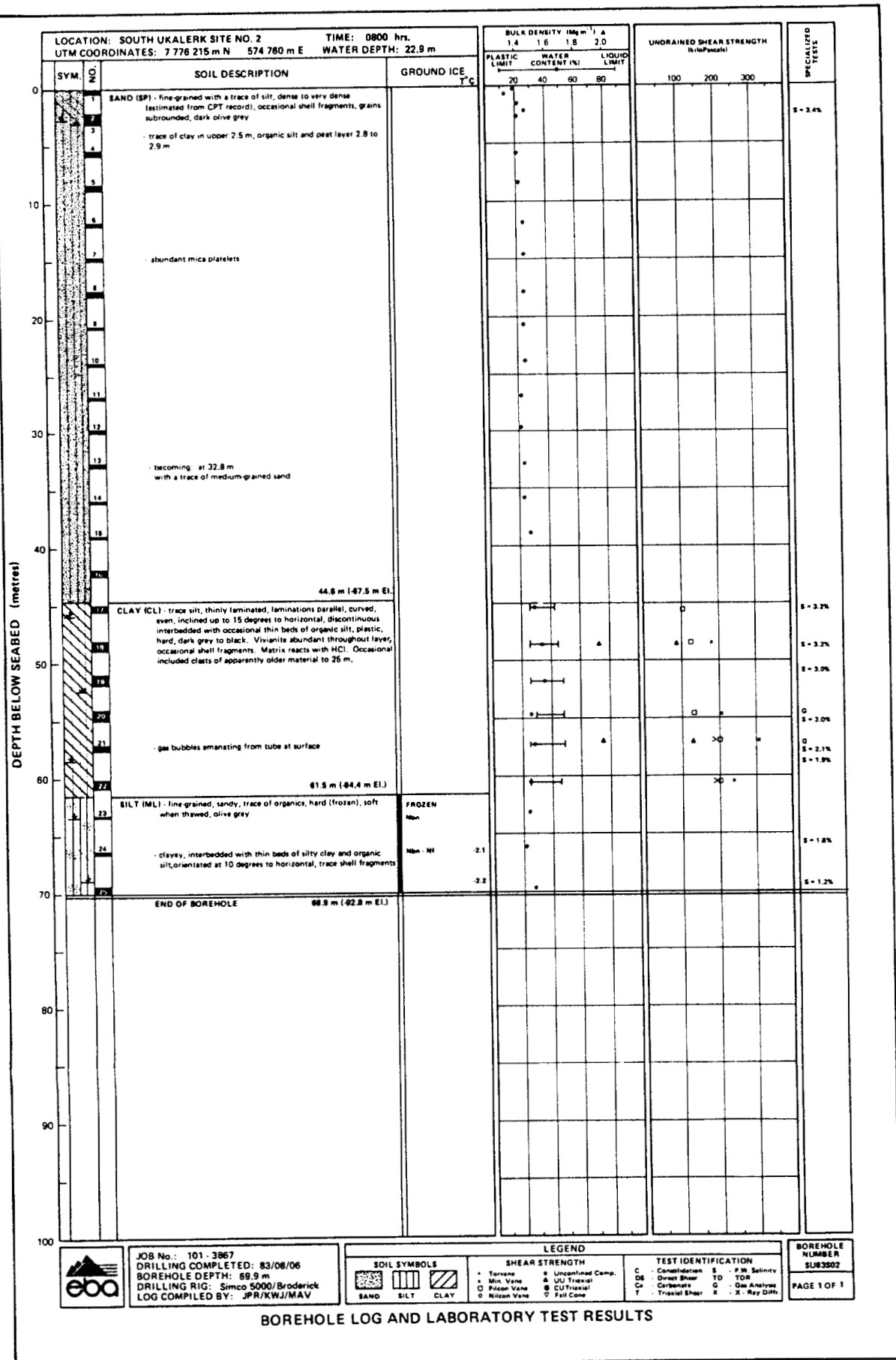


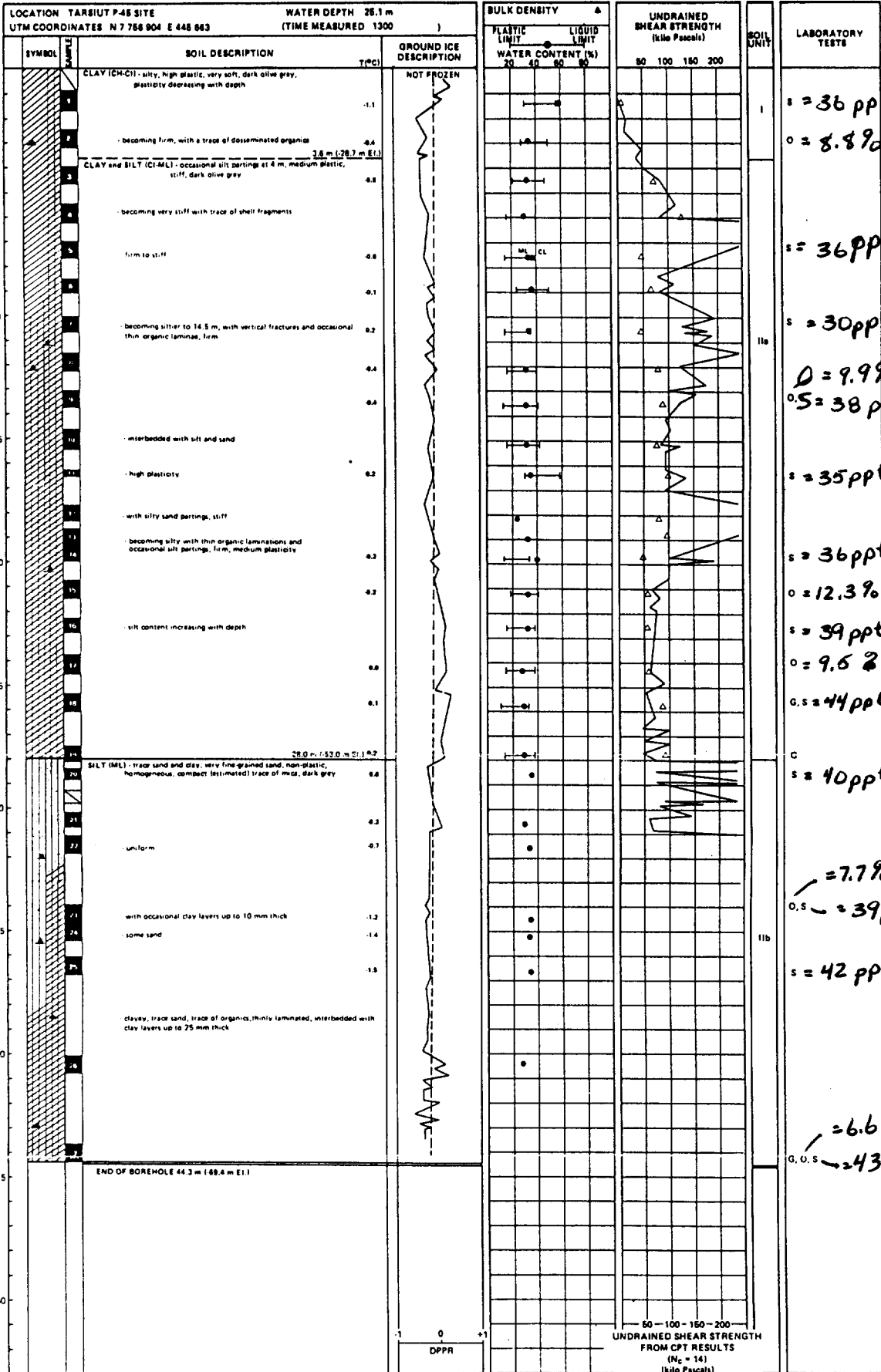










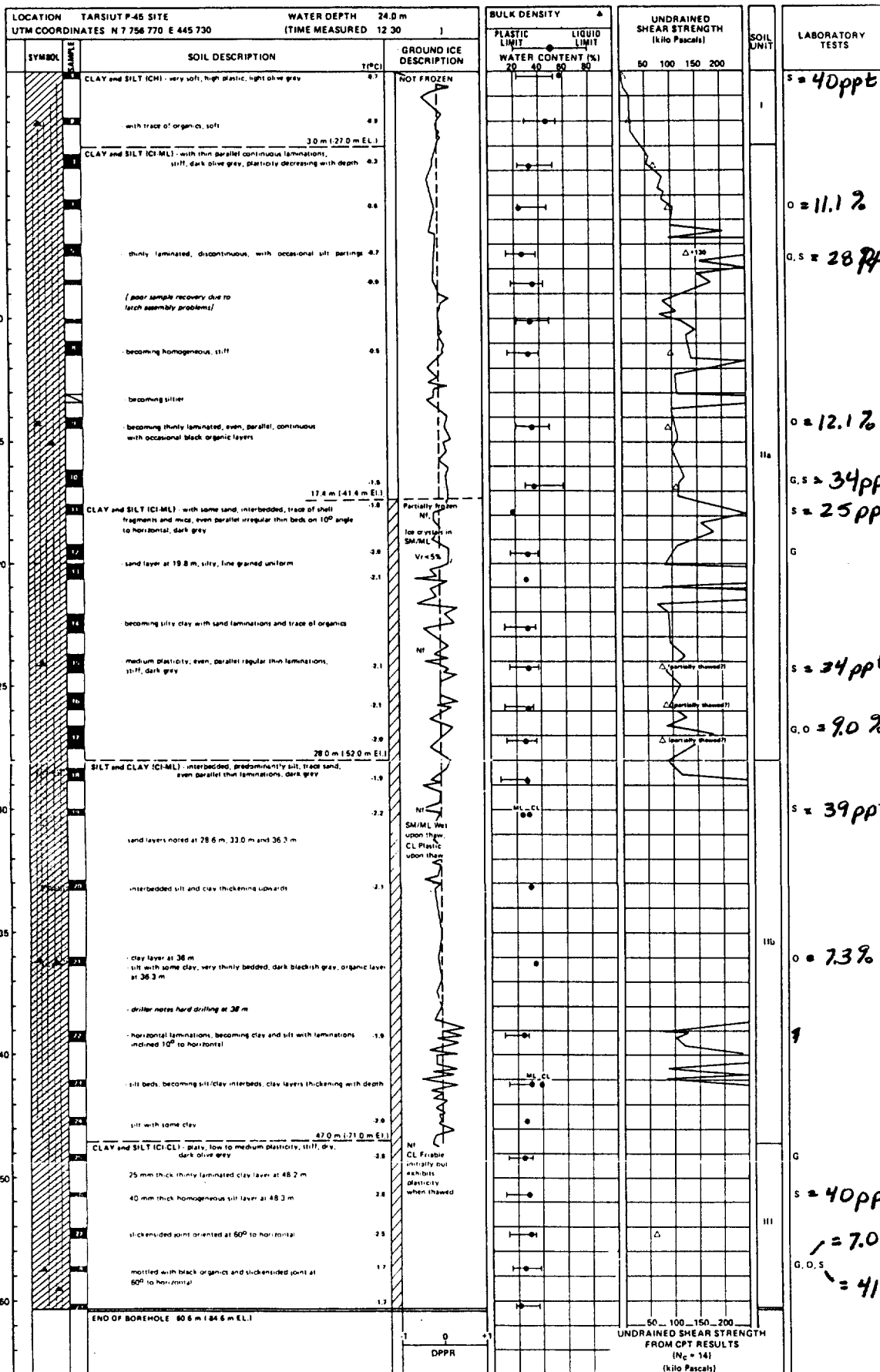


PROJECT NUMBER 101C-0098 DRILLING COMPLETED 8/AUG/84 TERMINATION DEPTH 44.3 m DRILLING RIG SIMCO 5000 (KIGQIAK) LOG COMPILED BY PMR/KWJ/MAV	SOIL SYMBOLS Gravel Sand Silt Clay	SAMPLE TYPE Thin Wall Tube Split Spoon Liner Core Disturbed No Recovery	SHEAR STRENGTH + Torvane x Mini Vane Δ Vane Vane ○ In Situ Vane ▲ UU Triaxial ▽ Fall Cone	TEST IDENTIFICATION C Consolidation TS Triaxial Shear DS Direct Shear OSS Direct Simple Shear P.M. Salinity Q Cw Analysis O Organic	BOREHOLE NUMBER TDB45101 PAGE 1 OF 1
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TARSUUT P-45 SITE

EDA Engineering Consultants Ltd.





PROJECT NUMBER 101C-4098
 DRILLING COMPLETED 03/AUG/84
 TERMINATION DEPTH 50.6 m
 DRILLING RIG SIMCO 5000 (KIGIAKI)
 LOG COMPILED BY PMR/KWJ/MAV

SOIL SYMBOLS	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
Gravel	Thin Wall Tube	+ Torvex	C Consolidation	TDB45112
Sand	Split Spoon	x Mini Vane	TS Shear Stress	
Silt	Core	Δ UU Triaxial	DS Direct Shear	
Clay	Disturbed	▽ Fall Cone	S P.W. Salinity	
	No Recovery	Δ Picon Vane	G Gas Analysis	
		Φ In Site Vane	DSS Direct Simple Shear	
			O Organic	

TARSUPT P-45 SITE

EDA Engineering Consultants Ltd.



DEPTH BELOW SEABED (metres)

LOCATION: HERSCHEL ISLAND BASIN UTM COORDINATES: 7 715 887 m N 578 482 m E			TIME: 0100 HRS. 29/JULY/84 WATER DEPTH: 18.1 m		BULK DENSITY ($Mg\ m^{-3}$) ▲ 1.4 1.6 1.8 2.0			UNDRAINED SHEAR STRENGTH (kiloPascals)			SPECIALIZED TESTS
SYM.	No.	SOIL DESCRIPTION	GROUND ICE T(°C)		PLASTIC LIMIT	WATER CONTENT (%)	LIQUID LIMIT	50	100	150	
					20	40	60	80			
0	1	CLAY (Cl) - trace silt, very soft, homogeneous, dark grey	NOT FROZEN	-1.2					X		
	2			-0.8					X		
2	3			-0.8					X		
	4			-1.5					X		
	5			-1.0					X		
4	6								X		
	7	[Driller noted slightly stiffer material]		-0.6					X		
6	8	- occasional shell fragments less than 1 mm		-0.2					X		
	9										
8	10	- occasional black organic streaks		-1.0					X		
	11	- disseminated specks of organics, less than 1 %									
10	12	- becoming soft		-1.0					X		
	13										
12	14	- becoming with some silt, faint laminations, - shell fragments, disseminated organics up to 15%		-0.9					X		
14		- homogeneous		-1.0					X		
16		END OF BOREHOLE 14.2 m (-32.3 m EL.)									

JOB No.: 101C - 4101
 DRILLING COMPLETED: 29/JULY/84
 BOREHOLE DEPTH: 14.2 m
 DRILLING RIG: SIMCO 5000(KIGGIAK)
 LOG COMPILED BY: JPR/PMR

SOIL SYMBOLS

SAND	SILT	CLAY

LEGEND

SHEAR STRENGTH

+ Torvane	● Unconfined Compr.
X Min. Vane	▲ UU Triaxial
□ Picon Vane	■ CU Triaxial

TEST IDENTIFICATION

C - Consolidation	T - Triaxial Shear
TS - Thaw Strain	S - P.W. Salinity
DS - Direct Shear	

BOREHOLE
NUMBER
HI84 S01

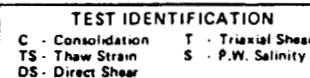
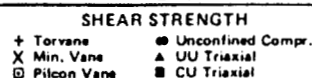
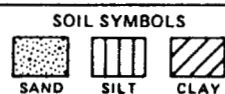
PAGE 1 OF 1

DEPTH BELOW SEABED (metres)

LOCATION: HERSCHEL ISLAND BASIN UTM COORDINATES: 7 715 887 m N 578 485 m E			TIME 0630 HRS 29/JUL/84 WATER DEPTH: 17.9 m		BULK DENSITY (Mg m ⁻³) ▲ 1.4 1.6 1.8 2.0				UNDRAINED SHEAR STRENGTH (kiloPascals)			SPECIALIZED TESTS	
SYM.	No.	SOIL DESCRIPTION	GROUND ICE T(°C)		PLASTIC LIMIT WATER CONTENT (%) LIQUID LIMIT								
					20	40	60	80	50	100	150		
	1	CLAY (CI) - trace of silt and organics, homogeneous, very soft, medium plastic, very dark olive grey - occasional shell fragments - high plastic	NOT FROZEN	-1.6									
	2			-1.5						X			
	3			-1.3									
	4												
	5			-0.6					X				
	6								X				
		END OF BOREHOLE 7.8 m (-25.7 m EL.)											
0													
2													
4													
6													
8													
10													
12													
14													
16													
18													
20													
22													
24													
26													
28													



JOB No.: 101C-4101
 DRILLING COMPLETED: 29/JUL/84
 BOREHOLE DEPTH: 7.8 m
 DRILLING RIG: SIMCO 5000 (KIGGIAK)
 LOG COMPILED BY: MAV/PMR



BOREHOLE
NUMBER
H184S02

PAGE1 OF 1

BOREHOLE LOG AND LABORATORY TEST RESULTS

DEPTH BELOW SEABED (metres)

LOCATION: HERSHEL ISLAND, THETIS BAY			TIME: 1415 HRS. 9/AUG/84								
UTM COORDINATES: 7719 401 m N 579 734 m E			WATER DEPTH: 6.8 m								
SYM.	No.	SOIL DESCRIPTION	GROUND ICE		BULK DENSITY (Mg m ⁻³) ▲			UNDRAINED SHEAR STRENGTH (kiloPascals)			SPECIALIZED TESTS
			T (°C)		PLASTIC LIMIT	WATER CONTENT (%)	LIQUID LIMIT				
	1	SILT (CI) - some clay, trace of fine-grained sand and shell fragments, homogeneous with pebble up to 10 mm diameter	NOT FROZEN	1.6							
	2	- 5 mm thick SAND layer on 15° angle to horizontal at 1.5 m		1.3							
	3	CLAY (CI) - silty, homogeneous, trace of shell fragments, organics & sand, stiff, low plastic, dark grey		1.2							
	4	- soft layer of 30 kPa at 5.6 m		1.7							
	5			-0.4							
	6			0.5							
	7	- black organic layer on 30° angle to horizontal at 7.2 m		0.4							
	8	SILT (ML) - trace of clay and fine-grained sand, homogeneous nonplastic		0.5							
	9	CLAY (CI) - silty, trace shell fragments, firm, low plastic, very organic, dark greyish black		0.7							
		END OF BOREHOLE 11.2 m (-18 m El.)									



JOB No.: 101C-4101
 DRILLING COMPLETED: 9/AUG/84
 BOREHOLE DEPTH: 11.16 m
 DRILLING RIG: SIMCO 5000(KIGGIK)
 LOG COMPILED BY: KWJ/PMR

SOIL SYMBOLS



LEGEND

SHEAR STRENGTH
 + Torvane
 X Min. Vane
 □ Picon Vane
 ● Unconfined Compr.
 ▲ UU Triaxial
 ■ CU Triaxial

TEST IDENTIFICATION
 C - Consolidation
 TS - Thaw Strain
 DS - Direct Shear
 T - Triaxial Shear
 S - P.W. Salinity

BOREHOLE NUMBER
 TB84 SO1

PAGE 1 OF 1

BOREHOLE LOG AND LABORATORY TEST RESULTS

DEPTH BELOW SEABED (metres)

LOCATION: HERSCHEL ISLAND, THETIS BAY UTM COORDINATES: 7719 387 m N 579 668 m E			TIME: 2300 HRS 9/AUG/84 WATER DEPTH: 6.4 m		BULK DENSITY (Mg m ⁻³) ▲ 1.4 1.6 1.8 2.0			UNDRAINED SHEAR STRENGTH (kiloPascals)			SPECIALIZED TESTS
SYM.	No.	SOIL DESCRIPTION	GROUND ICE T (°C)		PLASTIC LIMIT	WATER CONTENT (%)	LIQUID LIMIT				
					20	40	60	80	50	100	150
	1	CLAY (CI) - trace to some silt, with organic pockets and shell fragments, homogeneous, firm, medium plastic, very dark grey	NOT FROZEN								
	2			1.1							
	3			-0.4							
	4	- soft layer at 4.4 m		-0.7							
	5	- becoming silty and friable, 10 mm by 30 mm organic pocket and 4 mm diameter drop stone at 5.9 m		-0.5							
	6			-0.3							
	7	SILT (OL) - trace of clay and sand, dense (estimated), dark greyish black		0.4							
	8	- sand mixed with clay at 7.3 m		-0.7							
	9	- 10 mm-thick black organic layer at 9.4 m		-0.8							
	10			-1.0							
	11			-1.1							
	12	CLAY (CH) - trace silt and shell fragments with organics pockets, homogeneous, firm, dark blackish grey		-0.8							
	13	- organic layers 10 - 15 mm thick at 13.5 m and 15.1 m		-0.5							
	14	- soft layer at 18.25 m		-1.4							
	15	- very strong odor, medium plastic		-0.4							
	16	- thin shell layer at 21.5 m		-1.0							
	17	- very strong odor	FROZEN Vr	-2.1							
	18	- thin layer of uniform, fine-grained sand at 24.5 m		-0.5							
		- organic layer 60 mm thick on 10° angle at 24.8 m									
		END OF BOREHOLE 24.9 m (-31.3 m El.)									



