APPENDIX A4 – Cone Calibration Certificate

Eijkelkamp GeoPoint
SoilSolutions

Rijkstraatweg 22F
2171 AL Sassenheim
The Netherlands
[redacted]

Cone Calibration Certificate

Certificate:	**GS-1867-003**	
Instrument Type:	Electric Subtraction Cone	
Model:	S15-CFIIP	
Serial number:	1867	
Calibration date:	07-06-2023	
Client:	In Situ	
Calibrated by:	A.Verhart	
Calibration instruments		
Manufacturer:	Hottinger Baldwin Messtechnik GmbH	
NMi certificate	2461165.00501	
Calibration conditions		
Ambient temperature:	24.6	°C
Atmospheric pressure:	1024	mBar
Cone specifications		
Cone base area:	1500	mm2
Load tip resistance (nom.):	100	kN
Friction sleeve area:	22500	mm2
Load tip + local friction (nom.):	100	kN
Load friction sleeve (nom.):	22.5	kN
Load pore pressure (nom.):	2	MPa
Inclination (nom.):	+/- 20	°
Temperature compensation (all channels):	0...+40	°C
Maximum overload capacity (all channels):	100	%
Cone area ratio (a):	0.79	
Max. Inaccuracy, relative to measurement value:	1.0	%

	Tip:		Sleeve:		Pore Pressure:		Inclinometer:		
	qc in kN	mV	fs in kN	mV	MPa	mV	Degrees	X (mV)	Y (mV)
Zero points:		0213		0266		0188			
	0	0	0	0	0	0	0	2477	2266
	5	0304	5	0315	0.4	1714	-20	0515	0238
	10	0611	10	0629	0.8	3428	20	4497	4229
	15	0915	15	0944	1.2	5128			
	20	1224	20	1261	1.6	6824			
	25	1529	25	1578	2	8524			
	30	1835	30	1895					
	35	2140	35	2209					
	40	2447	40	2526					
	45	2753	45	2842					
	50	3059	50	3159					
	75	4590	75	4741					
	100	6117	100	6319					

Max. eror, abs. qc:	35 kPa
Max. error, abs. fs:	5 kPa
Max. error, abs. u2:	10 kPa
Max. error, abs. I:	1 °

This calibration is compliant with Eijkelkamp GeoPoint SoilSolutions internal quality system, internal calibration procedures and meets the requirements of NEN2649, NEN-EN-ISO 22476-1, NORSOK G-001, ISSMFE and ASTM using calibration equipment traceable to (Inter-)National Standards.

Approved by: [redacted]
Date:

Eijkelkamp GeoPoint SoilSolutions
V.A.T. NO. NL 8584.21.422.B01
Trade Reg. Arnhem no. 70686149
IBAN NL43 RABO 0326 7904 38
BIC: RABONL2U

APPENDIX A5 – Symbol List

English

a	is area ratio of the cone (=)
A	is area
A_c	is projected area of the cone
A_n	is cross sectional area of load cell or shaft
A_s	is area of friction sleeve
A_{sb}	is bottom end area of friction sleeve
A_{st}	is top end area of friction sleeve
B_q	is pore pressure parameter (= $\frac{(u_2 - u_0)}{(q_t - \sigma_{v0})}$)
c_h	is horizontal coefficient of consolidation
c_v	is vertical coefficient of consolidation
D	is diameter
D_r	is relative density (= $\frac{e_{max} - e}{e_{max} - e_{min}}$ 100%)
e	is void ratio
e_{max}	is maximum void ratio
e_{min}	is minimum void ratio
E	is Young's modulus
f_s	is unit sleeve friction resistance
f_t	is sleeve friction corrected for pore pressure effects
F_s	is total force acting on friction sleeve
F_R	is normalized friction ratio (= $\frac{f_s}{(q_t - \sigma_{v0})}$)
FoS	is factor of safety
FC	is fines content
g	is acceleration due to gravity
G_0	is initial or maximum shear modulus, shear stiffness
I_c	is soil behavior type index
I_r	is rigidity index (=)
I_p	is plasticity index
k	is coefficient of permeability
k_h	is coefficient of permeability in horizontal direction
k_v	is coefficient of permeability in vertical direction
K_0	is coefficient of earth pressure at rest (= $\sigma'_{h0} / \sigma_{v0}$)
L	is length
m_v	is coefficient of volume change
M	is constrained deformation modulus
M7.5	is earthquake magnitude of 7.5 Richter scale
N	is number of blows of SPT
N_{60}	is SPT energy ratio
N_k	is cone factor
N_{ke}	is cone factor
N_{kt}	is cone factor
$N_{\Delta u}$	is cone factor
p_a	is reference stress (= 100)
q_c	is measured cone resistance
q_e	is effective cone resistance (= $q_c - u_2$)
q_n	is net cone resistance (= $q_c - u_0$)
q_t	is corrected cone resistance (= $q_c + (1 - a) u_2$)
Q_c	is total force acting on the cone
Q_t	is normalized cone resistance (= $\frac{q_t - \sigma_{v0}}{\sigma'_{v0}}$)

R_f	is friction ratio (= 100% or alternatively = 100%)
s_u	is undrained shear strength
s_{ur}	is remoulded undrained shear strength
S_t	is sensitivity
t	is time
t_{50}	is time for 50% dissipation of excess pore water pressure
T_{50}	is time factor at = 50 %
u	is pore water pressure
u_0	is in situ pore pressure
u_1	is pore pressure measured on the cone
u_2	is pore pressure measured behind the cone
u_3	is pore pressure measured behind sleeve friction
Δu	is excess pore water pressure
U	is normalized excess pore pressure
V_s	is shear wave velocity
z	is depth

Greek

α	is constant
α	is cone roughness
β	is constant
β_1	is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane, in degrees
β_2	is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane that is perpendicular to the plane of angle $_1$, in degrees
γ	is unit weight of soil
γ_w	unit weight of water
Δ	is change
Δu	is excess pore pressure (= – $_0$)
μ	is Poisson's ratio
ρ	is density
ψ	is state parameter
σ, σ'	is normal stress (total, effective)
σ_h, σ_h'	is horizontal stress (total, effective)
σ_v, σ_v'	is horizontal stress (total, effective)
σ_{v0},σ_{v0}'	is overburden stress (total, effective)
τ_{av}	is average cyclic shear stress
τ_{cy}	is cyclic shear stress
φ'	is effective friction angle

APPENDIX A6 – Abbreviations

ASTM	American Society for Testing and Materials
CPTU	Cone Penetration Test with Pore Pressure Measurement (Piezocone Test)
CRR	Cyclic Resistance Ratio
CSR	Cyclic Stress Ratio
GWT	Ground Water Table
NC	Normally Consolidated
OC	Over consolidated
OCR	Over consolidation Ratio
PL	Limit Pressure
SCPT	Seismic Cone Penetration
SDMT	Seismic Dilatometer Marchetti
SPT	Standard Penetration Test
TC	Technical Committee

APPENDIX A7 – Glossary

CPT
Cone Penetration Test.

Cone
The part of the cone penetrometer on which the end bearing is developed.

Cone Penetrometer
The assembly containing the *cone*, *friction sleeve*, any other sensors and measuring systems, as well as the connections to the *push-rods.*

Cone resistance, q_c
The total force acting on the cone, Q_c, divided by the projected area of the cone, A_c. =

Corrected cone resistance, q_t
The *cone resistance*, q_c corrected for pore water pressure effects.

Corrected sleeve friction, f_t
The *sleeve friction* corrected for pore water pressure effects on the ends of the *friction sleeve*.

Data acquisition system
The system used to measure and record the measurements made by the *cone penetrometer*.

Dissipation Test
A test when the decay of the pore water pressure is monitored during a pause in penetration.

Filter element
The porous element inserted into the cone penetrometer to allow transmission of the pore water pressure to the pore pressure sensor, while maintaining the correct profile of the *cone penetrometer*.

Friction ratio, R_f
The ratio, expressed as a percentage of the *sleeve friction*, f_s, to the *cone resistance*, q_c, both measured at the same depth.

Friction reducer
A local enlargement on the push-rod surface, placed at a distance above the cone penetrometer, and provided to reduce the friction on the *push-rods*.

Friction sleeve
The section of the *cone penetrometer* upon which the *sleeve friction* is measured.

Normalized cone resistance, Q_c or Q_t
The *cone resistance* expressed in a non-dimensional form and taking account of stress changes *in situ*, $= (- _0) , _0$, or when the *corrected cone resistance* is used $= (- _0) , _0$. where σ_{v0} and σ'_{v0} are the total and effective vertical stress respectively.

Net cone resistance, q_n
The *corrected cone resistance* minus the vertical total stress. $= - _0$

Normalized friction ratio, F_r
The *sleeve friction* normalized by the *net cone resistance*.

Piezocone
A *cone penetrometer* containing a pore pressure sensor.

Pore pressure, *u*
The pore pressure generated during penetration and measured by a pore pressure sensor, u_1 when measured on the cone, u_2 when measured just behind the cone and u_3 when measured just behind the friction sleeve.

Pore pressure ratio, B_q
The *net pore pressure* normalized with respect to the *net cone resistance*.

Push-rods
The thick-walled tubes or rods used for advancing the cone penetrometer.

Rig machine
The equipment which pushes the cone penetrometer and rods into the ground.

Sleeve friction, f_s
The total frictional force acting on the *friction sleeve*, F_s, divided by its *surface area*, A_s. =

APPENDIX A8 – Soils Description Tables

GRANULAR SOILS (Sands and Gravels)

Description	Relative Density D_r (%)	SPT N value, N_{SPT}
Very Loose	0 – 15	0 - 4
Loose	15 – 35	4 - 10
Medium Dense	35 – 65	10 - 30
Dense	65 – 85	30 - 50
Very Dense	>85	>50

COHESIVE SOILS (Clays and Silts)

Term based on measurement	Undrained Shear Strength Classification, s_u (kPa)
Extremely low	<10
Very low	10 - 20
Low	20 - 40
Medium	40 - 75
High	75 - 150
Very high	150 - 300
Extremely high	>300

APPENDIX B

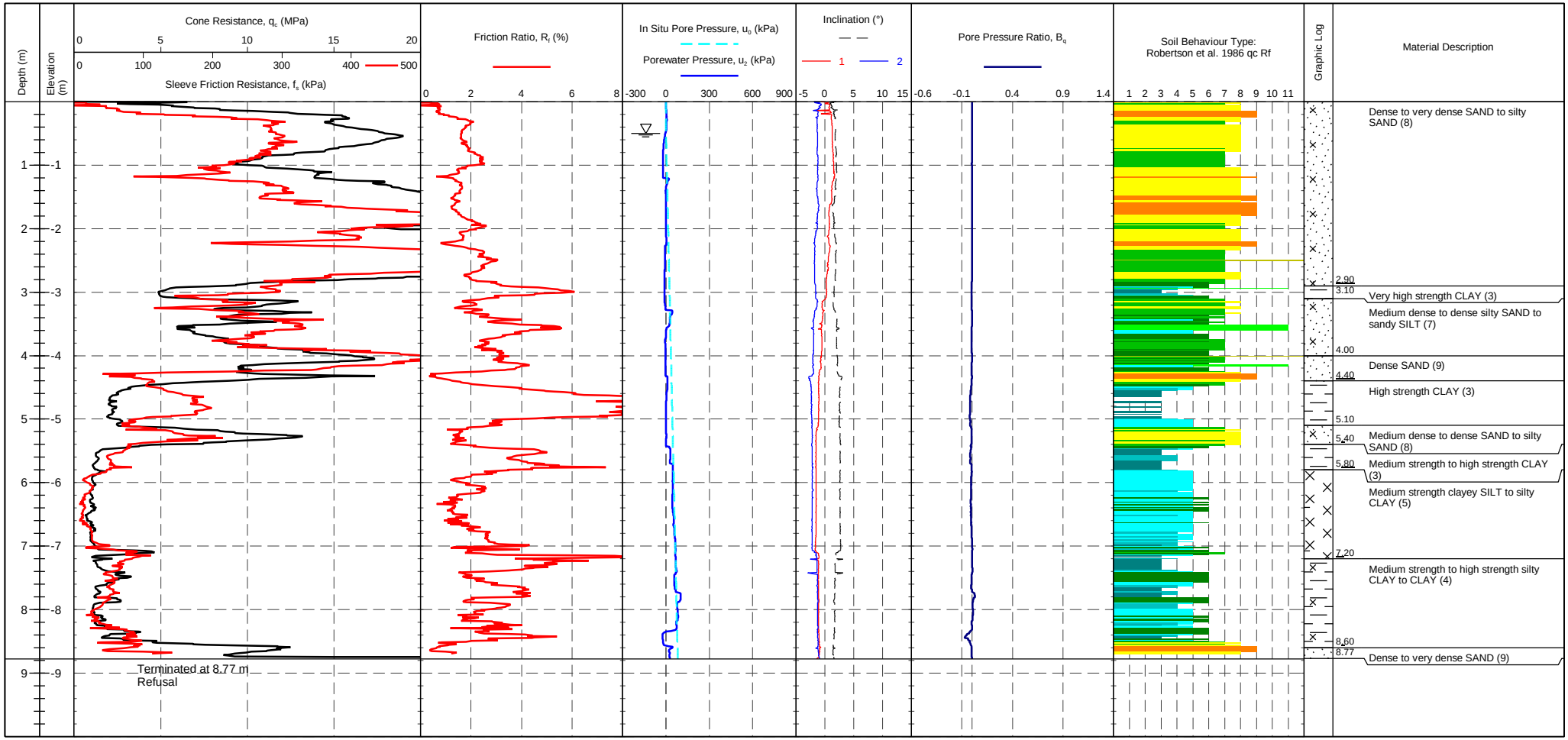
Cone Penetration Measured Parameters and Geotechnical Derived Parameters

CPT LOG 01

Working with: TRC

PointID: **CPT101**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	242 mV	0.011 MPa
Sleeve	299 mV	301 mV	0.001 kPa
Pore Pressure 2	200 mV	189 mV	-0.003 kPa
X-Y Inclinometer	2454 mV	2438 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

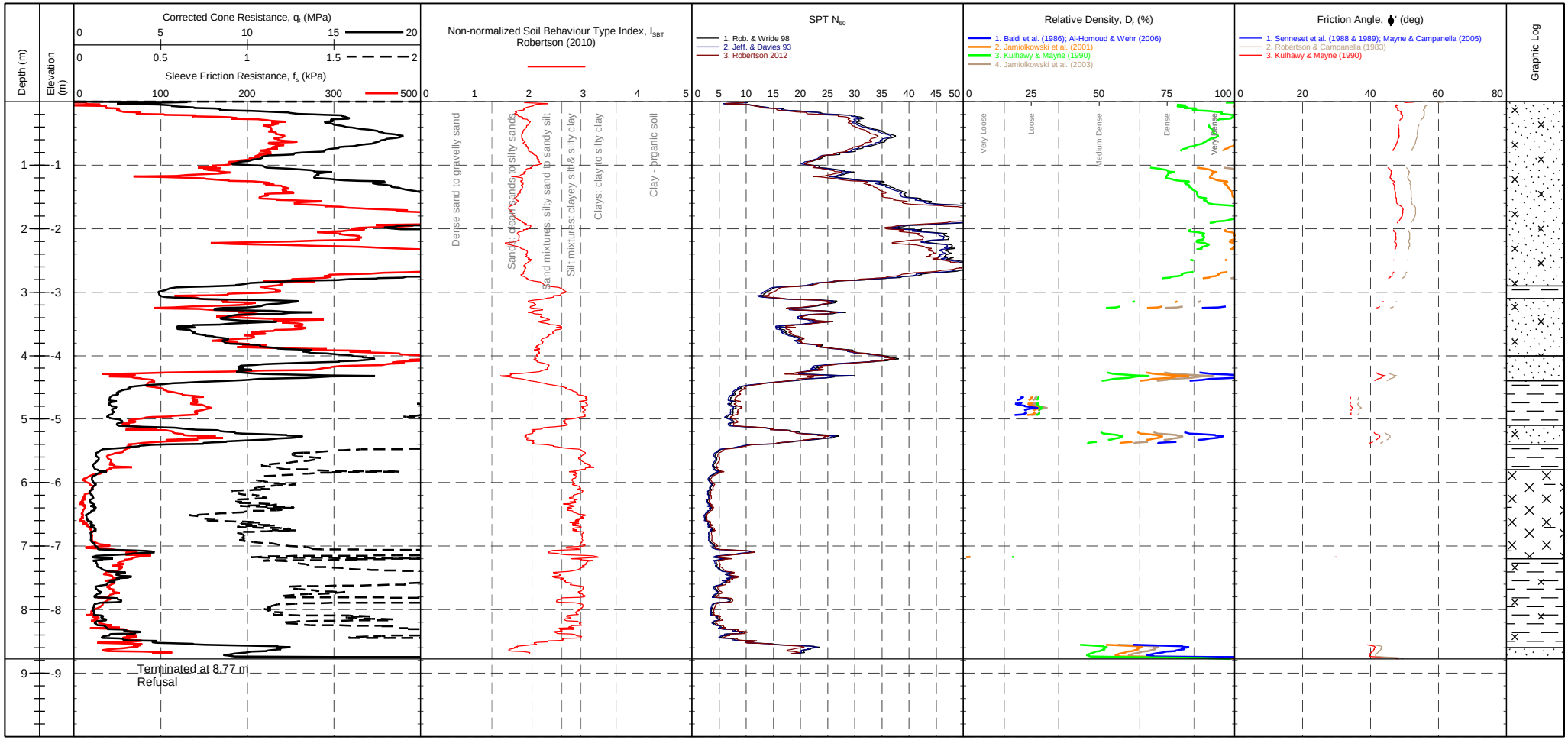
PointID **CPT101**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 06/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka
CONE AREA RATIO	: 0.79	OPERATOR	: AC
FILTER POSITION	: u2	FRICTION REDUCER	: None
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	242 mV	0.011 MPa
Sleeve	299 mV	301 mV	0.001 kPa
Pore Pressure 2	200 mV	189 mV	-0.003 kPa
X-Y Inclinometer	2454 mV	2438 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

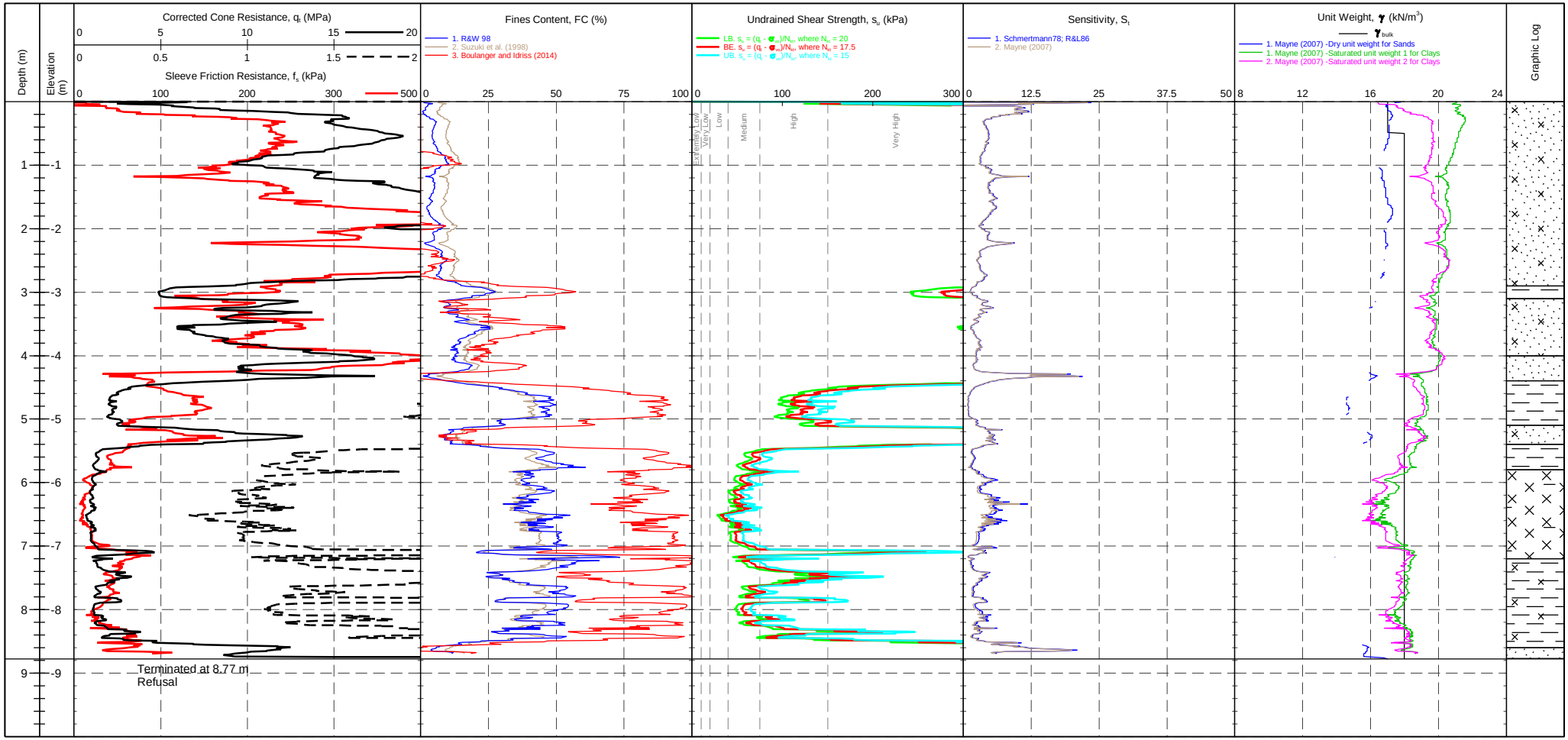
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT101**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



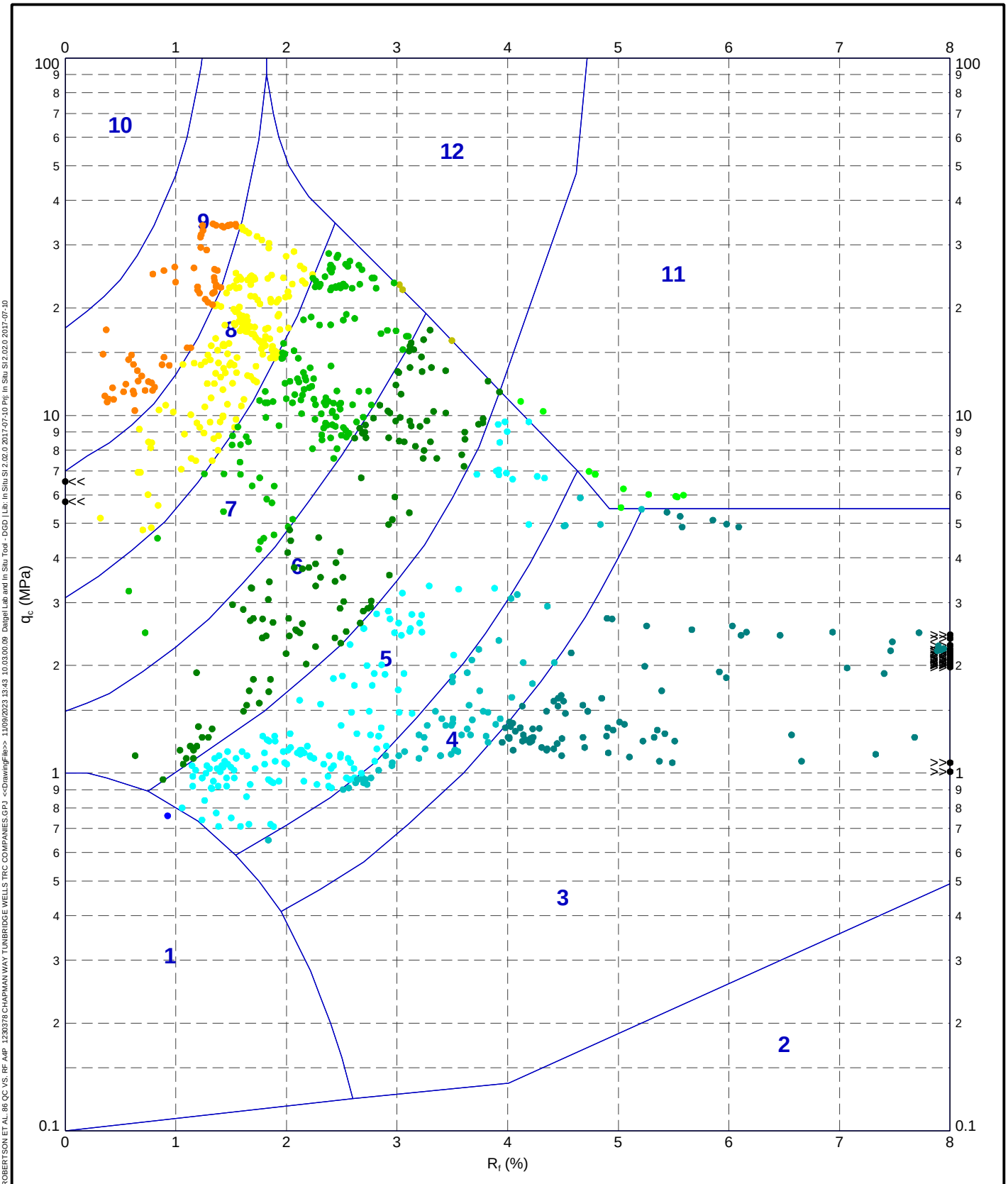
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	242 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	299 mV	301 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	200 mV	189 mV	-0.003 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2454 mV	2438 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT101

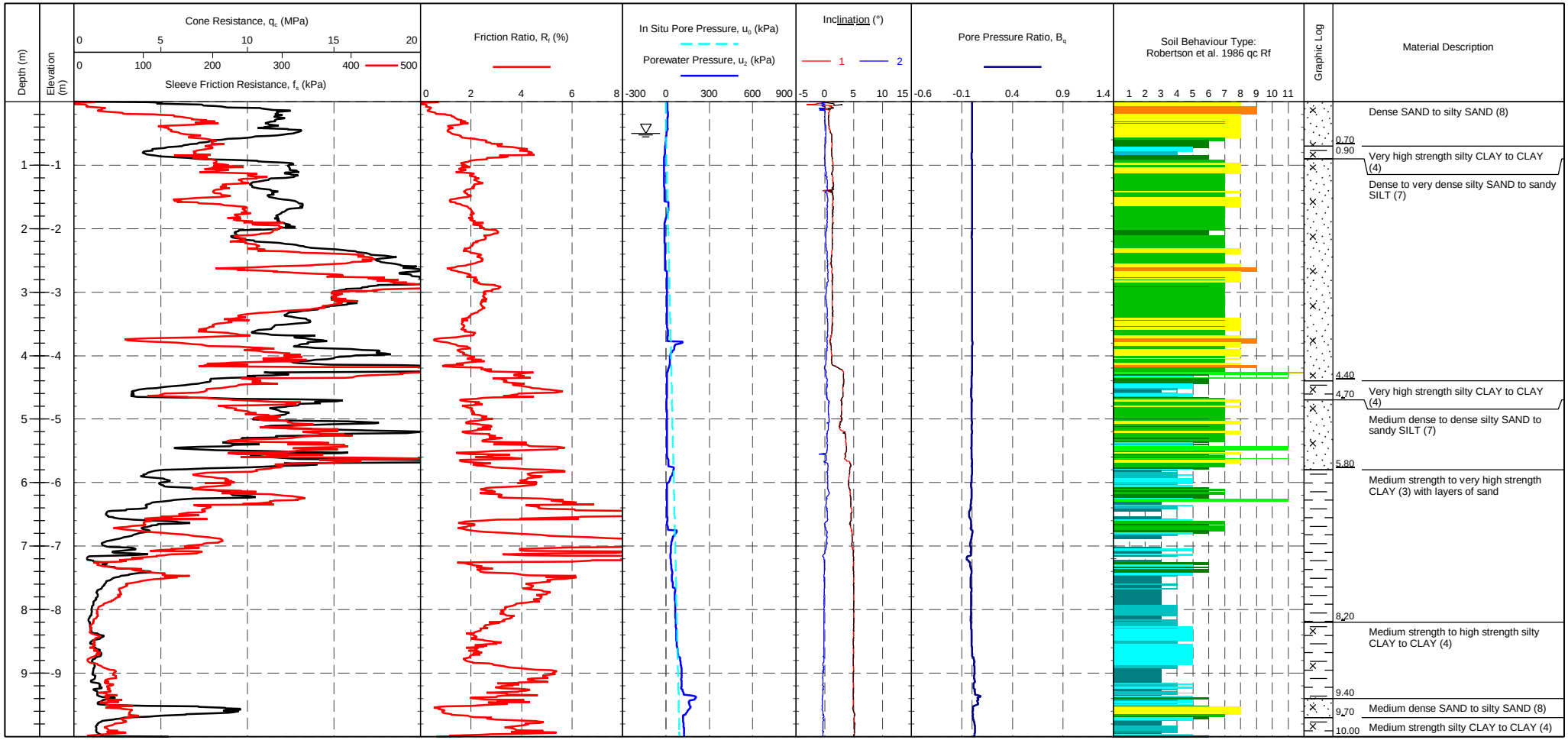
DRAWN	DATE 11/09/2023	
CHECKED	DATE 11/09/2023	
SCALE Not To Scale		A4
PROJECT No 1230378	FIGURE No	

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID **CPT102**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	244 mV	241 mV	-0.033 MPa
Sleeve	303 mV	300 mV	-0.002 kPa
Pore Pressure 2	152 mV	200 mV	0.011 kPa
X-Y Inclinometer	2708 mV	2523 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

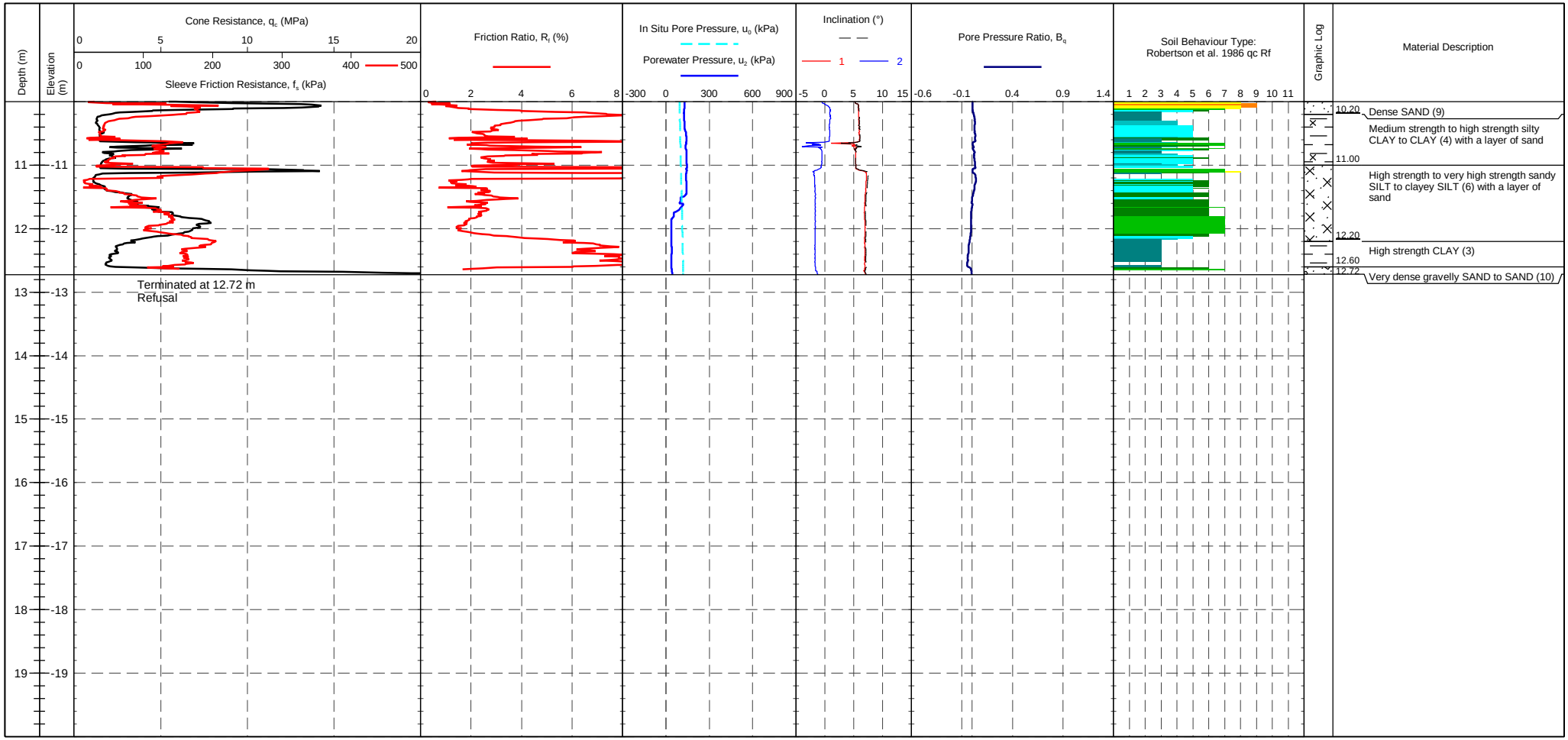
Dissipation Test

CPT LOG 01

Working with: TRC

PointID: **CPT102**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID : S15-CFIP.1867	TEST TYPE : TE2	
CALIBRATION DATE : 07/06/2023	APPLICATION CLASS : 2	
CONE MODEL : Subtraction	RIG : CPT 007 - Morooka	
CONE AREA : 15cm²	OPERATOR : AC	
CONE AREA RATIO : 0.79	FRICTION REDUCER : None	
FILTER POSITION : u2	WEATHER : Sunny & Hot	
FILTER TYPE : HDPE	GROUNDWATER DEPTH : Assumed for calculation purposes.	

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	244 mV	241 mV	-0.033 MPa
Sleeve	303 mV	300 mV	-0.002 kPa
Pore Pressure 2	152 mV	200 mV	0.011 kPa
X-Y Inclinometer	2708 mV	2523 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

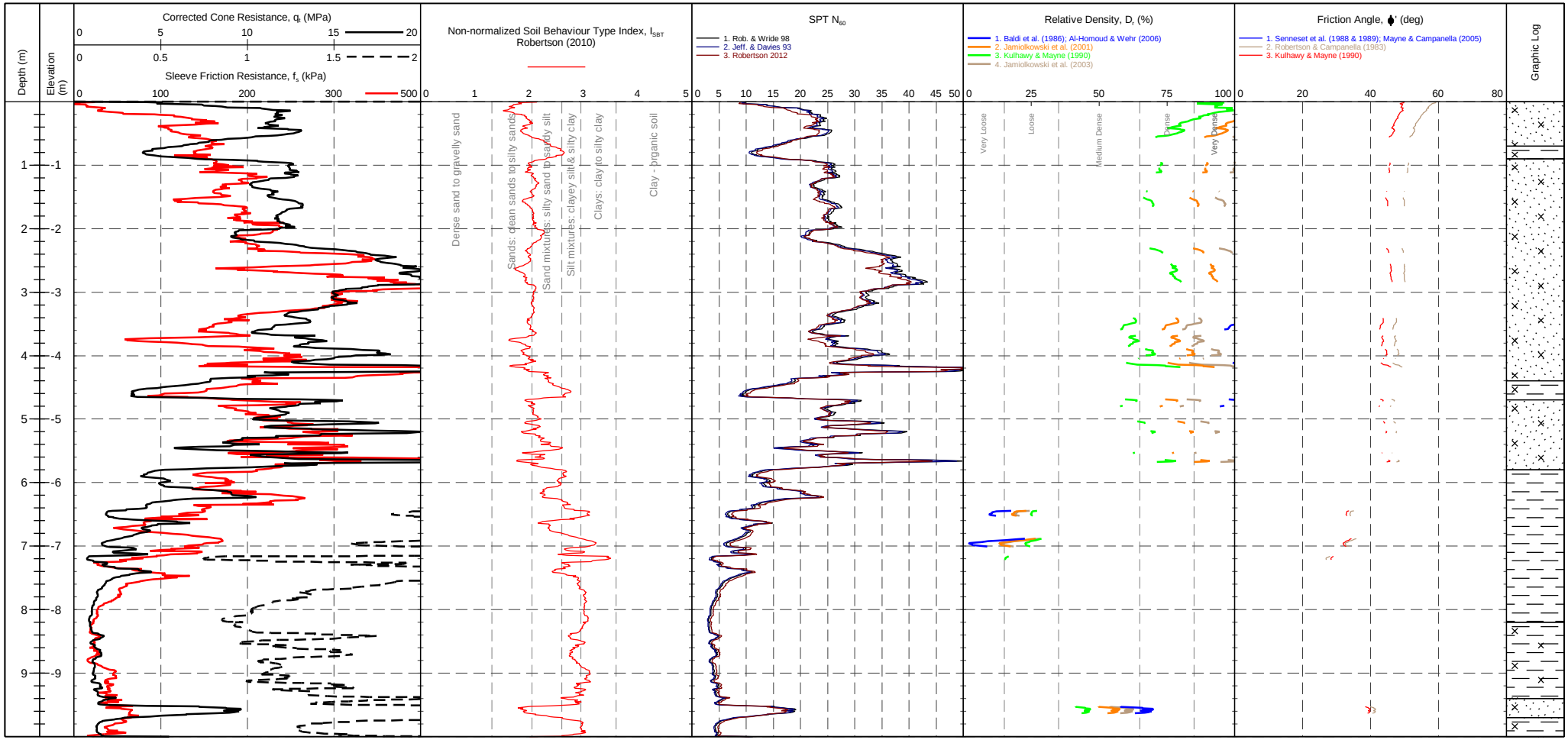
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT102**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID : S15-CFIP.1867	TEST TYPE : TE2	CPTU ZERO VALUES		
CONE MODEL : Subtraction	APPLICATION CLASS : 2	Transducer	Pre	Post	Difference
CONE AREA : 15cm²	RIG : CPT 007 - Morooka	Tip	244 mV	241 mV	-0.033 MPa
CONE AREA RATIO : 0.79	OPERATOR : AC	Sleeve	303 mV	300 mV	-0.002 kPa
FILTER POSITION : u2	FRICTION REDUCER : None	Pore Pressure 2	152 mV	200 mV	0.011 kPa
FILTER TYPE : HDPE	WEATHER : Sunny & Hot	X-Y Inclinometer	2708 mV	2523 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

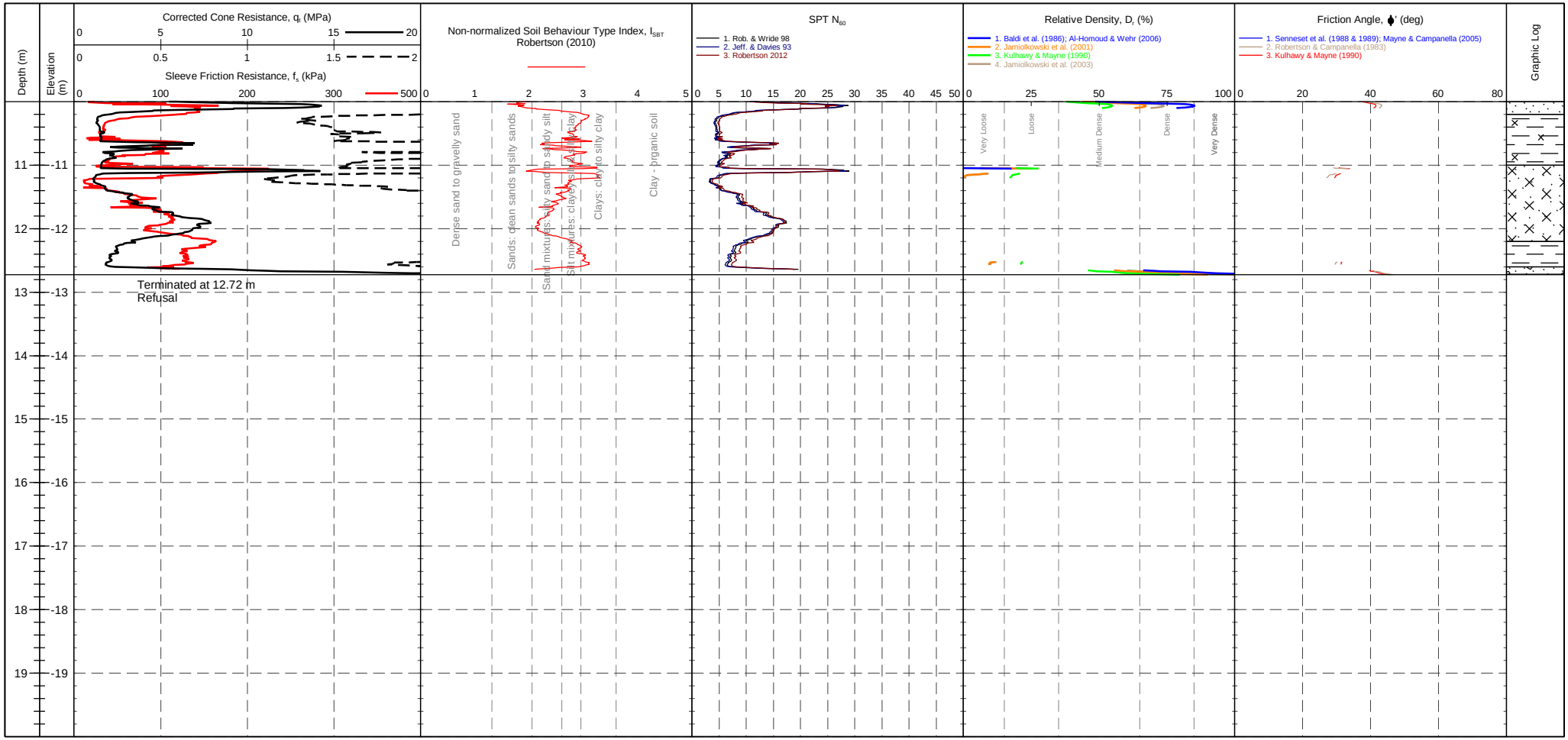
Dissipation Test

CPT LOG 02

Working with: TRC

PointID
CPT102

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 2 OF 2 STATUS : Final TEST DATE : 05/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka	Tip	244 mV	241 mV	-0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	303 mV	300 mV	-0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	152 mV	200 mV	0.011 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2708 mV	2523 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

Dissipation Test

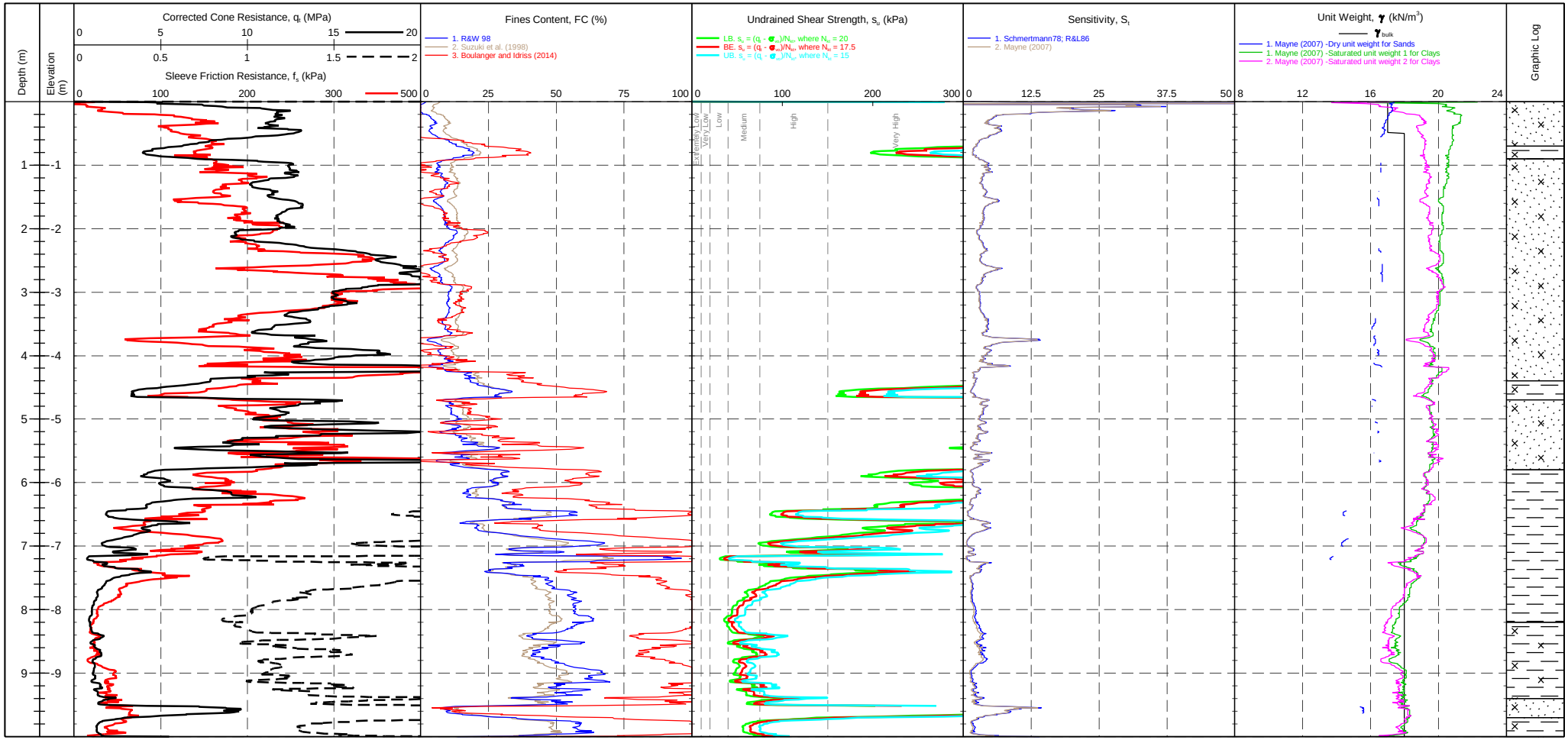
IN SITU SITE INVESTIGATION

Working with: TRC

CPT LOG 03

PointID: **CPT102**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	244 mV	241 mV	-0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	303 mV	300 mV	-0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	152 mV	200 mV	0.011 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2708 mV	2523 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

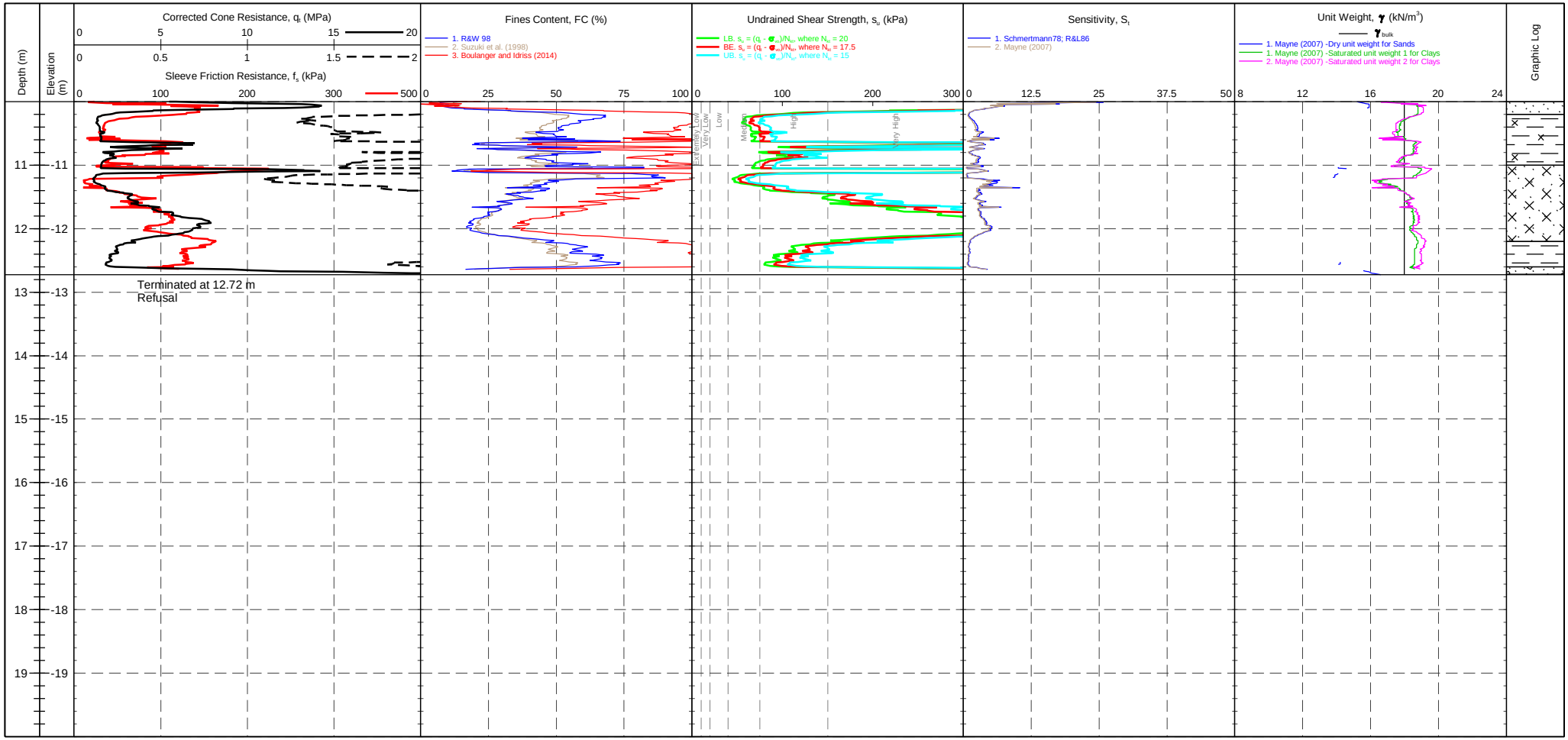
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT102**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



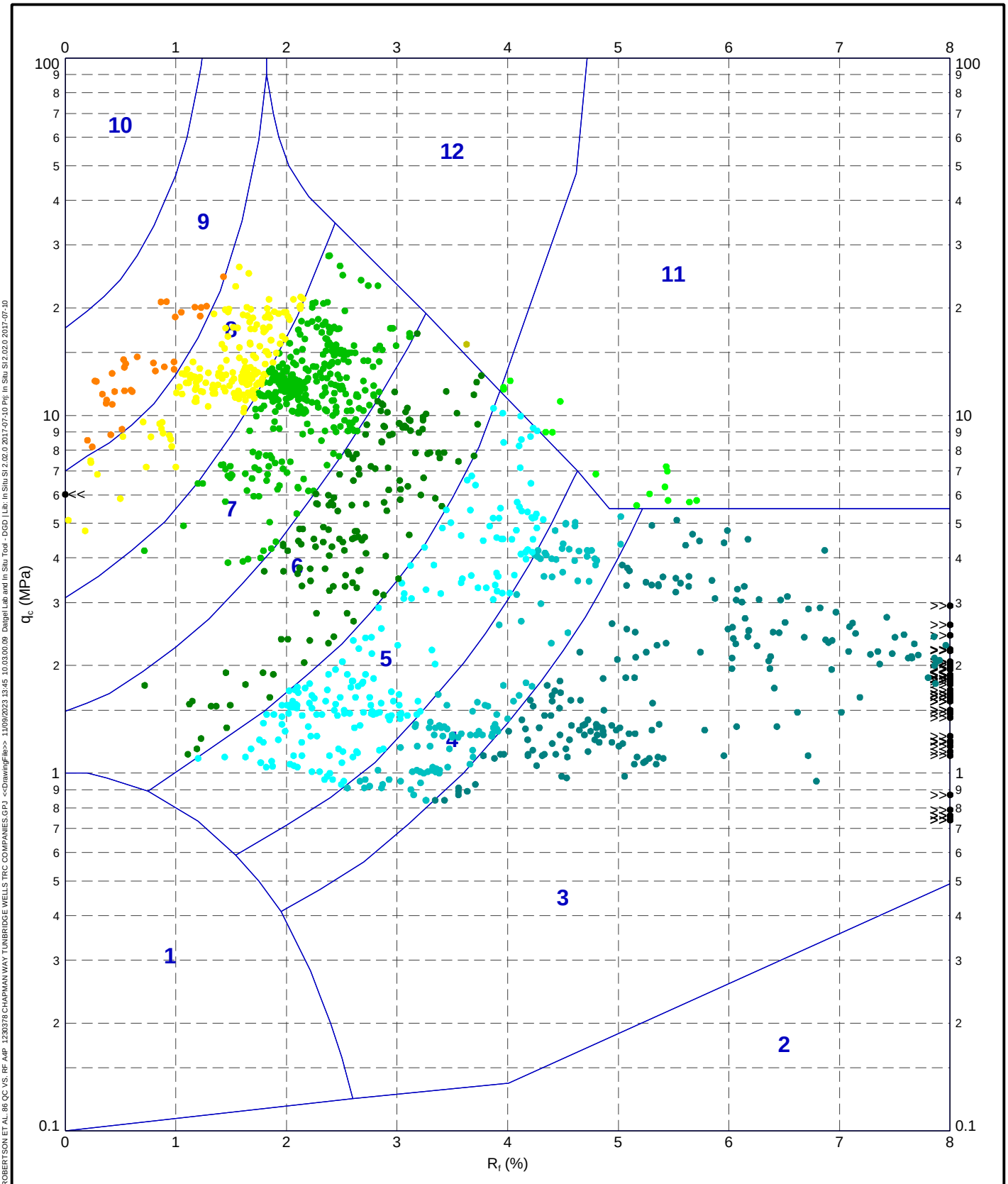
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	244 mV	241 mV	-0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	303 mV	300 mV	-0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	152 mV	200 mV	0.011 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2708 mV	2523 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT102

DRAWN	DATE 11/09/2023	
CHECKED	DATE 11/09/2023	
SCALE Not To Scale		A4
PROJECT No 1230378	FIGURE No	

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

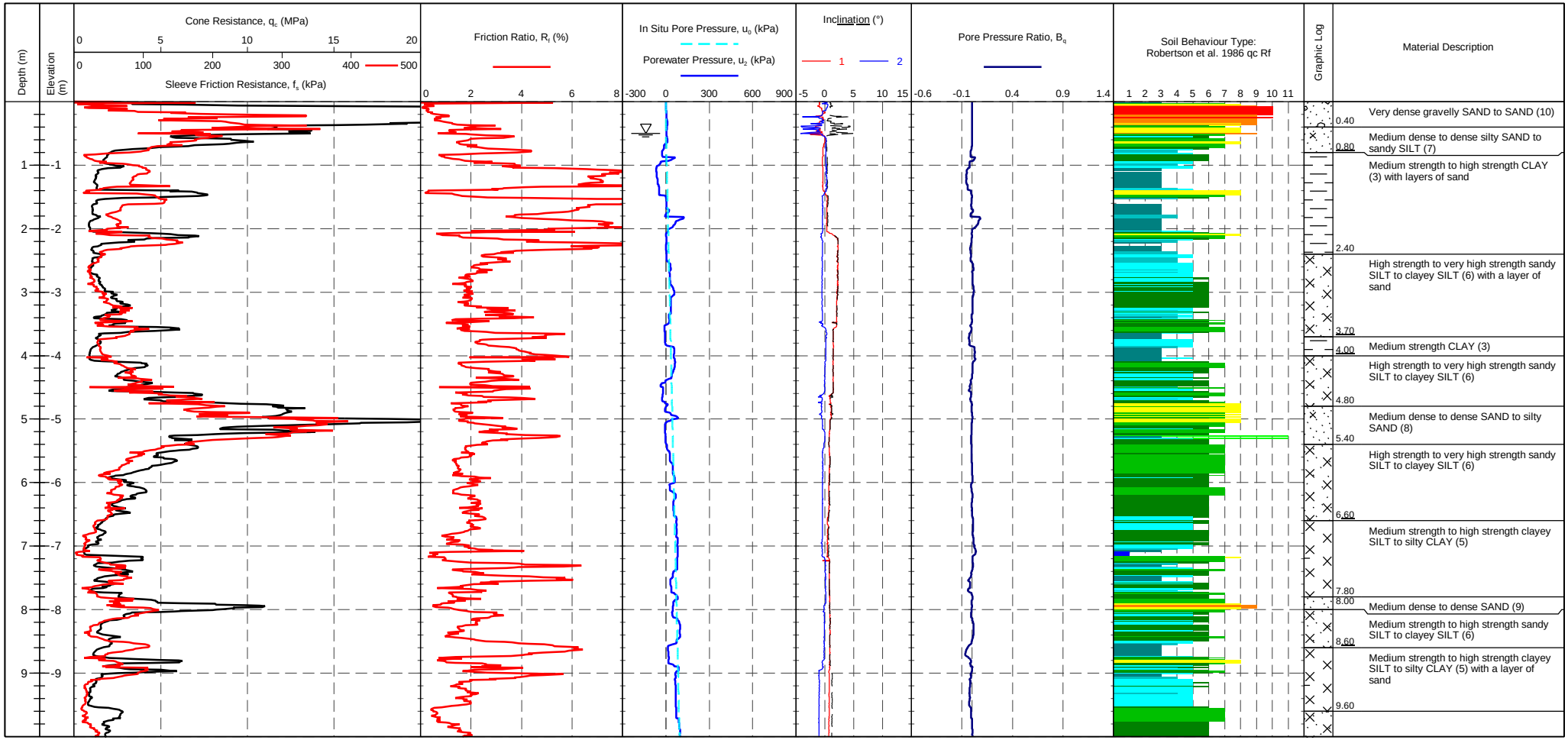
PointID **CPT103**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 2
STATUS : Final
TEST DATE : 06/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm²	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	243 mV	0.022 MPa
Sleeve	300 mV	302 mV	0.001 kPa
Pore Pressure 2	165 mV	229 mV	0.015 kPa
X-Y Inclinometer	2442 mV	2425 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

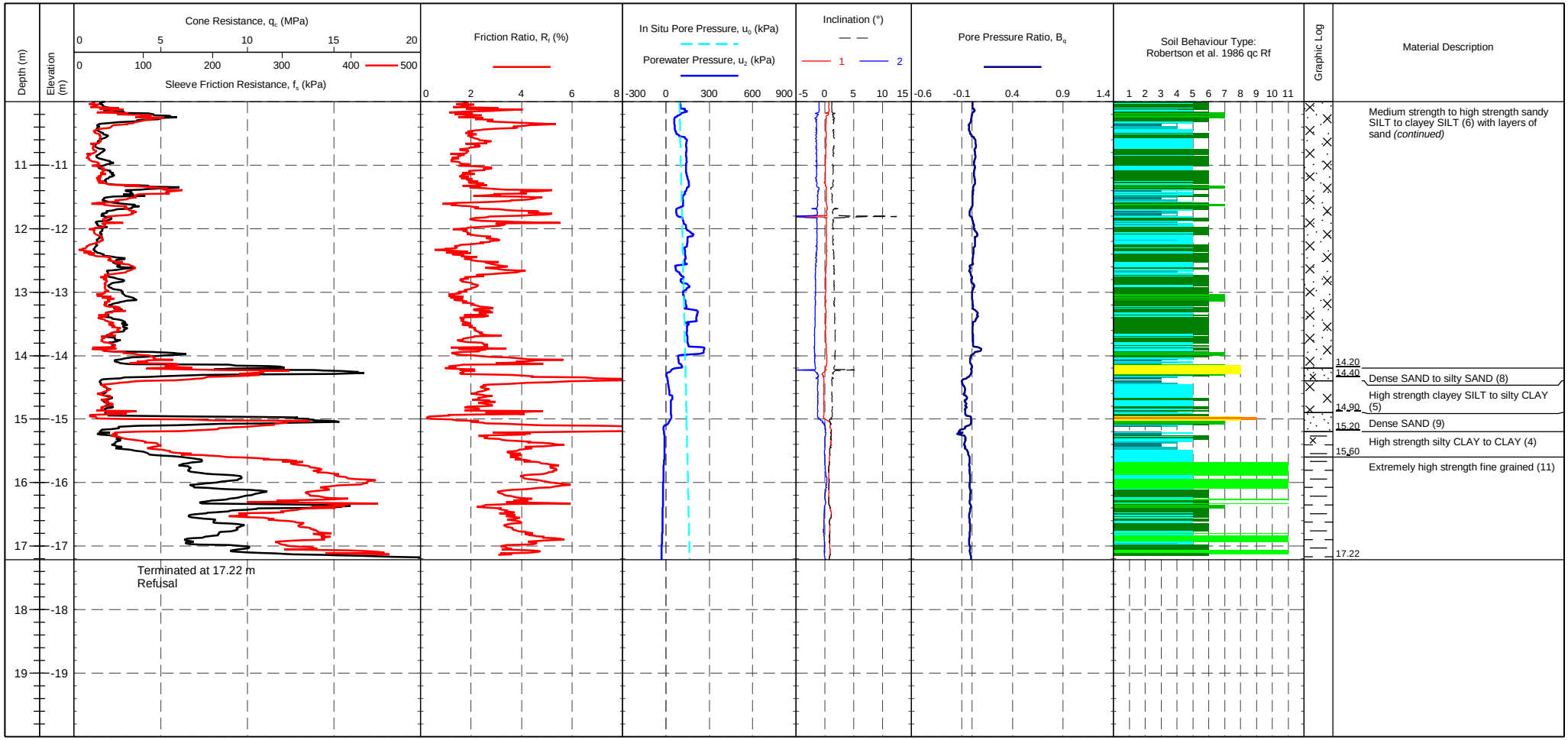
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID: **CPT103**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	243 mV	0.022 MPa
Sleeve	300 mV	302 mV	0.001 kPa
Pore Pressure 2	165 mV	229 mV	0.015 kPa
X-Y Inclinometer	2442 mV	2425 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

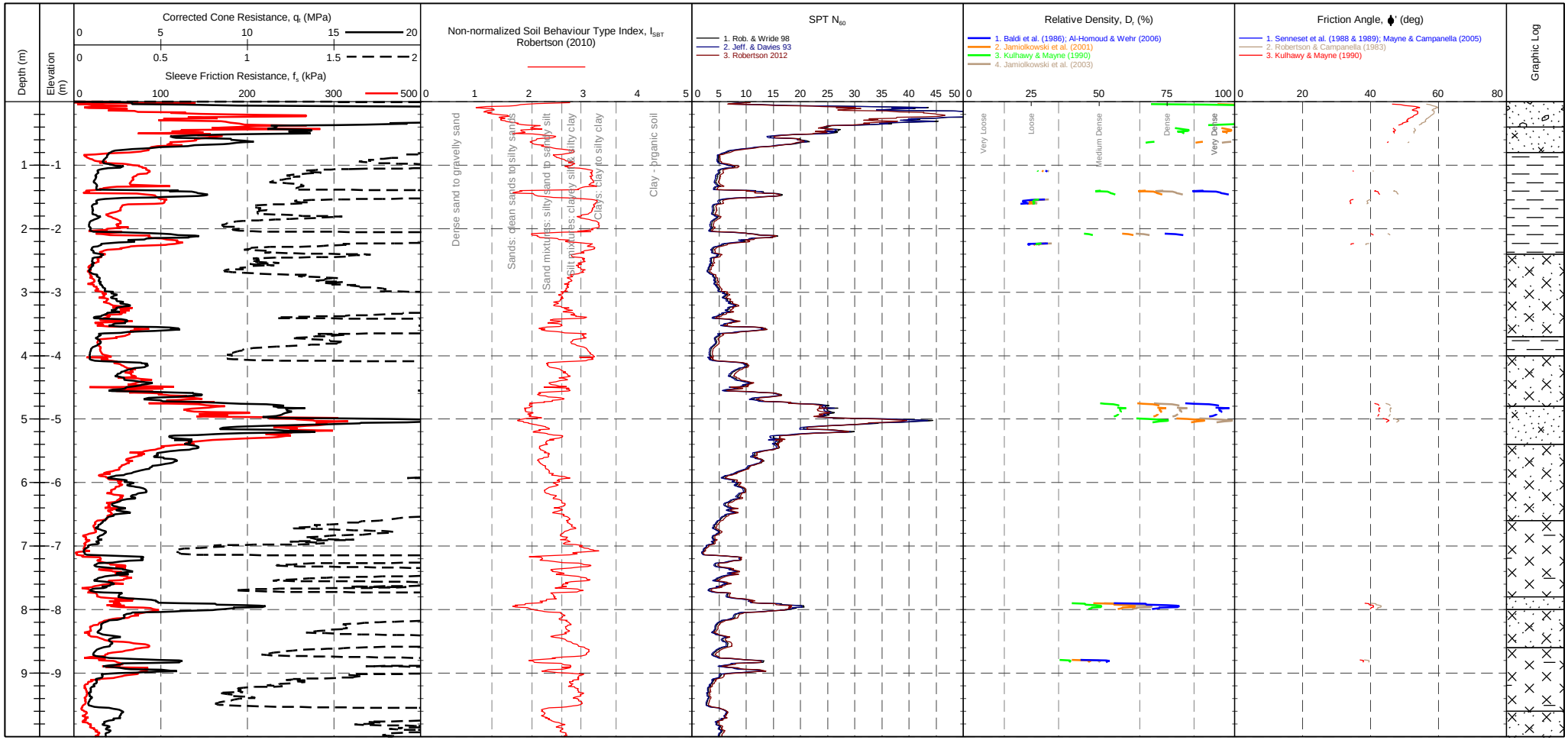
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

PointID **CPT103**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 2 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	243 mV	0.022 MPa
Sleeve	300 mV	302 mV	0.001 kPa
Pore Pressure 2	165 mV	229 mV	0.015 kPa
X-Y Inclinometer	2442 mV	2425 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

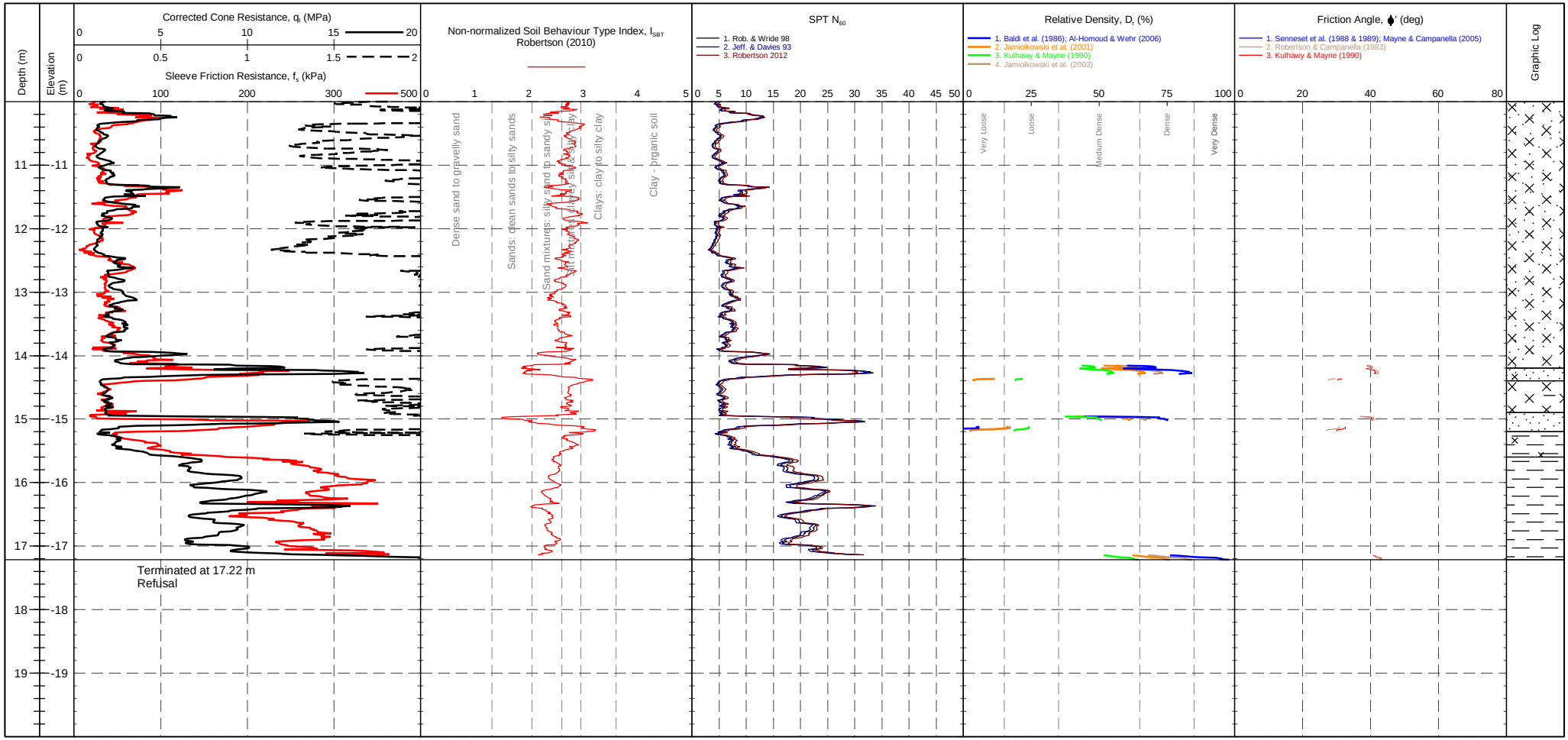
PointID **CPT103**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 2 OF 2
STATUS : Final
TEST DATE : 06/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka
CONE AREA RATIO	: 0.79	OPERATOR	: AC
FILTER POSITION	: u2	FRICTION REDUCER	: None
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	243 mV	0.022 MPa
Sleeve	300 mV	302 mV	0.001 kPa
Pore Pressure 2	165 mV	229 mV	0.015 kPa
X-Y Inclinometer	2442 mV	2425 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

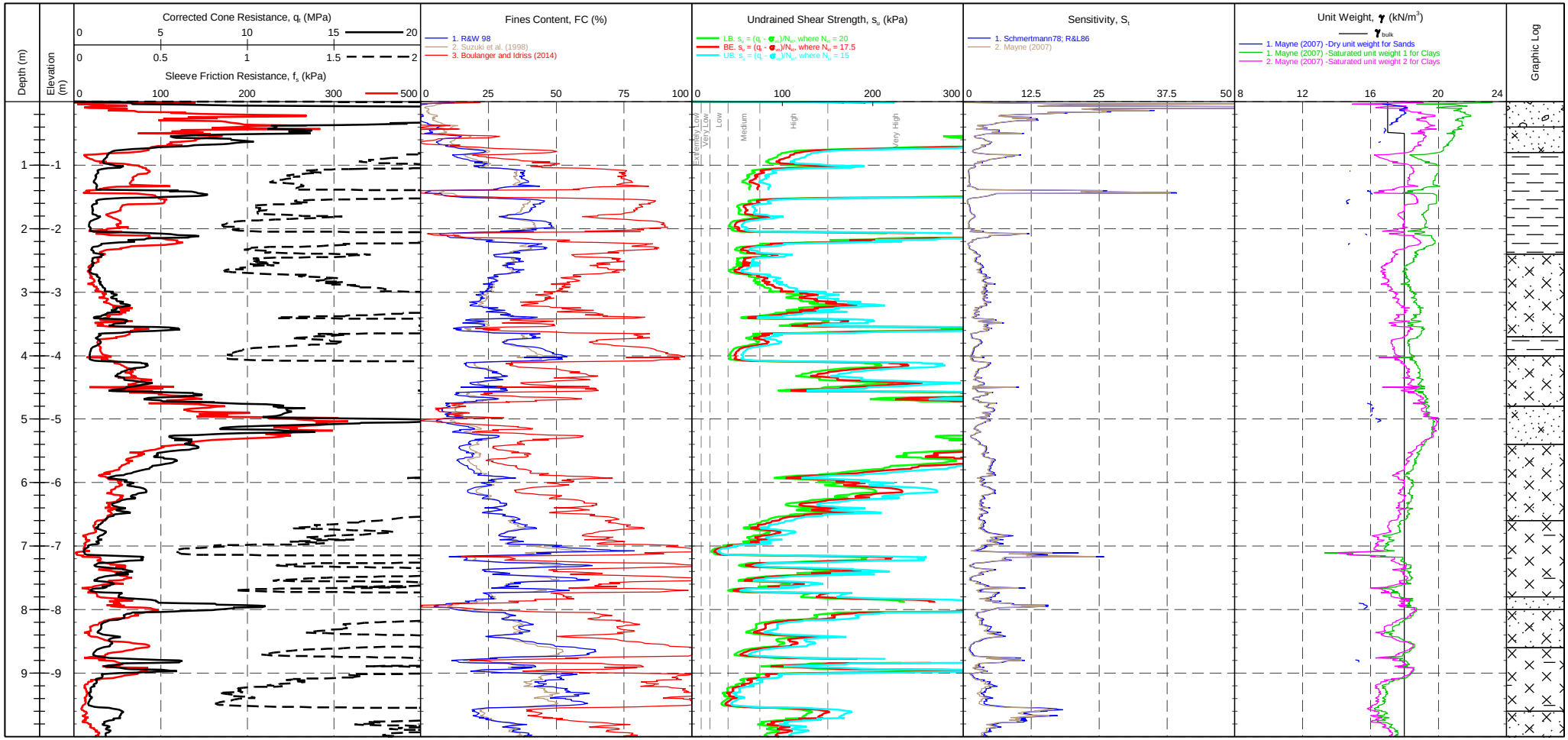
IN SITU SITE INVESTIGATION

Working with: TRC

CPT LOG 03

PointID: **CPT103**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	243 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	300 mV	302 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	165 mV	229 mV	0.015 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2442 mV	2425 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

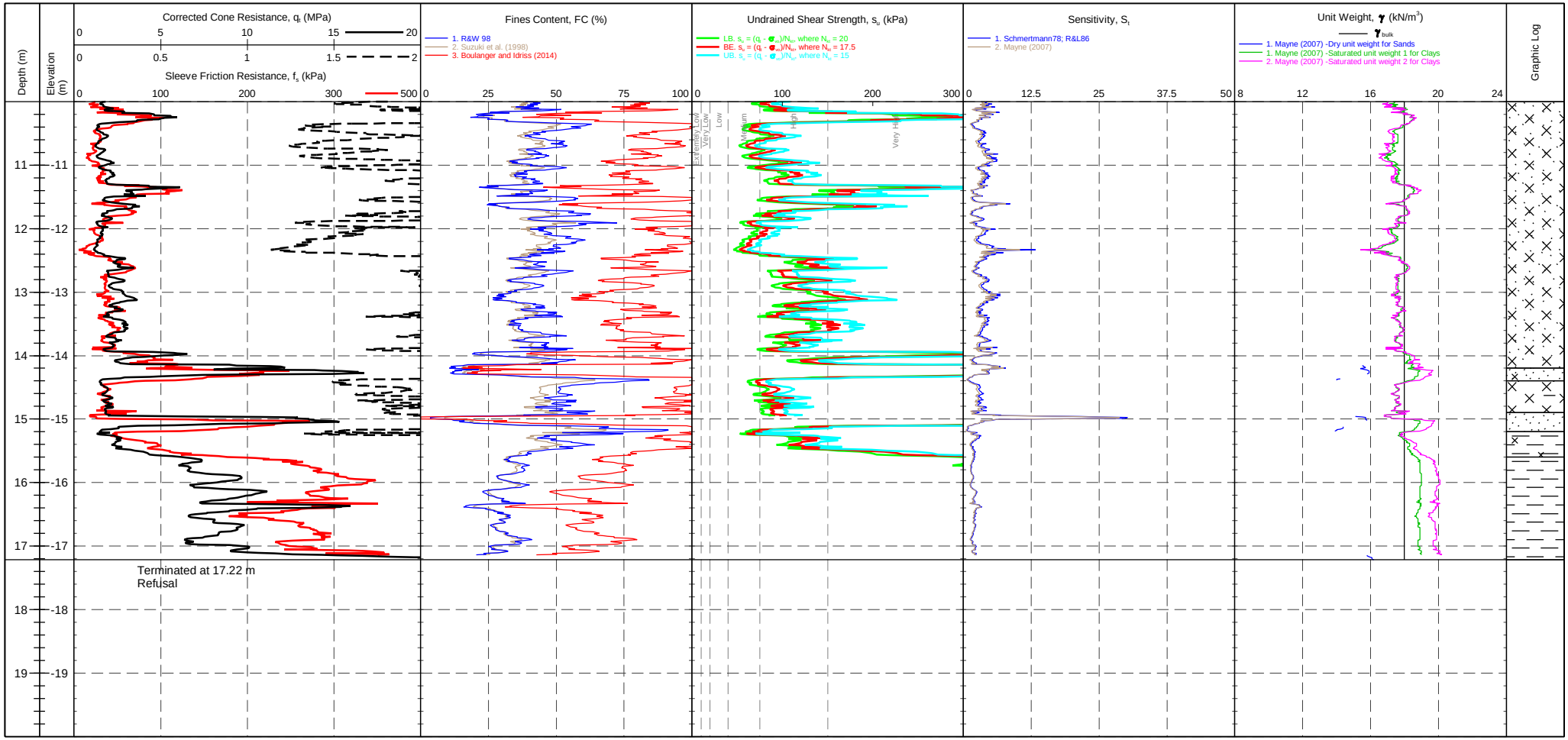
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 03

PointID **CPT103**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



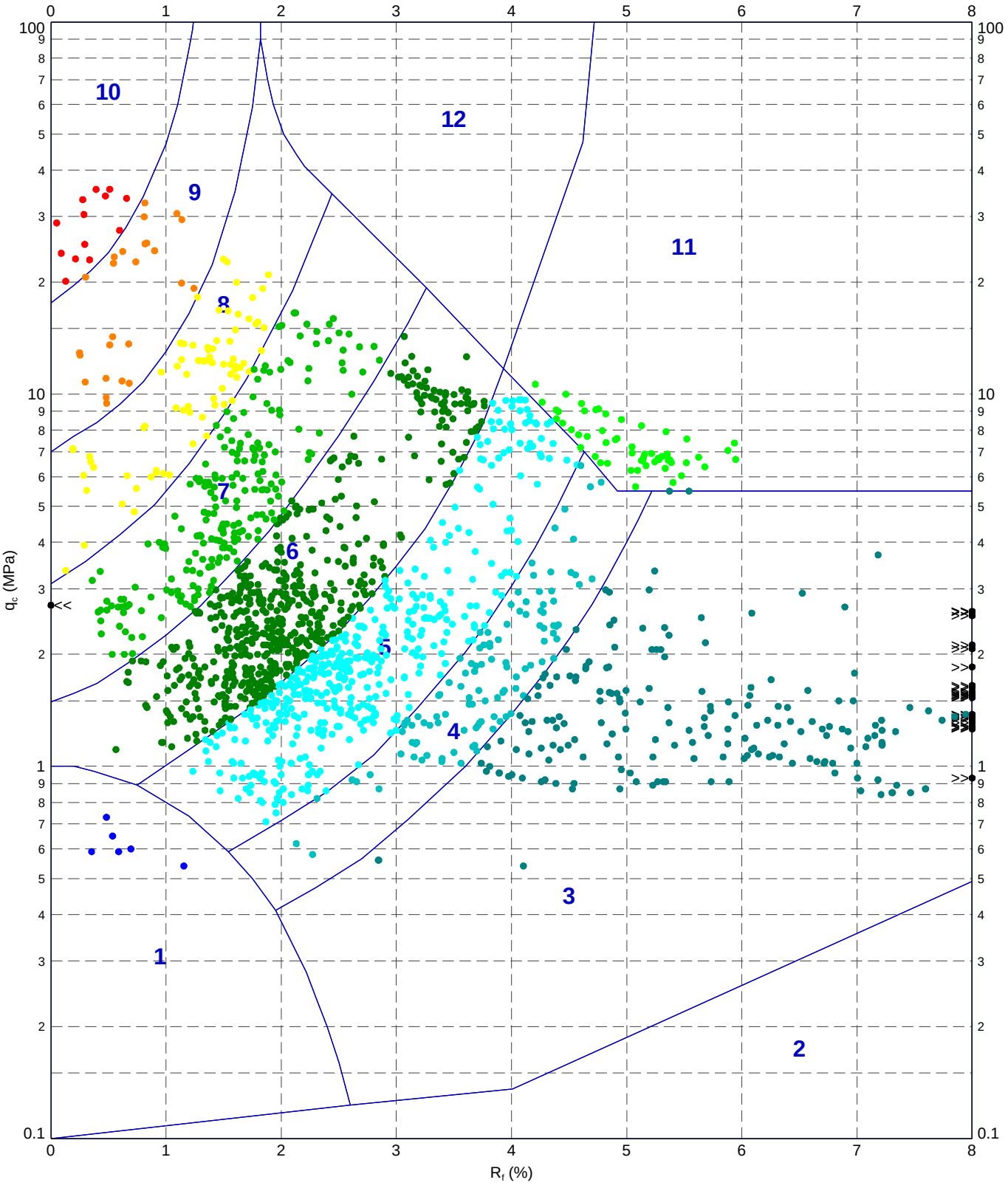
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	243 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	300 mV	302 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	165 mV	229 mV	0.015 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2442 mV	2425 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT103

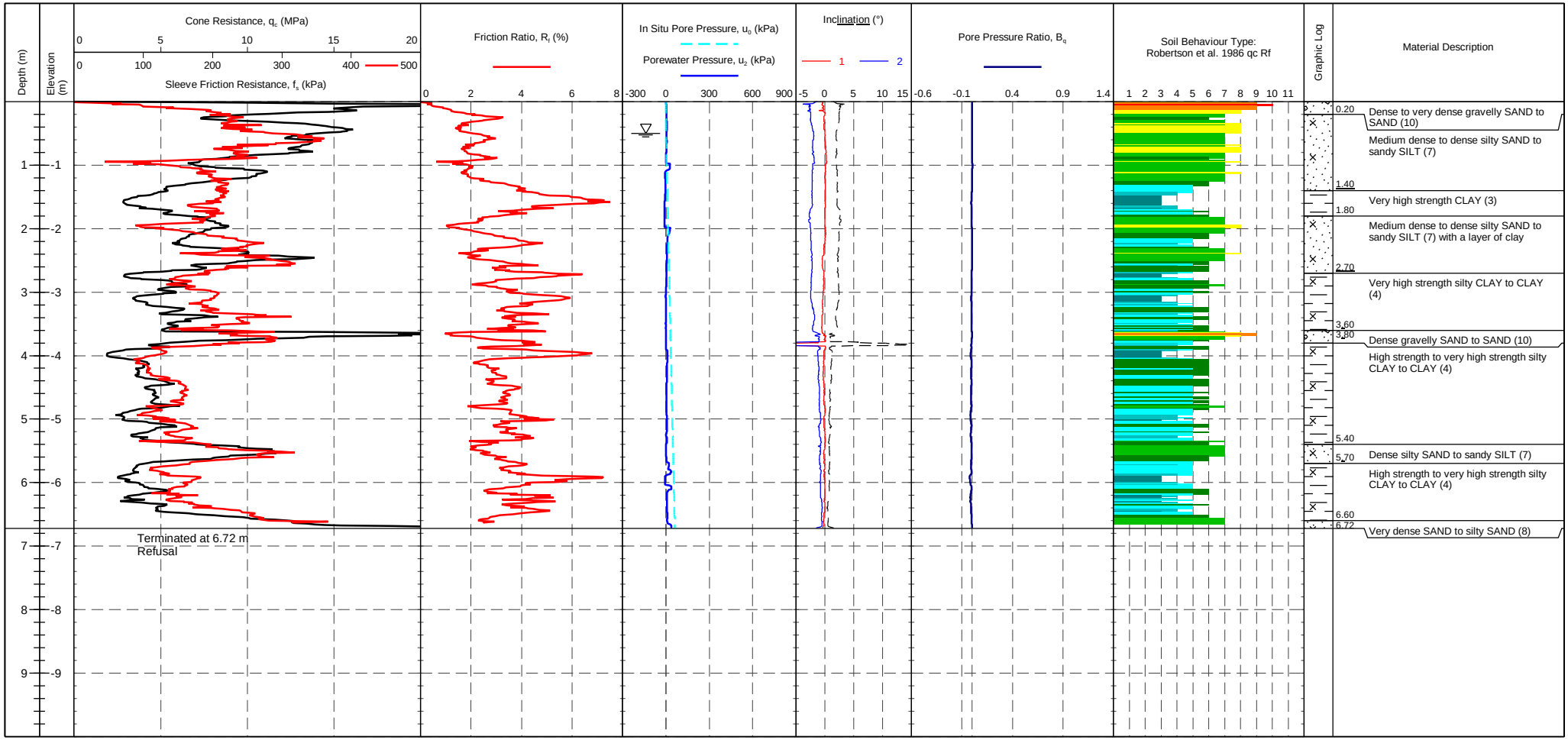
DRAWN	DATE 11/09/2023	
CHECKED	DATE 11/09/2023	
SCALE Not To Scale		A4
PROJECT No 1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT104**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID : S15-CFIP.1867	TEST TYPE : TE2		
CALIBRATION DATE : 07/06/2023	APPLICATION CLASS : 2		
CONE MODEL : Subtraction	RIG : CPT 007 - Morooka		
CONE AREA : 15cm²	OPERATOR : AC		
CONE AREA RATIO : 0.79	FRICTION REDUCER : None		
FILTER POSITION : u2	WEATHER : Sunny & Hot		
FILTER TYPE : HDPE	GROUNDWATER DEPTH : Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	299 mV	299 mV	0 kPa
Pore Pressure 2	169 mV	219 mV	0.012 kPa
X-Y Inclinometer	2471 mV	2469 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

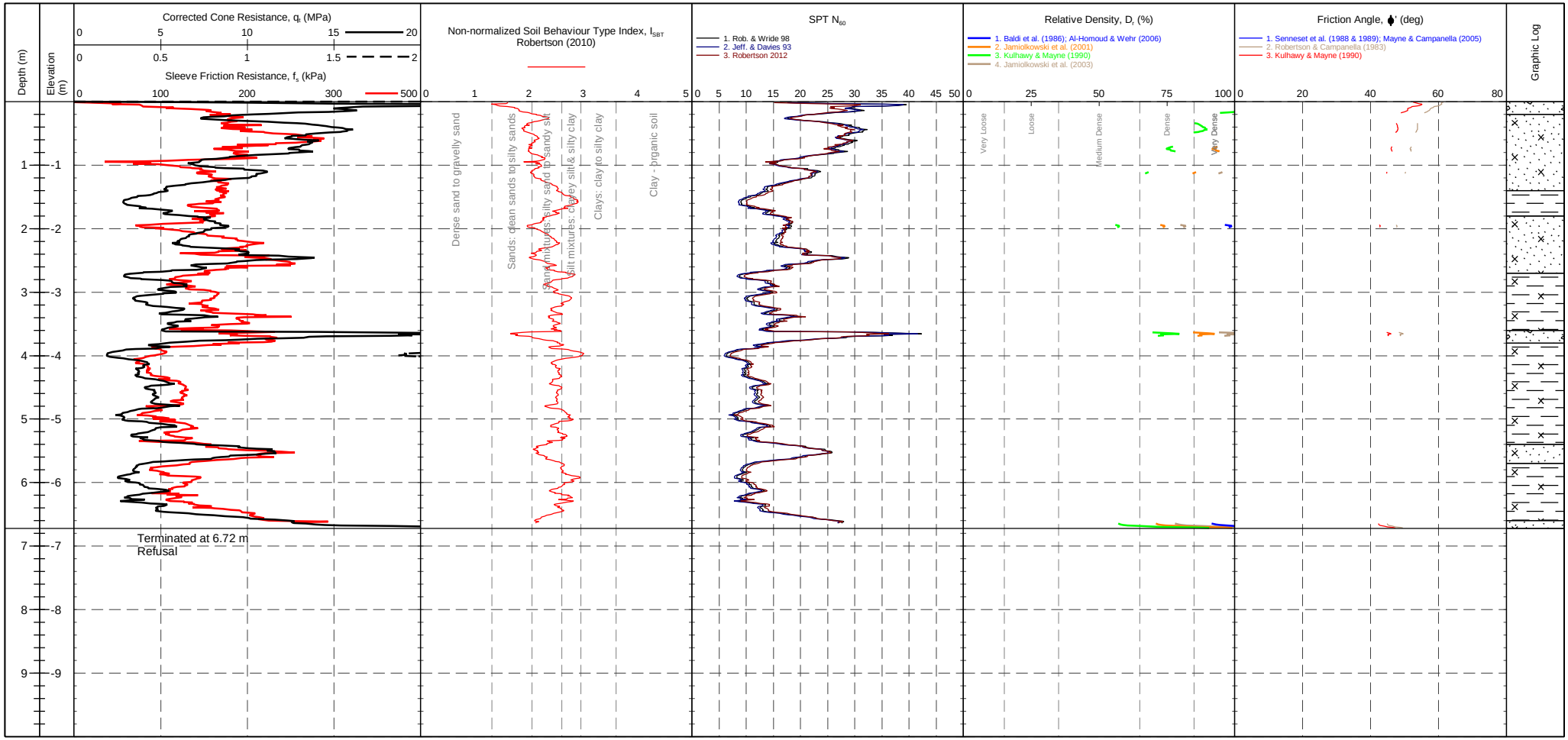
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT104**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka	Tip	241 mV	241 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	299 mV	299 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	169 mV	219 mV	0.012 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2471 mV	2469 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

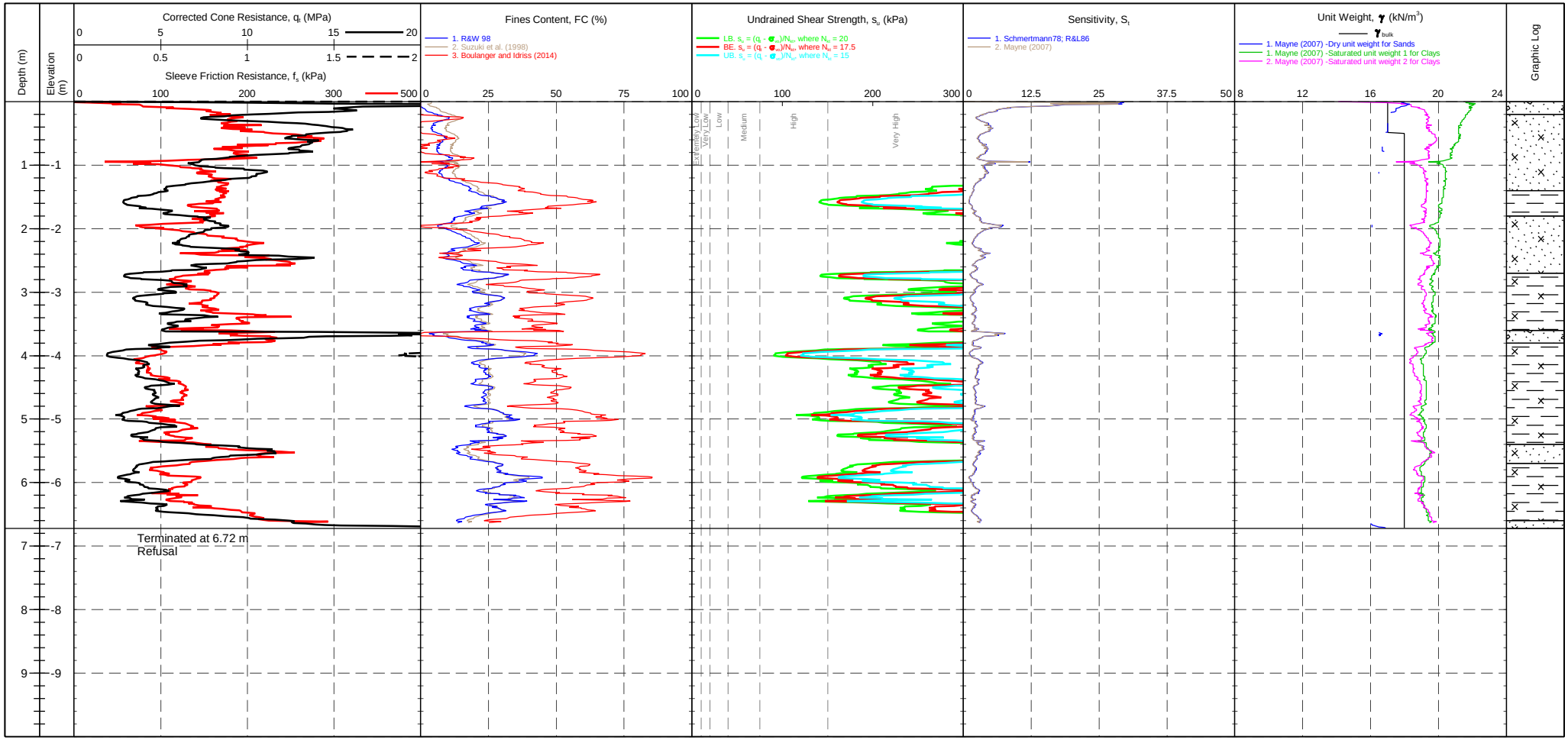
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 03