JOB No.: 101C-4101
 DRILLING COMPLETED: 10/AUG/84
 BOREHOLE DEPTH: 24.9 m
 DRILLING RIG: SIMCO 5000 (KIGGIAK)
 LOG COMPILED BY: PMR/KWJ

SOIL SYMBOLS
 SAND
 SILT
 CLAY

LEGEND
 SHEAR STRENGTH
 + Torvane
 X Min. Vane
 □ Pilcon Vane
 ● Unconfined Compr.
 ▲ UU Triaxial
 ■ CU Triaxial

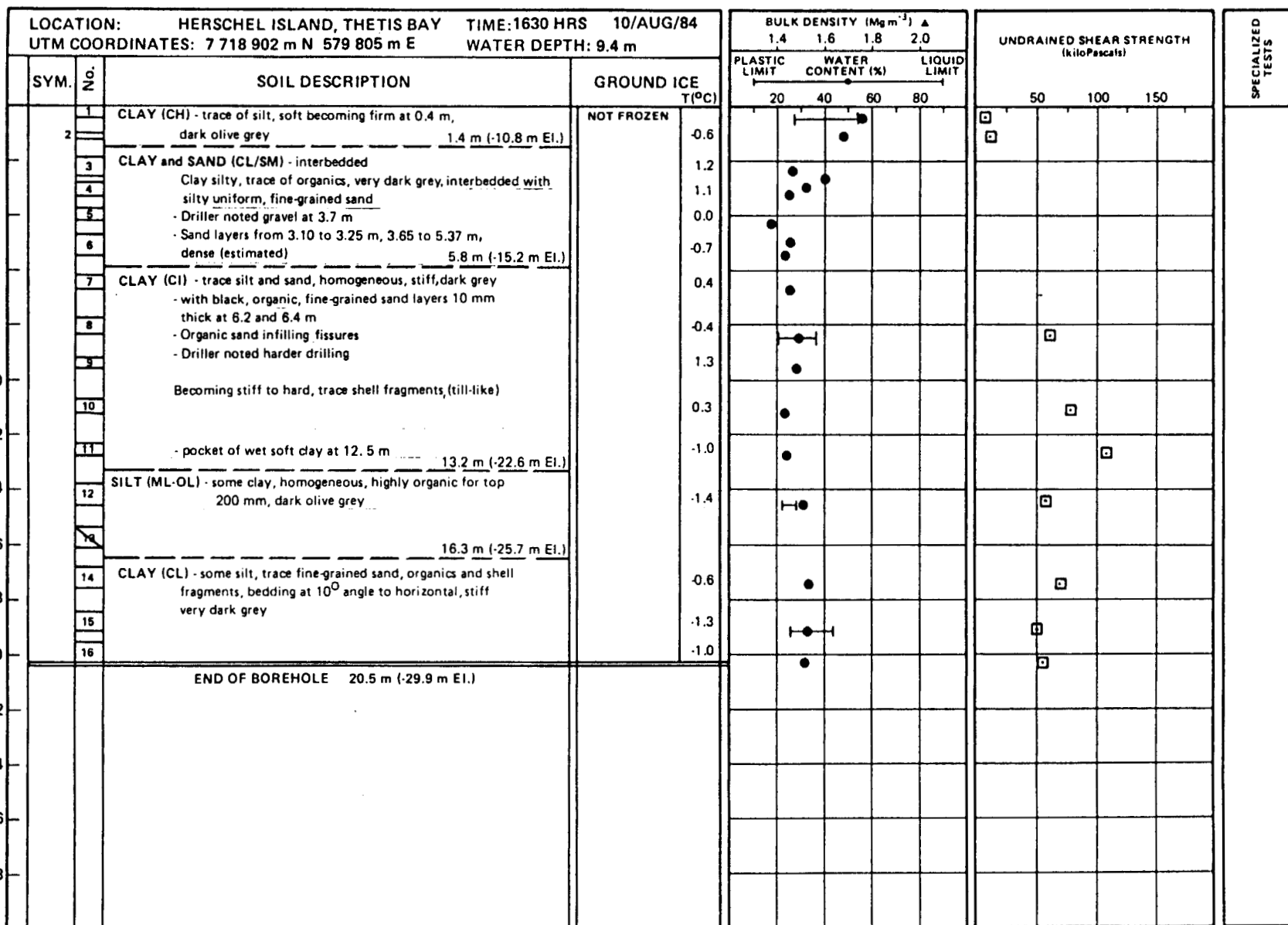
TEST IDENTIFICATION
 C - Consolidation
 TS - Thaw Strain
 DS - Direct Shear
 T - Triaxial Shear
 S - P.W. Salinity

BOREHOLE
 NUMBER
 TB84 S02

PAGE 1 OF 1

BOREHOLE LOG AND LABORATORY TEST RESULTS

DEPTH BELOW SEABED (metres)



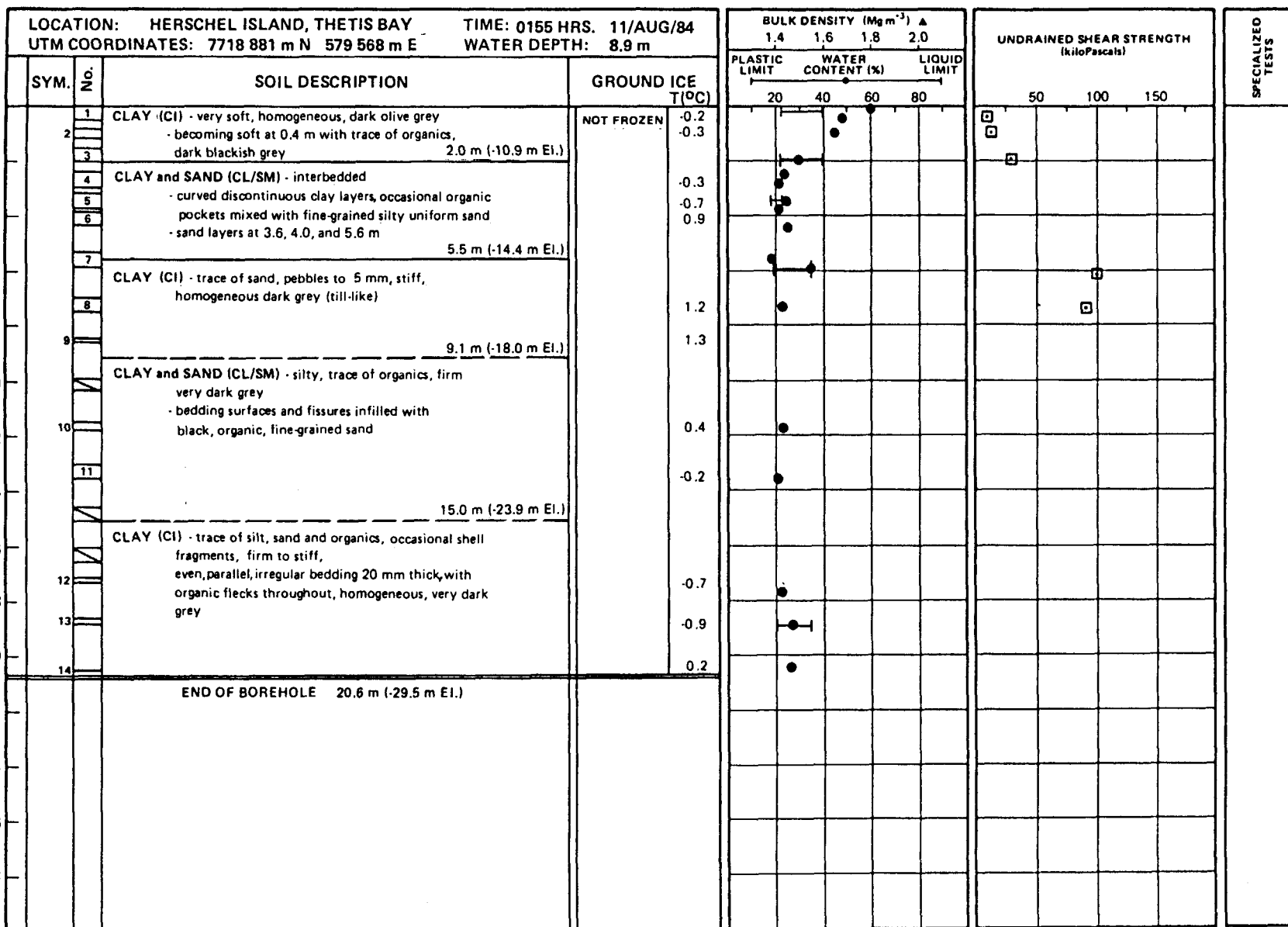
JOB No.: 101C-4101
 DRILLING COMPLETED: 10 AUG 1984
 BOREHOLE DEPTH: 20.5 m
 DRILLING RIG: SIMCO 5000 (KIGGIAK)
 LOG COMPILED BY: PMR/KWJ

LEGEND		
SOIL SYMBOLS		
SAND	SILT	CLAY
SHEAR STRENGTH		
+ Torvane	● Unconfined Compr.	
X Min. Vane	▲ UU Triaxial	
□ Pilcon Vane	■ CU Triaxial	
TEST IDENTIFICATION		
C - Consolidation	T - Triaxial Shear	
TS - Thaw Strain	S - P.W. Salinity	
DS - Direct Shear		

BOREHOLE NUMBER
 TB84S03
 PAGE 1 OF 1

BOREHOLE LOG AND LABORATORY TEST RESULTS

DEPTH BELOW SEABED (metres)



JOB No.: 101C-4101
 DRILLING COMPLETED: 11 AUGUST 84
 BOREHOLE DEPTH: 20.60 m
 DRILLING RIG: SIMCO 5000(KIGGIAK)
 LOG COMPILED BY: PMR/KWJ

SOIL SYMBOLS

SAND	SILT	CLAY

LEGEND

SHEAR STRENGTH

+ Torvane	● Unconfined Compr.
X Min. Vane	▲ UU Triaxial
□ Pilon Vane	■ CU Triaxial

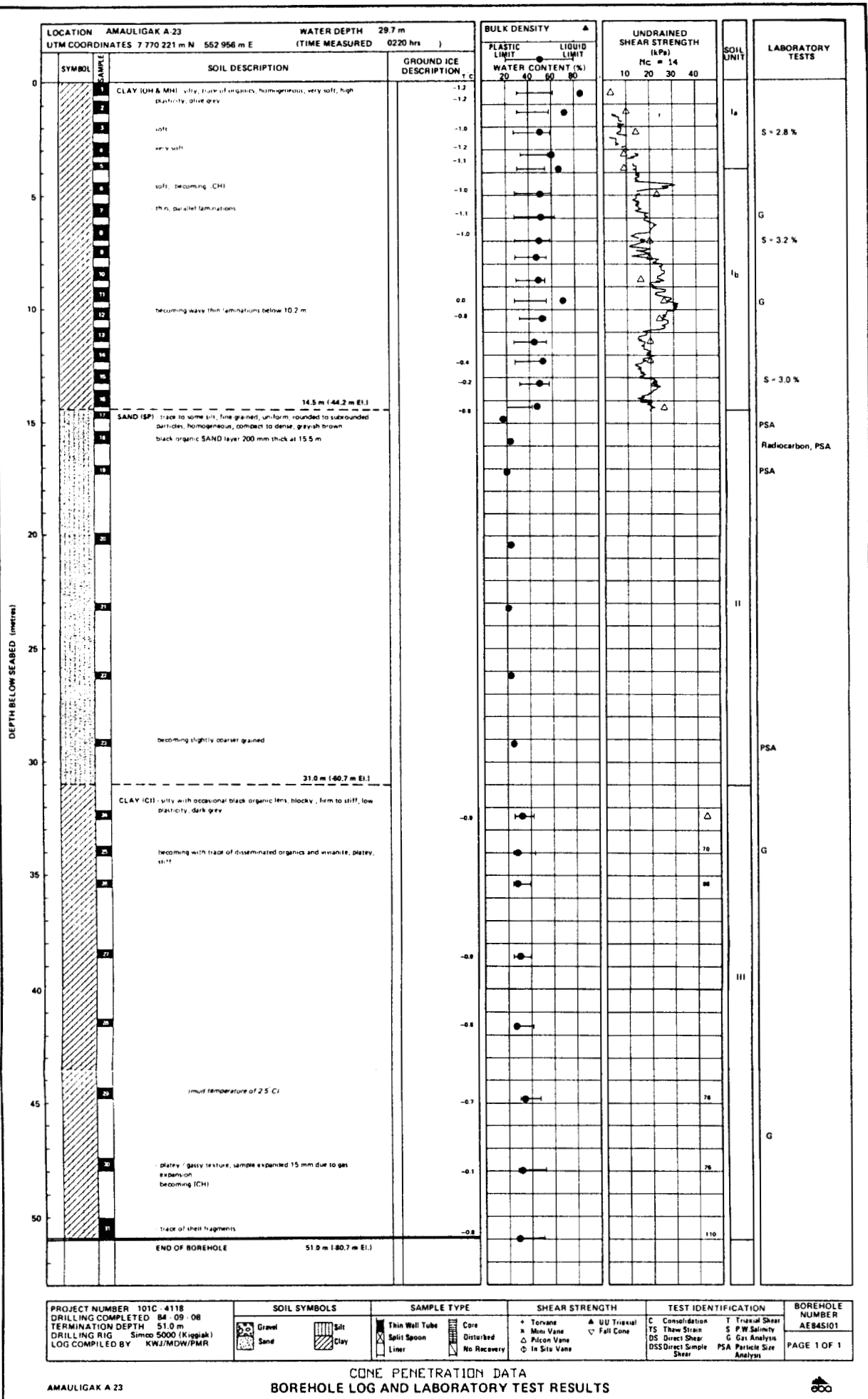
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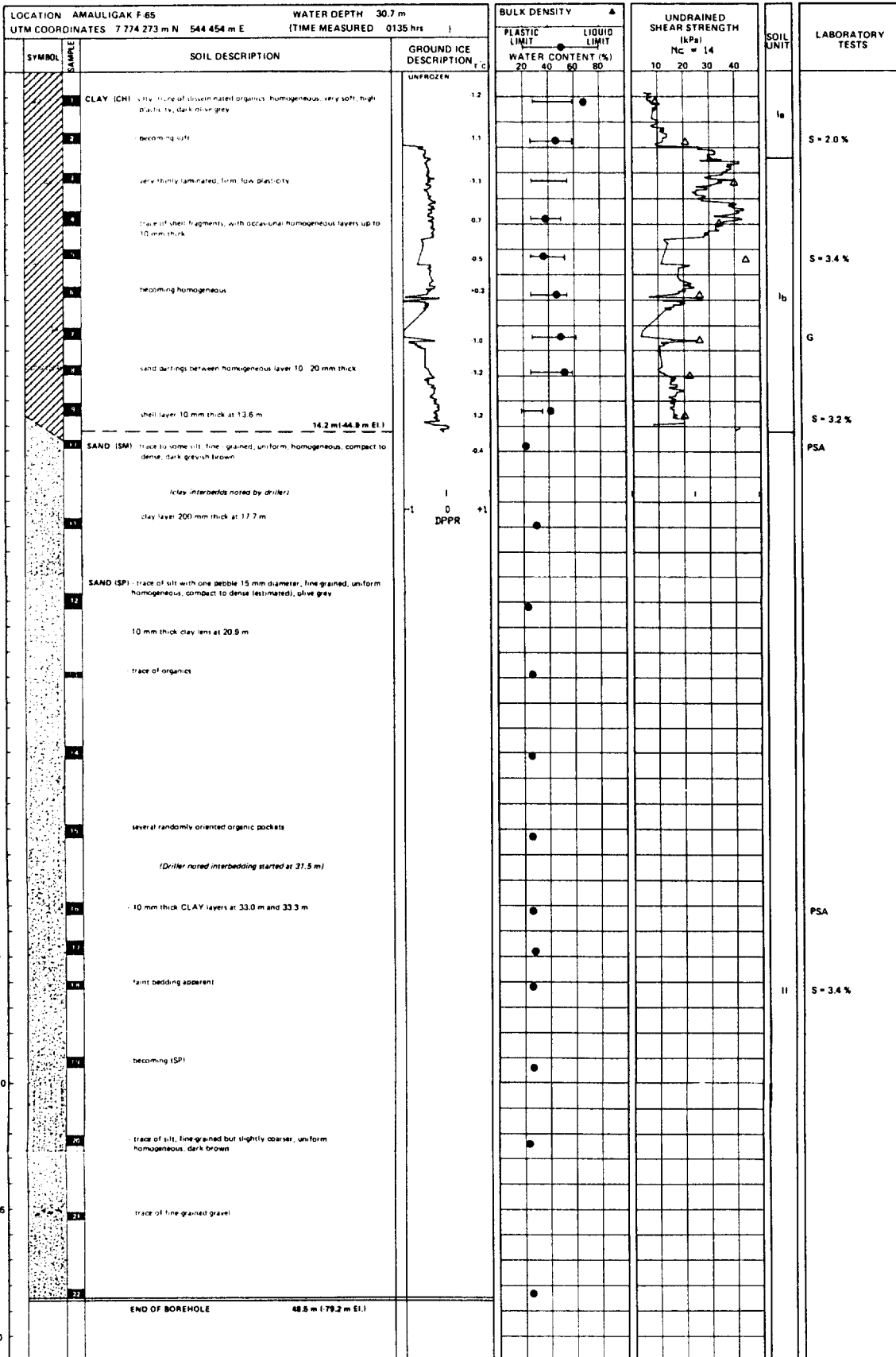
C - Consolidation	T - Triaxial Shear
TS - Thaw Strain	S - P.W. Salinity
DS - Direct Shear	

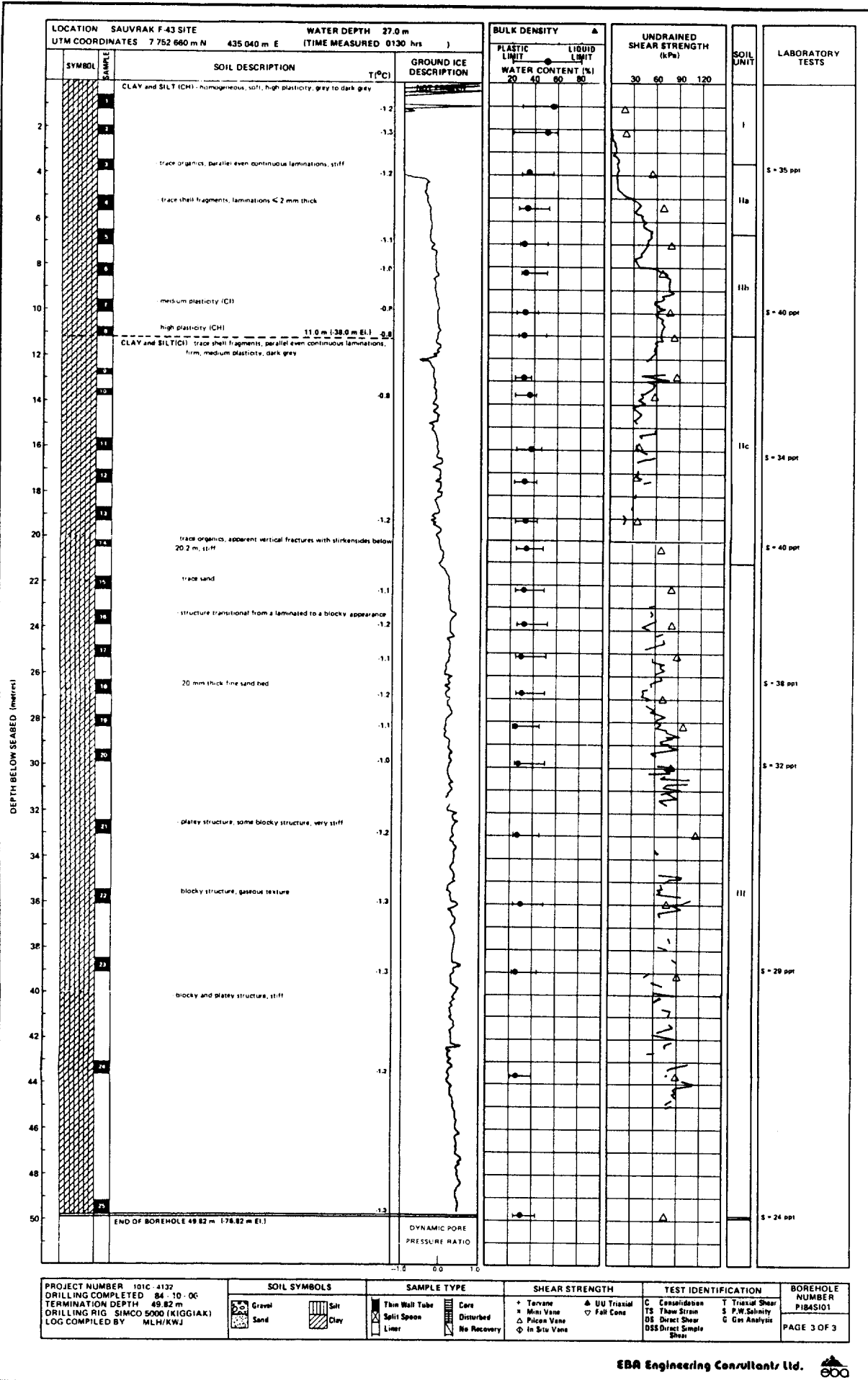
BOREHOLE NUMBER
TB84 S04

PAGE 1 OF 1

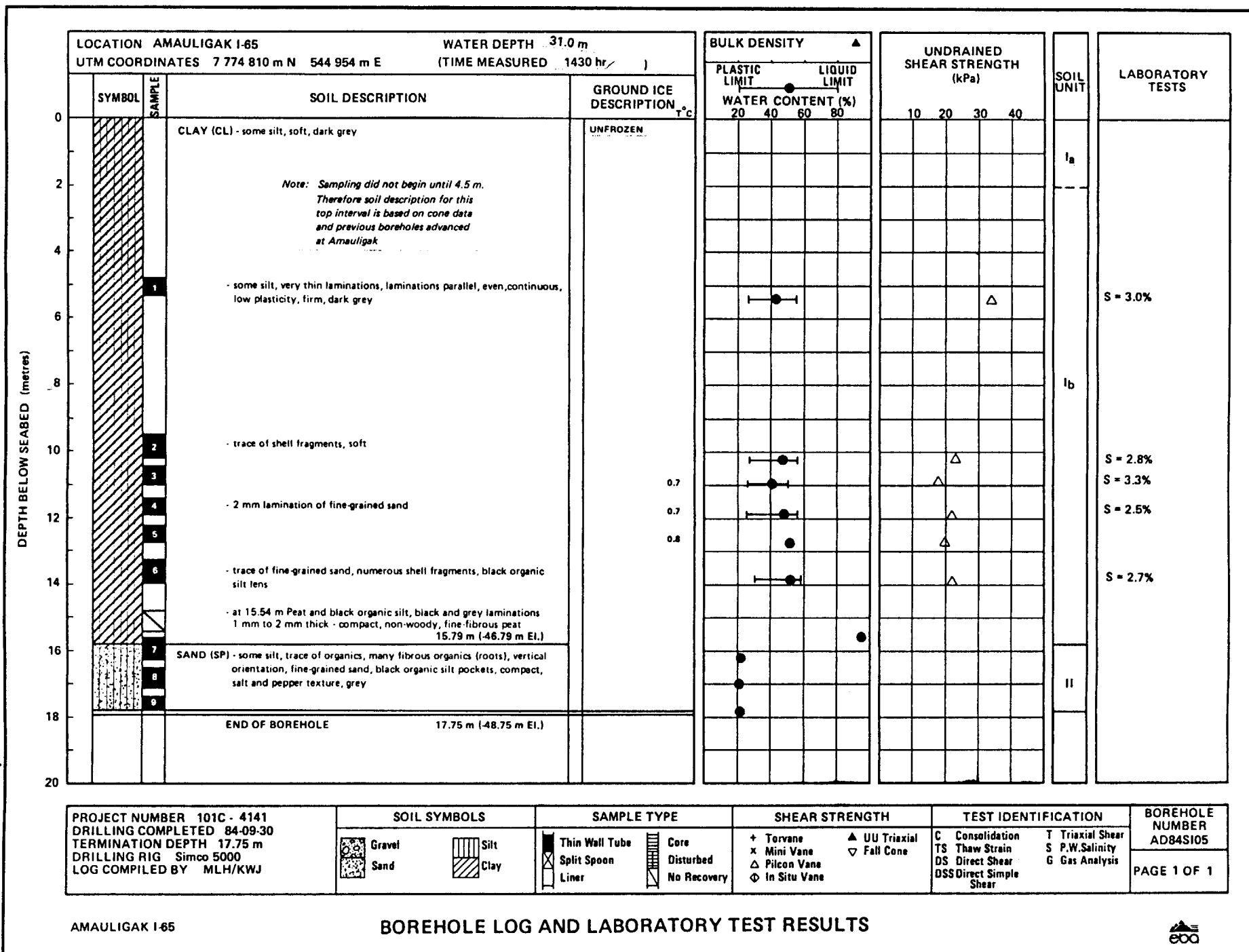
BOREHOLE LOG AND LABORATORY TEST RESULTS