PointID **CPT104**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



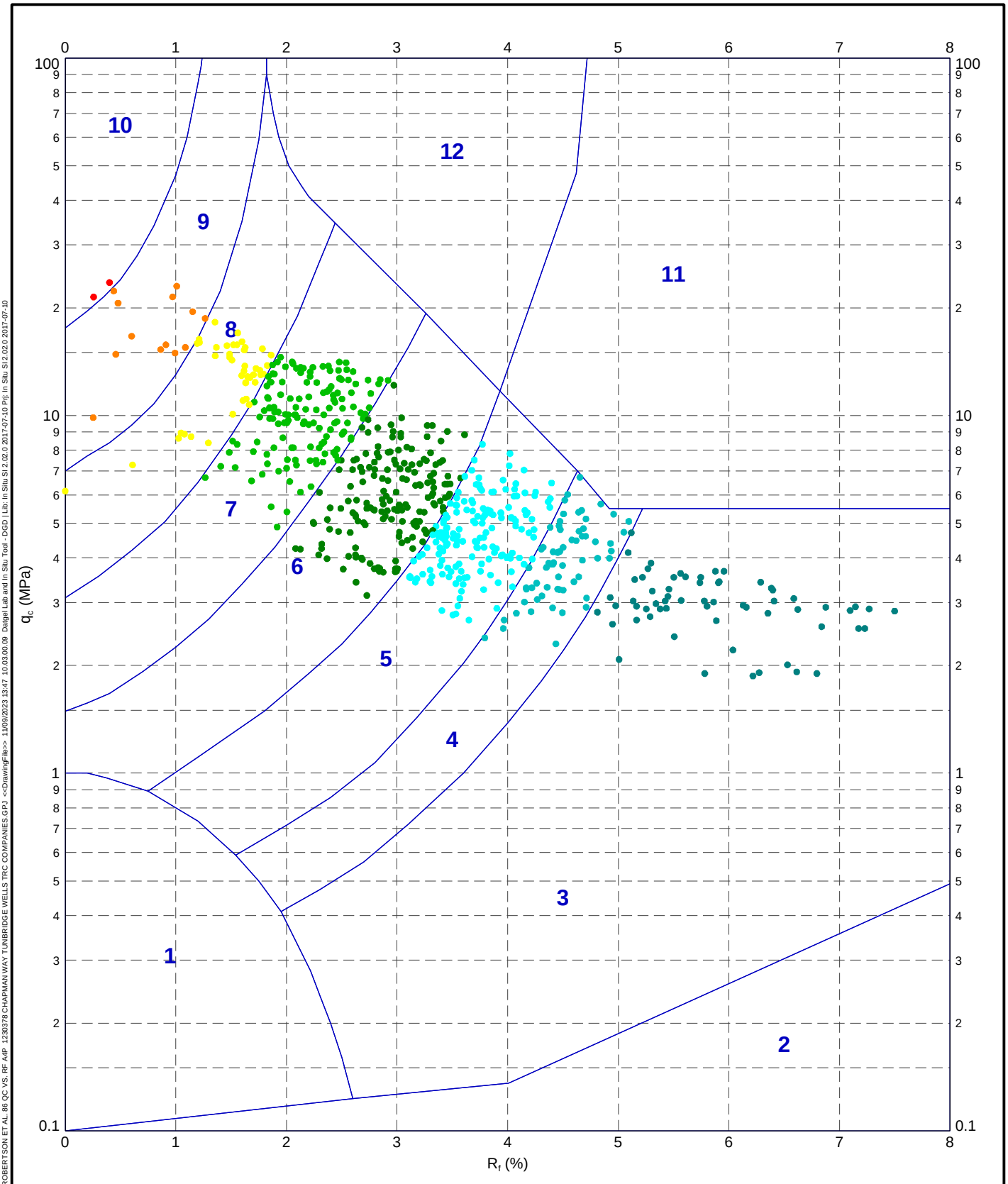
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	241 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	299 mV	299 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	169 mV	219 mV	0.012 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2471 mV	2469 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

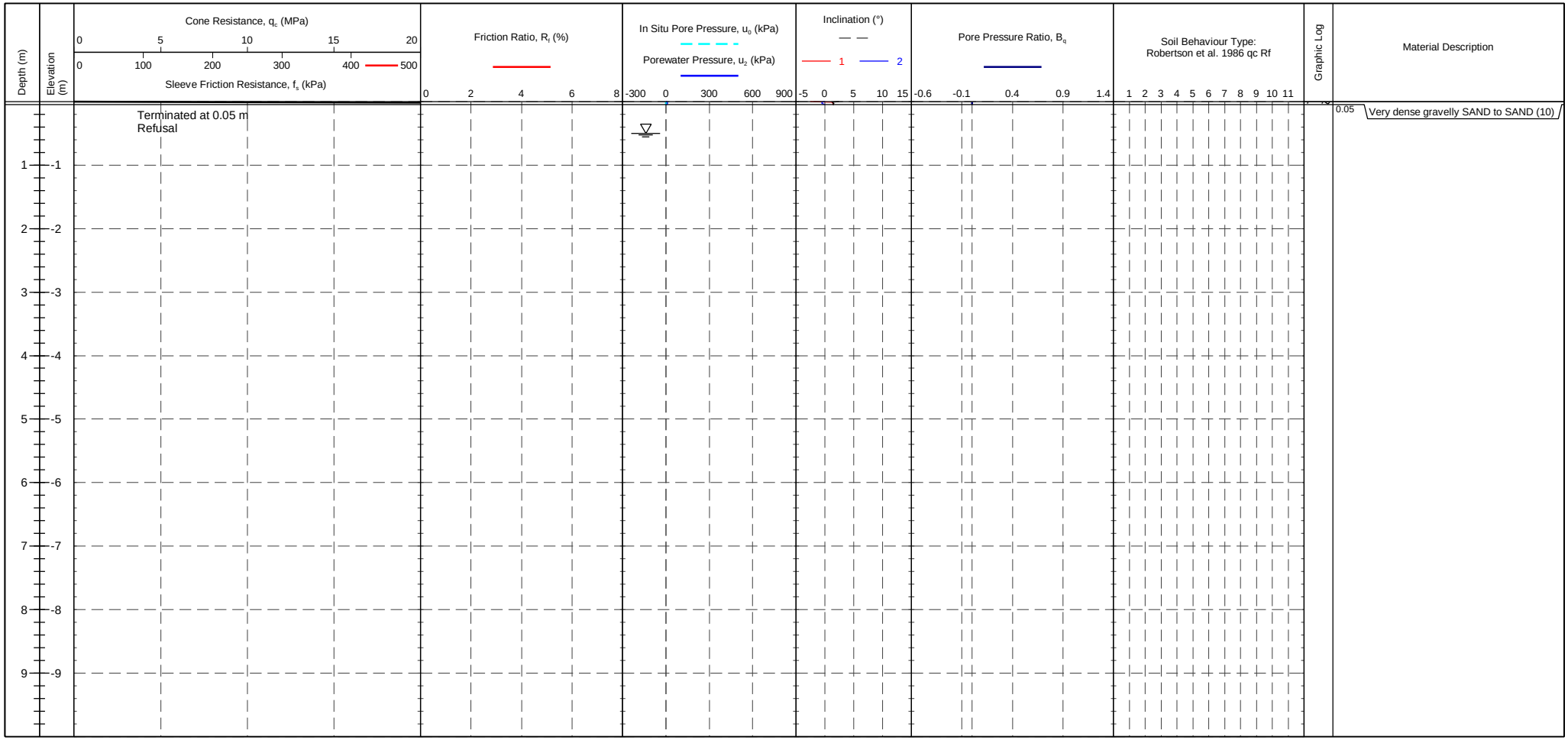
TITLE: TRC Tunbridge Wells Chapman Way Robertson et al. 1986 q_c vs. R_f - CPT104	DRAWN	DATE 11/09/2023	
	CHECKED	DATE 11/09/2023	
	SCALE Not To Scale		A4
	PROJECT No 1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT105**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	243 mV	244 mV	0.011 MPa
Sleeve	301 mV	303 mV	0.001 kPa
Pore Pressure 2	193 mV	153 mV	-0.009 kPa
X-Y Inclinometer	2264 mV	2610 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

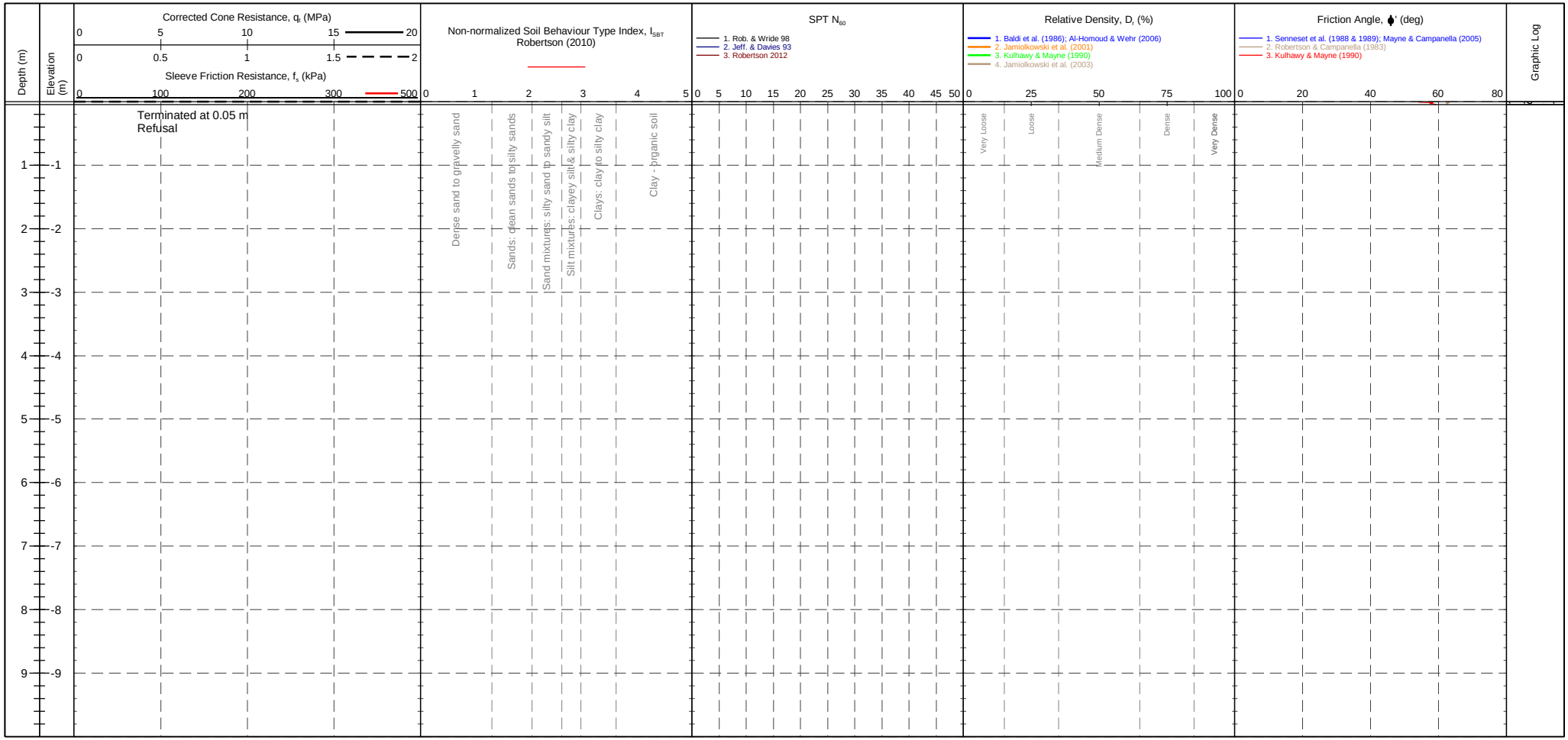
Dissipation Test

CPT LOG 02

Working with: TRC

PointID
CPT105

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 05/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	244 mV	0.011 MPa
Sleeve	301 mV	303 mV	0.001 kPa
Pore Pressure 2	193 mV	153 mV	-0.009 kPa
X-Y Inclinometer	2264 mV	2610 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

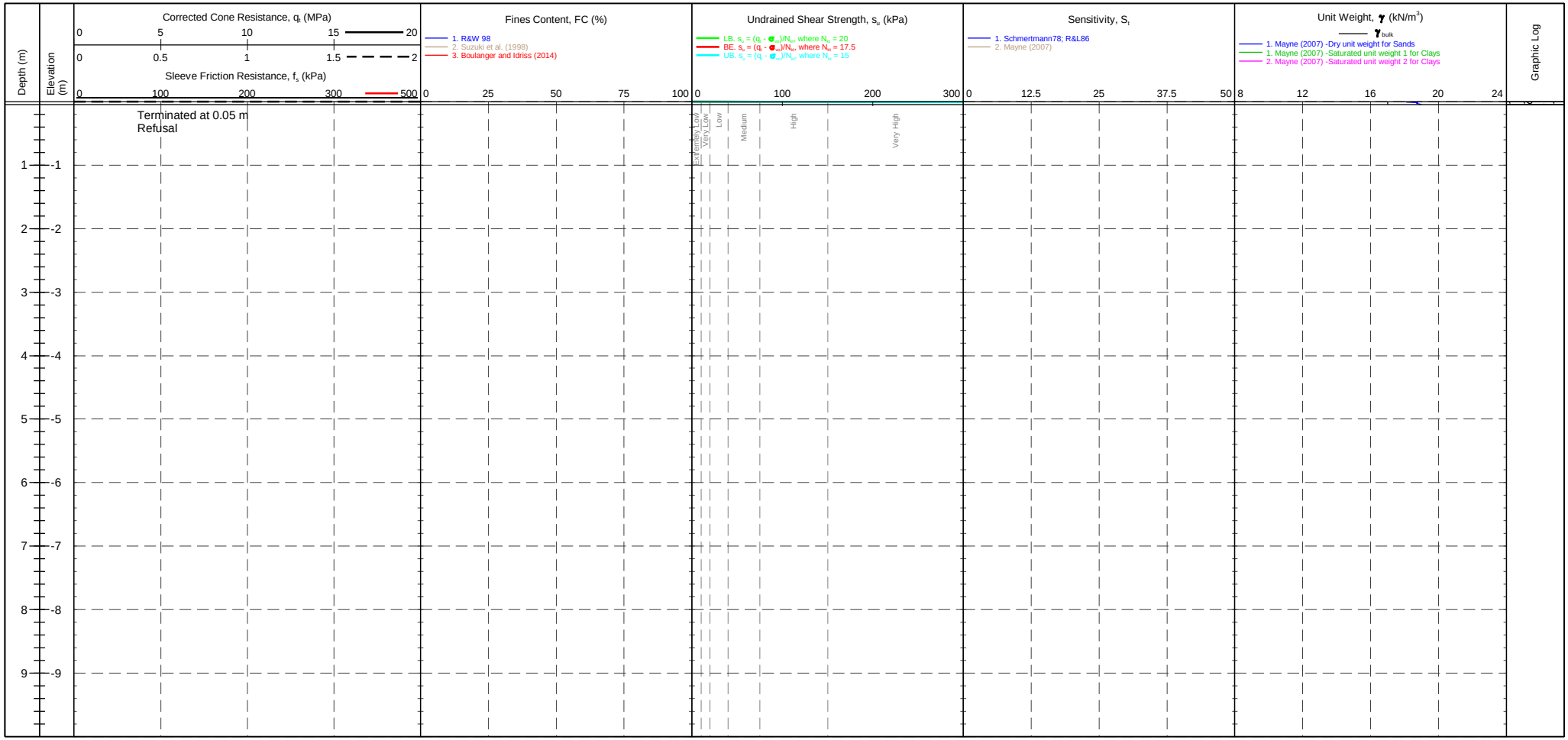
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT105**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	243 mV	244 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	301 mV	303 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	193 mV	153 mV	-0.009 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2264 mV	2610 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

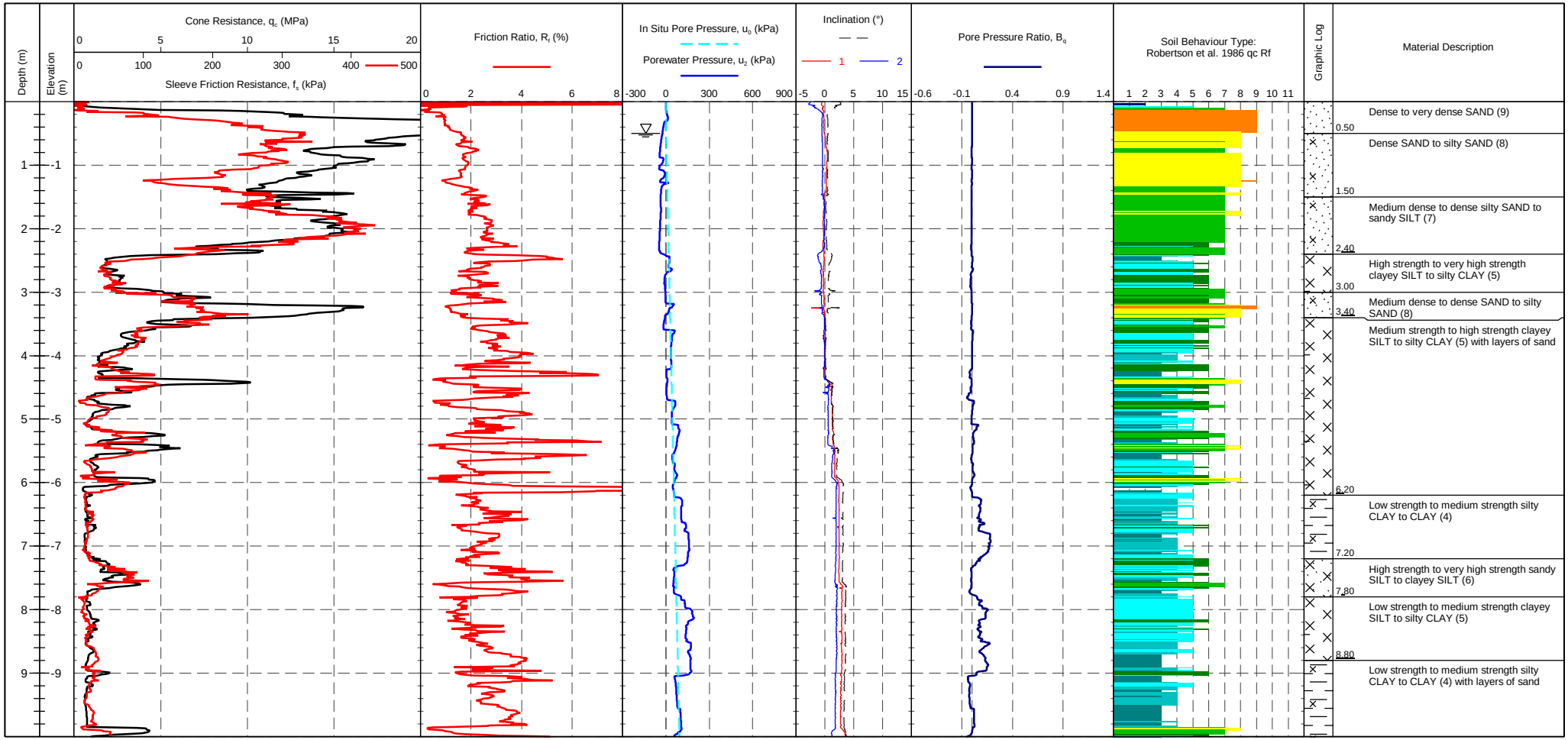
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID **CPT105A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	239 mV	240 mV	0.011 MPa
Sleeve	297 mV	299 mV	0.001 kPa
Pore Pressure 2	179 mV	370 mV	0.045 kPa
X-Y Inclinometer	2472 mV	2473 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

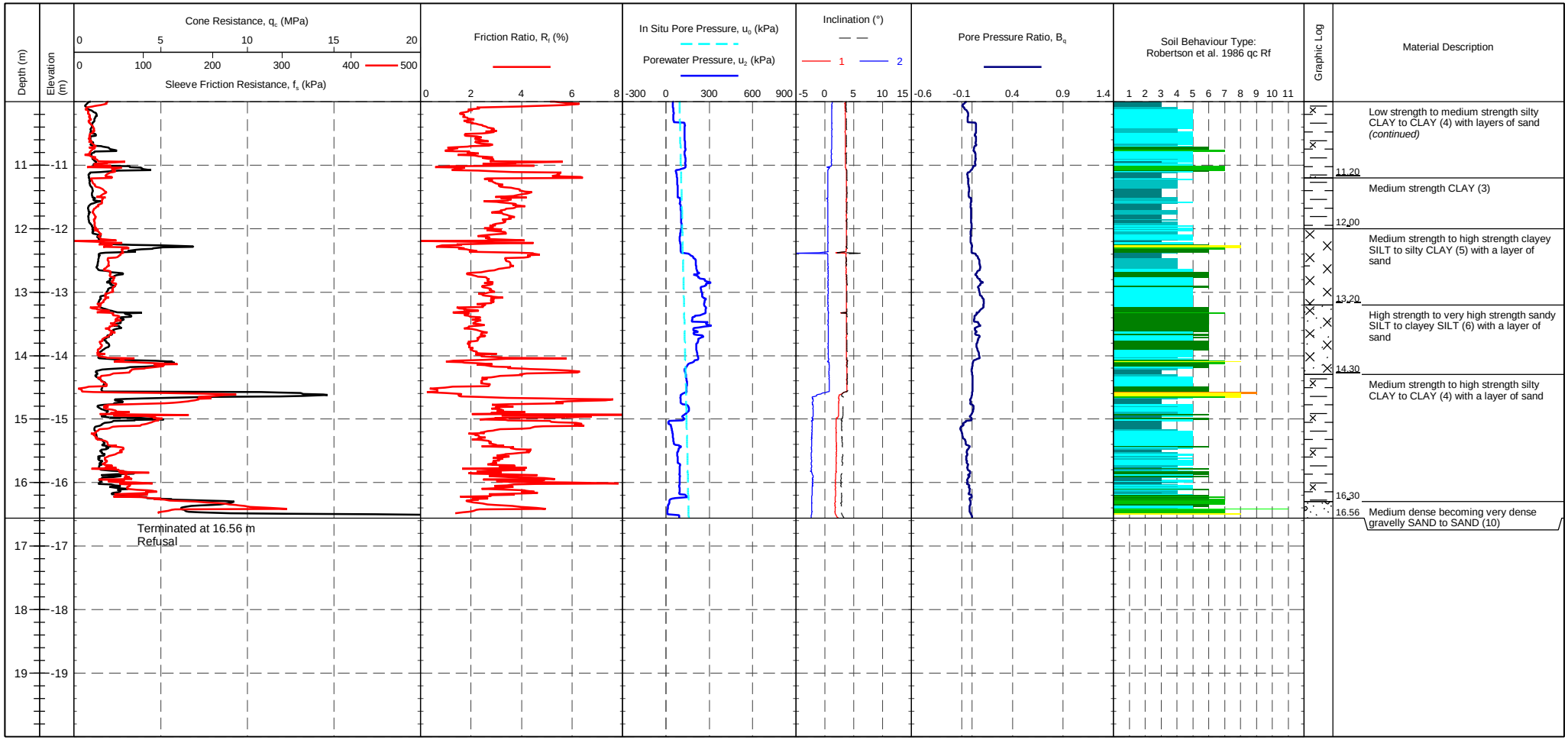
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID **CPT105A**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 2 OF 2 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



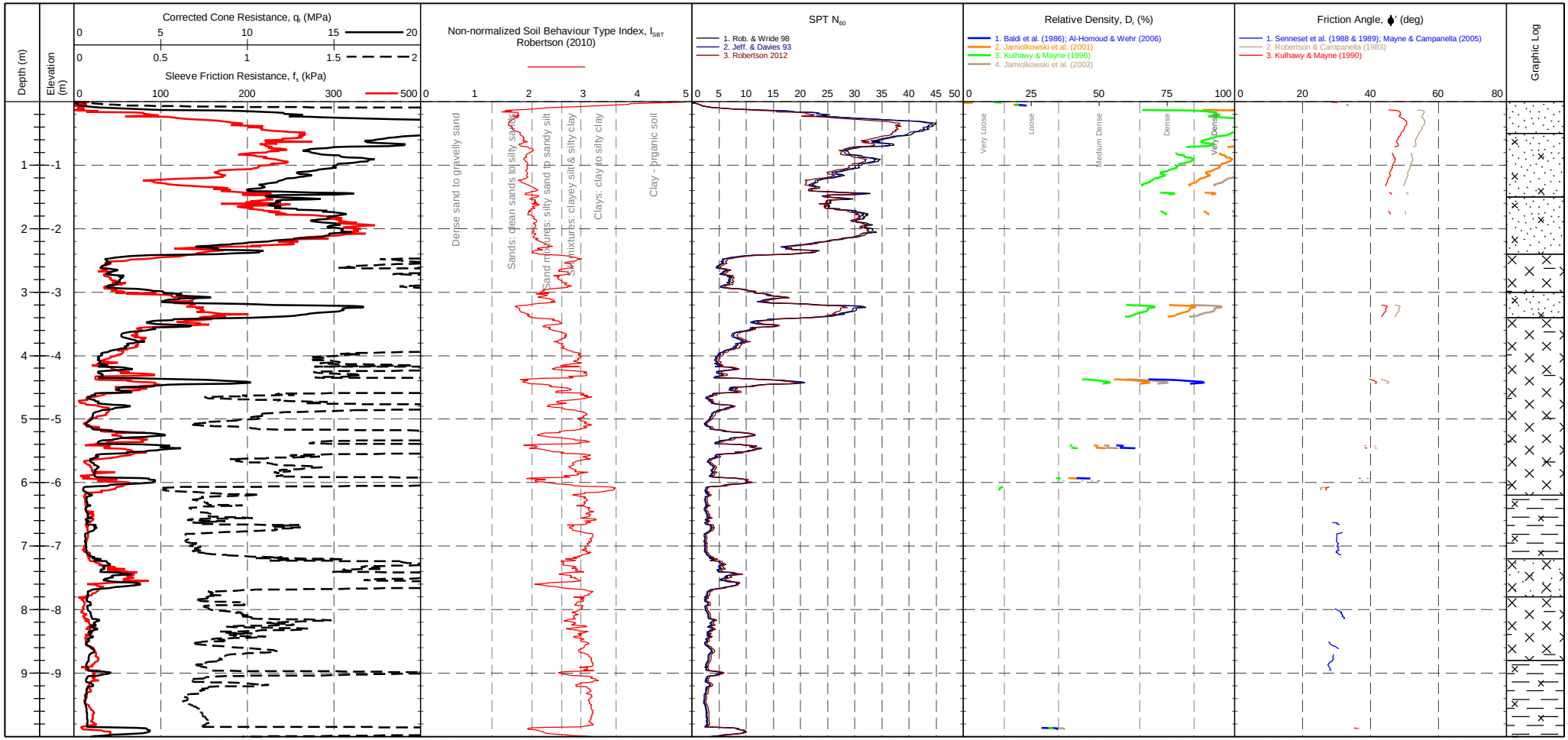
CONE ID : S15-CFIP.1867 CALIBRATION DATE : 07/06/2023 CONE MODEL : Subtraction CONE AREA : 15cm² CONE AREA RATIO : 0.79 FILTER POSITION : u2 FILTER TYPE : HDPE	TEST TYPE : TE2 APPLICATION CLASS : 2 RIG : CPT 007 - Morooka OPERATOR : AC FRICTION REDUCER : None WEATHER : Sunny & Hot GROUNDWATER DEPTH : Assumed for calculation purposes.	CPTU ZERO VALUES Transducer: Tip / Sleeve / Pore Pressure 2 / X-Y Inclinometer Pre: 239 mV / 297 mV / 179 mV / 2472 mV Post: 240 mV / 299 mV / 370 mV / 2473 mV Difference: 0.011 MPa / 0.001 kPa / 0.045 kPa	METHOD: Robertson et al. 1986 qc Rf 1 - Sensitive fine grained material 2 - Organic material 3 - CLAY 4 - Silty CLAY to CLAY 5 - Clayey SILT to silty CLAY 6 - Sandy SILT to clayey SILT 7 - Silty SAND to sandy SILT 8 - SAND to silty SAND 9 - SAND 10 - Gravelly SAND to SAND 11 - Very stiff fine grained 12 - SAND to clayey SAND Groundwater Level Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

PointID **CPT105A**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 2 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	239 mV	240 mV	0.011 MPa
Sleeve	297 mV	299 mV	0.001 kPa
Pore Pressure 2	179 mV	370 mV	0.045 kPa
X-Y Inclinometer	2472 mV	2473 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

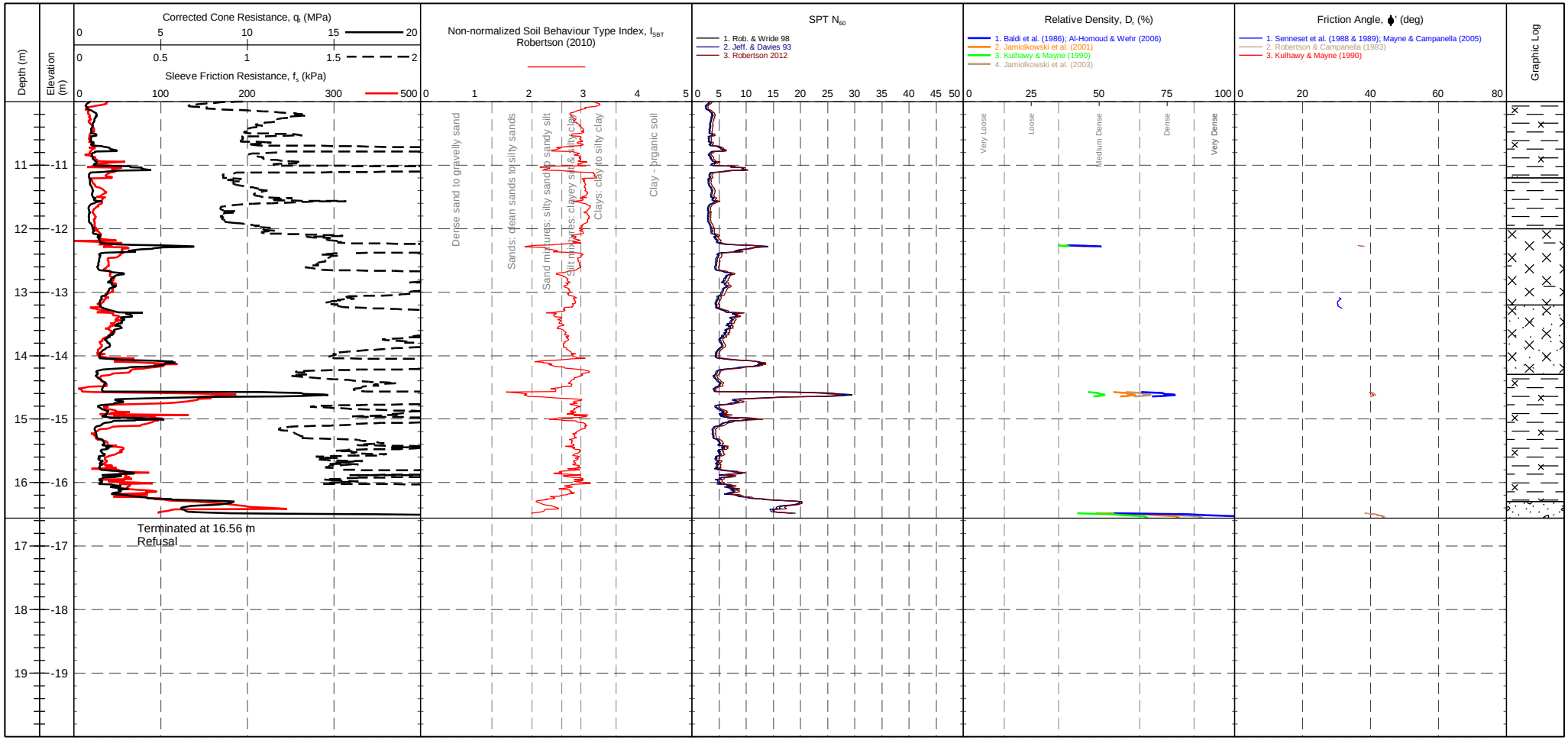
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

PointID **CPT105A**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 2 OF 2 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2			
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka			
CONE AREA RATIO	: 0.79	OPERATOR	: AC			
FILTER POSITION	: u2	FRICTION REDUCER	: None			
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot			

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	239 mV	240 mV	0.011 MPa
Sleeve	297 mV	299 mV	0.001 kPa
Pore Pressure 2	179 mV	370 mV	0.045 kPa
X-Y Inclinometer	2472 mV	2473 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

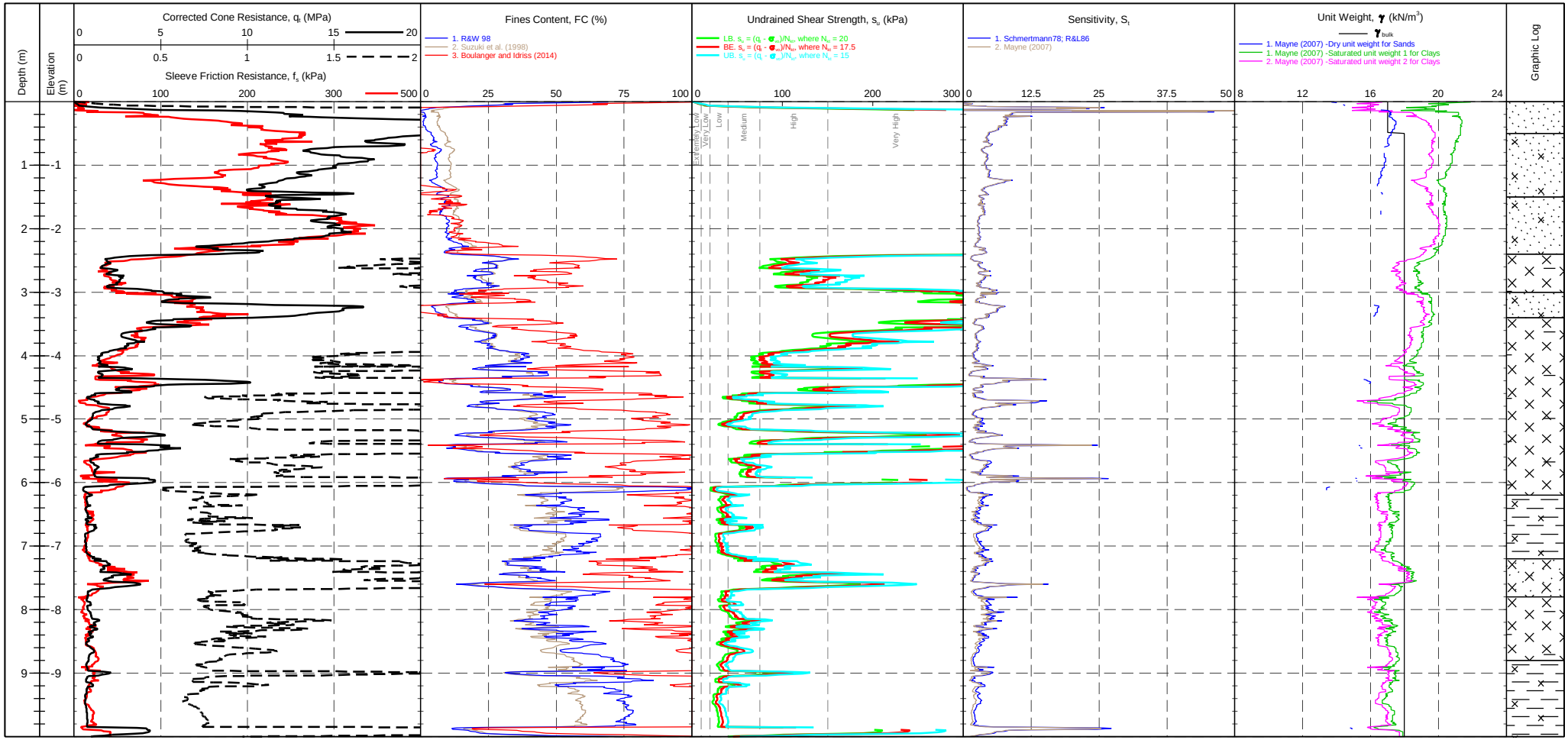
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 03

PointID **CPT105A**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 2 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



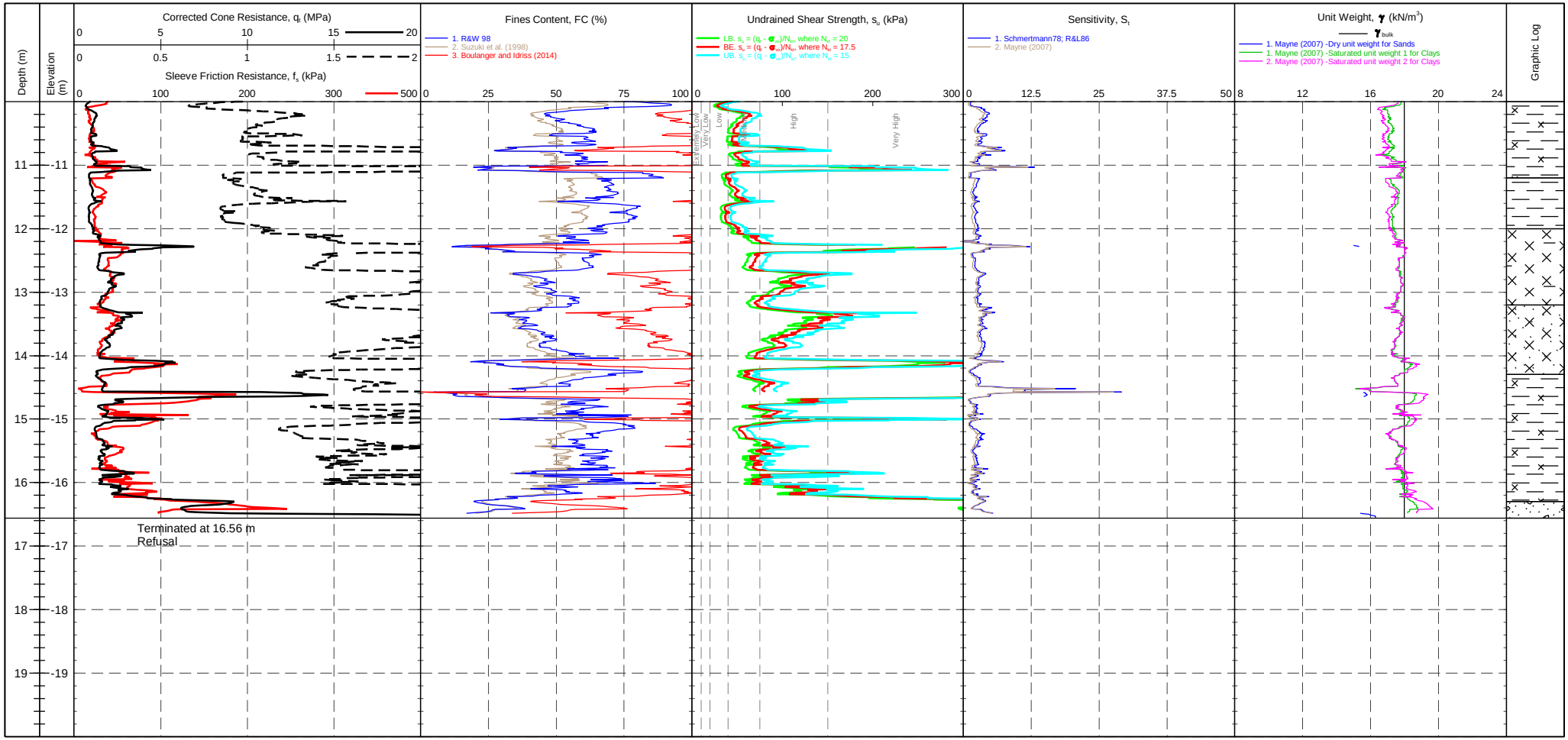
CONE ID : S15-CFIP.1867 CONE MODEL : Subtraction CONE AREA : 15cm^2 CONE AREA RATIO : 0.79 FILTER POSITION : u2 FILTER TYPE : HDPE	TEST TYPE : TE2 APPLICATION CLASS : 2 RIG : CPT 007 - Morooka OPERATOR : AC FRICTION REDUCER : None WEATHER : Sunny & Hot	CPTU ZERO VALUES Transducer / Pre / Post / Difference Tip 239 mV 240 mV 0.011 MPa Sleeve 297 mV 299 mV 0.001 kPa Pore Pressure 2 179 mV 370 mV 0.045 kPa X-Y Inclinometer 2472 mV 2473 mV	COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11 Term based on measurement / su (kPa) Extremely low strength <10 Very low strength 10-20 Low strength 20-40	Term based on measurement / su (kPa) Medium strength 40-75 High strength 75-150 Very high strength 150-300 Extremely high strength >300	Groundwater Level Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 03

PointID **CPT105A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



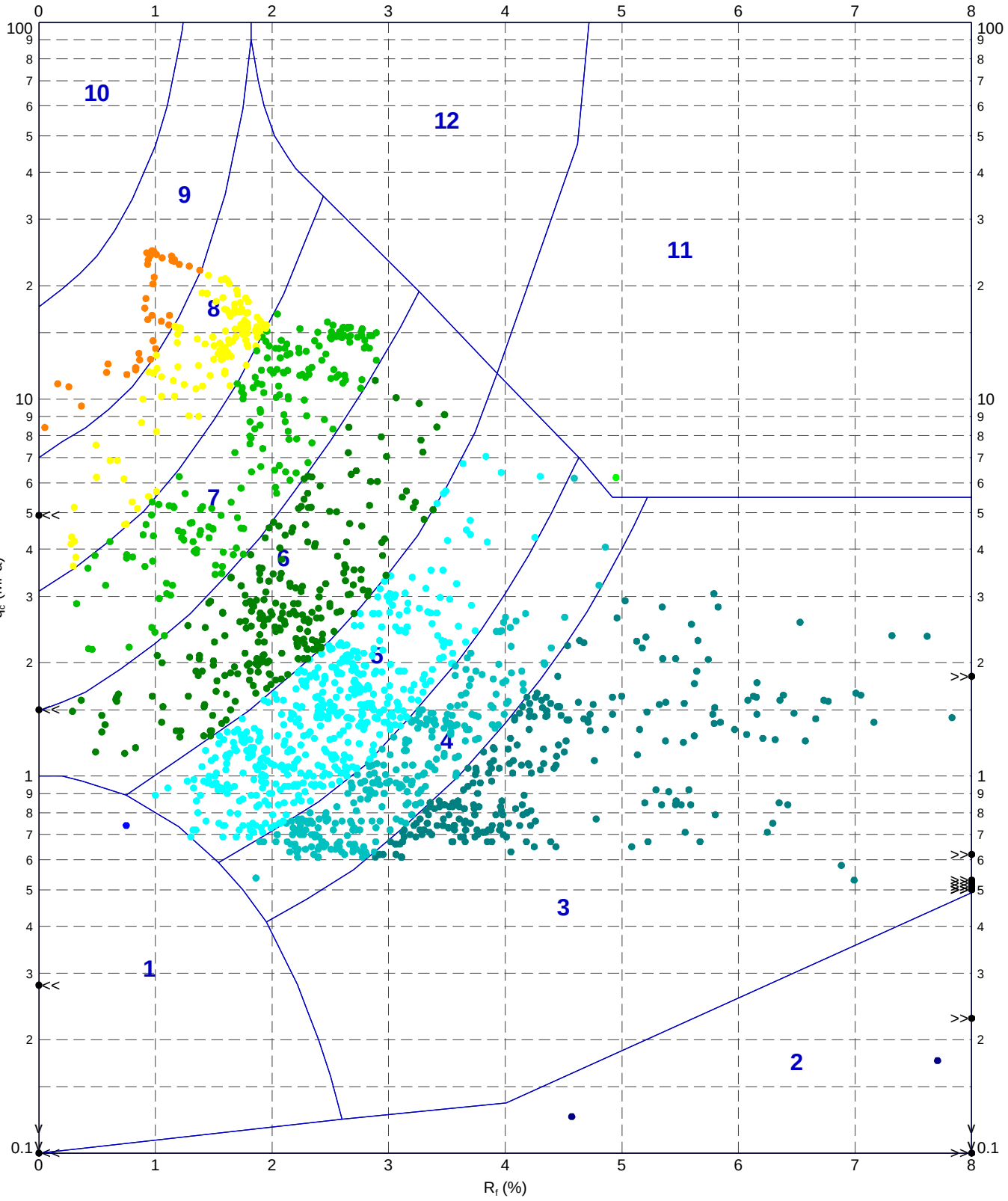
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	239 mV	240 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	297 mV	299 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	179 mV	370 mV	0.045 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2472 mV	2473 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT105A

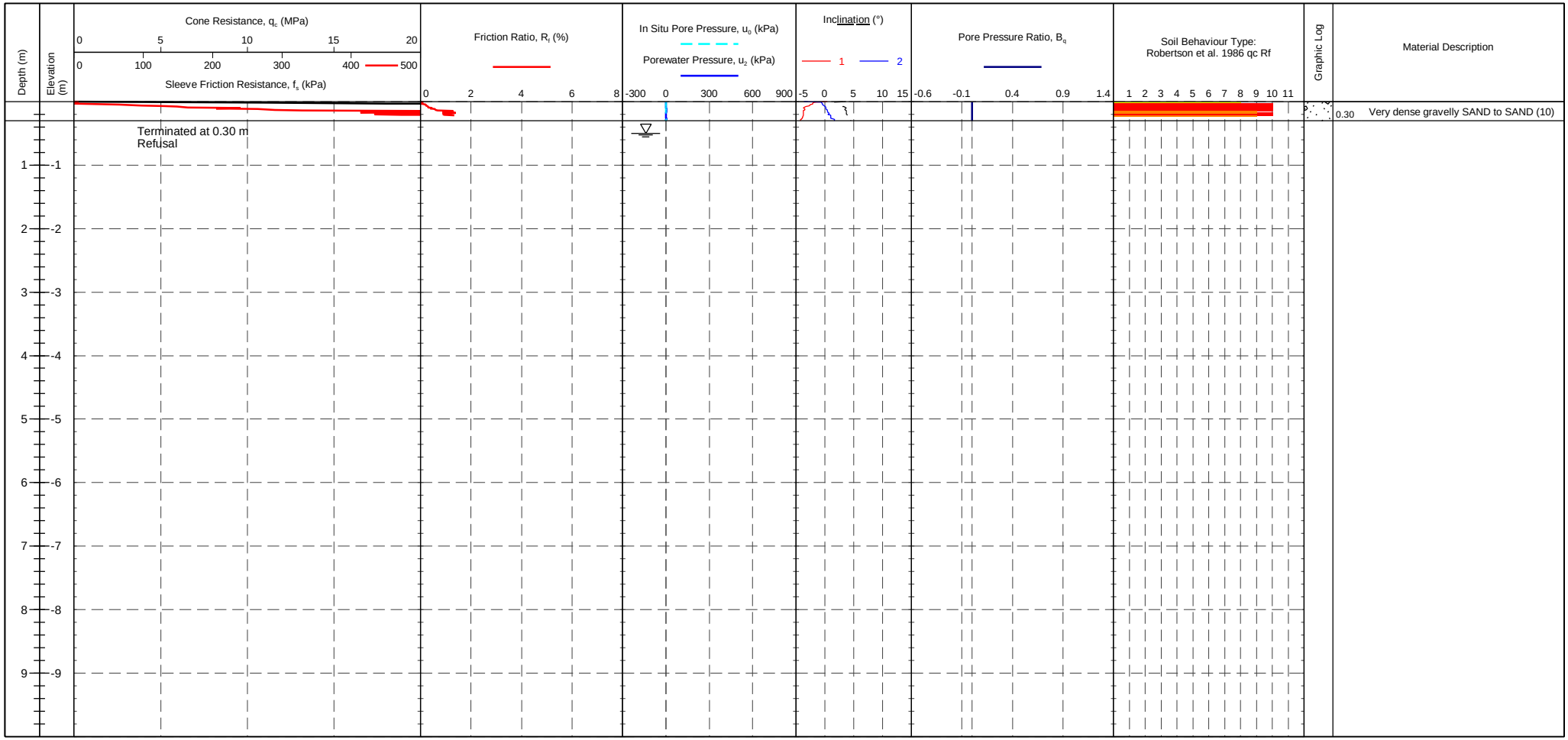
DRAWN	DATE 11/09/2023	
CHECKED	DATE 11/09/2023	
SCALE Not To Scale		A4
PROJECT No 1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT106**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	239 mV	240 mV	0.011 MPa
Sleeve	298 mV	301 mV	0.002 kPa
Pore Pressure 2	226 mV	196 mV	-0.007 kPa
X-Y Inclinometer	2571 mV	2486 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

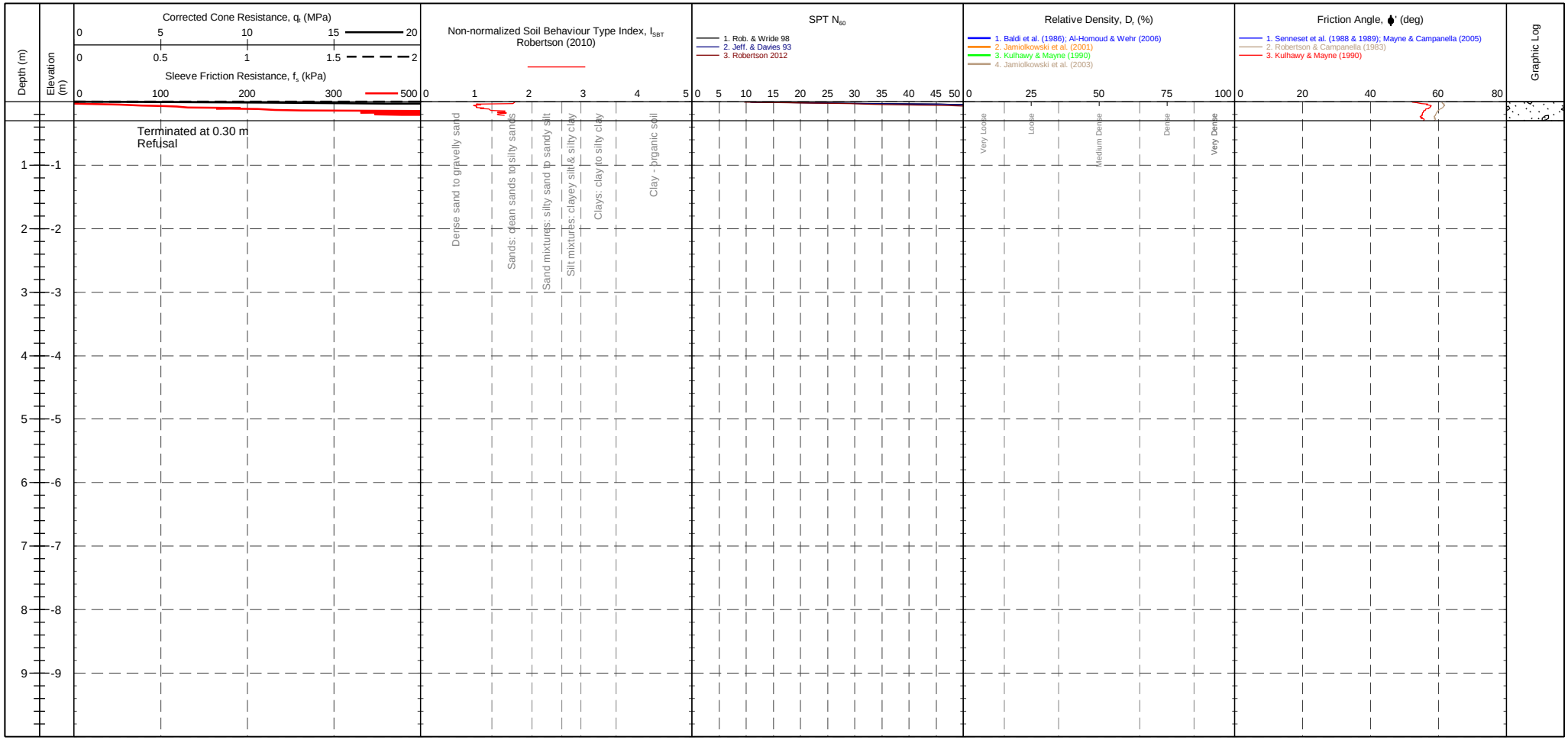
Dissipation Test

CPT LOG 02

IN SITU SITE INVESTIGATION Working with: TRC

PointID: **CPT106**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 06/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka	Tip	239 mV	240 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	298 mV	301 mV	0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	226 mV	196 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2571 mV	2486 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

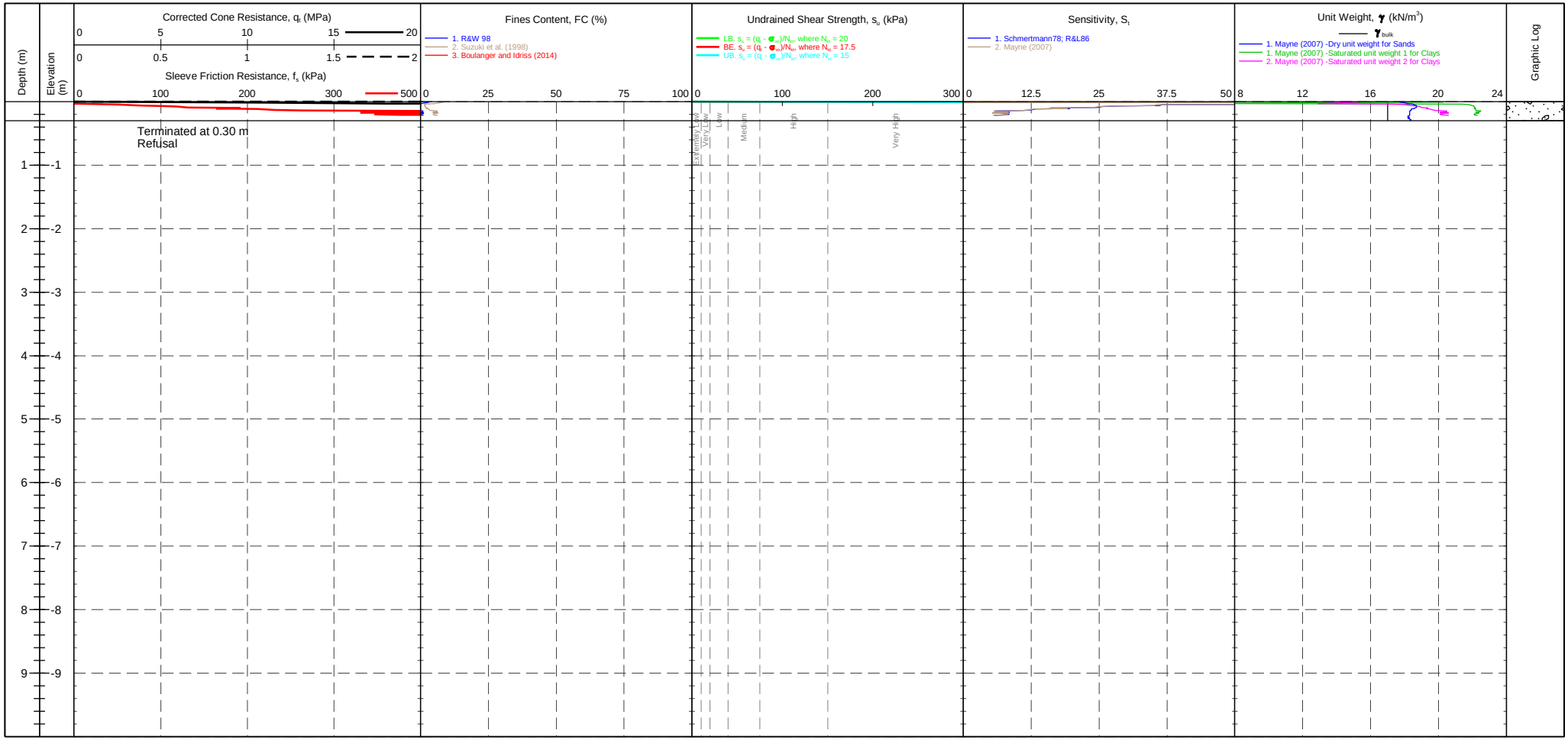
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT106**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 06/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



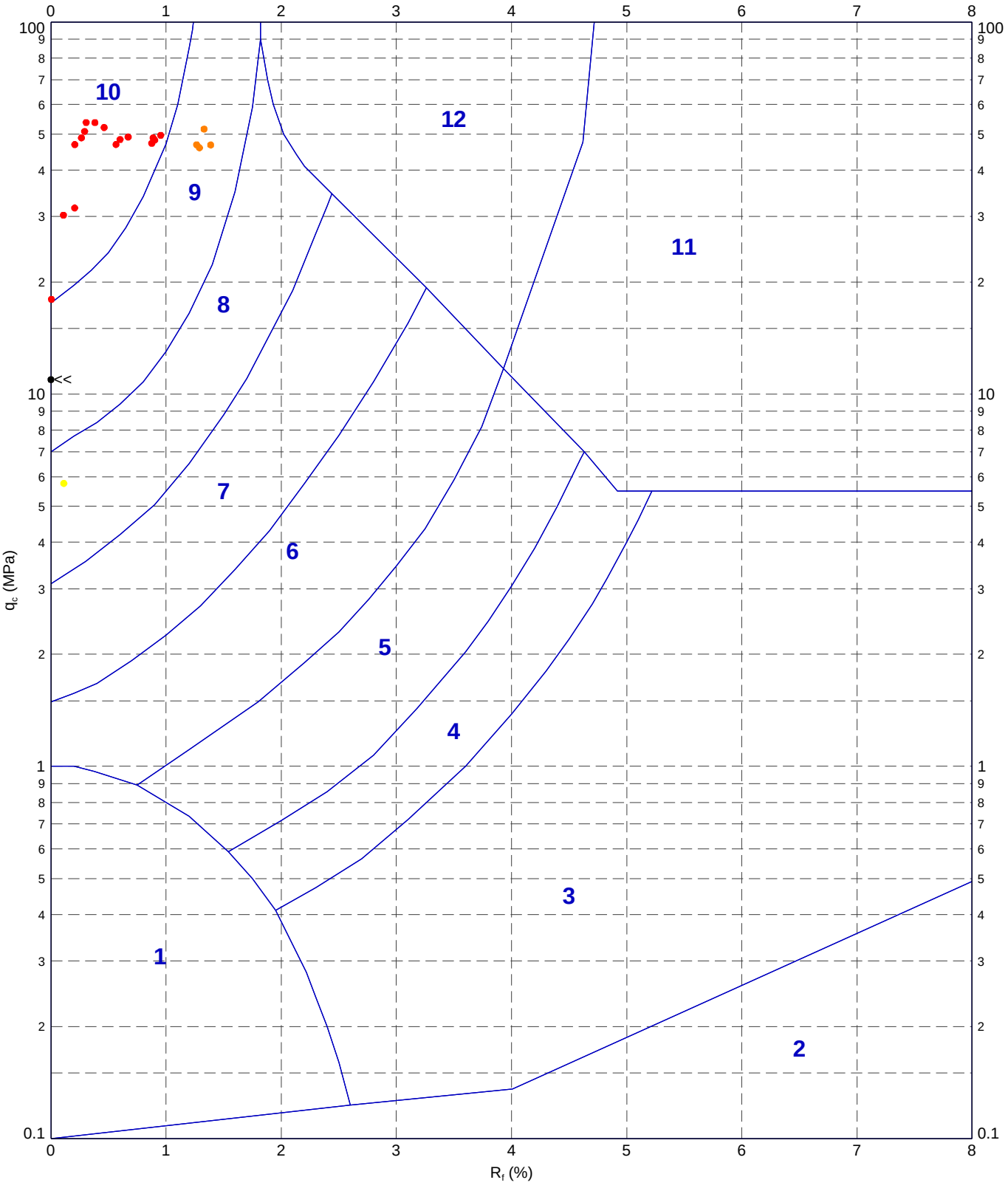
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	239 mV	240 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	298 mV	301 mV	0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	226 mV	196 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2571 mV	2486 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT106

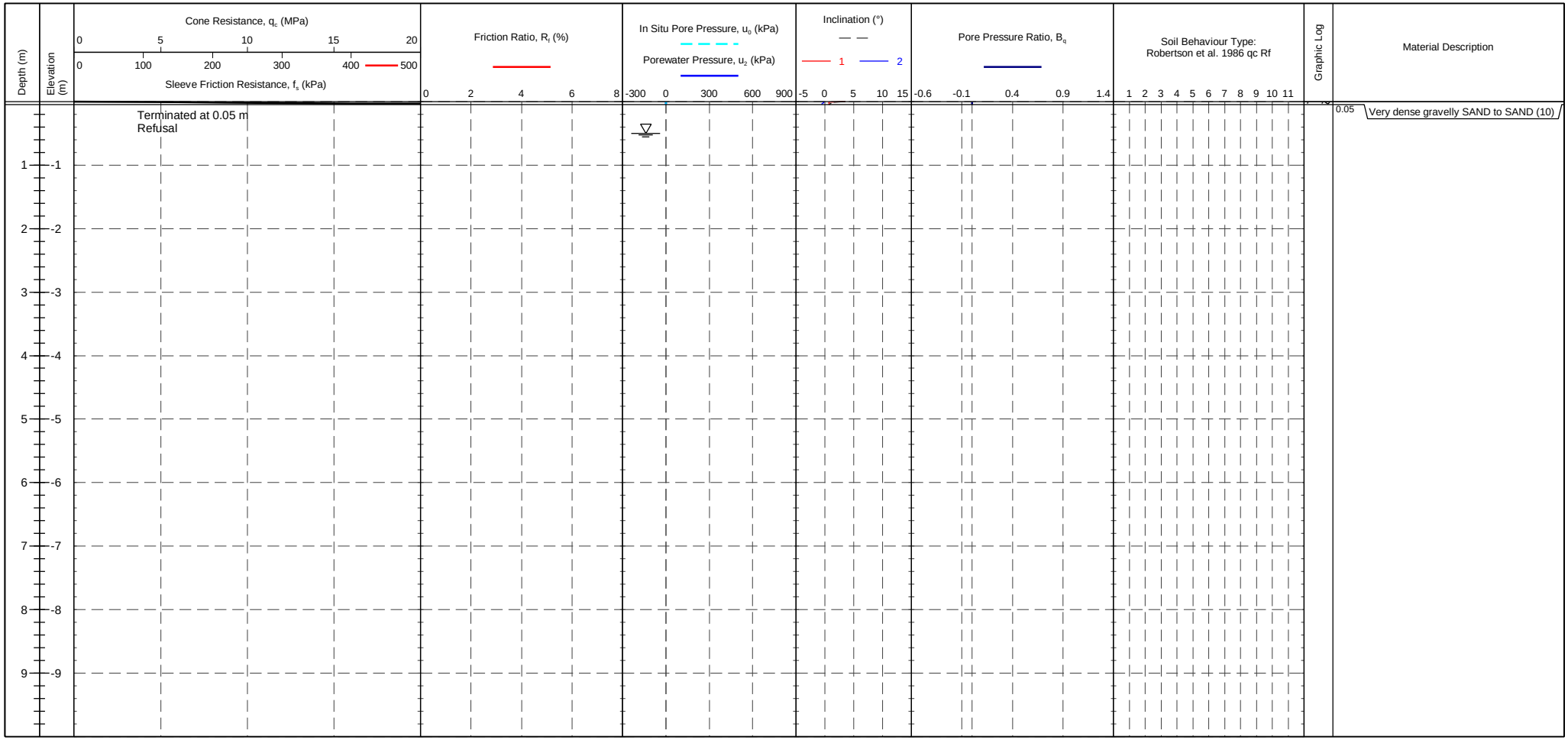
DRAWN	DATE 11/09/2023	
CHECKED	DATE 11/09/2023	
SCALE Not To Scale		A4
PROJECT No 1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT107**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	242 mV	243 mV	0.011 MPa
Sleeve	303 mV	303 mV	0 kPa
Pore Pressure 2	150 mV	150 mV	0 kPa
X-Y Inclinometer	2876 mV	2627 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

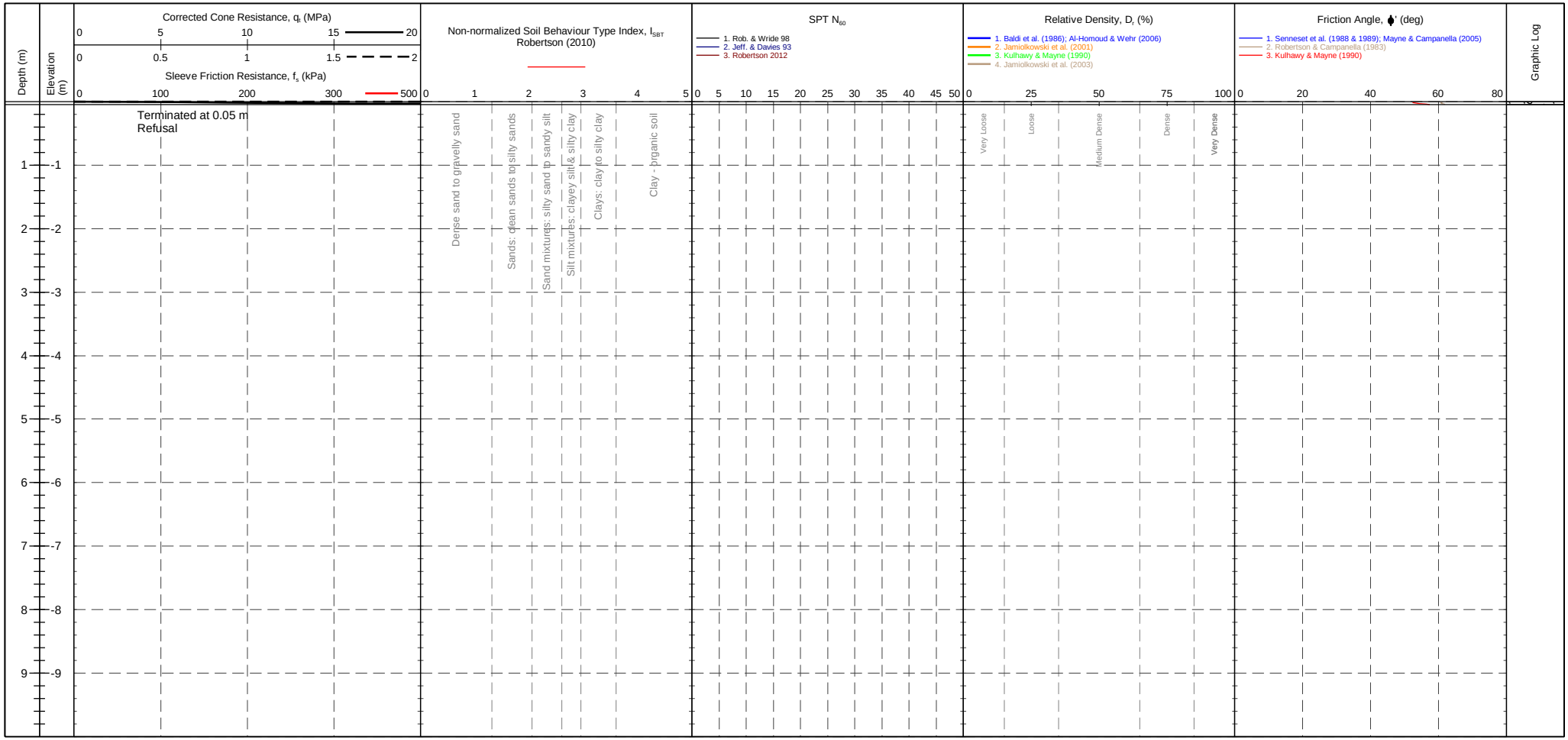
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT107**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	242 mV	243 mV	0.011 MPa
Sleeve	303 mV	303 mV	0 kPa
Pore Pressure 2	150 mV	150 mV	0 kPa
X-Y Inclinometer	2876 mV	2627 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

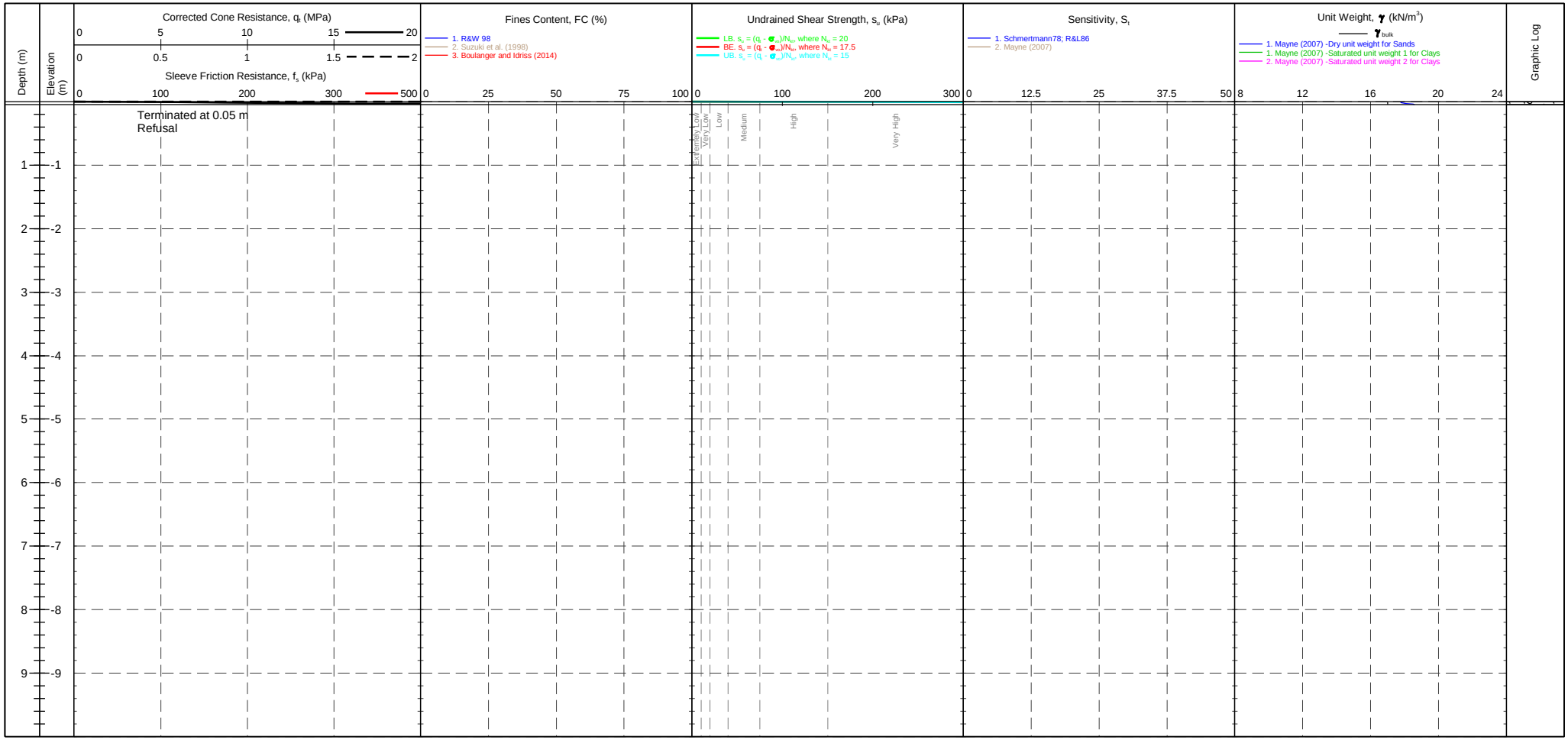
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT107**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	242 mV	243 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	303 mV	303 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	150 mV	150 mV	0 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2876 mV	2627 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

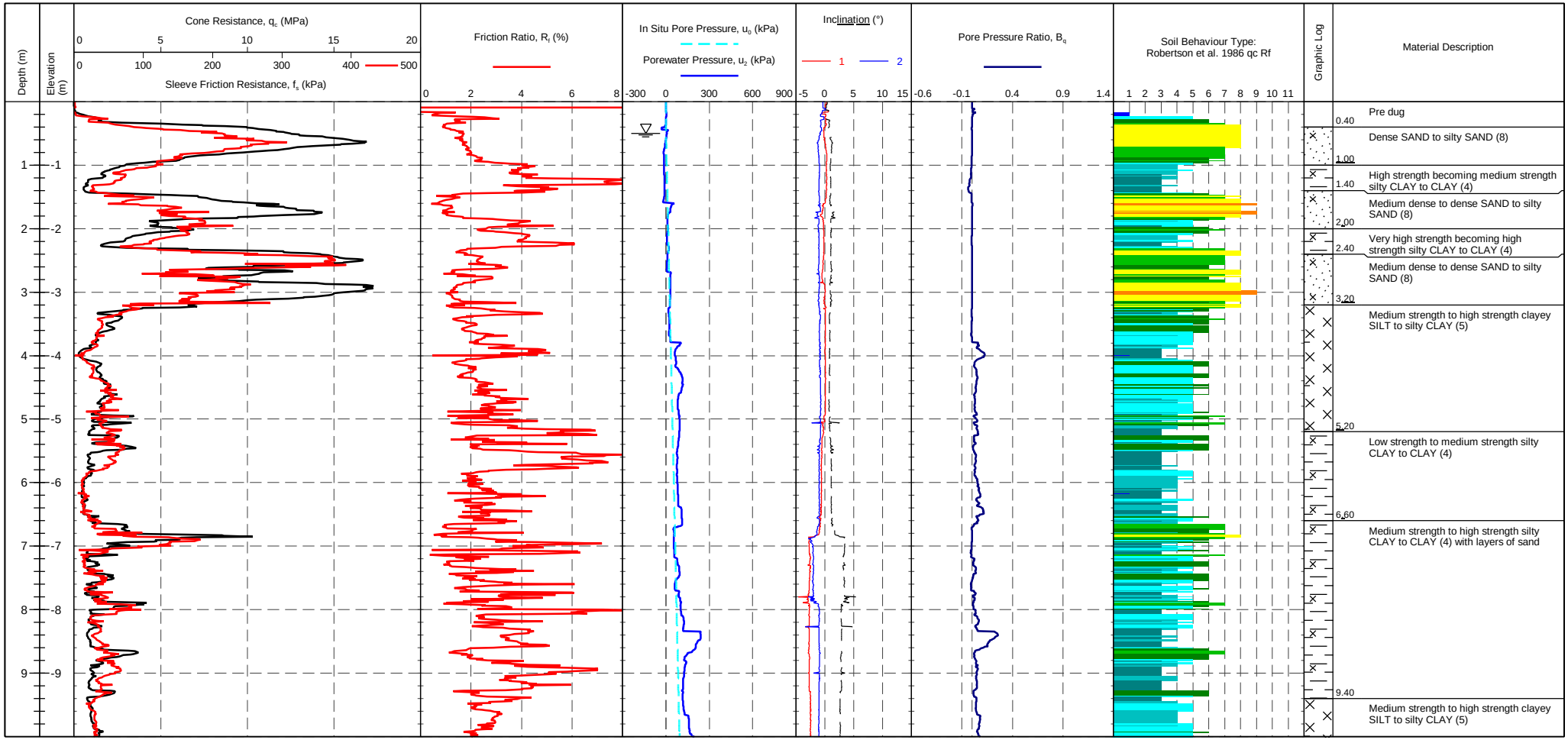
Dissipation Test

CPT LOG 01

Working with: TRC

PointID: **CPT107A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm²	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	249 mV	0.066 MPa
Sleeve	303 mV	306 mV	0.002 kPa
Pore Pressure 2	150 mV	472 mV	0.076 kPa
X-Y Inclinometer	2567 mV	2521 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

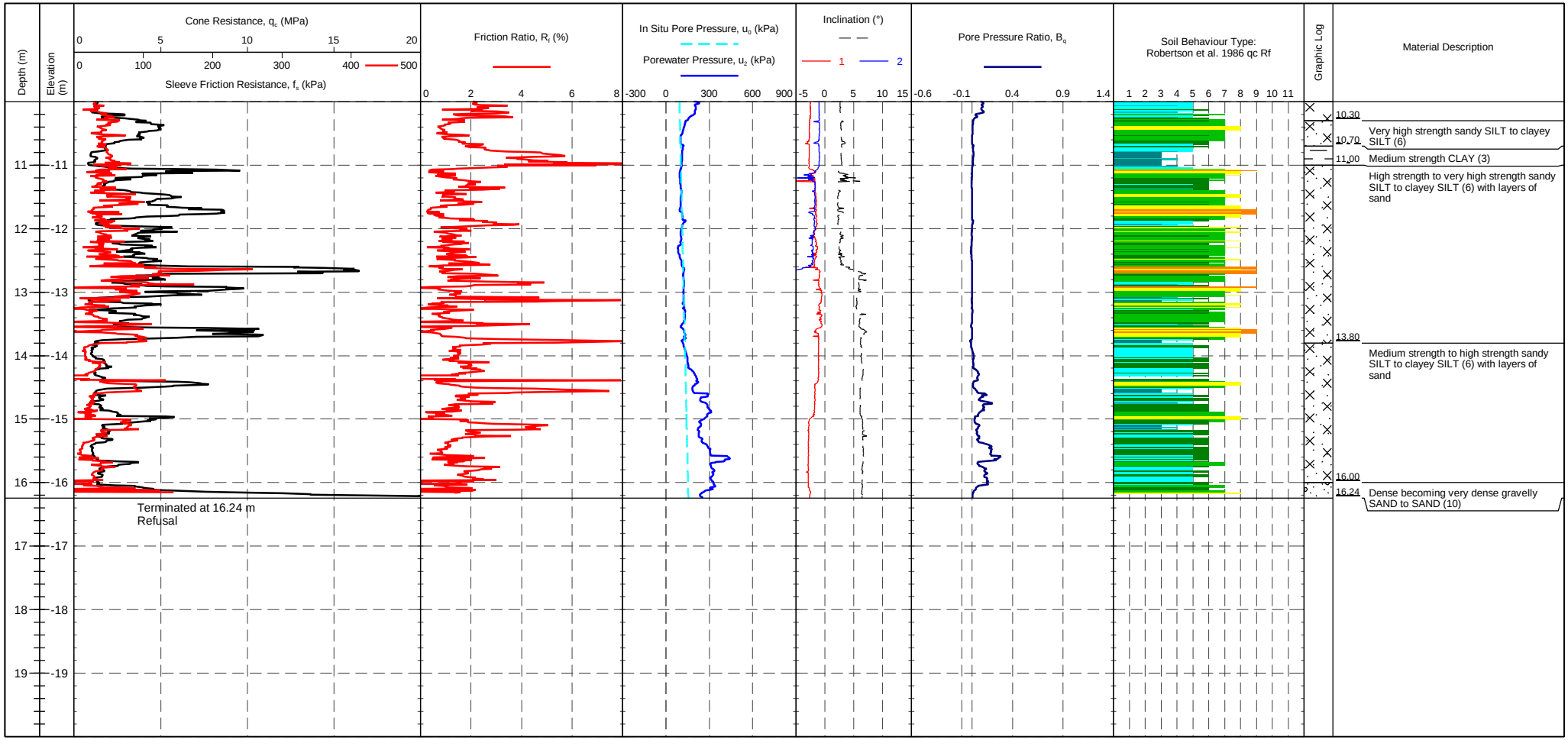
Dissipation Test

CPT LOG 01

Working with: TRC

PointID: **CPT107A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	249 mV	0.066 MPa
Sleeve	303 mV	306 mV	0.002 kPa
Pore Pressure 2	150 mV	472 mV	0.076 kPa
X-Y Inclinometer	2567 mV	2521 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

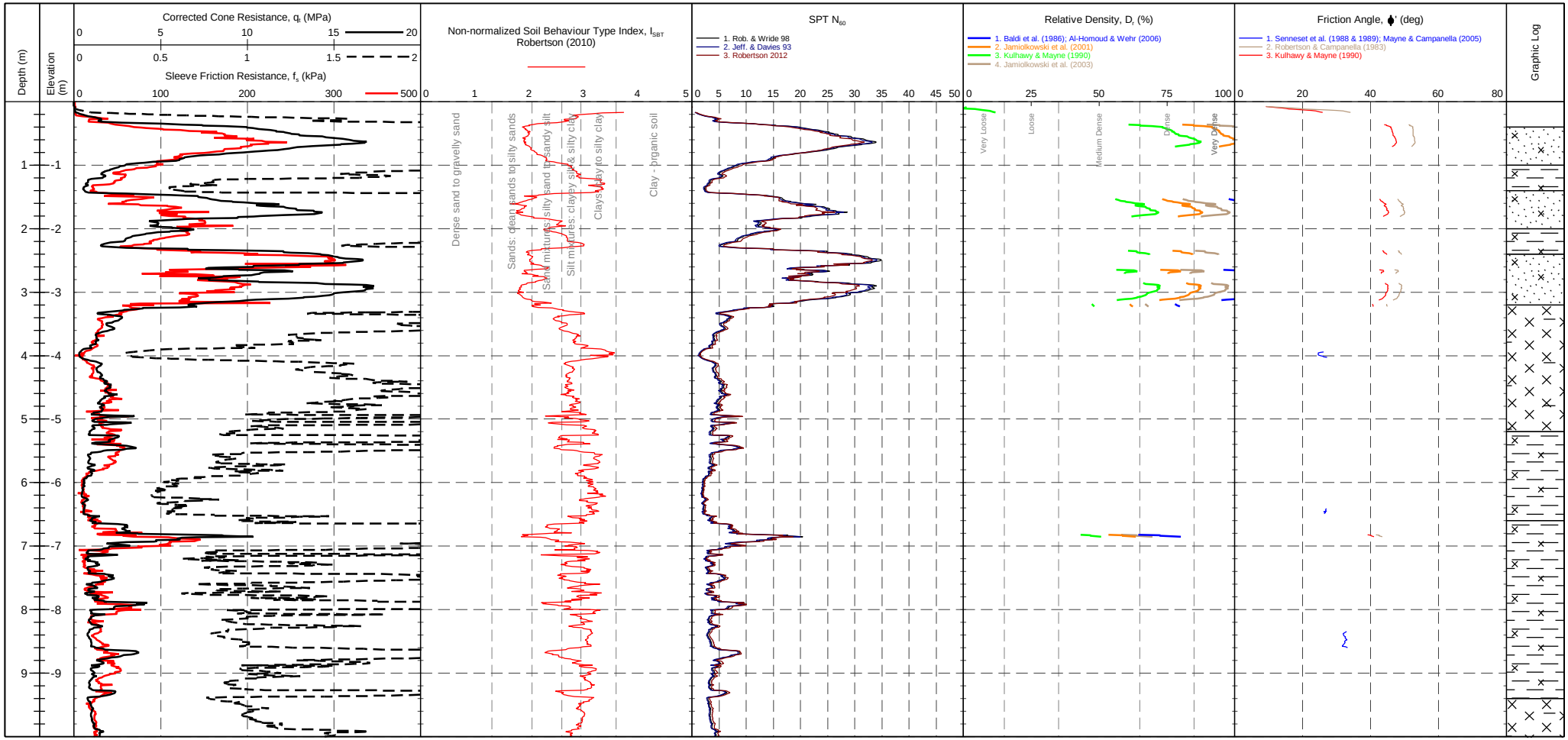
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT107A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID : S15-CFIP.1867	TEST TYPE : TE2	CPTU ZERO VALUES			
CONE MODEL : Subtraction	APPLICATION CLASS : 2	Transducer	Pre	Post	Difference
CONE AREA : 15cm²	RIG : CPT 007 - Morooka	Tip	243 mV	249 mV	0.066 MPa
CONE AREA RATIO : 0.79	OPERATOR : AC	Sleeve	303 mV	306 mV	0.002 kPa
FILTER POSITION : u2	FRICTION REDUCER : None	Pore Pressure 2	150 mV	472 mV	0.076 kPa
FILTER TYPE : HDPE	WEATHER : Sunny & Hot	X-Y Inclinometer	2567 mV	2521 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

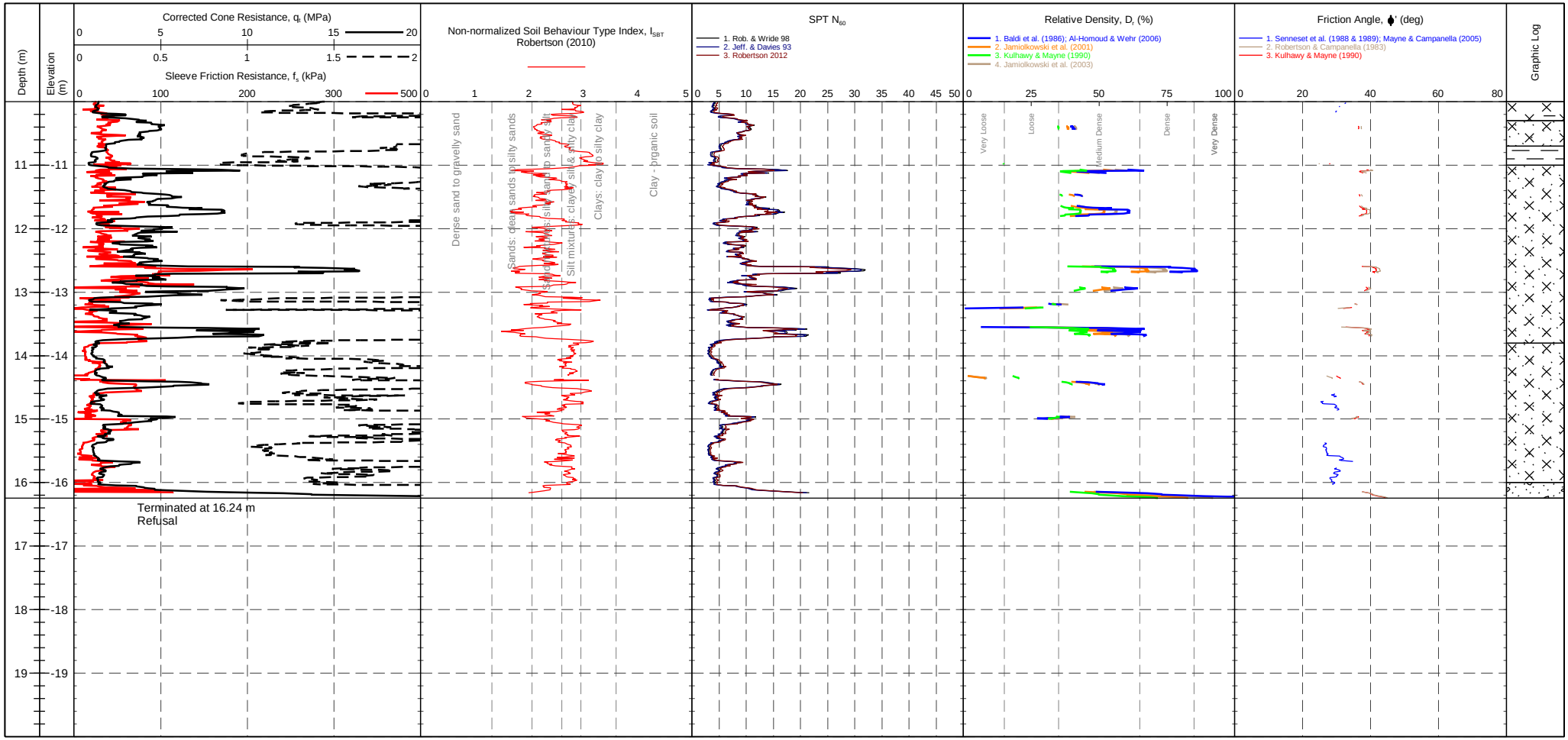
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT107A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	249 mV	0.066 MPa
Sleeve	303 mV	306 mV	0.002 kPa
Pore Pressure 2	150 mV	472 mV	0.076 kPa
X-Y Inclinometer	2567 mV	2521 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 03