BOREHOLE LOG AND LABORATORY TEST RESULTS
CONE PENETRATION TEST DATA



LOCATION AMAULIGAK I-65
 UTM COORDINATES 7 774 830 m N 545 450 m E
 WATER DEPTH 31.4 m
 (TIME MEASURED 0900 hrs)

BULK DENSITY ▲
 PLASTIC LIMIT ● LIQUID LIMIT
 WATER CONTENT (%)
 20 40 60 80

UNDRAINED
 SHEAR STRENGTH
 (kPa)
 10 20 30 40

SOIL
 UNIT

LABORATORY
 TESTS

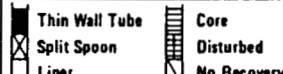
DEPTH BELOW SEABED (metres)	SYMBOL	SAMPLE	SOIL DESCRIPTION	GROUND ICE DESCRIPTION T °C	BULK DENSITY	UNDRAINED SHEAR STRENGTH (kPa)	SOIL UNIT	LABORATORY TESTS
0			CLAY (CL) - trace to some silt, homogeneous with occasional dark grey and grey laminations, soft, high plasticity, dark grey	UNFROZEN			I _a	
2		1		0.9				S = 3.1%
4		2	- trace of organics, trace of shell fragments, soft	1.6			I _b	
6		3		1.7				S = 4.1%
8		4	- lenticular structure becoming parallel even, continuous laminations below 8.7 m	2.0				
10		5	9.0 m (-40.4 m El.)	1.8				S = 3.4%
12		6	SAND (SM - SP) - silty, fine-grained to medium-grained, compact, grey, 50 mm bed of medium-grained iron oxide stained sand, trace of organic and shell fragments, dark olive grey				II	
14		7	- becoming homogeneous at 9.35 m					
16		8	- uniform, olive grey					
18		9						
20		10	END OF BOREHOLE 15.5 m (-46.9 m El.)					

PROJECT NUMBER 101C - 4141
 DRILLING COMPLETED 84 - 10 - 02
 TERMINATION DEPTH 15.1 m
 DRILLING RIG Simco 5000 (Kiggiak)
 LOG COMPILED BY KWJ/MLH

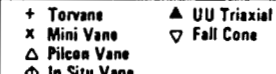
SOIL SYMBOLS



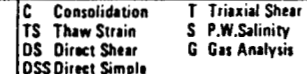
SAMPLE TYPE



SHEAR STRENGTH

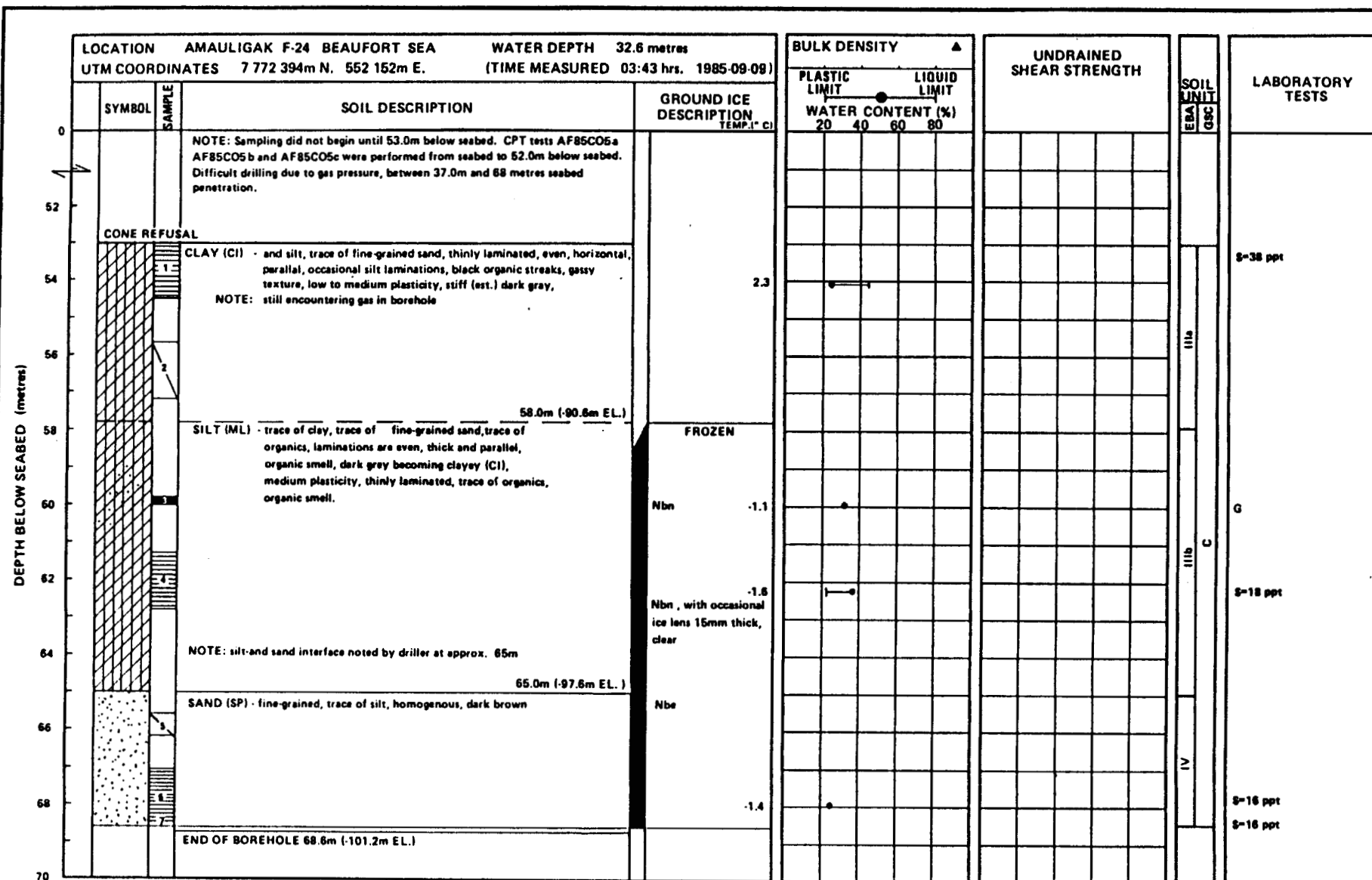


TEST IDENTIFICATION



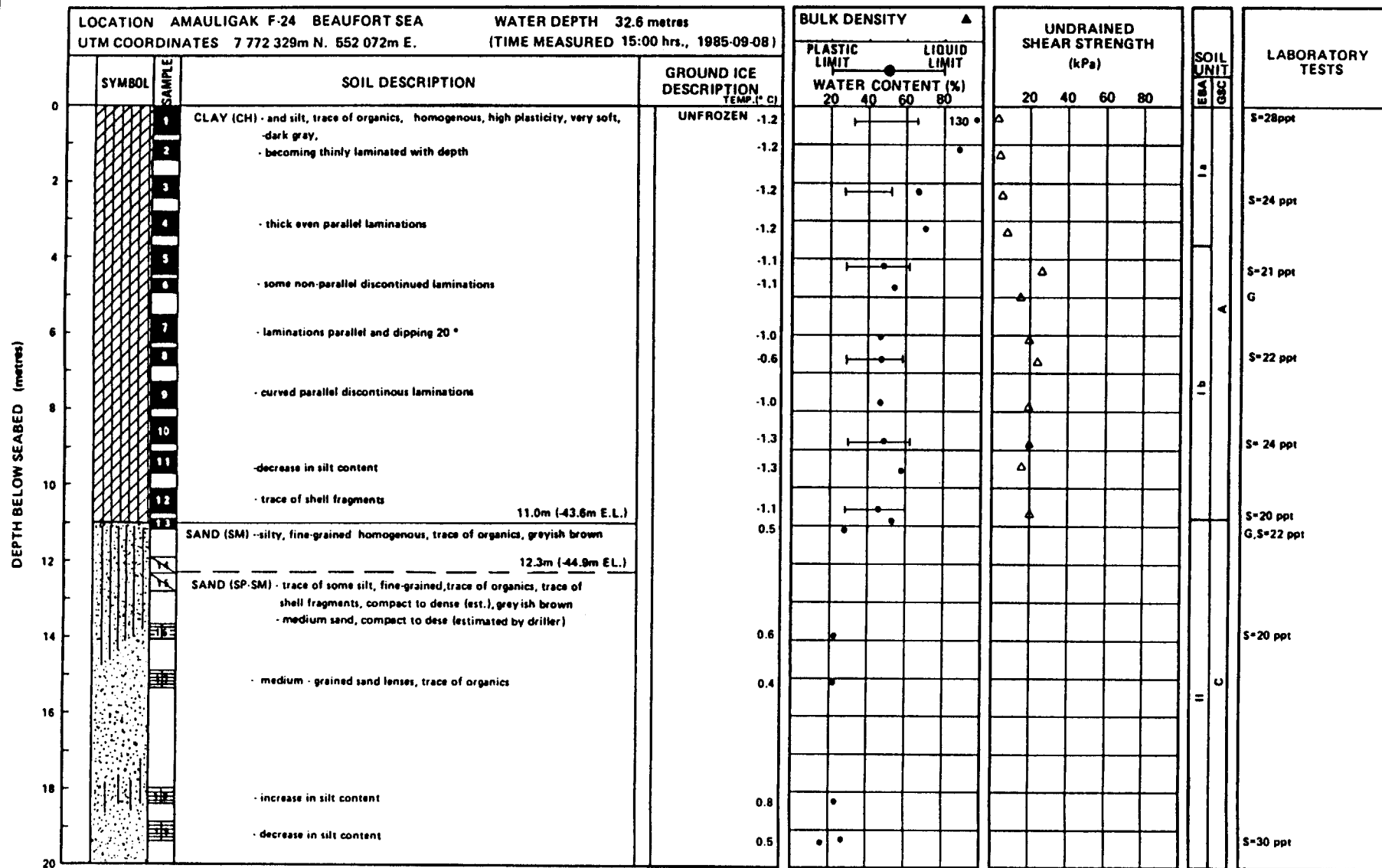
BOREHOLE
 NUMBER
 AM84SI05

PAGE 1 OF 1



PROJECT NUMBER 101C-4416	SOIL SYMBOLS	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER AF85S05
DRILLING COMPLETED 1985-09-04	 Gravel	 Thin Wall Tube	+ Torvane	C Consolidation	T Triaxial Shear
TERMINATION DEPTH 68.6m (-101.2m EL.)	 Sand	 Split Spoon	x Mini Vane	TS Thaw Strain	S P.W. Salinity
DRILLING RIG SIMCO 5000/KIGGIAK	 Clay	 Liner	△ Pilcon Vane	DS Direct Shear	G Gas Analysis
LOG COMPILED BY TRM/MDW		 No Recovery	◇ In Situ Vane	DSS Direct Simple Shear	

LOCATION AMAULIGAK F-24 BEAUFORT SEA			WATER DEPTH 31.5 m																
UTM COORDINATES 7 772 337 m N 552 081 m E			(TIME MEASURED 13:00 hrs 1985-09-06)																
SYMBOL		SAMPLE		SOIL DESCRIPTION				GROUND ICE DESCRIPTION		TEMPERATURE (°C)		BULK DENSITY		UNDRAINED SHEAR STRENGTH kPa		SOIL UNIT		LABORATORY TESTS	
				NOTE: Purpose of borehole is to confirm penetration of the lower clay layer before deploying the latch-in pressuremeter								PLASTIC LIMIT		LIQUID LIMIT		EM		GSC	
												WATER CONTENT (%)							
												20 40 60 80		20 40 60 80					



PROJECT NUMBER 101C-4416
 DRILLING COMPLETED 1985-09-09
 TERMINATION DEPTH 53.4m (-86.0m E.L.)
 DRILLING RIG SIMCO 5000/KIGGIK
 LOG COMPILED BY TRM/MDW/RVW

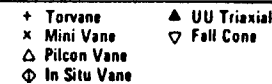
SOIL SYMBOLS



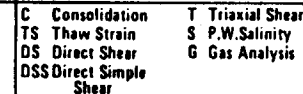
SAMPLE TYPE



SHEAR STRENGTH



TEST IDENTIFICATION

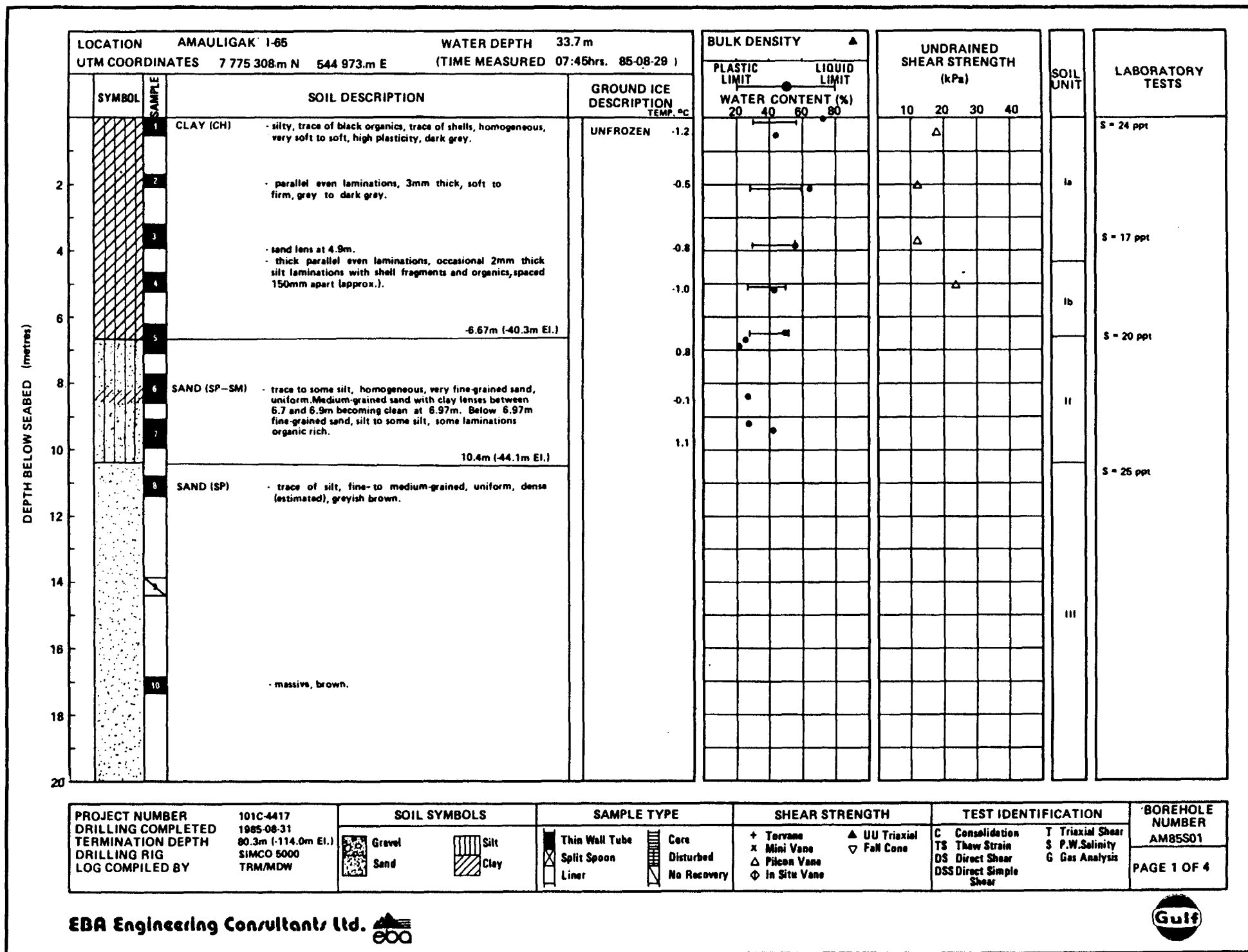


BOREHOLE NUMBER
AFB5506B

PAGE 1 OF 3

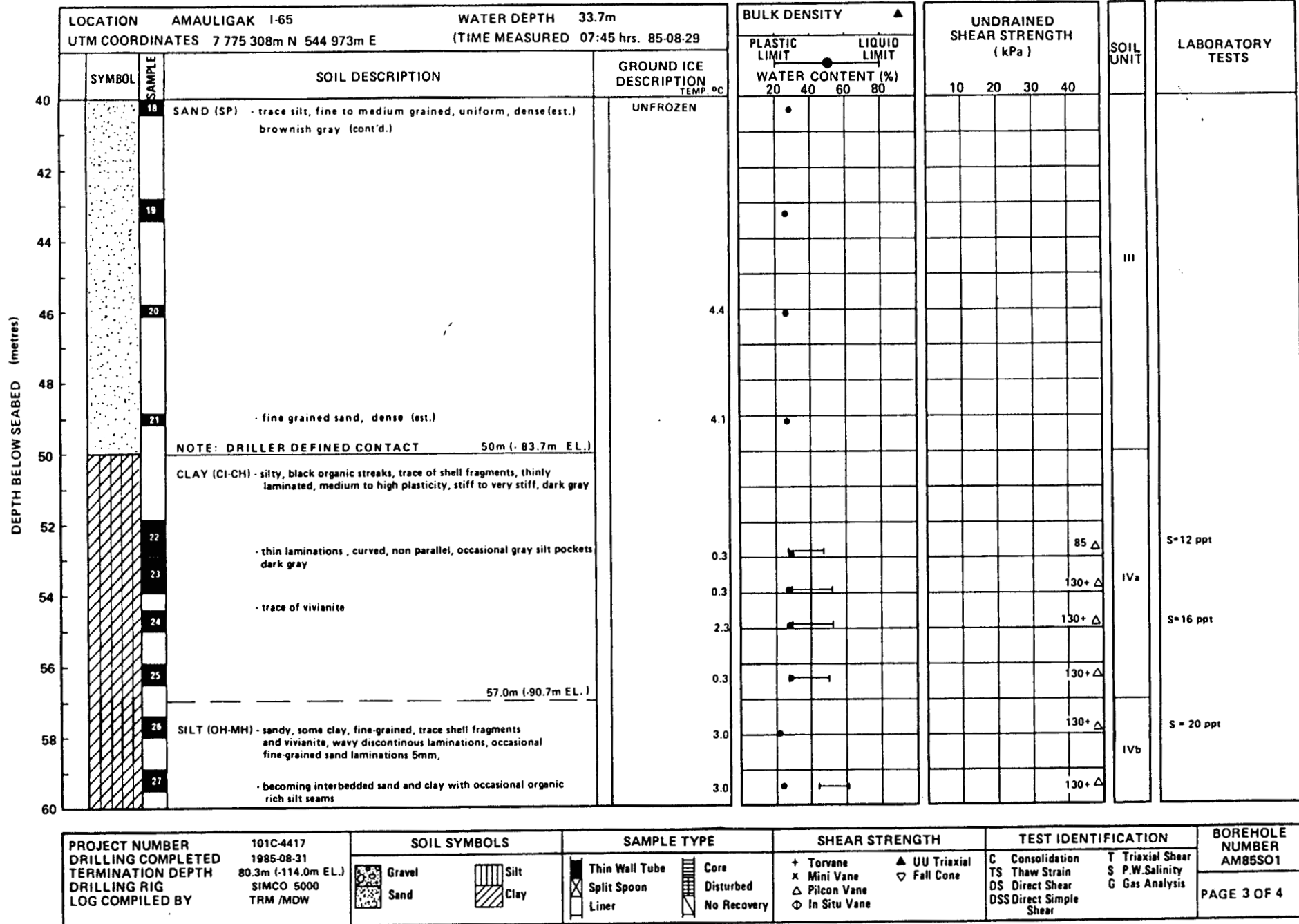
LOCATION AMAULIGAK F-24 BEAUFORT SEA			WATER DEPTH 32.6 metres						
UTM COORDINATES 7 772 329m N. 552 072m E.			(TIME MEASURED 15:00 hrs. 1985 09-08)						
DEPTH BELOW SEABED (metres)	SYMBOL	SAMPLE	SOIL DESCRIPTION	GROUND ICE DESCRIPTION TEMP. (°C)	BULK DENSITY		UNDRAINED SHEAR STRENGTH (kPa)	SOIL UNIT	LABORATORY TESTS
					PLASTIC LIMIT	LIQUID LIMIT			
					WATER CONTENT (%)		20 40 60 80		
					20 40 60 80				
20			SAND (SP-SM) - trace to some silt, fine-grained, trace of gravel with	UNFROZEN					
			- occasional seams of medium-grained sand, homogenous, dense (est.), brownish gray	-1.7					S=20 ppt
22			(SM)- becoming fine-grained with higher silt content @ 21.0m	3.0					
24			(SP) - predominantly medium-grained sand with a trace of silt.						S=20 ppt
26									
			- gravelly, 30mm max. diameter, rounded to subangular, clayey silt matrix around gravel						S=12 ppt
28									
			DRILLERS NOTE: Higher gravel content throughout this zone, larger diameter becoming finer-grained, gravel 40mm max. diameter, rounded to subangular, dense (est.)						
30									
32									
34									
			- gravelly, trace of silt (SP-SM)						S=21 ppt
36			NOTE: Top of clay determined from drillers observation 36.3m (-68.9m EL.)						
38			CLAY (CI-CH) - and silt, thinly laminated, horizontal, even, continuous, parallel, black organic streaks, occasional fine-grained sand seams near top of layer, medium plasticity, stiff, gray						
				1.8					S=19 ppt
				1.8					G
40				1.6				120+ Δ	S=27 ppt