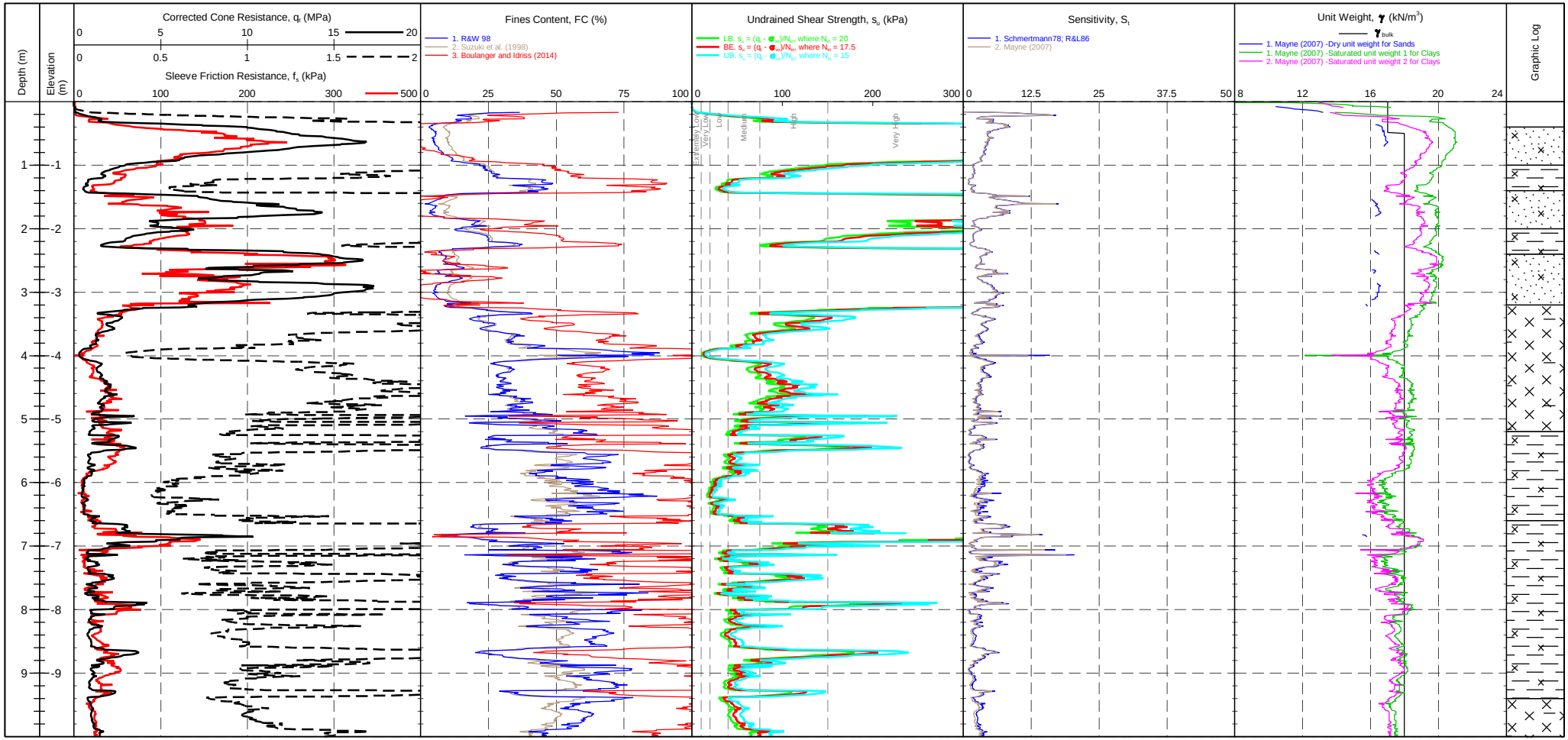
PointID **CPT107A**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 2
STATUS : Final
TEST DATE : 05/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	249 mV	0.066 MPa
Sleeve	303 mV	306 mV	0.002 kPa
Pore Pressure 2	150 mV	472 mV	0.076 kPa
X-Y Inclinometer	2567 mV	2521 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)
Extremely low strength	<10
Very low strength	10-20
Low strength	20-40

Term based on measurement	su (kPa)
Medium strength	40-75
High strength	75-150
Very high strength	150-300
Extremely high strength	>300

Groundwater Level

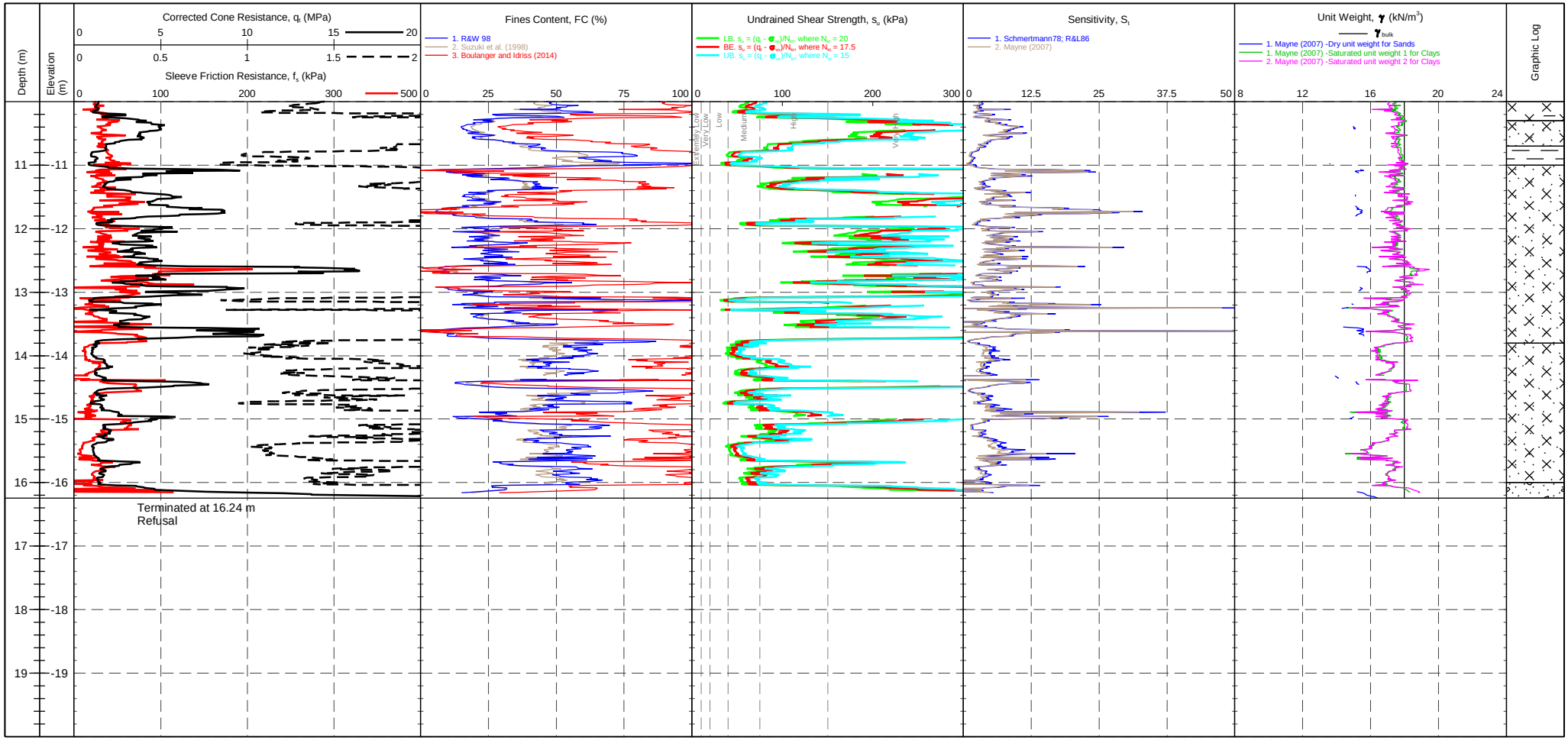
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT107A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	249 mV	0.066 MPa
Sleeve	303 mV	306 mV	0.002 kPa
Pore Pressure 2	150 mV	472 mV	0.076 kPa
X-Y Inclinometer	2567 mV	2521 mV	

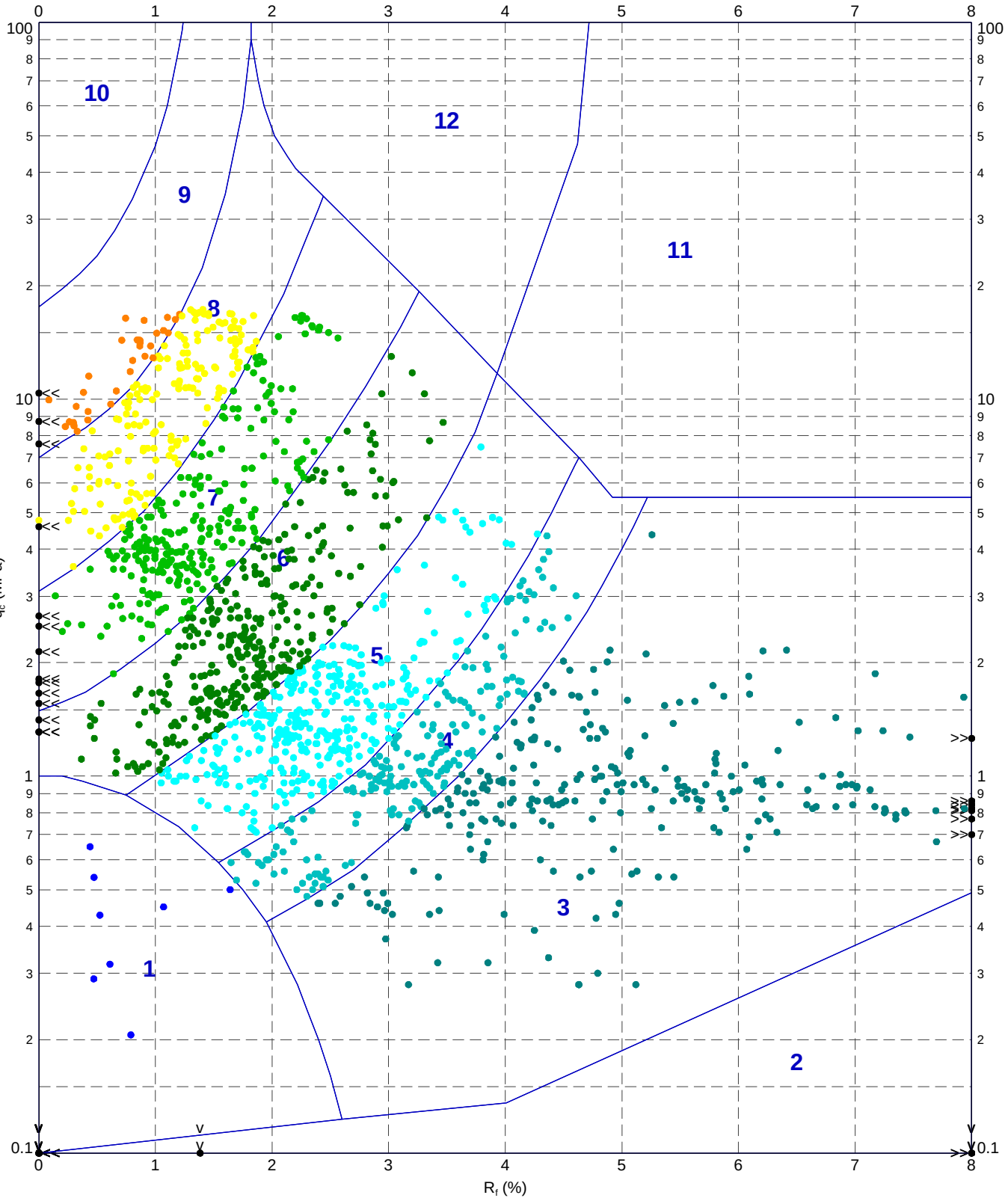
COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)
Extremely low strength	<10
Very low strength	10-20
Low strength	20-40

Term based on measurement	su (kPa)
Medium strength	40-75
High strength	75-150
Very high strength	150-300
Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

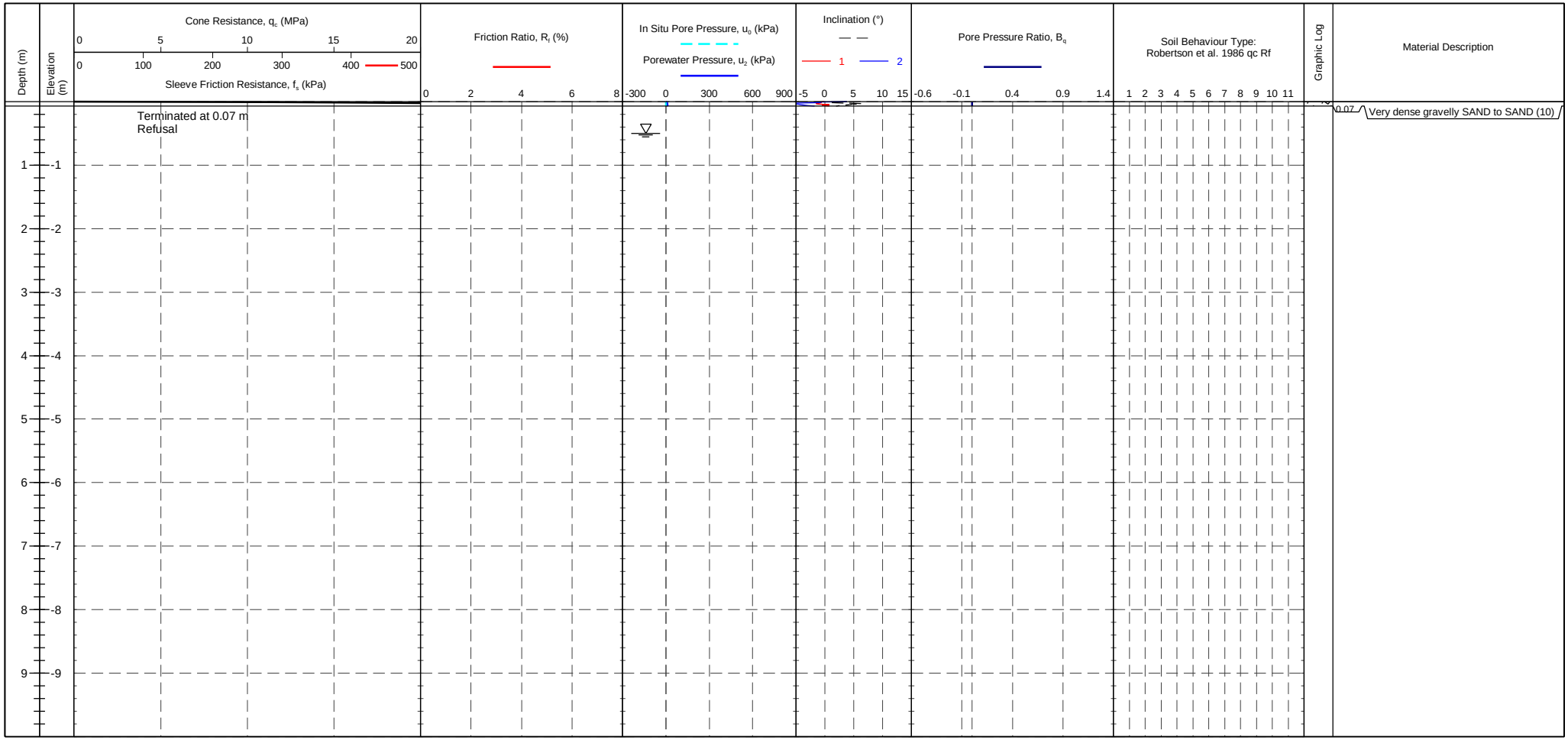
TITLE: TRC Tunbridge Wells Chapman Way Robertson et al. 1986 q_c vs. R_f - CPT107A	DRAWN	DATE 11/09/2023	
	CHECKED	DATE 11/09/2023	
	SCALE Not To Scale		A4
	PROJECT No 1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT108**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	242 mV	243 mV	0.011 MPa
Sleeve	302 mV	302 mV	0 kPa
Pore Pressure 2	152 mV	151 mV	0 kPa
X-Y Inclinometer	2511 mV	2528 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

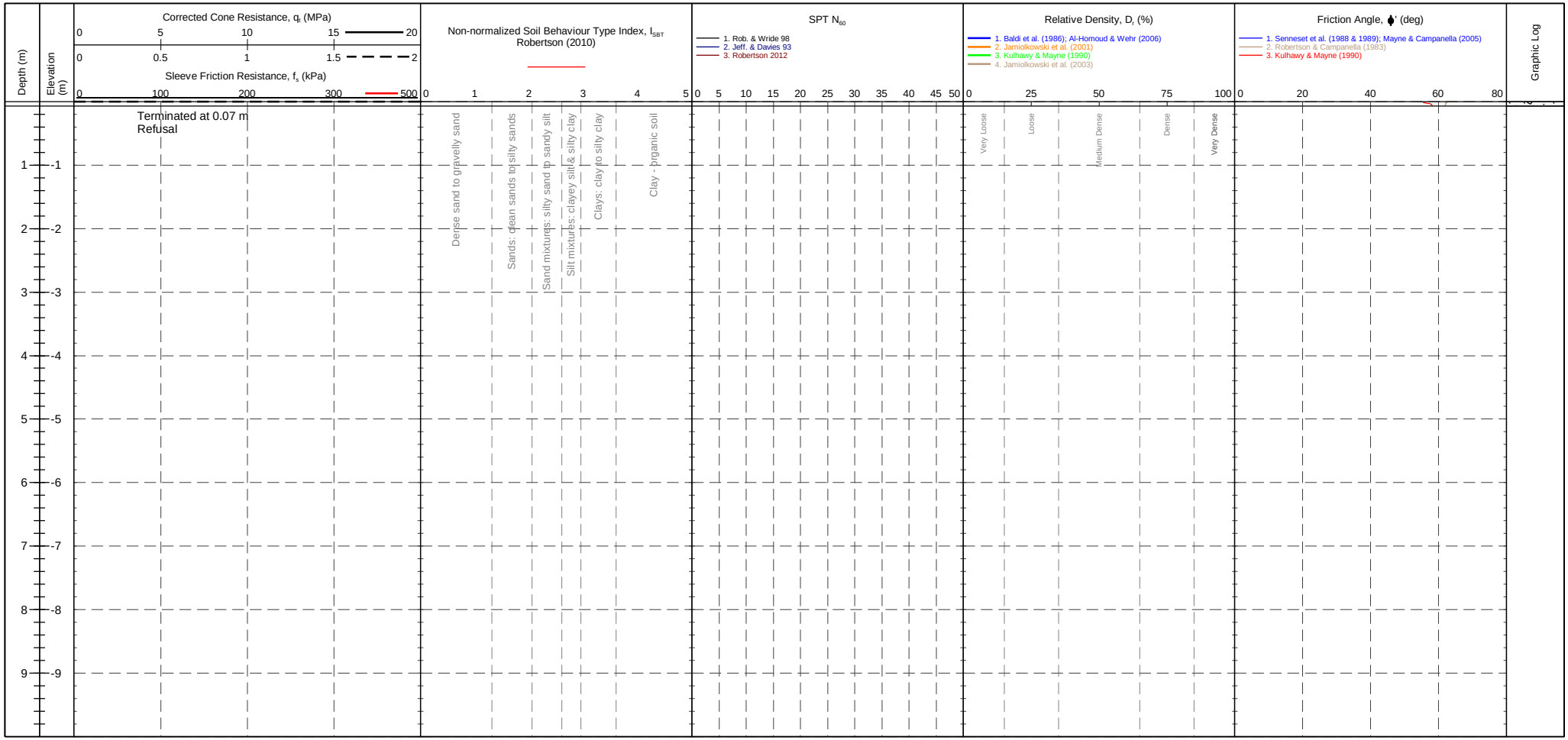
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT108**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 05/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post / Difference
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka	Tip	242 mV	243 mV / 0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	302 mV	302 mV / 0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	152 mV	151 mV / 0 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2511 mV	2528 mV

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

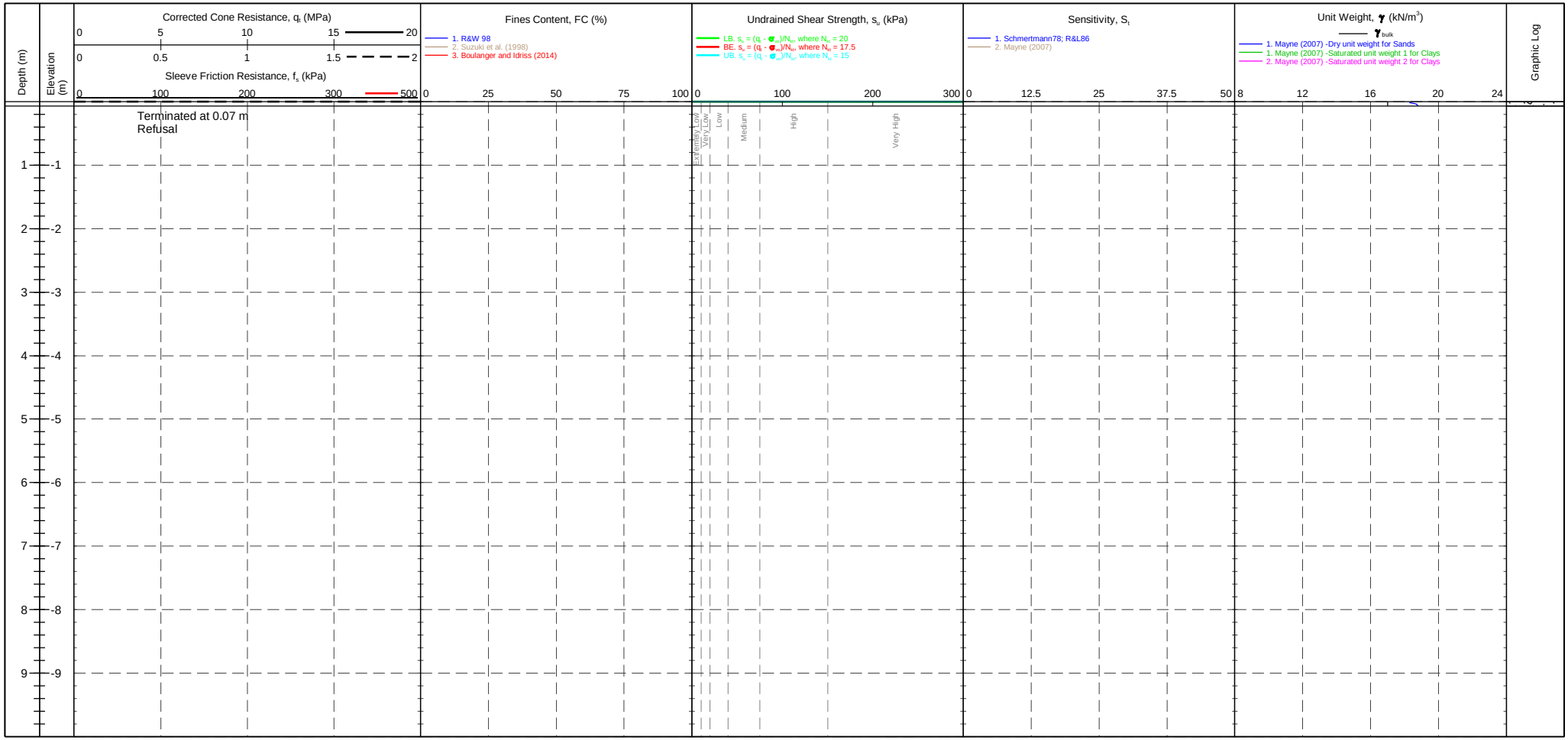
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT108**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	242 mV	243 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	302 mV	302 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	152 mV	151 mV	0 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2511 mV	2528 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

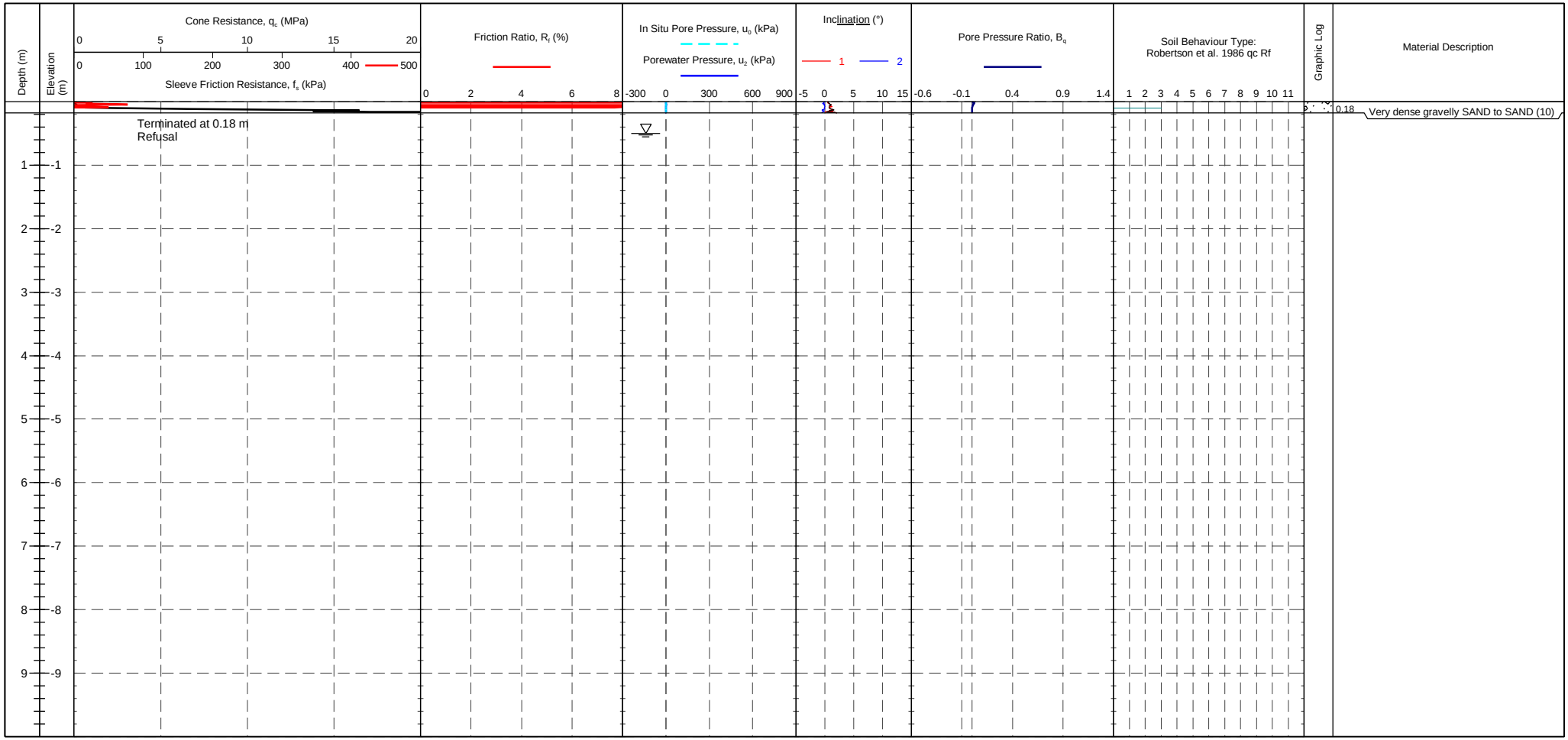
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID **CPT108A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	242 mV	244 mV	0.022 MPa
Sleeve	302 mV	302 mV	0 kPa
Pore Pressure 2	150 mV	149 mV	0 kPa
X-Y Inclinometer	2568 mV	2579 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

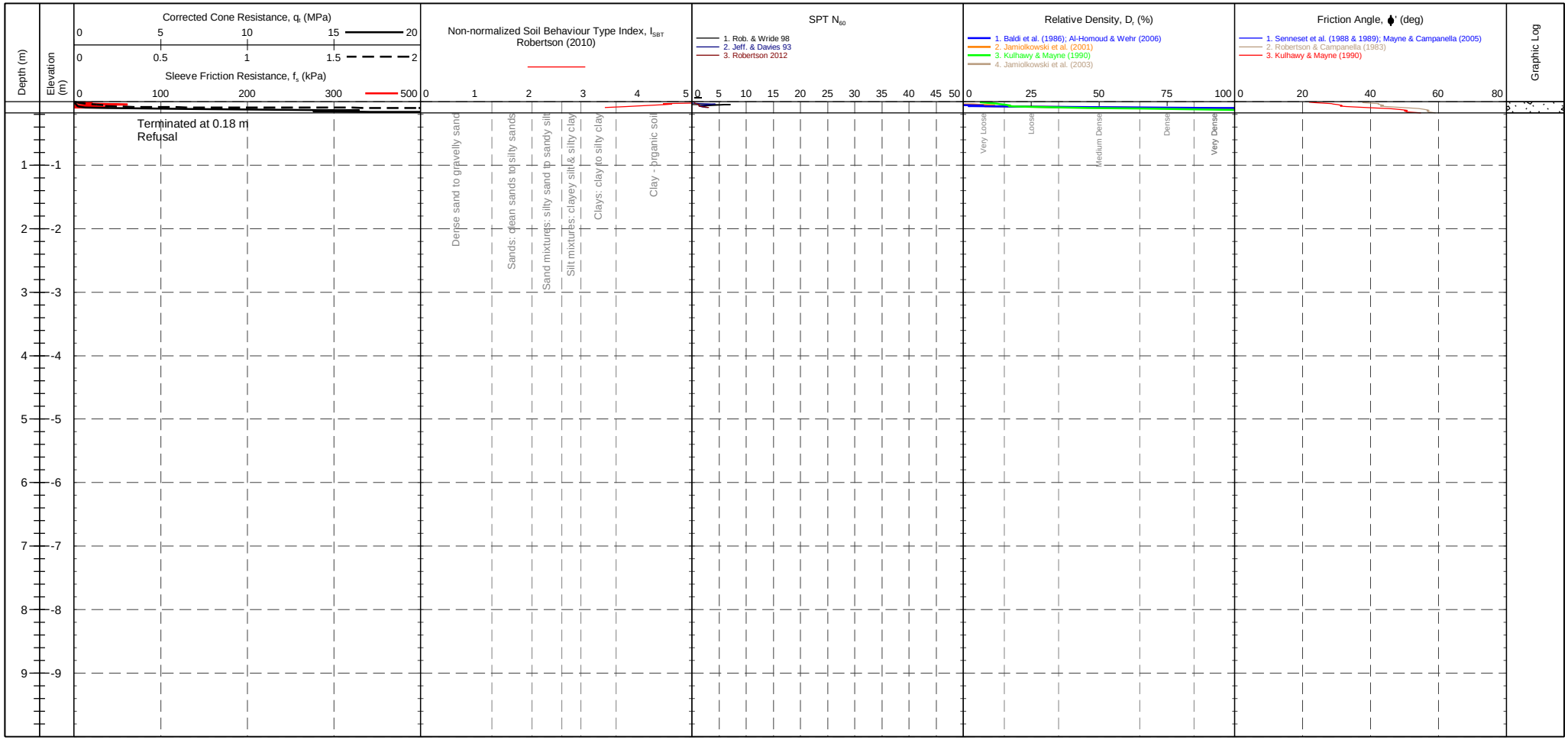
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT108A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	242 mV	244 mV	0.022 MPa
Sleeve	302 mV	302 mV	0 kPa
Pore Pressure 2	150 mV	149 mV	0 kPa
X-Y Inclinometer	2568 mV	2579 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

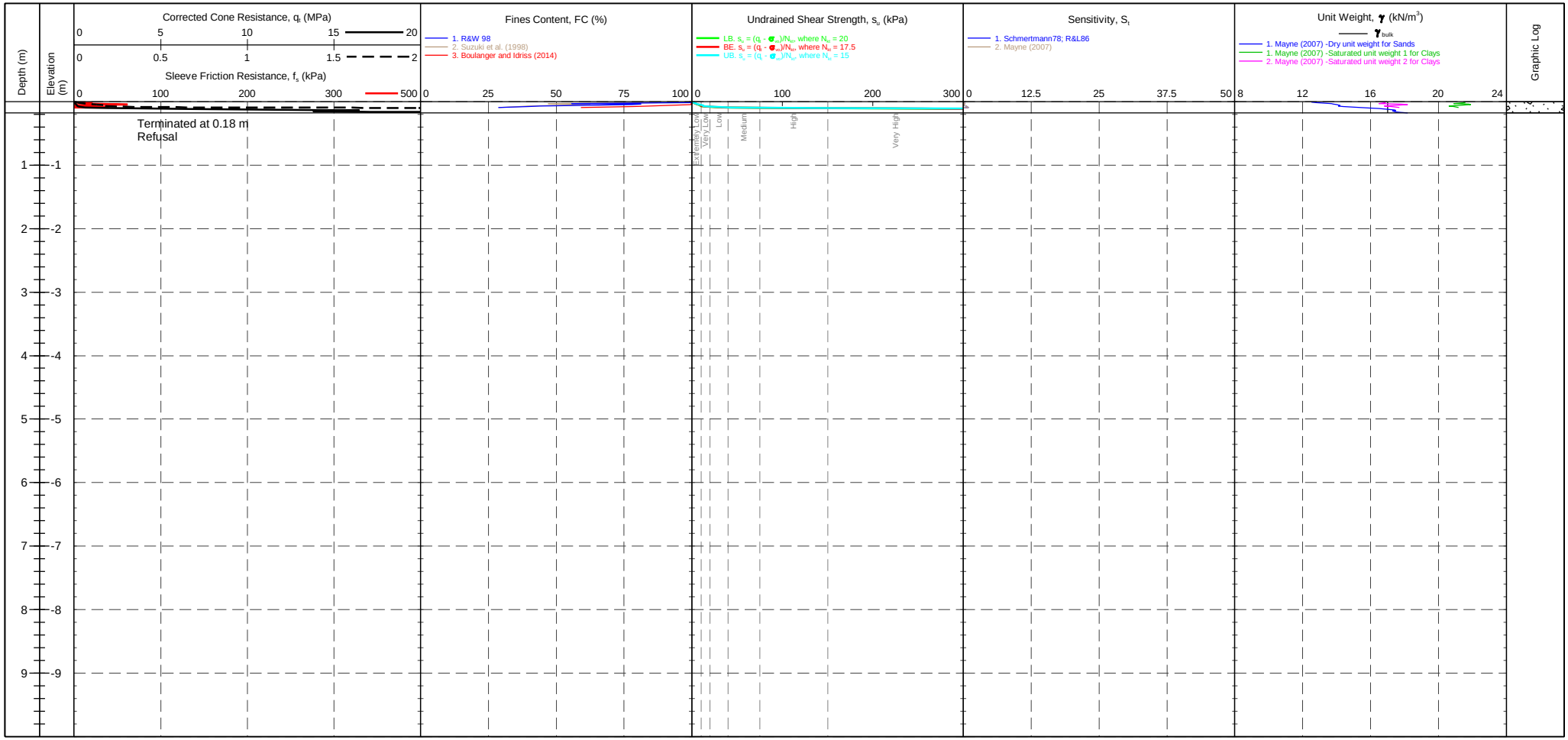
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT108A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



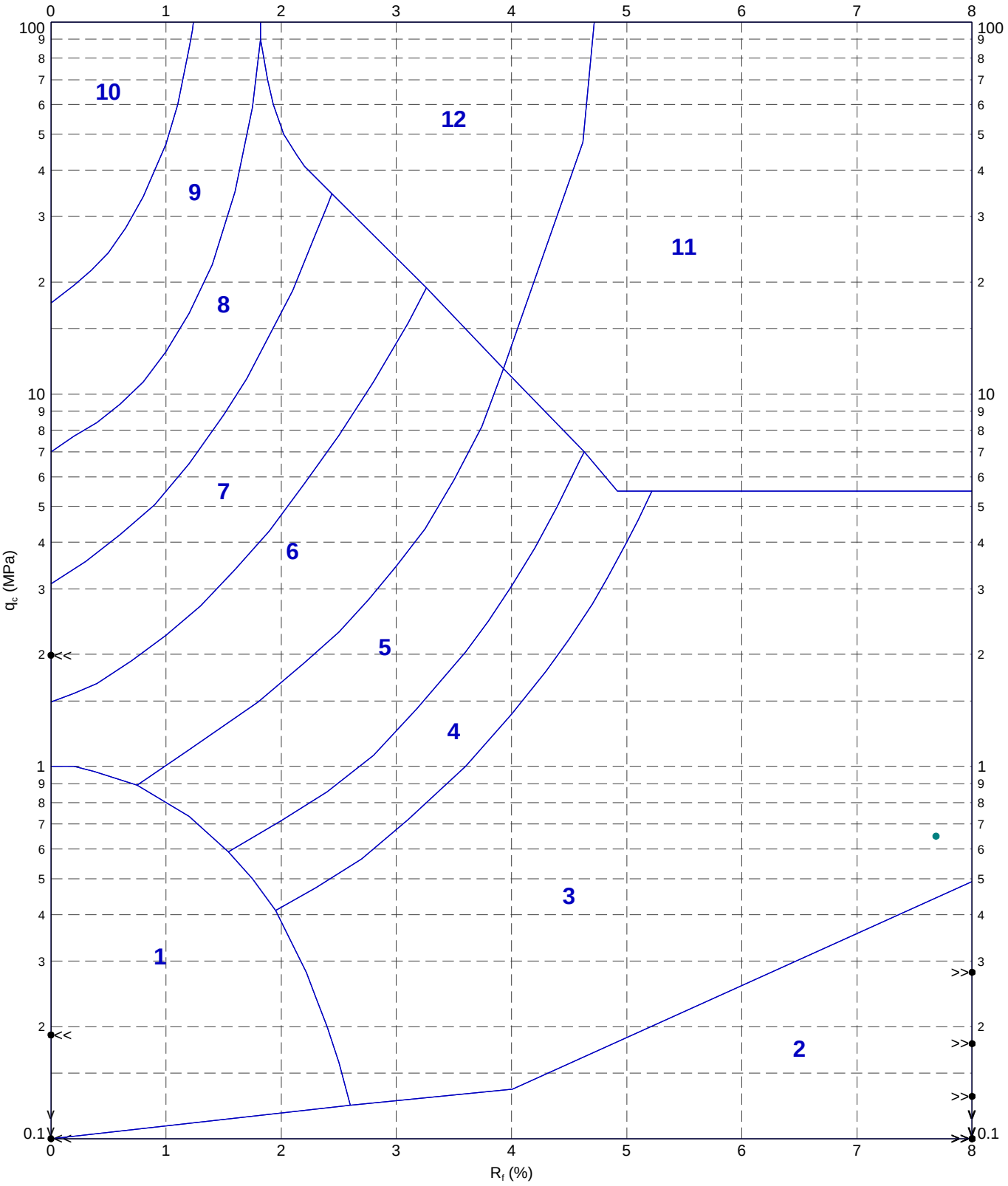
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	242 mV	244 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	302 mV	302 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	150 mV	149 mV	0 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2568 mV	2579 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT108A

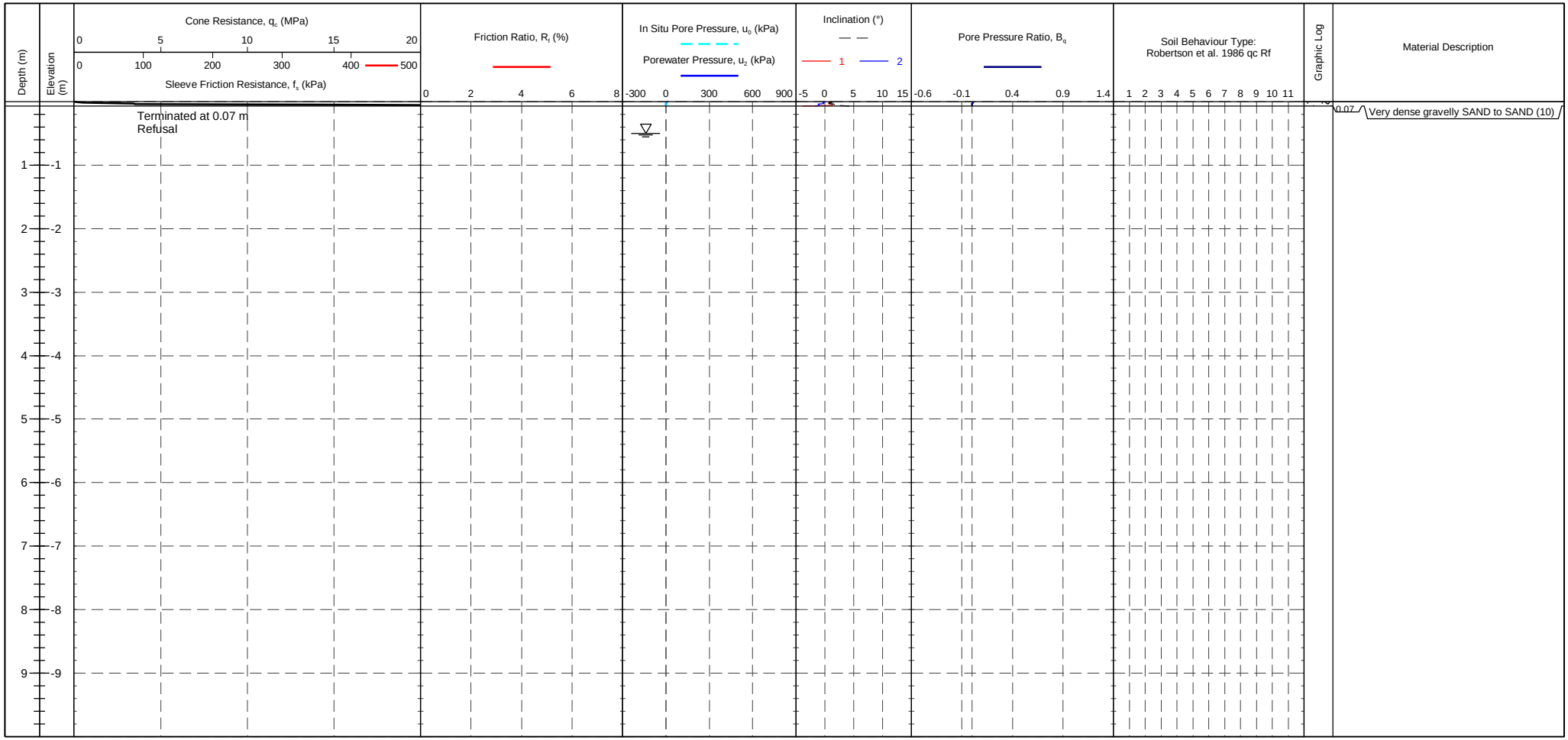
DRAWN		DATE	11/09/2023
CHECKED		DATE	11/09/2023
SCALE	Not To Scale		A4
PROJECT No	1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT108B**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka	Tip	243 mV	242 mV	-0.011 MPa
CONE AREA	: 15cm^2	OPERATOR	: AC	Sleeve	301 mV	304 mV	0.002 kPa
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None	Pore Pressure 2	149 mV	149 mV	0 kPa
FILTER POSITION	: u2	WEATHER	: Sunny & Hot	X-Y Inclinometer	2618 mV	2573 mV	
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.				