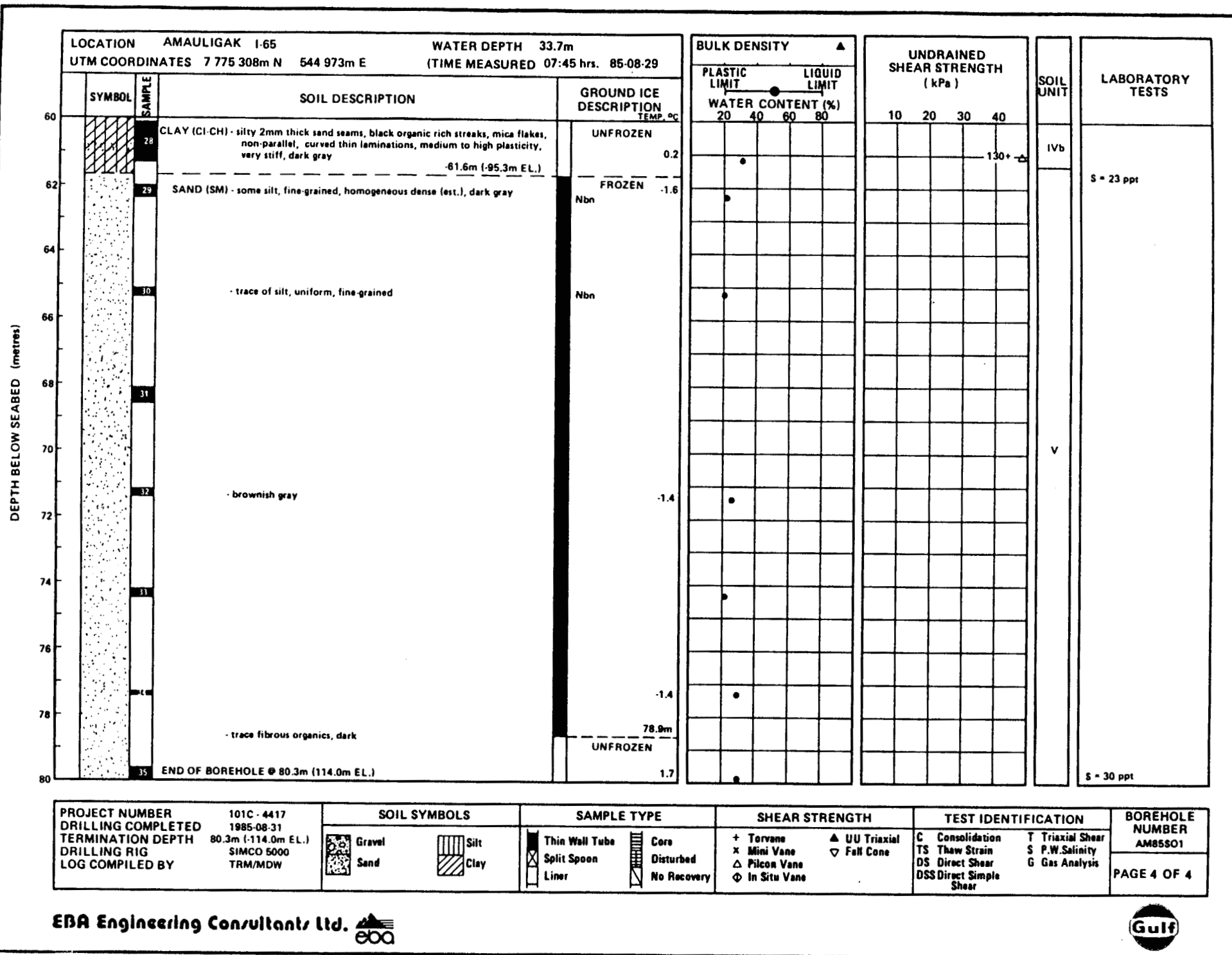
PROJECT NUMBER 101-4416	SOIL SYMBOLS	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER AF85S06B
DRILLING COMPLETED 1985-09-09	Gravel	Thin Wall Tube	+ Torvane	C Consolidation	
TERMINATION DEPTH 53.4m (-86.0m EL.)	Sand	Split Spoon	x Mini Vane	TS Thaw Strain	
DRILLING RIG SIMCO/5000/KIGGIK	Clay	Liner	Δ Pilcon Vane	DS Direct Shear	
LOG COMPILED BY MDW/TRM/RVW		No Recovery	◇ In Situ Vane	DSS Direct Simple Shear	
				T Triaxial Shear	
				S P.W. Salinity	
				G Gas Analysis	

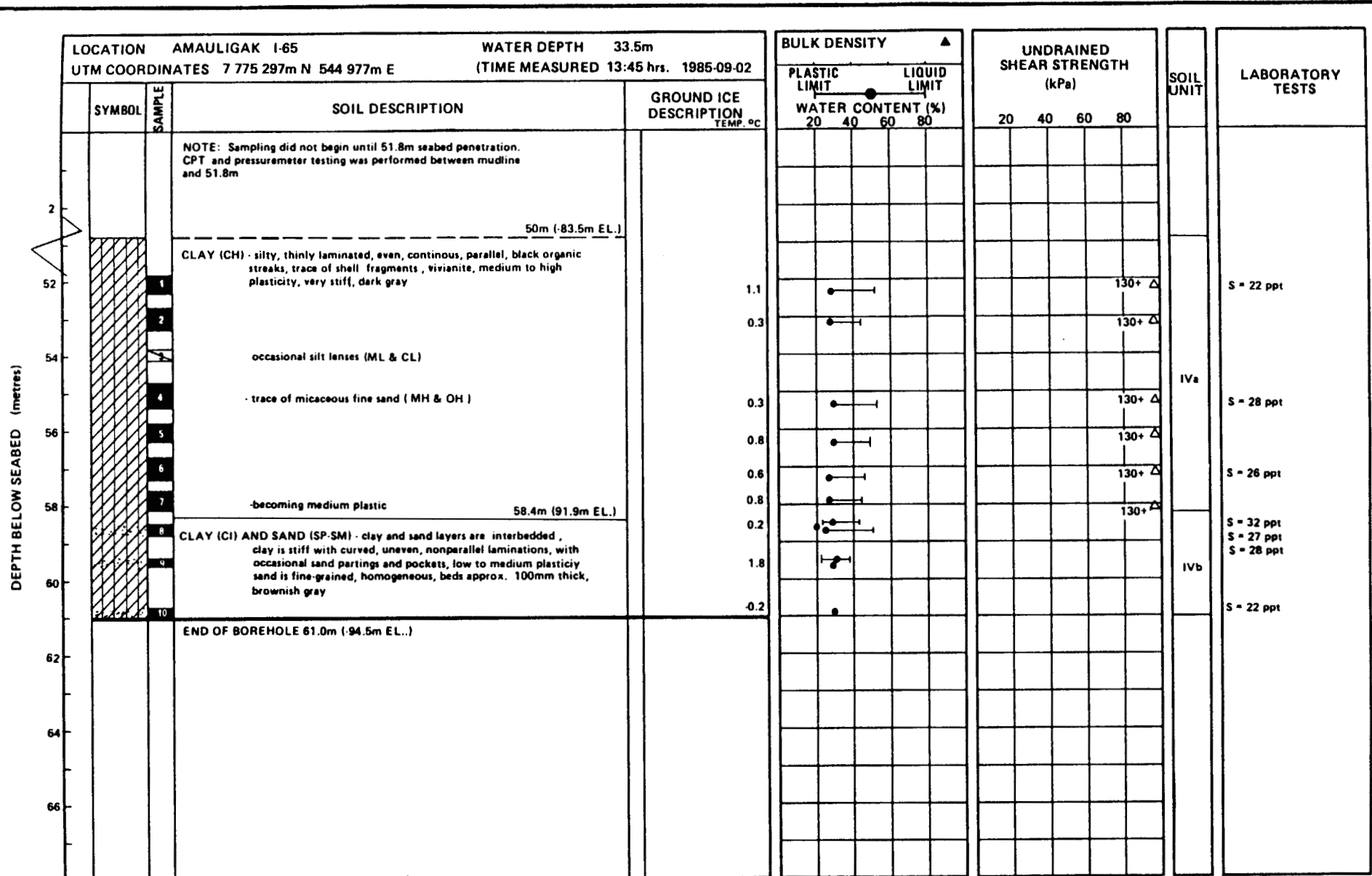


LOCATION AMAULIGAK 1-65 UTM COORDINATES 7 775 308m N 544973 m E		WATER DEPTH 33.7m (TIME MEASURED 07:45 hrs. 85-08-29)		BULK DENSITY ▲ PLASTIC LIMIT — LIQUID LIMIT WATER CONTENT (%) 20 40 60 80		UNDRAINED SHEAR STRENGTH (kPa) 10 20 30 40		SOIL UNIT	LABORATORY TESTS
DEPTH BELOW SEABED (metres)	SYMBOL	SAMPLE	SOIL DESCRIPTION	GROUND ICE DESCRIPTION TEMP. °C	PLASTIC LIMIT WATER CONTENT (%)	LIQUID LIMIT WATER CONTENT (%)	UNDRAINED SHEAR STRENGTH (kPa)		
20			SAND (SP) — fine grained, trace silt, uniform, gray brown (cont'd.)	UNFROZEN					
22									
24		12	— some 5mm to 25mm diameter gravel sizes, gap graded fine grained sand, brown						
26									
28		13	— medium to fine-grained sand with occasional gravel and clay lenses, trace of shells, dark brown						
30									
32		14							
34		15	— fine grained, uniform, homogeneous						
36									
38		16	— driller notes gravel between 35.2 and 36.3 metres						
40									
		18	— medium to fine-grained						

PROJECT NUMBER 101C-4417 DRILLING COMPLETED 1985-08-31 TERMINATION DEPTH 80.3m (-114.0m EL.) DRILLING RIG SIMCO 5000 LOG COMPILED BY TRM /MDW	SOIL SYMBOLS Gravel Sand Silt Clay	SAMPLE TYPE Thin Wall Tube Split Spoon Liner Core Disturbed No Recovery	SHEAR STRENGTH + Torvane ▲ UU Triaxial x Mini Vane ▼ Fall Cone △ Pilcon Vane ◇ In Situ Vane	TEST IDENTIFICATION C Consolidation T Triaxial Shear TS Thaw Strain S P.W. Salinity DS Direct Shear G Gas Analysis DSS Direct Simple Shear	BOREHOLE NUMBER AM85S01 PAGE 2 OF 4
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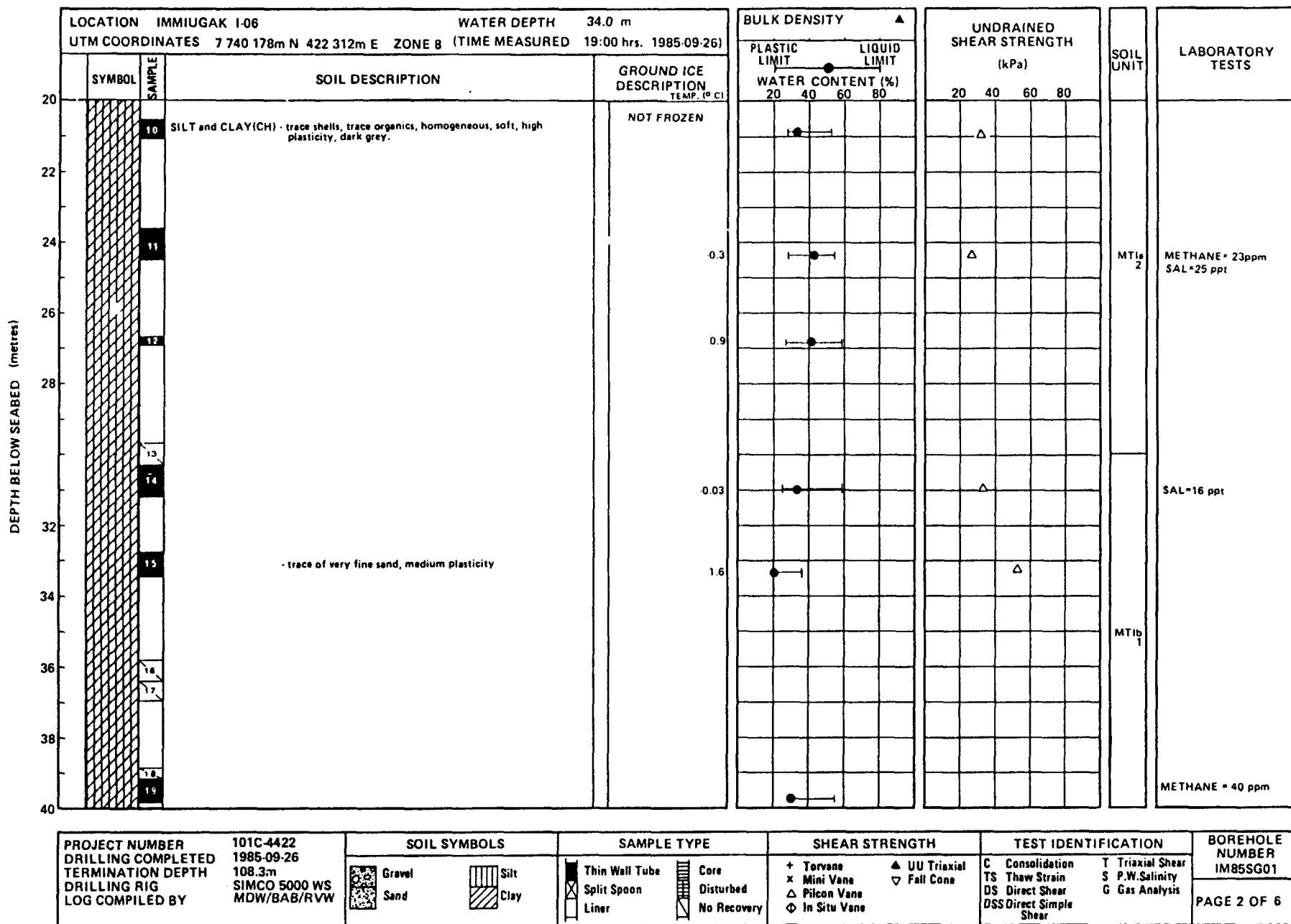




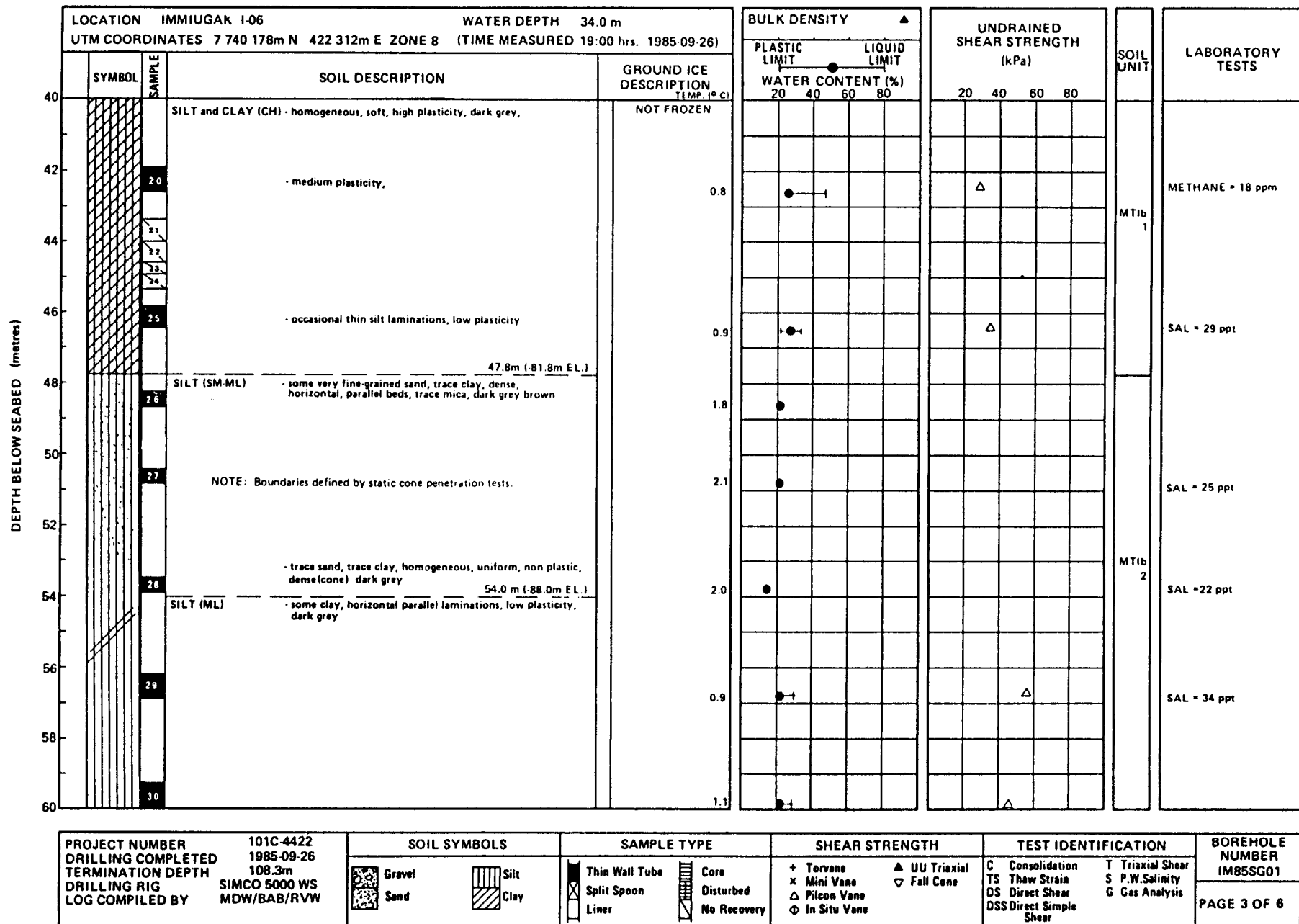
PROJECT NUMBER 101C-4417	SOIL SYMBOLS	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
DRILLING COMPLETED 1985-09-02	Gravel	Thin Wall Tube	+ Torvane	C Consolidation	AM85S01B
TERMINATION DEPTH 61.0m	Sand	Split Spoon	x Mini Vane	TS Thaw Strain	
DRILLING RIG SIMCO 5000 --KIGGIKAK	Clay	Liner	△ Picon Vane	DS Direct Shear	
LOG COMPILED BY TRM/MDW/RVW		No Recovery	◇ In Situ Vane	DSS Direct Simple Shear	
				T Triaxial Shear	
				S P.W. Salinity	
				G Gas Analysis	



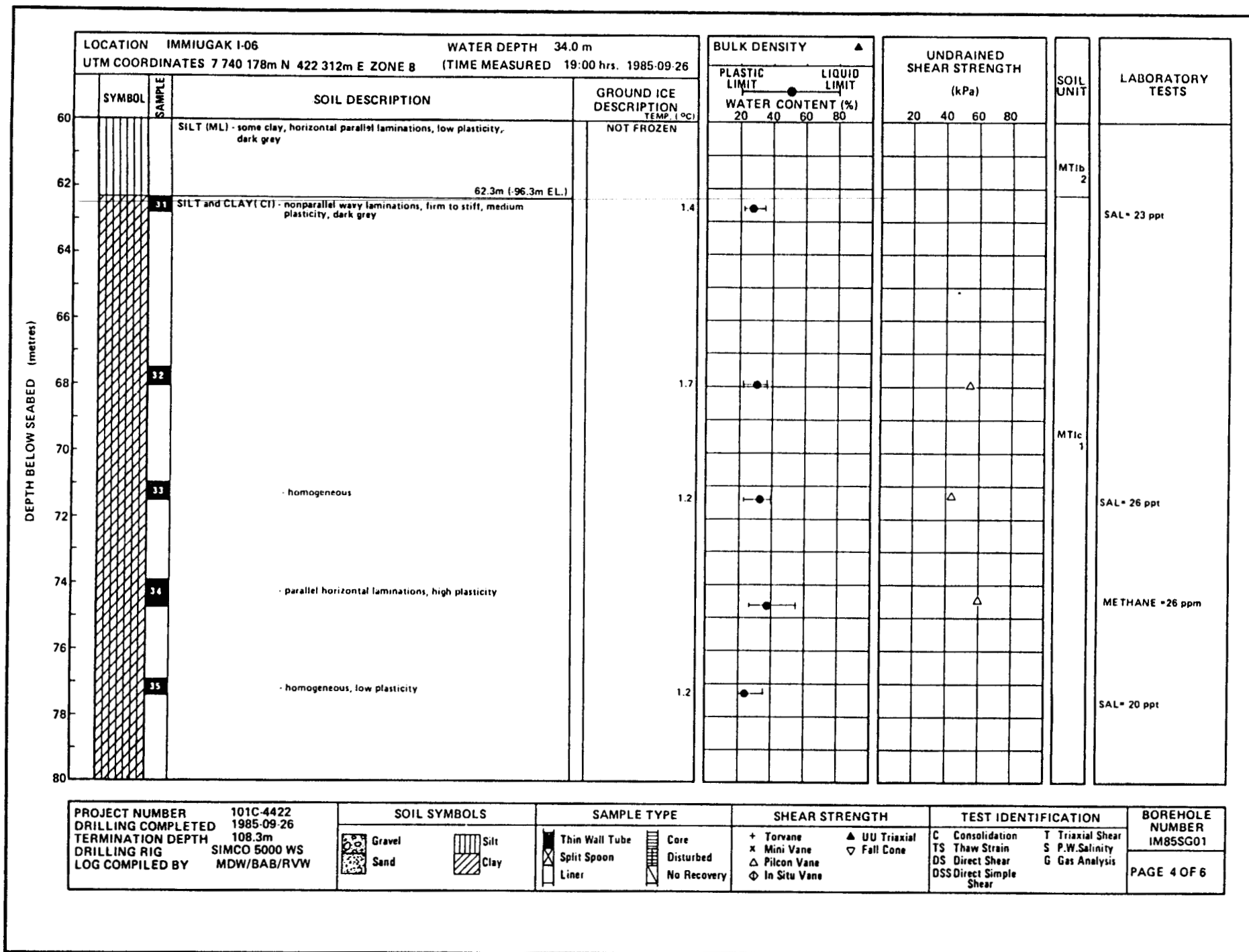
BOREHOLE LOG AND LABORATORY TEST RESULTS



BOREHOLE LOG AND LABORATORY TEST RESULTS

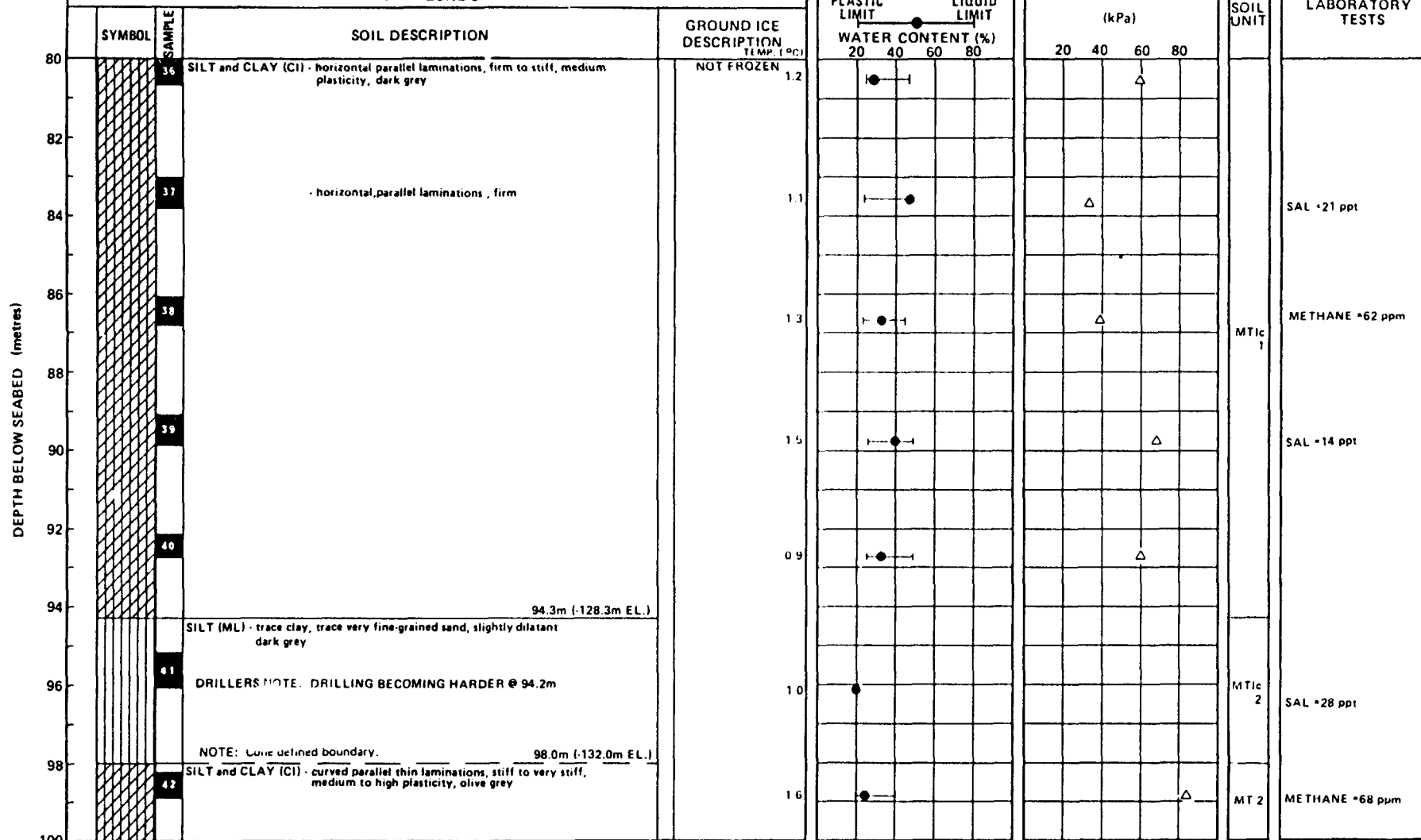


BOREHOLE LOG AND LABORATORY TEST RESULTS



BOREHOLE LOG AND LABORATORY TEST RESULTS

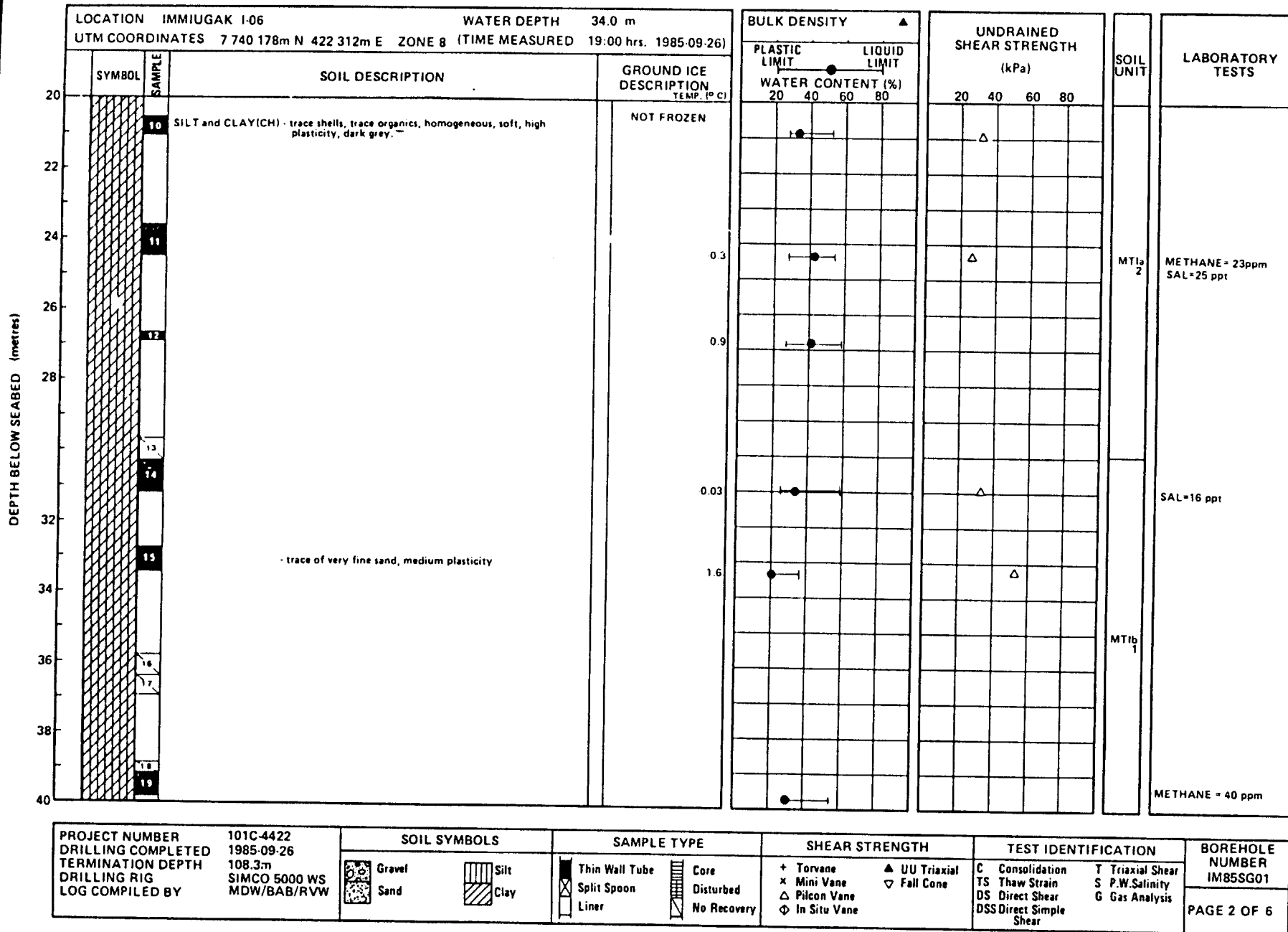
LOCATION IMMIUGAK I-06 WATER DEPTH 34.0 m
 UTM COORDINATES 7 740 178m N 422 312m E ZONE 8 (TIME MEASURED 19:00 hrs. 1985 09 26)

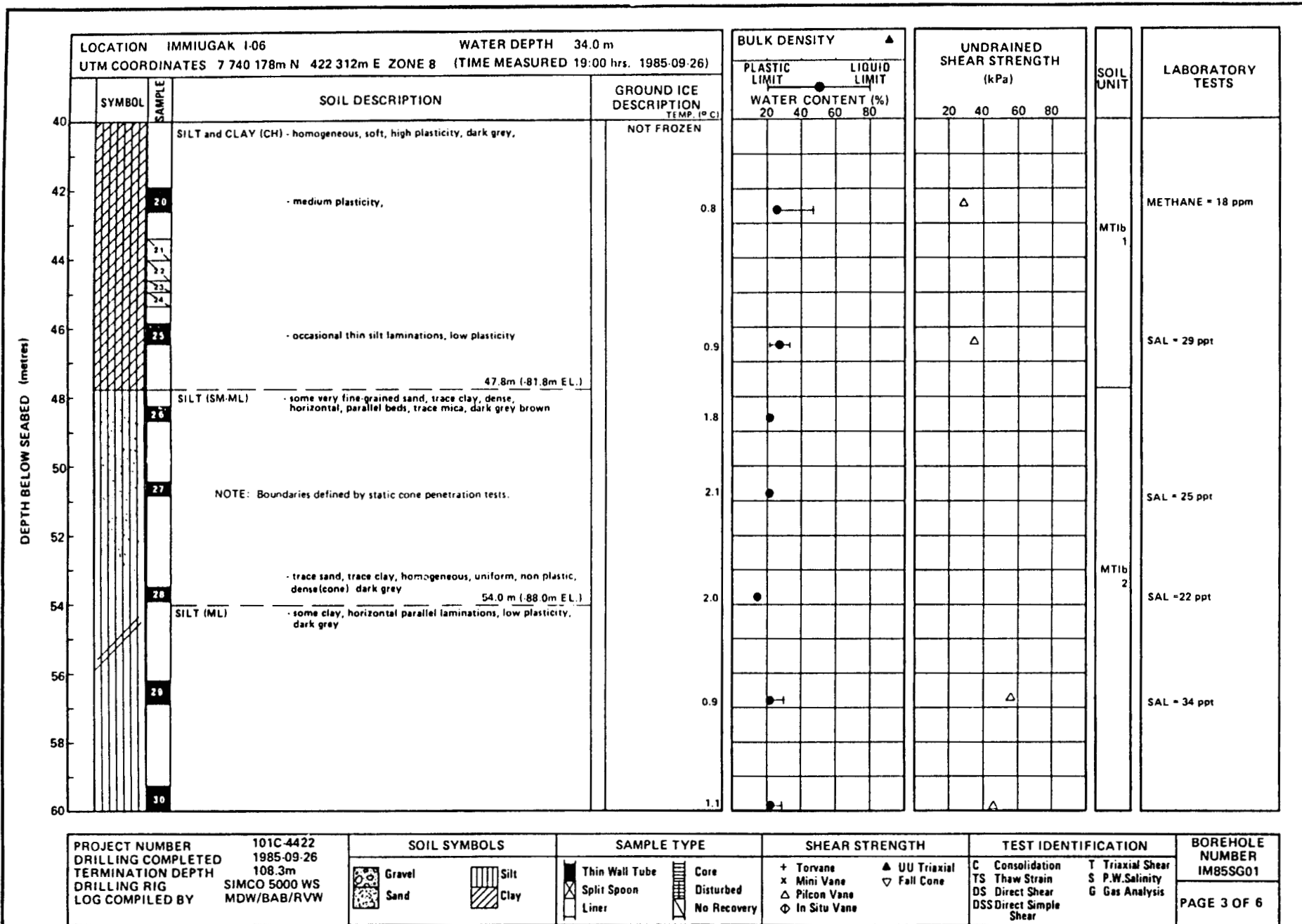


PROJECT NUMBER 101C-4422	SOIL SYMBOLS	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
DRILLING COMPLETED 1985-09-26	Gravel	Thin Wall Tube	+ Torvane	C Consolidation	
TERMINATION DEPTH 108.3m	Sand	Split Spoon	x Mini Vane	TS Thaw Strain	
DRILLING RIG SIMCO 5000 WS	Silt	Liner	△ Picon Vane	DS Direct Shear	
LOG COMPILED BY MDW/BAB/RVW	Clay	Core	◇ In Situ Vane	DSS Direct Simple Shear	
		No Recovery	▲ UU Triaxial	T Triaxial Shear	
			▽ Fall Cone	S P.W. Salinity	
				G Gas Analysis	

PAGE 5 OF 6

BOREHOLE LOG AND LABORATORY TEST RESULTS



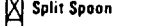
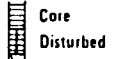
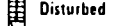


LOCATION IMMIUGAK I-06 WATER DEPTH 34.0 m
 UTM COORDINATES 7 740 178m N 422 312m E ZONE 8 (TIME MEASURED 19:00 hrs. 1985-09-26)

DEPTH BELOW SEABED (metres)	SYMBOL	SAMPLE	SOIL DESCRIPTION	GROUND ICE DESCRIPTION TEMP. (°C)	BULK DENSITY		UNDRAINED SHEAR STRENGTH (kPa)		SOIL UNIT	LABORATORY TESTS
					PLASTIC LIMIT	LIQUID LIMIT	WATER CONTENT (%)			
60			SILT (ML) - some clay, horizontal parallel laminations, low plasticity, dark grey	NOT FROZEN						
62			62.3m (-96.3m EL.)							
62		31	SILT and CLAY (CI) - nonparallel wavy laminations, firm to stiff, medium plasticity, dark grey	1.4	•				MT1b 2	SAL = 23 ppt
64										
66										
68		32		1.7	•			△	MT1c 1	
70										
72		33	homogeneous	1.2	•			△		SAL = 26 ppt
74		34	parallel horizontal laminations, high plasticity		•			△		METHANE = 26 ppm
76										
78		35	homogeneous, low plasticity	1.2	•					SAL = 20 ppt
80										

PROJECT NUMBER 101C-4422
 DRILLING COMPLETED 1985-09-26
 TERMINATION DEPTH 108.3m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY MDW/BAB/RVW

SOIL SYMBOLS
 Gravel
 Sand
 Silt
 Clay

SAMPLE TYPE
 Thin Wall Tube
 Split Spoon
 Liner
 Core
 Disturbed
 No Recovery

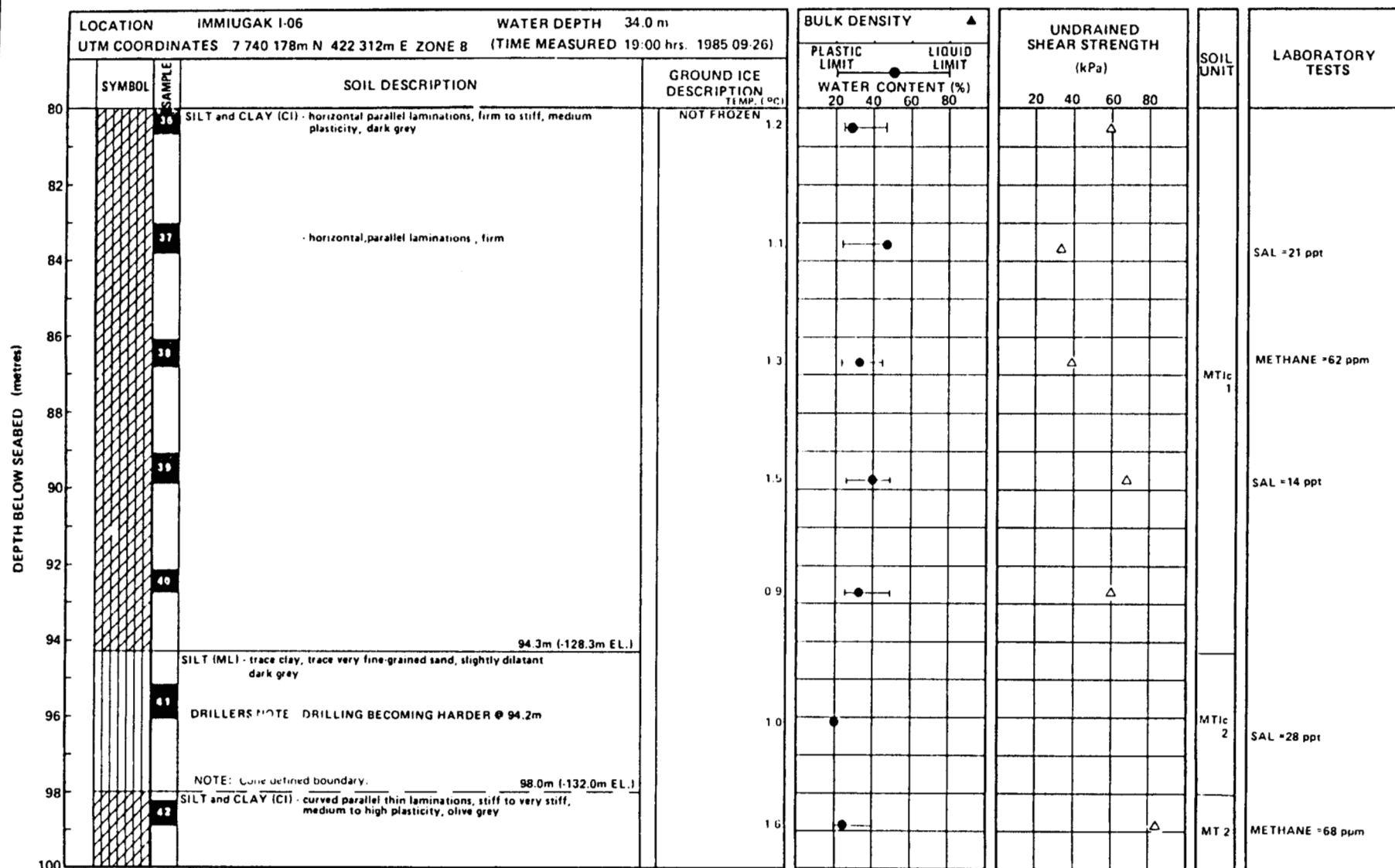
SHEAR STRENGTH
 + Torvane
 x Mini Vane
 △ Pilcon Vane
 ◇ In Situ Vane
 ▲ UU Triaxial
 ▽ Fall Cone

TEST IDENTIFICATION
 C Consolidation
 TS Thaw Strain
 DS Direct Shear
 DSS Direct Simple Shear
 T Triaxial Shear
 S P.W. Salinity
 G Gas Analysis