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

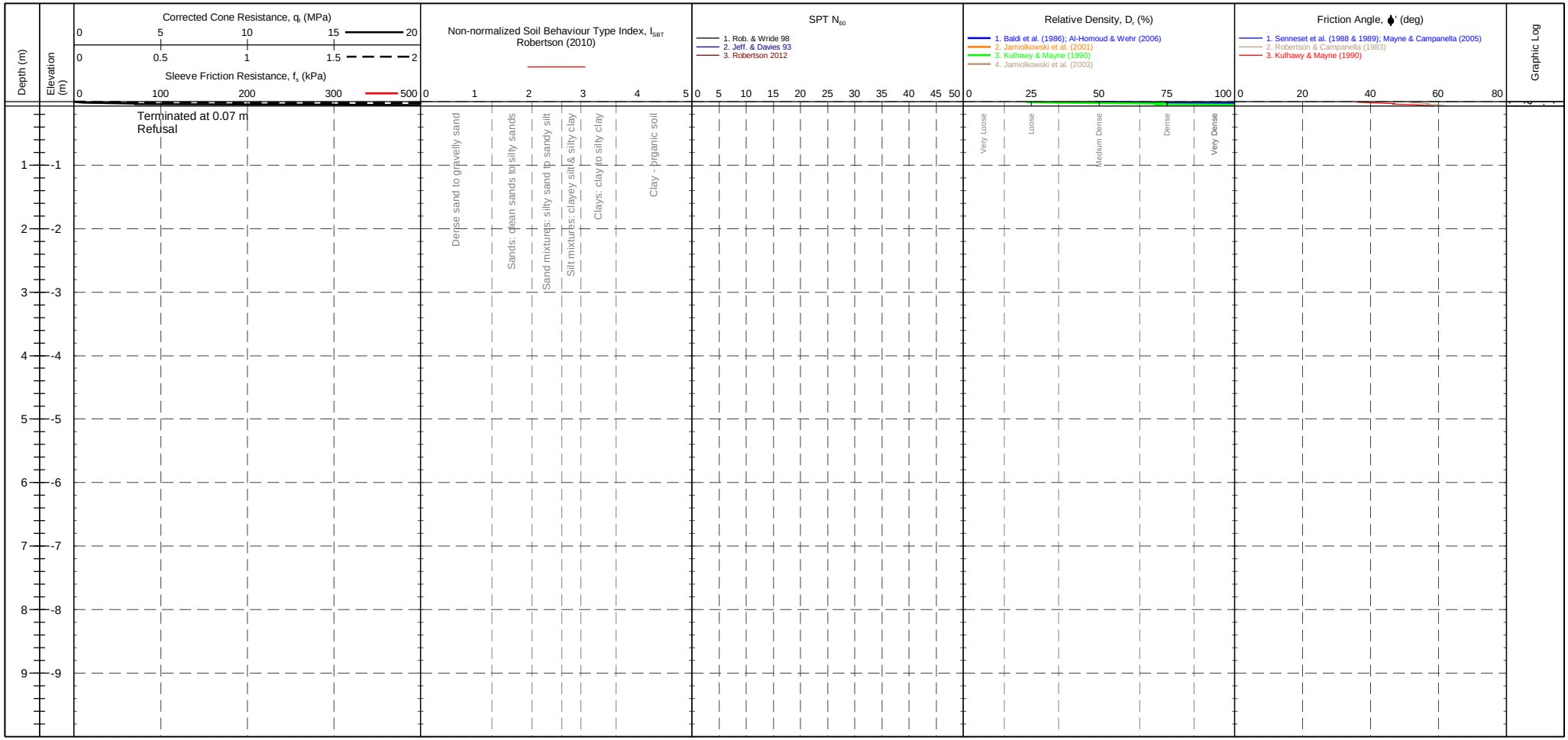
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT108B**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka	
CONE AREA RATIO	: 0.79	OPERATOR	: AC	
FILTER POSITION	: u2	FRICTION REDUCER	: None	
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	243 mV	242 mV	-0.011 MPa
Sleeve	301 mV	304 mV	0.002 kPa
Pore Pressure 2	149 mV	149 mV	0 kPa
X-Y Inclinometer	2618 mV	2573 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

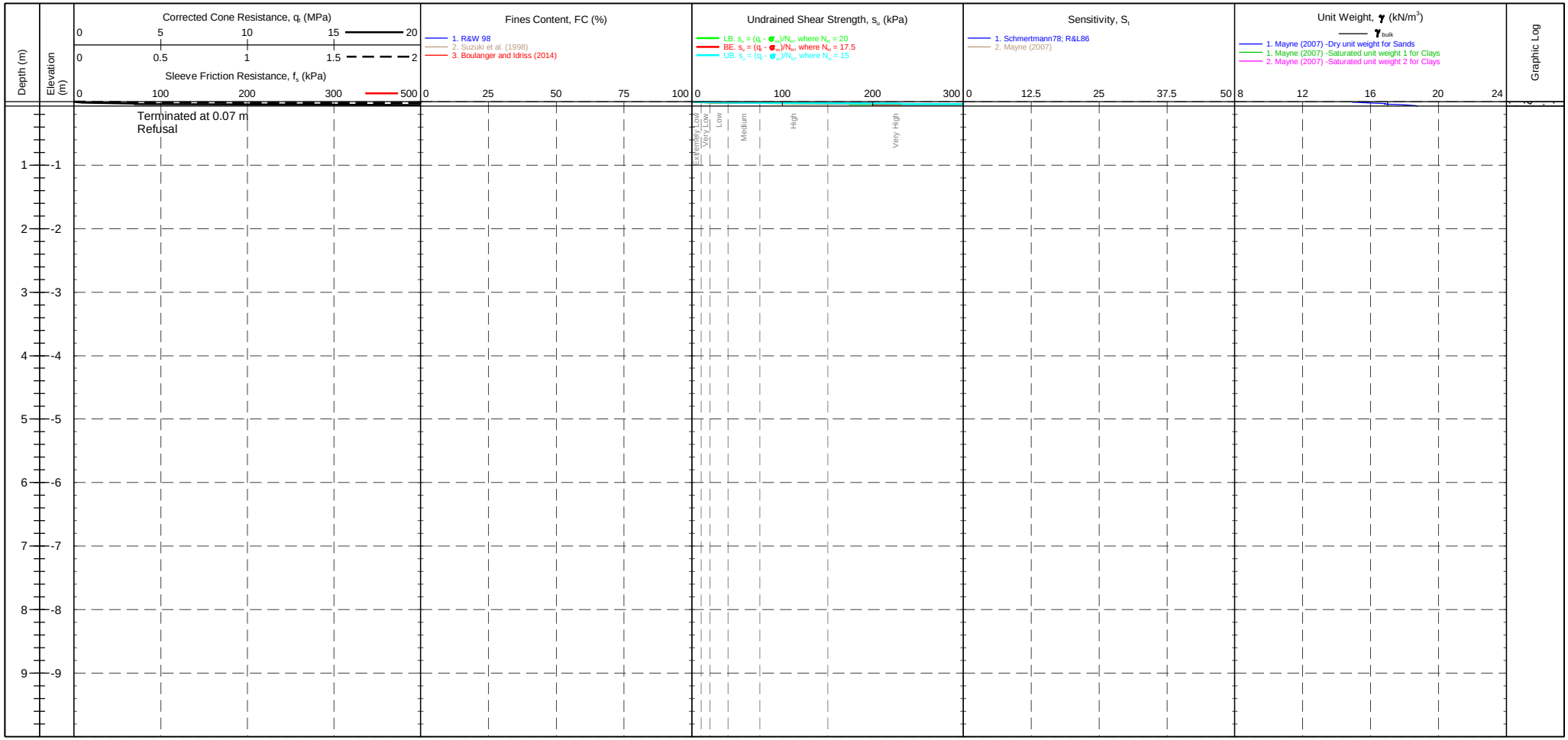
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT108B**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	243 mV	242 mV	-0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	301 mV	304 mV	0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	149 mV	149 mV	0 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2618 mV	2573 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

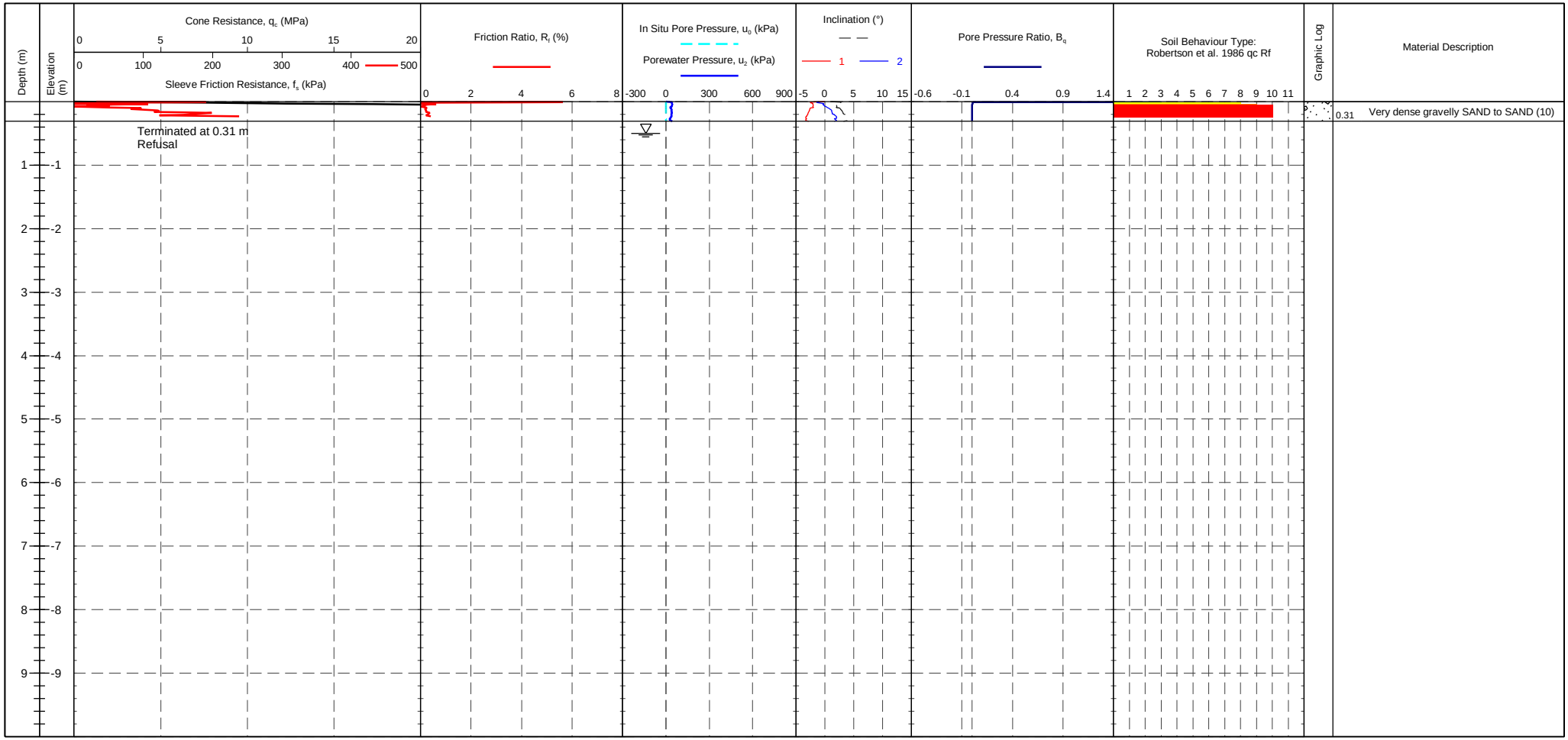
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID **CPT109**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	241 mV	244 mV	0.033 MPa
Sleeve	300 mV	301 mV	0.001 kPa
Pore Pressure 2	168 mV	144 mV	-0.006 kPa
X-Y Inclinometer	2523 mV	2440 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

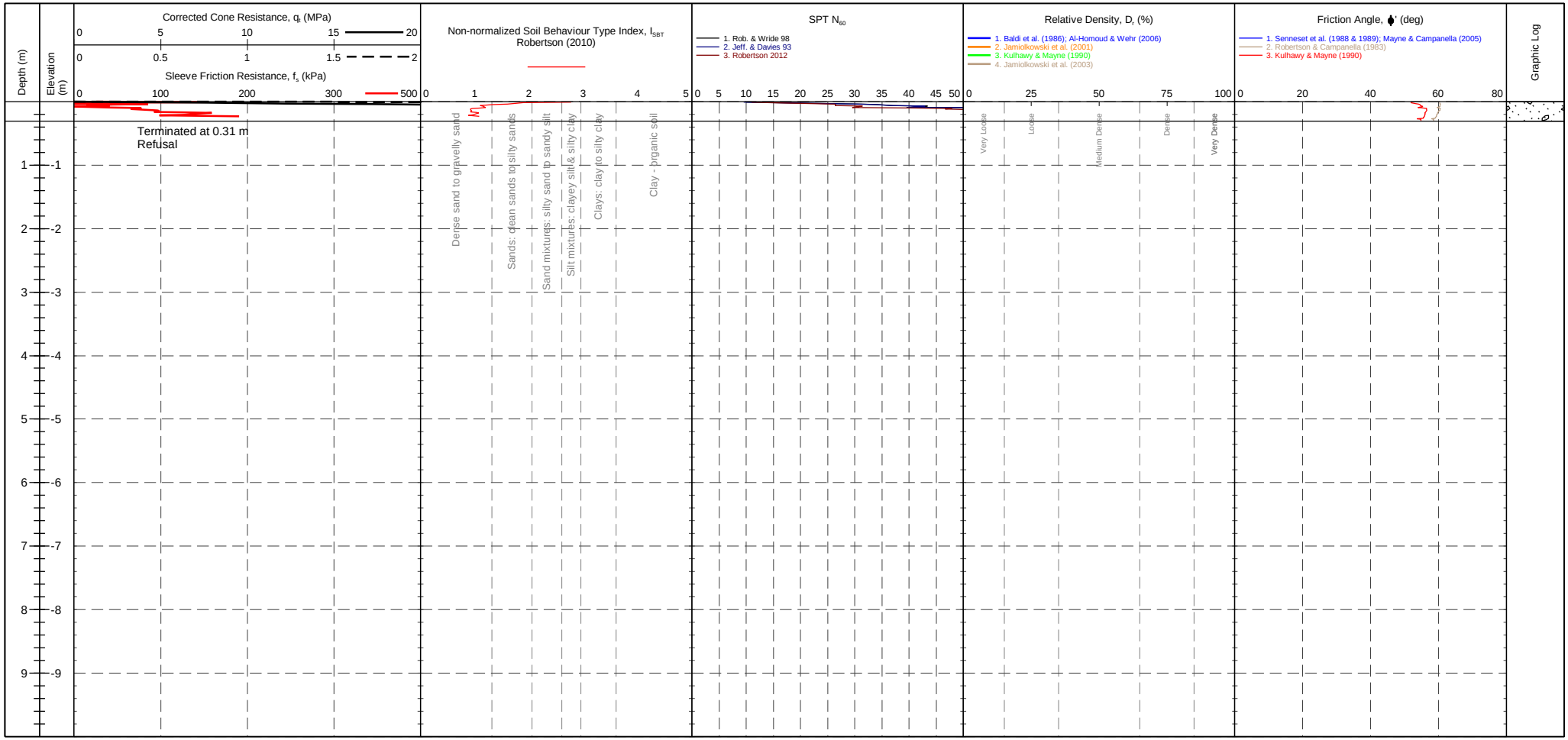
PointID **CPT109**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 05/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	244 mV	0.033 MPa
Sleeve	300 mV	301 mV	0.001 kPa
Pore Pressure 2	168 mV	144 mV	-0.006 kPa
X-Y Inclinometer	2523 mV	2440 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

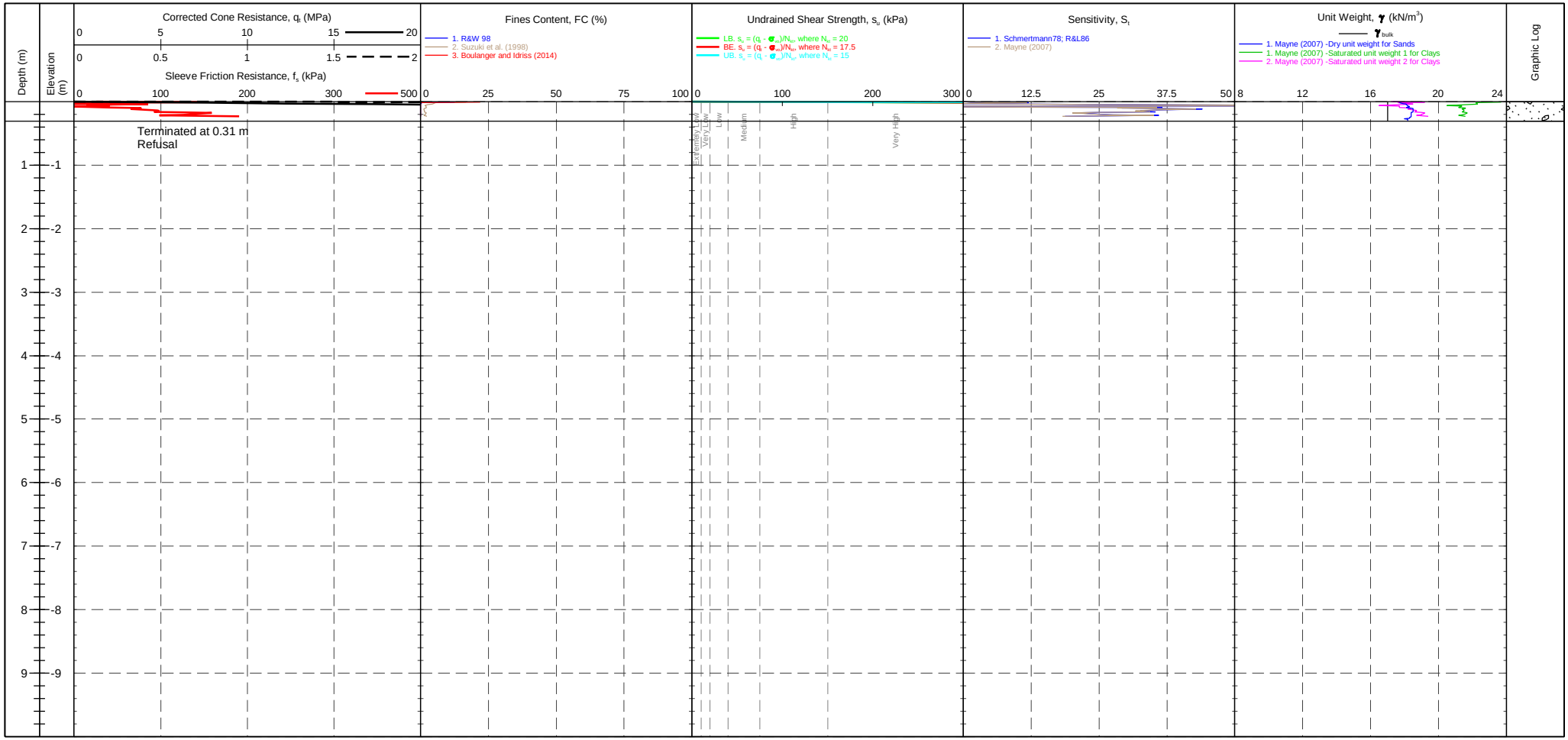
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT109**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



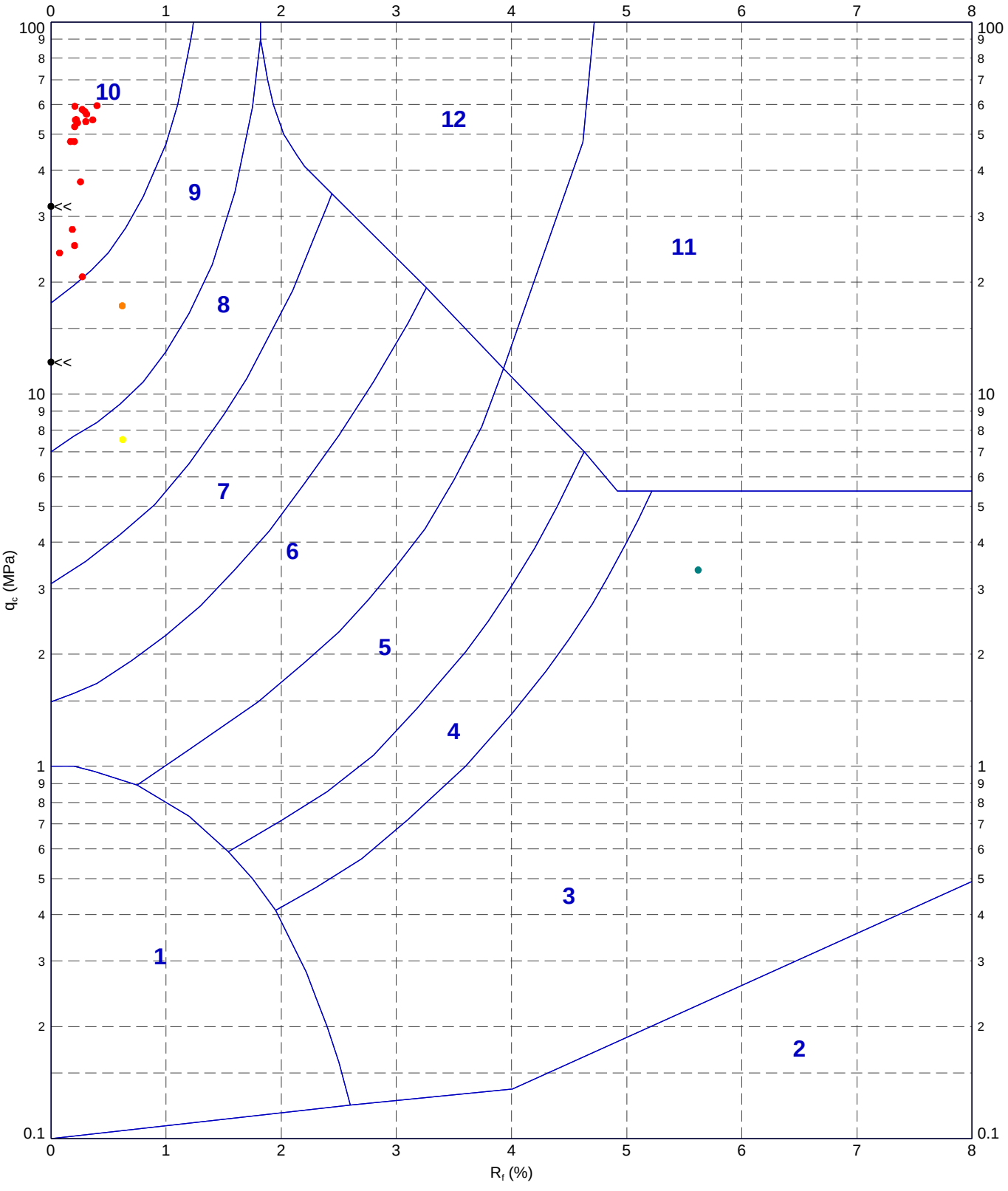
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	244 mV	0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	300 mV	301 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	168 mV	144 mV	-0.006 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2523 mV	2440 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT109

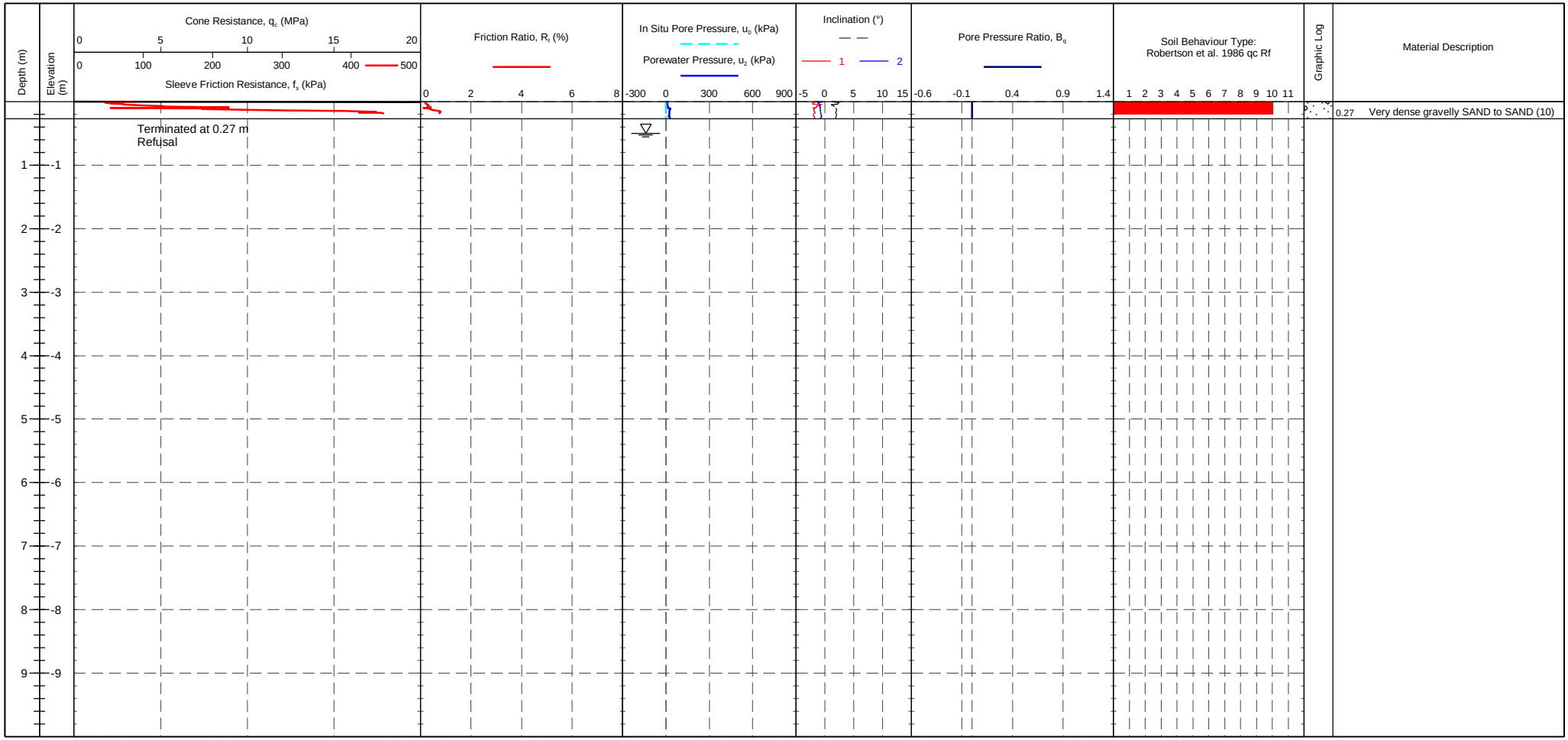
DRAWN		DATE	11/09/2023
CHECKED		DATE	11/09/2023
SCALE	Not To Scale		A4
PROJECT No	1230378	FIGURE No	

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

PointID **CPT109A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	242 mV	248 mV	0.066 MPa
Sleeve	301 mV	304 mV	0.002 kPa
Pore Pressure 2	143 mV	126 mV	-0.004 kPa
X-Y Inclinometer	2398 mV	2390 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

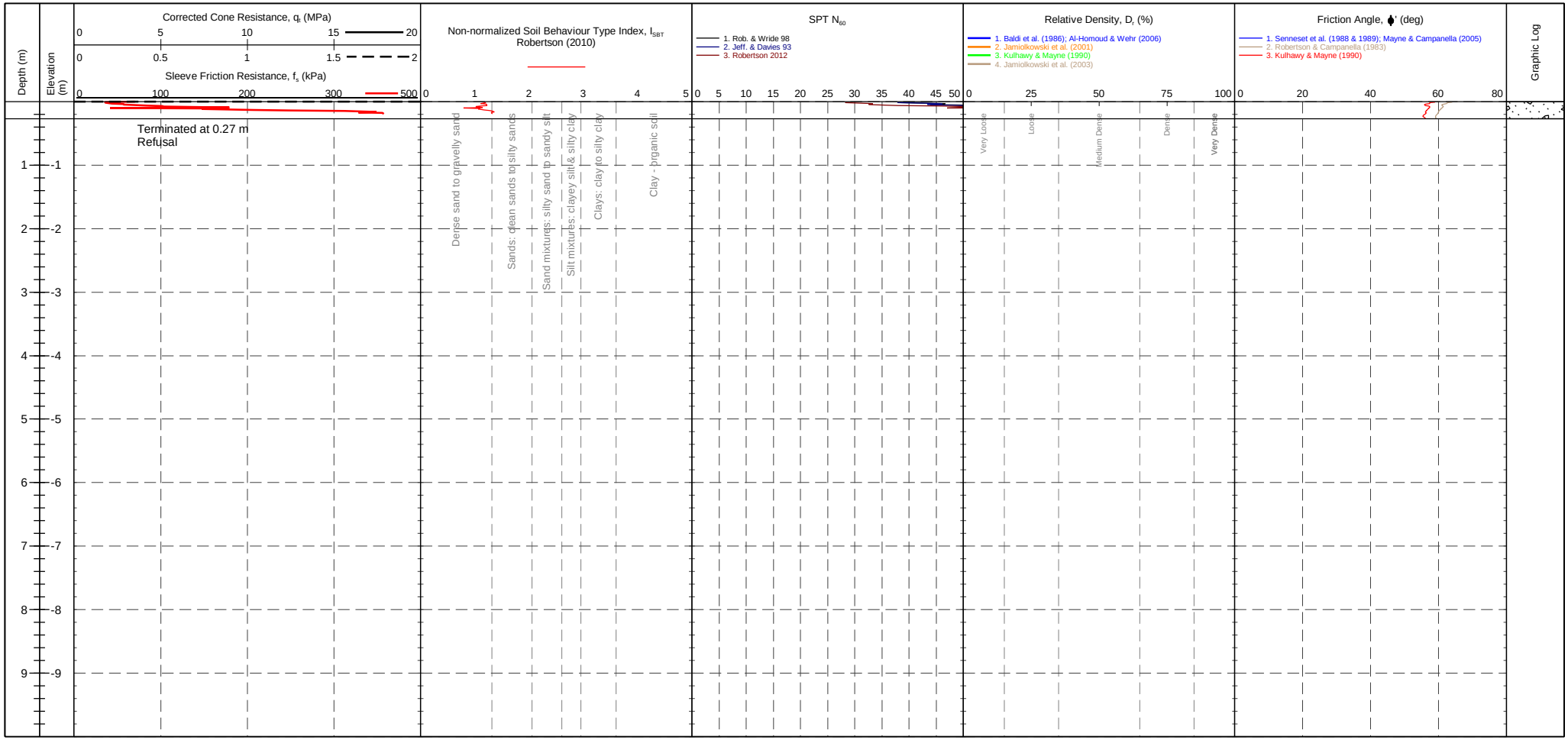
Dissipation Test

CPT LOG 02

Working with:

PointID
CPT109A

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 05/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	242 mV	248 mV	0.066 MPa
Sleeve	301 mV	304 mV	0.002 kPa
Pore Pressure 2	143 mV	126 mV	-0.004 kPa
X-Y Inclinometer	2398 mV	2390 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

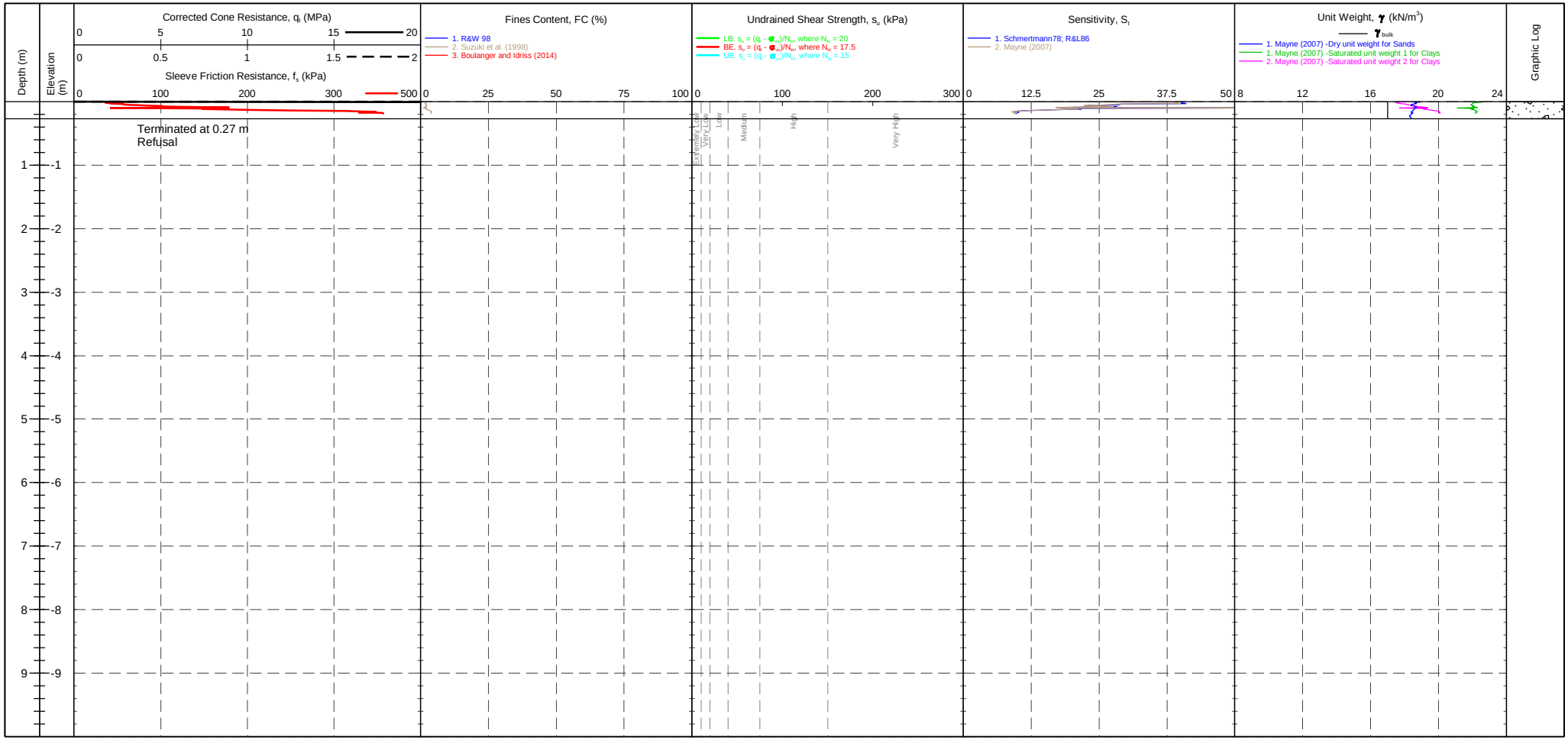
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT109A**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



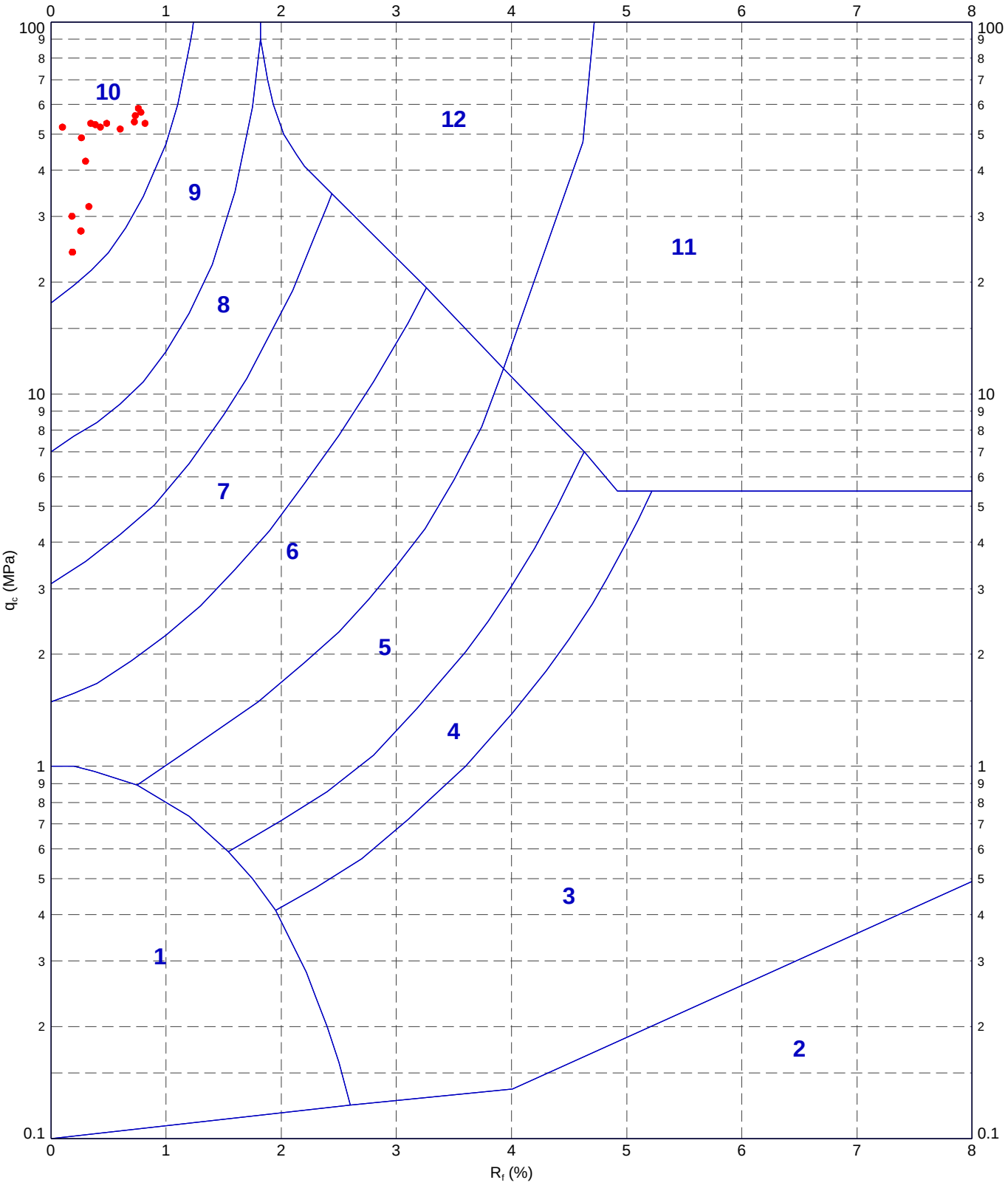
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	242 mV	248 mV	0.066 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	301 mV	304 mV	0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	143 mV	126 mV	-0.004 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2398 mV	2390 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT109A

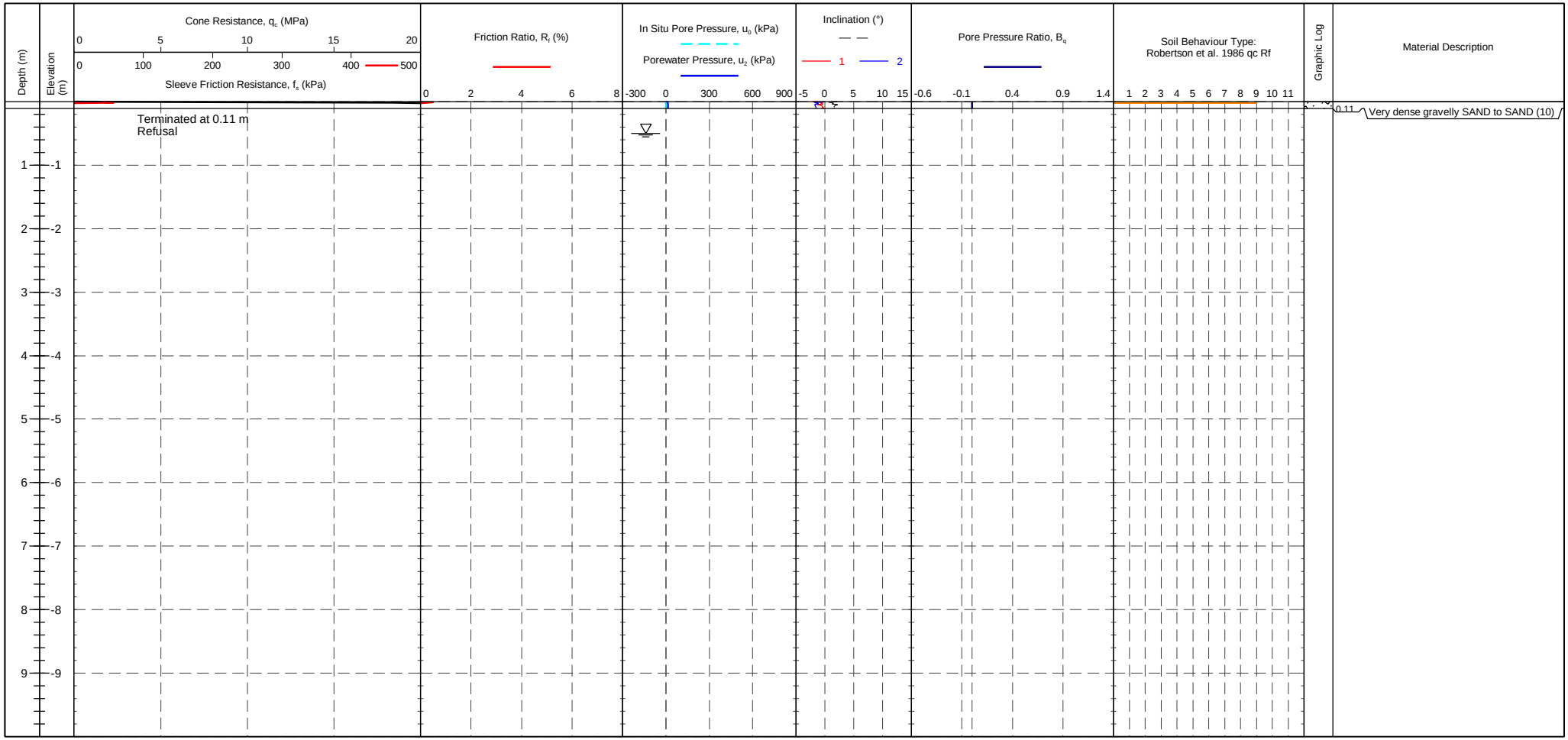
DRAWN	DATE 11/09/2023	
CHECKED	DATE 11/09/2023	
SCALE Not To Scale		A4
PROJECT No 1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT109B**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2	Transducer	Pre	Post / Difference
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka	Tip	241 mV	237 mV / -0.044 MPa
CONE AREA	: 15cm²	OPERATOR	: AC	Sleeve	300 mV	300 mV / 0 kPa
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None	Pore Pressure 2	129 mV	129 mV / 0 kPa
FILTER POSITION	: u2	WEATHER	: Sunny & Hot	X-Y Inclinometer	2325 mV	2519 mV
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.			