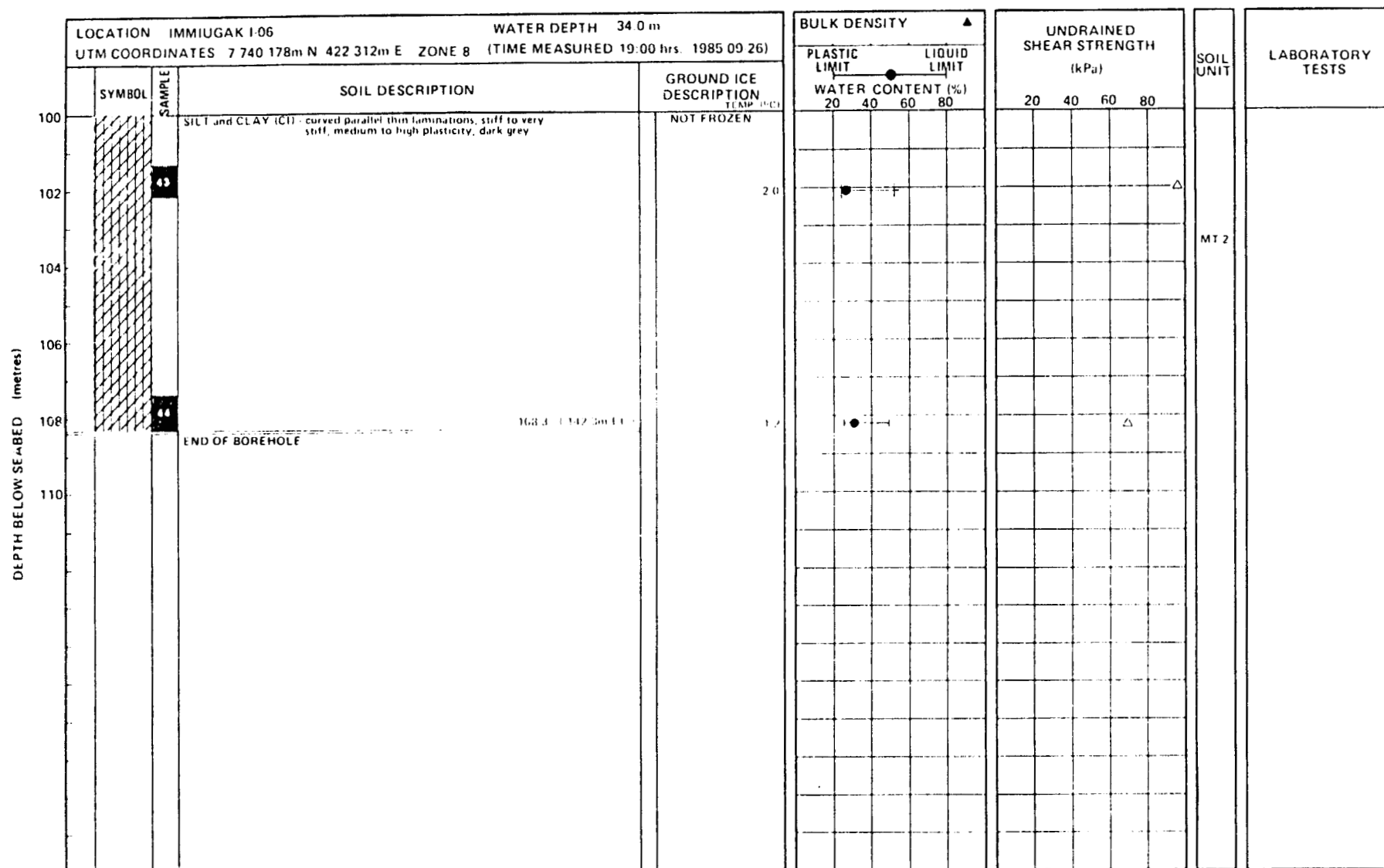
BOREHOLE NUMBER
 IM85SG01

PAGE 4 OF 6





PROJECT NUMBER 101C-4422	SOIL SYMBOLS	SAMPLE TYPE	SHEAR STRENGTH	TEST IDENTIFICATION	BOREHOLE NUMBER
DRILLING COMPLETED 1985-09-26	Gravel	Thin Wall Tube	+ Torvane	C Consolidation	
TERMINATION DEPTH 108.3m	Sand	Split Spoon	x Mini Vane	TS Thaw Strain	
DRILLING RIG SIMCO 5000 WS	Clay	Liner	△ Pilcon Vane	DS Direct Shear	
LOG COMPILED BY MDW/BAB/RVW			Φ In Situ Vane	DSS Direct Simple Shear	
				T Triaxial Shear	
				S P.W. Salinity	
				G Gas Analysis	
					PAGE 5 OF 6



PROJECT NUMBER	101C 4422	SOIL SYMBOLS		SAMPLE TYPE		SHEAR STRENGTH		TEST IDENTIFICATION		BORE HOLE NUMBER IM85SG01
DRILLING COMPLETED	1985 09 26	 Gravel  Sand	 Silt  Clay	 Thin Wall Tube  Split Spoon  Liner	 Core  Disturbed  No Recovery	 Torvane  Mini Vane  Pilecon Vane  In Situ Vane	 UU Triaxial  Fall Cone	C Consolidation TS Thaw Strain DS Direct Shear DSS Direct Simple Shear	T Triaxial Shear S PW Satmtry G Gas Analysis	
TERMINATION DEPTH	108.3m									
DRILLING RIG	SIMCO 5000 WS									
LOG COMPILED BY	MDW/BAB/RVW									

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LOCATION		WATER DEPTH		BULK DENSITY		UNDRAINED		SOIL UNIT	LABORATORY TESTS		
UTM COORDINATES		51.3m		(TIME MEASURED 08:00 hrs. 1985-09-27)		SHEAR STRENGTH					
SYMBOL		SAMPLE		SOIL DESCRIPTION		GROUND ICE DESCRIPTION		WATER CONTENT (%)		UNDRAINED SHEAR STRENGTH (kPa)	
						TEMP. (°C)		PLASTIC LIMIT		LIQUID LIMIT	
								20 40 60 80		10 20 30 40	
				CLAY (CH) - silty, trace of organics, homogeneous, very soft, high plasticity, dark olive grey		NOT FROZEN					

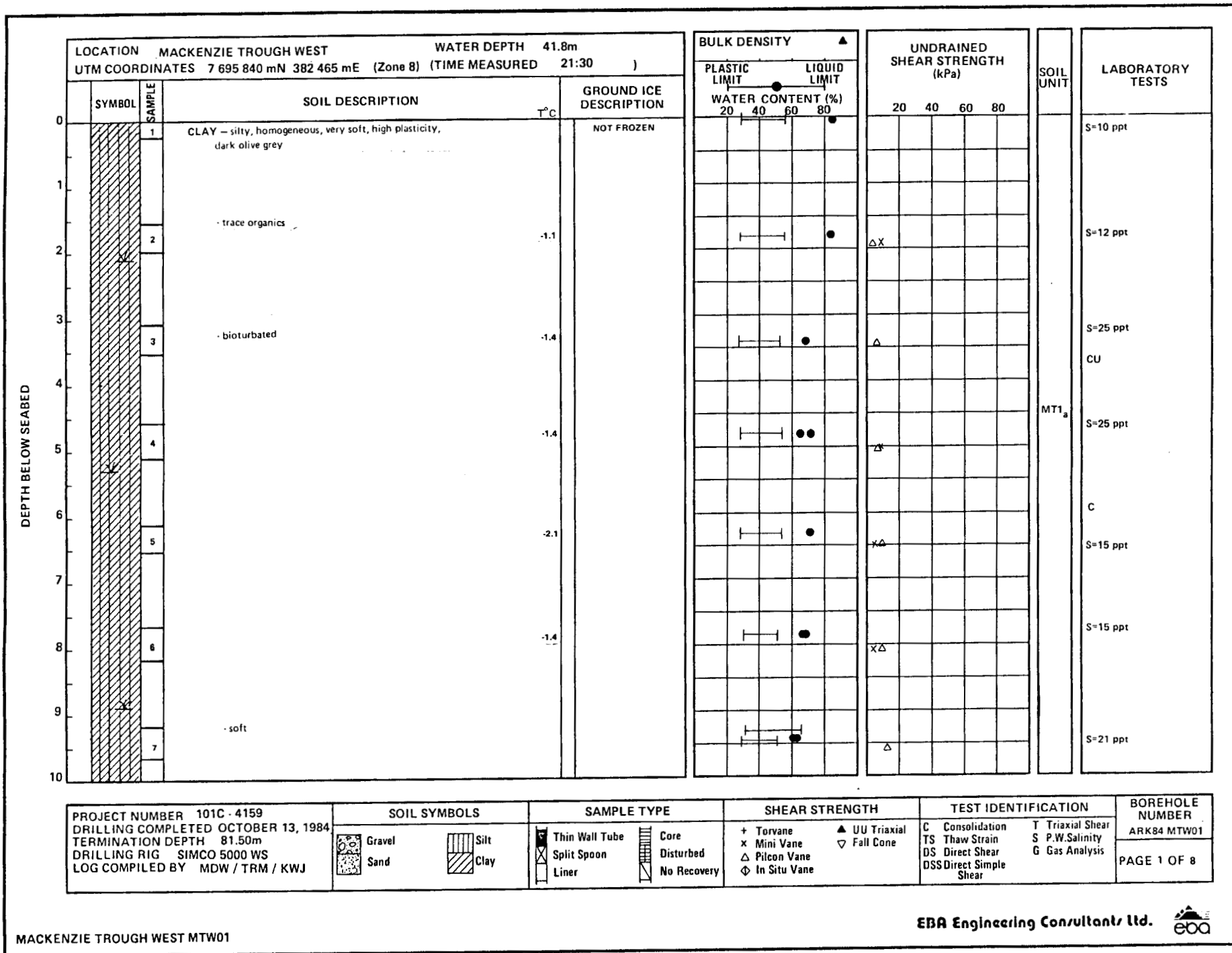
LOCATION		UQSUG - I-36		WATER DEPTH		51.3m	
UTM COORDINATES		7 722 234m N 407 288m E, ZONE 8		(TIME MEASURED		08:00 hrs. 1985-09-27)	
SYMBOL	SAMPLE	SOIL DESCRIPTION		GROUND ICE DESCRIPTION		BULK DENSITY	
				TEMP. (°C)		▲	
						PLASTIC LIMIT	
						LIQUID LIMIT	
						WATER CONTENT (%)	
						20 40 60 80	
						10 20 30 40	
						UNDRAINED SHEAR STRENGTH (kPa)	
						10 20 30 40	

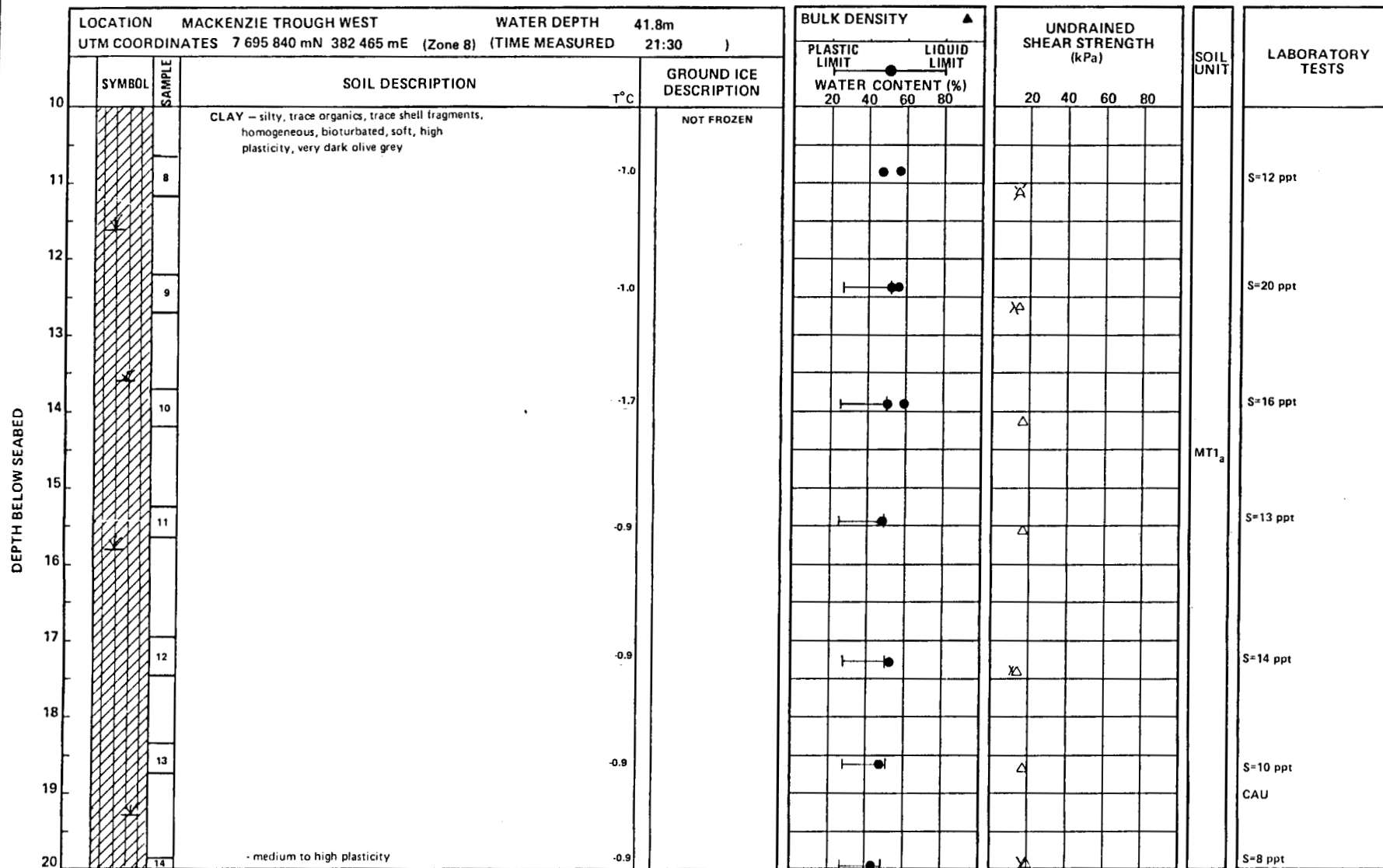
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BOREHOLE LOG AND LABORATORY TEST RESULTS



LOCATION ADLARTOK I-01					WATER DEPTH 56.1m							
UTM COORDINATES 7 713 634m N 392 264m E ZONE 8 (TIME MEASURED 09:00 hrs. 1985-09-28)												
DEPTH BELOW SEABED (metres)	SYMBOL	SAMPLE	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	BULK DENSITY				UNDRAINED SHEAR STRENGTH (kPa)	SOIL UNIT	LABORATORY TESTS	
					PLASTIC LIMIT		LIQUID LIMIT					
					WATER CONTENT (%)							
					20	40	60	80				
20			SILT (ML) - trace of fine-grained sand, wavy parallel and nonparallel laminations, dark grey	NOT FROZEN							MT1b 2	SAL = 33 ppt
22		6										
24												
26		7	trace clay, convoluted laminations bending from horizontal to near vertical, low plastic to nonplasticity									
28												
30		8	laminations dipping 30°, becoming convoluted									
32												
34		9										
		10	homogeneous, dense									
			33.7 m (-89.7 m El.)									SAL = 23 ppt
			END OF BOREHOLE									





PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 13, 1984
 TERMINATION DEPTH 81.50m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY MDW / TRM / KWJ

SOIL SYMBOLS

Gravel
 Sand
 Silt
 Clay

SAMPLE TYPE

Thin Wall Tube
 Split Spoon
 Liner
 Core
 Disturbed
 No Recovery

SHEAR STRENGTH

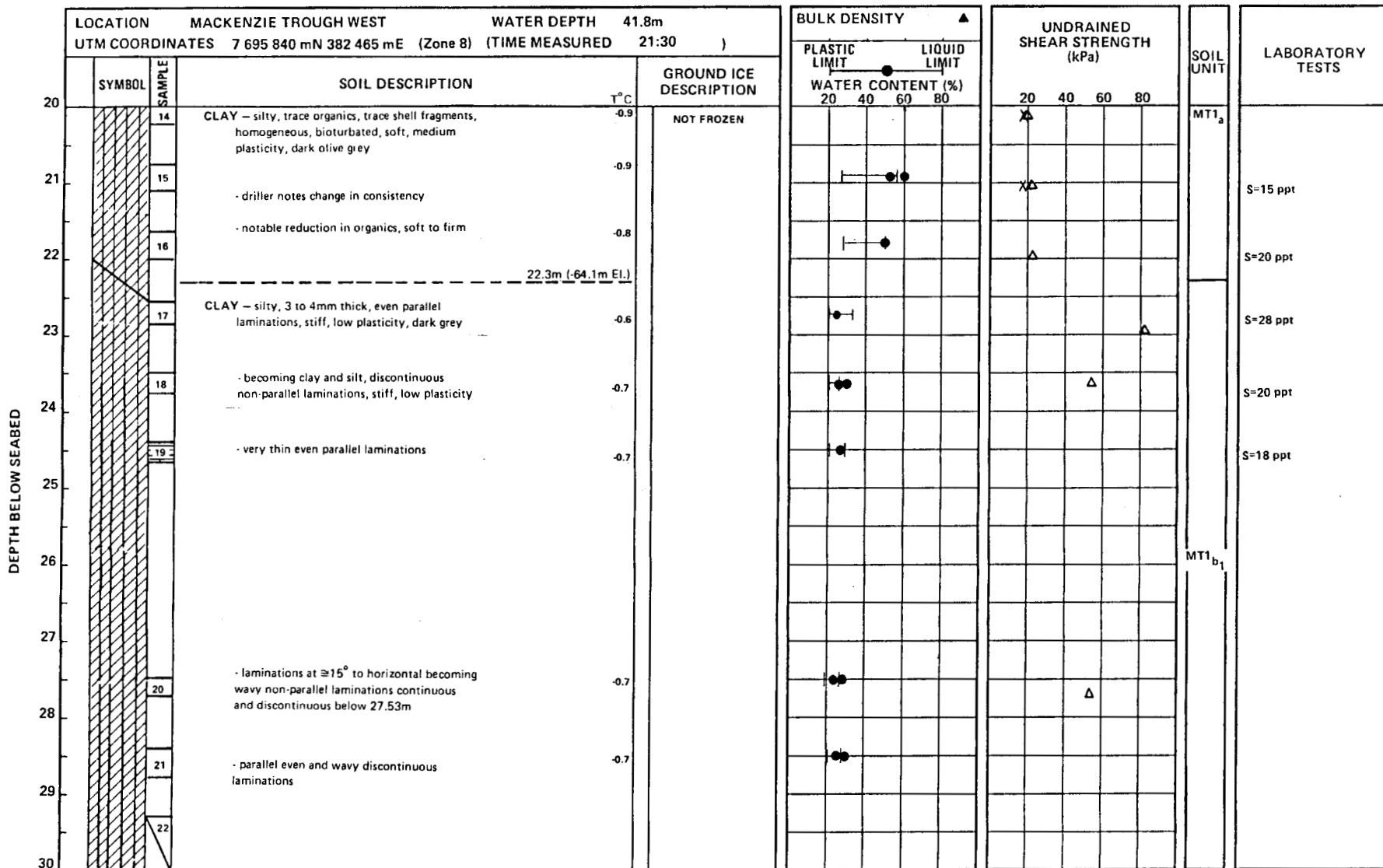
+ Torvane
 x Mini Vane
 Δ Pilcon Vane
 ◇ In Situ Vane
 ▲ UU Triaxial
 ▽ Fall Cone

TEST IDENTIFICATION

C Consolidation
 TS Thaw Strain
 DS Direct Shear
 DSS Direct Simple Shear
 T Triaxial Shear
 S P.W. Salinity
 G Gas Analysis

BOREHOLE NUMBER
 ARK84 MTW01

PAGE 2 OF 8



PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 13, 1984
 TERMINATION DEPTH 81.50m
 DRILLING RIG SIMCO 5000WS
 LOG COMPILED BY MDW / TRM / KWJ

SOIL SYMBOLS

Gravel Sand Silt Clay

SAMPLE TYPE

Thin Wall Tube Split Spoon Liner Core Disturbed No Recovery

SHEAR STRENGTH

+ Torvane x Mini Vane Δ Pilcon Vane ◇ In Situ Vane ▲ UU Triaxial ∇ Fall Cone

TEST IDENTIFICATION

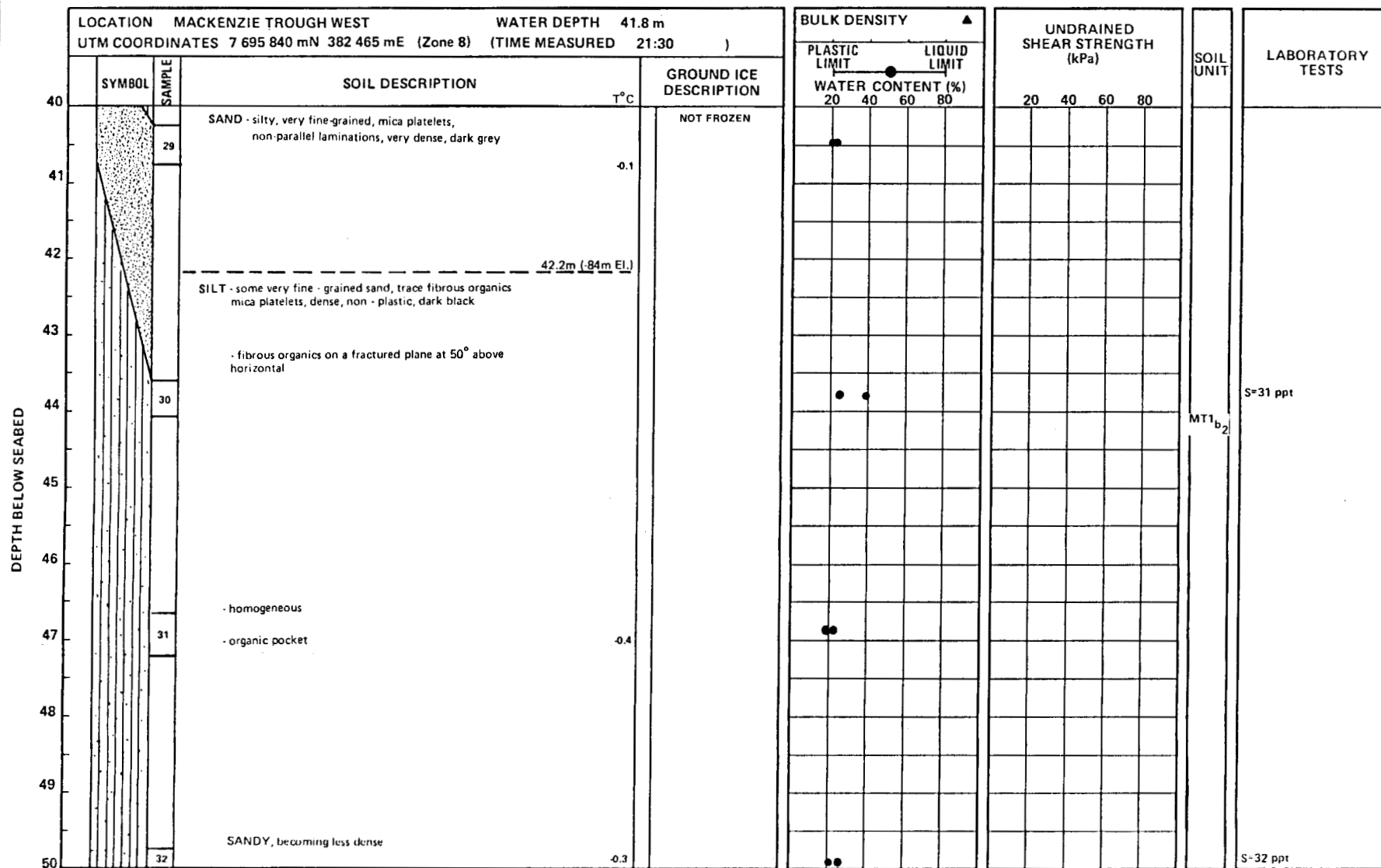
C Consolidation TS Thaw Strain DS Direct Shear DSS Direct Simple Shear T Triaxial Shear S P.W. Salinity G Gas Analysis

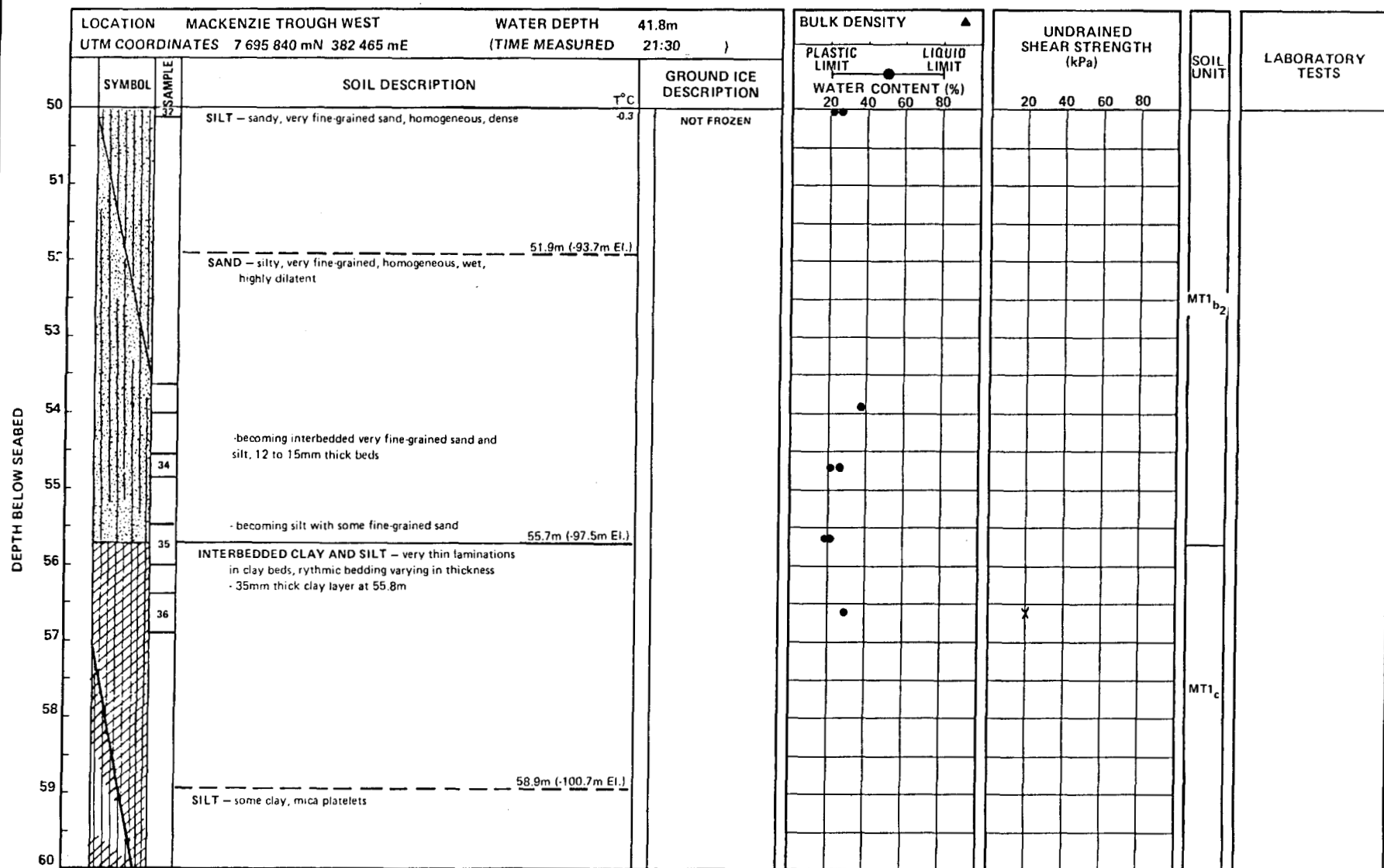
BOREHOLE NUMBER
 ARK84 MTW01

PAGE 3 OF 8

LOCATION		MACKENZIE TROUGH WEST		WATER DEPTH		41.8m					
UTM COORDINATES		7 695 840 mN 382 465 mE (Zone 8)		(TIME MEASURED		21:30)					
DEPTH BELOW SEABED	SYMBOL	SAMPLE	SOIL DESCRIPTION	T°C	GROUND ICE DESCRIPTION	BULK DENSITY		UNDRAINED SHEAR STRENGTH (kPa)	SOIL UNIT	LABORATORY TESTS	
						PLASTIC LIMIT	LIQUID LIMIT				
						WATER CONTENT (%)					
						20	40	60	80		
30		23	CLAY AND SILT – parallel even and wavy discontinuous laminations, dense, moist, low plasticity, dark grey		NOT FROZEN					MT1 _{b1}	
31		24	- even parallel continuous laminations, low to non-plastic 31.7m (-73.5m El.)	-0.9							S=15 ppt
32		25	SILT – some sand, trace clay, non-parallel discontinuous and parallel continuous intervals, very fine-grained sand, mica platelets, non plastic, dense	-0.8							S=26 ppt
33											
34											
35		26								MT1 _{b2}	
36											
37		27	- thin even parallel laminations, dense	-0.5							
38		28		-0.4							
39											
40			SAND – silty, very fine grained, mica platelets, non-parallel laminations, very dense, dark grey 39.4m (-81.2m El.)								

PROJECT NUMBER 101C - 4159 DRILLING COMPLETED OCTOBER 13, 1984 TERMINATION DEPTH 81.50m DRILLING RIG SIMCO 5000 WS LOG COMPILED BY MDW / TRM / KWJ	SOIL SYMBOLS  Gravel  Sand  Silt  Clay	SAMPLE TYPE  Thin Wall Tube  Split Spoon  Liner  Core  Disturbed  No Recovery	SHEAR STRENGTH  Torvane  Mini Vane  Pilcon Vane  In Situ Vane  UU Triaxial  Fall Cone	TEST IDENTIFICATION  Consolidation  Thaw Strain  Direct Shear  Direct Simple Shear  Triaxial Shear  P.W. Salinity  Gas Analysis	BOREHOLE NUMBER ARK84 MTW01 PAGE 4 OF 8
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PROJECT NUMBER 101C-4159 DRILLING COMPLETED OCTOBER 13, 1984 TERMINATION DEPTH 81.50m DRILLING RIG SIMCO 5000 WS LOG COMPILED BY MDW / TRM / KWJ	SOIL SYMBOLS  Gravel  Sand  Silt  Clay	SAMPLE TYPE  Thin Wall Tube  Split Spoon  Liner  Core  Disturbed  No Recovery	SHEAR STRENGTH + Torvane ▲ UU Triaxial x Mini Vane ▼ Fall Cone △ Pilcon Vane ◇ In Situ Vane	TEST IDENTIFICATION C Consolidation T Triaxial Shear TS Thaw Strain S P.W. Salinity DS Direct Shear G Gas Analysis DSS Direct Simple Shear	BOREHOLE NUMBER ARK84 MTW01
					PAGE 6 OF 8

LOCATION MACKENZIE TROUGH WEST			WATER DEPTH 41.8m							
UTM COORDINATES 7 695 840 mN 382 465 mE (Zone 8)			(TIME MEASURED 21:30)							
DEPTH BELOW SEABED	SYMBOL	SAMPLE	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	BULK DENSITY ▲		UNDRAINED SHEAR STRENGTH (kPa)	SOIL UNIT	LABORATORY TESTS	
					PLASTIC LIMIT	LIQUID LIMIT				
					WATER CONTENT (%)					
					20	40	60	80		
60			SILT – some clay, mica platelets							
61		37	- uniform at top becoming thinly laminated at bottom of sample		•	•				S=30 ppt
62		38	- trace clay, trace fine-grained sand, dryer, non-plastic, dark grey		•	•				
63										
64										
65										
66										
67		39	- interbedded with clay, graduating from thin to medium thick laminations		•	•	•			S=30 ppt
68										
69										
70										

PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 13, 1984
 TERMINATION DEPTH 81.50m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY MDW / TRM / KWJ

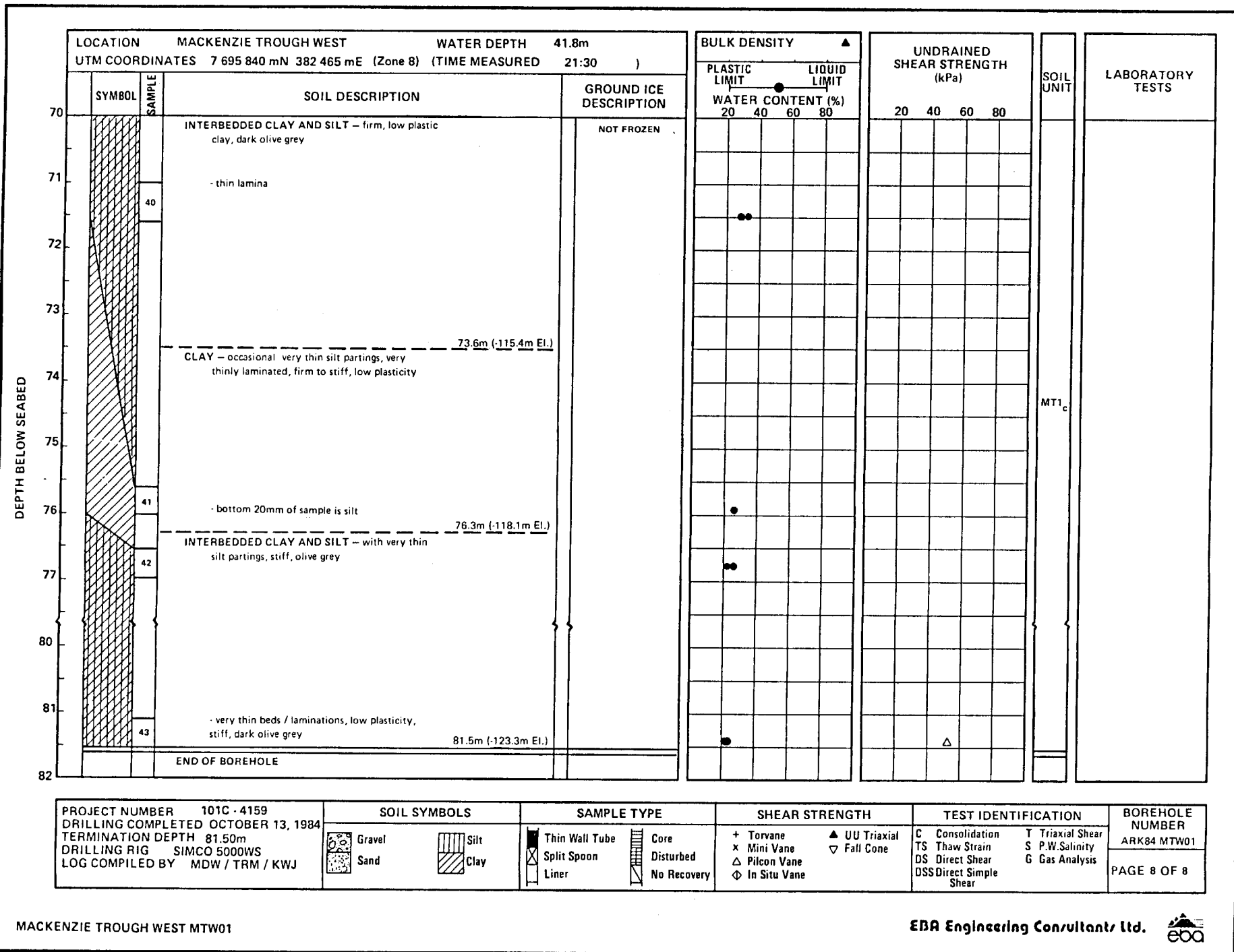
SOIL SYMBOLS
 Gravel
 Sand
 Silt
 Clay

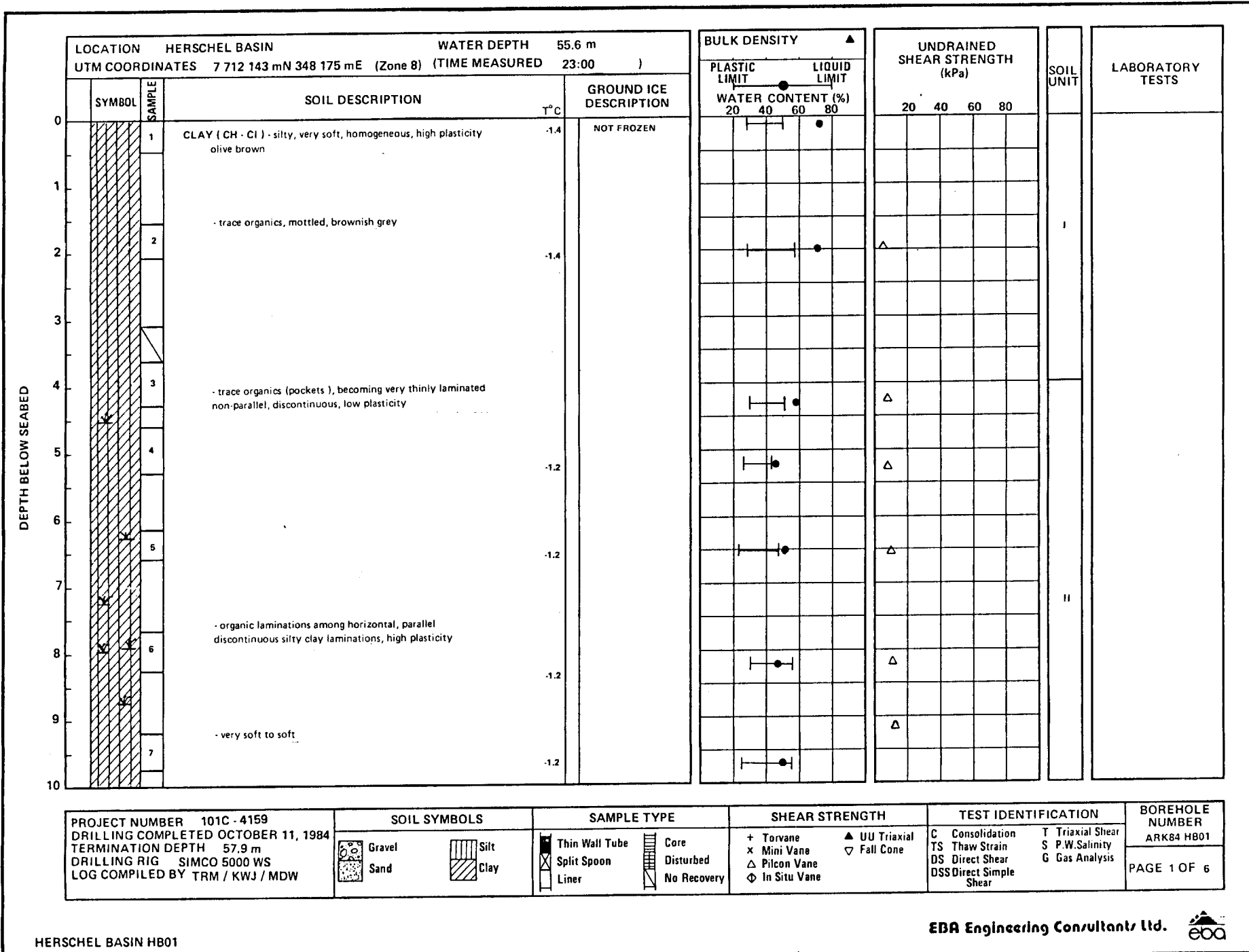
SAMPLE TYPE
 Thin Wall Tube
 Split Spoon
 Liner
 Core
 Disturbed
 No Recovery

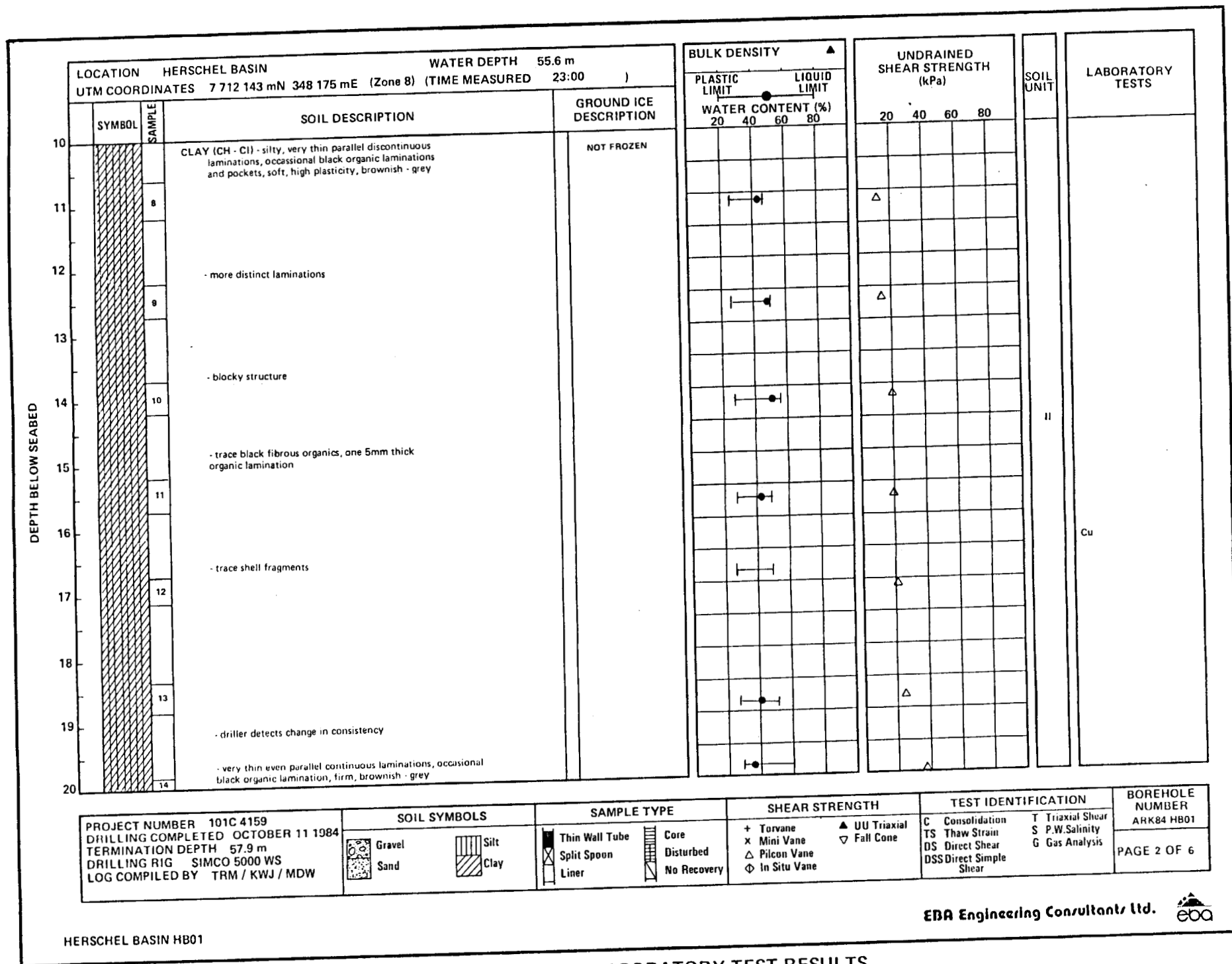
SHEAR STRENGTH
 + Torvane
 x Mini Vane
 Δ Pilcon Vane
 ◇ In Situ Vane
 ▲ UU Triaxial
 ▼ Fall Cone

TEST IDENTIFICATION
 C Consolidation
 TS Thaw Strain
 OS Direct Shear
 DSS Direct Simple Shear
 T Triaxial Shear
 S P.W. Salinity
 G Gas Analysis

BOREHOLE NUMBER
 ARK84 MTW01
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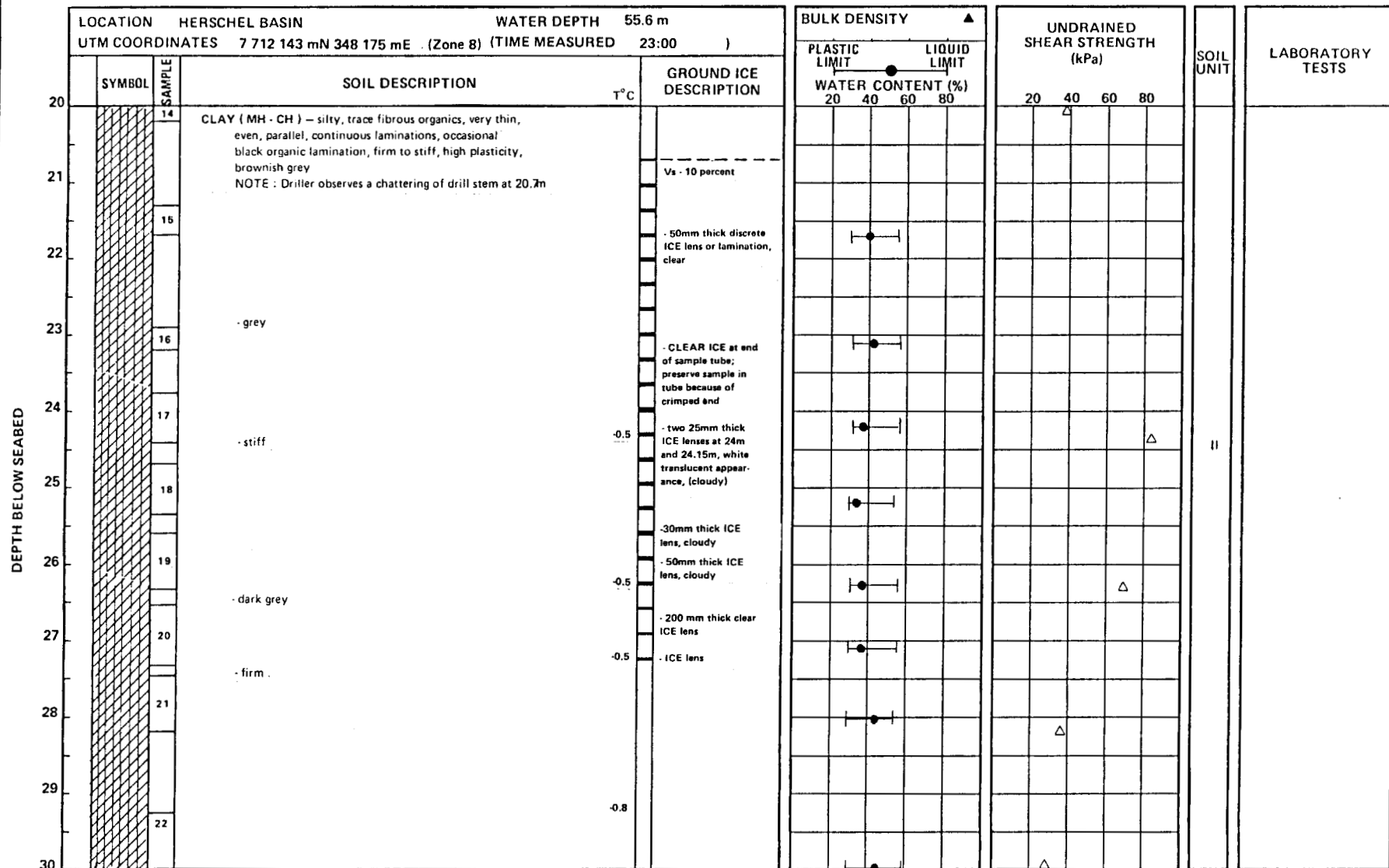


HERSCHEL BASIN HB01

EBA Engineering Consultants/ Ltd.