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

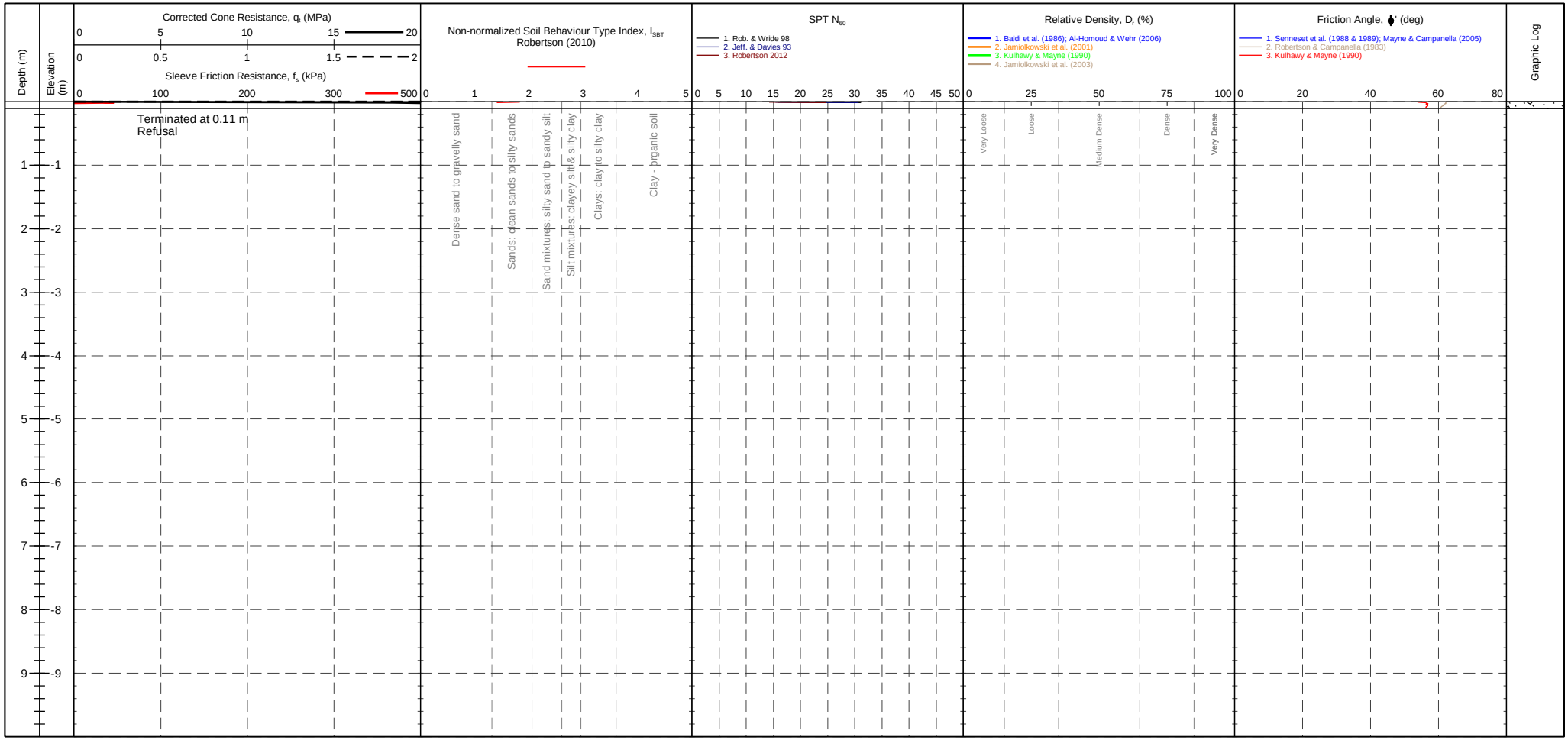
Dissipation Test

CPT LOG 02

Working with: TRC

PointID: **CPT109B**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	237 mV
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	300 mV	300 mV
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	129 mV	129 mV
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2325 mV	2519 mV

Transducer	Difference
Tip	-0.044 MPa
Sleeve	0 kPa
Pore Pressure 2	0 kPa

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

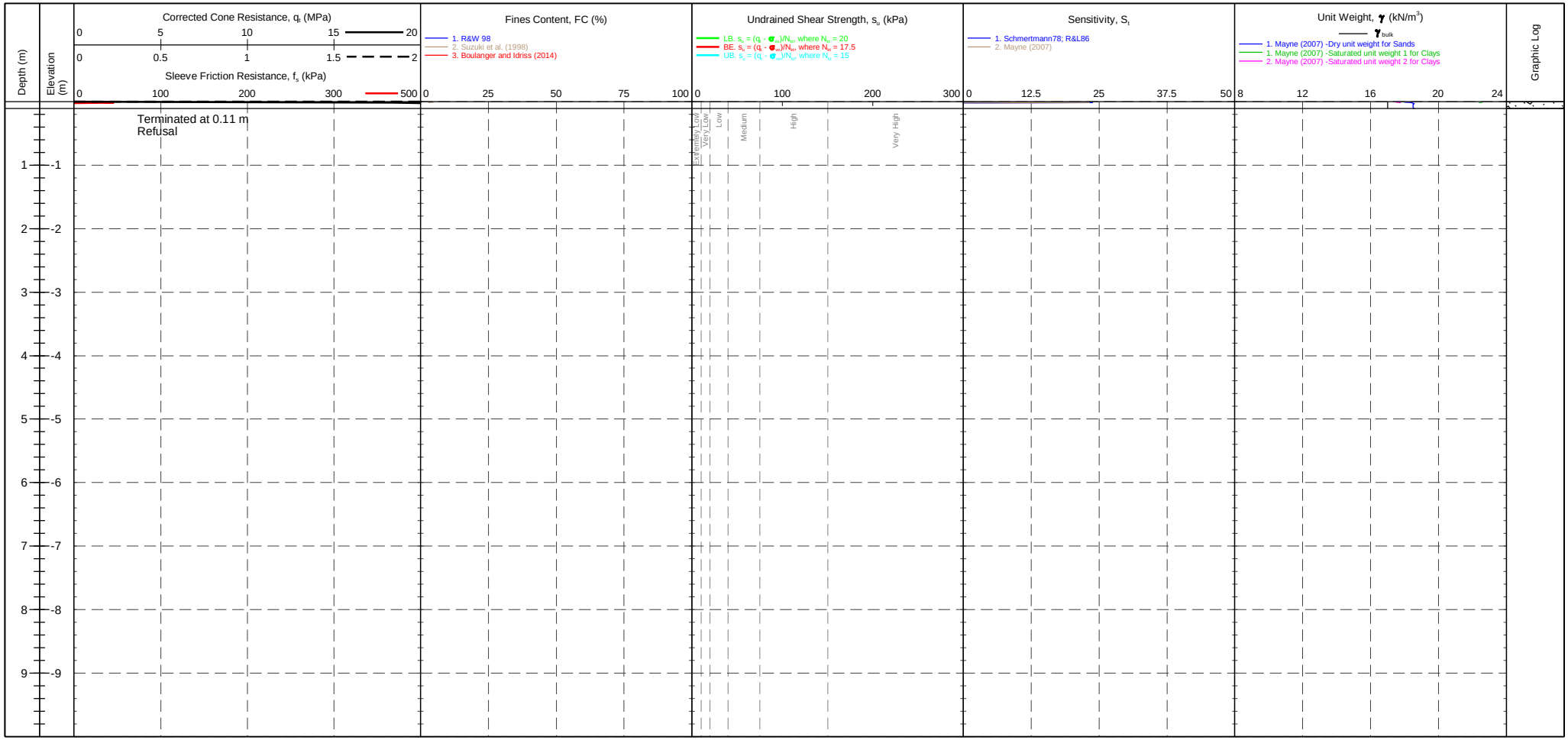
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT109B**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chapman Way	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	237 mV	-0.044 MPa
Sleeve	300 mV	300 mV	0 kPa
Pore Pressure 2	129 mV	129 mV	0 kPa
X-Y Inclinometer	2325 mV	2519 mV	

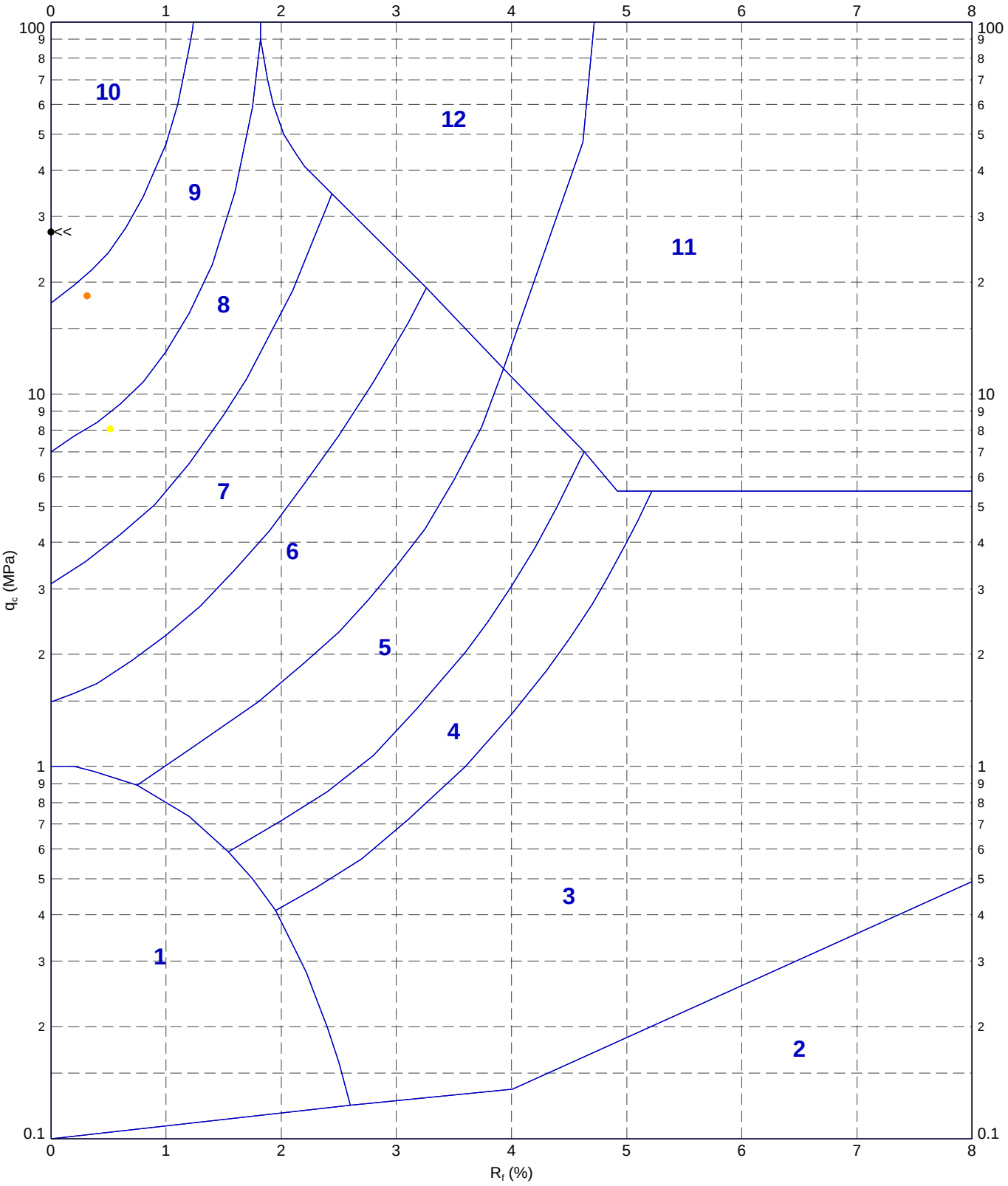
COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)
Extremely low strength	<10
Very low strength	10-20
Low strength	20-40

Term based on measurement	su (kPa)
Medium strength	40-75
High strength	75-150
Very high strength	150-300
Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	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

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT109B

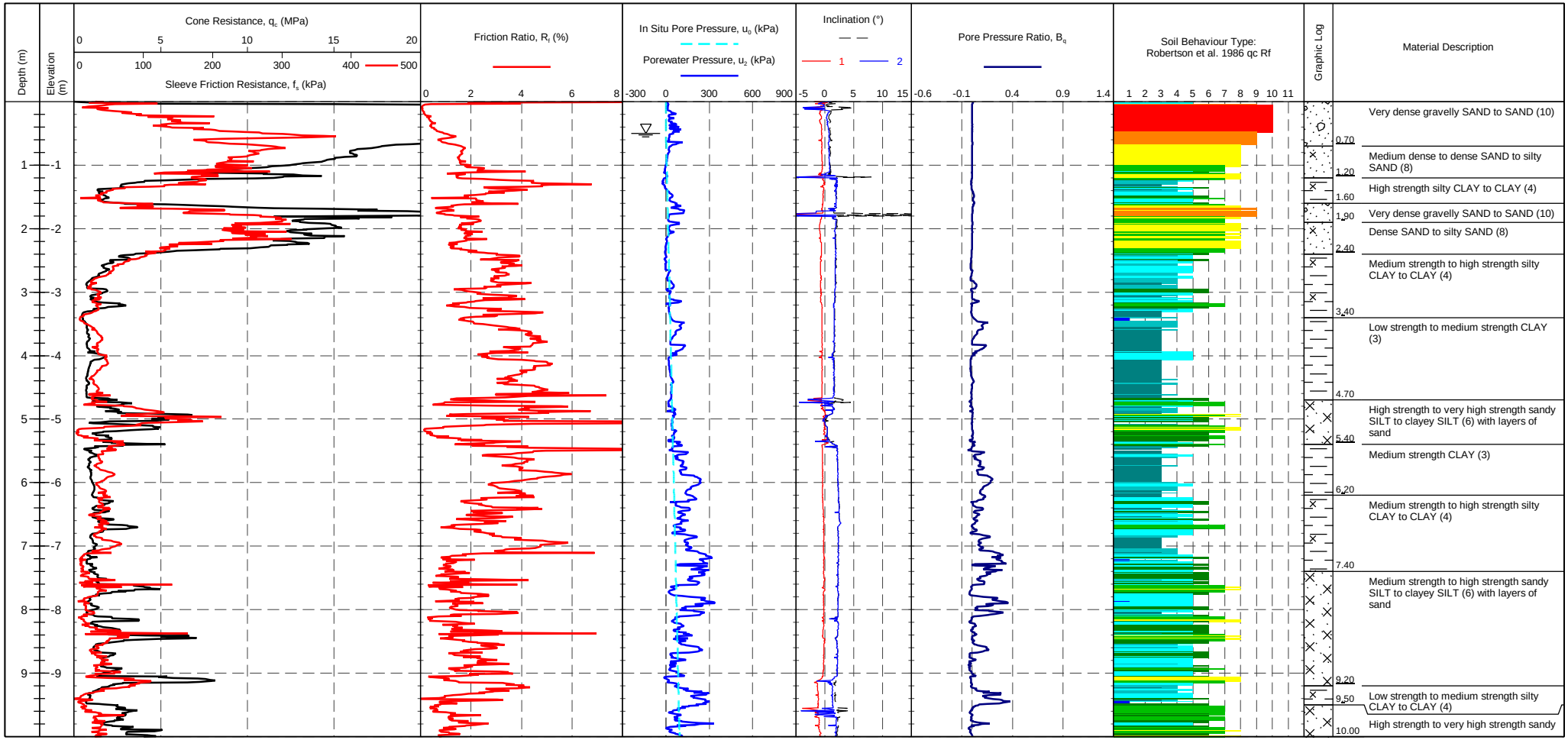
DRAWN		DATE	11/09/2023
CHECKED		DATE	11/09/2023
SCALE	Not To Scale		A4
PROJECT No	1230378	FIGURE No	

CPT LOG 01

Working with: TRC

PointID: **CPT110**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 3
PROJECT : Chapman Way	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm^2	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 01

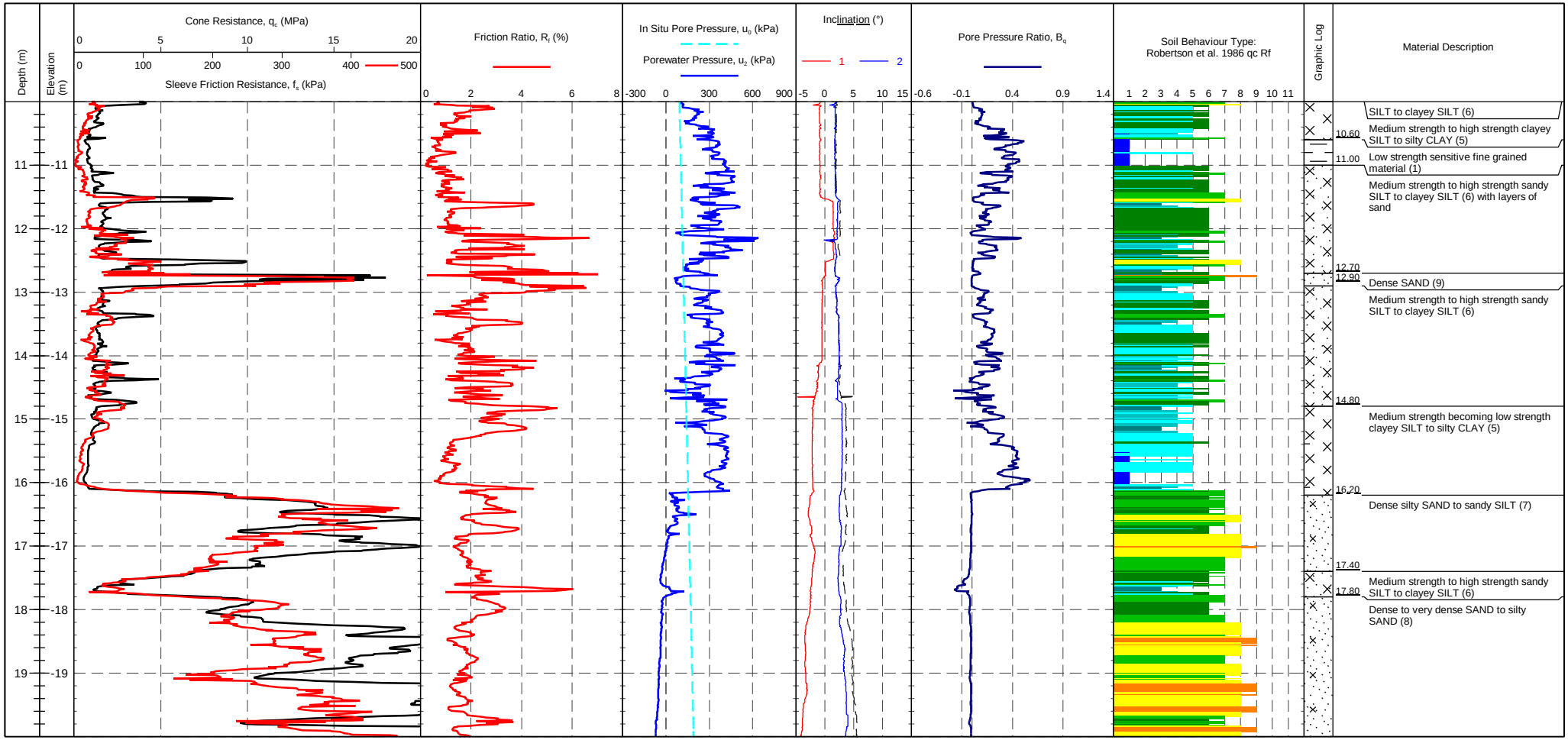
PointID **CPT110**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Target depth

Remark:
Test completed at target depth.

SHEET : 2 OF 3
STATUS : Final
TEST DATE : 05/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka
CONE AREA	: 15cm^2	OPERATOR	: AC
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Hot
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

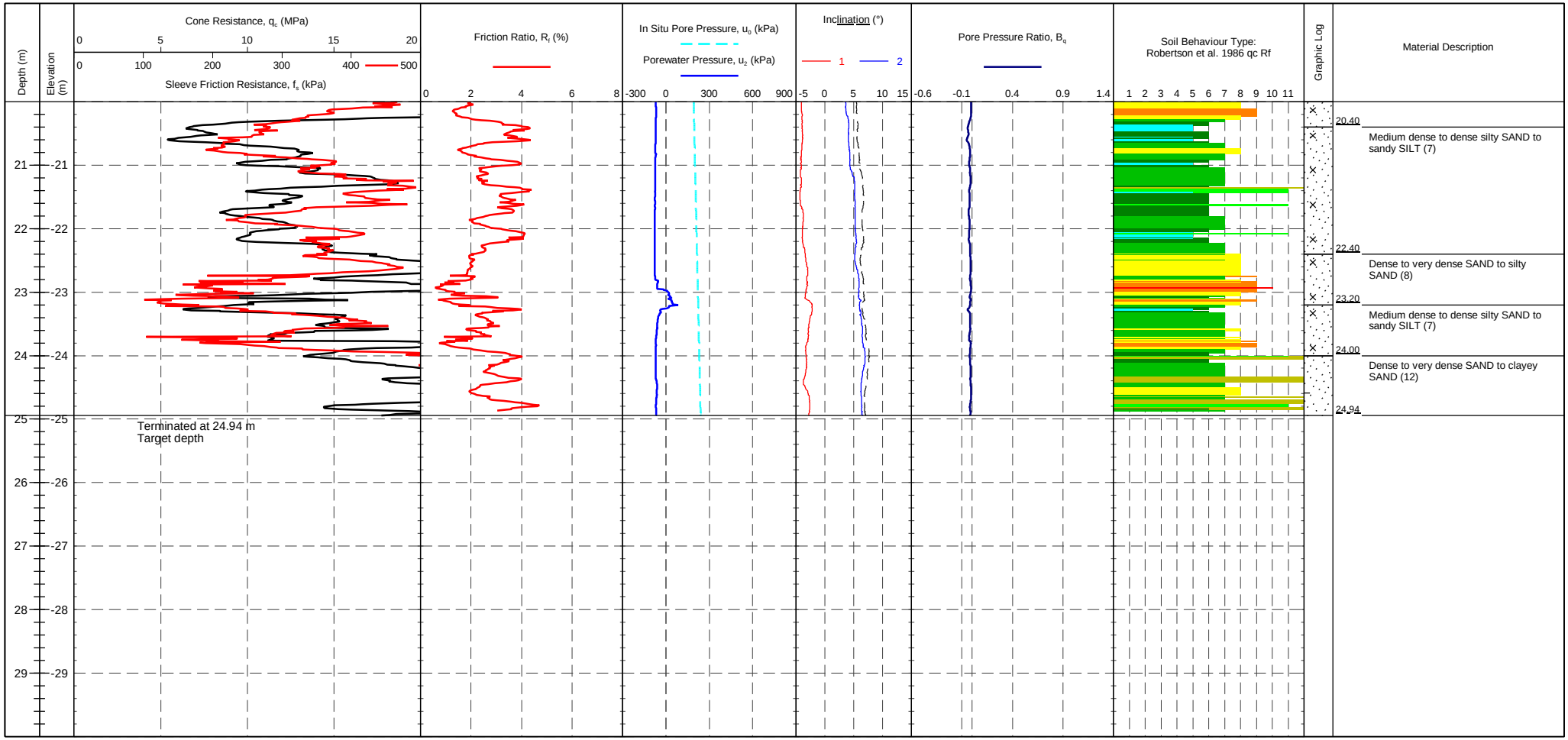
Dissipation Test

CPT LOG 01

Working with: TRC

PointID: **CPT110**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 3 OF 3
PROJECT : Chapman Way	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 007 - Morooka		
CONE AREA	: 15cm²	OPERATOR	: AC		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Hot		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

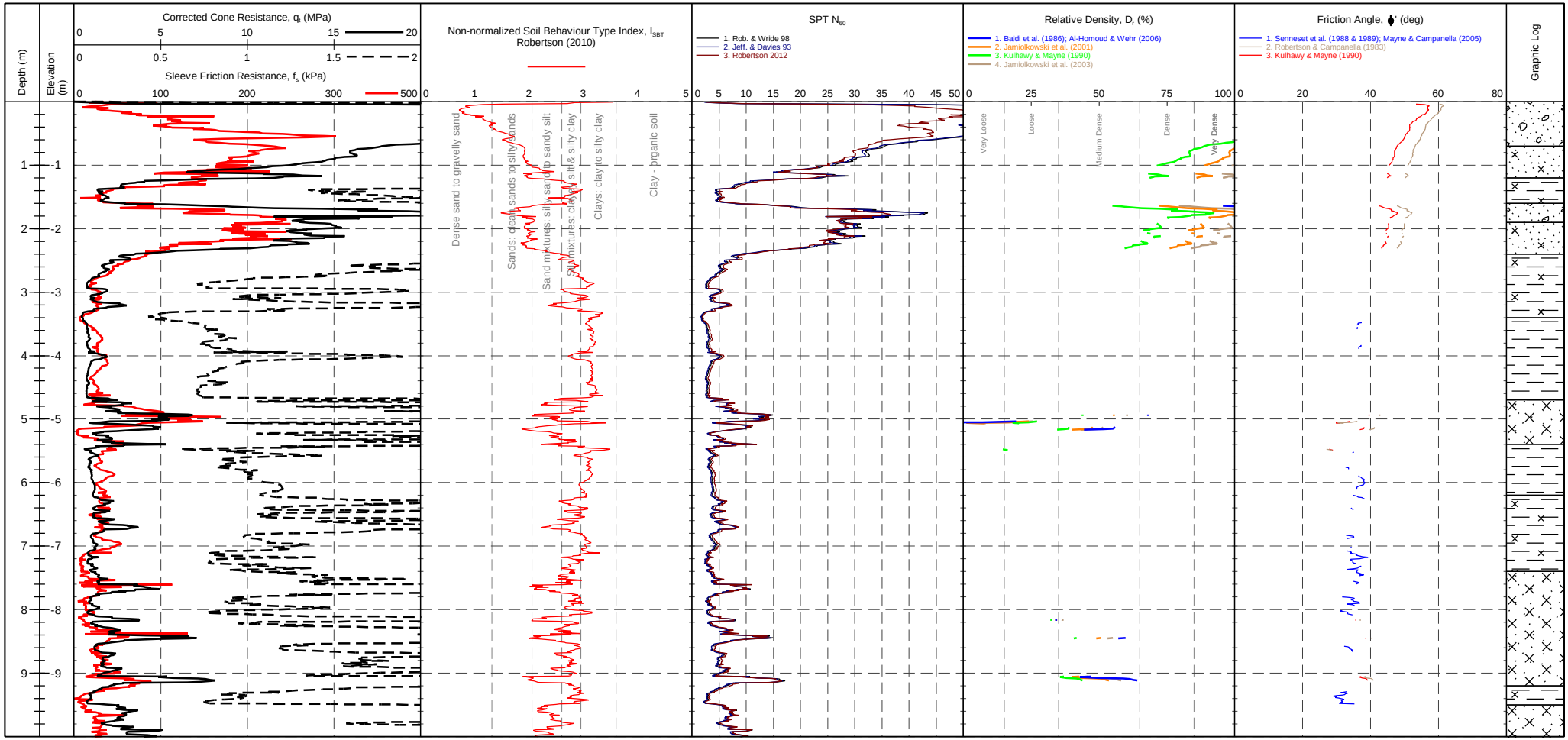
PointID **CPT110**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Target depth

Remark:
Test completed at target depth.

SHEET : 1 OF 3
STATUS : Final
TEST DATE : 05/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka	
CONE AREA RATIO	: 0.79	OPERATOR	: AC	
FILTER POSITION	: u2	FRICTION REDUCER	: None	
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

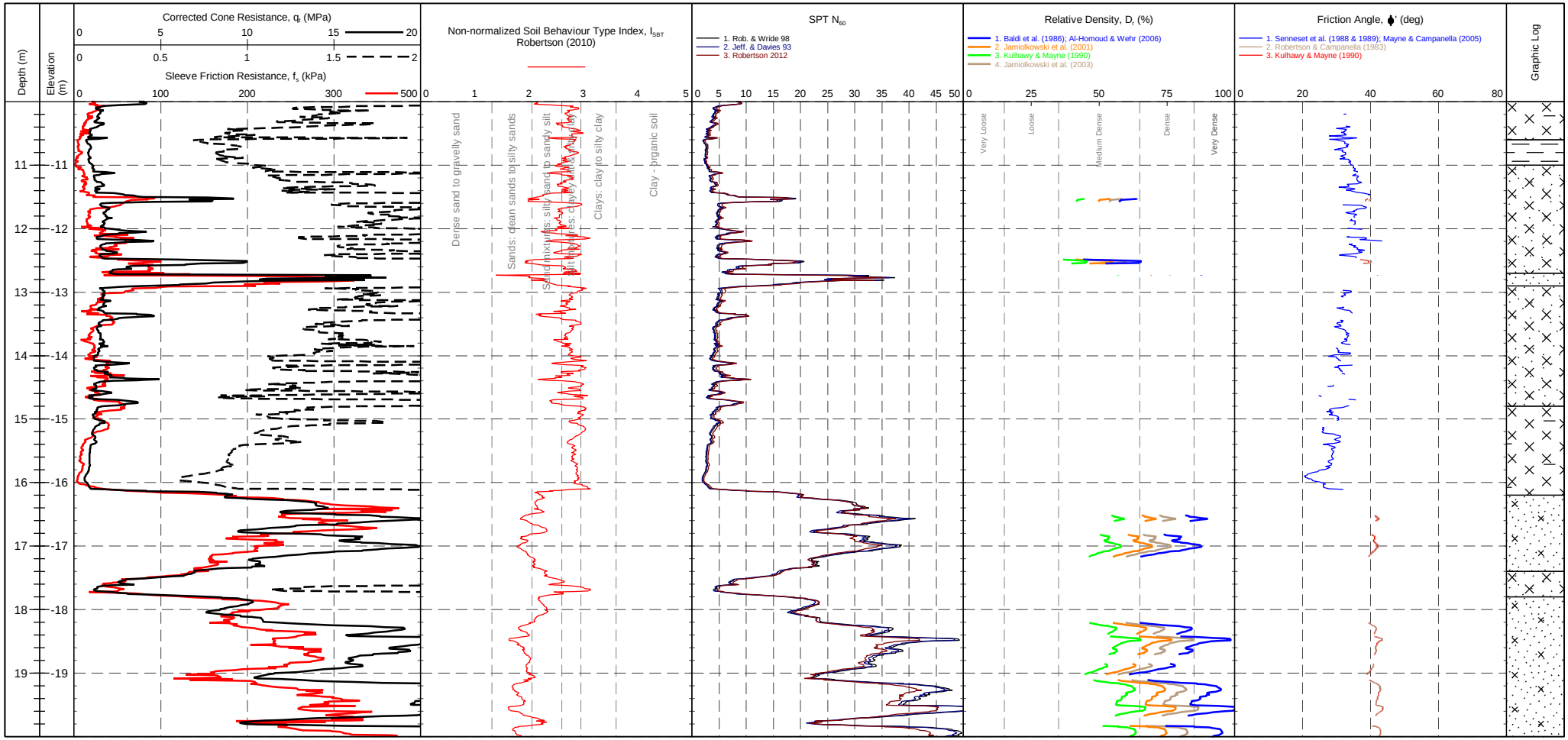
PointID **CPT110**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Target depth

Remark:
Test completed at target depth.

SHEET : 2 OF 3
STATUS : Final
TEST DATE : 05/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka
CONE AREA RATIO	: 0.79	OPERATOR	: AC
FILTER POSITION	: u2	FRICTION REDUCER	: None
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

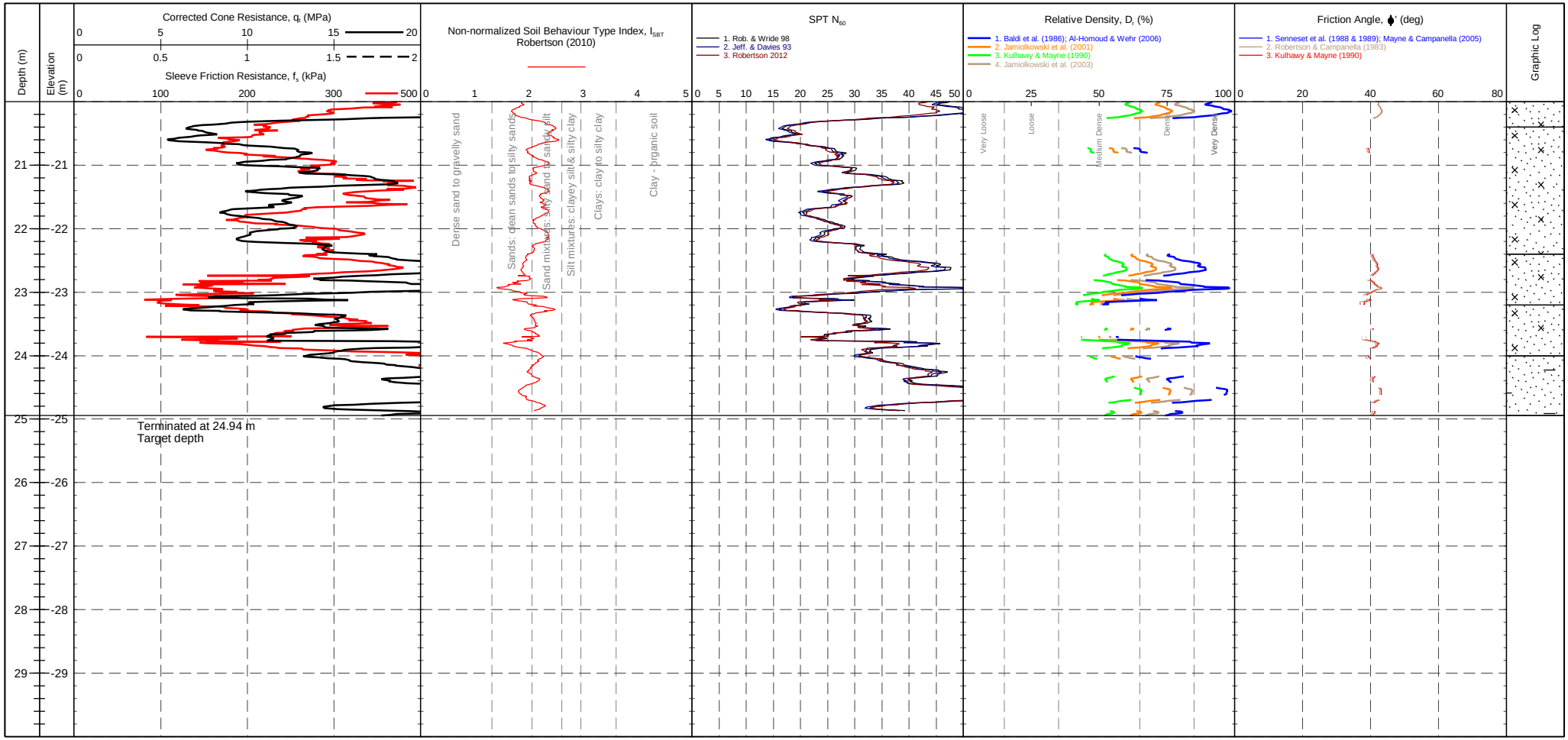
Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 02

PointID **CPT110**

CLIENT : TRC PROJECT : Chapman Way LOCATION : Tunbridge Wells PROJECT No. : 1230378	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Target depth	Remark: Test completed at target depth.	SHEET : 3 OF 3 STATUS : Final TEST DATE : 05/09/2023 PLOT DATE : 11/09/2023 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

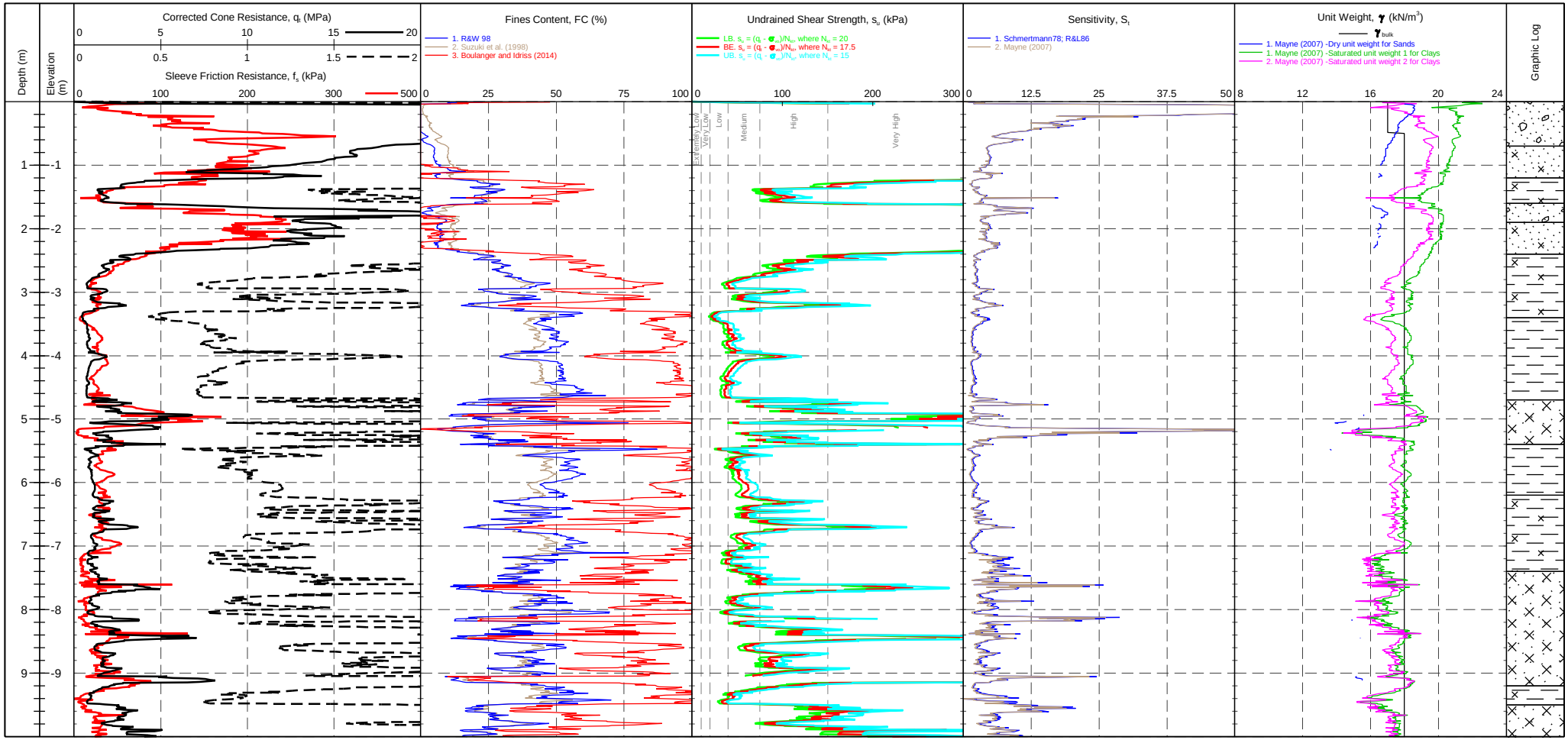
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT110**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 1 OF 3
PROJECT : Chapman Way	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	241 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	300 mV	299 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	168 mV	187 mV	0.004 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2330 mV	2492 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

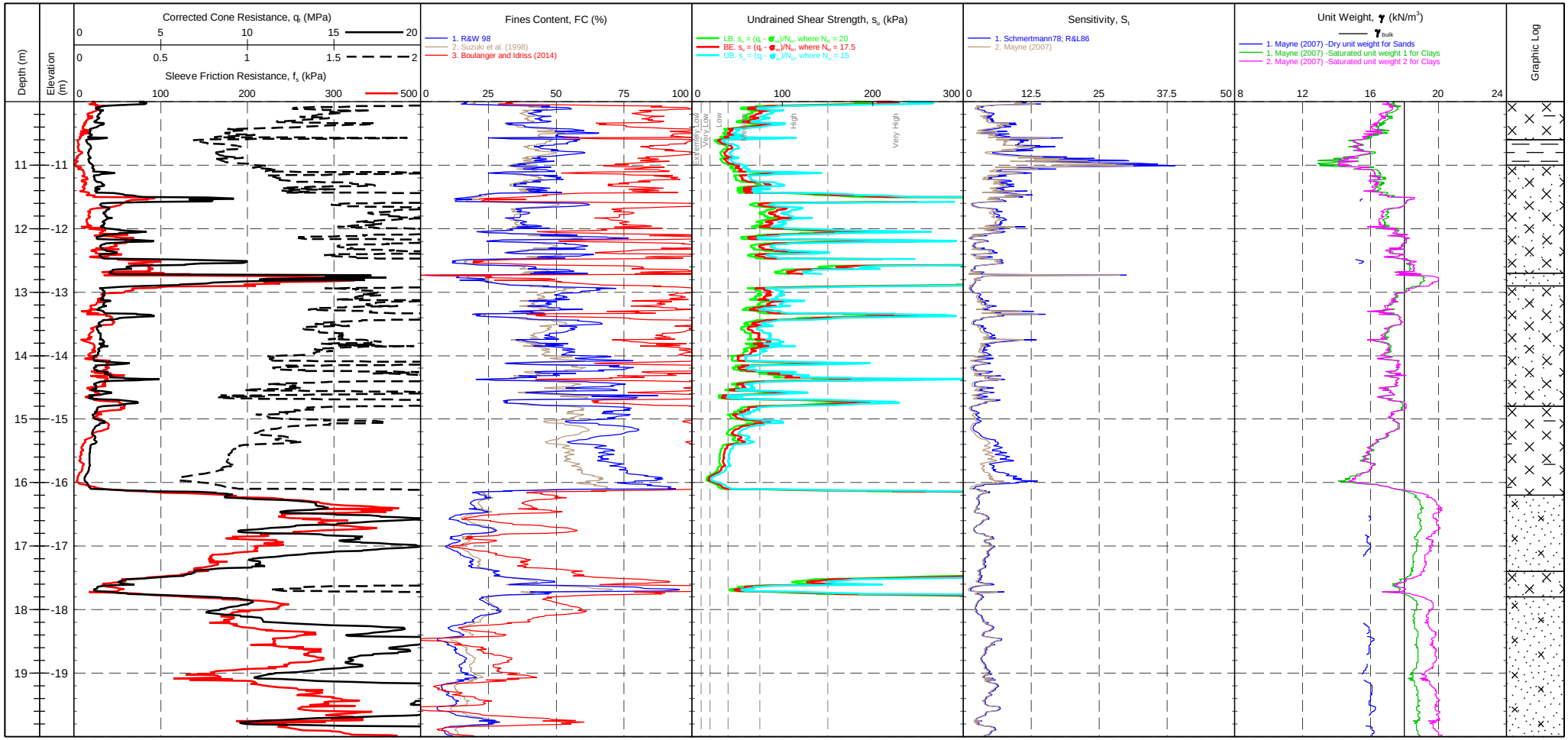
Dissipation Test

CPT LOG 03

Working with: TRC

PointID: **CPT110**

CLIENT : TRC	EASTING : 0.000 m	Remark:	SHEET : 2 OF 3
PROJECT : Chapman Way	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Tunbridge Wells	ELEVATION : 0.000 m OD		TEST DATE : 05/09/2023
PROJECT No. : 1230378	CHECKED BY : DW		PLOT DATE : 11/09/2023
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka	Tip	241 mV	241 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: AC	Sleeve	300 mV	299 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	168 mV	187 mV	0.004 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot	X-Y Inclinometer	2330 mV	2492 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: TRC

CPT LOG 03

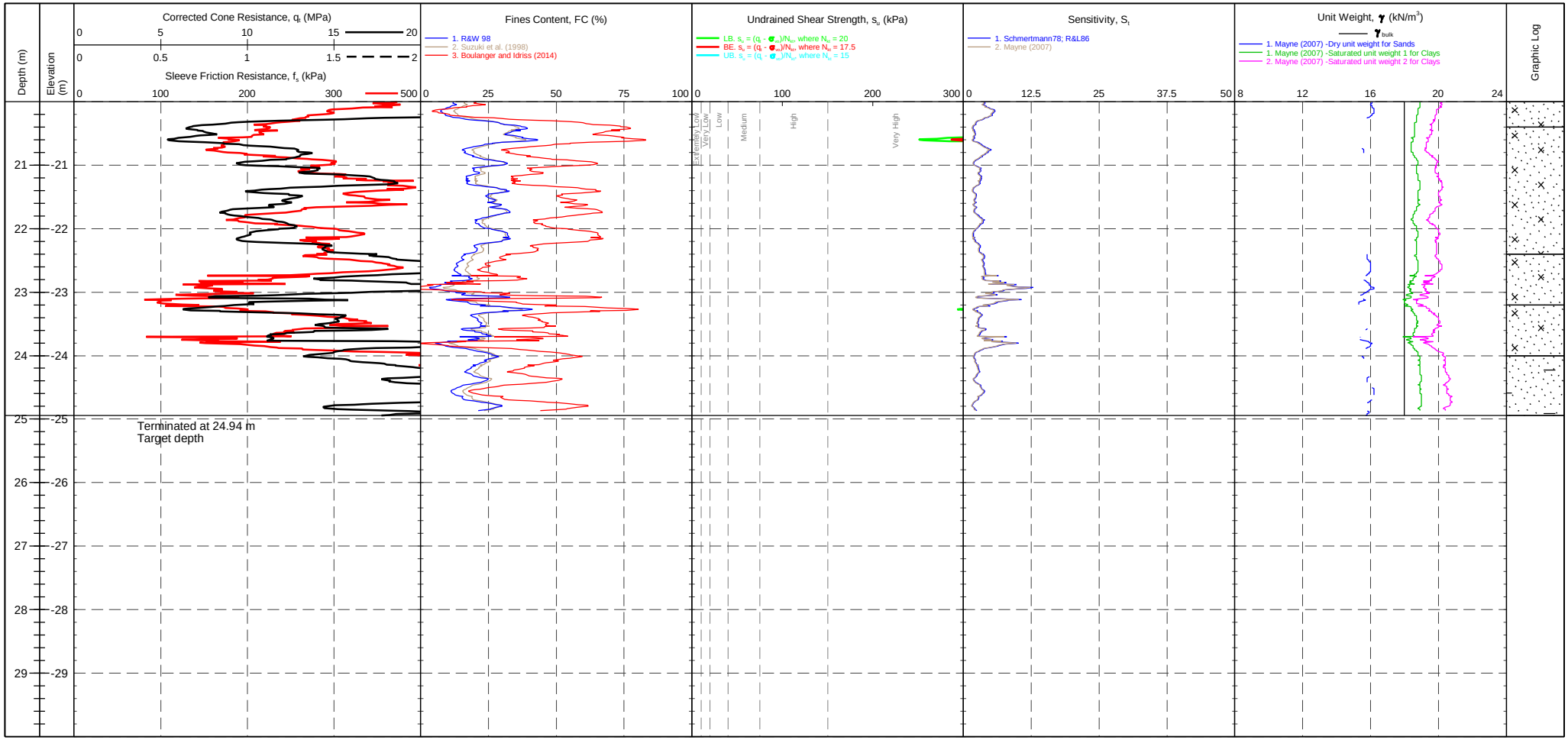
PointID **CPT110**

CLIENT : TRC
PROJECT : Chapman Way
LOCATION : Tunbridge Wells
PROJECT No. : 1230378

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Target depth

Remark:
Test completed at target depth.

SHEET : 3 OF 3
STATUS : Final
TEST DATE : 05/09/2023
PLOT DATE : 11/09/2023
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 007 - Morooka		
CONE AREA RATIO	: 0.79	OPERATOR	: AC		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Hot		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	241 mV	241 mV	0 MPa
Sleeve	300 mV	299 mV	-0.001 kPa
Pore Pressure 2	168 mV	187 mV	0.004 kPa
X-Y Inclinometer	2330 mV	2492 mV	

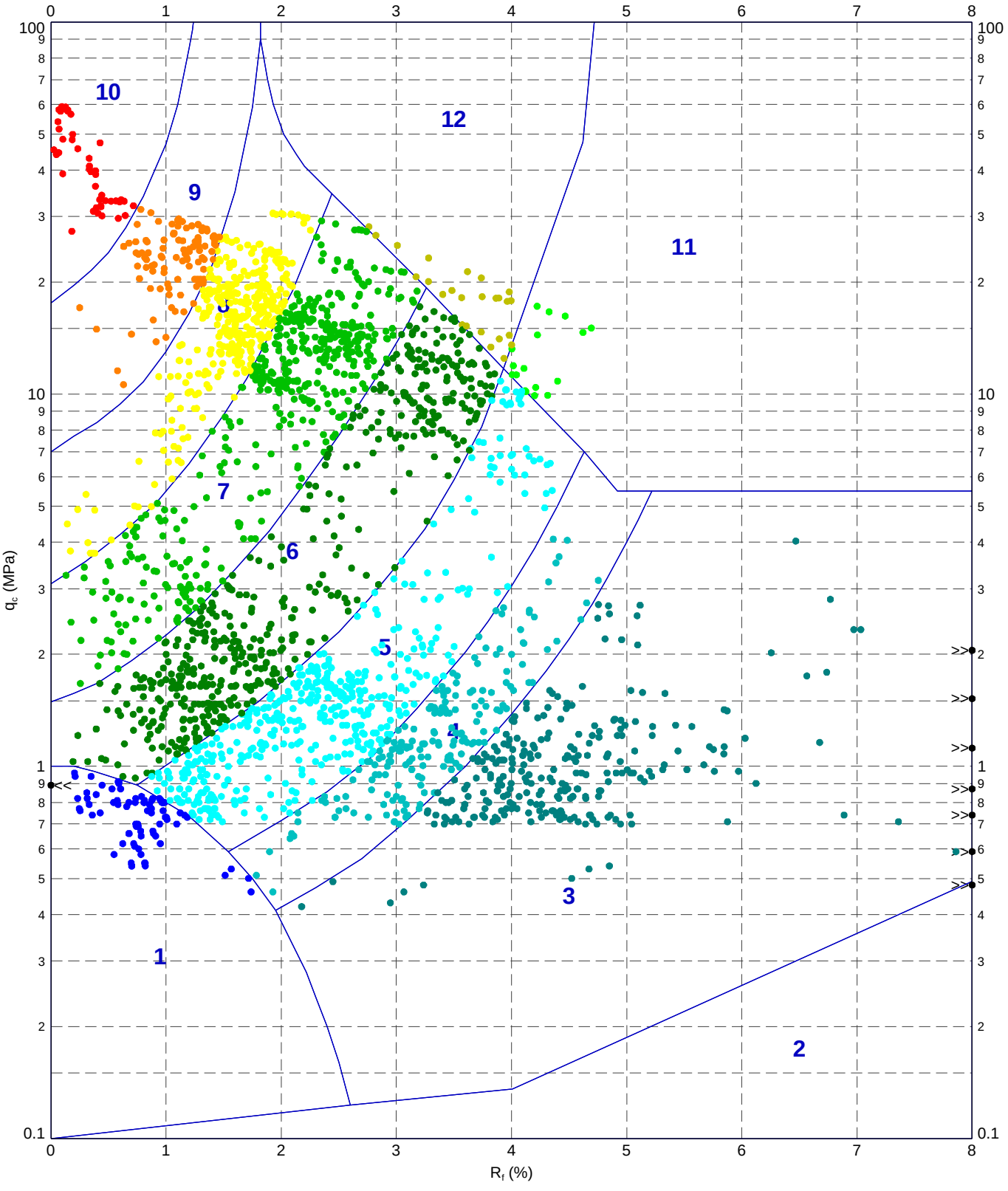
COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)
Extremely low strength	<10
Very low strength	10-20
Low strength	20-40

Term based on measurement	su (kPa)
Medium strength	40-75
High strength	75-150
Very high strength	150-300
Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

TRC
Tunbridge Wells
Chapman Way
Robertson et al. 1986 q_c vs. R_f - CPT110

DRAWN	DATE 11/09/2023
CHECKED	DATE 11/09/2023
SCALE Not To Scale	A4
PROJECT No 1230378	FIGURE No

IN SITU SITE INVESTIGATION

Unit 23 Hastings Innovation Centre,
Highfield Drive
St. Leonards on Sea, East Sussex,
TN38 9UH, U.K.