BOREHOLE LOG AND LABORATORY TEST RESULTS



PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 11, 1984
 TERMINATION DEPTH 57.9 m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY TRM / KWJ / MDW

SOIL SYMBOLS
 Gravel
 Sand
 Silt
 Clay

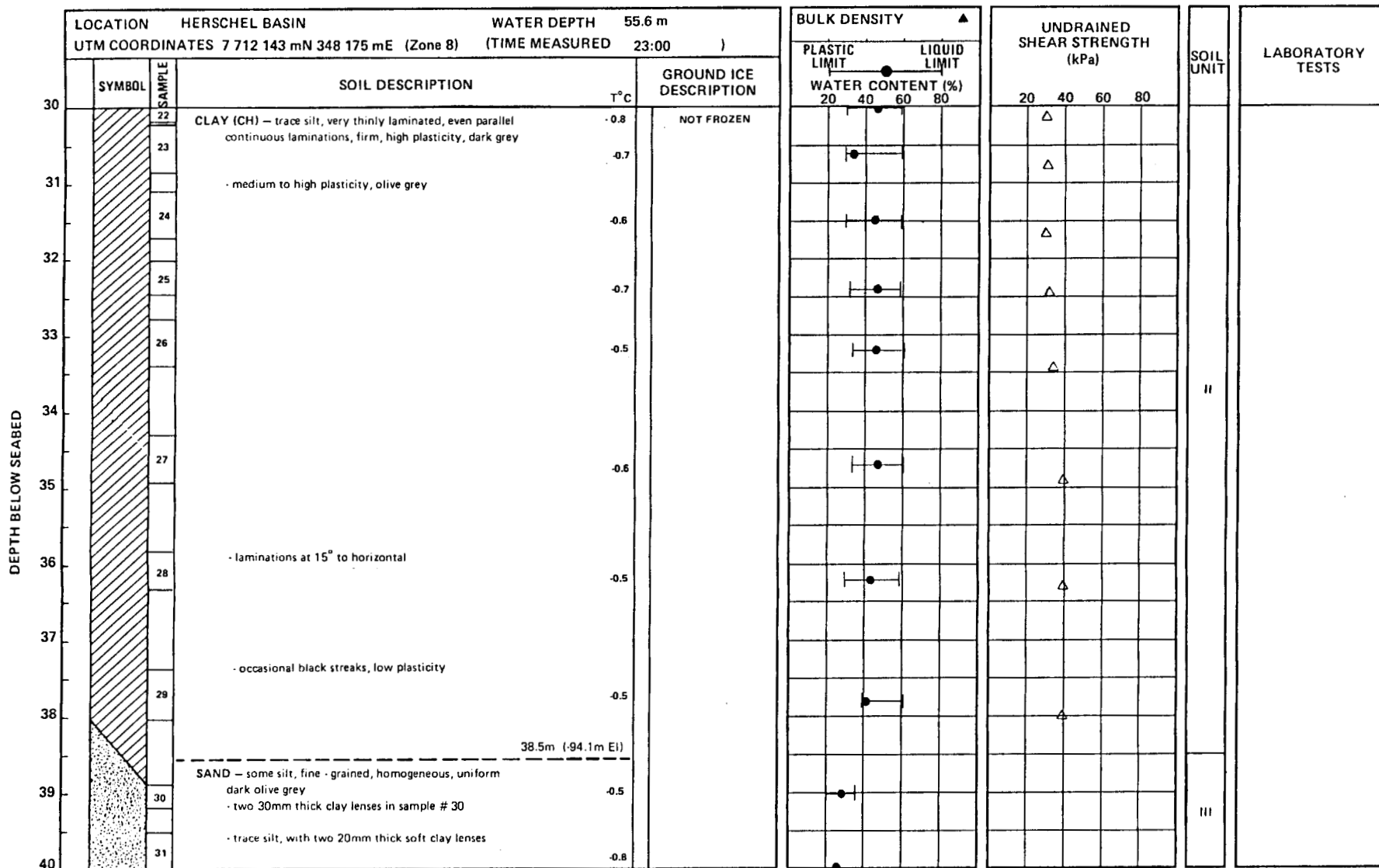
SAMPLE TYPE
 Thin Wall Tube
 Split Spoon
 Liner
 Core
 Disturbed
 No Recovery

SHEAR STRENGTH
 + Torvane
 x Mini Vane
 Δ Pilcon Vane
 ◇ In Situ Vane
 ▲ UU Triaxial
 ▽ Fall Cone

TEST IDENTIFICATION
 C Consolidation
 TS Thaw Strain
 DS Direct Shear
 DSS Direct Simple Shear
 T Triaxial Shear
 S P.W. Salinity
 G Gas Analysis

BOREHOLE NUMBER
 ARK64 HB01

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PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 11, 1984
 TERMINATION DEPTH 57.9 m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY TRM / KWJ / MDW

SOIL SYMBOLS

Gravel
 Sand
 Silt
 Clay

SAMPLE TYPE

Thin Wall Tube
 Split Spoon
 Liner
 Core
 Disturbed
 No Recovery

SHEAR STRENGTH

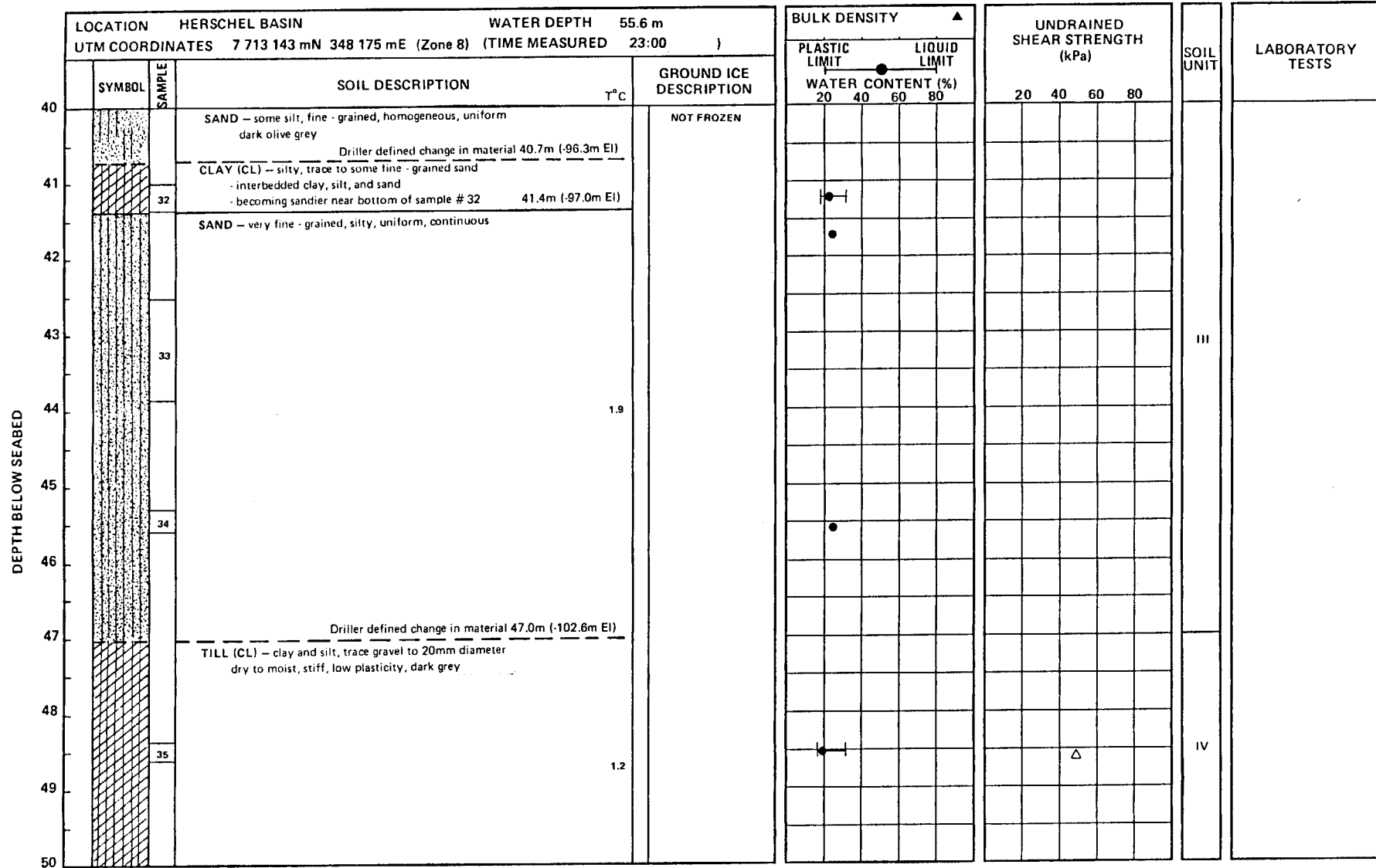
+ Torvane
 x Mini Vane
 Δ Pilcon Vane
 ◇ In Situ Vane
 ▲ UU Triaxial
 ▼ Fall Cone

TEST IDENTIFICATION

C Consolidation
 TS Thaw Strain
 DS Direct Shear
 DSS Direct Simple Shear
 T Triaxial Shear
 S P.W. Salinity
 G Gas Analysis

BOREHOLE NUMBER
 ARK84 HB01

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PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 11, 1984
 TERMINATION DEPTH 57.9m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY TRM / KWJ / MDW

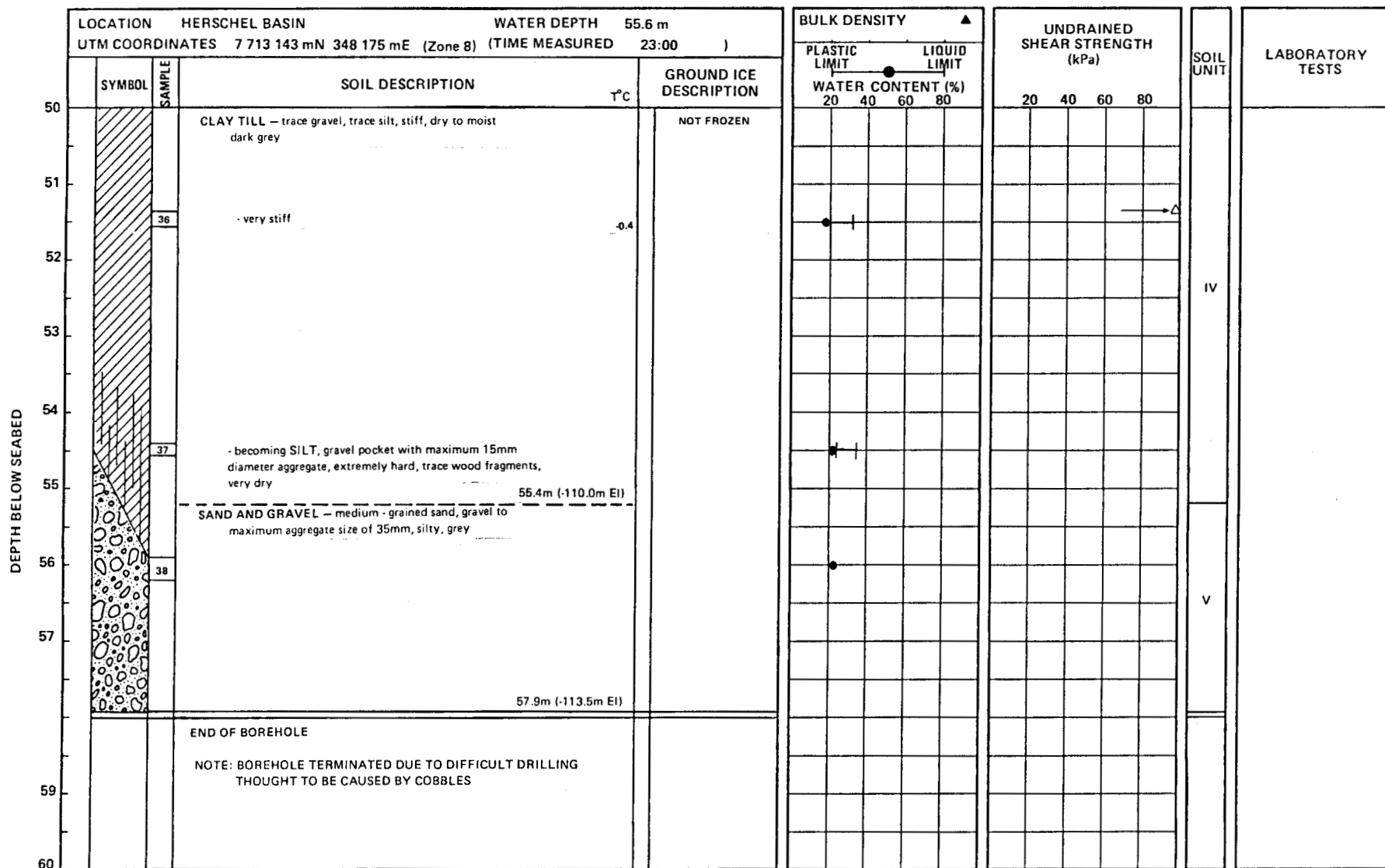
SOIL SYMBOLS	
	Gravel
	Sand
	Silt
	Clay

SAMPLE TYPE	
	Thin Wall Tube
	Split Spoon
	Liner
	Core
	Disturbed
	No Recovery

SHEAR STRENGTH	
+	Torvane
x	Mini Vane
△	Pilcon Vane
◇	In Situ Vane
▲	UU Triaxial
▽	Fall Cone

TEST IDENTIFICATION	
C	Consolidation
TS	Thaw Strain
DS	Direct Shear
DSS	Direct Simple Shear
T	Triaxial Shear
S	P.W. Salinity
G	Gas Analysis

BOREHOLE NUMBER
 ARK84 HB01
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PROJECT NUMBER 101C - 4159
 DRILLING COMPLETED OCTOBER 11, 1984
 TERMINATION DEPTH 57.9m
 DRILLING RIG SIMCO 5000 WS
 LOG COMPILED BY TRM / KWJ / MDW

SOIL SYMBOLS

Gravel
 Sand
 Silt
 Clay

SAMPLE TYPE

Thin Wall Tube
 Split Spoon
 Liner
 Core
 Disturbed
 No Recovery

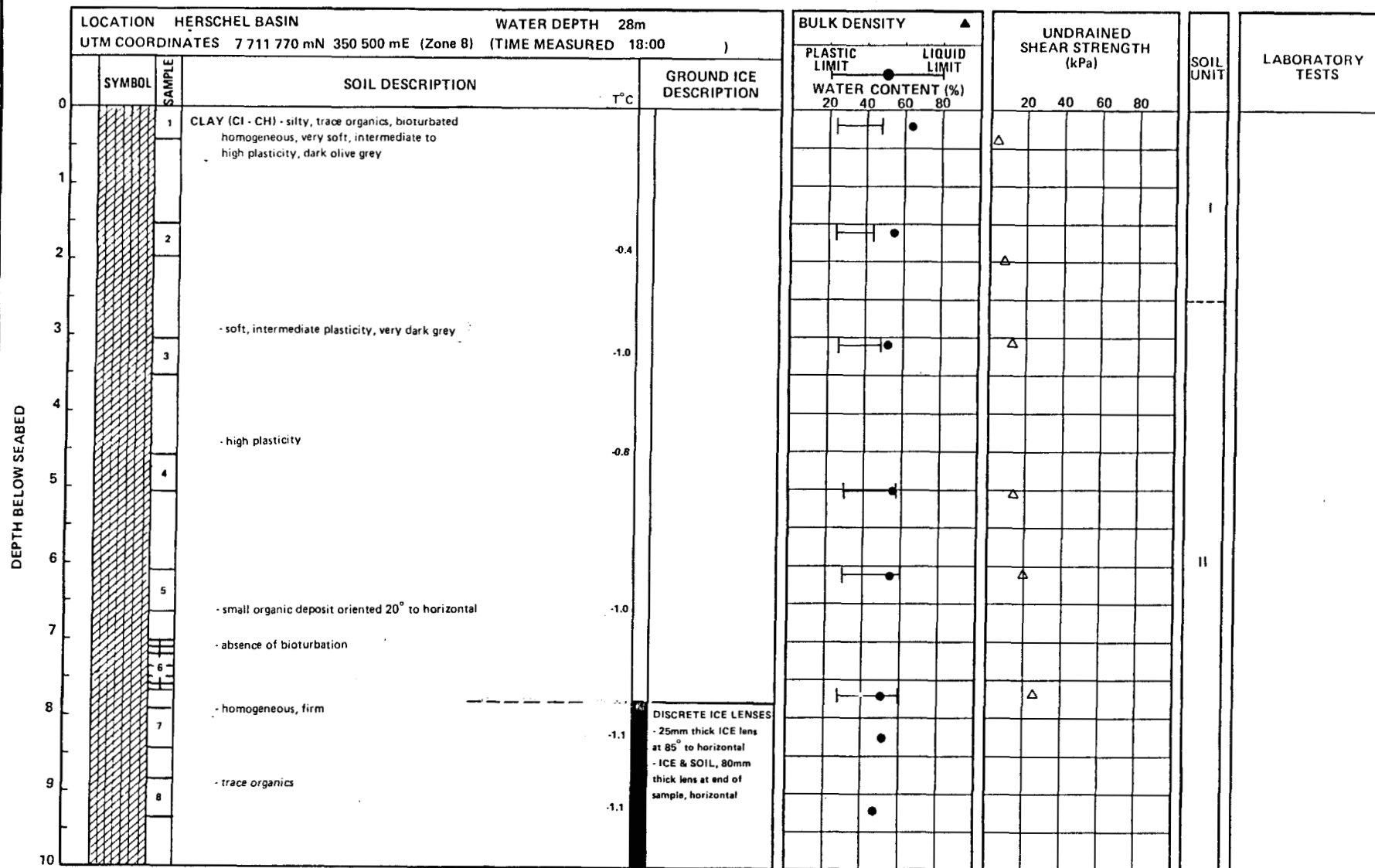
SHEAR STRENGTH

+ Torvane
 x Mini Vane
 Δ Pilcon Vane
 ◇ In Situ Vane
 ▲ UU Triaxial
 ▼ Fall Cone

TEST IDENTIFICATION

C Consolidation
 TS Thaw Strain
 DS Direct Shear
 DSS Direct Simple Shear
 T Triaxial Shear
 S P.W. Salinity
 G Gas Analysis

BOREHOLE NUMBER
 ARK84 HB01
 PAGE 6 OF 6



65.147

PROJECT NUMBER 101C 4159
DRILLING COMPLETED OCTOBER 15 1984
TERMINATION DEPTH 20.2 m
DRILLING RIG SIMCO 5000 WS
LOG COMPILED BY MDW/TRM

SOIL SYMBOLS

Gravel	Silt
Sand	Clay

SAMPLE TYPE

Thin Wall Tube	Core
Split Spoon	Disturbed
Liner	No Recovery

SHEAR STRENGTH

+ Torvane	▲ UU Triaxial
x Mini Vane	▽ Fall Cone
△ Pilcon Vane	
⊕ In Situ Vane	

TEST IDENTIFICATION

C Consolidation	T Triaxial Shear
TS Thaw Strain	S P.W. Salinity
DS Direct Shear	G Gas Analysis
DSS Direct Simple Shear	

BOREHOLE NUMBER
ARK84 HB02

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