Company No.: 6339499
VAT No.: 922 3561 41

Annex E: Laboratory Geotechnical Data

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LABORATORY TEST REPORT

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Senior Technician

SUMMARY OF GEOTECHNICAL TESTING

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CHAPMAN WAY, TUNBRIDGE WELLS
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SUMMARY OF GEOTECHNICAL TESTING

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SUMMARY OF GEOTECHNICAL TESTING

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CHAPMAN WAY, TUNBRIDGE WELLS
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SUMMARY OF CHEMICAL TESTS ON SOIL

Location	Depth m	Sample Ref	Sample Type	pH Value	Total acid soluble sulphate (%)	Water soluble sulphate (water/soil extract) g/l	Total sulphur %	Water soluble chloride g/l	Water soluble nitrate g/l	Magnesium g/l	Organic content %	Mass Loss on Ignition %	Carbonate content %
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Tested in accordance with [illegible]

Checked and Approved [illegible]

[redacted]

[illegible] Senior Technician

Project Number: GEO / 38882

Project Name: CHAPMAN WAY, TUNBRIDGE WELLS 561063

PARTICLE SIZE DISTRIBUTION

Location [illegible]	R[illegible]
Depth (m) [illegible]	[illegible]
Sample type [illegible]	[illegible]

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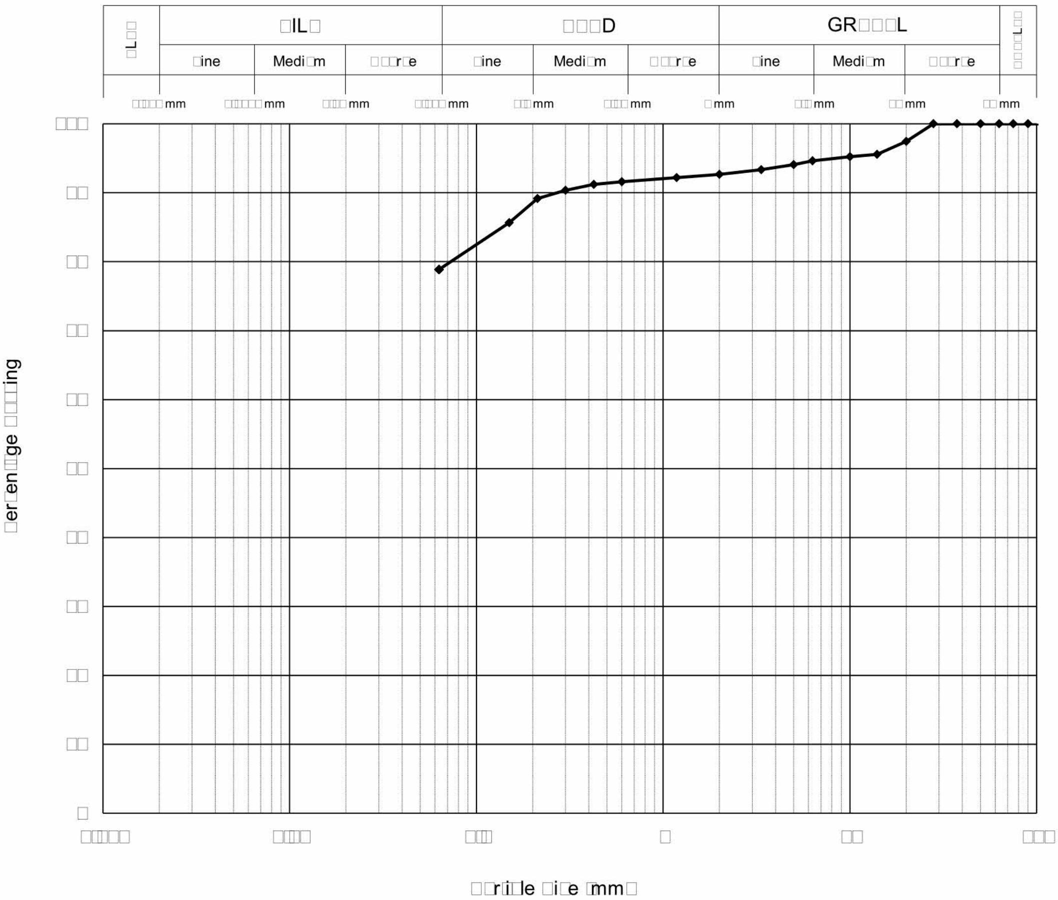

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CHAPMAN WAY, TUNBRIDGE WELLS
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GEOLABS
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PARTICLE SIZE DISTRIBUTION

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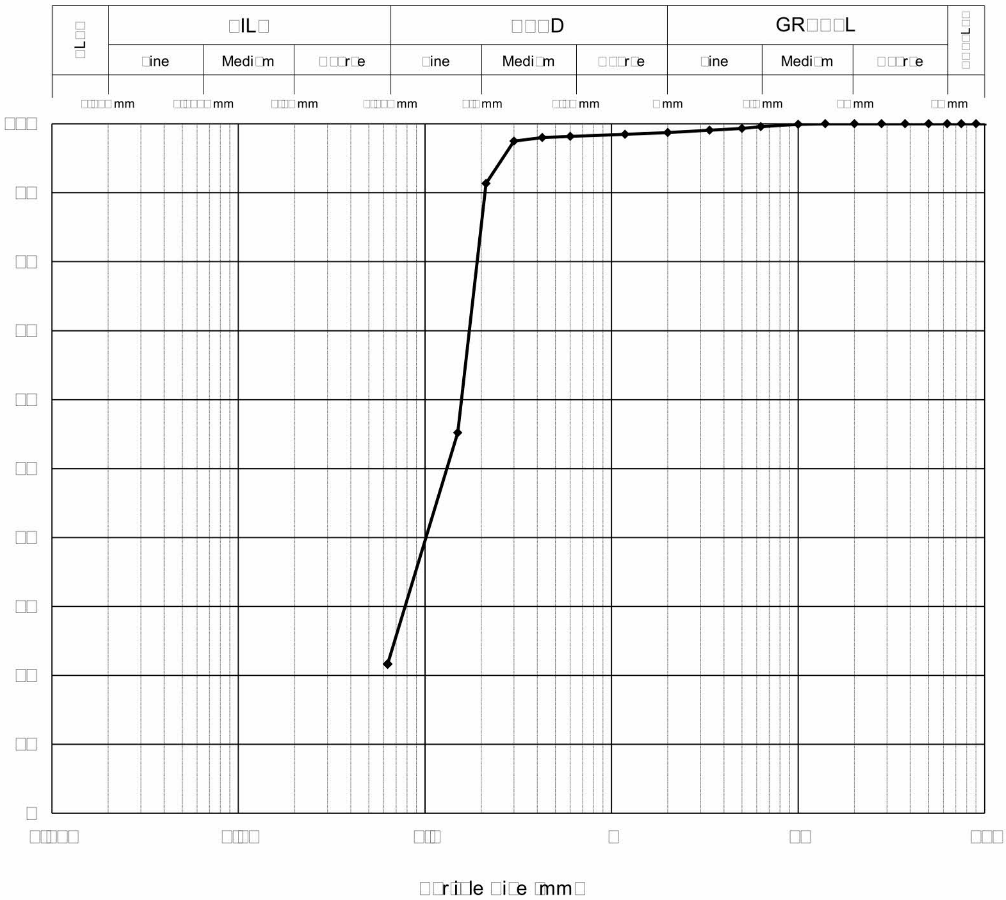

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CHAPMAN WAY, TUNBRIDGE WELLS
561063

PARTICLE SIZE DISTRIBUTION

Location [illegible]
Depth (m) [illegible]
Sample Type [illegible]

Description

Grey sandy gravelly silty CLAY

Sieve	
Size	% Passing
[illegible] mm	[illegible]
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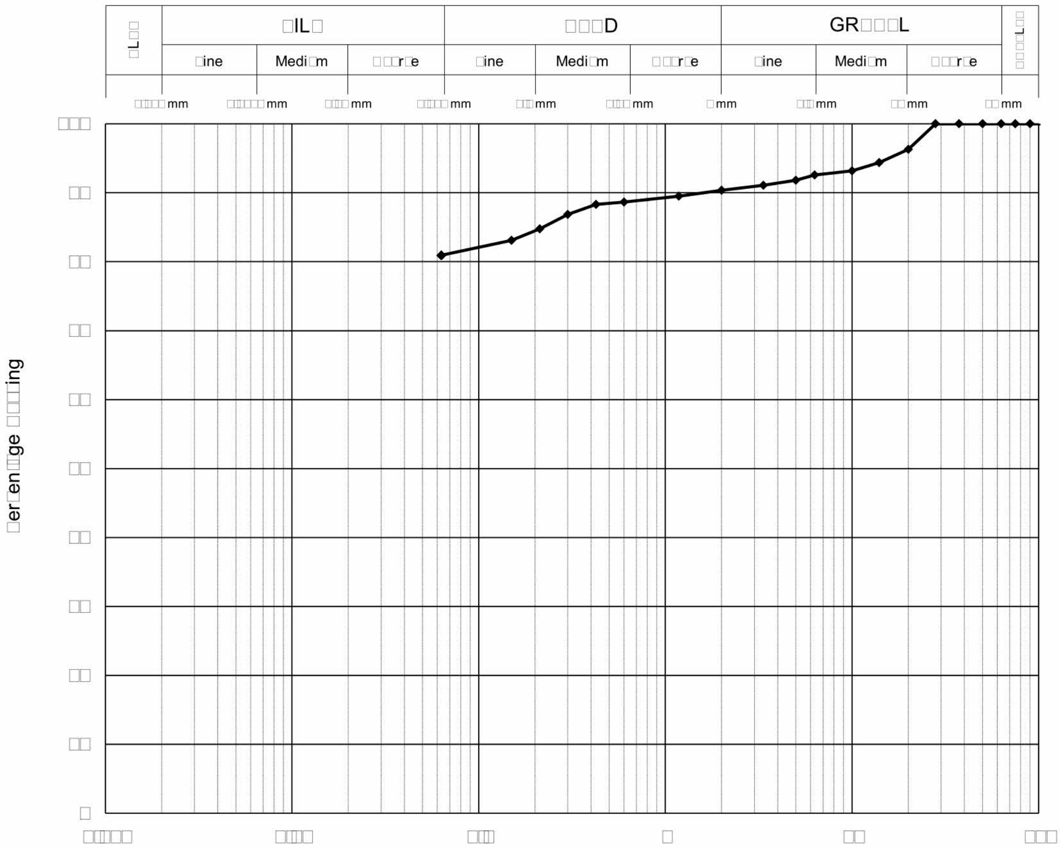

Particle Size (mm)

Particle Proportions	
Cobbles	[illegible]
Gravel	[illegible]
Sand	[illegible]
Silt/Clay	[illegible]

Checked and Approved
[redacted]

Project Number:

GEO / 38882

Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS
561063

GEOLABS
UKAS TESTING 1982

Client: [illegible] Limited [illegible] Red Lion Street, London [illegible]

PARTICLE SIZE DISTRIBUTION

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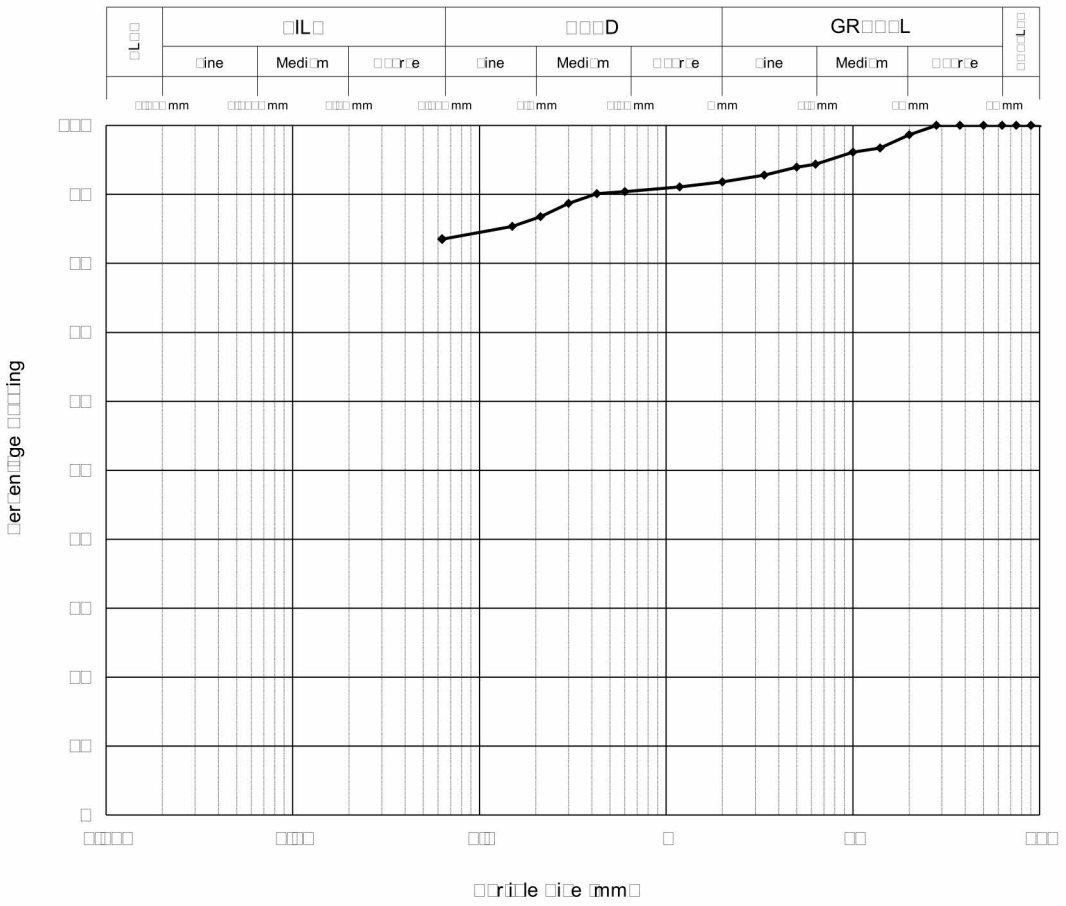

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CHAPMAN WAY, TUNBRIDGE WELLS
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GEOLABS®
UKAS TESTING
1982

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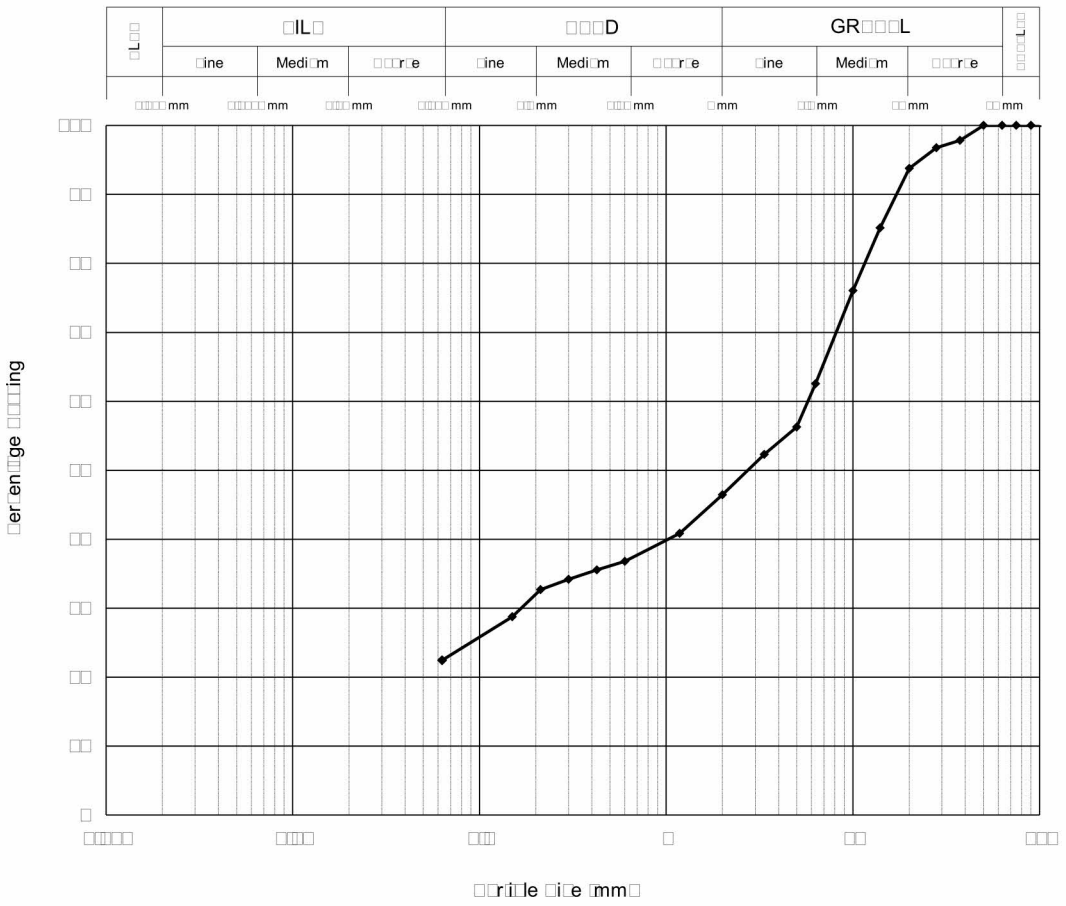

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CHAPMAN WAY, TUNBRIDGE WELLS
561063

GEOLABS
UKAS TESTING
1982

PARTICLE SIZE DISTRIBUTION

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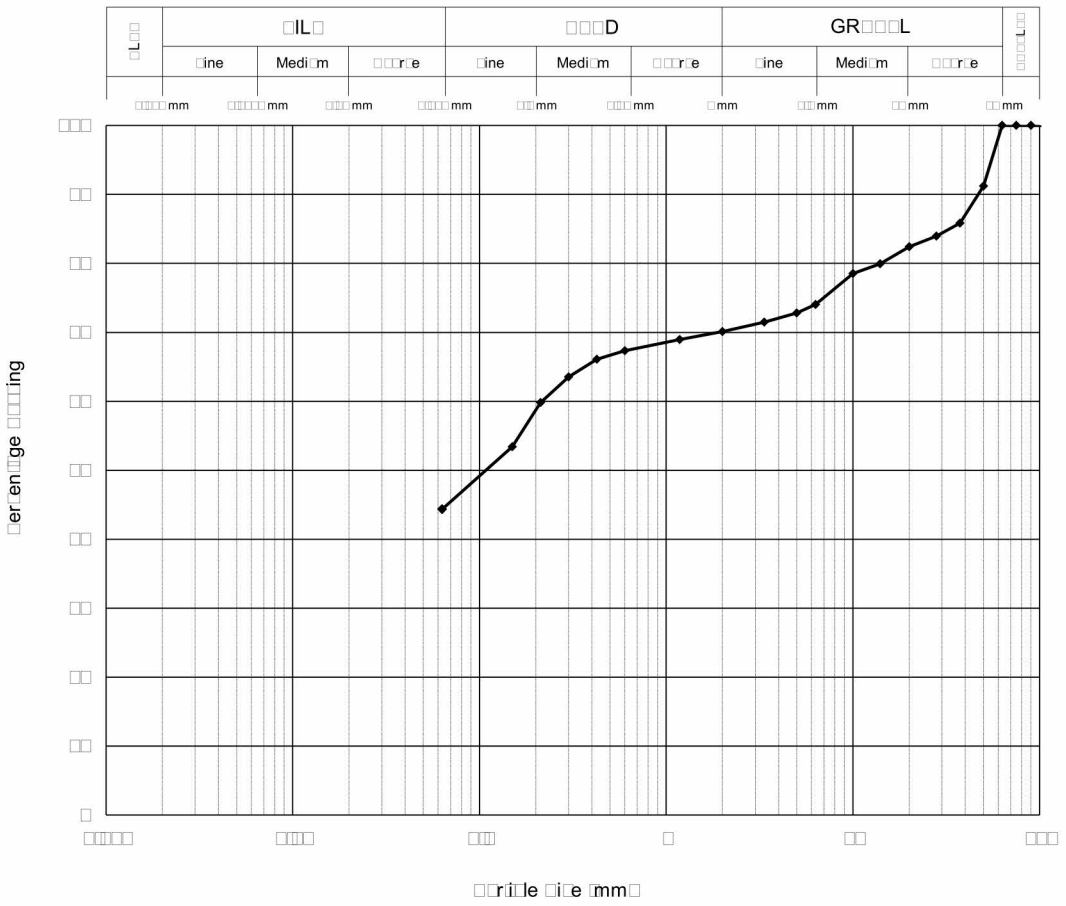

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CHAPMAN WAY, TUNBRIDGE WELLS
561063

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1982

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INCREMENTAL LOADING OEDOMETER TEST

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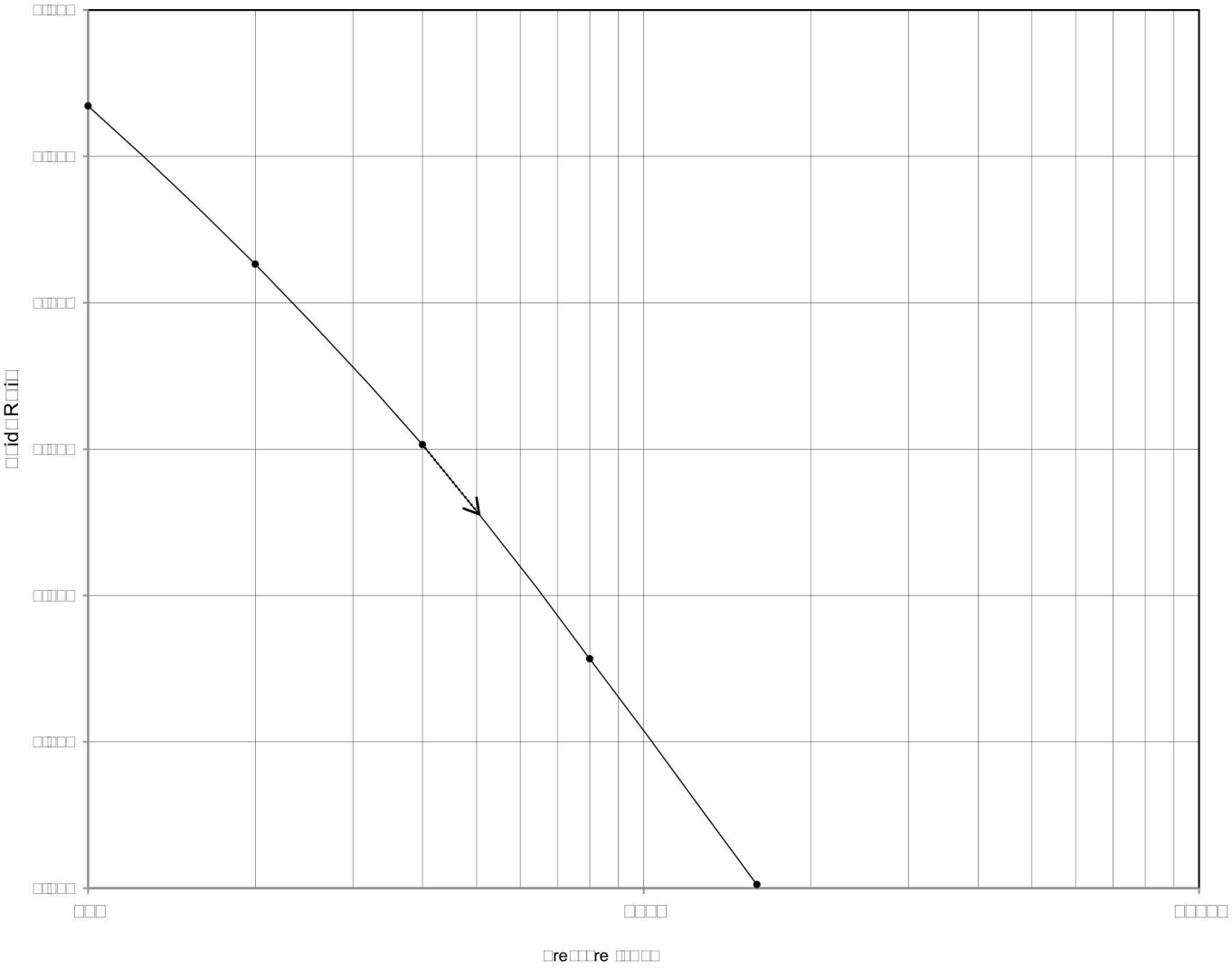

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INCREMENTAL LOADING OEDOMETER TEST

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CHAPMAN WAY, TUNBRIDGE WELLS
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INCREMENTAL LOADING OEDOMETER TEST

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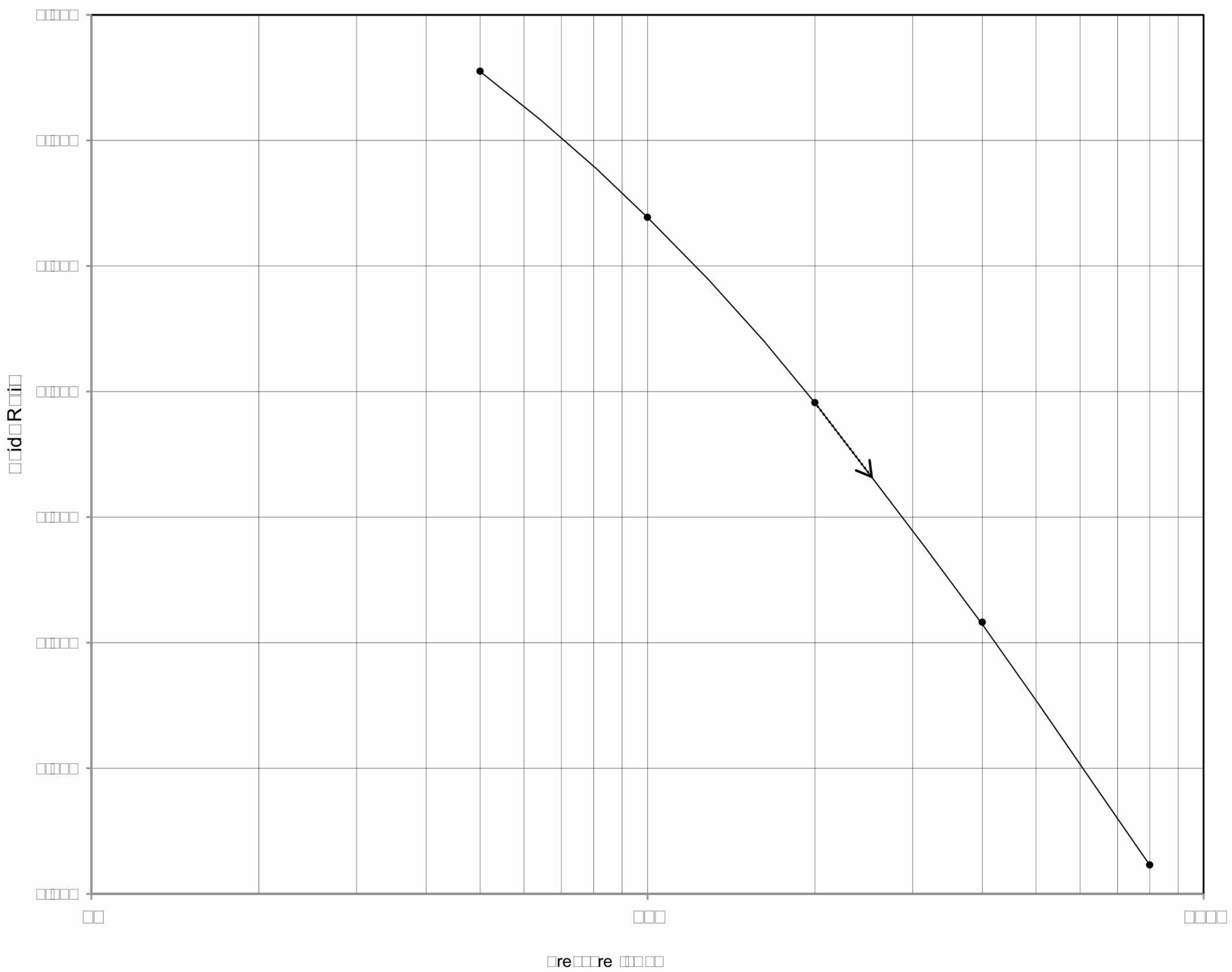

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INCREMENTAL LOADING OEDOMETER TEST

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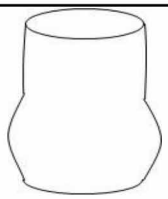

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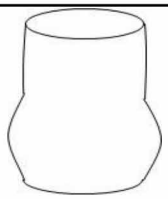

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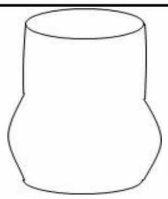

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Specimen Details

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Mode of failure

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CHAPMAN WAY, TUNBRIDGE WELLS
561063

GEOLABS
UKAS TESTING 1982

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

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Specimen Details

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Test Details		
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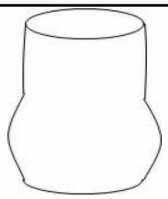
Mode of failure



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GEO / 38882

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CHAPMAN WAY, TUNBRIDGE WELLS
561063

GEOLABS®
UKAS TESTING
1982

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

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Mode of failure

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CHAPMAN WAY, TUNBRIDGE WELLS
561063

GEOLABS®
UKAS TESTING
1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006 In-house Technical Procedure TP35

DETERMINATION OF POINT LOAD STRENGTH ON ROCK

Sample details				Point Load test										
Borehole Ref.	Sample Ref.	Depth (m)	Description	D. Tested	Test type & Direction		Sample width W (mm)	Platen separation (mm) Start D	Platen separation (mm) End D'	Water Content (%)	Equiv. Diameter D_e (mm)	Failure Load P (kN)	I_s P/De^2 (MPa)	Correction Factor F	Point Load Index $I_{s(50)}$ (MPa)
RO102		18.00-19.50	Weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	A	P	78.2	43.8	40.4		63.4	0.51	0.13	1.11	0.14
			Determination 2	29/09/23	A	P	79.3	45.5	42.7		65.7	2.72	0.63	1.13	0.71
			Determination 3	29/09/23	A	P	78.2	38.9	36.1		60.0	0.28	0.08	1.09	0.09
RO102		21.00-22.50	Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	D	L	74.4	74.3	72.1		73.2	0.29	0.05	1.19	0.06
			Determination 2	29/09/23	A	P	75.0	44.8	43.6		64.5	0.42	0.10	1.12	0.11
RO103		19.50-21.00	Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	D	L	78.4	78.0	76.2		77.1	0.33	0.06	1.22	0.07
			Determination 2	29/09/23	A	P	79.0	45.3	42.6		65.5	0.24	0.06	1.13	0.07
			Determination 3	29/09/23	A	P	78.3	46.8	43.5		65.9	0.16	0.04	1.13	0.05
RO103		23.00-25.00	Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	A	P	78.4	44.3	41.8		64.6	0.44	0.10	1.12	0.11
			Determination 2	29/09/23	A	P	80.0	43.2	41.4		64.9	0.21	0.05	1.12	0.06

(*) Sample failed on weakness

Test type and direction: **D** - Diametral **A** - Axial **B** - Block **I** - Irregular lump **P** - Perpendicular to planes of weakness **U** - Random or unknown orientation **L** - Parallel to planes of weakness

Checked and Approved by

[redacted]

I Tabios (Head of Department)

Date: 04/10/2023

Project Number:

GEO / 38882

Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS

561063

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UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006 In-house Technical Procedure TP35

DETERMINATION OF POINT LOAD STRENGTH ON ROCK

Sample details				Point Load test										
Borehole Ref.	Sample Ref.	Depth (m)	Description	D. Tested	Test type & Direction		Sample width W (mm)	Platen separation (mm) Start D	Platen separation (mm) End D'	Water Content (%)	Equiv. Diameter D_e (mm)	Failure Load P (kN)	I_s P/De^2 (MPa)	Correction Factor F	Point Load Index $I_{s(50)}$ (MPa)
RO104		21.00-22.50	Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	A	P	77.0	38.3	36.7		60.0	0.18	0.05	1.09	0.05
RO104		24.00-25.50	Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	D	L	74.0	71.8	68.3		70.0	0.23	0.05	1.16	0.06
RO104		25.50-27.00	Extremely weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	D	L	79.8	78.9	75.7		77.3	0.10	0.02	1.22	0.02
RO104		27.00-28.50	Extremely weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	A	P	78.0	47.3	44.6		66.6	0.18	0.04	1.14	0.05
RO104		28.50-30.00	Extremely weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	29/09/23	D	L	78.9	76.8	74.5		75.6	0.21	0.04	1.20	0.05

(*) Sample failed on weakness

Test type and direction: **D** - Diametral **A** - Axial **B** - Block **I** - Irregular lump **P** - Perpendicular to planes of weakness **U** - Random or unknown orientation **L** - Parallel to planes of weakness

Checked and Approved by

[redacted]

I Tabios (Head of Department)

Date: 04/10/2023

Project Number:

GEO / 38882

Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS
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UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Sample details				Density				Uniaxial Compression Test (LF0879C (1000kN) compression frame used)							
								Mean after prep.							
Borehole Ref.	Sample Ref.	Depth (m)	Description	MC (%)	Degree of Saturation (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Diameter (mm)	Height (mm)	H/D Ratio	Load at Failure (kN)	UCS (MPa) 3 sig. fig.	Failure Sketch	D. Tested	Remarks
RO104		24.00-25.50	Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	9.8	69.2	2.26	2.06	79.60	178.50	2.2	1.5	0.301		03/10/23	
RO104		27.00-28.50	Extremely weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	13	85.4	2.29	2.03	81.40	190.00	2.3	1.1	0.211		03/10/23	

Note: The dimensional requirements of flatness (<0.02 mm), perpendicularity (<0.05 / 50 mm) and straightness (0.3 mm deviation) are all met. Specific Gravity used for Degree of Saturation is assumed unless specified by the client.

Checked and Approved by

[redacted]

I Tabios (Head of Department)

Date: 04/10/2023

Project Number:

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Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS

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UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	RO104
Sample Ref.:	-
Depth (m):	24.00-25.50

Description:
Very weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered

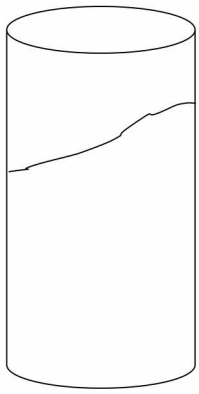
Diameter	79.60 mm
Height	178.50 mm
Bulk Density	2.26 Mg/m³
Dry Density	2.06 Mg/m³
Water Content	9.8 %

Degree of Saturation: 69.2 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Date tested: 03/10/2023

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Test results

Unconfined Compressive Strength (Maximum load (kN): 1.50)	0.301 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

[redacted]

I Tabios (Head of Department)

Date: 04/10/2023

Project Number:

GEO / 38882

Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS
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ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	RO104
Sample Ref.:	-
Depth (m):	27.00-28.50

Description:
Extremely weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered

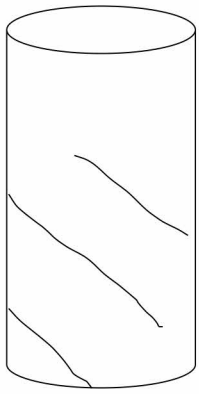
Diameter	81.40 mm
Height	190.00 mm
Bulk Density	2.29 Mg/m³
Dry Density	2.03 Mg/m³
Water Content	13 %

Degree of Saturation: 85.4 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Date tested: 03/10/2023

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Test results

Unconfined Compressive Strength Maximum load (kN): 1.10	0.211 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

[redacted]

I Tabios (Head of Department)

Date: 04/10/2023

Project Number:

GEO / 38882

Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS
561063

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UKAS TESTING 1982

TESTING RESTRICTION

The following tests have been scheduled on the below project. Those listed **CANNOT** be performed for the reason stated. If alternative samples are available for the restricted tests, please supply details.

Sample details					
Borehole Ref.	Sample Ref.	Depth (m)	Description	Tests restricted	Reason for restriction and comments
RO104		28.50-30.00	Extremely weak thinly laminated dark grey SILTSTONE / MUDSTONE. Highly to completely weathered	UCS	Sample broken up into short untestable pieces, also shows some degree of desiccation.

Checked and Approved by

[redacted]

I Tabios (Head of Department)

Date: 27/09/2023

Project Number:

GEO / 38882

Project Name:

CHAPMAN WAY, TUNBRIDGE WELLS
561063

GEOLABS®

Annex F: Laboratory Chemical Data

Tim Singer
TRC Companies Limited
20 Red Lion Street
Holborn
London
WC1R 4PQ

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
[redacted]

DETS Report No: 23-11933

Site Reference:	Tunbridge Wells
Project / Job Ref:	561063
Order No:	None Supplied
Sample Receipt Date:	22/09/2023
Sample Scheduled Date:	22/09/2023
Report Issue Number:	1
Reporting Date:	28/09/2023

Authorised by:

[redacted]

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

UKAS TESTING
4480

Water Analysis Certificate						
DETS Report No: 23-11933	**Date Sampled**	20/09/23	20/09/23	20/09/23	20/09/23	
TRC Companies Limited	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Tunbridge Wells	**TP / BH No**	R0101	R0102	R0103	R0104	
Project / Job Ref: 561063	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	
Reporting Date: 28/09/2023	**DETS Sample No**	676353	676354	676355	676356	

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	8.3	8.0	8.1	7.9	
Sulphate as SO_4	mg/l	< 1	ISO17025	164	76	181	695	
Arsenic (dissolved)	ug/l	< 5	ISO17025	< 5	5	< 5	< 5	
Boron (dissolved)	ug/l	< 5	ISO17025	165	174	259	1600	
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	< 0.4	< 0.4	< 0.4	< 0.4	
Chromium (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20	< 20	
Copper (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	
Lead (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	
Mercury (dissolved)	ug/l	< 0.05	ISO17025	< 0.05	< 0.05	< 0.05	0.20	
Nickel (dissolved)	ug/l	< 5	ISO17025	30	11	8	< 5	
Selenium (dissolved)	ug/l	< 5	ISO17025	6	< 5	< 5	< 5	
Zinc (dissolved)	ug/l	< 2	ISO17025	12	4	2	8	

Subcontracted analysis (S)
Insufficient sample I/S
Unsuitable Sample U/S

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Water Analysis Certificate - Speciated PAH						
DETS Report No: 23-11933	**Date Sampled**	20/09/23	20/09/23	20/09/23	20/09/23	
TRC Companies Limited	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Tunbridge Wells	**TP / BH No**	R0101	R0102	R0103	R0104	
Project / Job Ref: 561063	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	
Reporting Date: 28/09/2023	**DETS Sample No**	676353	676354	676355	676356	

Determinand	Unit	RL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	0.07	0.03	0.27	0.06	
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	ug/l	< 0.01	NONE	0.13	0.13	0.24	6.70	
Fluorene	ug/l	< 0.01	NONE	0.07	0.03	0.11	3.34	
Phenanthrene	ug/l	< 0.01	NONE	0.02	< 0.01	0.06	1.97	
Anthracene	ug/l	< 0.01	NONE	0.02	< 0.01	0.04	0.84	
Fluoranthene	ug/l	< 0.01	NONE	0.08	0.02	0.05	0.83	
Pyrene	ug/l	< 0.01	NONE	0.06	0.02	0.03	0.43	
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008	< 0.008	< 0.008	< 0.008	
Total EPA-16 PAHs	ug/l	< 0.16	NONE	0.45	0.23	0.80	14.17	

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Water Analysis Certificate - TPH CWG Banded						
DETS Report No: 23-11933	**Date Sampled**	20/09/23	20/09/23	20/09/23	20/09/23	
TRC Companies Limited	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Tunbridge Wells	**TP / BH No**	R0101	R0102	R0103	R0104	
Project / Job Ref: 561063	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	
Reporting Date: 28/09/2023	**DETS Sample No**	676353	676354	676355	676356	

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS_1D_MS_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C6 - C8 : HS_1D_MS_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C8 - C10 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C10 - C12 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C12 - C16 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C16 - C21 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic >C21 - C34 : EH_CU_1D_AL	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	ug/l	< 70	NONE	< 70	< 70	< 70	< 70	
Aromatic >C5 - C7 : HS_1D_MS_AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C7 - C8 : HS_1D_MS_AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C8 - C10 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C10 - C12 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic >C12 - C16 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10	27	
Aromatic >C16 - C21 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10	19	
Aromatic >C21 - C35 : EH_CU_1D_AR	ug/l	< 10	NONE	< 10	< 10	< 10	< 10	
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	ug/l	< 70	NONE	< 70	< 70	< 70	< 70	
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Total	ug/l	< 140	NONE	< 140	< 140	< 140	< 140	

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Water Analysis Certificate - BTEX / MTBE						
DETS Report No: 23-11933	**Date Sampled**	20/09/23	20/09/23	20/09/23	20/09/23	
TRC Companies Limited	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Tunbridge Wells	**TP / BH No**	R0101	R0102	R0103	R0104	
Project / Job Ref: 561063	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	**Depth (m)**	None Supplied	None Supplied	None Supplied	None Supplied	
Reporting Date: 28/09/2023	**DETS Sample No**	676353	676354	676355	676356	

Determinand	Unit	RL	Accreditation					
Benzene : HS_1D_MS	ug/l	< 1	ISO17025	< 1	< 1	< 1	< 1	
Toluene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	
Ethylbenzene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	
p & m-xylene : HS_1D_MS	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	
o-xylene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	
MTBE : HS_1D_MS	ug/l	< 10	ISO17025	< 10	< 10	< 10	< 10	

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Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-11933
TRC Companies Limited
Site Reference: Tunbridge Wells
Project / Job Ref: 561063
Order No: None Supplied
Reporting Date: 28/09/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

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List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Aromatic C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

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[redacted]

Analytical Report Number : 23-55077

Project / Site name:	Chapman Way, Tunbridge Wells	**Samples received on:**	06/09/2023
Your job number:	561063	**Samples instructed on/ Analysis started on:**	06/09/2023
Your order number:	561063	**Analysis completed by:**	13/09/2023
Report Issue Number:	1	**Report issued on:**	13/09/2023
Samples Analysed:	5 soil samples		

Signed: [redacted]

Joanna Szwagrzak
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-55077
Project / Site name: Chapman Way, Tunbridge Wells
Your Order No: 561063

Lab Sample Number				2803249	2803250	2803251	2803252	2803253
Sample Reference				RO102	RO102	RO102	RO102	RO102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	5.00	10.40	WAC	17.20
Date Sampled				04/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	15	21	17	8.7
Total mass of sample received	kg	0.001	NONE	0.8	0.9	1.1	1.2	1
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	IZJ	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7	7.9	7.6	8	7.9
Total Cyanide	mg/kg	1	MCERTS	-	-	-	< 1.0	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	340	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.17	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	170	-
Organic Matter (automated)	%	0.1	MCERTS	-	-	-	3.4	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	1.9	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.2	0.12	15	0.67	0.09
Acenaphthylene	mg/kg	0.05	MCERTS	0.06	< 0.05	8.4	0.61	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.08	0.08	23	0.55	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.12	0.11	37	0.72	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.1	0.82	230	7.9	0.08
Anthracene	mg/kg	0.05	MCERTS	0.22	0.16	59	1.6	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.4	0.72	220	20	0.09
Pyrene	mg/kg	0.05	MCERTS	2.1	0.57	180	17	0.07
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.26	73	10	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.1	0.27	75	8.9	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.5	0.31	77	13	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.54	0.12	29	4.9	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	0.22	67	11	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.56	0.13	39	6.5	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.16	< 0.05	10	1.5	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.64	0.16	45	6.6	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	12.9	4.05	1190	111	< 0.80

Analytical Report Number: 23-55077
Project / Site name: Chapman Way, Tunbridge Wells
Your Order No: 561063

Lab Sample Number				2803249	2803250	2803251	2803252	2803253
Sample Reference				RO102	RO102	RO102	RO102	RO102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	5.00	10.40	WAC	17.20
Date Sampled				04/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	11	16	14	16
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	1.6	0.6	1.9	2.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	< 0.2	1.6	0.7	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	17	27	29	24	39
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	27	29	24	40
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	23	70	140	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	23	260	520	32
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.6	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	30	27	26	56
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	310	64	350	220	90
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) $_{HS\_1D\_TOTAL}$	mg/kg	0.1	NONE	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	11	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	30	2.5	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	74	22	31
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	120	25	33
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	11	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	3.8	90	4.7	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	500	43	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	14	< 10	450	100	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	18	21	1100	150	< 10

Analytical Report Number: 23-55077
Project / Site name: Chapman Way, Tunbridge Wells
Your Order No: 561063

Lab Sample Number				2803249	2803250	2803251	2803252	2803253
Sample Reference				RO102	RO102	RO102	RO102	RO102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	5.00	10.40	WAC	17.20
Date Sampled				04/09/2023	05/09/2023	05/09/2023	05/09/2023	05/09/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-55077
Project / Site name: Chapman Way, Tunbridge Wells

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2803249	RO102	None Supplied	0.9	Brown clay and loam with gravel and vegetation.
2803250	RO102	None Supplied	5	Brown clay.
2803251	RO102	None Supplied	10.4	Brown clay.
2803252	RO102	None Supplied	WAC	Brown clay with gravel.
2803253	RO102	None Supplied	17.2	Brown clay.

Analytical Report Number : 23-55077
Project / Site name: Chapman Way, Tunbridge Wells

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS