



PointID

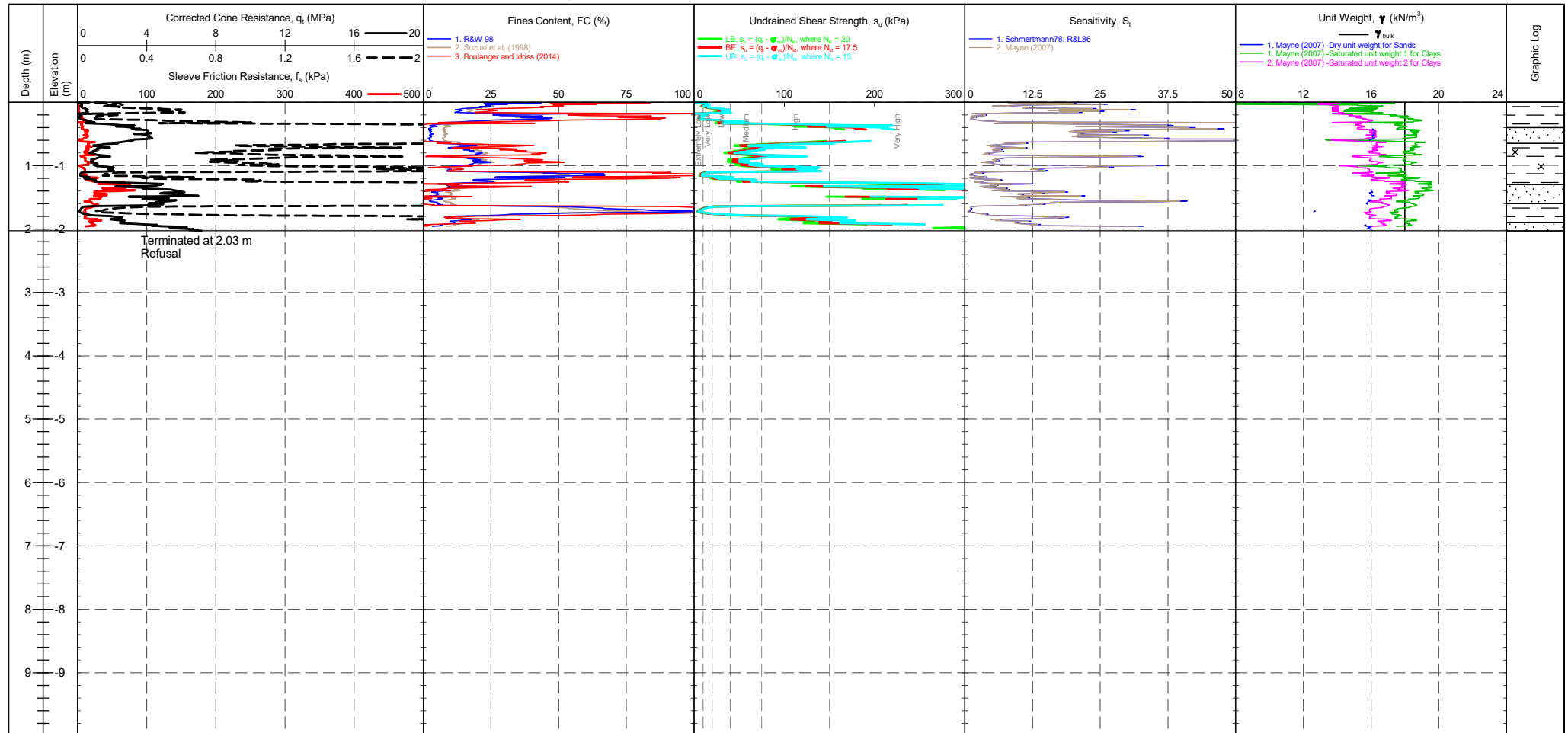
CPT01T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.8m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	338 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	208 mV	214 mV	0.002 kPa
X-Y Inclinator	2487 mV	2554 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

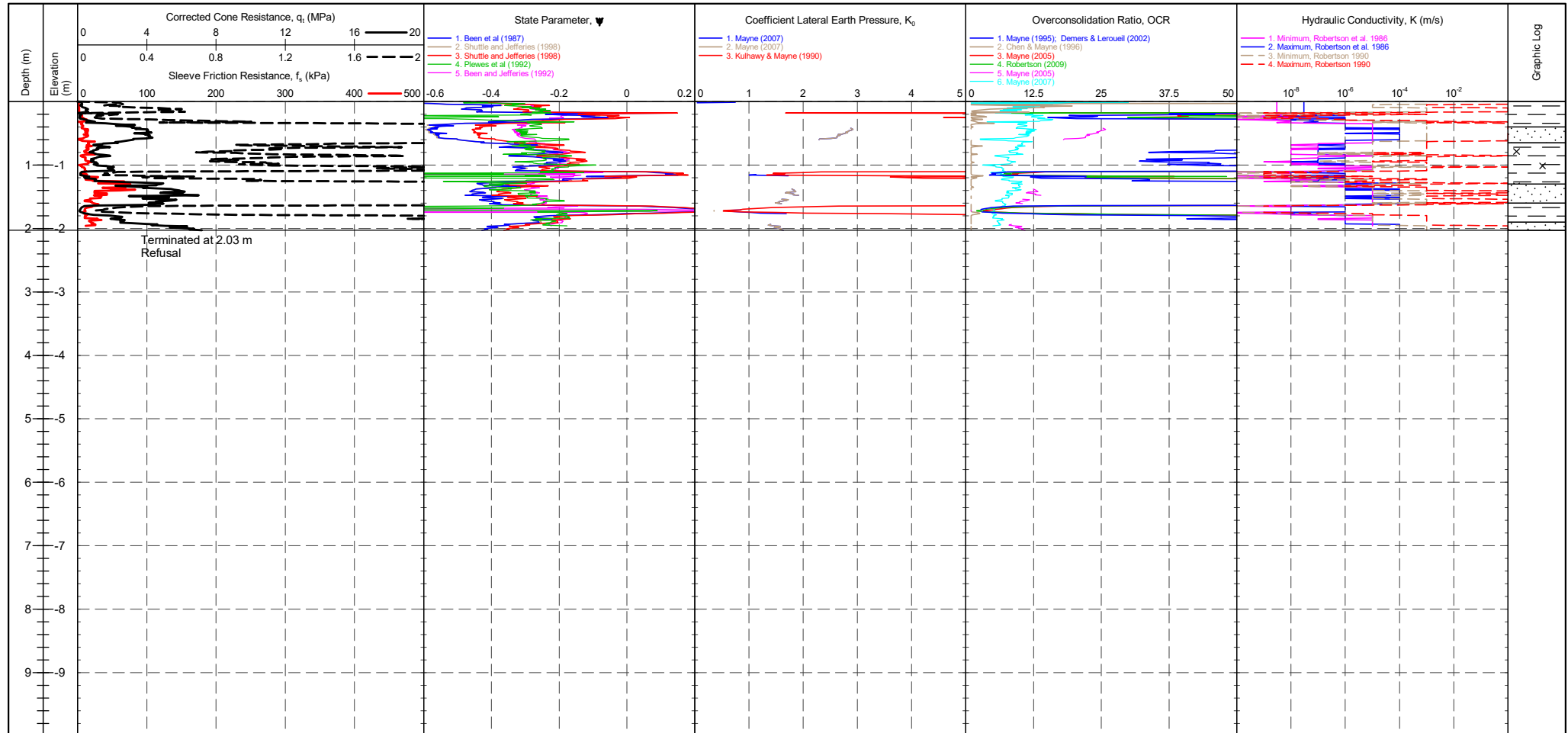
CPT01T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.8m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	338 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	208 mV	214 mV	0.002 kPa
X-Y Inclinator	2487 mV	2554 mV	

Groundwater Level
Dissipation Test



PointID

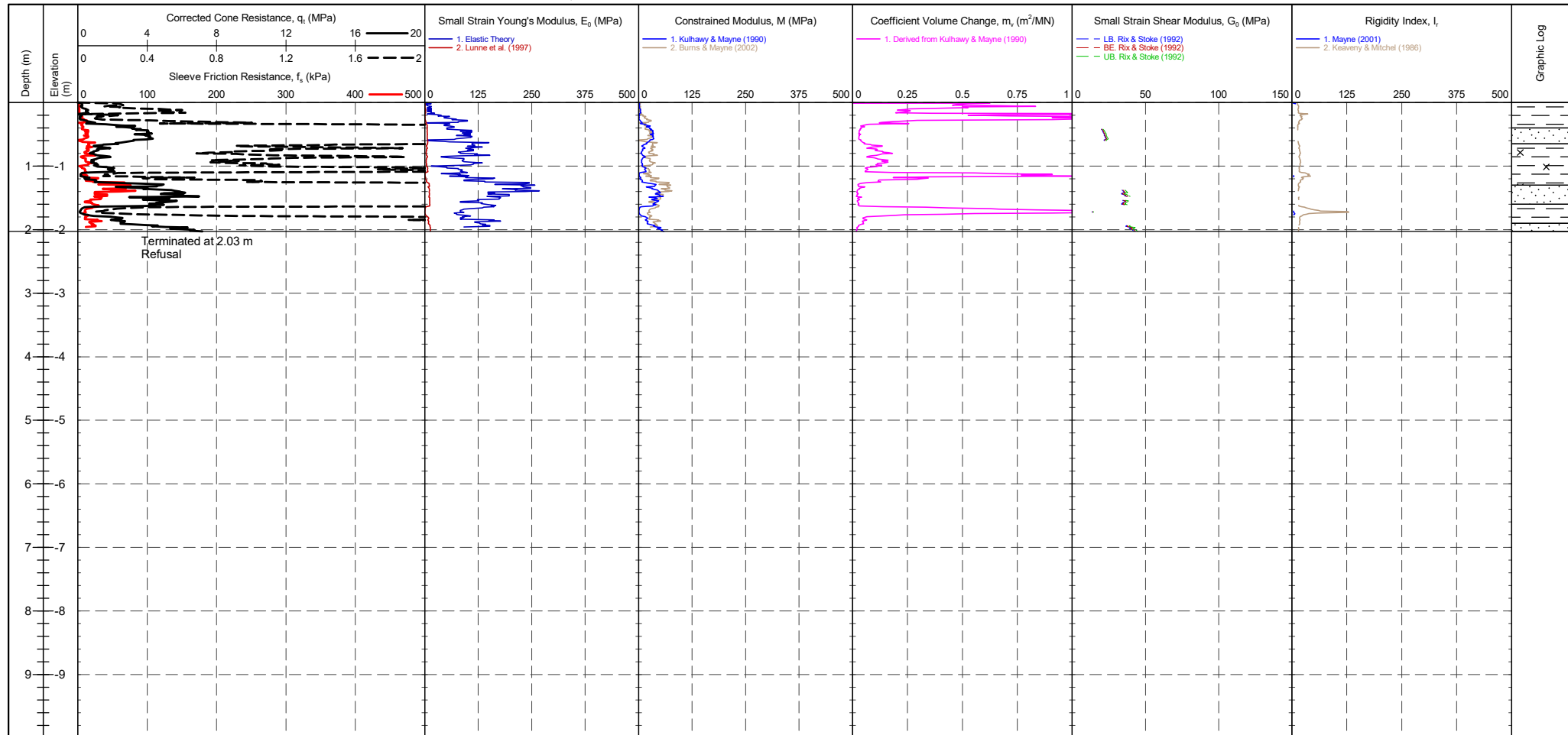
CPT01T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.8m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : 15cm²
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

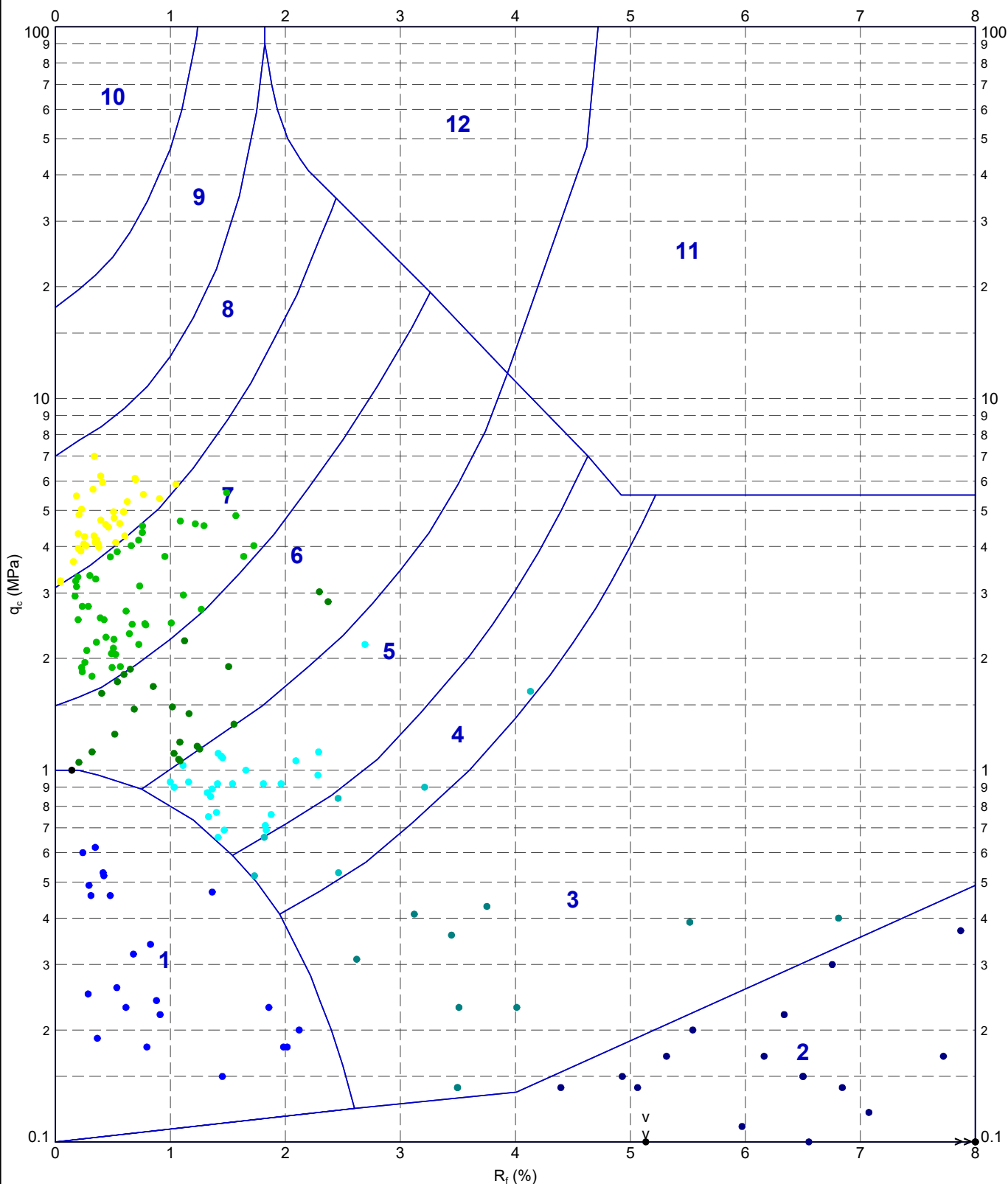
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	338 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	208 mV	214 mV	0.002 kPa
X-Y Inclinator	2487 mV	2554 mV	

Groundwater Level
Dissipation Test

220228-ADVANCED REPORT INSTITUSI 2.02.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF AP. 1220236-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:03 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c vs R_f

- 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

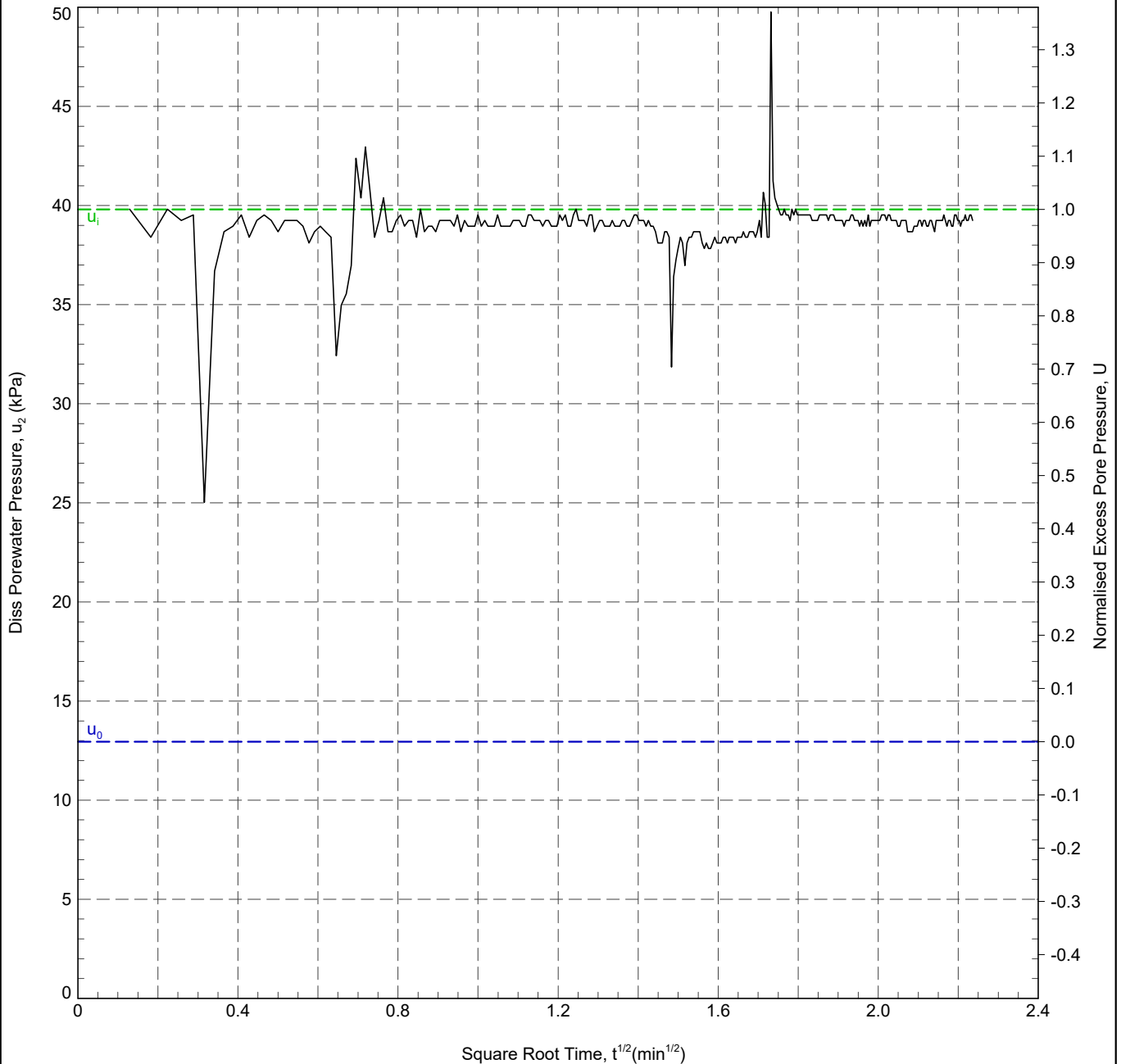
12 - SAND to clayey SAND

	TITLE Central Alliance Oliver Dustan Cardigan Cardigan Tidal Flood Risk Management Robertson et al. 1986 q _c vs. R _f - CPT01T2	DRAWN	DATE	25/03/2022
		CHECKED	DATE	25/03/2022
		SCALE	Not To Scale	A4
		PROJECT No	1220236	
		FIGURE No		

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 23/03/22



In Situ Pore Pressure, u_0 : 13.0 kPa
Initial Pore Pressure, u_i : 39.8 kPa
Final Pore Pressure: 39.3 kPa
Degree of Dissipation: 50%

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 23/03/2022
DATE: 23/03/2022
DATE: 23/03/2022

REMARK
T50 not reached.



PointID

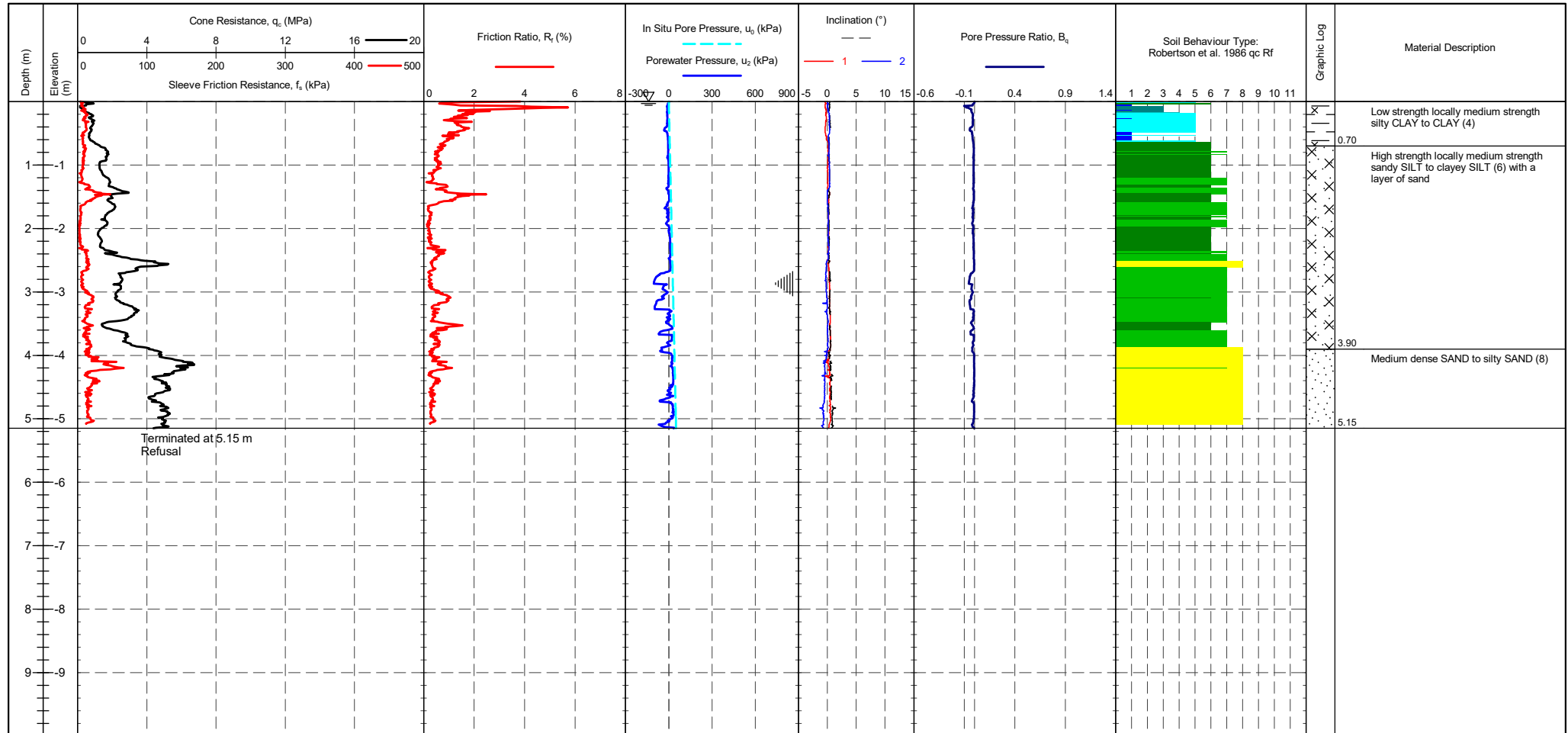
CPT01T3

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES
Transducer : Pre Post Difference
Tip : 341 mV 339 mV -0.022 MPa
Sleeve : 271 mV 269 mV -0.001 kPa
Pore Pressure 2 : 198 mV 202 mV 0.001 kPa
X-Y Inclinator : 2458 mV 2414 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



PointID

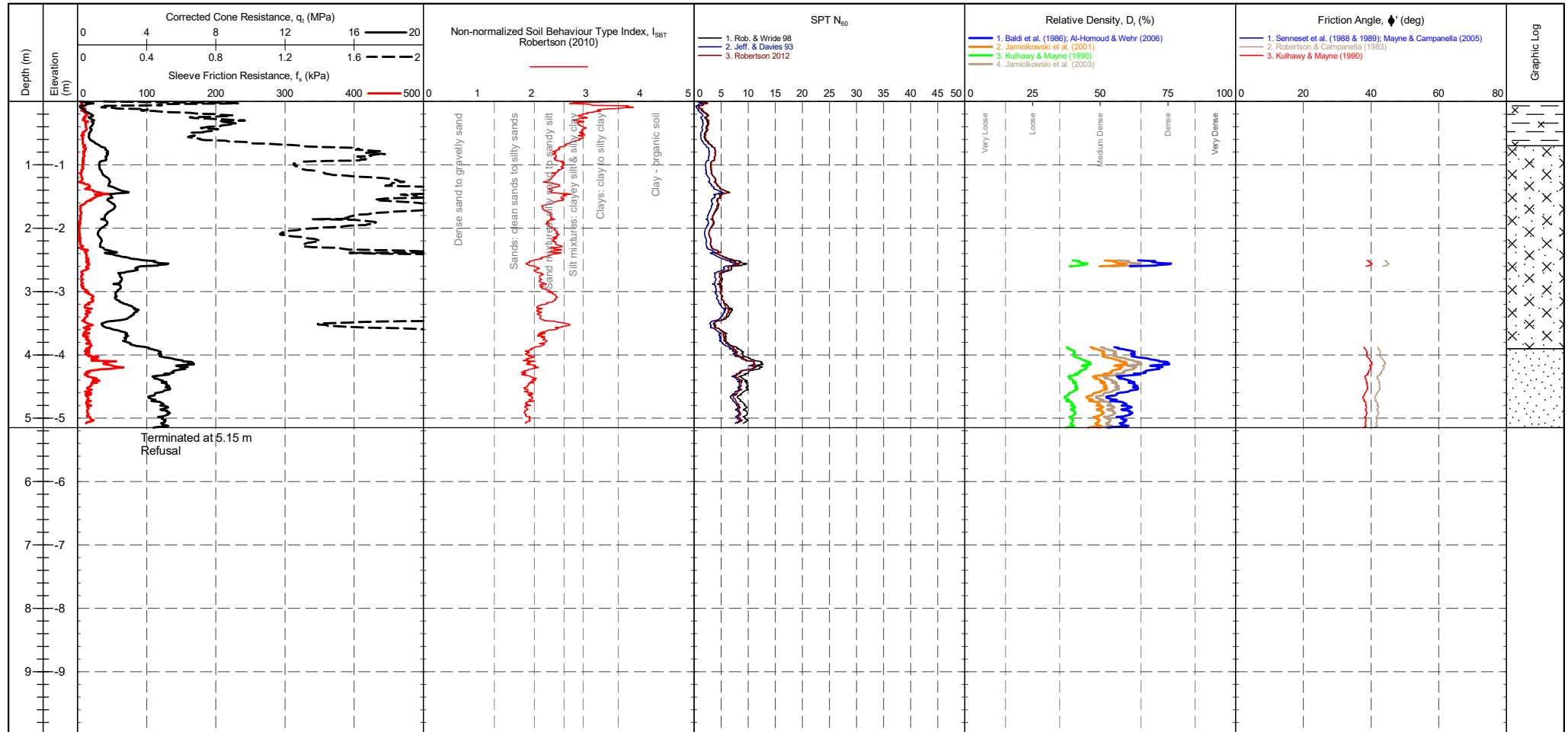
CPT01T3

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	341 mV	339 mV	-0.022 MPa
Sleeve	271 mV	269 mV	-0.001 kPa
Pore Pressure 2	198 mV	202 mV	0.001 kPa
X-Y Inclinator	2458 mV	2414 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12			
Description	SBT Index, I_c	Description	SPT N value, NSPT
Clays	2.95-3.60	Very Loose	0 - 4
Silt mixtures	2.60-2.95	Loose	4 - 10
Sand mixtures	2.05-2.60	Medium Dense	10 - 30
Sands	1.31-2.05	Dense	30 - 50
Gravelly sand	<1.31	Very Dense	>50

Groundwater Level
Dissipation Test



PointID

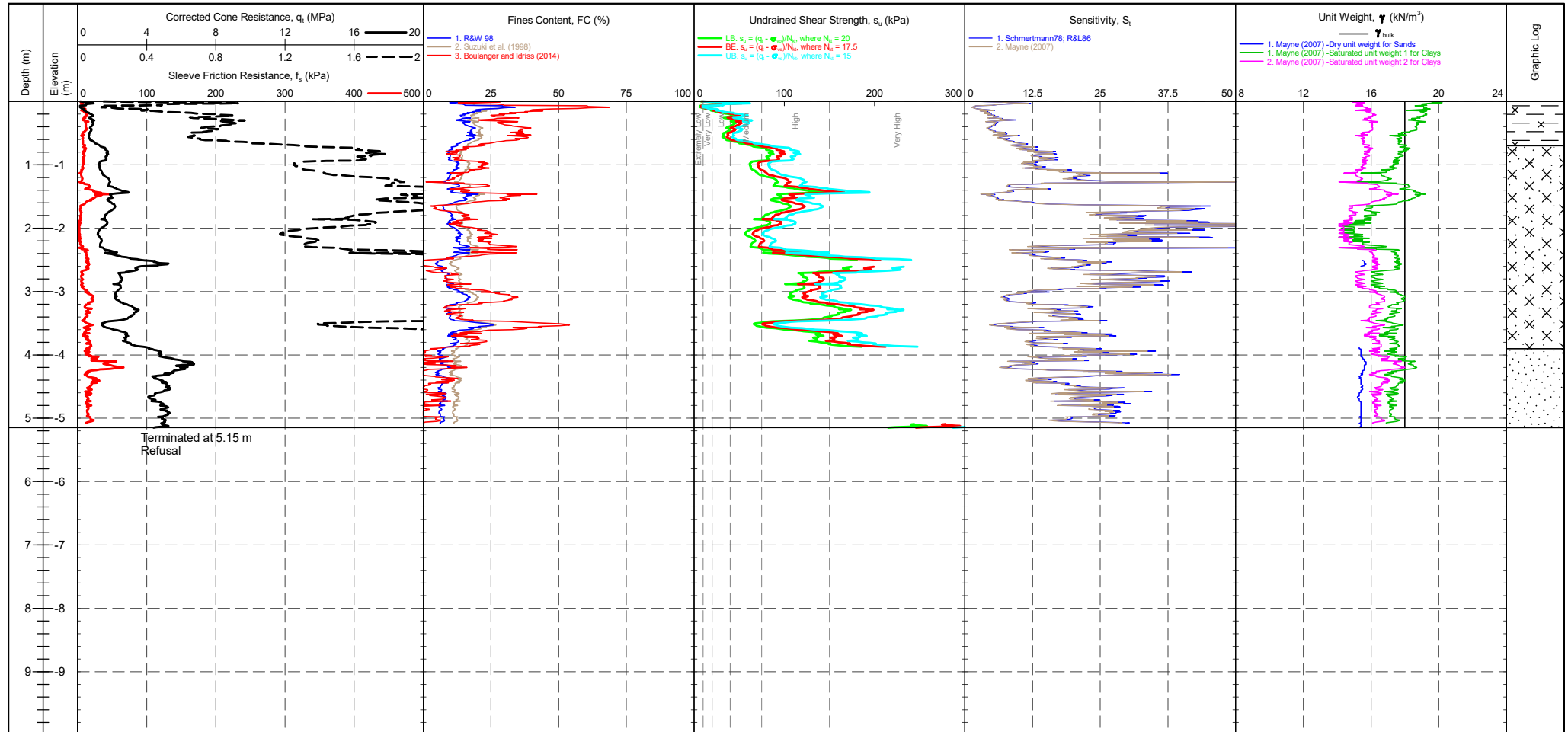
CPT01T3

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	341 mV	339 mV	-0.022 MPa
Sleeve	271 mV	269 mV	-0.001 kPa
Pore Pressure 2	198 mV	202 mV	0.001 kPa
X-Y Inclinator	2458 mV	2414 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

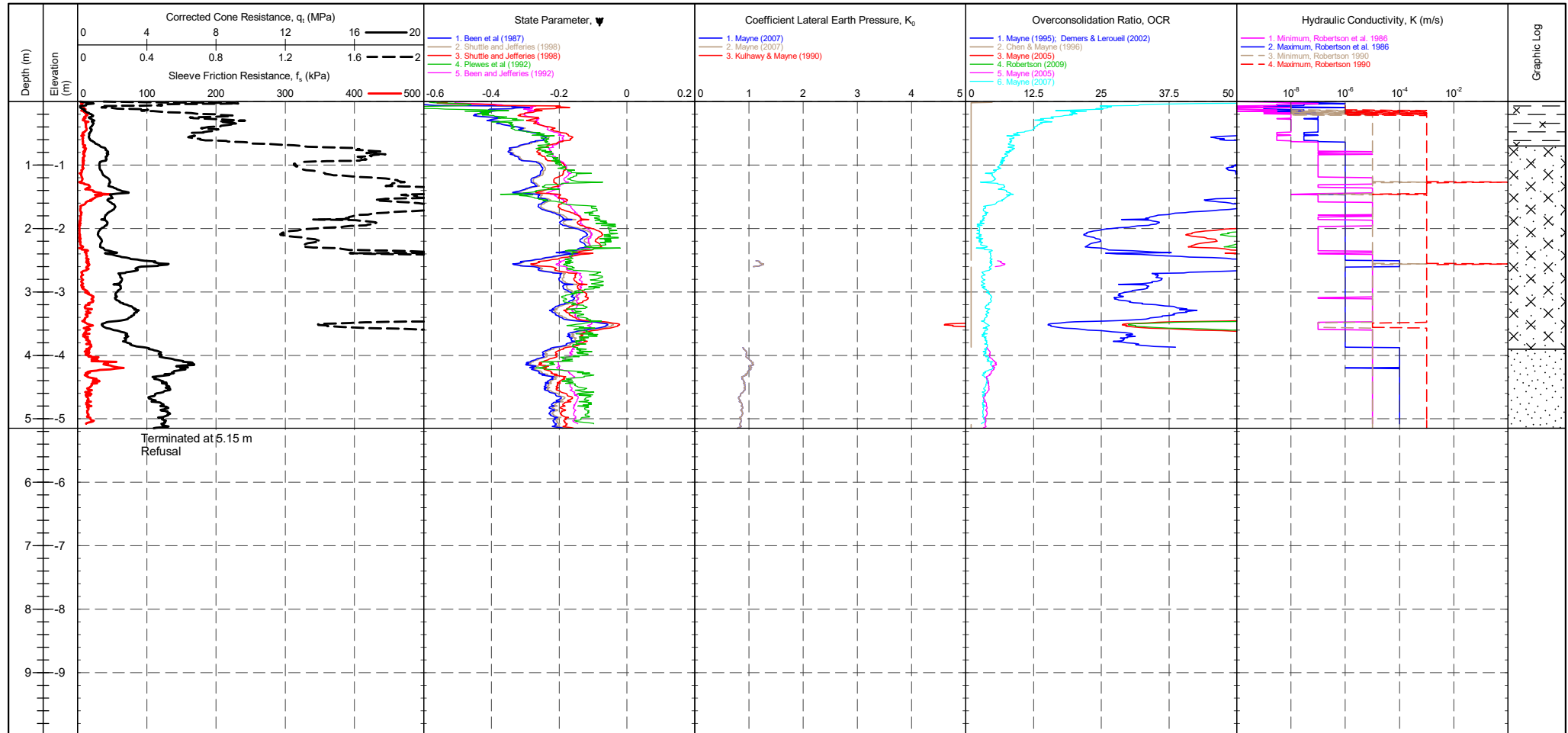
CPT01T3

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

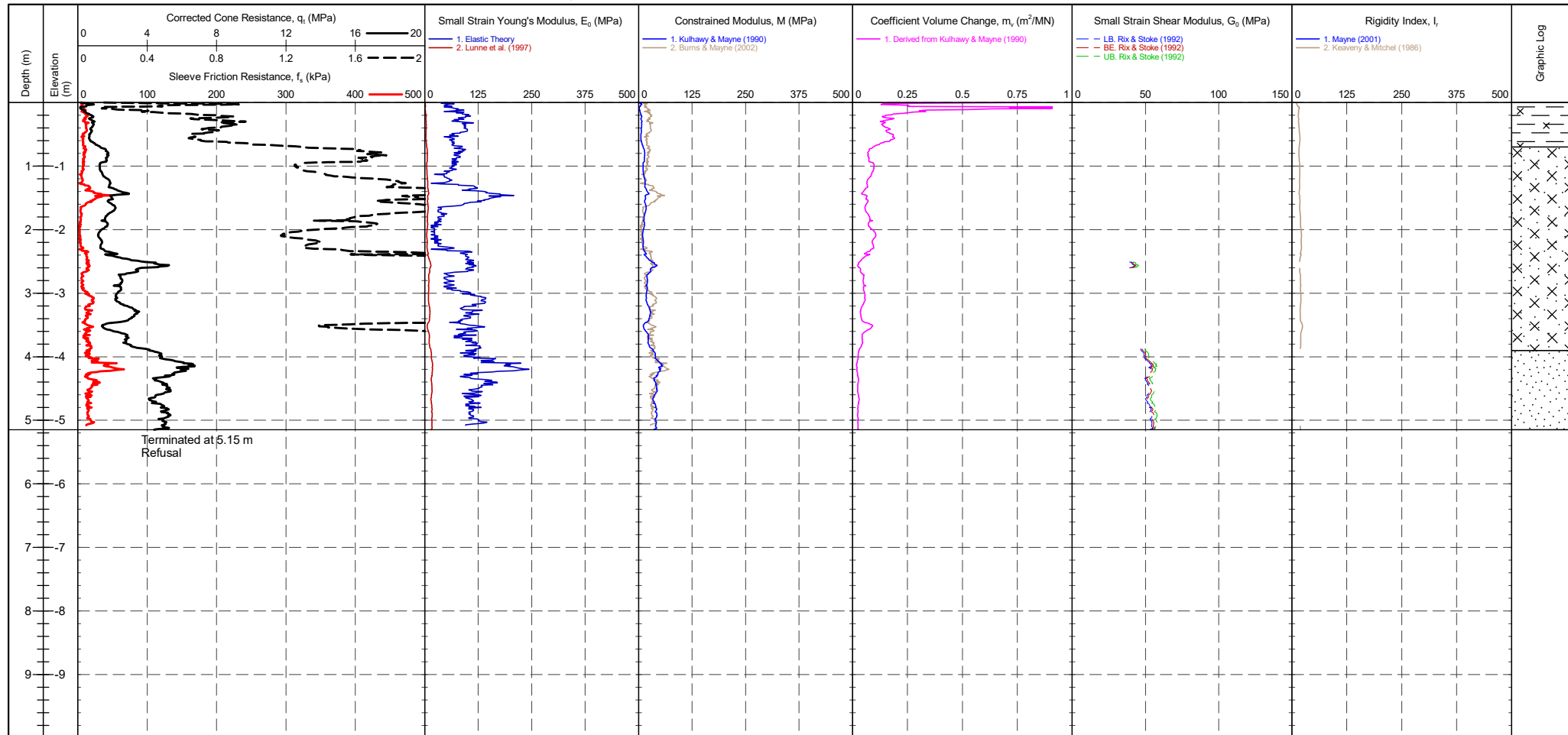
Transducer	Pre	Post	Difference
Tip	341 mV	339 mV	-0.022 MPa
Sleeve	271 mV	269 mV	-0.001 kPa
Pore Pressure 2	198 mV	202 mV	0.001 kPa
X-Y Inclinator	2458 mV	2414 mV	

Groundwater Level
Dissipation Test



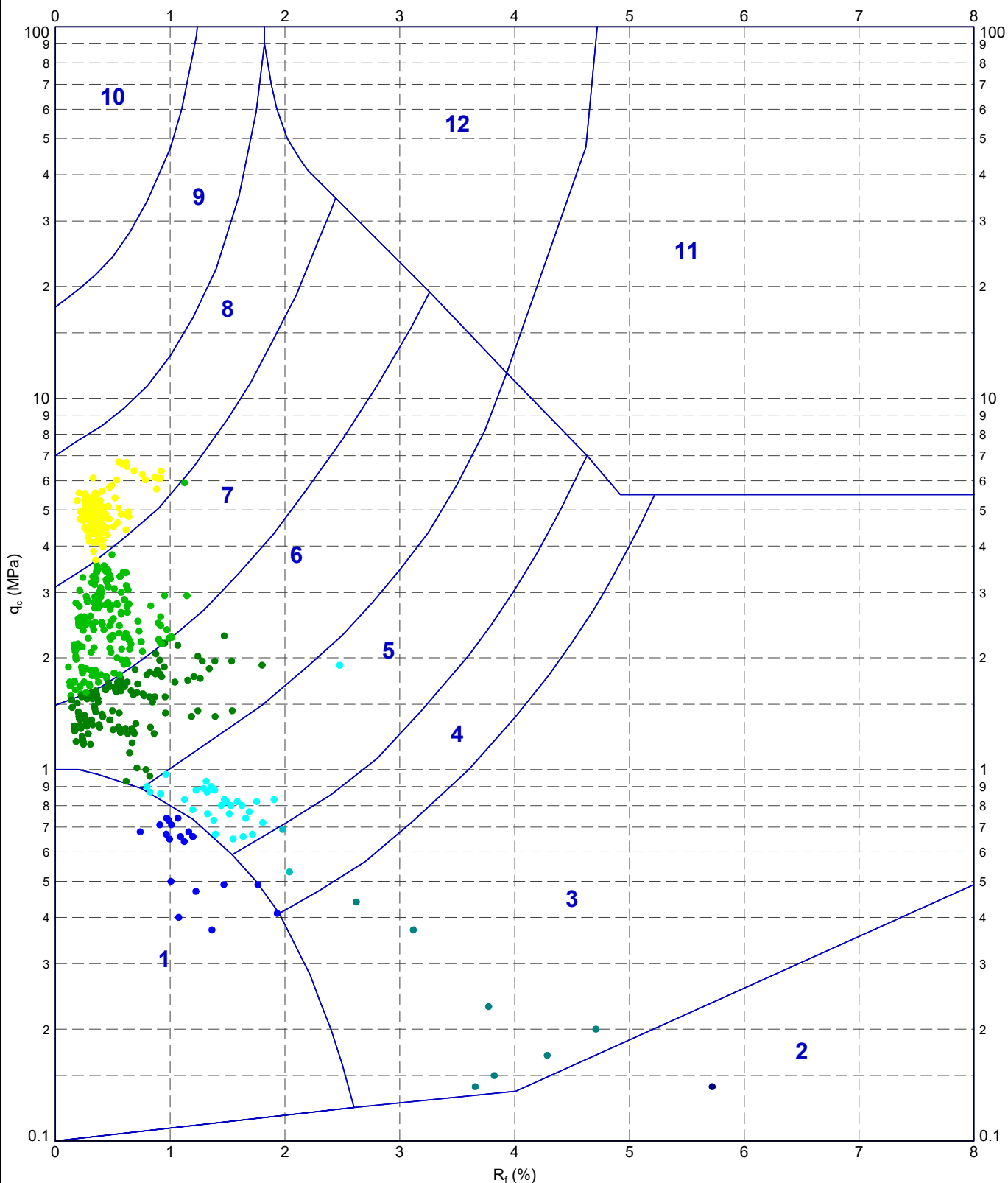
PointID	CPT01T3
---------	---------

CLIENT : Central Alliance	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Cardigan Tidal Flood Risk Management	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Cardigan	ELEVATION : 0.000 m OD		TEST DATE : 24/03/2022
PROJECT No. : 1220236	CHECKED BY : LD		PLOT DATE : 25/03/2022
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360	TEST TYPE : TE2	CPTU ZERO VALUES			Groundwater Level Dissipation Test
CONE MODEL : Subtraction	APPLICATION CLASS : 2	Transducer	Pre	Post	
CONE AREA : 15cm ²	RIG : CPT 020 - Pagani	Tip	341 mV	339 mV	
CONE AREA RATIO : 0.79	OPERATOR : IM & DR	Sleeve	271 mV	269 mV	
FILTER POSITION : u2	FRICITION REDUCER : None	Pore Pressure 2	198 mV	202 mV	
FILTER TYPE : HDPE	WEATHER : Sunny & Cold	X-Y Inclinator	2458 mV	2414 mV	

22028-ADVANCED REPORT INSTITUSI 202.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF AP 1220236-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:06 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c vs R_f

- | | | | |
|-------------------------------------|-------------------------------|------------------------------|------------------------------|
| 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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT01T3

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

1220236

FIGURE No

Test ID

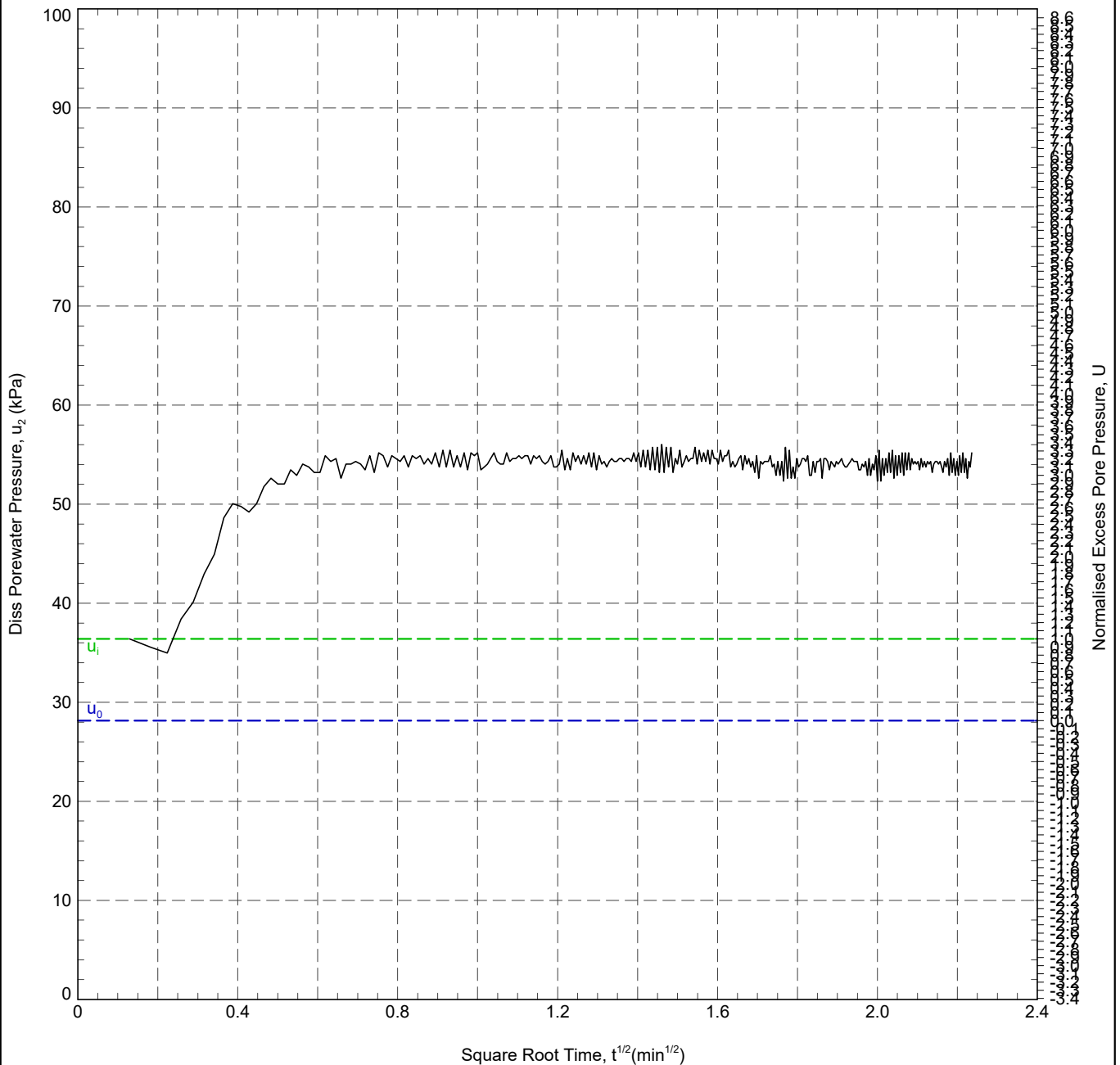
CPT01T3 - 2.87 m

Working with:

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 24/03/22



In Situ Pore Pressure, u_0 : 28.2 kPa
Initial Pore Pressure, u_i : 36.4 kPa
Final Pore Pressure: 55.2 kPa
Degree of Dissipation: 50%

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 25/03/2022
DATE: 24/03/2022
DATE: 24/03/2022

REMARK
T50 not reached.



Working with:

PointID

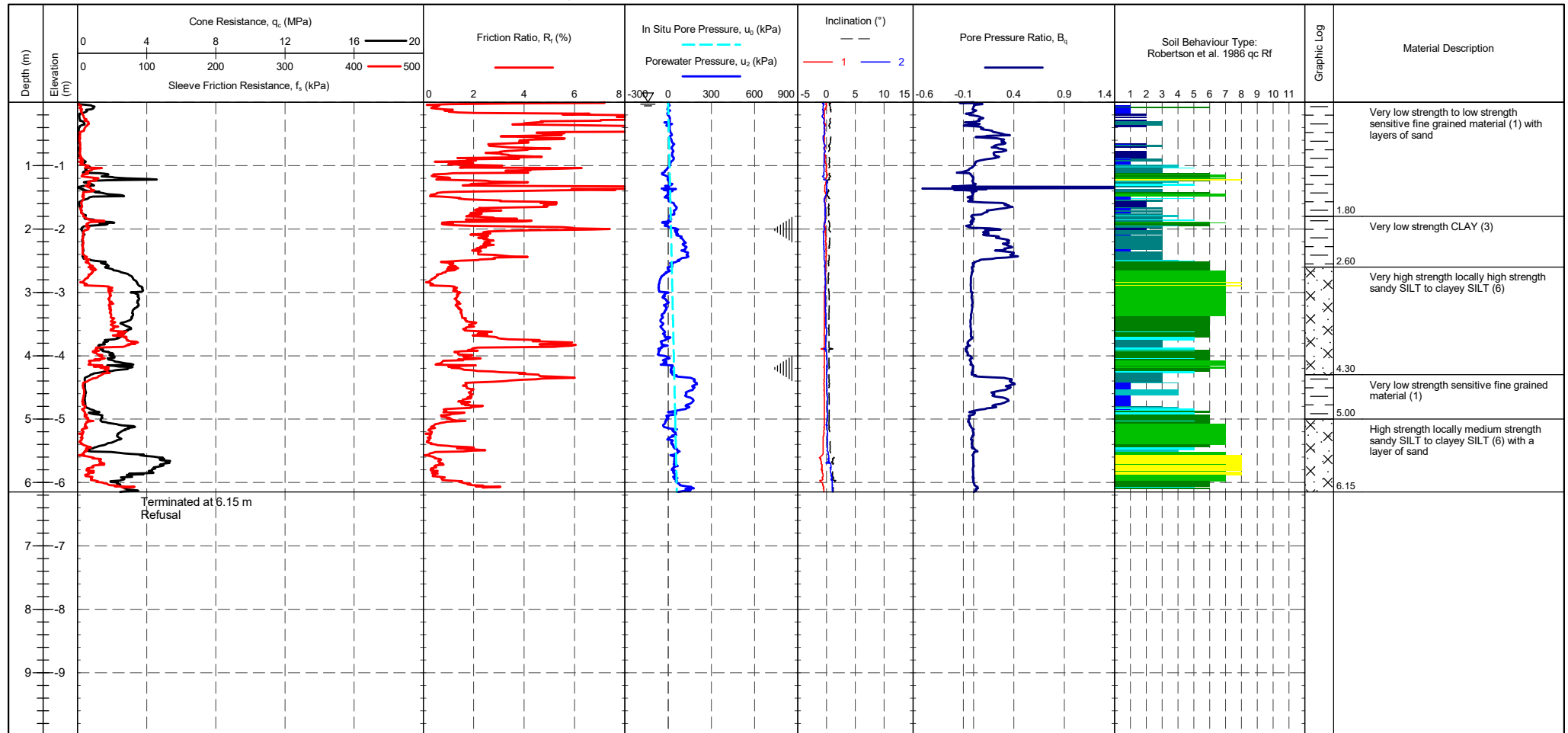
CPT02

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.1m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	265 mV	-0.001 kPa
Pore Pressure 2	207 mV	206 mV	0 kPa
X-Y Inclinator	2541 mV	2469 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level
Dissipation Test



PointID

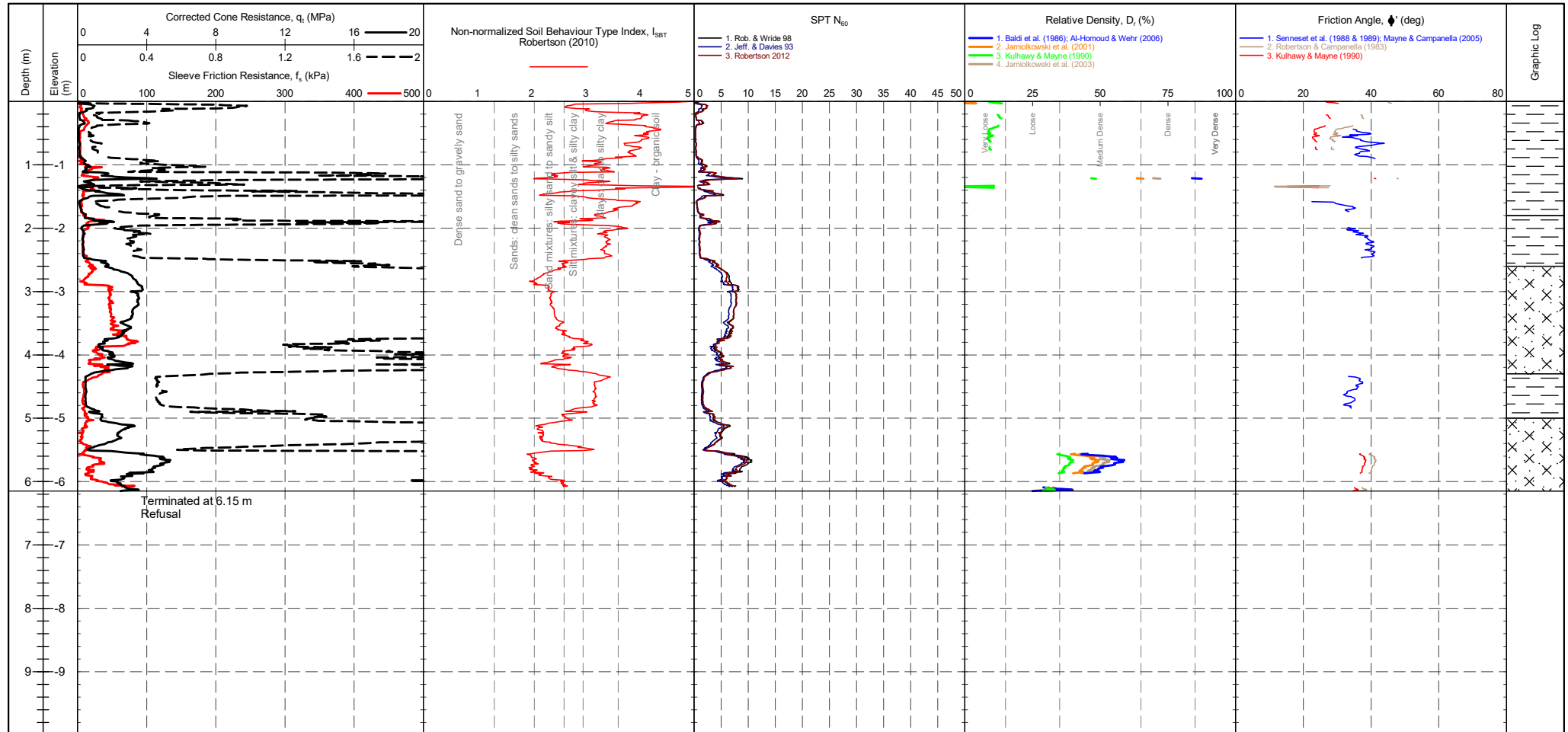
CPT02

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.1m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	265 mV	-0.001 kPa
Pore Pressure 2	207 mV	206 mV	0 kPa
X-Y Inclinator	2541 mV	2469 mV	

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

Description	SBT Index, I_c	Description	SPT N value, NSPT	Description	Relative Density D_r (%)
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



PointID

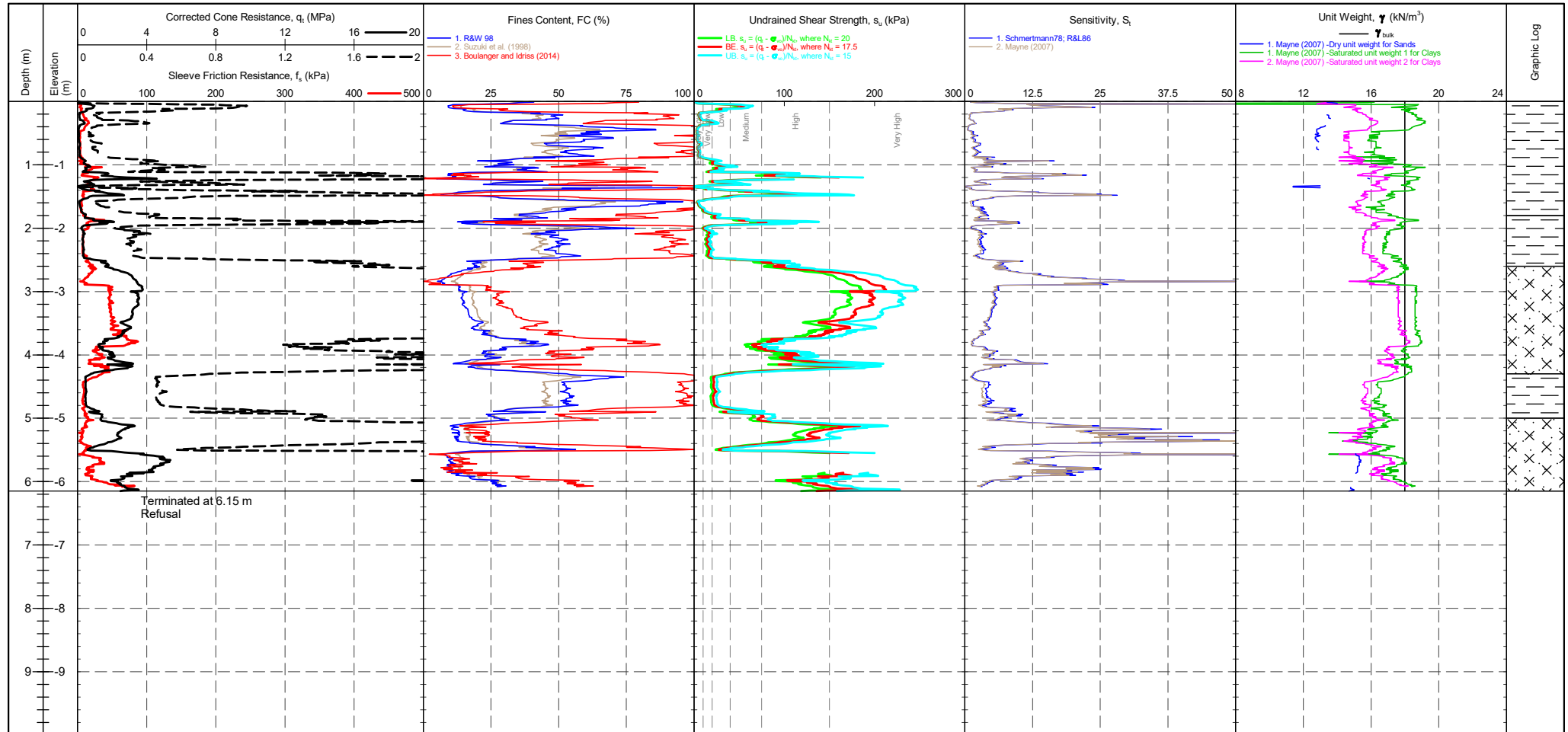
CPT02

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.1m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

Transducer
Tip
Sleeve
Pore Pressure 2
X-Y Inclinator

Pre
340 mV
267 mV
207 mV
2541 mV

Post
339 mV
265 mV
206 mV
2469 mV

Difference
-0.011 MPa
-0.001 kPa
0 kPa

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

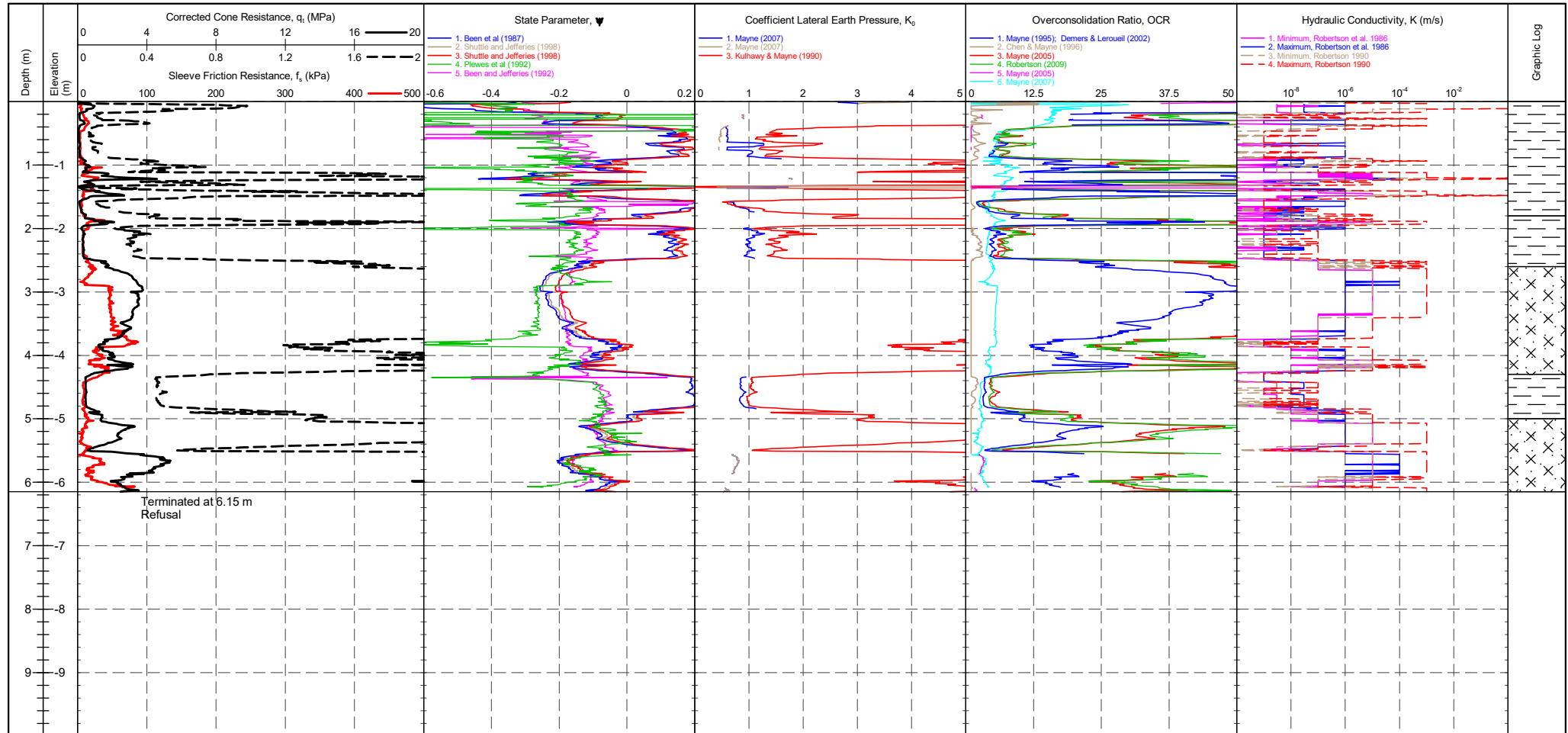
CPT02

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.1m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	265 mV	-0.001 kPa
Pore Pressure 2	207 mV	206 mV	0 kPa
X-Y Inclinator	2541 mV	2469 mV	

Groundwater Level
Dissipation Test



PointID

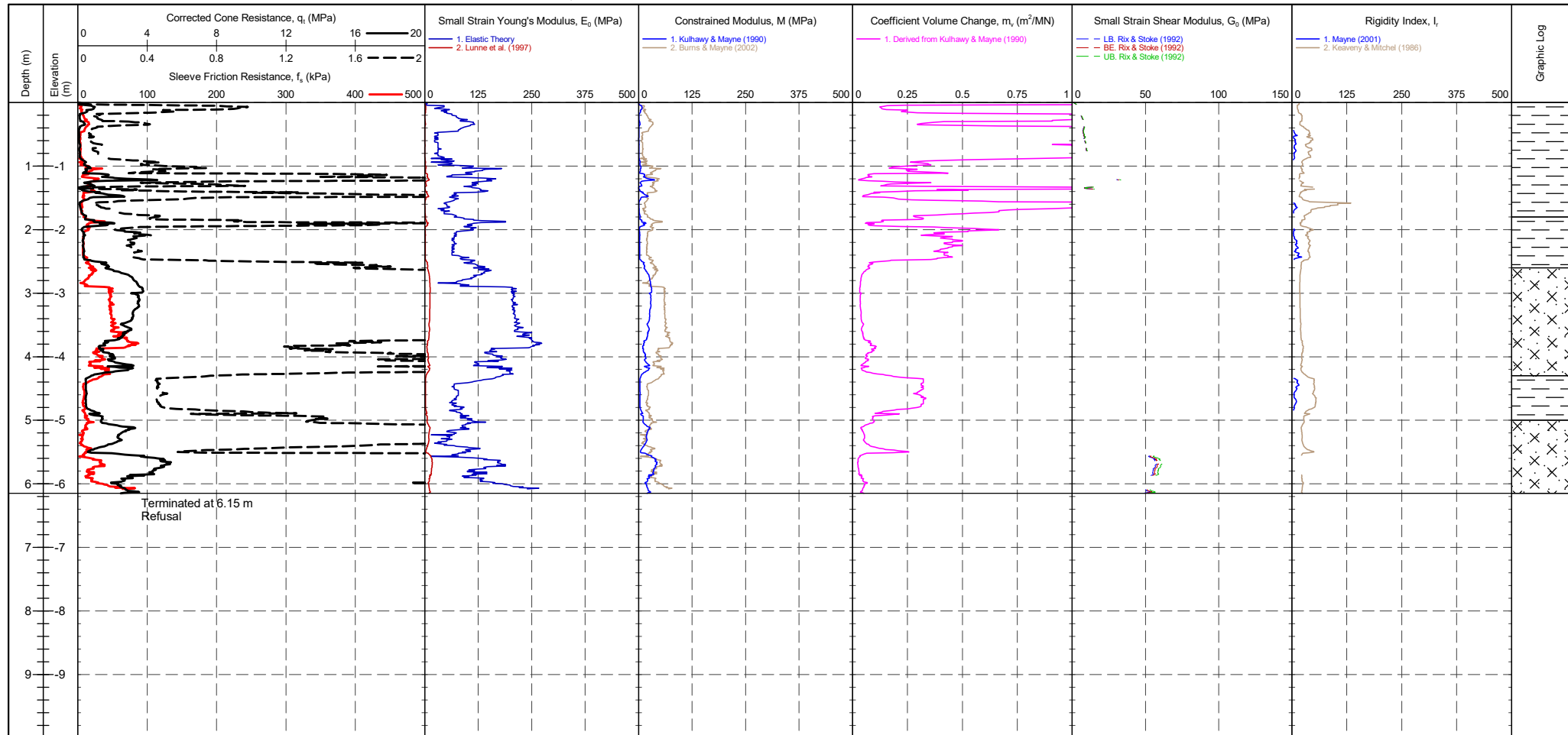
CPT02

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.1m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : 15cm²
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

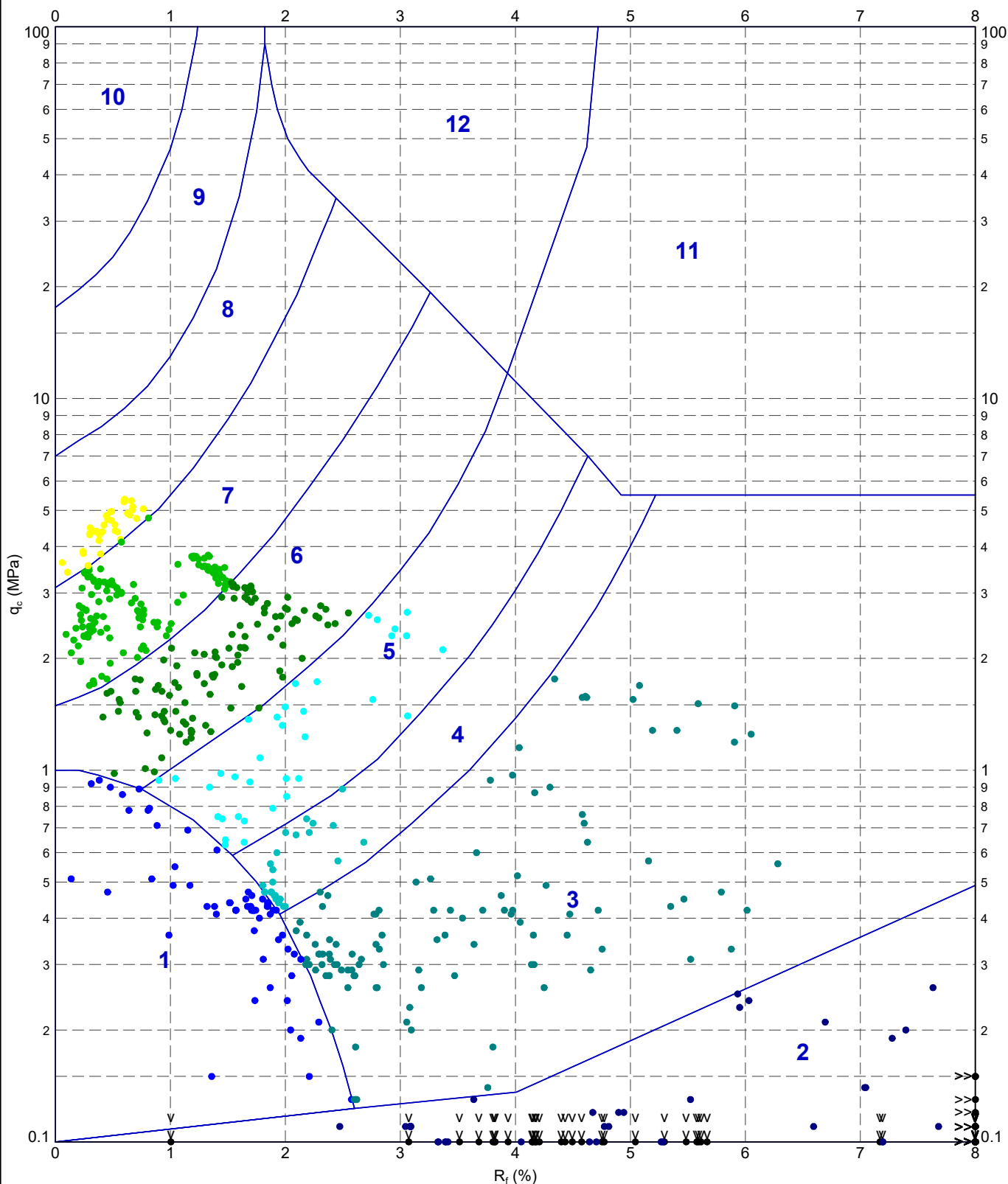
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	265 mV	-0.001 kPa
Pore Pressure 2	207 mV	206 mV	0 kPa
X-Y Inclinator	2541 mV	2469 mV	

Groundwater Level
Dissipation Test

220238-ADVANCED REPORT INSTITUSI 2.02.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. Rf AP 1220238-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:08 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10



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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT02

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

1220236

FIGURE No

Test ID

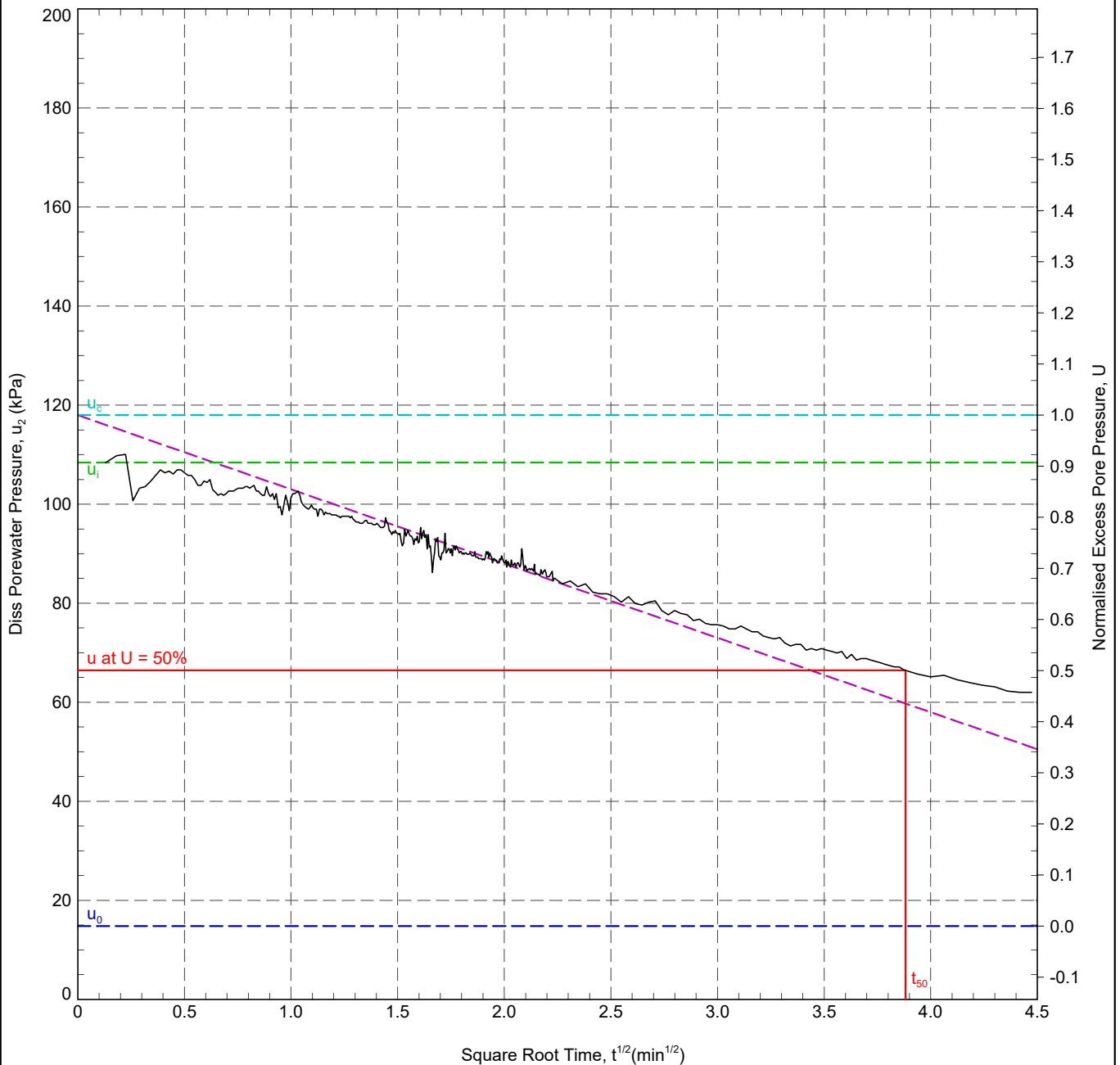
CPT02 - 2.01 m

Working with:

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 23/03/22



In Situ Pore Pressure, u_0 : 14.8 kPa
Initial Pore Pressure, u_i : 108.4 kPa
Final Pore Pressure: 62.0 kPa
Back Extrapolated Pore Pressure, u_c : 118 kPa
Degree of Dissipation: 50%
Dissipation Pressure: 66.4 kPa
Time for 50% Dissipation, t_{50} : 15.06 min

Rigidity Index, I_r : 7.6
Horizontal Coefficient of Consolidation, c_h : 1.25×10^1 m²/yr
Ratio c_h/c_v : 1.25
Vertical Coefficient of Consolidation, c_v : 9.97×10^0 m²/yr

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 24/03/2022
DATE: 24/03/2022
DATE: 24/03/2022

REMARK
T50 reached. Test OK.

Working with:

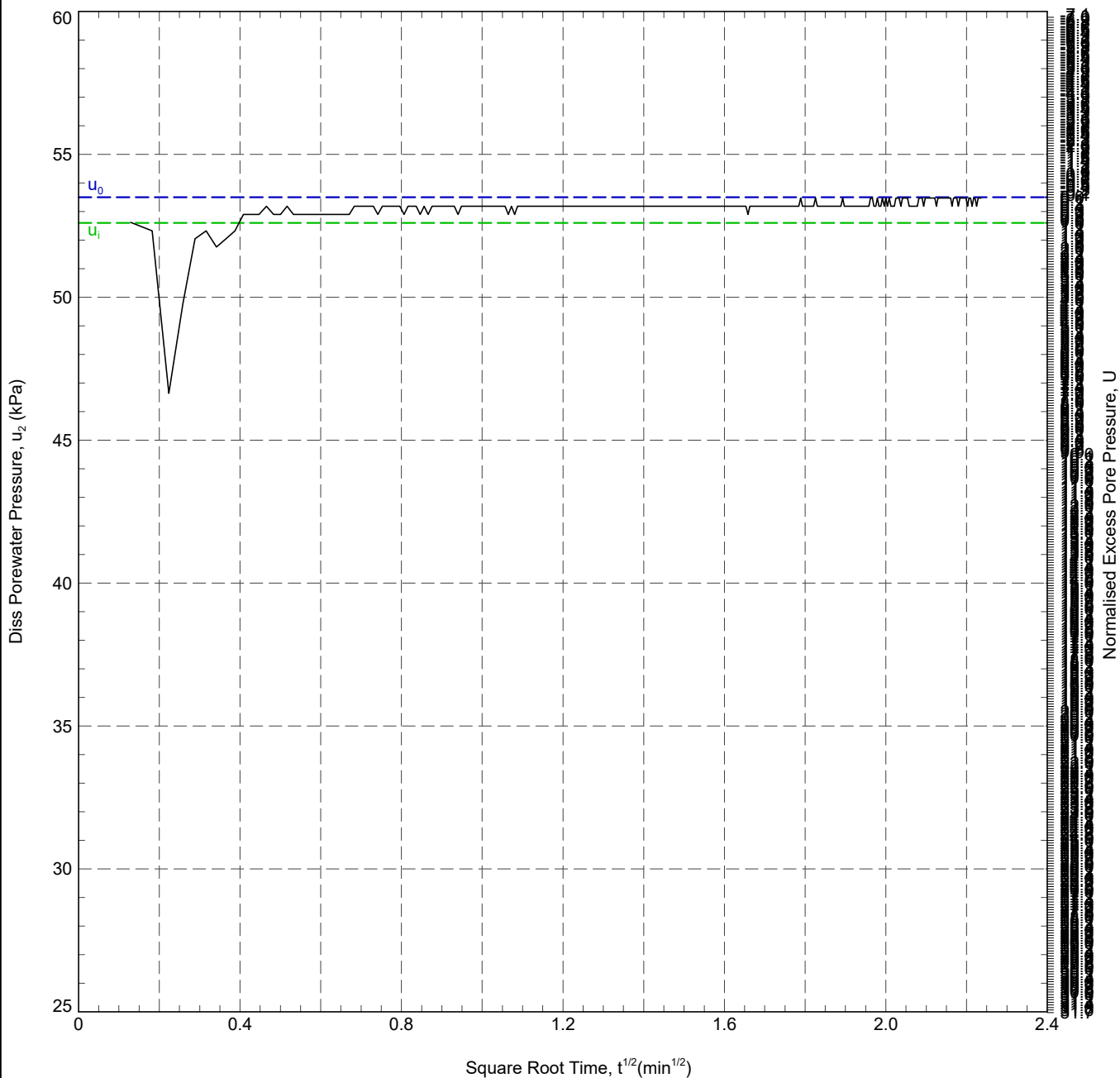
Test ID

CPT02 - 4.20 m

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 23/03/22



In Situ Pore Pressure, u_0 : 53.5 kPa
Initial Pore Pressure, u_i : 52.6 kPa
Final Pore Pressure: 53.5 kPa
Degree of Dissipation: 50%

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 24/03/2022
DATE: 24/03/2022
DATE: 24/03/2022

REMARK
T50 not reached.



PointID

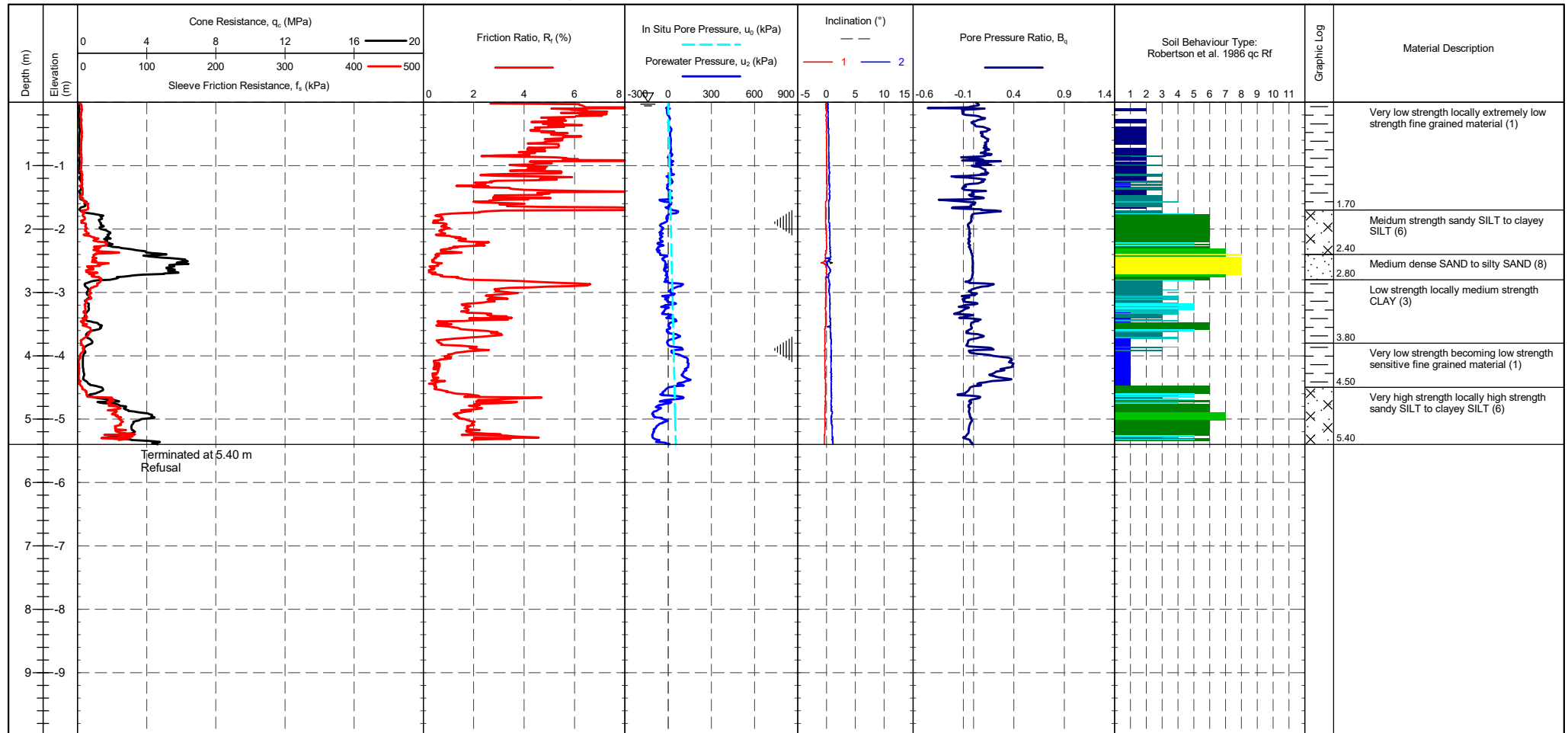
CPT03

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.6m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	206 mV	205 mV	0 kPa
X-Y Inclinator	2462 mV	2470 mV	

METHOD: Robertson et al. 1986 q_c R_f

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

Groundwater Level
Dissipation Test



PointID

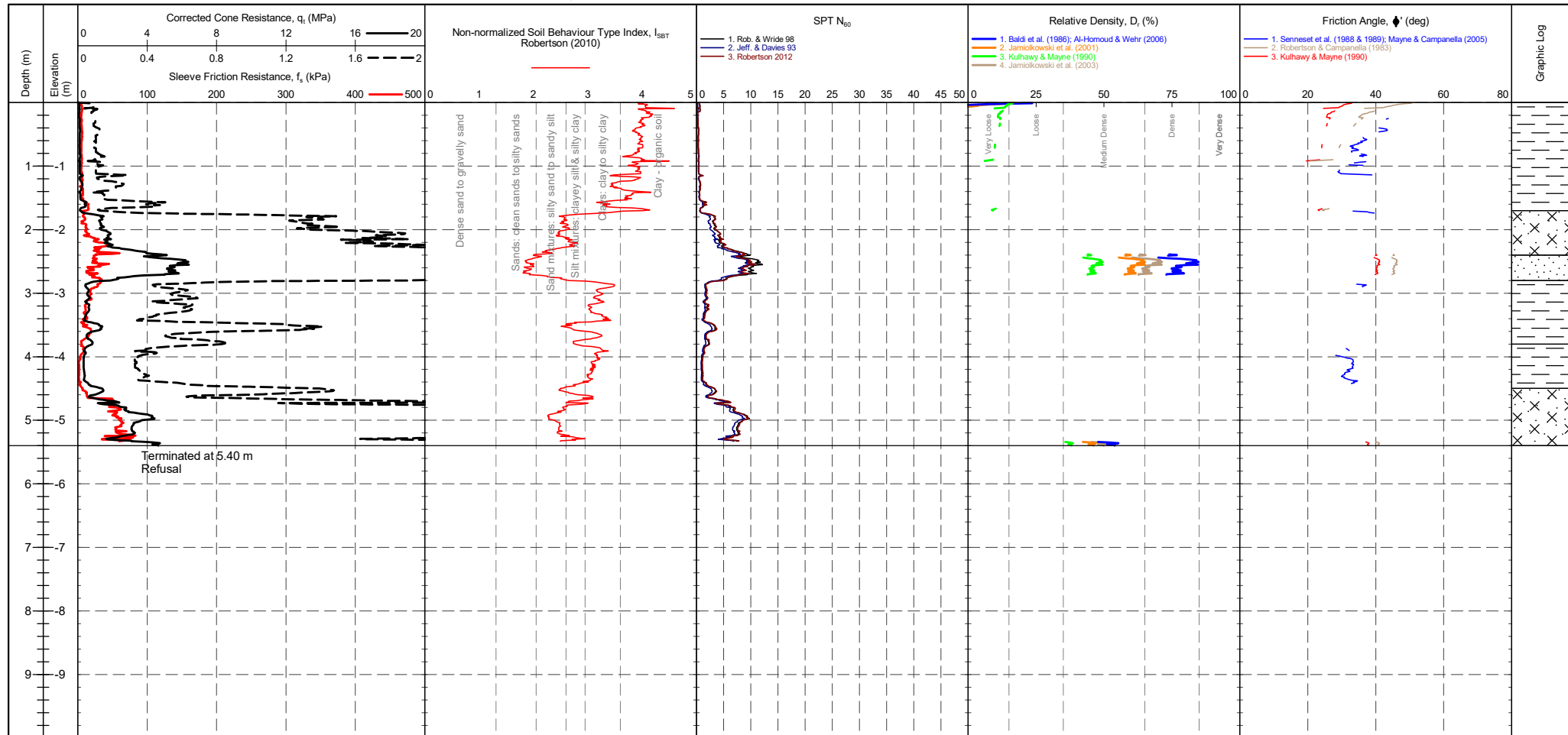
CPT03

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.6m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	206 mV	205 mV	0 kPa
X-Y Inclinator	2462 mV	2470 mV	

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

Description	SBT Index, I_c	Description	SPT N value, NSPT	Description	Relative Density D_r (%)
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



PointID

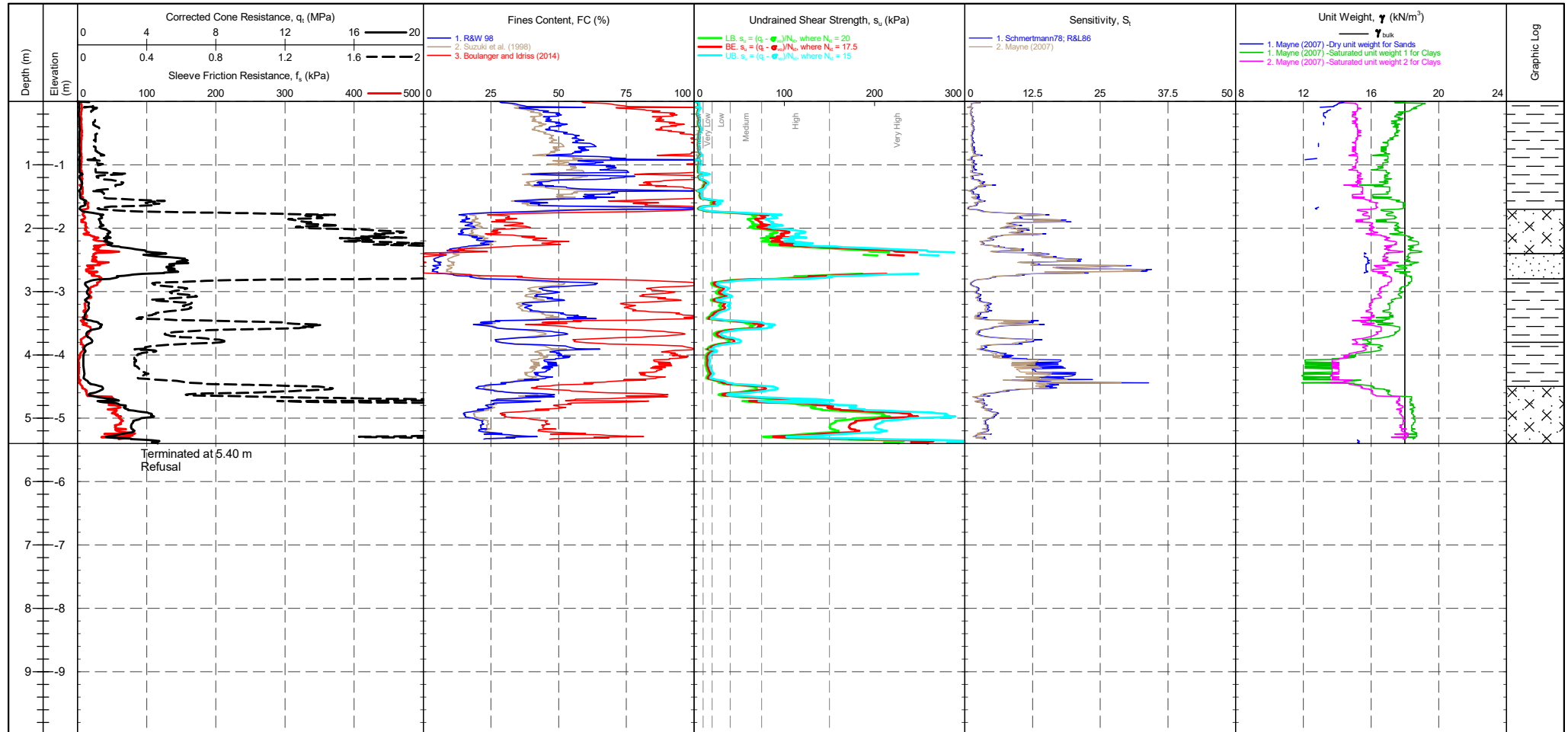
CPT03

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.6m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	206 mV	205 mV	0 kPa
X-Y inclinometer	2462 mV	2470 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

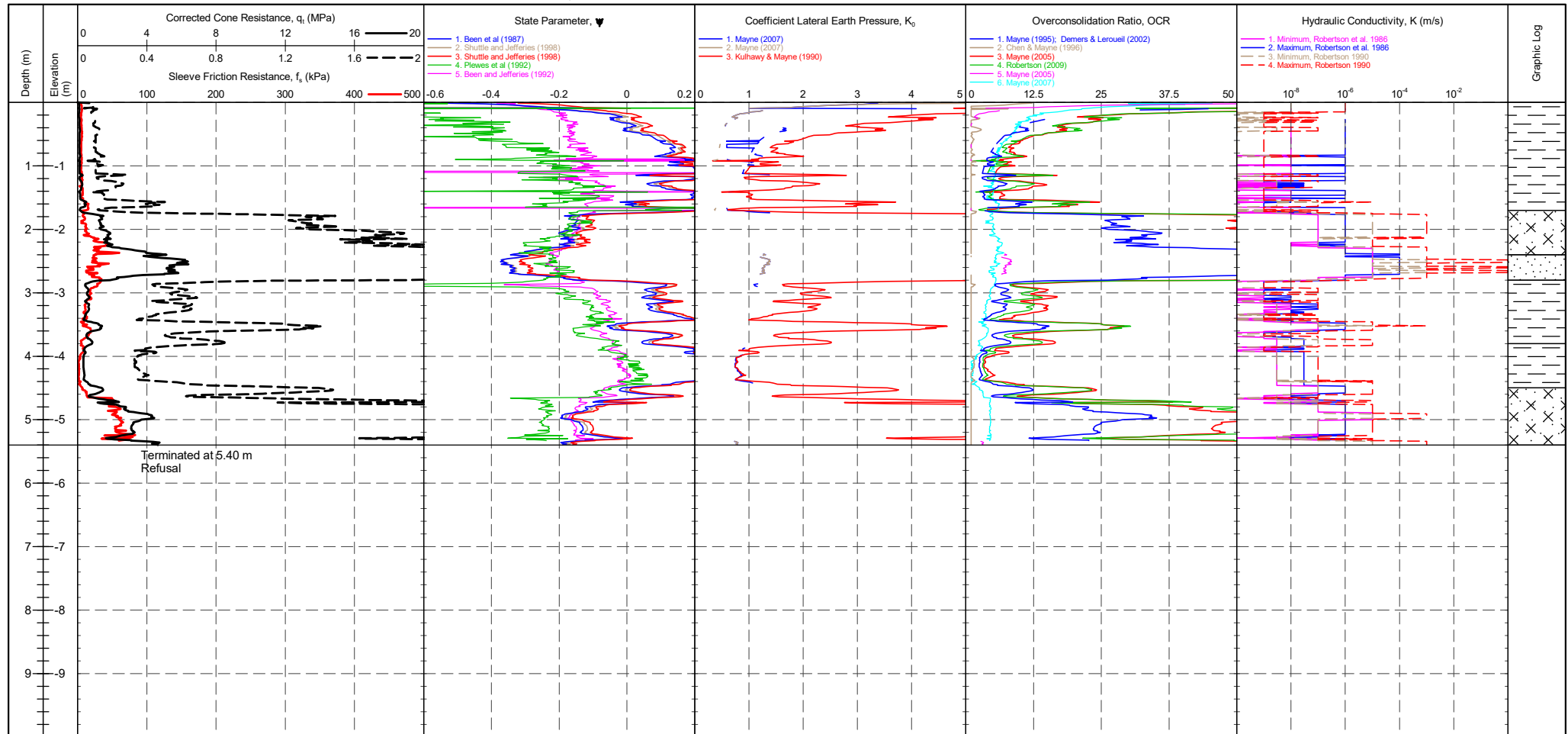
CPT03

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.6m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	206 mV	205 mV	0 kPa
X-Y Inclinator	2462 mV	2470 mV	

Groundwater Level
Dissipation Test



PointID

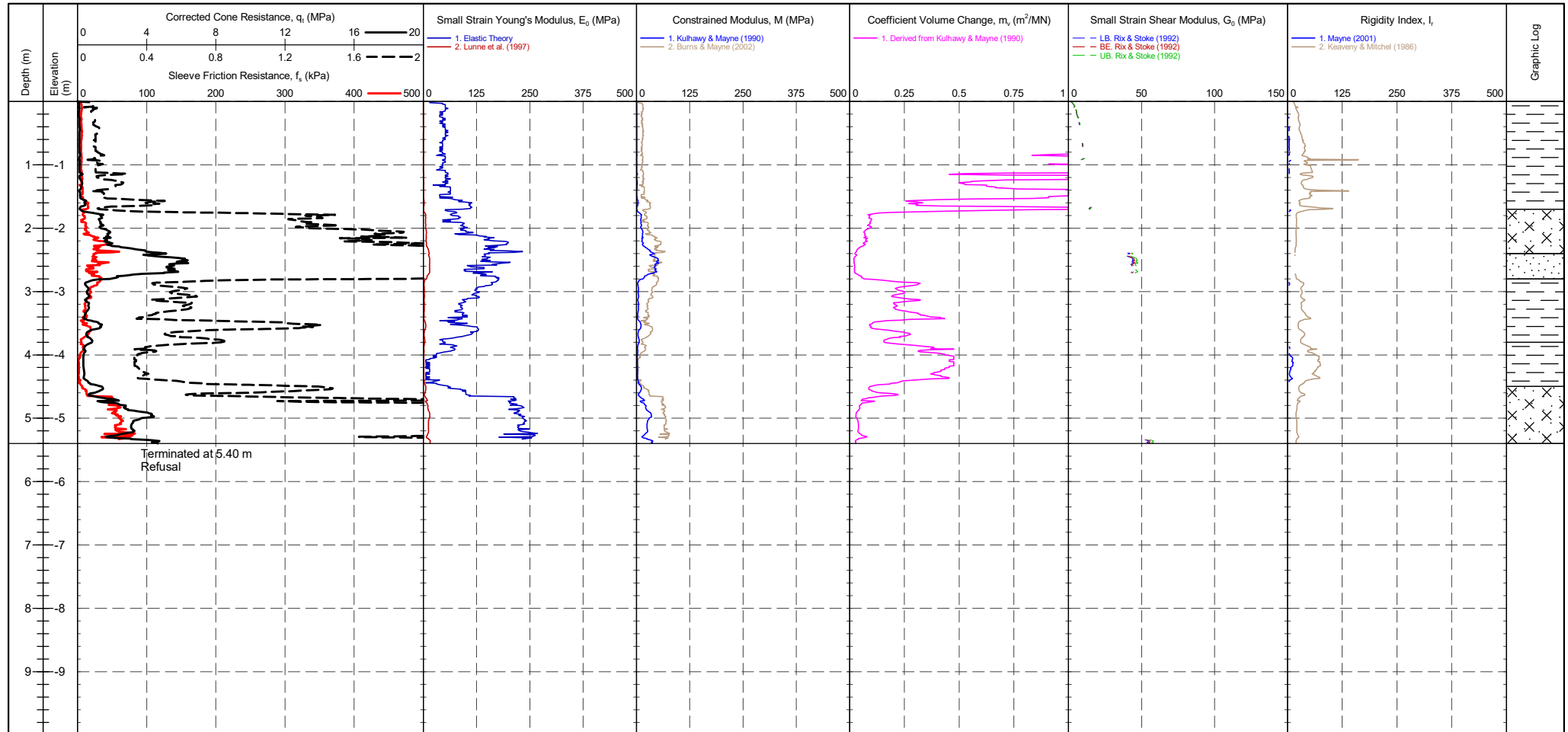
CPT03

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.6m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 23/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : $15cm^2$
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

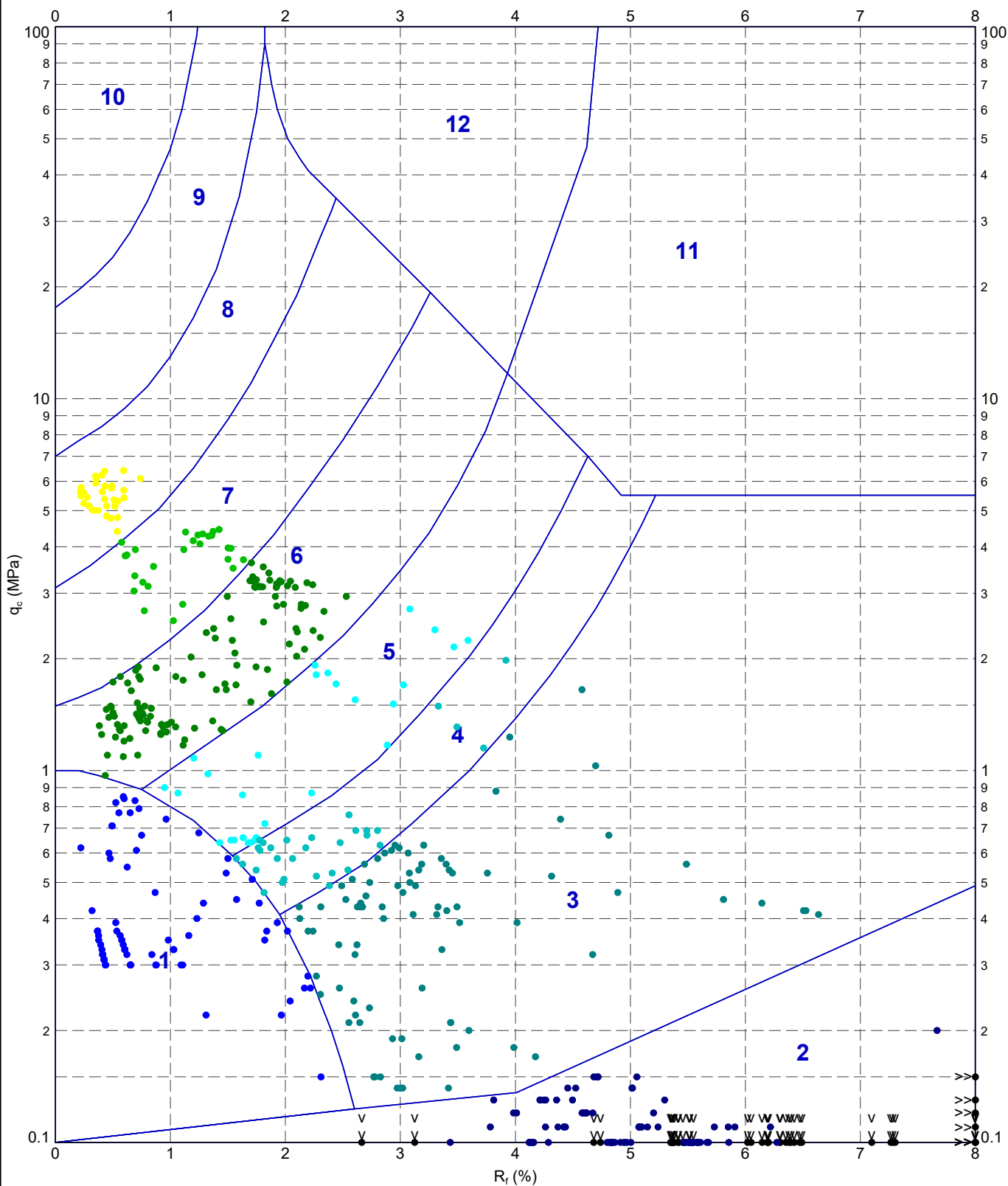
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	340 mV	339 mV	-0.011 MPa
Sleeve	267 mV	266 mV	-0.001 kPa
Pore Pressure 2	206 mV	205 mV	0 kPa
X-Y Inclinator	2462 mV	2470 mV	

Groundwater Level
Dissipation Test

220236-ADVANCED REPORT INSTITUSI 202.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF MAP 1220236-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:11 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c R_f

- | | | | |
|-------------------------------------|-------------------------------|------------------------------|------------------------------|
| 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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT03

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

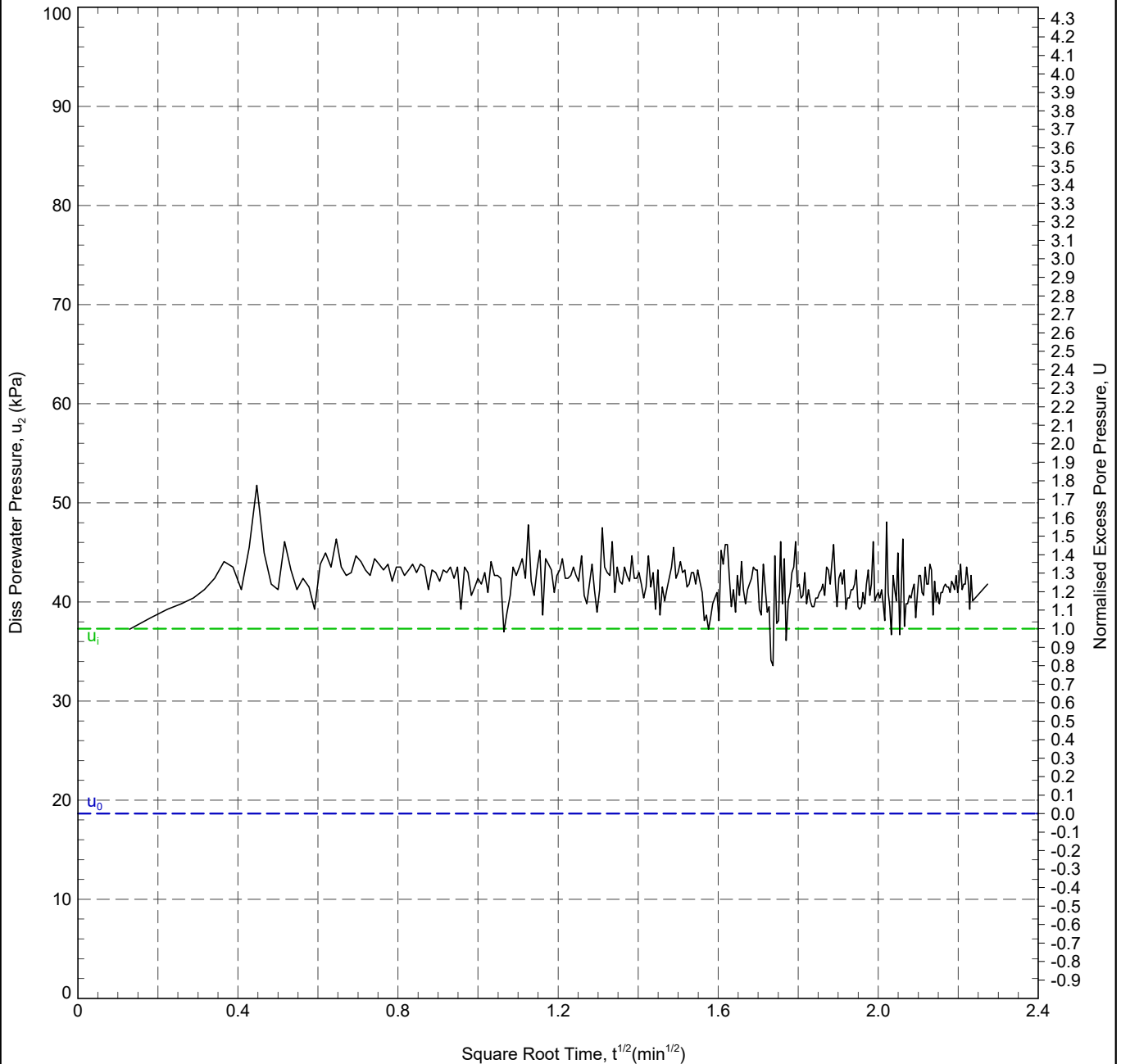
1220236

FIGURE No

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 23/03/22



In Situ Pore Pressure, u_0 : 18.6 kPa
Initial Pore Pressure, u_1 : 37.3 kPa
Final Pore Pressure: 41.8 kPa
Degree of Dissipation: 50%

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

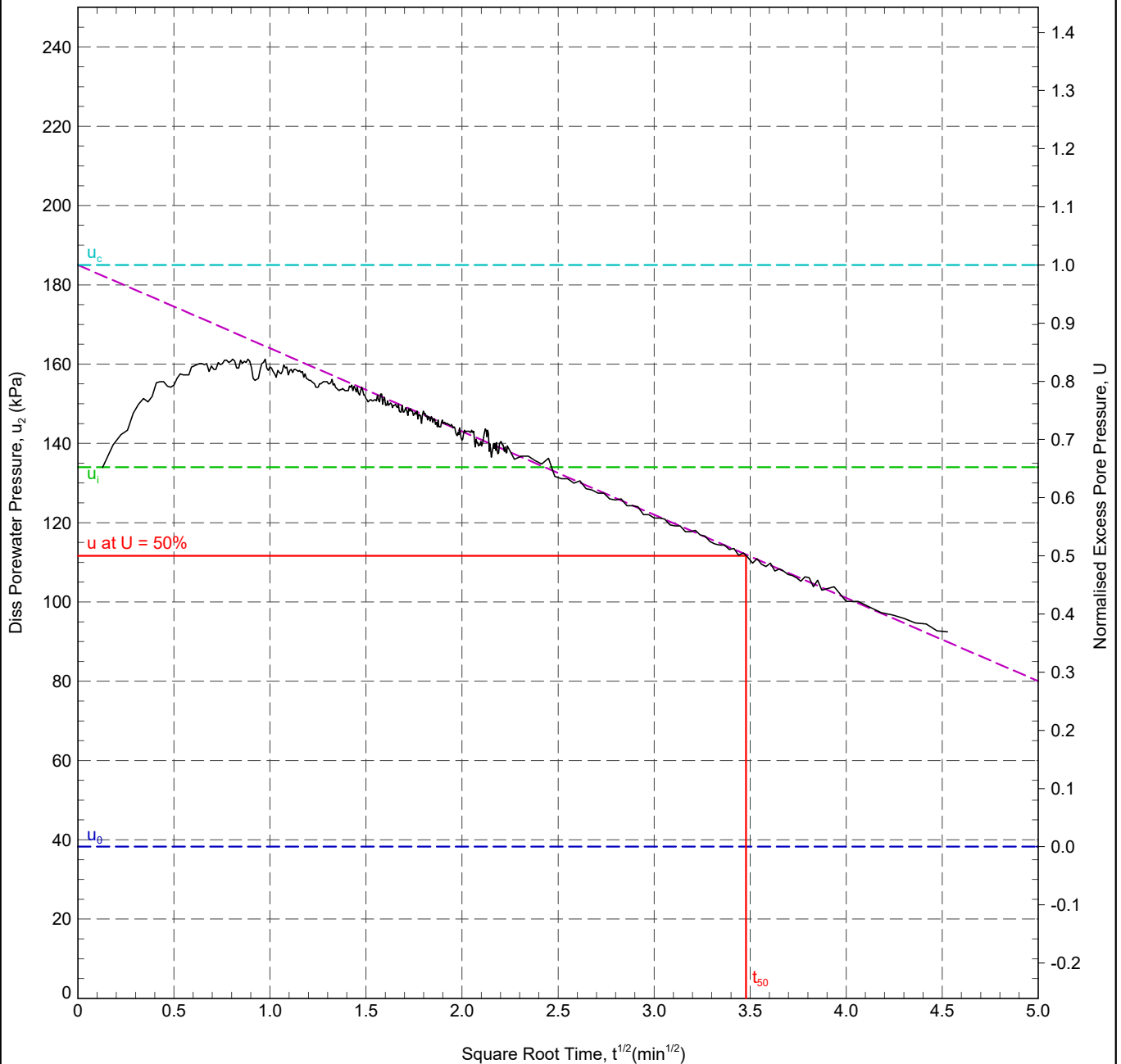
DATE: 24/03/2022
DATE: 24/03/2022
DATE: 24/03/2022

REMARK
T50 not reached.

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 23/03/22



In Situ Pore Pressure, u_0 : 38.3 kPa
Initial Pore Pressure, u_i : 134.0 kPa
Final Pore Pressure: 92.4 kPa
Back Extrapolated Pore Pressure, u_c : 185 kPa
Degree of Dissipation: 50%
Dissipation Pressure: 111.6 kPa
Time for 50% Dissipation, t_{50} : 12.10 min

Rigidity Index, I_r : 5
Horizontal Coefficient of Consolidation, c_h : 1.26×10^1 m²/yr
Ratio c_h/c_v : 1.25
Vertical Coefficient of Consolidation, c_v : 1.01×10^1 m²/yr

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 24/03/2022
DATE: 24/03/2022
DATE: 24/03/2022

REMARK
T50 reached. Test OK.



PointID

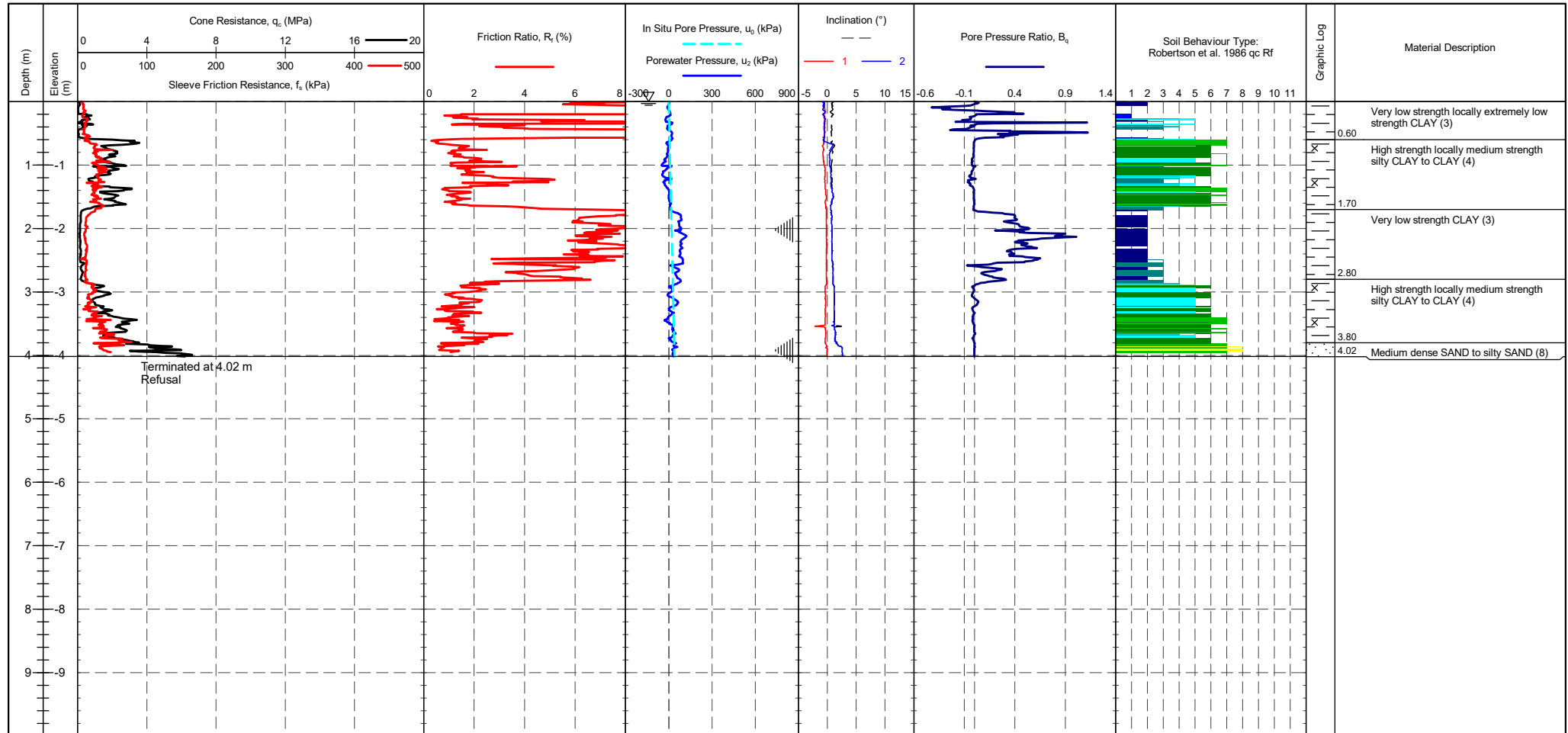
CPT04

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES
Transducer Pre Post Difference
Tip 347 mV 338 mV -0.099 MPa
Sleeve 272 mV 270 mV -0.001 kPa
Pore Pressure 2 183 mV 204 mV 0.006 kPa
X-Y Inclinator 2471 mV 2456 mV

METHOD: Robertson et al. 1986 q_c R_f

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 - Gravely SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level
Dissipation Test



PointID

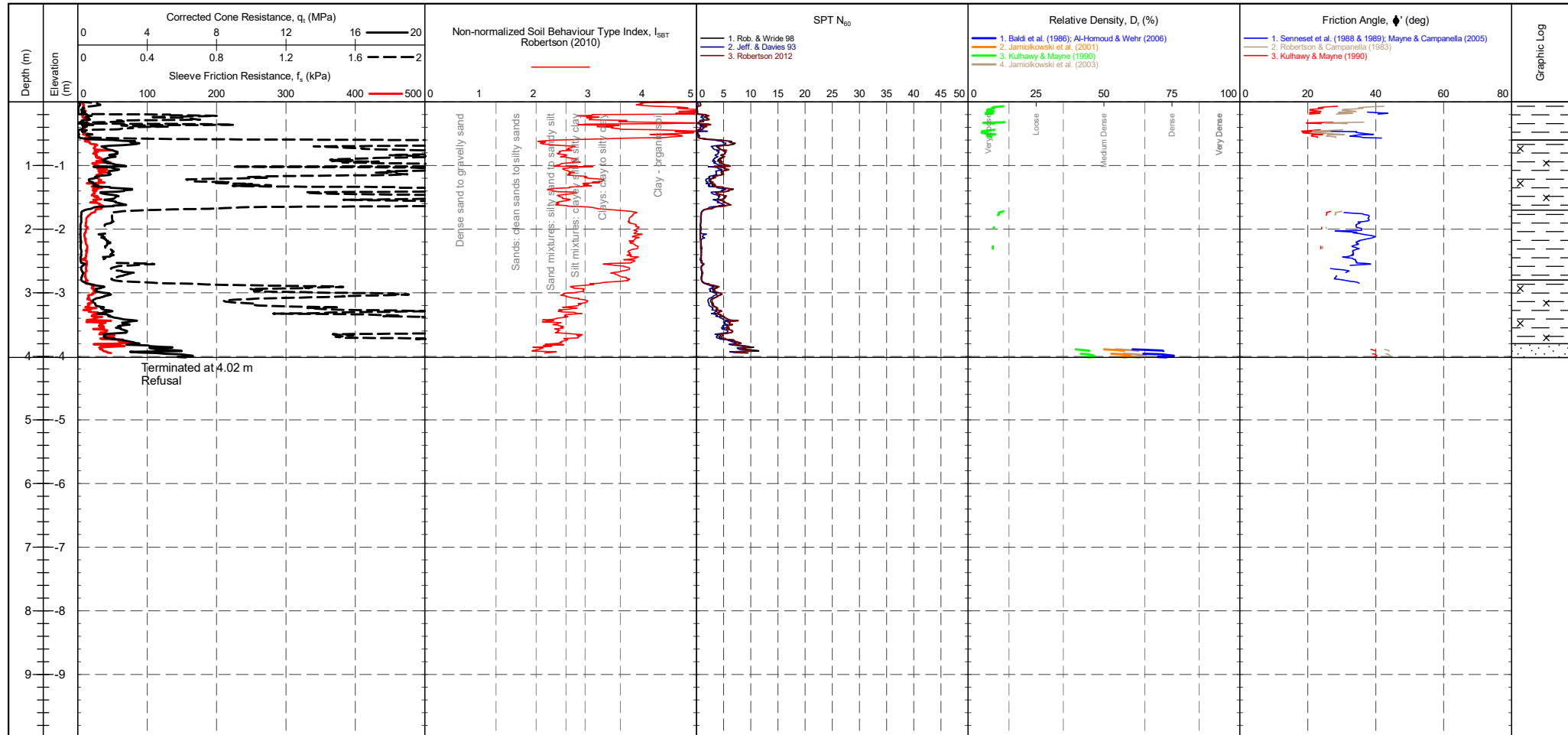
CPT04

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

Transducer : Pre Post
Tip : 347 mV 338 mV
Sleeve : 272 mV 270 mV
Pore Pressure 2 : 183 mV 204 mV
X-Y Inclinator : 2471 mV 2456 mV

CPTU ZERO VALUES

Difference : -0.099 MPa
-0.001 kPa
0.006 kPa

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12			
Description	SBT Index, I_c	Description	SPT N value, NSPT
Clays	2.95-3.60	Very Loose	0 - 4
Silt mixtures	2.60-2.95	Loose	4 - 10
Sand mixtures	2.05-2.60	Medium Dense	10 - 30
Sands	1.31-2.05	Dense	30 - 50
Gravelly sand	<1.31	Very Dense	>50

Groundwater Level
Dissipation Test



PointID

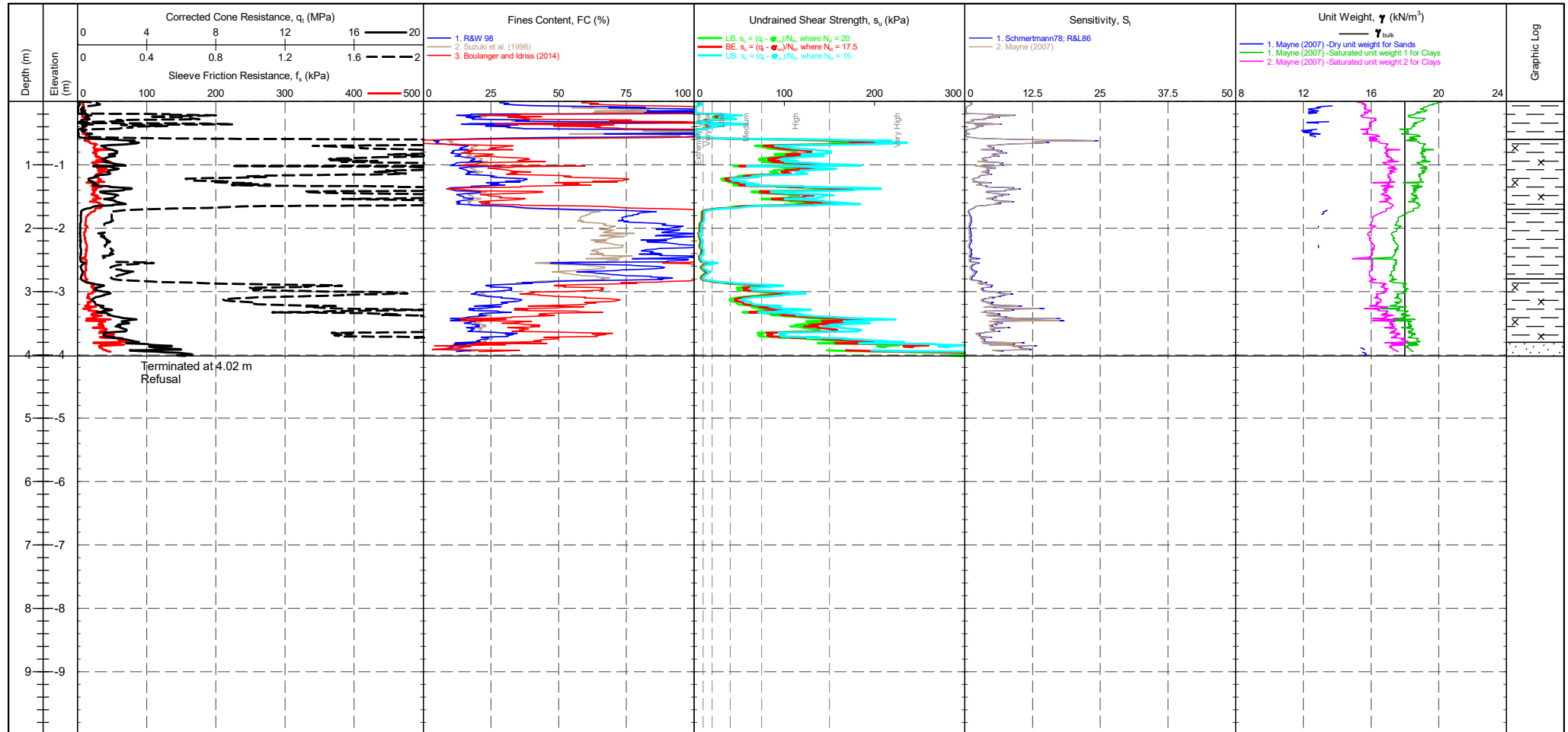
CPT04

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	347 mV	338 mV	-0.099 MPa
Sleeve	272 mV	270 mV	-0.001 kPa
Pore Pressure 2	183 mV	204 mV	0.006 kPa
X-Y Inclinator	2471 mV	2456 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

CPT04

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	347 mV	338 mV	-0.099 MPa
Sleeve	272 mV	270 mV	-0.001 kPa
Pore Pressure 2	183 mV	204 mV	0.006 kPa
X-Y Inclinator	2471 mV	2456 mV	

Groundwater Level
Dissipation Test



PointID

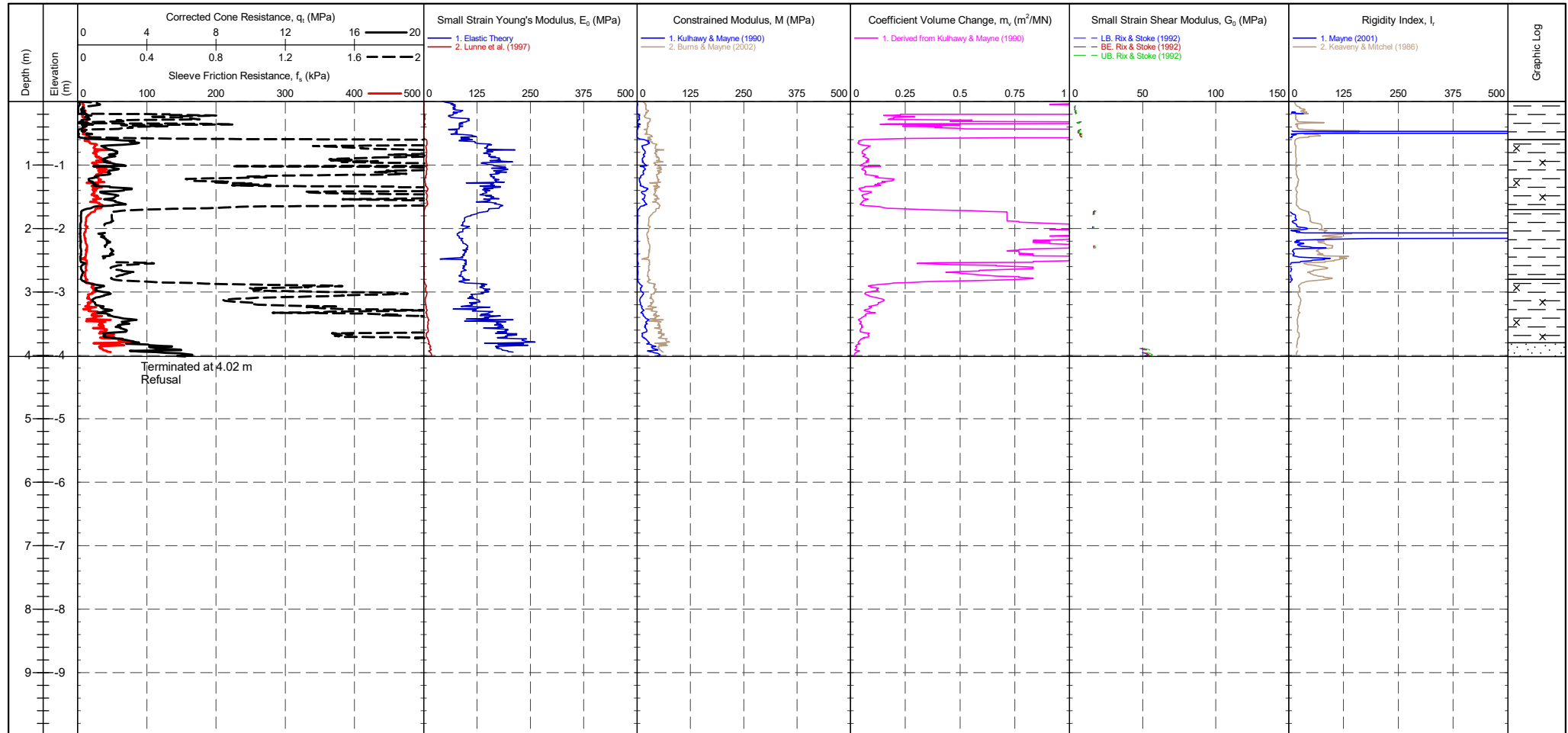
CPT04

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : $15cm^2$
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

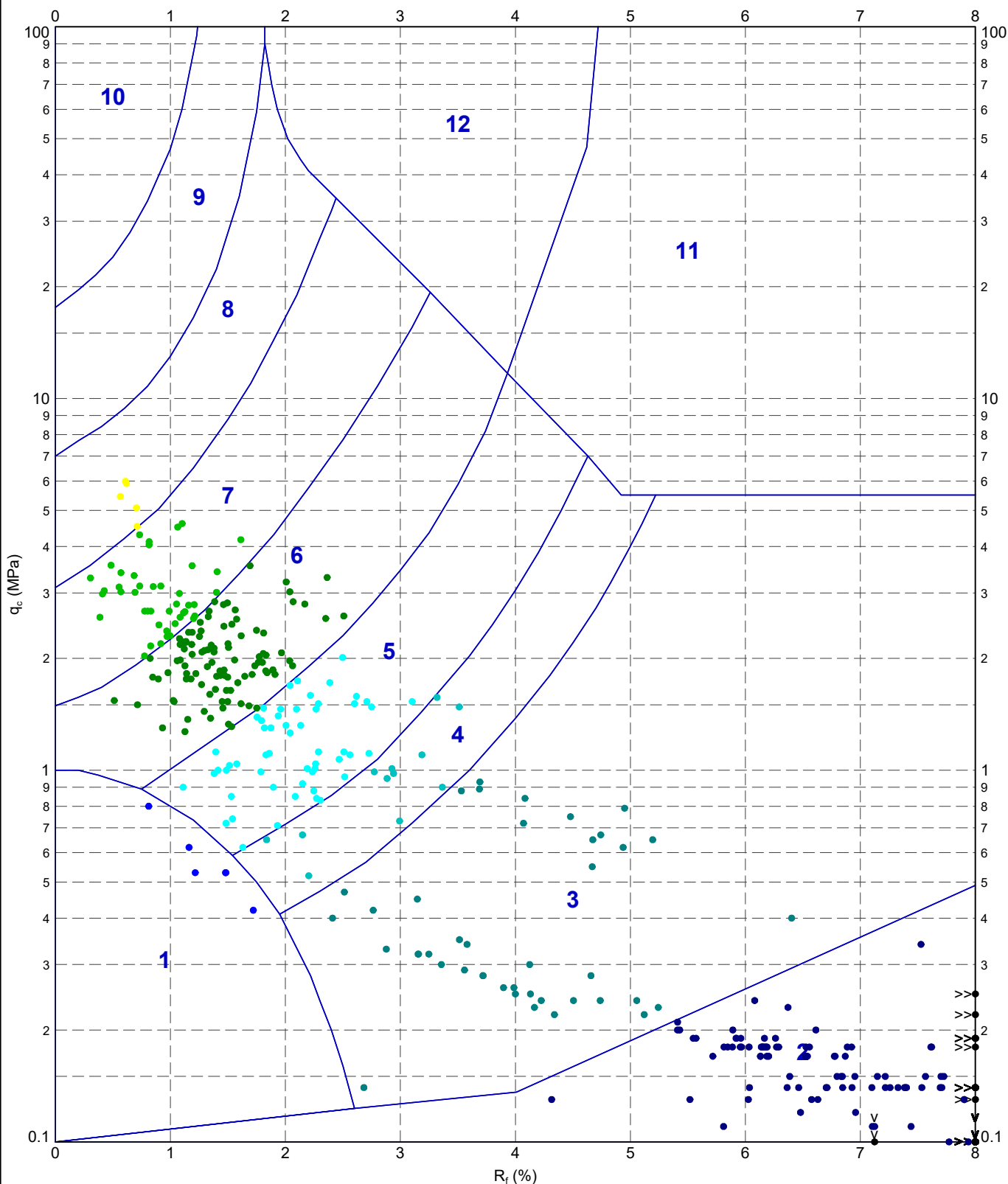
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	347 mV	338 mV	-0.099 MPa
Sleeve	272 mV	270 mV	-0.001 kPa
Pore Pressure 2	183 mV	204 mV	0.006 kPa
X-Y Inclinator	2471 mV	2456 mV	

Groundwater Level
Dissipation Test

22028-ADVANCED REPORT INSTITUSI 2.02.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF MAP 1220236-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:14 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Pj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c vs R_f

- | | | | |
|-------------------------------------|-------------------------------|------------------------------|------------------------------|
| 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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT04

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

1220236

FIGURE No

Test ID

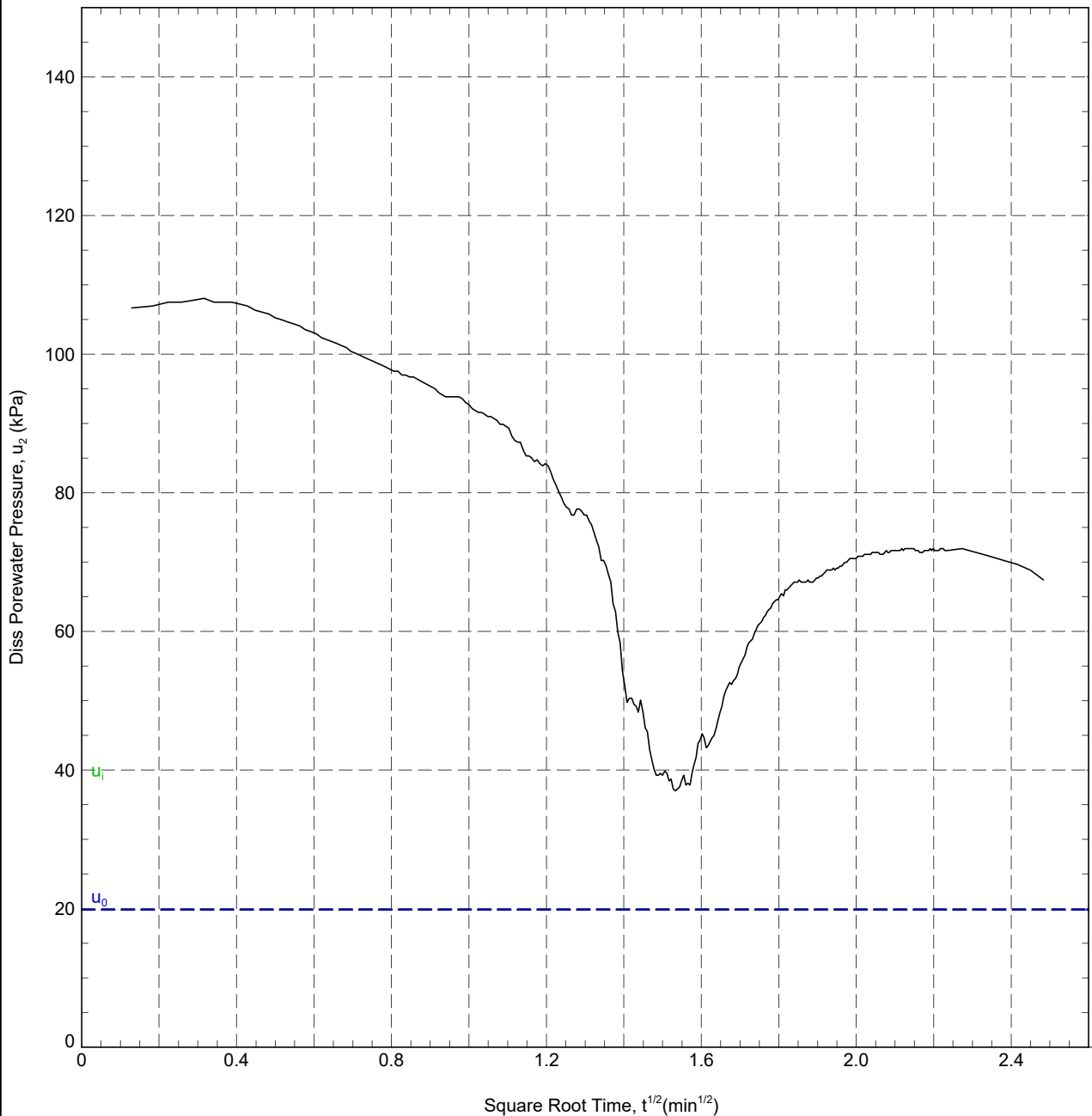
CPT04 - 2.02 m

Working with:

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 24/03/22



In Situ Pore Pressure, u_0 :
Final Pore Pressure:
Degree of Dissipation:

19.8 kPa
67.4 kPa
50%

Rigidity Index, I_r :

28.2

Normalised Excess Pore Pressure, U

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 25/03/2022
DATE: 25/03/2022
DATE: 25/03/2022

REMARK
T50 not reached.

DISSIPATION TEST

IN SITU
 SITE INVESTIGATION


Working with:

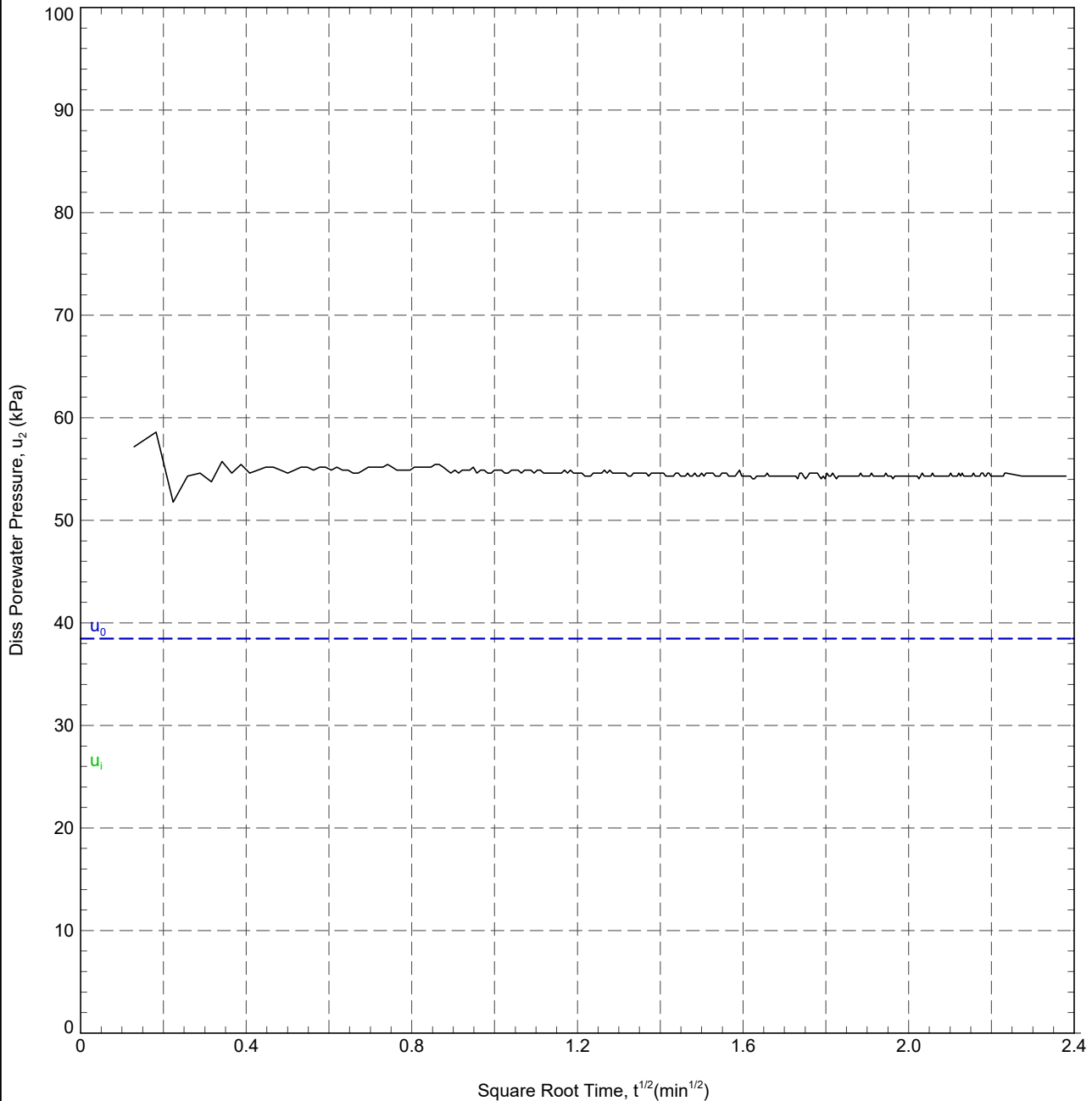
Test ID

CPT04 - 3.92 m

CLIENT : Central Alliance
 ENGINEER : Oliver Dustan
 PROJECT : Cardigan Tidal Flood Risk Management
 LOCATION : Cardigan
 PROJECT No. : 1220236

AREA : Cardigan
 EASTING : 0.0 m
 NORTHING : 0.0 m
 COORD. SYS.:
 ELEVATION : 0.00 m

SHEET : 1 OF 1
 STATUS : Final
 DATE : 24/03/22



In Situ Pore Pressure, u_0 : 38.5 kPa
 Final Pore Pressure: 54.3 kPa
 Degree of Dissipation: 50%

RIG : CPT 020 - Pagani
 CONE TYPE : Subtraction
 CONE ID : S15-CFIP.1360
 OPERATOR : IM & DR

ANALYSED BY : LD
 CHECKED BY : LD
 APPROVED BY : DW

DATE: 25/03/2022
 DATE: 25/03/2022
 DATE: 25/03/2022

REMARK
 T50 not reached.



PointID

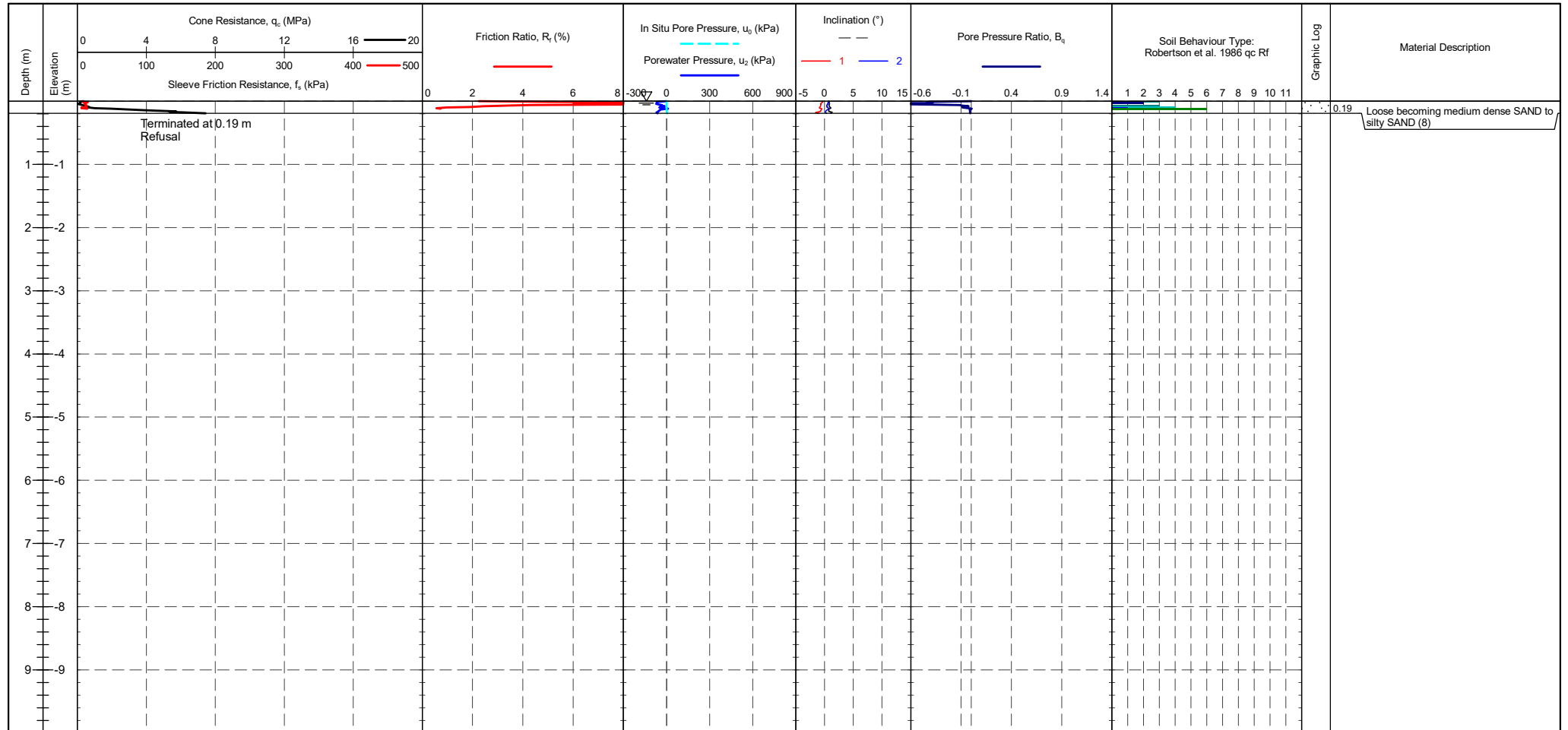
CPT05

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.0m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360	TEST TYPE : TE2	CPTU ZERO VALUES				METHOD: Robertson et al. 1986 qc Rf				Groundwater Level Dissipation Test
CALIBRATION DATE : 02/02/2022	APPLICATION CLASS : 2	Transducer	Pre	Post	Difference	1 - Sensitive fine grained material	5 - Clayey SILT to silty CLAY	9 - SAND		
CONE MODEL : Subtraction	RIG : CPT 020 - Pagani	Tip	349 mV	336 mV	-0.143 MPa	2 - Organic material	6 - Sandy SILT to clayey SILT	10 - Gravelly SAND to SAND		
CONE AREA : 15cm ²	OPERATOR : IM	Sleeve	264 mV	263 mV	-0.001 kPa	3 - CLAY	7 - Silty SAND to sandy SILT	11 - Very stiff fine grained		
CONE AREA RATIO : 0.79	FRICITION REDUCER : None	Pore Pressure 2	170 mV	203 mV	0.009 kPa	4 - Silty CLAY to CLAY	8 - SAND to silty SAND	12 - SAND to clayey SAND		
FILTER POSITION : u2	WEATHER : Sunny & Cold	X-Y Inclinator	2519 mV	2522 mV						
FILTER TYPE : HDPE	GROUNDWATER DEPTH : Assumed for calculation purposes									



PointID

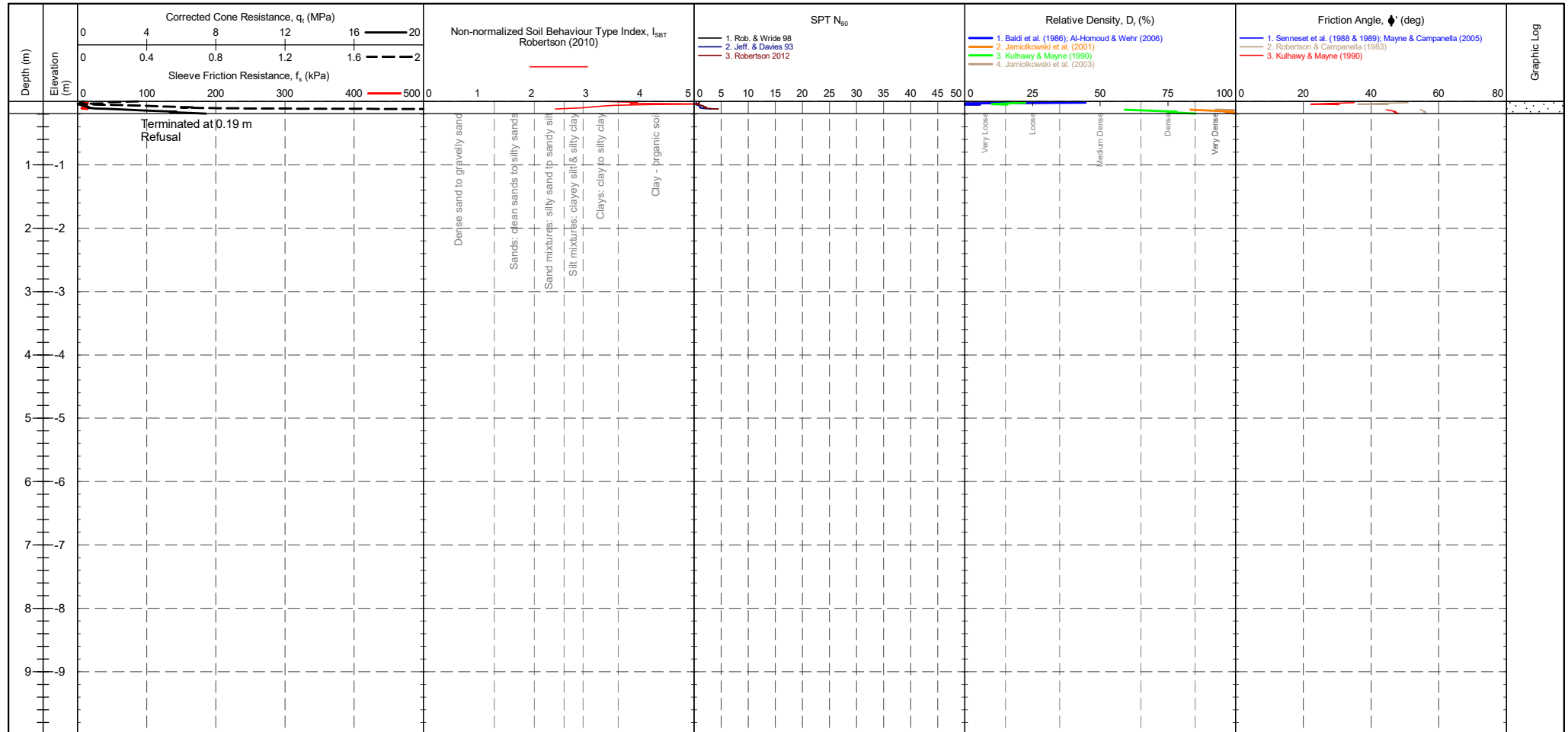
CPT05

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.0m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

Transducer
Tip
Sleeve
Pore Pressure 2
X-Y Inclinator

Pre
349 mV
264 mV
170 mV
2519 mV

Post
336 mV
263 mV
203 mV
2522 mV

Difference
-0.143 MPa
-0.001 kPa
0.009 kPa

CPTU ZERO VALUES

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12					
Description	SBT Index, I_c	Description	SPT N value, NSPT	Description	Relative Density D_r (%)
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



PointID

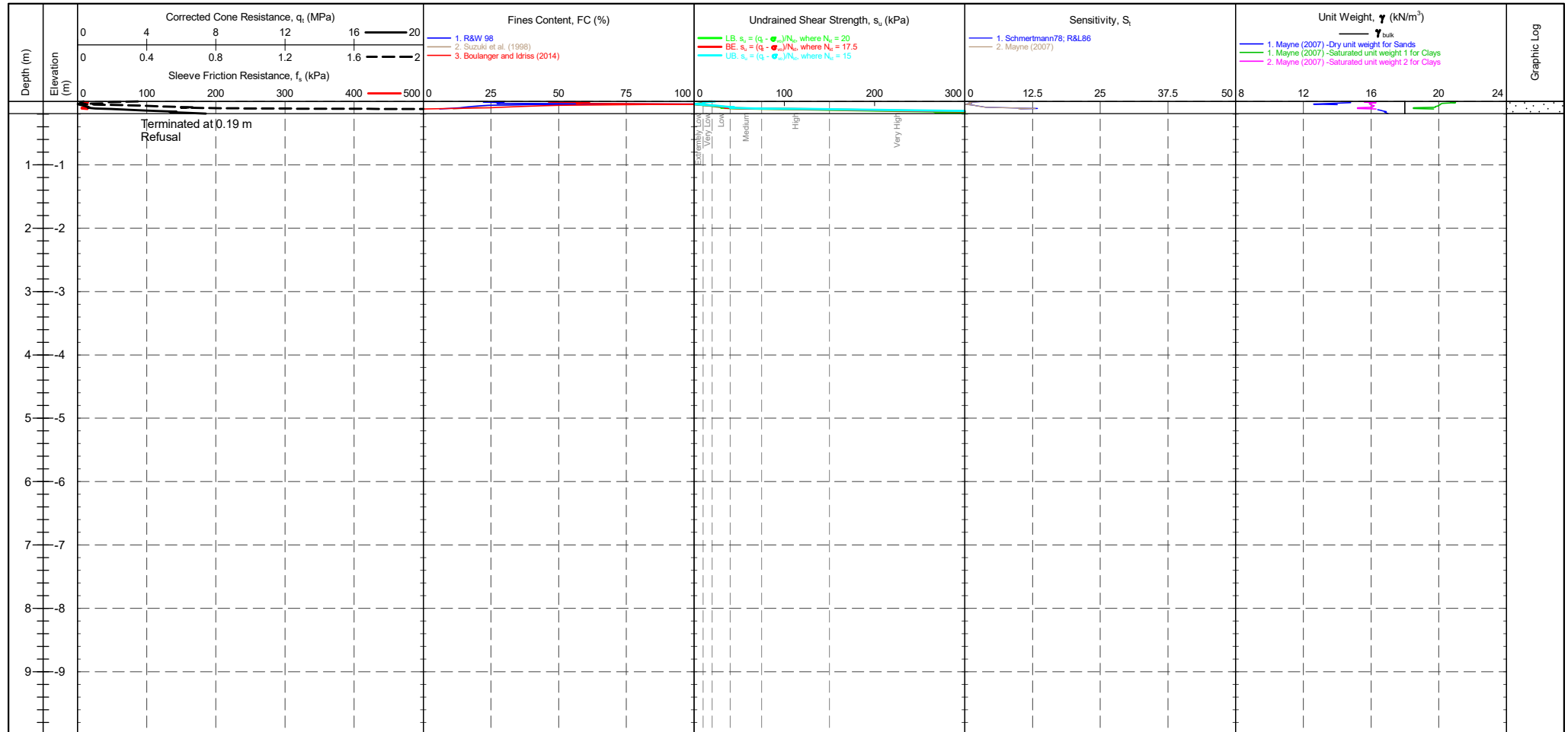
CPT05

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.0m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	349 mV	336 mV	-0.143 MPa
Sleeve	264 mV	263 mV	-0.001 kPa
Pore Pressure 2	170 mV	203 mV	0.009 kPa
X-Y Inclinator	2519 mV	2522 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

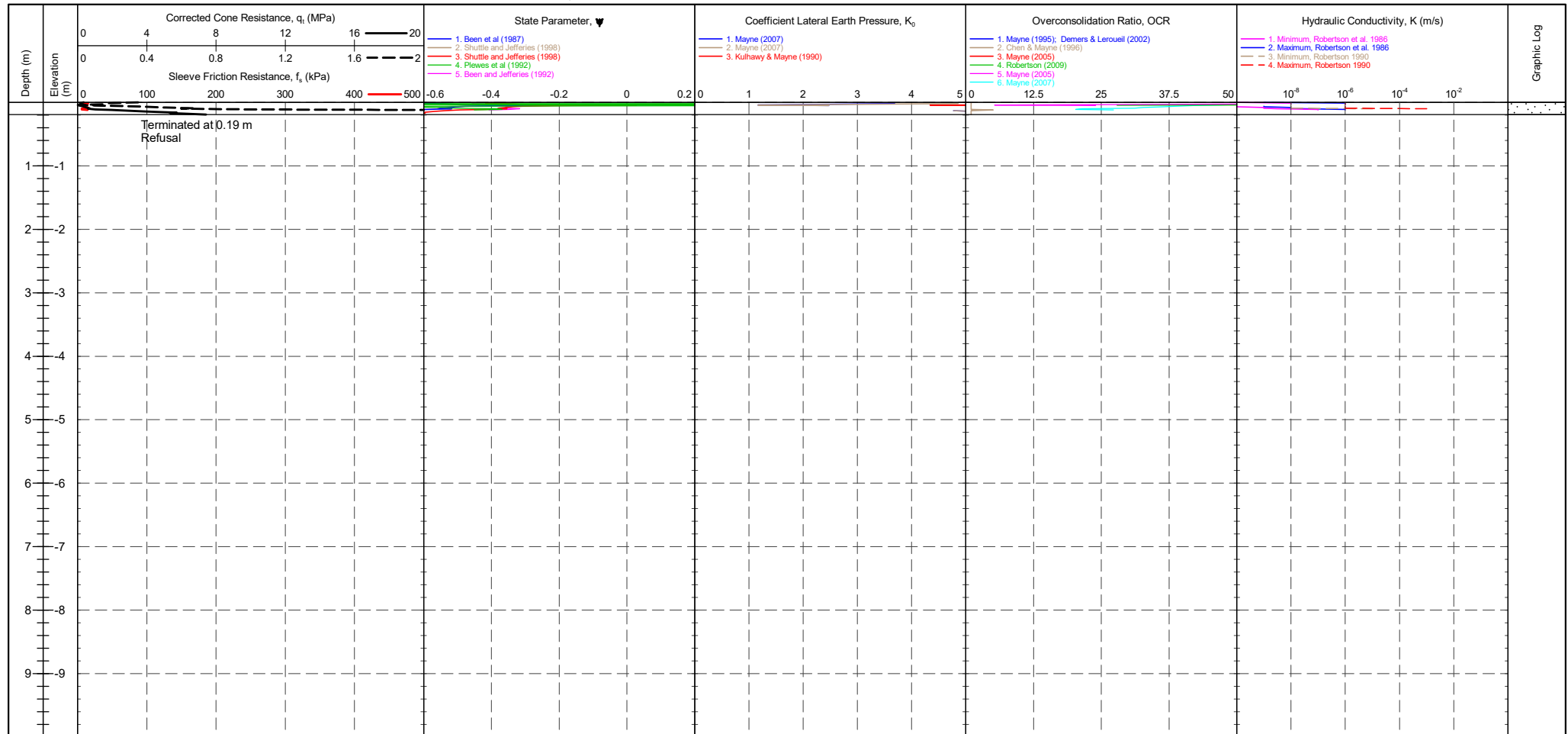
CPT05

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.0m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	349 mV	336 mV	-0.143 MPa
Sleeve	264 mV	263 mV	-0.001 kPa
Pore Pressure 2	170 mV	203 mV	0.009 kPa
X-Y Inclinator	2519 mV	2522 mV	

Groundwater Level
Dissipation Test



PointID

CPT05

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.0m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : 15cm²
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

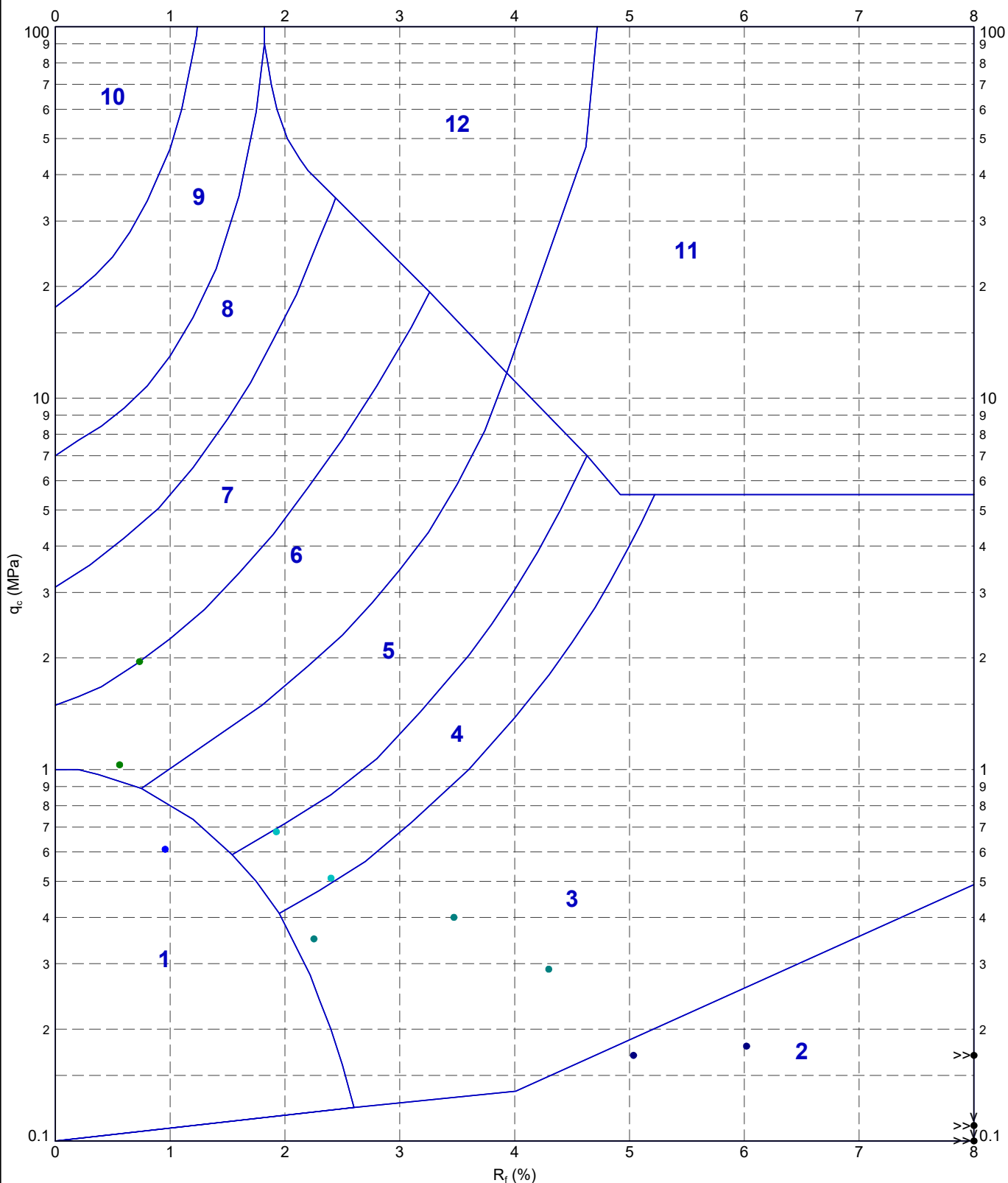
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	349 mV	336 mV	-0.143 MPa
Sleeve	264 mV	263 mV	-0.001 kPa
Pore Pressure 2	170 mV	203 mV	0.009 kPa
X-Y Inclinator	2519 mV	2522 mV	

Groundwater Level
Dissipation Test

220238-ADVANCED REPORT INSTITUSI 2.02.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF AP 1220238-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:16 10.03.00.09 Dargel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c R_f

- | | | | |
|-------------------------------------|-------------------------------|------------------------------|------------------------------|
| 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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT05

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

1220236

FIGURE No



PointID

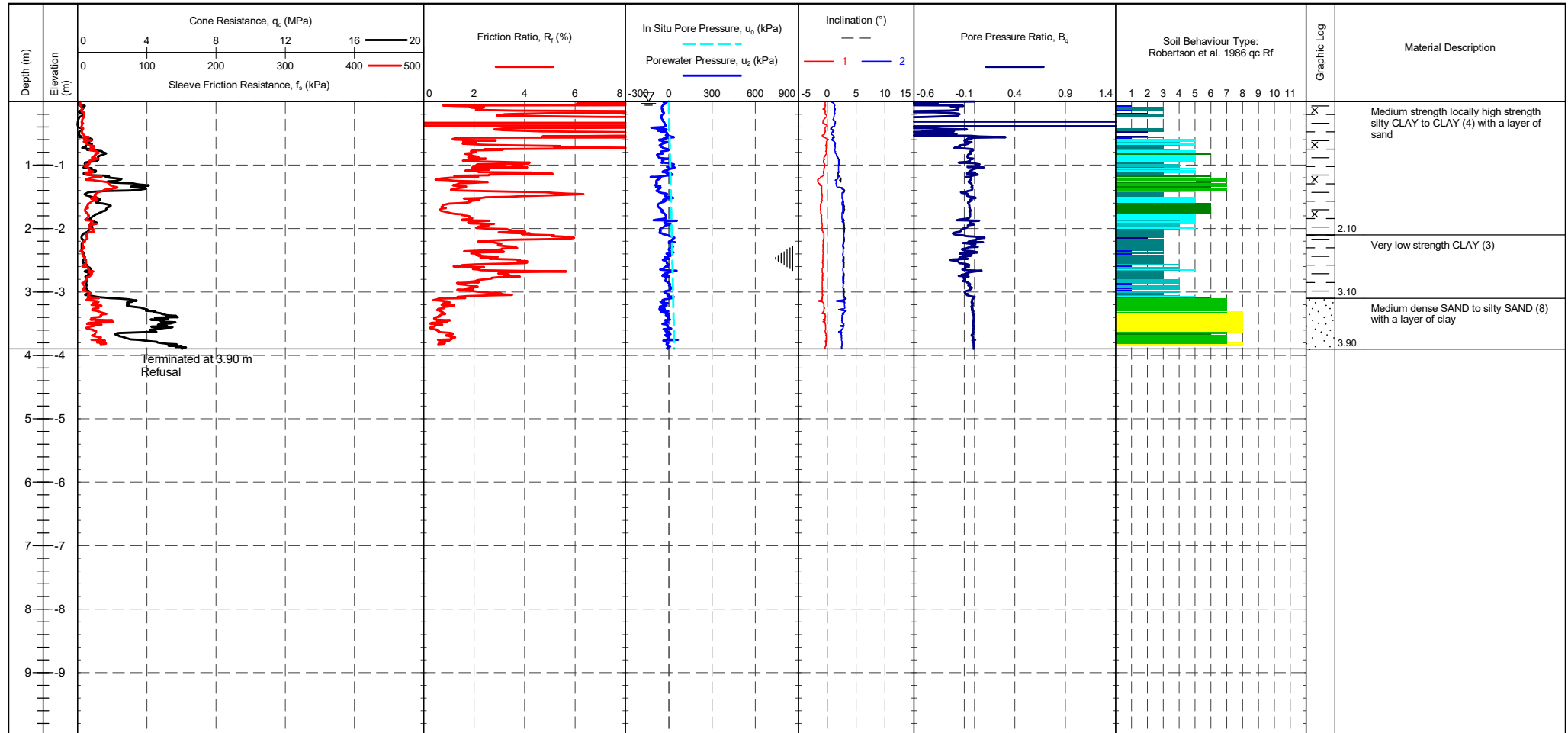
CPT05T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.5m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	343 mV	339 mV	-0.044 MPa
Sleeve	265 mV	262 mV	-0.002 kPa
Pore Pressure 2	186 mV	201 mV	0.004 kPa
X-Y Inclinator	2526 mV	2579 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level
Dissipation Test



PointID

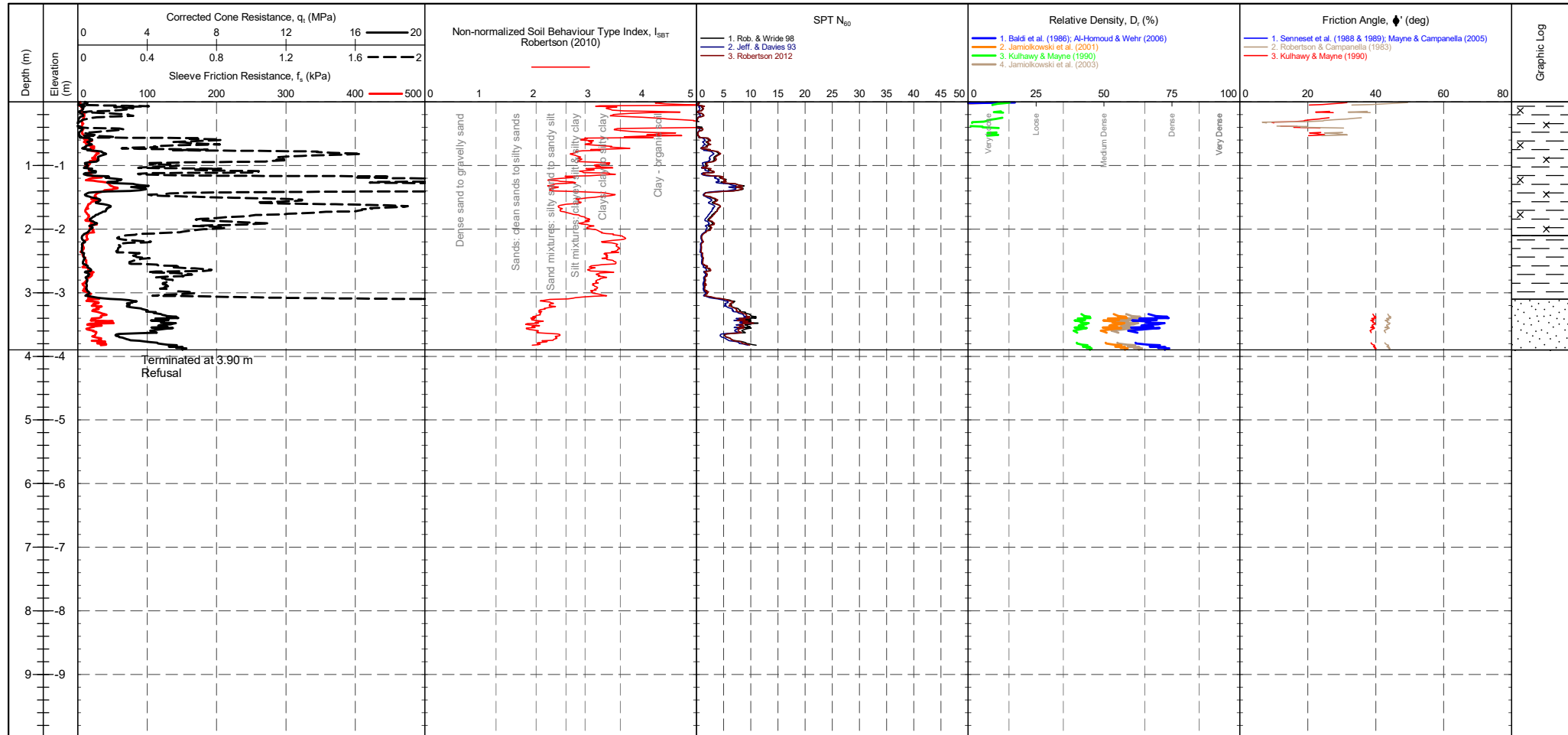
CPT05T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.5m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	343 mV	339 mV	-0.044 MPa
Sleeve	265 mV	262 mV	-0.002 kPa
Pore Pressure 2	186 mV	201 mV	0.004 kPa
X-Y Inclinator	2526 mV	2579 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12			
Description	SBT Index, I_c	Description	SPT N value, NSPT
Clays	2.95-3.60	Very Loose	0 - 4
Silt mixtures	2.60-2.95	Loose	4 - 10
Sand mixtures	2.05-2.60	Medium Dense	10 - 30
Sands	1.31-2.05	Dense	30 - 50
Gravelly sand	<1.31	Very Dense	>50

Groundwater Level

Dissipation Test



PointID

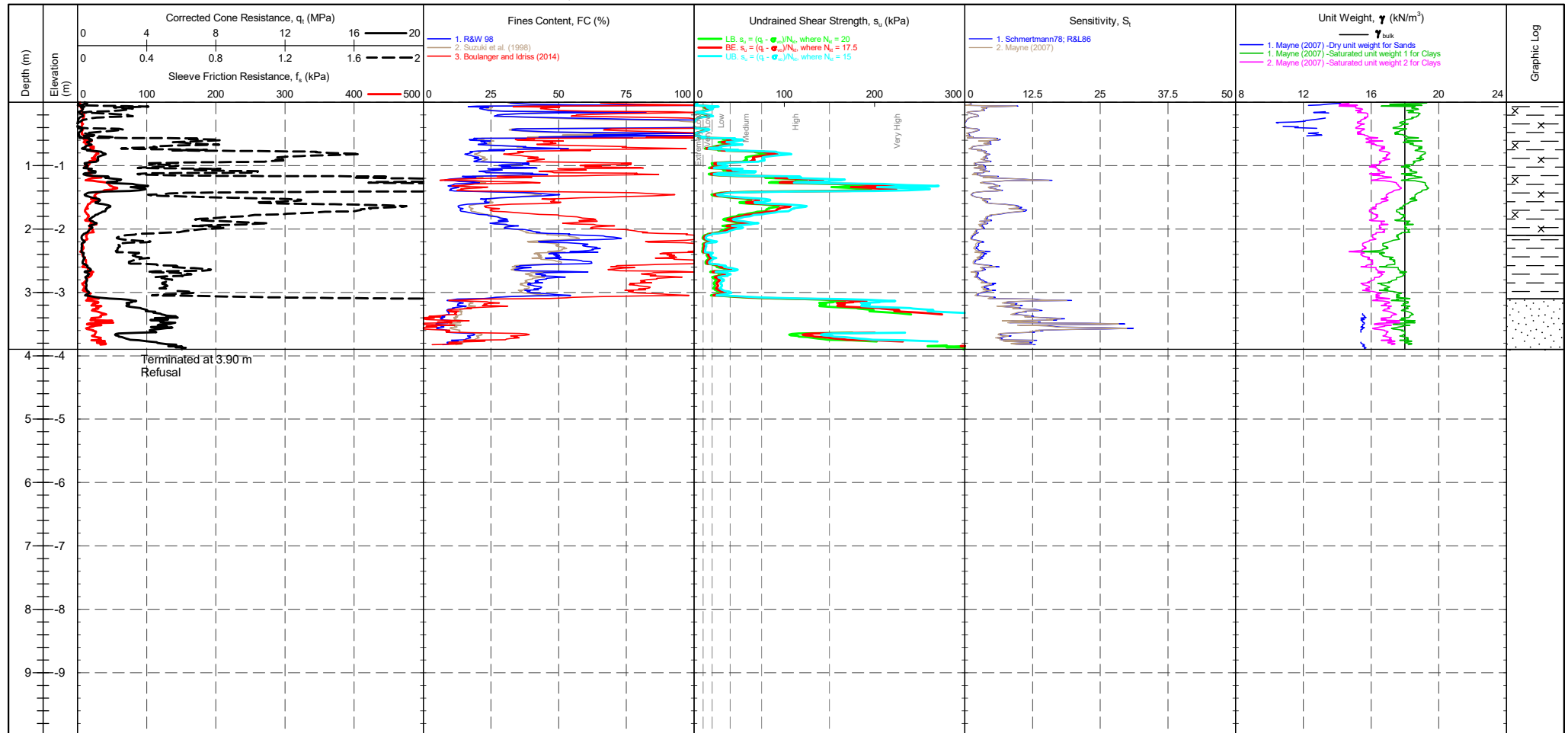
CPT05T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.5m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	343 mV	339 mV	-0.044 MPa
Sleeve	265 mV	262 mV	-0.002 kPa
Pore Pressure 2	186 mV	201 mV	0.004 kPa
X-Y Inclinator	2526 mV	2579 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

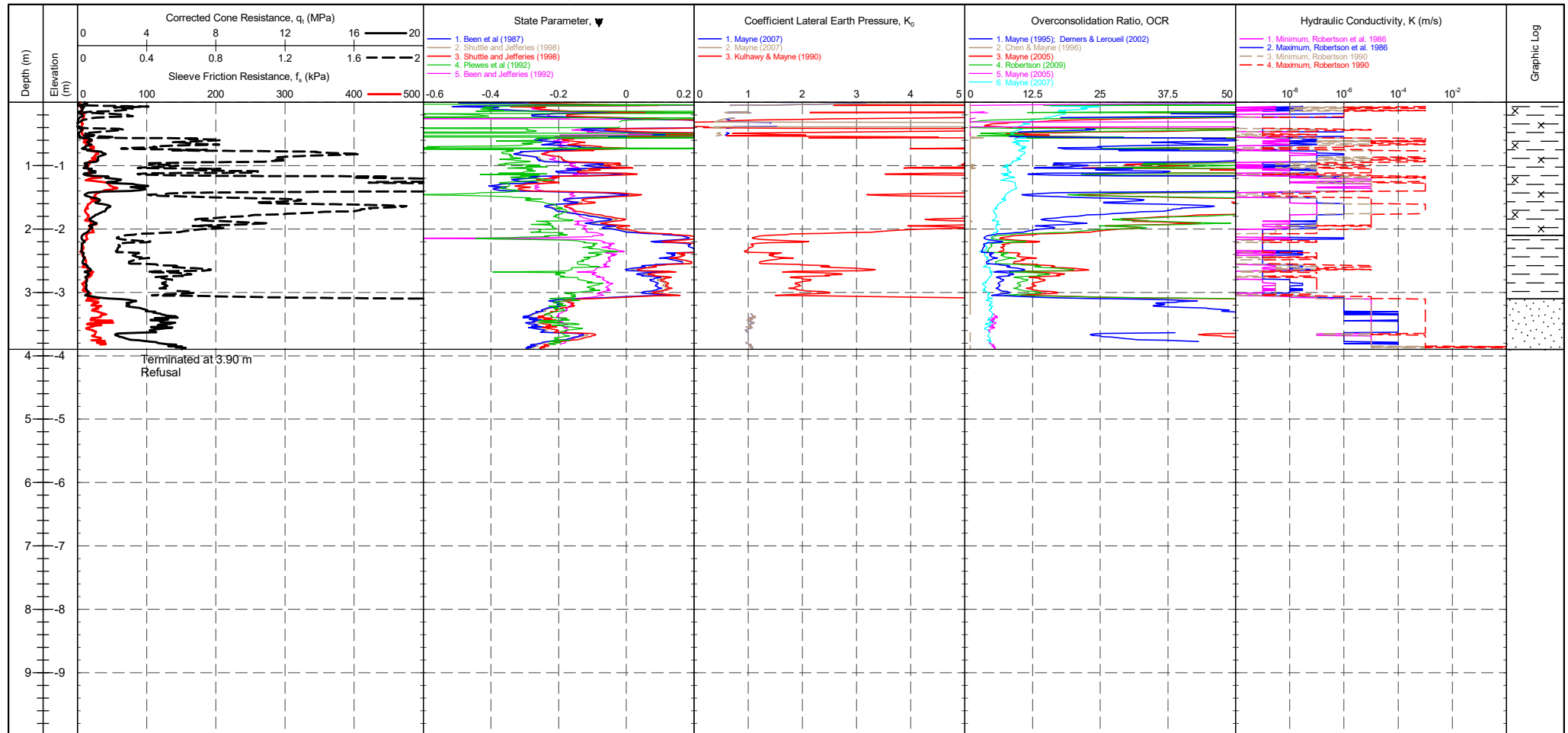
CPT05T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.5m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	343 mV	339 mV	-0.044 MPa
Sleeve	265 mV	262 mV	-0.002 kPa
Pore Pressure 2	186 mV	201 mV	0.004 kPa
X-Y Inclinator	2526 mV	2579 mV	

Groundwater Level
Dissipation Test



PointID

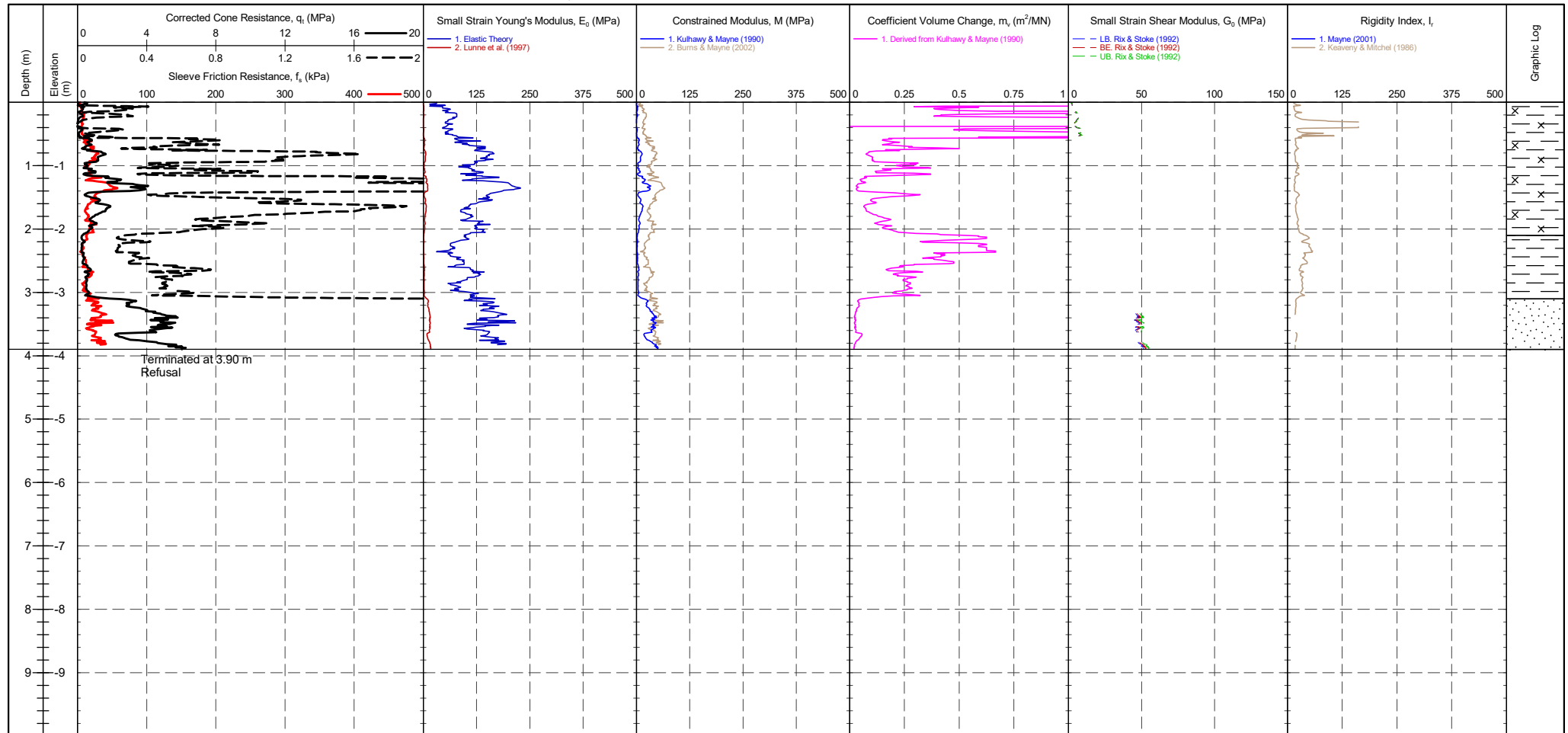
CPT05T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.
Water column 2.5m.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : 15cm²
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

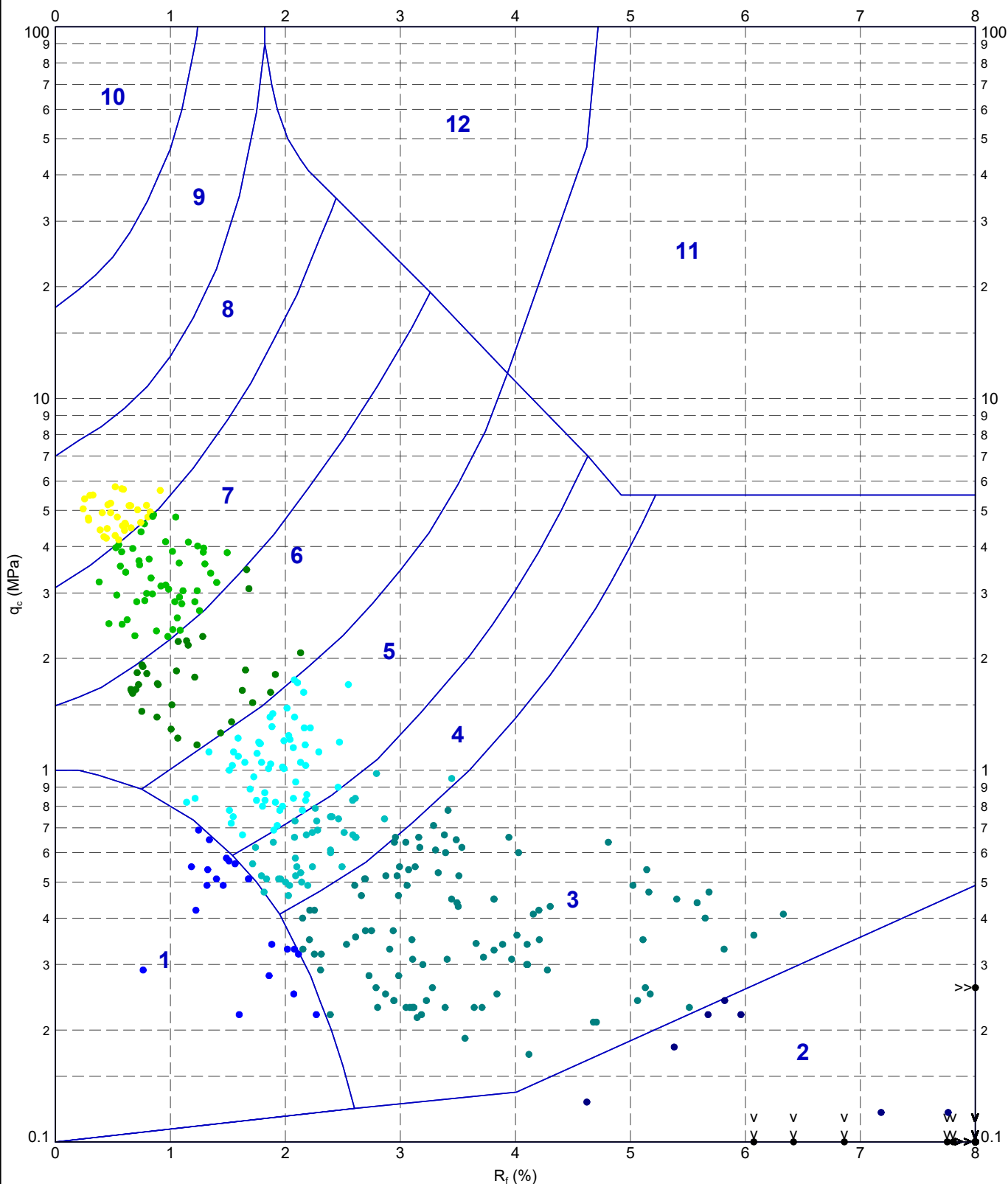
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	343 mV	339 mV	-0.044 MPa
Sleeve	265 mV	262 mV	-0.002 kPa
Pore Pressure 2	186 mV	201 mV	0.004 kPa
X-Y Inclinator	2526 mV	2579 mV	

Groundwater Level
Dissipation Test

220236-ADVANCED REPORT INSTITUSI 2.02.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF AP 1220236-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:18 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c vs R_f

- | | | | |
|-------------------------------------|-------------------------------|------------------------------|------------------------------|
| 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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT05T2

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

1220236

FIGURE No

Test ID

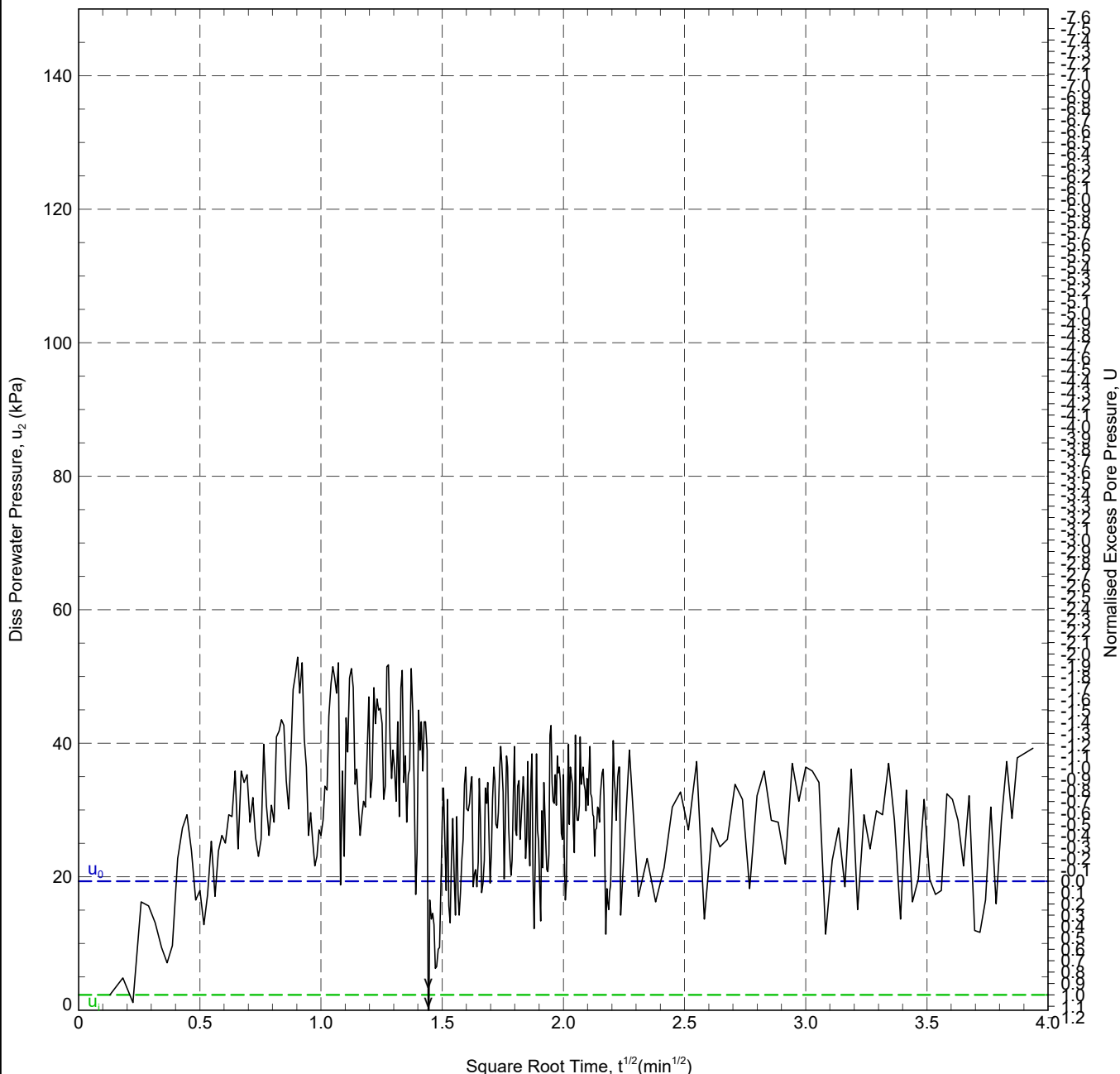
CPT05T2 - 2.47 m

Working with:

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 22/03/22



In Situ Pore Pressure, u_0 : 19.3 kPa
Initial Pore Pressure, u_i : 2.3 kPa
Final Pore Pressure: 39.3 kPa
Degree of Dissipation: 50%

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 23/03/2022
DATE: 23/03/2022
DATE: 23/03/2022

REMARK
T50 not reached.



PointID

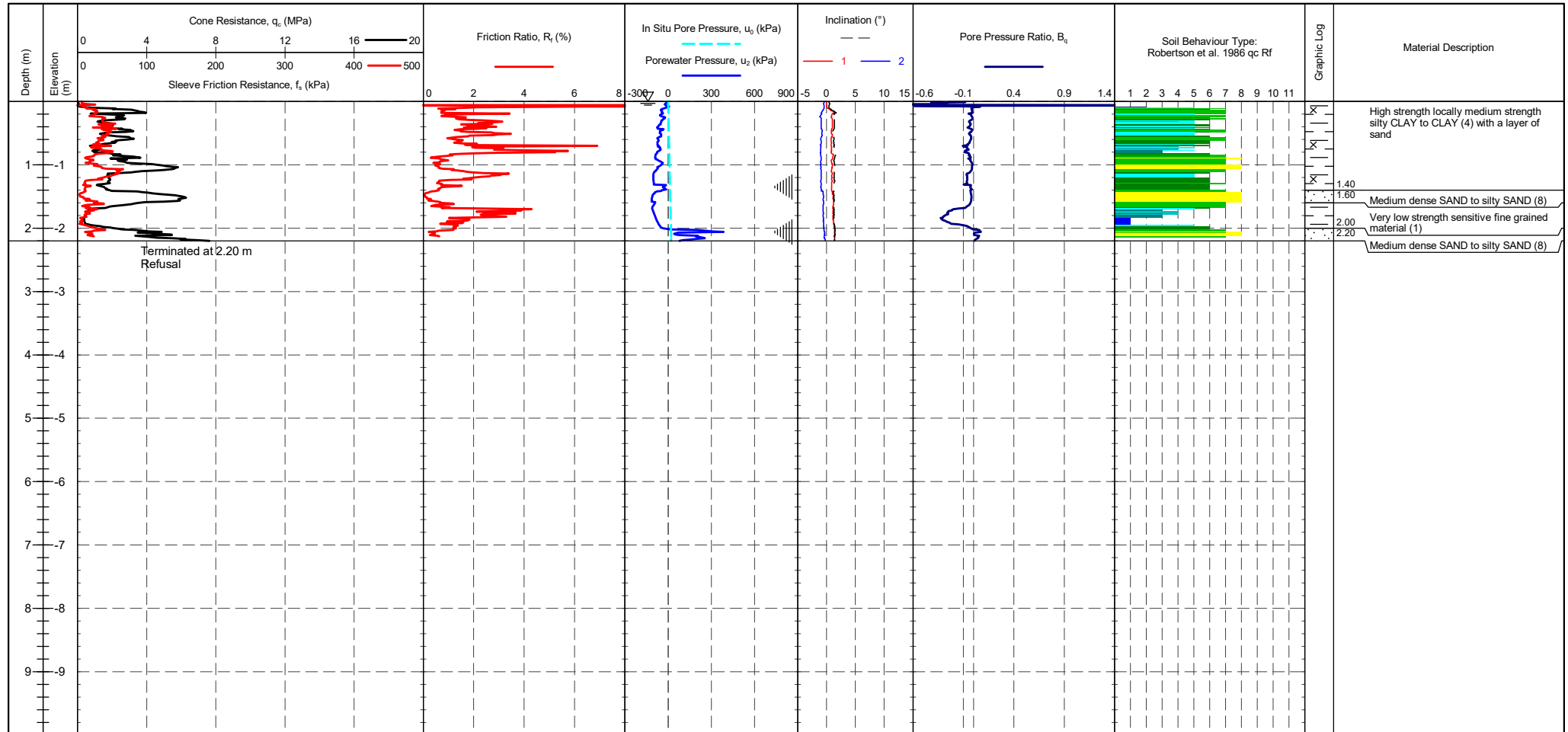
CPT06

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	271 mV	270 mV	-0.001 kPa
Pore Pressure 2	203 mV	199 mV	-0.001 kPa
X-Y Inclinator	2505 mV	2430 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level
Dissipation Test

PointID

CPT06

CLIENT : Central Alliance
PROJECT: Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

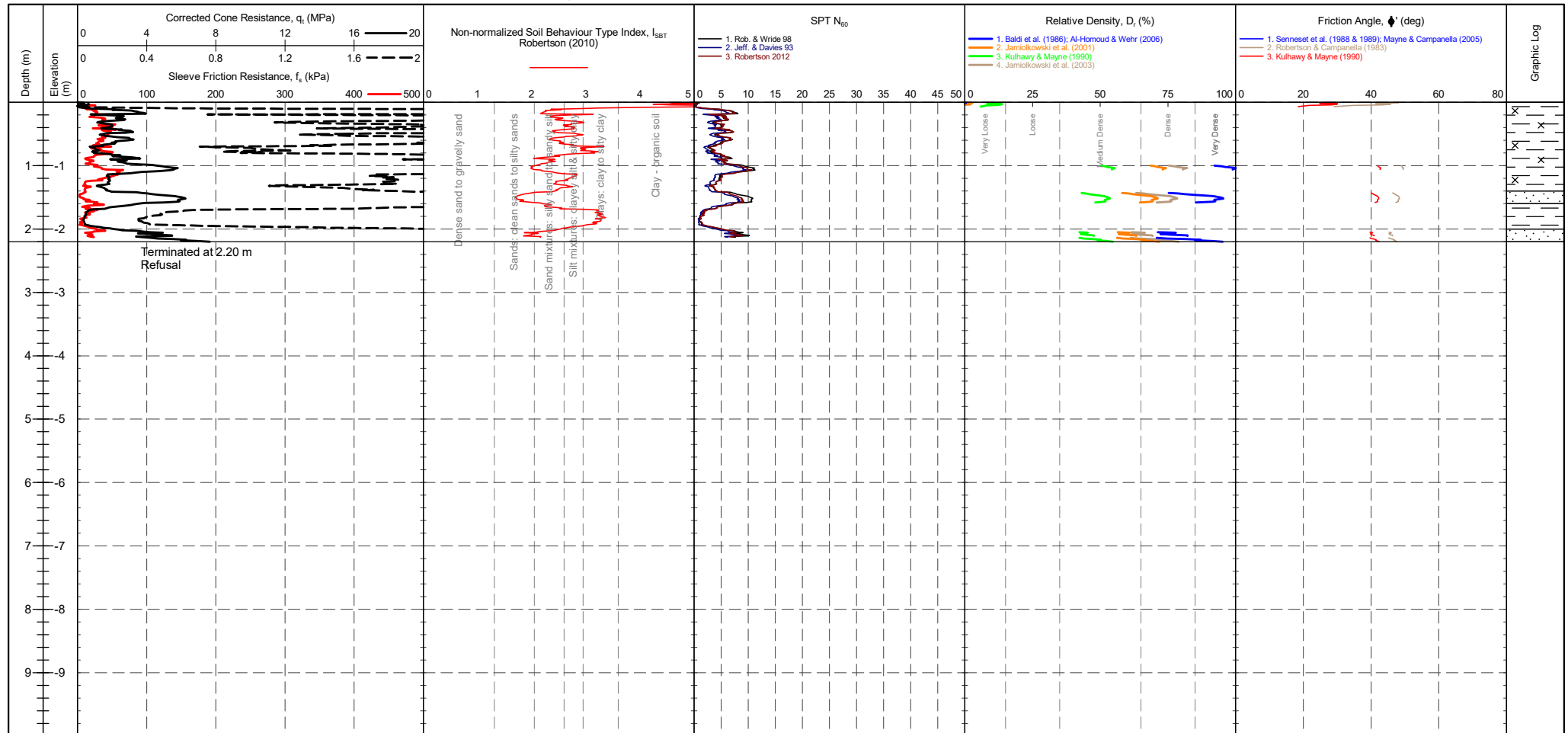
```

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

```

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
 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 020 - Paganini
OPERATOR	: IM & DR
FRICTION REDUCER	: None
WEATHER	: Sunny & Cold

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	271 mV	270 mV	-0.001 kPa
Pore Pressure 2	203 mV	199 mV	-0.001 kPa
X-Y Inclinator	2505 mV	2430 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12				
Description	SBT Index, I _c	Description	SPt N value, NSPT	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



PointID

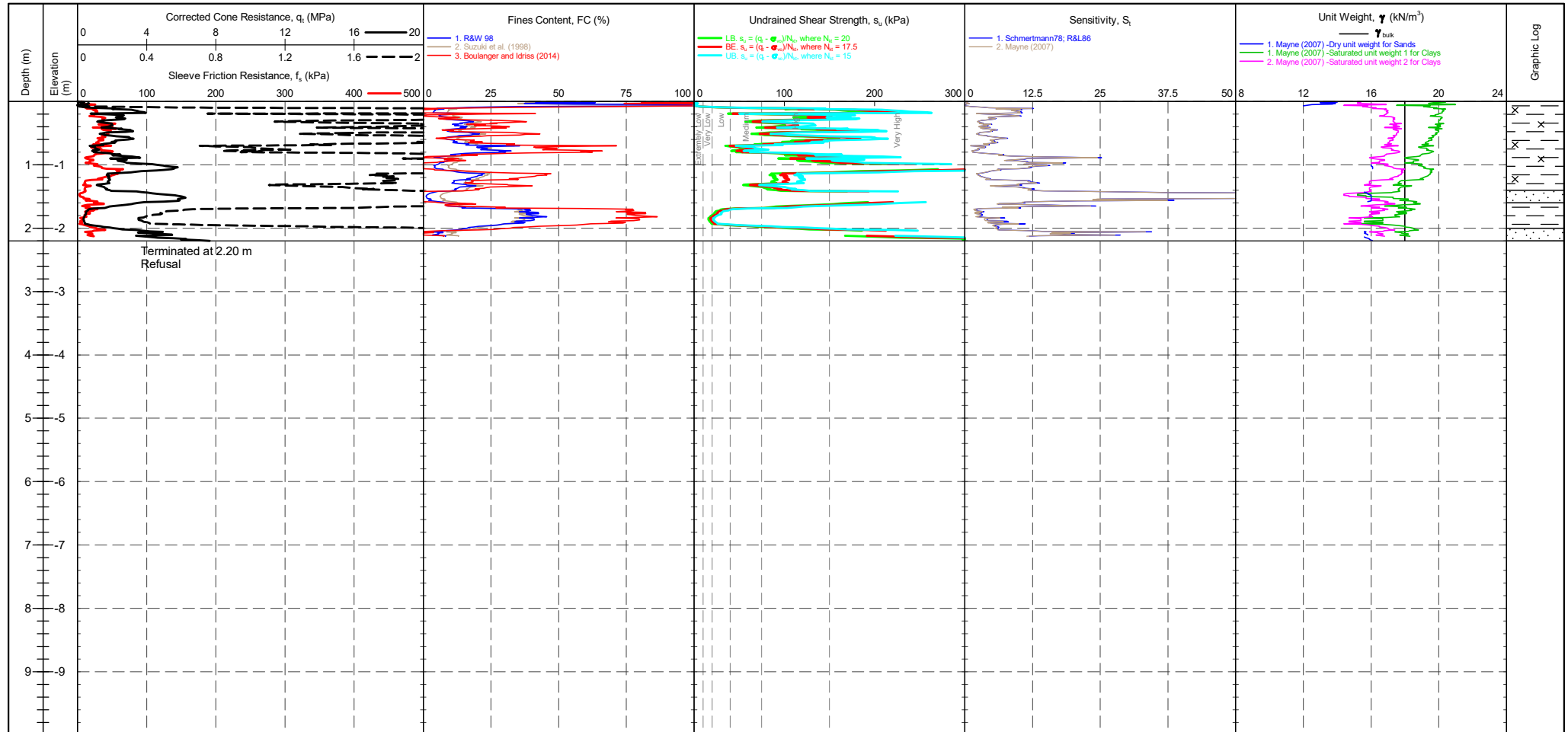
CPT06

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

Transducer Pre Post Difference
Tip 339 mV 339 mV 0 MPa
Sleeve 271 mV 270 mV -0.001 kPa
Pore Pressure 2 203 mV 199 mV -0.001 kPa
X-Y Inclinator 2505 mV 2430 mV

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

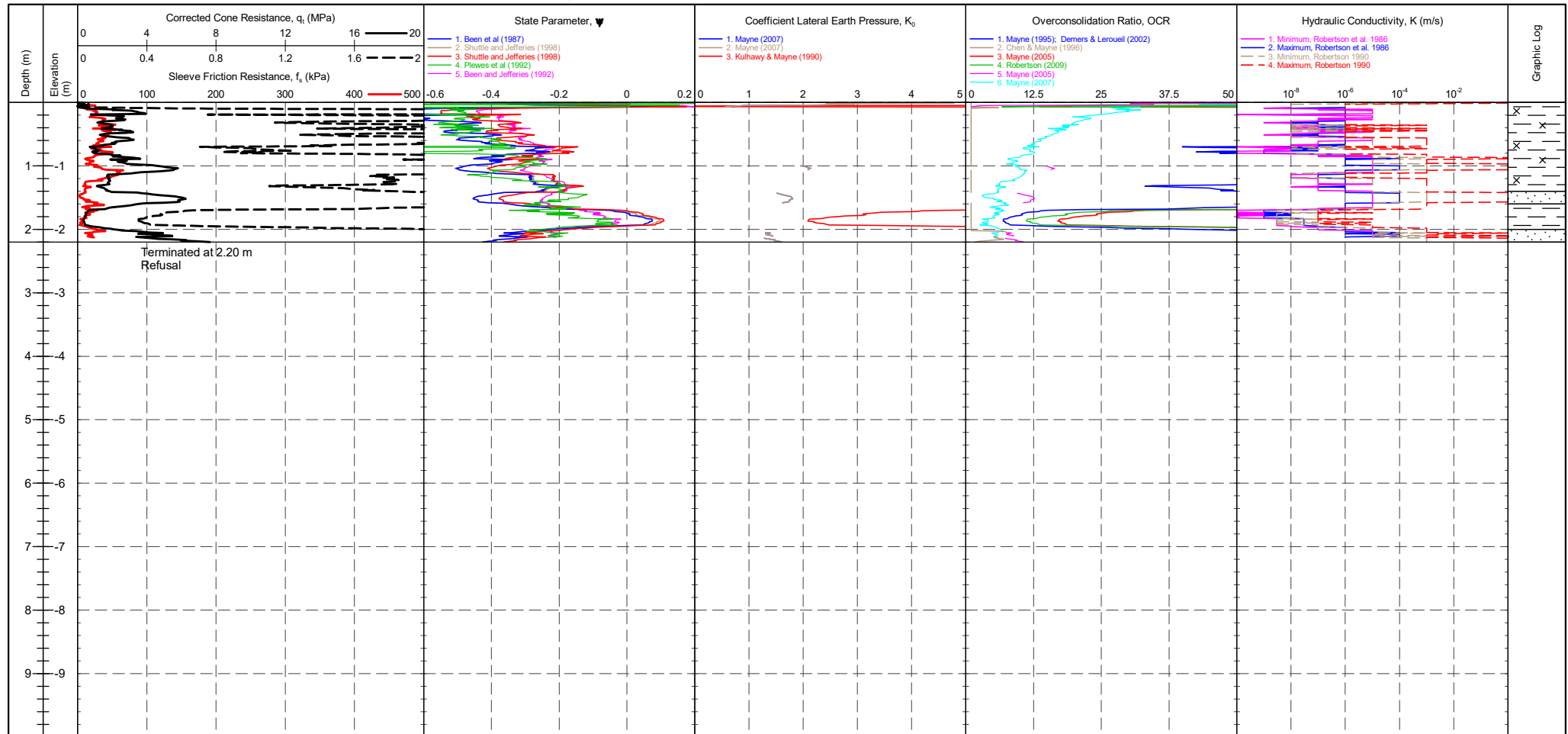
CPT06

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	271 mV	270 mV	-0.001 kPa
Pore Pressure 2	203 mV	199 mV	-0.001 kPa
X-Y Inclinator	2505 mV	2430 mV	

Groundwater Level
Dissipation Test



PointID

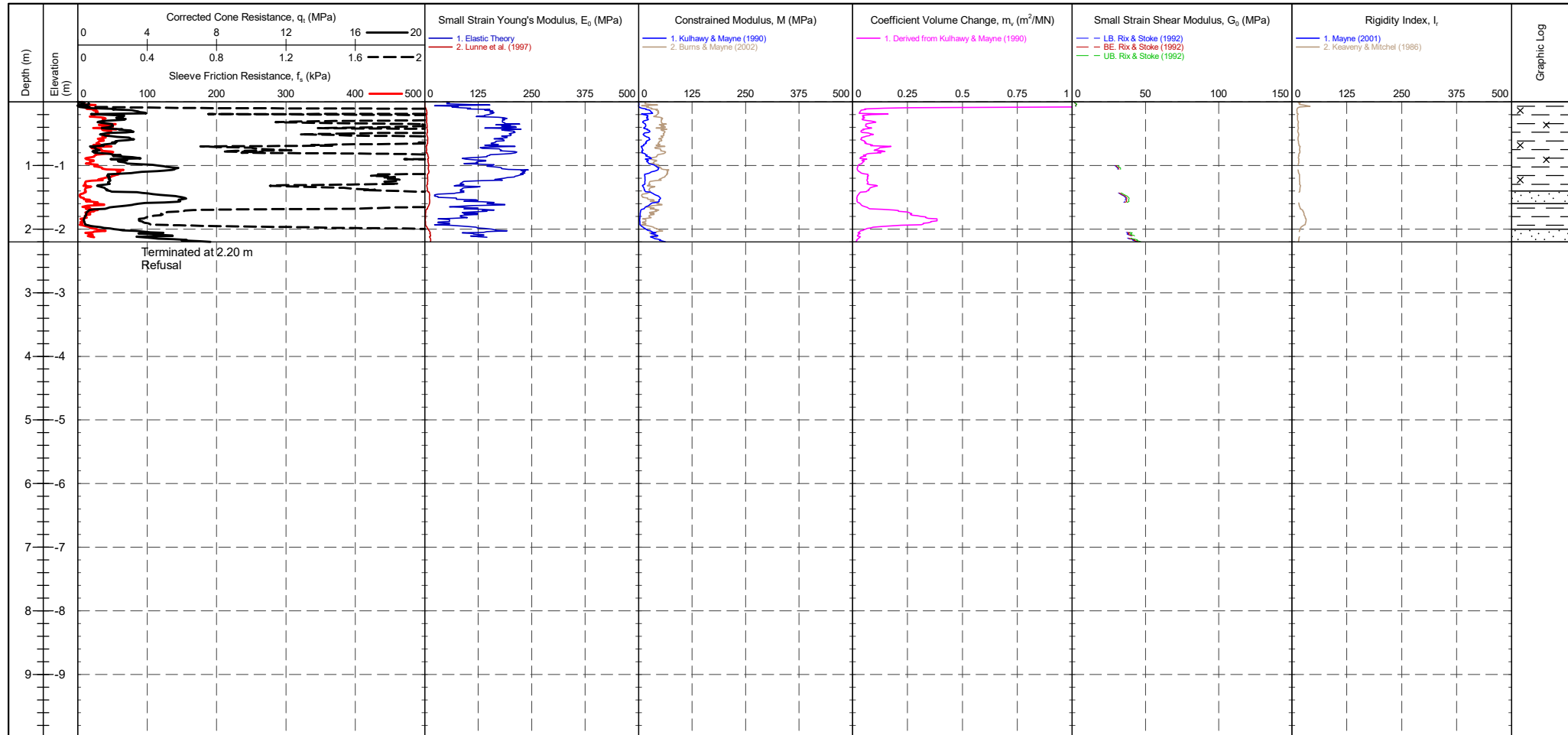
CPT06

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : $15cm^2$
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

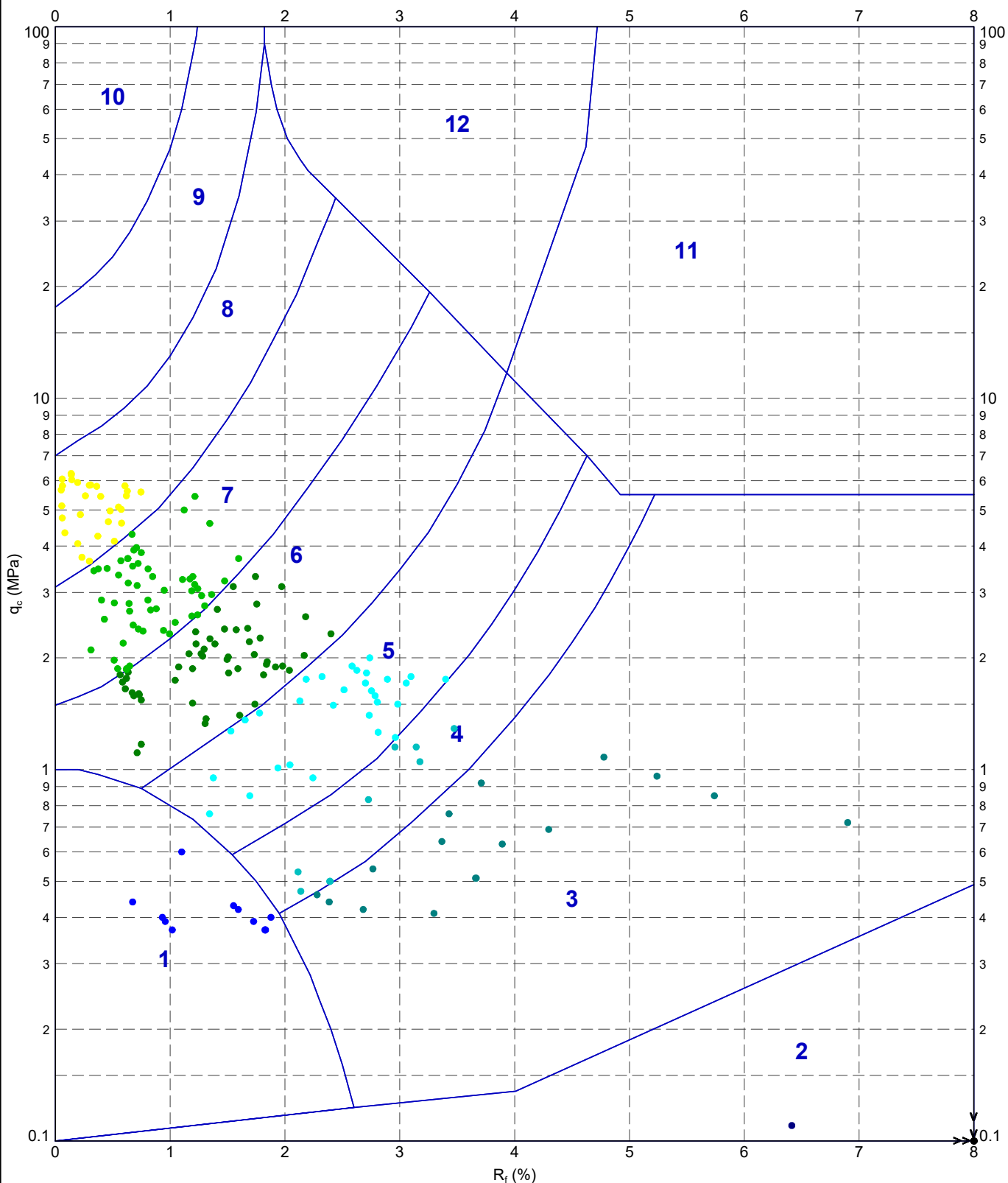
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	271 mV	270 mV	-0.001 kPa
Pore Pressure 2	203 mV	199 mV	-0.001 kPa
X-Y Inclinator	2505 mV	2430 mV	

Groundwater Level
Dissipation Test

220238-ADVANCED REPORT INSTITUSI 2.02.1 LIB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF AP 1220238-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:21 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



METHOD: Robertson et al. 1986 q_c R_f

- | | | | |
|-------------------------------------|-------------------------------|------------------------------|------------------------------|
| 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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT06

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

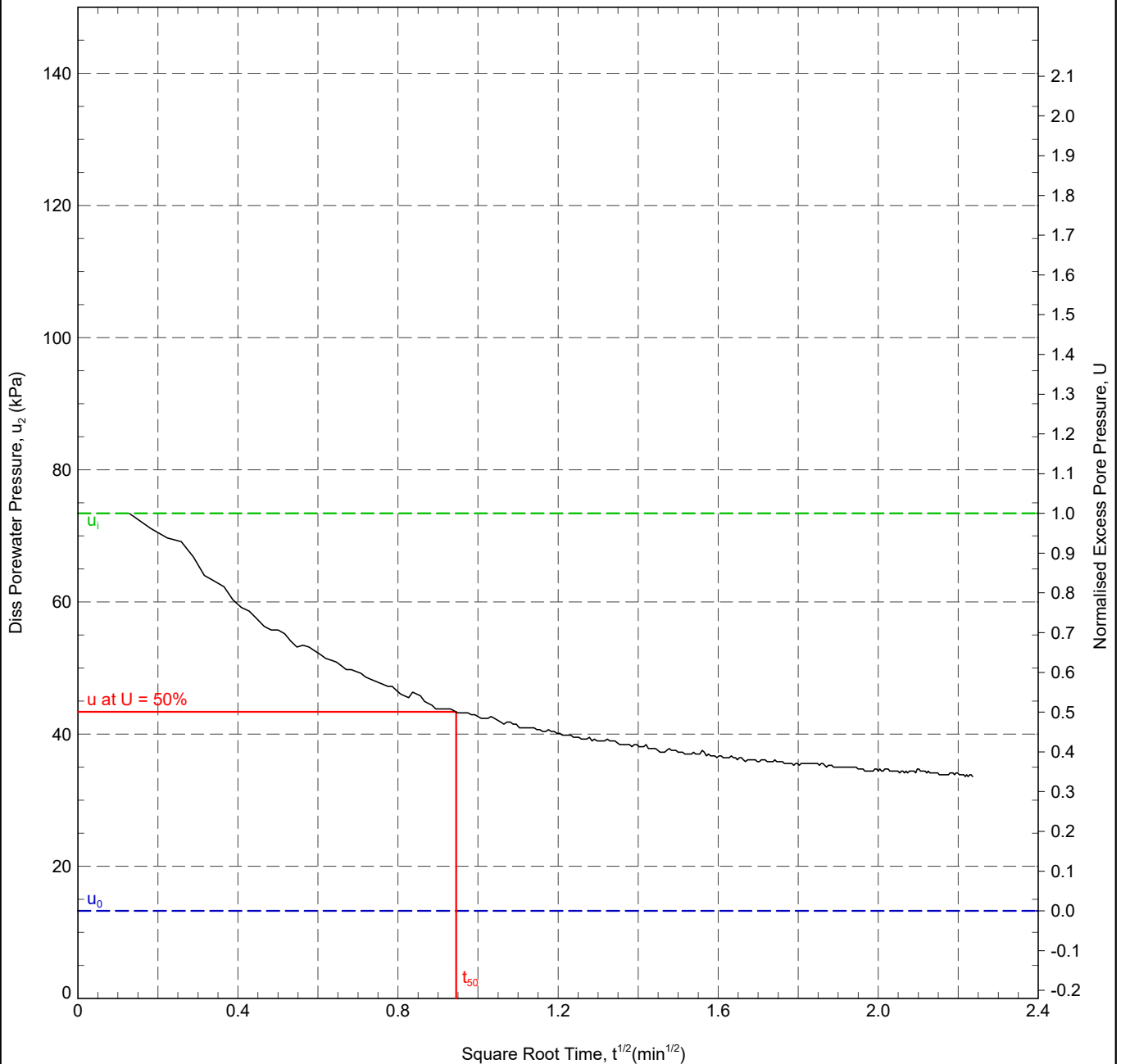
1220236

FIGURE No

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 24/03/22



In Situ Pore Pressure, u_0 : 13.2 kPa
Initial Pore Pressure, u_i : 73.4 kPa
Final Pore Pressure: 33.6 kPa
Degree of Dissipation: 50%
Dissipation Pressure: 43.4 kPa
Time for 50% Dissipation, t_{50} : 0.89 min

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 25/03/2022
DATE: 25/03/2022
DATE: 25/03/2022

REMARK
T50 reached. Quick dissipation.
 $t_{50}=53.6s$

Test ID

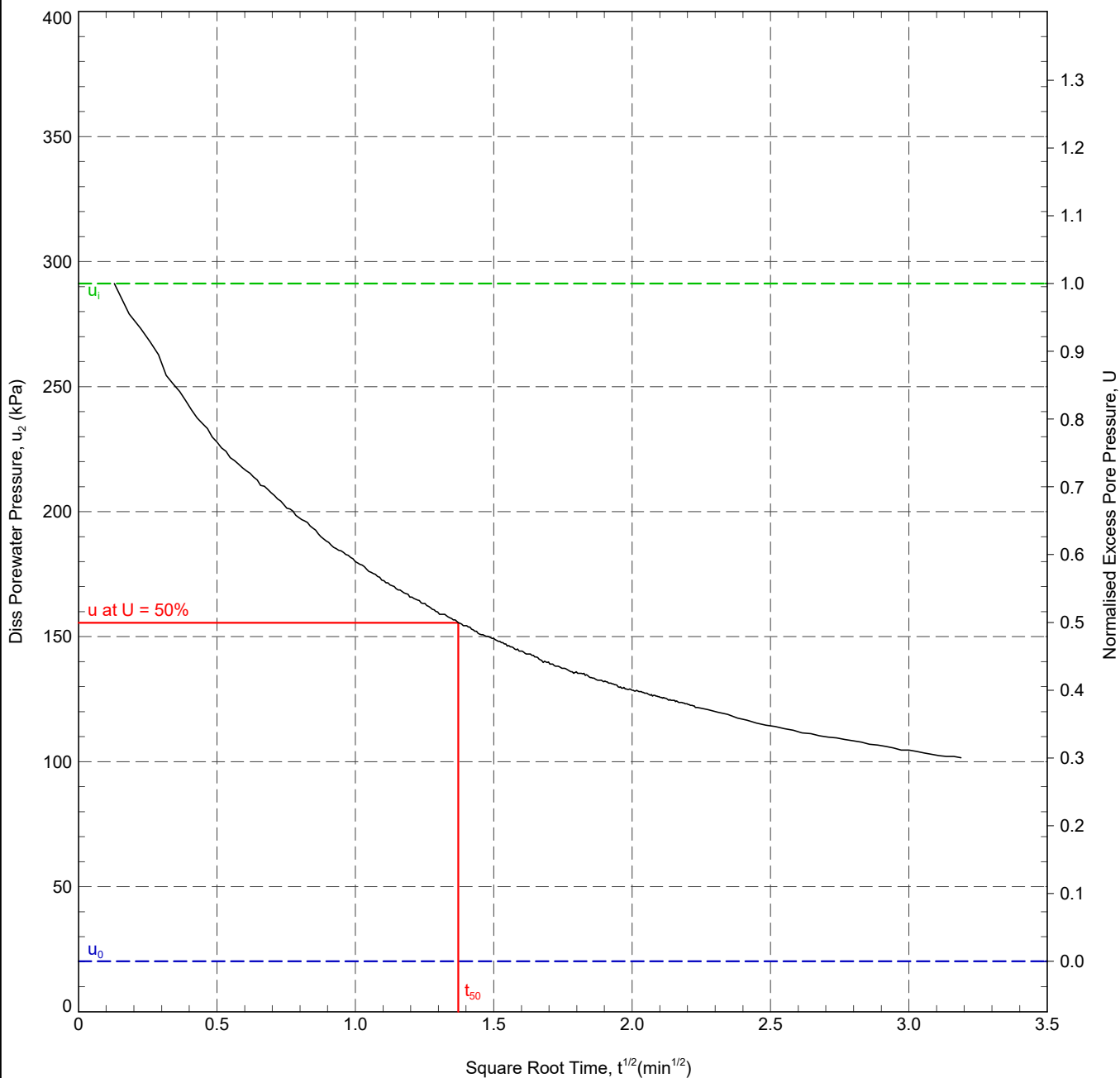
CPT06 - 2.06 m

Working with:

CLIENT : Central Alliance
ENGINEER : Oliver Dustan
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

AREA : Cardigan
EASTING : 0.0 m
NORTHING : 0.0 m
COORD. SYS.:
ELEVATION : 0.00 m

SHEET : 1 OF 1
STATUS : Final
DATE : 24/03/22



In Situ Pore Pressure, u_0 : 20.2 kPa
Initial Pore Pressure, u_1 : 291.2 kPa
Final Pore Pressure: 101.5 kPa
Degree of Dissipation: 50%
Dissipation Pressure: 155.6 kPa
Time for 50% Dissipation, t_{50} : 1.88 min

RIG : CPT 020 - Pagani
CONE TYPE : Subtraction
CONE ID : S15-CFIP.1360
OPERATOR : IM & DR

ANALYSED BY : LD
CHECKED BY : LD
APPROVED BY : DW

DATE: 25/03/2022
DATE: 25/03/2022
DATE: 25/03/2022

REMARK
T50 reached. Quick dissipation.
t50=113s



PointID

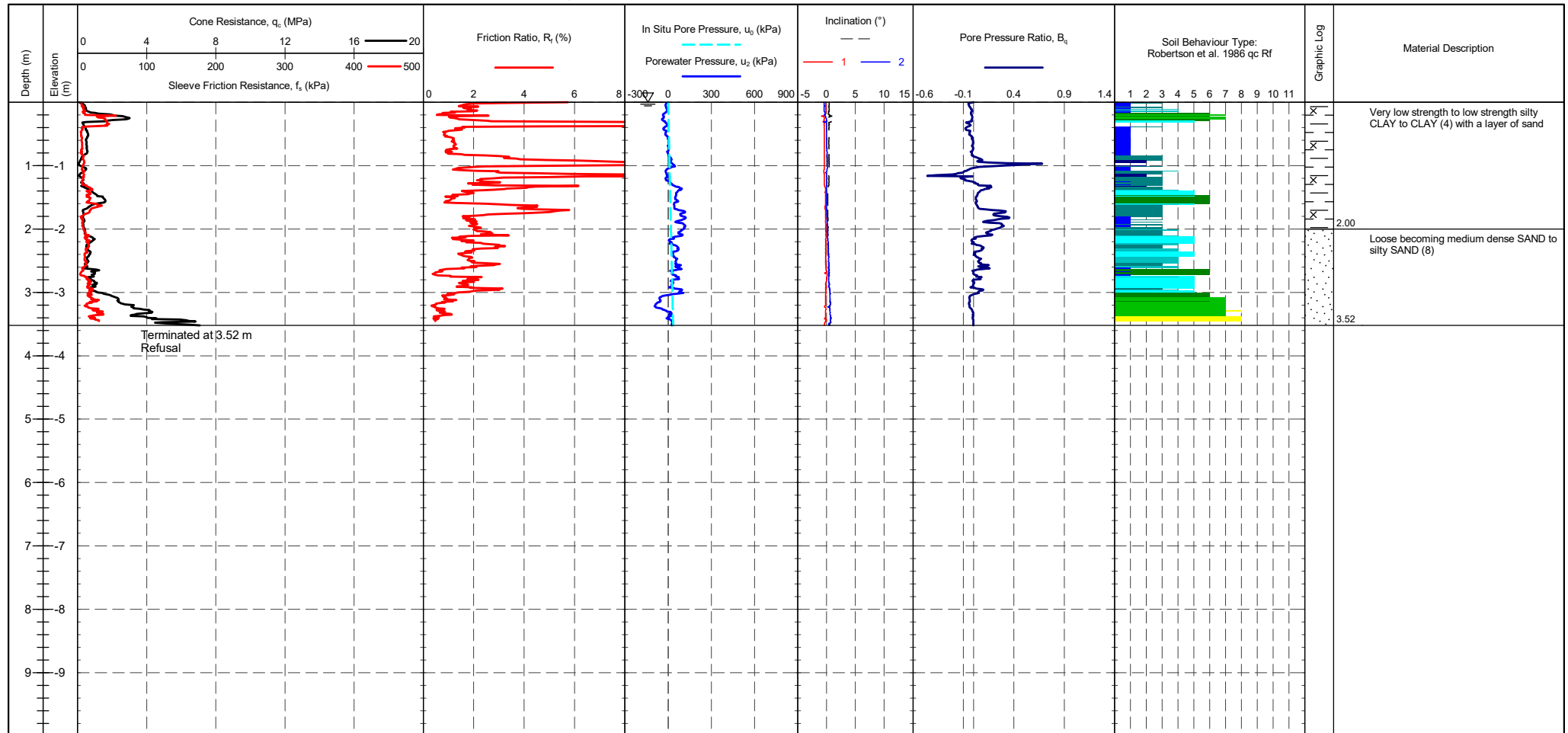
CPT06T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CALIBRATION DATE : 02/02/2022
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold
GROUNDWATER DEPTH : Assumed for calculation purposes

CPTU ZERO VALUES
Transducer Pre Post Difference
Tip 339 mV 339 mV 0 MPa
Sleeve 270 mV 269 mV -0.001 kPa
Pore Pressure 2 200 mV 200 mV 0 kPa
X-Y Inclinator 2494 mV 2378 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



PointID

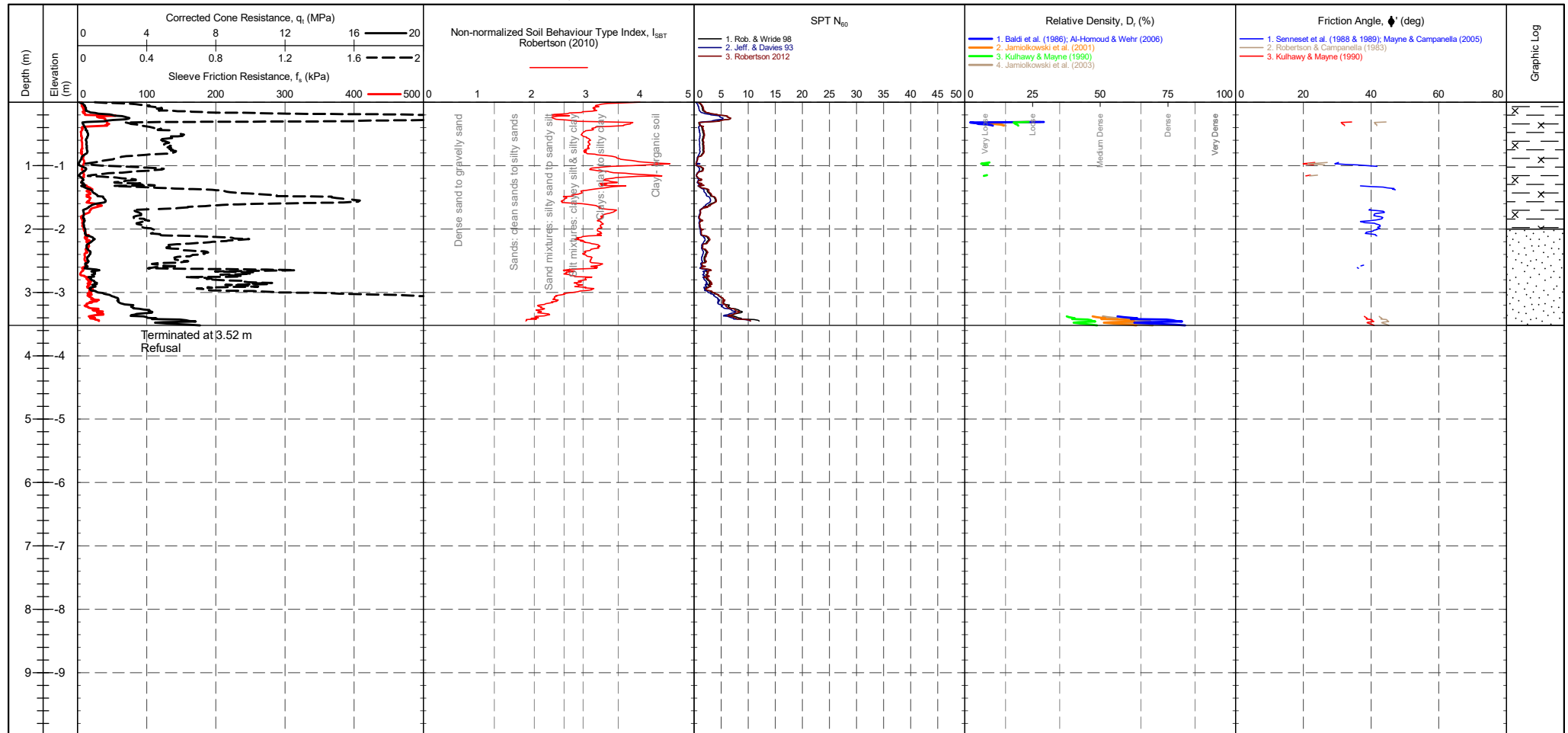
CPT06T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	270 mV	269 mV	-0.001 kPa
Pore Pressure 2	200 mV	200 mV	0 kPa
X-Y Inclinator	2494 mV	2378 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12			
Description	SBT Index, I_c	Description	SPT N value, NSPT
Clays	2.95-3.60	Very Loose	0 - 4
Silt mixtures	2.60-2.95	Loose	4 - 10
Sand mixtures	2.05-2.60	Medium Dense	10 - 30
Sands	1.31-2.05	Dense	30 - 50
Gravelly sand	<1.31	Very Dense	>50

Groundwater Level
Dissipation Test



PointID

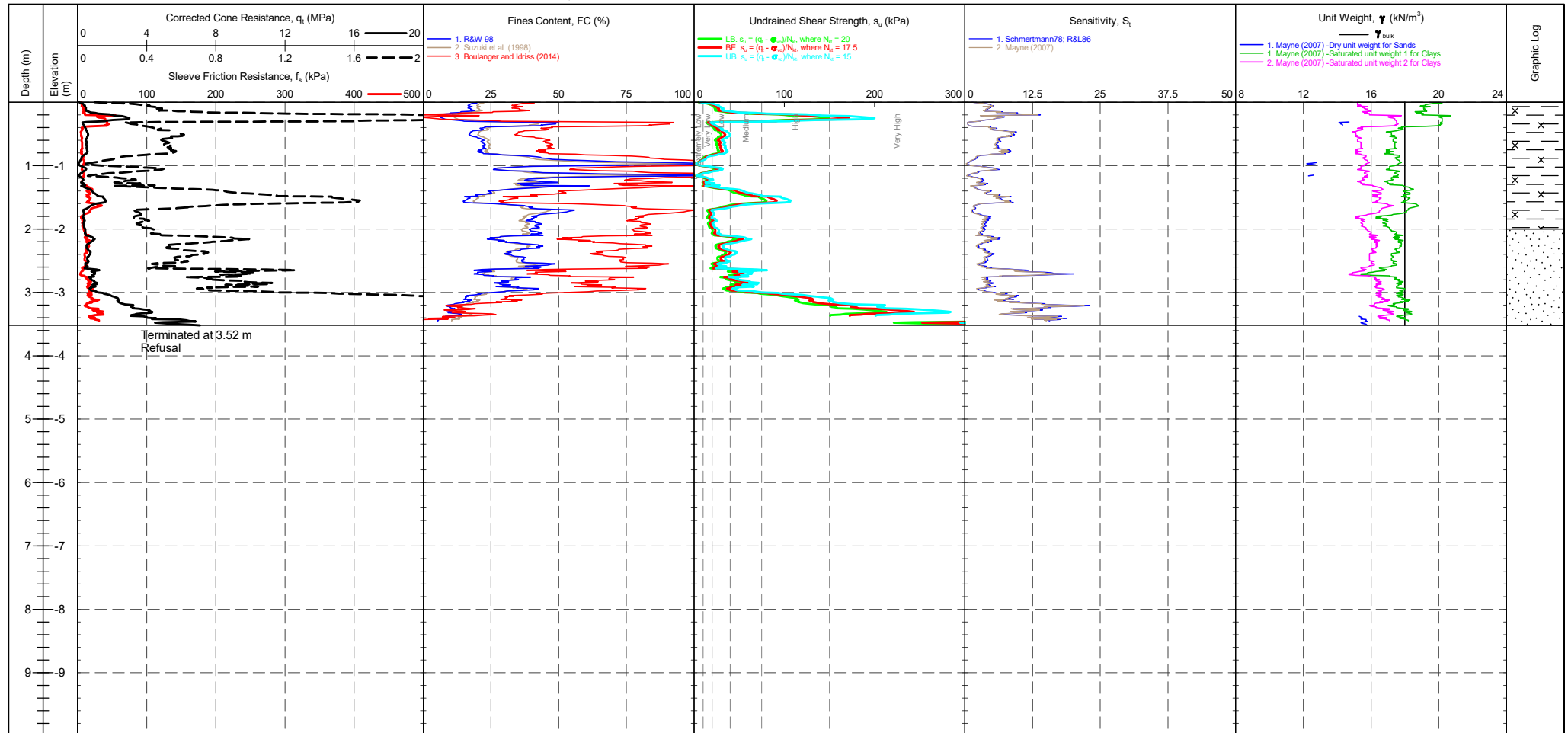
CPT06T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	270 mV	269 mV	-0.001 kPa
Pore Pressure 2	200 mV	200 mV	0 kPa
X-Y Inclinator	2494 mV	2378 mV	

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

Term based on measurement	s_u (kPa)	Term based on measurement	s_u (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



PointID

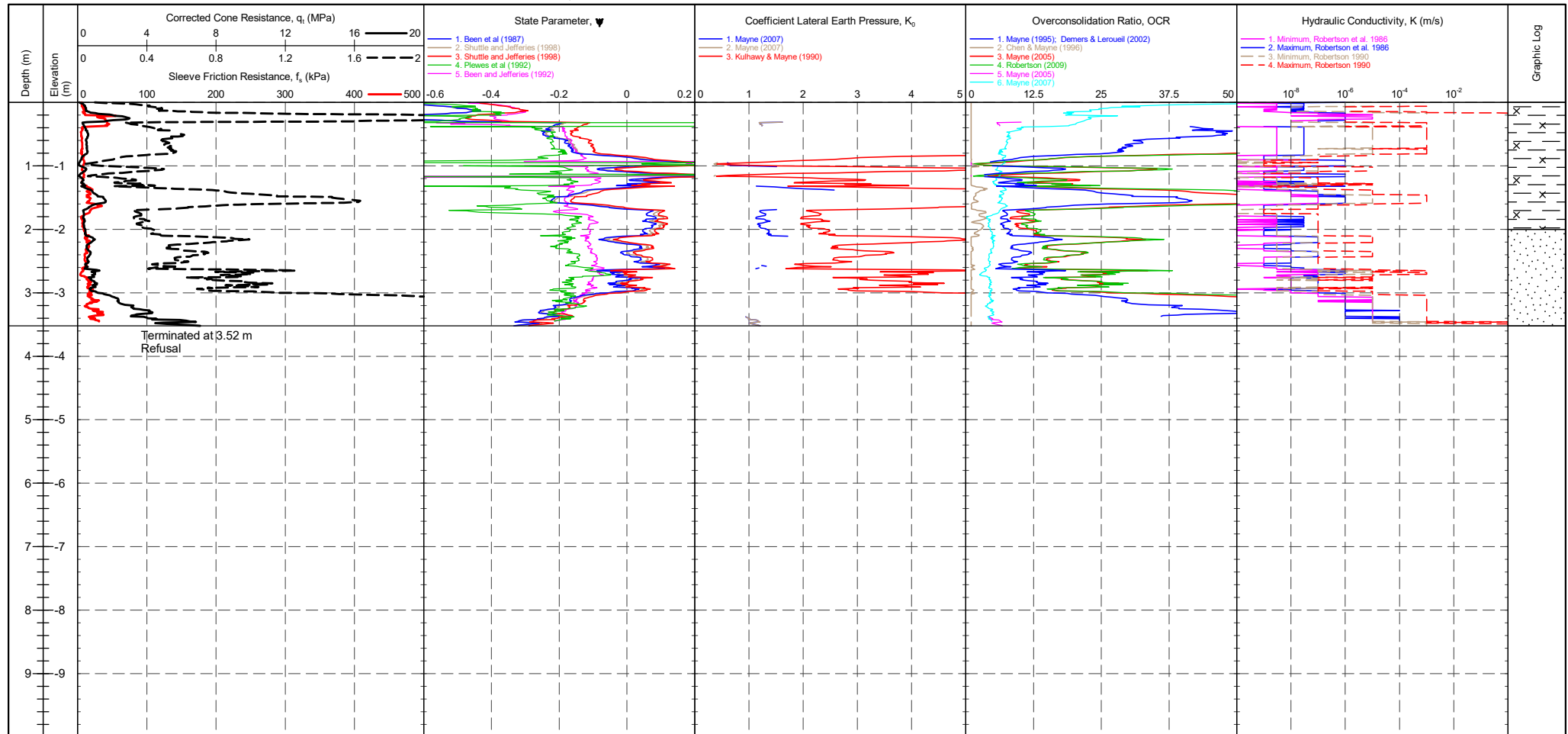
CPT06T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
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 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	270 mV	269 mV	-0.001 kPa
Pore Pressure 2	200 mV	200 mV	0 kPa
X-Y Inclinator	2494 mV	2378 mV	

Groundwater Level
Dissipation Test



PointID

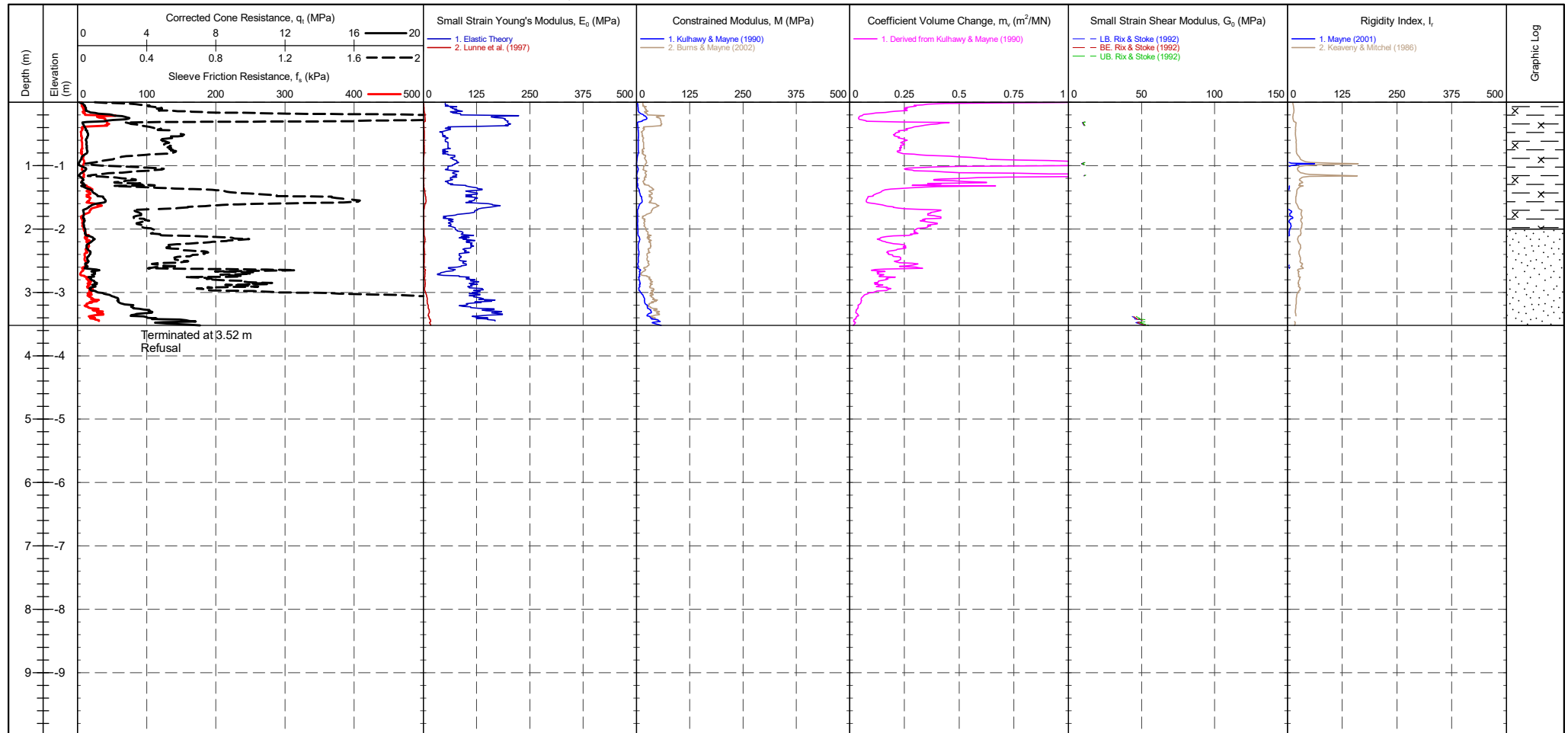
CPT06T2

CLIENT : Central Alliance
PROJECT : Cardigan Tidal Flood Risk Management
LOCATION : Cardigan
PROJECT No. : 1220236

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

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/03/2022
PLOT DATE : 25/03/2022
METHOD : ISO 22476-1:2012



CONE ID : S15-CFIP.1360
CONE MODEL : Subtraction
CONE AREA : $15cm^2$
CONE AREA RATIO : 0.79
FILTER POSITION : u2
FILTER TYPE : HDPE

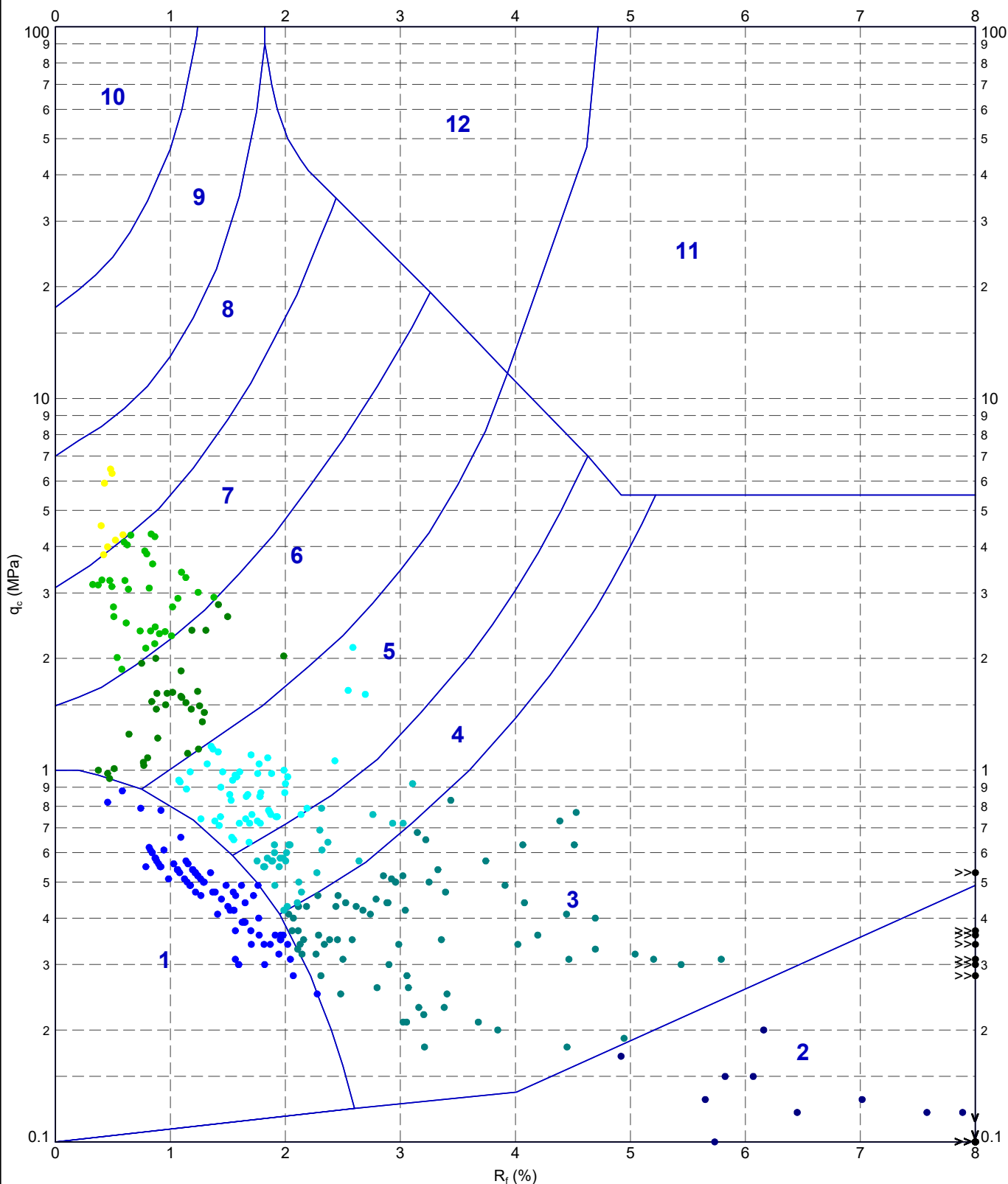
TEST TYPE : TE2
APPLICATION CLASS : 2
RIG : CPT 020 - Pagani
OPERATOR : IM & DR
FRICTION REDUCER : None
WEATHER : Sunny & Cold

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	339 mV	339 mV	0 MPa
Sleeve	270 mV	269 mV	-0.001 kPa
Pore Pressure 2	200 mV	200 mV	0 kPa
X-Y Inclinator	2494 mV	2378 mV	

Groundwater Level
Dissipation Test

220238-ADVANCED REPORT INSTITUSI 2.02.1 LUB - CHLOE GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF AP 1220238-CARDIGAN.GPJ <<DrawingFile>> 25/03/2022 15:23 10.03.00.09 Dated Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Proj: In Situ SI 2.02.0 2017-07-10



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

Central Alliance
Oliver Dustan
Cardigan
Cardigan Tidal Flood Risk Management
Robertson et al. 1986 q_c vs. R_f - CPT06T2

DRAWN

DATE

25/03/2022

CHECKED

DATE

25/03/2022

SCALE

Not To Scale

A4

PROJECT No

1220236

FIGURE No



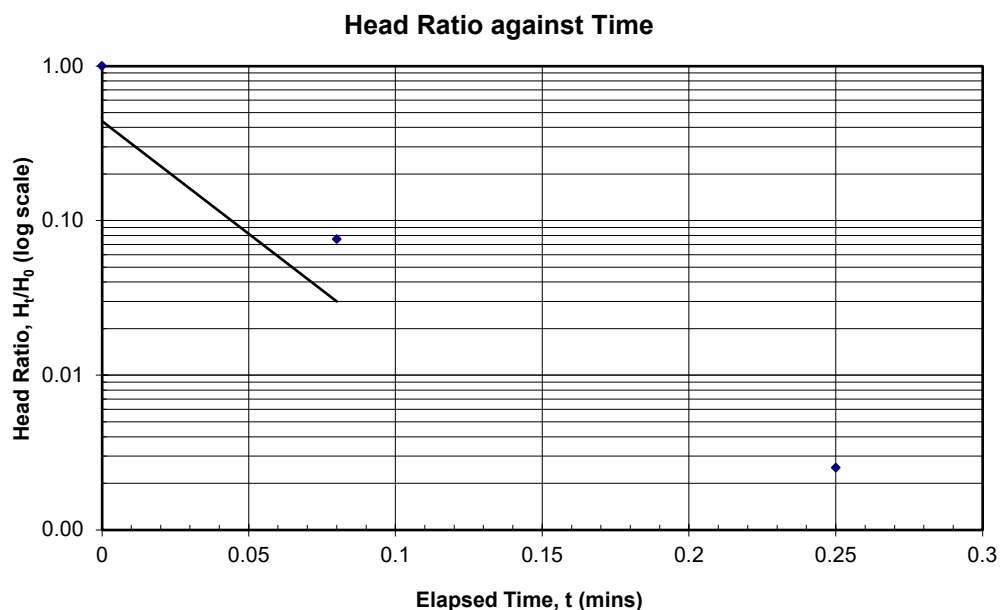
IN SITU SITE INVESTIGATION

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

Variable Head Permeability Test

TYPE OF TEST		Standpipe Falling Head	
DETAILS OF INSTALLATION:			
Top of response zone	5.00	m BGL	
Base of response zone	6.50	m BGL	
Groundwater level for analysis	1.73	m BGL	
Height of tubing above ground level (datum)	0.00	m	
Diameter of standpipe tubing	50	mm	
Elapsed time, t (minutes)	Depth to water from datum (m)	Head, H_t (m)	Head Ratio H_t/H_0
0	1.33	0.40	1.00
0.08	1.70	0.03	0.08
0.25	1.72	0.00	0.00
BOREHOLE No. BH02 TEST NUMBER 1 DATE OF TEST 08 Mar 2022 CONDITIONS OF TEST ZONE Ref BS 5930:1999+A2 (2010) Figure 7 Well point or hole extended in uniform soil (d) Diameter of borehole (D) 50 mm Length of response zone (L) 1500 mm Intake Factor (F) 2.62 m			
REMARKS Depth to groundwater prior to test 1.73 m BGL Depth to water measured from top of casing Permeability calculated using BS 5930:1999 (Section 25.4.6) (General Approach) 25 litres of water added. Unable to create a meaningful change in head due to high permeability. Test undertaken close to high tide.			
CALCULATED VALUES Differential head at start of test, H_0 0.40 m Differential head at end of test, H_f 0.001 m Time Elapsed at end of test 0.25 mins General Approach Coordinates of best fit line to data: $t_1 = 0.0$ mins $H_1/H_0 = 0.440$ $t_2 = 0.0$ mins $H_2/H_0 = 0.030$			
Permeability (k)		4.2E-04 m/sec	



Project: Cardigan Flood Risk Management
Number: 207916

Falling Head Test Data

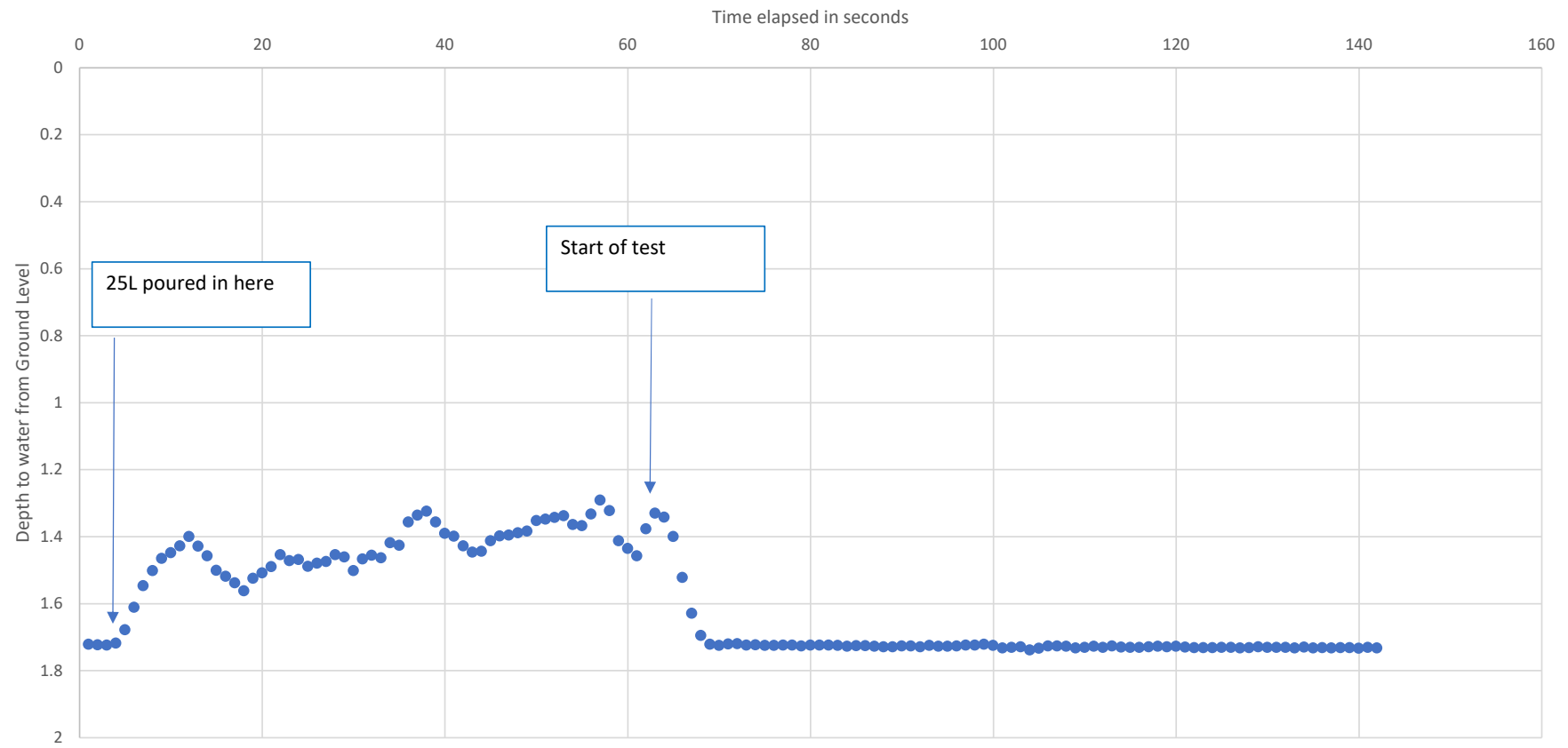
Exploratory ID: BH02

Date and Time	Time elapsed seconds	Level Depth To Water (m)
08/04/2022 13:48	1	1.722
08/04/2022 13:48	2	1.723
08/04/2022 13:48	3	1.724
08/04/2022 13:48	4	1.718
08/04/2022 13:48	5	1.678
08/04/2022 13:48	6	1.611
08/04/2022 13:48	7	1.547
08/04/2022 13:48	8	1.502
08/04/2022 13:48	9	1.465
08/04/2022 13:48	10	1.448
08/04/2022 13:48	11	1.428
08/04/2022 13:48	12	1.4
08/04/2022 13:48	13	1.429
08/04/2022 13:48	14	1.458
08/04/2022 13:48	15	1.501
08/04/2022 13:48	16	1.519
08/04/2022 13:48	17	1.538
08/04/2022 13:48	18	1.562
08/04/2022 13:48	19	1.525
08/04/2022 13:48	20	1.509
08/04/2022 13:48	21	1.49
08/04/2022 13:48	22	1.454
08/04/2022 13:48	23	1.472
08/04/2022 13:48	24	1.469
08/04/2022 13:48	25	1.489
08/04/2022 13:48	26	1.48
08/04/2022 13:48	27	1.475
08/04/2022 13:48	28	1.454
08/04/2022 13:48	29	1.461
08/04/2022 13:48	30	1.502
08/04/2022 13:48	31	1.467
08/04/2022 13:48	32	1.456
08/04/2022 13:48	33	1.464
08/04/2022 13:48	34	1.419
08/04/2022 13:48	35	1.426
08/04/2022 13:48	36	1.357
08/04/2022 13:48	37	1.336
08/04/2022 13:48	38	1.324
08/04/2022 13:48	39	1.357
08/04/2022 13:48	40	1.391
08/04/2022 13:48	41	1.399
08/04/2022 13:48	42	1.428
08/04/2022 13:48	43	1.447
08/04/2022 13:48	44	1.444
08/04/2022 13:48	45	1.413
08/04/2022 13:48	46	1.398
08/04/2022 13:48	47	1.396
08/04/2022 13:48	48	1.389
08/04/2022 13:48	49	1.384
08/04/2022 13:48	50	1.352
08/04/2022 13:48	51	1.348
08/04/2022 13:48	52	1.343
08/04/2022 13:48	53	1.338
08/04/2022 13:48	54	1.364

08/04/2022 13:48	55	1.368
08/04/2022 13:48	56	1.333
08/04/2022 13:48	57	1.291
08/04/2022 13:48	58	1.323
08/04/2022 13:48	59	1.413
08/04/2022 13:48	60	1.436
08/04/2022 13:49	61	1.458
08/04/2022 13:49	62	1.377
08/04/2022 13:49	63	1.33
08/04/2022 13:49	64	1.342
08/04/2022 13:49	65	1.4
08/04/2022 13:49	66	1.522
08/04/2022 13:49	67	1.629
08/04/2022 13:49	68	1.695
08/04/2022 13:49	69	1.722
08/04/2022 13:49	70	1.725
08/04/2022 13:49	71	1.721
08/04/2022 13:49	72	1.72
08/04/2022 13:49	73	1.724
08/04/2022 13:49	74	1.723
08/04/2022 13:49	75	1.725
08/04/2022 13:49	76	1.725
08/04/2022 13:49	77	1.724
08/04/2022 13:49	78	1.724
08/04/2022 13:49	79	1.727
08/04/2022 13:49	80	1.724
08/04/2022 13:49	81	1.724
08/04/2022 13:49	82	1.724
08/04/2022 13:49	83	1.725
08/04/2022 13:49	84	1.728
08/04/2022 13:49	85	1.726
08/04/2022 13:49	86	1.726
08/04/2022 13:49	87	1.728
08/04/2022 13:49	88	1.729
08/04/2022 13:49	89	1.729
08/04/2022 13:49	90	1.727
08/04/2022 13:49	91	1.727
08/04/2022 13:49	92	1.729
08/04/2022 13:49	93	1.725
08/04/2022 13:49	94	1.728
08/04/2022 13:49	95	1.728
08/04/2022 13:49	96	1.727
08/04/2022 13:49	97	1.724
08/04/2022 13:49	98	1.724
08/04/2022 13:49	99	1.722
08/04/2022 13:49	100	1.725
08/04/2022 13:49	101	1.733
08/04/2022 13:49	102	1.731
08/04/2022 13:49	103	1.729
08/04/2022 13:49	104	1.739
08/04/2022 13:49	105	1.734
08/04/2022 13:49	106	1.727
08/04/2022 13:49	107	1.727
08/04/2022 13:49	108	1.728
08/04/2022 13:49	109	1.733
08/04/2022 13:49	110	1.731
08/04/2022 13:49	111	1.728
08/04/2022 13:49	112	1.731
08/04/2022 13:49	113	1.727
08/04/2022 13:49	114	1.73

08/04/2022 13:49	115	1.731
08/04/2022 13:49	116	1.731
08/04/2022 13:49	117	1.729
08/04/2022 13:49	118	1.728
08/04/2022 13:49	119	1.729
08/04/2022 13:49	120	1.728
08/04/2022 13:50	121	1.73
08/04/2022 13:50	122	1.732
08/04/2022 13:50	123	1.732
08/04/2022 13:50	124	1.732
08/04/2022 13:50	125	1.731
08/04/2022 13:50	126	1.731
08/04/2022 13:50	127	1.733
08/04/2022 13:50	128	1.732
08/04/2022 13:50	129	1.729
08/04/2022 13:50	130	1.731
08/04/2022 13:50	131	1.731
08/04/2022 13:50	132	1.731
08/04/2022 13:50	133	1.733
08/04/2022 13:50	134	1.73
08/04/2022 13:50	135	1.733
08/04/2022 13:50	136	1.732
08/04/2022 13:50	137	1.733
08/04/2022 13:50	138	1.732
08/04/2022 13:50	139	1.732
08/04/2022 13:50	140	1.734
08/04/2022 13:50	141	1.731
08/04/2022 13:50	142	1.733

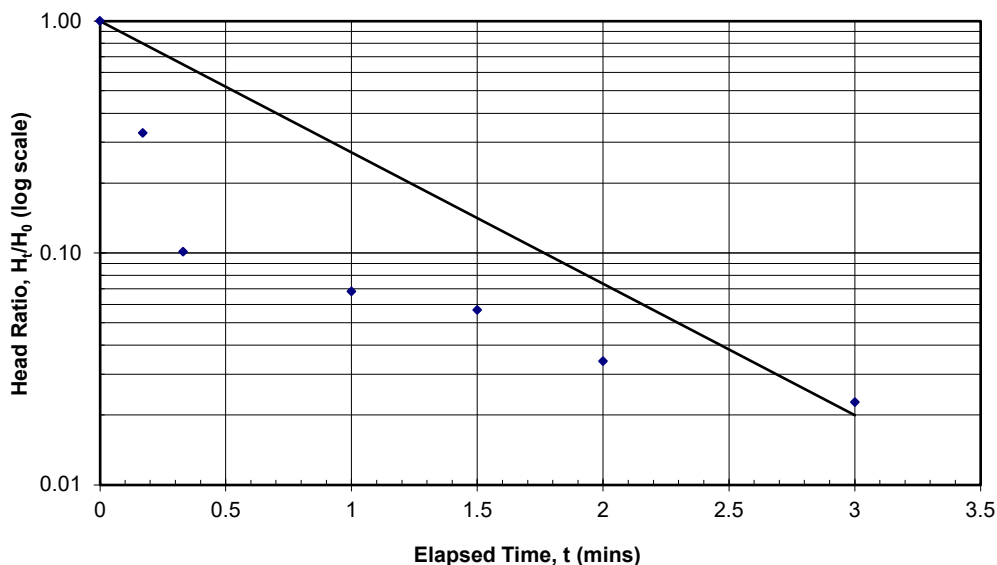
BH02 Falling Head test



Variable Head Permeability Test

TYPE OF TEST Standpipe Falling Head DETAILS OF INSTALLATION: Top of response zone 4.00 m BGL Base of response zone 5.00 m BGL Groundwater level for analysis 2.77 m BGL Height of tubing above ground level (datum) 0.00 m Diameter of standpipe tubing 50 mm <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Elapsed time, t (minutes)</th> <th>Depth to water from datum (m)</th> <th>Head, H_t (m)</th> <th>Head Ratio H_t/H_0</th> </tr> </thead> <tbody> <tr><td>0</td><td>1.89</td><td>0.88</td><td>1.00</td></tr> <tr><td>0.17</td><td>2.48</td><td>0.29</td><td>0.33</td></tr> <tr><td>0.33</td><td>2.68</td><td>0.09</td><td>0.10</td></tr> <tr><td>1</td><td>2.71</td><td>0.06</td><td>0.07</td></tr> <tr><td>1.5</td><td>2.72</td><td>0.05</td><td>0.06</td></tr> <tr><td>2</td><td>2.74</td><td>0.03</td><td>0.03</td></tr> <tr><td>3</td><td>2.75</td><td>0.02</td><td>0.02</td></tr> </tbody> </table>	Elapsed time, t (minutes)	Depth to water from datum (m)	Head, H_t (m)	Head Ratio H_t/H_0	0	1.89	0.88	1.00	0.17	2.48	0.29	0.33	0.33	2.68	0.09	0.10	1	2.71	0.06	0.07	1.5	2.72	0.05	0.06	2	2.74	0.03	0.03	3	2.75	0.02	0.02	BOREHOLE No. BH02 TEST NUMBER 1 DATE OF TEST 08 Mar 2022 CONDITIONS OF TEST ZONE Ref BS 5930:1999+A2 (2010) Figure 7 Piezometer tip in uniform soil Diameter of borehole (D) 50 mm Length of response zone (L) 1000 mm Intake Factor (F) 1.94 m REMARKS Depth to groundwater prior to test 1.73 m BGL Depth to water measured from top of standpipe Permeability calculated using BS 5930:1999 (Section 25.4.6) 25 litres of water added. Unable to create a meaningful change in head due to high permeability. Test undertaken close to high tide. CALCULATED VALUES Differential head at start of test, H_0 0.88 m Differential head at end of test, H_t 0.02 m Time Elapsed at end of test 3 mins General Approach Coordinates of best fit line to data: $t_1 = 0.0$ mins $H_1/H_0 = 1.000$ $t_2 = 3.0$ mins $H_2/H_0 = 0.020$ Permeability (k) 2.2E-05 m/sec
Elapsed time, t (minutes)	Depth to water from datum (m)	Head, H_t (m)	Head Ratio H_t/H_0																														
0	1.89	0.88	1.00																														
0.17	2.48	0.29	0.33																														
0.33	2.68	0.09	0.10																														
1	2.71	0.06	0.07																														
1.5	2.72	0.05	0.06																														
2	2.74	0.03	0.03																														
3	2.75	0.02	0.02																														

Head Ratio against Time



Notes:



Project Cardigan Flood Management
 Project No. 207916
 Client. Natural Resources Wales

Test

Sheet 1 of 1
BH03

Project: Cardigan Flood Risk Mangement
Number: 207196

Exploratory ID: BH03

Date and Time	Time elapsed (seconds)	Depth To Water (m)
08/04/2022 13:23	1	2.77
08/04/2022 13:24	2	2.766
08/04/2022 13:24	3	2.773
08/04/2022 13:24	4	2.771
08/04/2022 13:24	5	2.769
08/04/2022 13:24	6	2.768
08/04/2022 13:24	7	2.732
08/04/2022 13:24	8	2.664
08/04/2022 13:24	9	2.467
08/04/2022 13:24	10	2.336
08/04/2022 13:24	11	2.235
08/04/2022 13:24	12	2.184
08/04/2022 13:24	13	2.199
08/04/2022 13:24	14	2.226
08/04/2022 13:24	15	2.273
08/04/2022 13:24	16	2.315
08/04/2022 13:24	17	2.351
08/04/2022 13:24	18	2.366
08/04/2022 13:24	19	2.393
08/04/2022 13:24	20	2.394
08/04/2022 13:24	21	2.422
08/04/2022 13:24	22	2.424
08/04/2022 13:24	23	2.393
08/04/2022 13:24	24	2.403
08/04/2022 13:24	25	2.377
08/04/2022 13:24	26	2.364
08/04/2022 13:24	27	2.366
08/04/2022 13:24	28	2.366
08/04/2022 13:24	29	2.354
08/04/2022 13:24	30	2.366
08/04/2022 13:24	31	2.338
08/04/2022 13:24	32	2.311
08/04/2022 13:24	33	2.327
08/04/2022 13:24	34	2.337
08/04/2022 13:24	35	2.334
08/04/2022 13:24	36	2.311
08/04/2022 13:24	37	2.334
08/04/2022 13:24	38	2.271
08/04/2022 13:24	39	2.281
08/04/2022 13:24	40	2.227
08/04/2022 13:24	41	2.241
08/04/2022 13:24	42	2.243
08/04/2022 13:24	43	2.212
08/04/2022 13:24	44	2.217
08/04/2022 13:24	45	2.219
08/04/2022 13:24	46	2.221
08/04/2022 13:24	47	2.212
08/04/2022 13:24	48	2.198
08/04/2022 13:24	49	2.181
08/04/2022 13:24	50	2.188
08/04/2022 13:24	51	2.177
08/04/2022 13:24	52	2.172
08/04/2022 13:24	53	2.181
08/04/2022 13:24	54	2.173
08/04/2022 13:24	55	2.159
08/04/2022 13:24	56	2.126

08/04/2022 13:24	57	2.134
08/04/2022 13:24	58	2.128
08/04/2022 13:24	59	2.122
08/04/2022 13:24	60	2.132
08/04/2022 13:24	61	2.099
08/04/2022 13:25	62	2.074
08/04/2022 13:25	63	2.036
08/04/2022 13:25	64	1.966
08/04/2022 13:25	65	1.896
08/04/2022 13:25	66	1.896
08/04/2022 13:25	67	1.956
08/04/2022 13:25	68	2.02
08/04/2022 13:25	69	2.069
08/04/2022 13:25	70	2.05
08/04/2022 13:25	71	2.115
08/04/2022 13:25	72	2.205
08/04/2022 13:25	73	2.321
08/04/2022 13:25	74	2.411
08/04/2022 13:25	75	2.489
08/04/2022 13:25	76	2.553
08/04/2022 13:25	77	2.6
08/04/2022 13:25	78	2.637
08/04/2022 13:25	79	2.661
08/04/2022 13:25	80	2.67
08/04/2022 13:25	81	2.673
08/04/2022 13:25	82	2.679
08/04/2022 13:25	83	2.678
08/04/2022 13:25	84	2.679
08/04/2022 13:25	85	2.681
08/04/2022 13:25	86	2.679
08/04/2022 13:25	87	2.678
08/04/2022 13:25	88	2.682
08/04/2022 13:25	89	2.683
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08/04/2022 13:25	92	2.687
08/04/2022 13:25	93	2.688
08/04/2022 13:25	94	2.689
08/04/2022 13:25	95	2.688
08/04/2022 13:25	96	2.69
08/04/2022 13:25	97	2.69
08/04/2022 13:25	98	2.692
08/04/2022 13:25	99	2.692
08/04/2022 13:25	100	2.694
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08/04/2022 13:25	116	2.706
08/04/2022 13:25	117	2.709
08/04/2022 13:25	118	2.712
08/04/2022 13:25	119	2.712
08/04/2022 13:25	120	2.713
08/04/2022 13:25	121	2.713

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08/04/2022 13:26	123	2.713
08/04/2022 13:26	124	2.716
08/04/2022 13:26	125	2.716
08/04/2022 13:26	126	2.717
08/04/2022 13:26	127	2.713
08/04/2022 13:26	128	2.715
08/04/2022 13:26	129	2.715
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08/04/2022 13:26	131	2.719
08/04/2022 13:26	132	2.72
08/04/2022 13:26	133	2.721
08/04/2022 13:26	134	2.718
08/04/2022 13:26	135	2.723
08/04/2022 13:26	136	2.724
08/04/2022 13:26	137	2.722
08/04/2022 13:26	138	2.726
08/04/2022 13:26	139	2.726
08/04/2022 13:26	140	2.719
08/04/2022 13:26	141	2.727
08/04/2022 13:26	142	2.73
08/04/2022 13:26	143	2.728
08/04/2022 13:26	144	2.728
08/04/2022 13:26	145	2.73
08/04/2022 13:26	146	2.727
08/04/2022 13:26	147	2.73
08/04/2022 13:26	148	2.729
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08/04/2022 13:26	150	2.73
08/04/2022 13:26	151	2.73
08/04/2022 13:26	152	2.73
08/04/2022 13:26	153	2.73
08/04/2022 13:26	154	2.722
08/04/2022 13:26	155	2.727
08/04/2022 13:26	156	2.726
08/04/2022 13:26	157	2.73
08/04/2022 13:26	158	2.735
08/04/2022 13:26	159	2.732
08/04/2022 13:26	160	2.733
08/04/2022 13:26	161	2.73
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08/04/2022 13:26	170	2.734
08/04/2022 13:26	171	2.733
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08/04/2022 13:26	178	2.736
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08/04/2022 13:26	180	2.735
08/04/2022 13:26	181	2.735
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08/04/2022 13:27	183	2.738
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08/04/2022 13:27	185	2.737
08/04/2022 13:27	186	2.739

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08/04/2022 13:27	189	2.74
08/04/2022 13:27	190	2.738
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08/04/2022 13:27	204	2.741
08/04/2022 13:27	205	2.74
08/04/2022 13:27	206	2.74
08/04/2022 13:27	207	2.741
08/04/2022 13:27	208	2.739
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08/04/2022 13:27	213	2.743
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08/04/2022 13:27	215	2.745
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08/04/2022 13:27	218	2.743
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08/04/2022 13:27	232	2.746
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08/04/2022 13:27	234	2.745
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08/04/2022 13:27	237	2.746
08/04/2022 13:27	238	2.744
08/04/2022 13:27	239	2.743
08/04/2022 13:27	240	2.746
08/04/2022 13:27	241	2.747
08/04/2022 13:28	242	2.745
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08/04/2022 13:28	244	2.748
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08/04/2022 13:28	246	2.746
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08/04/2022 13:28	248	2.747
08/04/2022 13:28	249	2.748
08/04/2022 13:28	250	2.747
08/04/2022 13:28	251	2.745

08/04/2022 13:28	252	2.747
08/04/2022 13:28	253	2.746
08/04/2022 13:28	254	2.747
08/04/2022 13:28	255	2.748
08/04/2022 13:28	256	2.748
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08/04/2022 13:28	259	2.747
08/04/2022 13:28	260	2.749
08/04/2022 13:28	261	2.749
08/04/2022 13:28	262	2.749
08/04/2022 13:28	263	2.745
08/04/2022 13:28	264	2.751
08/04/2022 13:28	265	2.745
08/04/2022 13:28	266	2.745
08/04/2022 13:28	267	2.748
08/04/2022 13:28	268	2.745
08/04/2022 13:28	269	2.747
08/04/2022 13:28	270	2.743
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08/04/2022 13:28	272	2.749
08/04/2022 13:28	273	2.749
08/04/2022 13:28	274	2.746
08/04/2022 13:28	275	2.745
08/04/2022 13:28	276	2.744
08/04/2022 13:28	277	2.747
08/04/2022 13:28	278	2.75
08/04/2022 13:28	279	2.746
08/04/2022 13:28	280	2.747
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08/04/2022 13:28	288	2.747
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08/04/2022 13:28	290	2.75
08/04/2022 13:28	291	2.746
08/04/2022 13:28	292	2.749
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08/04/2022 13:28	299	2.746
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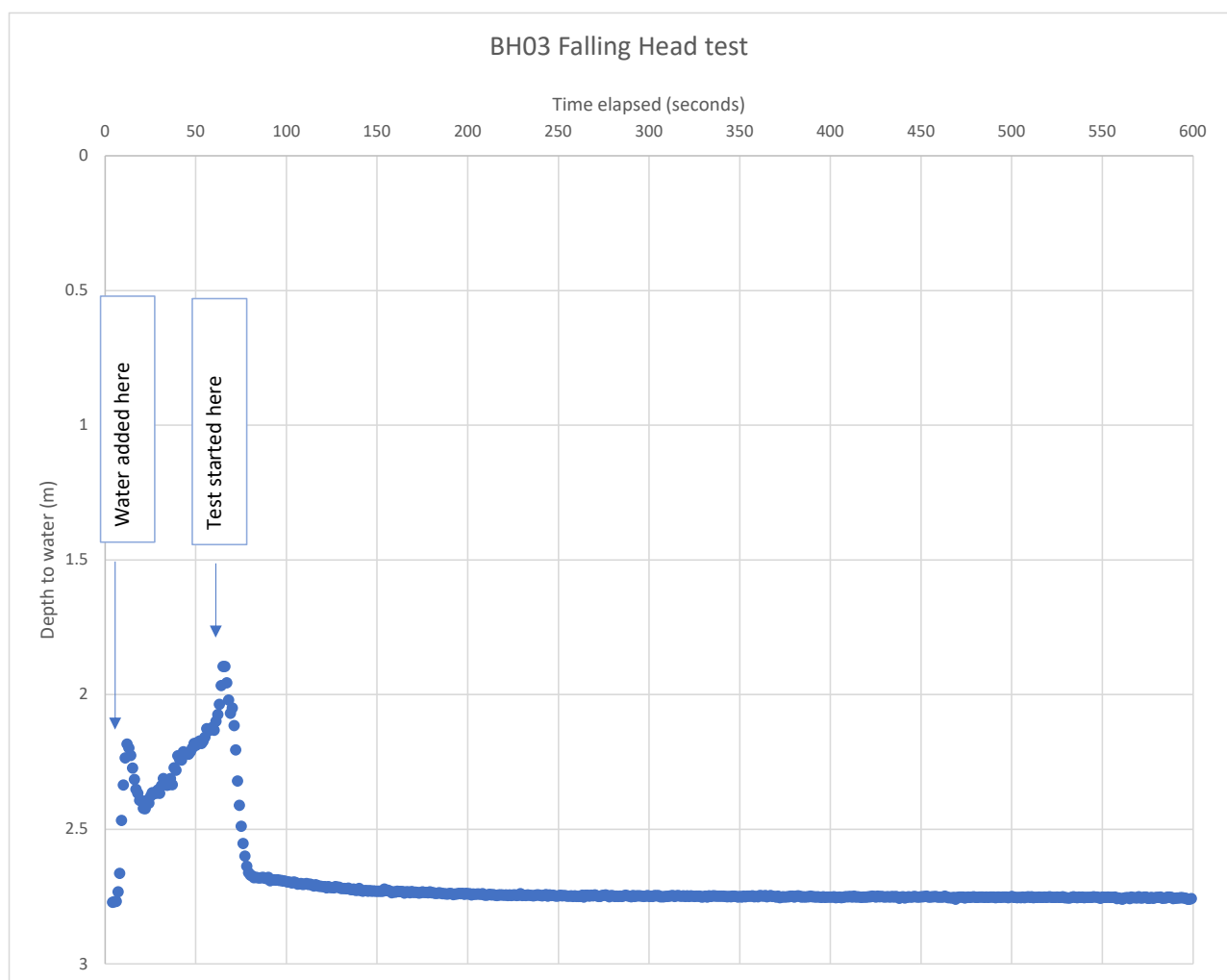
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08/04/2022 13:29	359	2.749
08/04/2022 13:29	360	2.75
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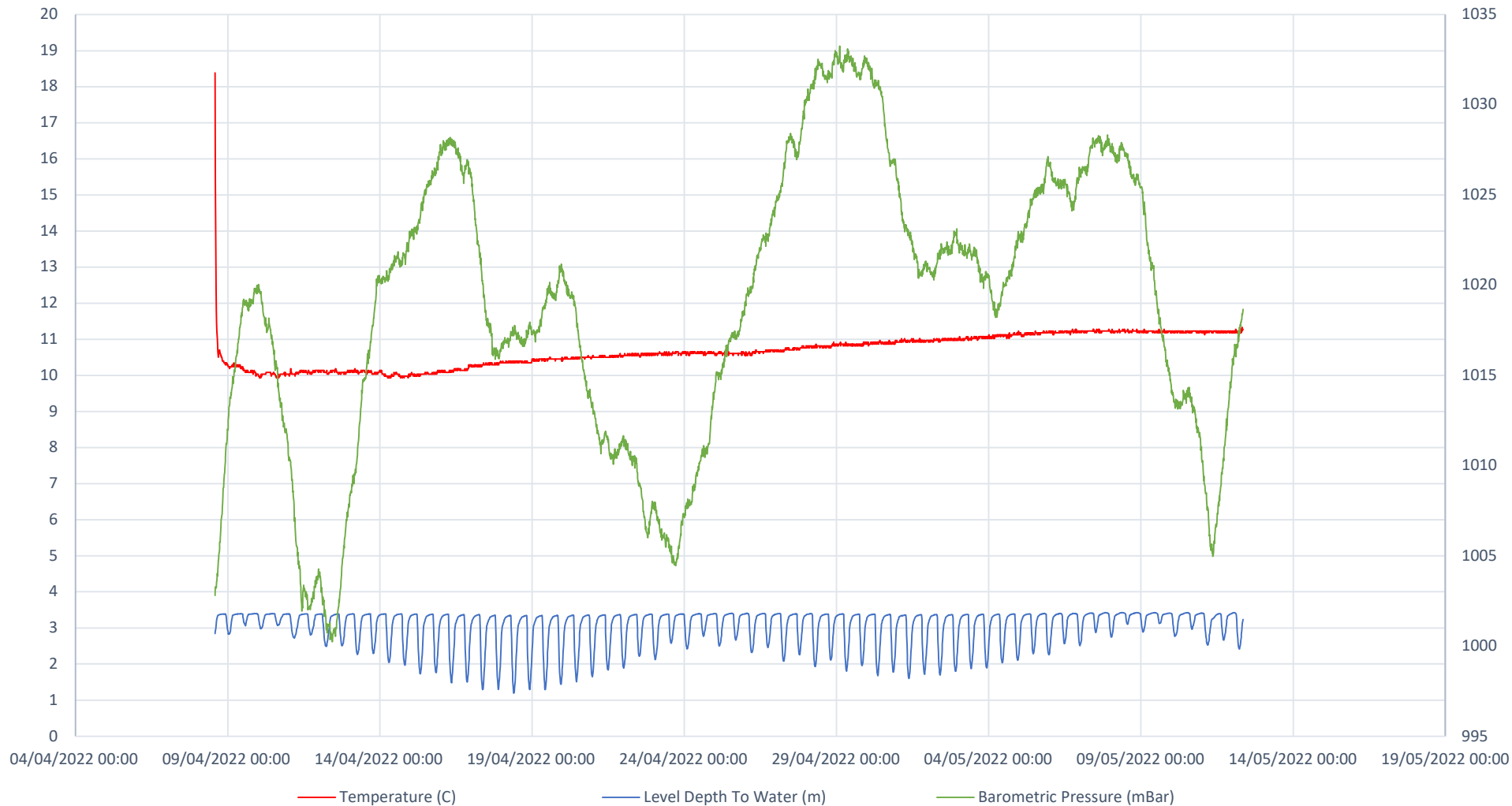
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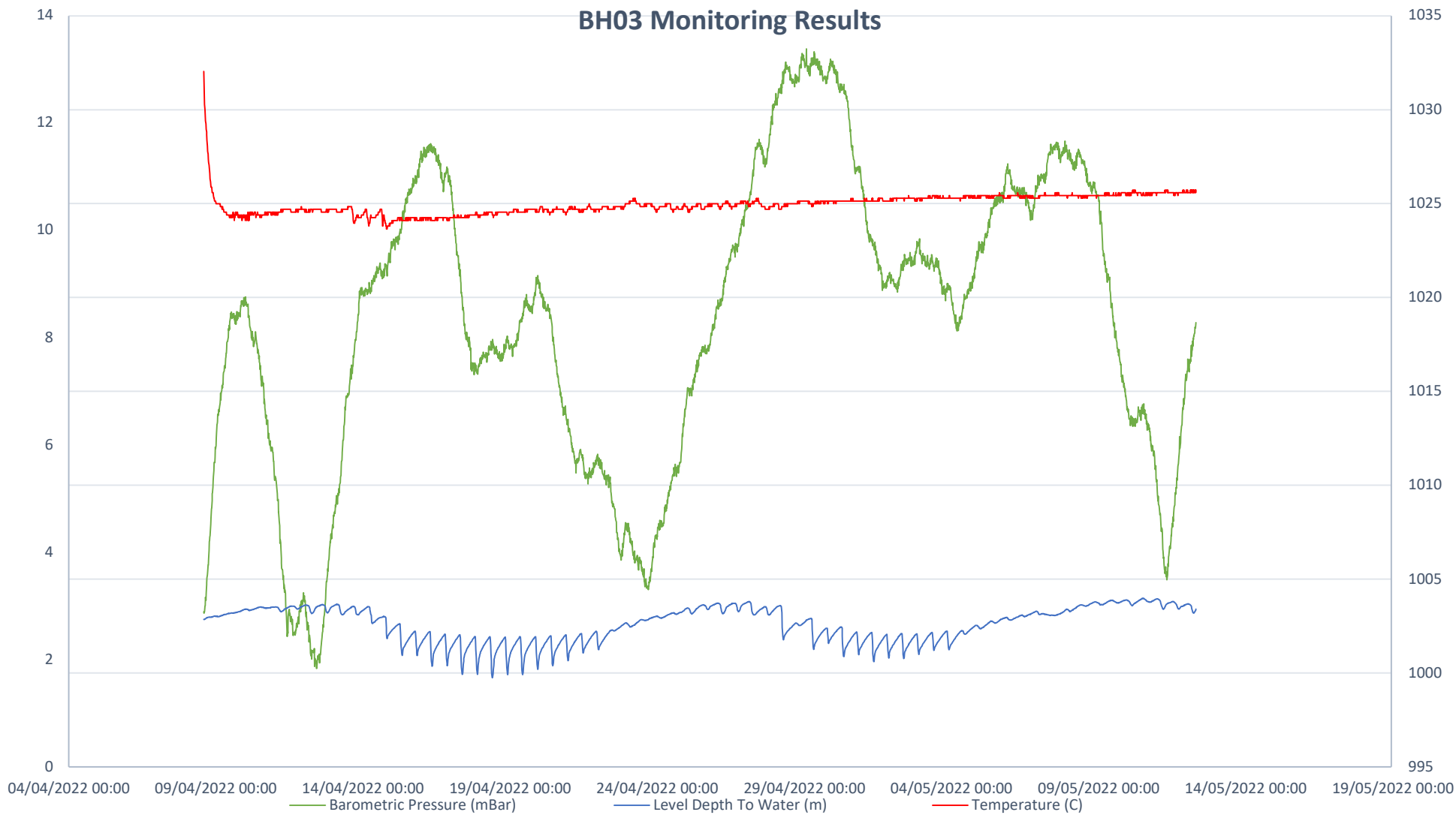
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08/04/2022 13:33	598	2.76
08/04/2022 13:33	599	2.757



**2071916 Cardigan Tidal Flood Risk Management GI
BH02 Monitoring Results**



**2071916 Cardigan Tidal Flood Risk Management GI
BH03 Monitoring Results**



Appendix D- Laboratory Testing Results

Laboratory Test Certificate



Site Cardigan GI
Client Binnies
Job Number 2071916
Lab Number L15572 & L15580
Order Number -

F.A.O. Shaun O'Farrell

Number of samples submitted for testing: 10 sample (s)

Suite E 10 suite(s)
Suite H - Inert WAC 7 suite(s)

* Non UKAS Accredited Test

Date (s) sample (s) received at laboratory: 28 Mar-22
Date of receipt of testing instructions 4 Apr-22
Date testing started: 4 Apr-22
Date of issue: 14 Apr-22

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.



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Approved by :
Lorna Logan

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 22/03045
Issue Number: 1

Date: 12 April, 2022

Client: CJ Associates
Portview Road
Avonmouth
Bristol
BS11 9JE

Project Manager: Admin/Lorna Logan
Project Name: Cardigan GI
Project Ref: 2071916_L15572_S9173
Order No: N/A
Date Samples Received: 24/03/22
Date Instructions Received: 30/03/22
Date Analysis Completed: 12/04/22

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 22/03045

Client Project Name: Cardigan GI

Client Project Ref: 2071916_L15572_S9173

Lab Sample ID	22/03045/2	22/03045/5	22/03045/8	22/03045/10	22/03045/11	22/03045/13	22/03045/15	Units	Limit of Detection	Method ref
Client Sample No	ES2	ES5	ES8	ES10	ES11					
Client Sample ID	BH03	BH03	BH03	BH03	BH03	BH02	BH02			
Depth to Top	0.50	1.50	3.00	4.50	6.00	0.50	1.50			
Depth To Bottom										
Date Sampled	21-Mar-22	22-Mar-22	22-Mar-22	22-Mar-22	22-Mar-22	25-Mar-22	25-Mar-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6A	6A	6AE	6AE	6AE	6AE			
% Stones >10mm _A	10.9	<0.1	7.7	7.4	<0.1	3.8	19.0	% w/w	0.1	A-T-044
pH _D ^{M#}	8.22	8.14	7.92	8.42	8.31	7.59	8.42	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05	0.18	0.03	0.08	0.26	<0.01	<0.01	g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	6.1	3.7	1.8	1.0	1.6	11.2	1.0	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	7	9	12	8	3	12	11	mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	1.4	<1.0	1.3	3.6	1.7	<1.0	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.0	1.0	1.1	1.1	0.9	1.9	1.7	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	48	25	38	32	10	53	32	mg/kg	1	A-T-024s
Chromium _D ^{M#}	22	25	26	26	20	34	25	mg/kg	1	A-T-024s
Lead _D ^{M#}	61	57	69	31	12	261	30	mg/kg	1	A-T-024s
Mercury _D	0.32	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	25	27	30	32	23	30	31	mg/kg	1	A-T-024s
Zinc _D ^{M#}	116	97	138	93	63	188	83	mg/kg	5	A-T-024s
TPH total (>C6-C40) _A ^{M#}	72	623	49	80	19	538	29	mg/kg	10	A-T-007s

Envirolab Job Number: 22/03045

Client Project Name: Cardigan GI

Client Project Ref: 2071916_L15572_S9173

Lab Sample ID	22/03045/2	22/03045/5	22/03045/8	22/03045/10	22/03045/11	22/03045/13	22/03045/15	Units	Limit of Detection	Method ref
Client Sample No	ES2	ES5	ES8	ES10	ES11					
Client Sample ID	BH03	BH03	BH03	BH03	BH03	BH02	BH02			
Depth to Top	0.50	1.50	3.00	4.50	6.00	0.50	1.50			
Depth To Bottom										
Date Sampled	21-Mar-22	22-Mar-22	22-Mar-22	22-Mar-22	22-Mar-22	25-Mar-22	25-Mar-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6A	6A	6AE	6AE	6AE	6AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 22/03045

Client Project Name: Cardigan GI

Client Project Ref: 2071916_L15572_S9173

Lab Sample ID	22/03045/2	22/03045/5	22/03045/8	22/03045/10	22/03045/11	22/03045/13	22/03045/15	Units	Limit of Detection	Method ref
Client Sample No	ES2	ES5	ES8	ES10	ES11					
Client Sample ID	BH03	BH03	BH03	BH03	BH03	BH02	BH02			
Depth to Top	0.50	1.50	3.00	4.50	6.00	0.50	1.50			
Depth To Bottom										
Date Sampled	21-Mar-22	22-Mar-22	22-Mar-22	22-Mar-22	22-Mar-22	25-Mar-22	25-Mar-22			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	6A	6A	6AE	6AE	6AE	6AE			
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	0.02	<0.01	<0.01	<0.01	0.22	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.02	0.04	<0.01	0.02	<0.01	0.26	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.09	0.28	<0.02	0.05	<0.02	0.88	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.59	1.72	<0.04	0.26	<0.04	10.6	0.07	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.53	1.50	<0.04	0.25	<0.04	10.7	0.09	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.71	1.86	<0.05	0.27	<0.05	15.7	0.13	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.28	0.74	<0.05	0.09	<0.05	5.84	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.27	0.73	<0.07	0.14	<0.07	5.71	<0.07	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.64	1.82	<0.06	0.28	<0.06	11.2	0.08	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.09	0.23	<0.04	<0.04	<0.04	1.79	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	1.00	2.71	<0.08	0.23	<0.08	15.4	0.09	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	0.05	<0.01	0.02	<0.01	0.22	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.33	0.87	<0.03	0.10	<0.03	7.34	0.05	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.30	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.33	0.84	<0.03	0.13	<0.03	3.25	<0.03	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.79	2.16	<0.07	0.27	<0.07	12.6	0.09	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	5.67	15.6	<0.08	2.11	<0.08	102	0.60	mg/kg	0.01	A-T-019s

Envirolab Job Number: 22/03045

Client Project Name: Cardigan GI

Client Project Ref: 2071916_L15572_S9173

Lab Sample ID	22/03045/18	22/03045/20	22/03045/22					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH02	BH02	BH02							
Depth to Top	3.00	4.00	6.00							
Depth To Bottom										
Date Sampled	25-Mar-22	25-Mar-22	25-Mar-22							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	6A	6A	4A							
% Stones >10mm _A	35.6	<0.1	30.1					% w/w	0.1	A-T-044
pH _D ^{M#}	8.31	8.42	8.46					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.23	0.23	0.02					g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042STCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	2.2	2.1	0.3					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	19	21	<1					mg/kg	1	A-T-024s
Boron (water soluble) _D	2.4	2.1	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.2	1.5	1.5					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	14	15	12					mg/kg	1	A-T-024s
Chromium _D ^{M#}	18	21	19					mg/kg	1	A-T-024s
Lead _D ^{M#}	33	20	11					mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	20	24	24					mg/kg	1	A-T-024s
Zinc _D ^{M#}	68	69	68					mg/kg	5	A-T-024s
TPH total (>C6-C40) _A ^{M#}	44	140	38					mg/kg	10	A-T-007s

Envirolab Job Number: 22/03045

Client Project Name: Cardigan GI

Client Project Ref: 2071916_L15572_S9173

Lab Sample ID	22/03045/18	22/03045/20	22/03045/22					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH02	BH02	BH02							
Depth to Top	3.00	4.00	6.00							
Depth To Bottom										
Date Sampled	25-Mar-22	25-Mar-22	25-Mar-22							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	6A	6A	4A							
Asbestos in Soil (inc. matrix)										
Asbestos in soil _D [#]	NAD	NAD	NAD							A-T-045
Asbestos Matrix (visual) _D	-	-	-							A-T-045
Asbestos Matrix (microscope) _D	-	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 22/03045

Client Project Name: Cardigan GI

Client Project Ref: 2071916_L15572_S9173

Lab Sample ID	22/03045/18	22/03045/20	22/03045/22					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH02	BH02	BH02							
Depth to Top	3.00	4.00	6.00							
Depth To Bottom										
Date Sampled	25-Mar-22	25-Mar-22	25-Mar-22							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	6A	6A	4A							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.11	<0.04	<0.04					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.08	<0.04	<0.04					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.11	<0.05	<0.05					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.11	<0.06	<0.06					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.10	<0.08	<0.08					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.10	<0.07	<0.07					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	0.64	<0.08	<0.08					mg/kg	0.01	A-T-019s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: CJ Associates, Portview Road, Avonmouth, Bristol, BS11 9JE

Project No: 22/03045

Project: Cardigan GI

Date Received: 30/03/2022 (am)

Clients Project No: 2071916_L15572_S9173

Cool Box Temperatures (°C): 8.1 & 8.2

Lab Sample ID	22/03045/8	22/03045/22
Client Sample No	ES8	
Client Sample ID/Depth	BH03 3.00m	BH02 6.00m
Date Sampled	22/03/22	25/03/22
Deviation Code		
D (no glass)	✓	
E (no date)		✓

Key

D (no glass) Glass container not provided for extractable organics analysis
E (no date) No sampling date provided (all results affected if not provided)

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	22/03045/2	22/03045/5	22/03045/8	22/03045/10	22/03045/11	22/03045/13	22/03045/15	22/03045/18	22/03045/20	22/03045/22
Client Sample No	ES2	ES5	ES8	ES10	ES11					
Client Sample ID/Depth	BH03 0.50m	BH03 1.50m	BH03 3.00m	BH03 4.50m	BH03 6.00m	BH02 0.50m	BH02 1.50m	BH02 3.00m	BH02 4.00m	BH02 6.00m
Date Sampled	21/03/22	22/03/22	22/03/22	22/03/22	22/03/22	25/03/22	25/03/22	25/03/22	25/03/22	25/03/22
A-T-004s	04/04/2022	08/04/2022	04/04/2022		04/04/2022	11/04/2022	11/04/2022		11/04/2022	
A-T-007s	11/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022	08/04/2022	08/04/2022	08/04/2022	08/04/2022	08/04/2022
A-T-019s	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022
A-T-022s	04/04/2022	04/04/2022	04/04/2022		04/04/2022	08/04/2022	08/04/2022		08/04/2022	
A-T-024s	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022
A-T-025w	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
A-T-026s	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
A-T-026w	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
A-T-027s	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022	11/04/2022
A-T-031s	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
A-T-031w	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
A-T-032 OM	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022	12/04/2022
A-T-032s	07/04/2022	07/04/2022	07/04/2022		07/04/2022	12/04/2022	12/04/2022		12/04/2022	
A-T-032w	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
A-T-037w	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
A-T-042sTCN	01/04/2022	01/04/2022	01/04/2022	01/04/2022	01/04/2022	08/04/2022	08/04/2022	08/04/2022	08/04/2022	08/04/2022
A-T-044	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
A-T-045	01/04/2022	01/04/2022	01/04/2022	01/04/2022	01/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
A-T-050s	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022	08/04/2022	08/04/2022	08/04/2022	08/04/2022	08/04/2022
A-T-050w	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
Calc-no stones	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	
Probe (w)	12/04/2022	12/04/2022	12/04/2022		12/04/2022	12/04/2022	12/04/2022		12/04/2022	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Final Test Report
SUPPLEMENT TO TEST REPORT 22/03045/1

Envirolab Job Number: 22/03045
Issue Number: 2

Date: 13-Apr-22

Client: CJ Associates
Portview Road
Avonmouth
Bristol
BS11 9JE

Project Manager: Admin/Lorna Logan
Project Name: Cardigan GI
Project Ref: 2071916_L15572_S9173
Order No: N/A

Date Samples Received: 24-Mar-22
Date Instructions Received: 30-Mar-22
Date Analysis Completed: 12-Apr-22

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:



Sophie France
Client Service Manager

Sample Details					Landfill Waste Acceptance Criteria Limits				
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/2		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample Number				ES2					
Client Sample ID				BH03					
Depth to Top				0.5					
Depth to Bottom									
Date Sampled				21/03/2022					
Sample Type				Soil - ES					
Sample Matrix Code				6AE					
Solid Waste Analysis									
pH (pH Units) _D	A-T-031	N	N	8.22		-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N			-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	3.54		3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	5.8		100	-	-	
Mineral Oil (mg/kg) _{A EH, CU, 1D, AL}	A-T-007	N	N	<10		500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-	
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
				mg/l	mg/kg				
Arsenic	A-T-025	N	N	0.005	0.050	0.5	2	25	
Barium	A-T-025	N	N	0.044	0.440	20	100	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5	
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70	
Copper	A-T-025	N	N	0.011	0.110	2	50	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2	
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30	
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	10	40	
Lead	A-T-025	N	N	0.030	0.300	0.5	10	50	
Antimony	A-T-025	N	N	0.003	0.030	0.06	0.7	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7	
Zinc	A-T-025	N	N	0.020	0.200	4	50	200	
Chloride	A-T-026	N	N	2	20	800	15000	25000	
Fluoride	A-T-026	N	N	0.2	2.0	10	150	500	
Sulphate as SO ₄	A-T-026	N	N	4	39	1000	20000	50000	
Total Dissolved Solids	A-T-035	N	N	60	600	4000	60000	100000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-	
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000	
Leach Test Information									
pH (pH Units)	A-T-031	N	N	6.9					
Conductivity (µS/cm)	A-T-037	N	N	120					
Mass Sample (kg)				0.193					
Dry Matter (%)	A-T-044	N	N	90.6					
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation									

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/5				
Client Sample Number				ES5	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				BH03				
Depth to Top				1.5				
Depth to Bottom								
Date Sampled				22/03/2022				
Sample Type				Soil - ES				
Sample Matrix Code				6A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.14	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N		-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	2.16	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	15.9	100	-	-	
Mineral Oil (mg/kg) _{A EH, CU, 1D, AL}	A-T-007	N	N	195	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.007	0.070	0.5	25	
Barium	A-T-025	N	N	0.005	0.050	20	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	5	
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	70	
Copper	A-T-025	N	N	0.007	0.070	2	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	2	
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	30	
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	40	
Lead	A-T-025	N	N	0.027	0.270	0.5	50	
Antimony	A-T-025	N	N	0.002	0.020	0.06	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	7	
Zinc	A-T-025	N	N	0.024	0.240	4	200	
Chloride	A-T-026	N	N	12	124	800	15000	
Fluoride	A-T-026	N	N	0.2	2.0	10	150	
Sulphate as SO ₄	A-T-026	N	N	9	89	1000	20000	
Total Dissolved Solids	A-T-035	N	N	59	590	4000	60000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.3				
Conductivity (µS/cm)	A-T-037	N	N	117				
Mass Sample (kg)				0.227				
Dry Matter (%)	A-T-044	N	N	77.2				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/8				
Client Sample Number				ES8	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				BH03				
Depth to Top				3				
Depth to Bottom								
Date Sampled				22/03/2022				
Sample Type				Soil - ES				
Sample Matrix Code				6A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.92	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N		-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	1.03	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	<0.08	100	-	-	
Mineral Oil (mg/kg) _{A EH, CU, 1D, AL}	A-T-007	N	N	21	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.017	0.170	0.5	25	
Barium	A-T-025	N	N	0.014	0.140	20	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	5	
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	70	
Copper	A-T-025	N	N	0.009	0.090	2	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	2	
Molybdenum	A-T-025	N	N	0.018	0.180	0.5	30	
Nickel	A-T-025	N	N	0.001	0.010	0.4	40	
Lead	A-T-025	N	N	0.011	0.110	0.5	50	
Antimony	A-T-025	N	N	0.007	0.070	0.06	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	7	
Zinc	A-T-025	N	N	0.015	0.150	4	200	
Chloride	A-T-026	N	N	2	20	800	15000	
Fluoride	A-T-026	N	N	0.2	2.0	10	500	
Sulphate as SO ₄	A-T-026	N	N	38	383	1000	50000	
Total Dissolved Solids	A-T-035	N	N	128	1280	4000	100000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	
Dissolved Organic Carbon	A-T-032	N	N	22.60	226	500	1000	
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.2				
Conductivity (µS/cm)	A-T-037	N	N	256				
Mass Sample (kg)				0.218				
Dry Matter (%)	A-T-044	N	N	80.2				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/11				
Client Sample Number				ES11	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				BH03				
Depth to Top				6				
Depth to Bottom								
Date Sampled				22/03/2022				
Sample Type				Soil - ES				
Sample Matrix Code				6AE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.31	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N		-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N		-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	0.94	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	<0.08	100	-	-	
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	<10	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.011	0.110	0.5	25	
Barium	A-T-025	N	N	0.009	0.090	20	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	5	
Chromium	A-T-025	N	N	0.001	0.010	0.5	70	
Copper	A-T-025	N	N	0.005	0.050	2	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	2	
Molybdenum	A-T-025	N	N	0.007	0.070	0.5	30	
Nickel	A-T-025	N	N	0.003	0.030	0.4	40	
Lead	A-T-025	N	N	0.006	0.060	0.5	50	
Antimony	A-T-025	N	N	0.002	0.020	0.06	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	7	
Zinc	A-T-025	N	N	0.050	0.500	4	200	
Chloride	A-T-026	N	N	126	1260	800	15000	
Fluoride	A-T-026	N	N	0.3	3.0	10	150	
Sulphate as SO ₄	A-T-026	N	N	76	760	1000	20000	
Total Dissolved Solids	A-T-035	N	N	390	3900	4000	60000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	
Leach Test Information								
pH (pH Units)	A-T-031	N	N	6.9				
Conductivity (µS/cm)	A-T-037	N	N	781				
Mass Sample (kg)				0.235				
Dry Matter (%)	A-T-044	N	N	74.5				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits				
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/13					
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill		
Client Sample ID				BH02					
Depth to Top				0.5					
Depth to Bottom									
Date Sampled				25/03/2022					
Sample Type				Soil - ES					
Sample Matrix Code				6AE					
Solid Waste Analysis									
pH (pH Units) _D	A-T-031	N	N	7.59		-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N			-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	6.47		3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	104		100	-	-	
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	32		500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic	A-T-025	N	N	0.015	0.150	0.5	2	25	
Barium	A-T-025	N	N	0.260	2.600	20	100	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5	
Chromium	A-T-025	N	N	0.002	0.020	0.5	10	70	
Copper	A-T-025	N	N	0.041	0.410	2	50	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2	
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30	
Nickel	A-T-025	N	N	0.006	0.060	0.4	10	40	
Lead	A-T-025	N	N	0.214	2.140	0.5	10	50	
Antimony	A-T-025	N	N	0.003	0.030	0.06	0.7	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7	
Zinc	A-T-025	N	N	0.181	1.810	4	50	200	
Chloride	A-T-026	N	N	19	195	800	15000	25000	
Fluoride	A-T-026	N	N	0.8	8.0	10	150	500	
Sulphate as SO ₄	A-T-026	N	N	6	58	1000	20000	50000	
Total Dissolved Solids	A-T-035	N	N	57	570	4000	60000	100000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-	
Dissolved Organic Carbon	A-T-032	N	N	25.10	251	500	800	1000	
Leach Test Information									
pH (pH Units)	A-T-031	N	N	7.2					
Conductivity (µS/cm)	A-T-037	N	N	113					
Mass Sample (kg)				0.217					
Dry Matter (%)	A-T-044	N	N	80.5					
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation									

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/15				
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				BH02				
Depth to Top				1.5				
Depth to Bottom								
Date Sampled				25/03/2022				
Sample Type				Soil - ES				
Sample Matrix Code				6AE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.42		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N			-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	0.57		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	0.62		100	-	-
Mineral Oil (mg/kg) _{A EH, CU, 1D, AL}	A-T-007	N	N	25		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.014	0.140	0.5	2	25
Barium	A-T-025	N	N	0.022	0.220	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	0.015	0.150	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.001	0.010	0.5	10	30
Nickel	A-T-025	N	N	0.002	0.020	0.4	10	40
Lead	A-T-025	N	N	0.023	0.230	0.5	10	50
Antimony	A-T-025	N	N	0.002	0.020	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.025	0.250	4	50	200
Chloride	A-T-026	N	N	6	63	800	15000	25000
Fluoride	A-T-026	N	N	0.4	4.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	5	49	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	51	510	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	8.3				
Conductivity (µS/cm)	A-T-037	N	N	101				
Mass Sample (kg)				0.194				
Dry Matter (%)	A-T-044	N	N	90.3				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits				
Lab Sample ID	Method	ISO17025	MCERTS	22/03045/20					
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill		
Client Sample ID				BH02					
Depth to Top				4					
Depth to Bottom									
Date Sampled				25/03/2022					
Sample Type				Soil - ES					
Sample Matrix Code				6A					
Solid Waste Analysis									
pH (pH Units) _D	A-T-031	N	N	8.42		-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N			-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N			-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	1.2		3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	<0.08		100	-	-	
Mineral Oil (mg/kg) _{A EH, CU, 1D, AL}	A-T-007	N	N	84		500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic	A-T-025	N	N	0.006	0.060	0.5	2	25	
Barium	A-T-025	N	N	0.003	0.030	20	100	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5	
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70	
Copper	A-T-025	N	N	<0.001	<0.01	2	50	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2	
Molybdenum	A-T-025	N	N	0.014	0.140	0.5	10	30	
Nickel	A-T-025	N	N	<0.001	<0.01	0.4	10	40	
Lead	A-T-025	N	N	0.001	0.010	0.5	10	50	
Antimony	A-T-025	N	N	0.001	0.010	0.06	0.7	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7	
Zinc	A-T-025	N	N	0.004	0.040	4	50	200	
Chloride	A-T-026	N	N	56	557	800	15000	25000	
Fluoride	A-T-026	N	N	0.4	4.0	10	150	500	
Sulphate as SO ₄	A-T-026	N	N	106	1061	1000	20000	50000	
Total Dissolved Solids	A-T-035	N	N	252	2520	4000	60000	100000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-	
Dissolved Organic Carbon	A-T-032	N	N	20.70	207	500	800	1000	
Leach Test Information									
pH (pH Units)	A-T-031	N	N	7.4					
Conductivity (µS/cm)	A-T-037	N	N	503					
Mass Sample (kg)				0.209					
Dry Matter (%)	A-T-044	N	N	83.8					
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation									

Laboratory Test Certificate



Site Cardigan GI
Client Binnies
Job Number 2071916
Lab Number L15575
Order Number -

F.A.O. Shaun O'Farrell

Number of samples submitted for testing:	36	sample (s)
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Natural Water Content	20	test(s)
Atterberg Limits	2	test(s)
Coarse Particle Size Distribution	21	test(s)
Fine Particle Size Distribution	5	test(s)
Point Load Determination (set of 10)	1	test(s)
Point Load Determination (individual)	5	test(s)
BRE SD1 - suite A	7	test(s)

* Non UKAS Accredited Test

Date (s) sample (s) received at laboratory:	28	Mar-22
Date of receipt of testing instructions	28	Mar-22
Date testing started:	29	Mar-22
Date of issue:	29	Apr-22

Please note that we will keep the sample (s) for one month after submission of our report and will then dispose of them without notice unless you ask us to store them. We will then make a separate charge for this.



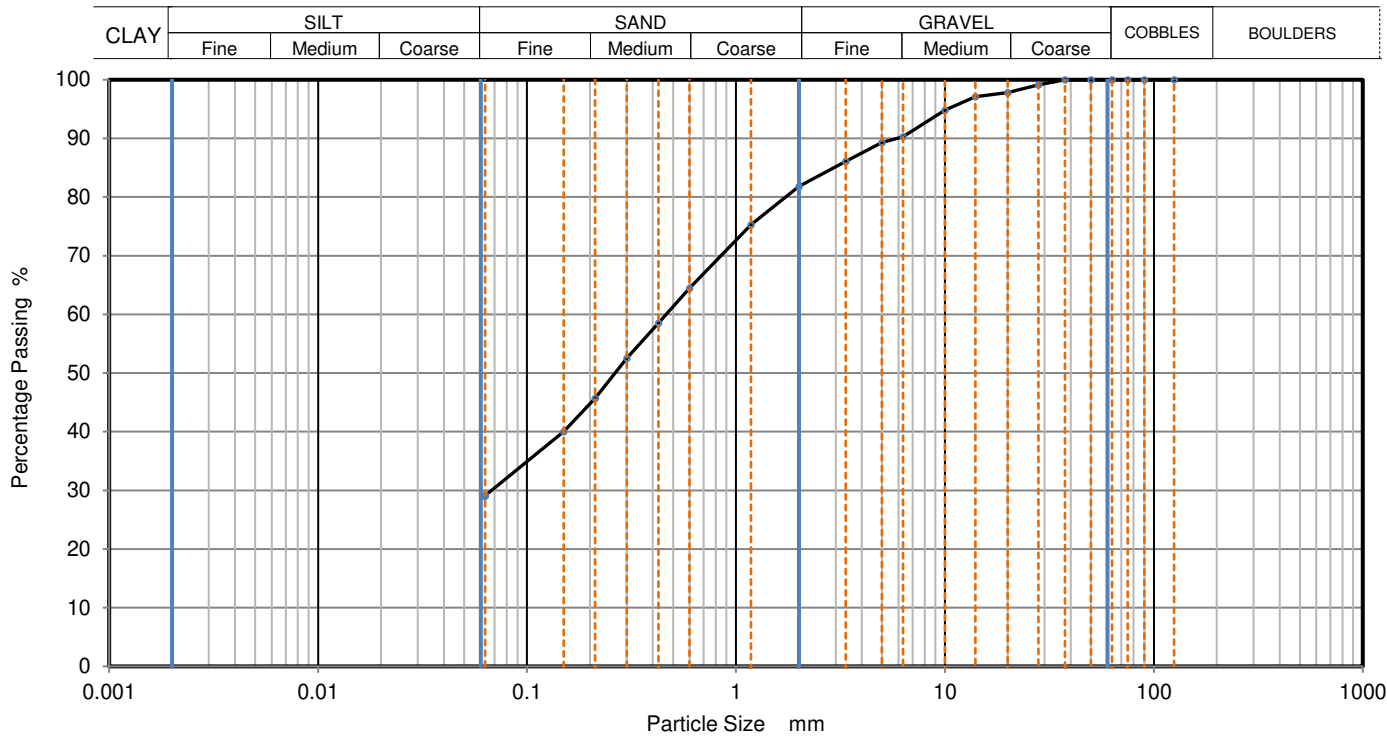
1429

Approved by :
Lorna Logan

Water Content Performed in accordance with BS EN ISO 17892-1 : 2014

Key				Date Printed	Approved By	Table
Density test	Liquid Limit	Atterberg Prep	Particle density	20/04/2022	Lisa Maiden	1
Linear measurement unless	4pt cone unless :	1. in natural condition	sp - small pyknom			sheet
wd - water displacement	cas - Casagrande method	2. after >425um removed by hand	gj - gas jar			1
wi - immersion in water	1pt - single point test	3. after washing to remove >425um				

	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	0.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204010	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	98		
14	97		
10	95		
6.3	90		
5	89		
3.35	86		
2	82		
1.18	75		
0.6	65		
0.425	59		
0.3	53		
0.212	46		
0.15	40		
0.063	29		

Dry Mass of sample, g		5727
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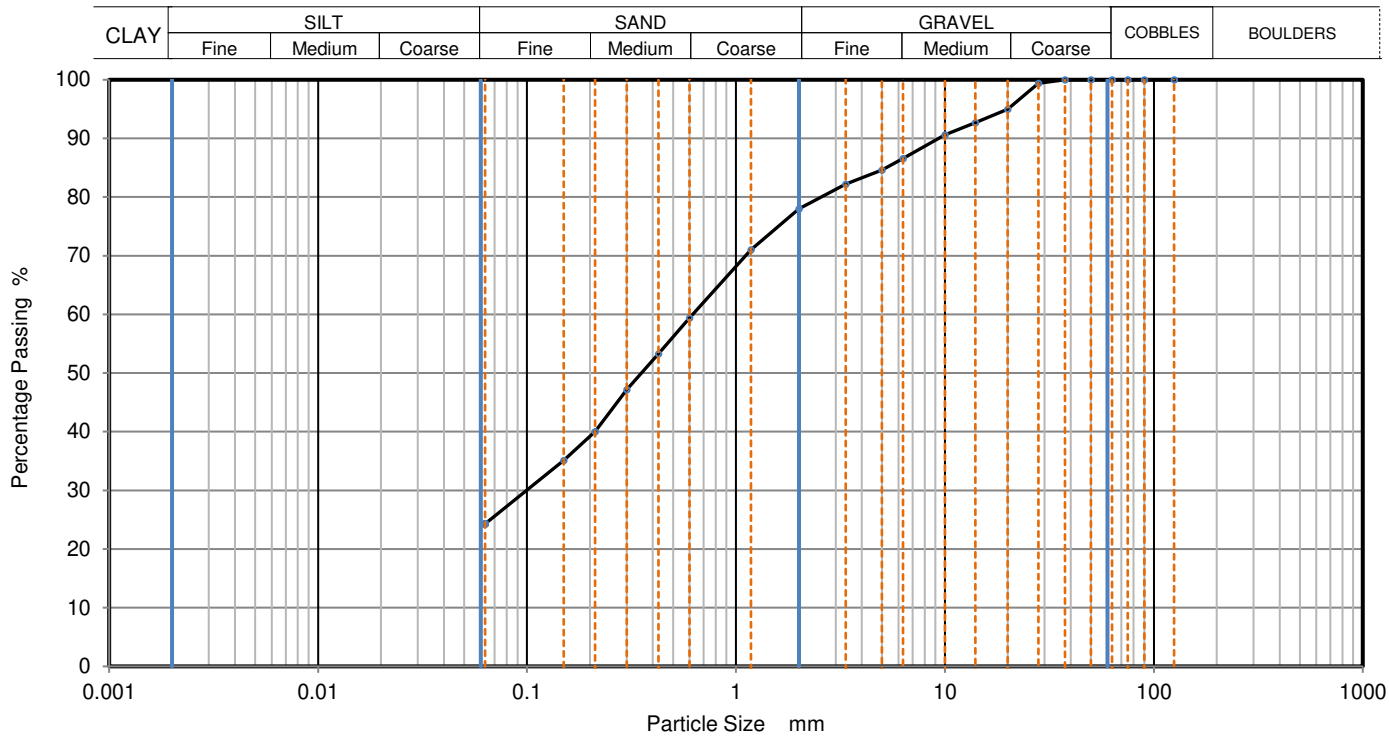
Sample Proportions		% dry mass
Very coarse		0
Gravel		18
Sand		53
Fines <0.063mm		29

Grading Analysis		
D100	mm	
D60	mm	0.464
D30	mm	0.0675
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1 Sheet
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	0.50	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204011	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	95		
14	93		
10	91		
6.3	87		
5	85		
3.35	82		
2	78		
1.18	71		
0.6	59		
0.425	53		
0.3	47		
0.212	40		
0.15	35		
0.063	24		

Dry Mass of sample, g	6873
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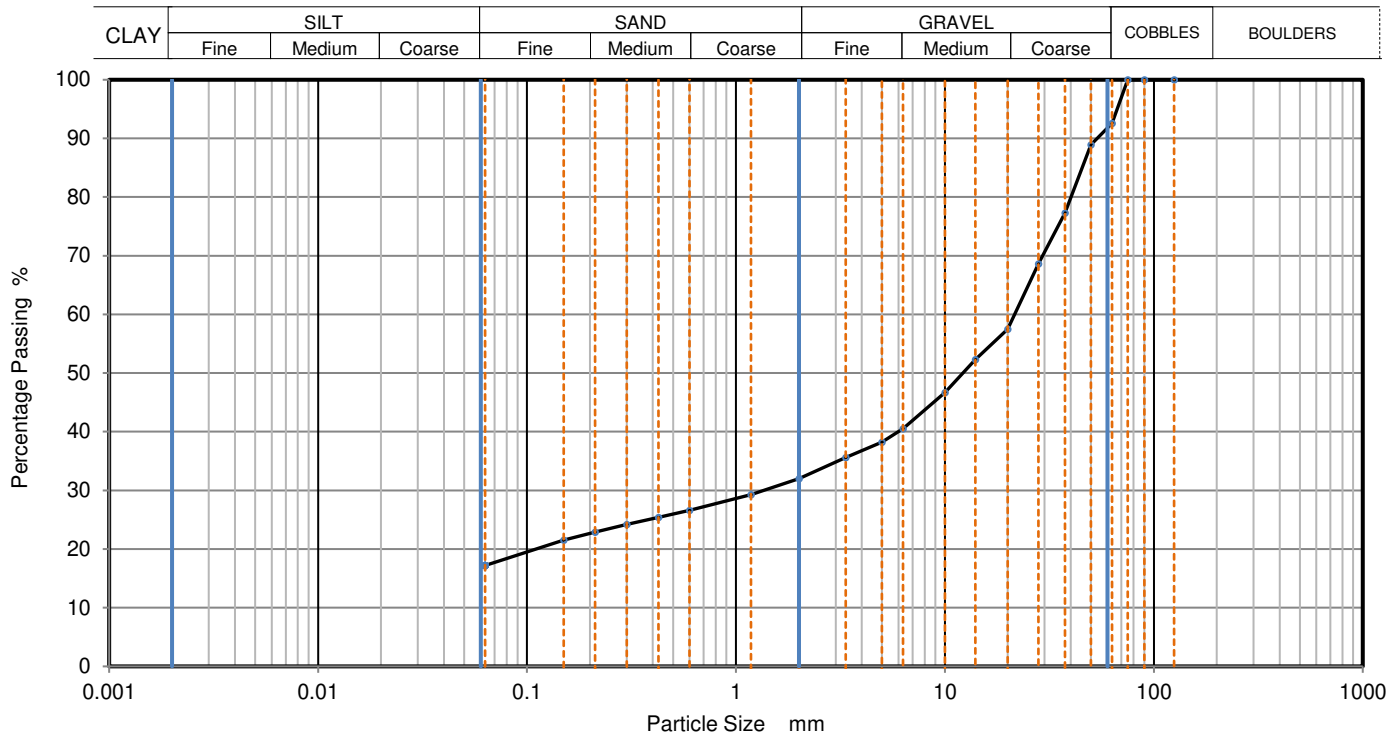
Sample Proportions	% dry mass
Very coarse	0
Gravel	22
Sand	54
Fines <0.063mm	24

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	1.20	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204012	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	89		
37.5	77		
28	69		
20	58		
14	52		
10	47		
6.3	41		
5	38		
3.35	36		
2	32		
1.18	29		
0.6	27		
0.425	25		
0.3	24		
0.212	23		
0.15	22		
0.063	17		

Dry Mass of sample, g		7051
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Sample Proportions		% dry mass
Very coarse		7
Gravel		61
Sand		15
Fines <0.063mm		17

Grading Analysis		
D100	mm	
D60	mm	21.6
D30	mm	1.36
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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PARTICLE SIZE DISTRIBUTION

Job Ref

2071916

Borehole/Pit No.

BH02

Site Name

Cardigan GI

Sample No.

Soil Description

Depth, m

2.00

Specimen
ReferenceSpecimen
Depth

m

Sample Type

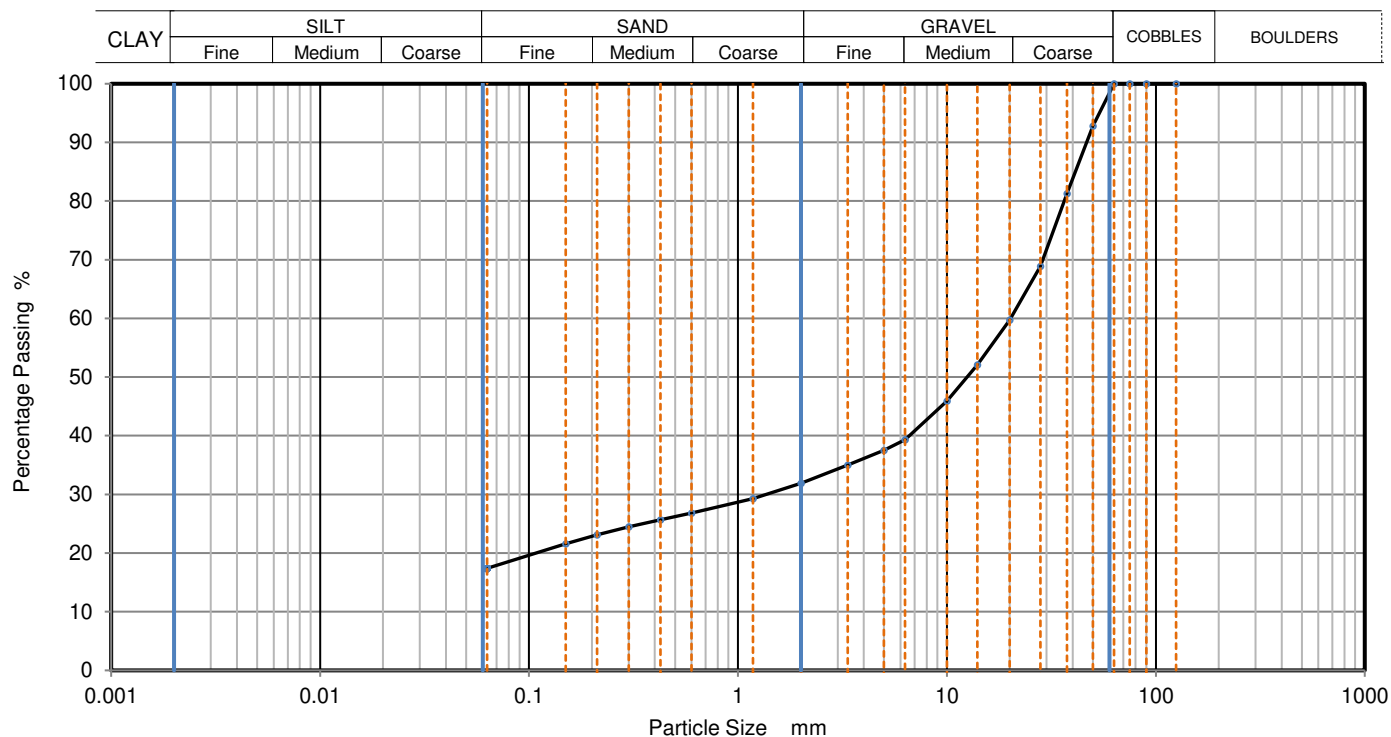
B

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CJA_202204013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	81		
28	69		
20	60		
14	52		
10	46		
6.3	39		
5	38		
3.35	35		
2	32		
1.18	29		
0.6	27		
0.425	26		
0.3	25		
0.212	23		
0.15	22		
0.063	17		

Dry Mass of sample, g

6368

Sample Proportions	% dry mass
Very coarse	0
Gravel	68
Sand	15
Fines <0.063mm	17

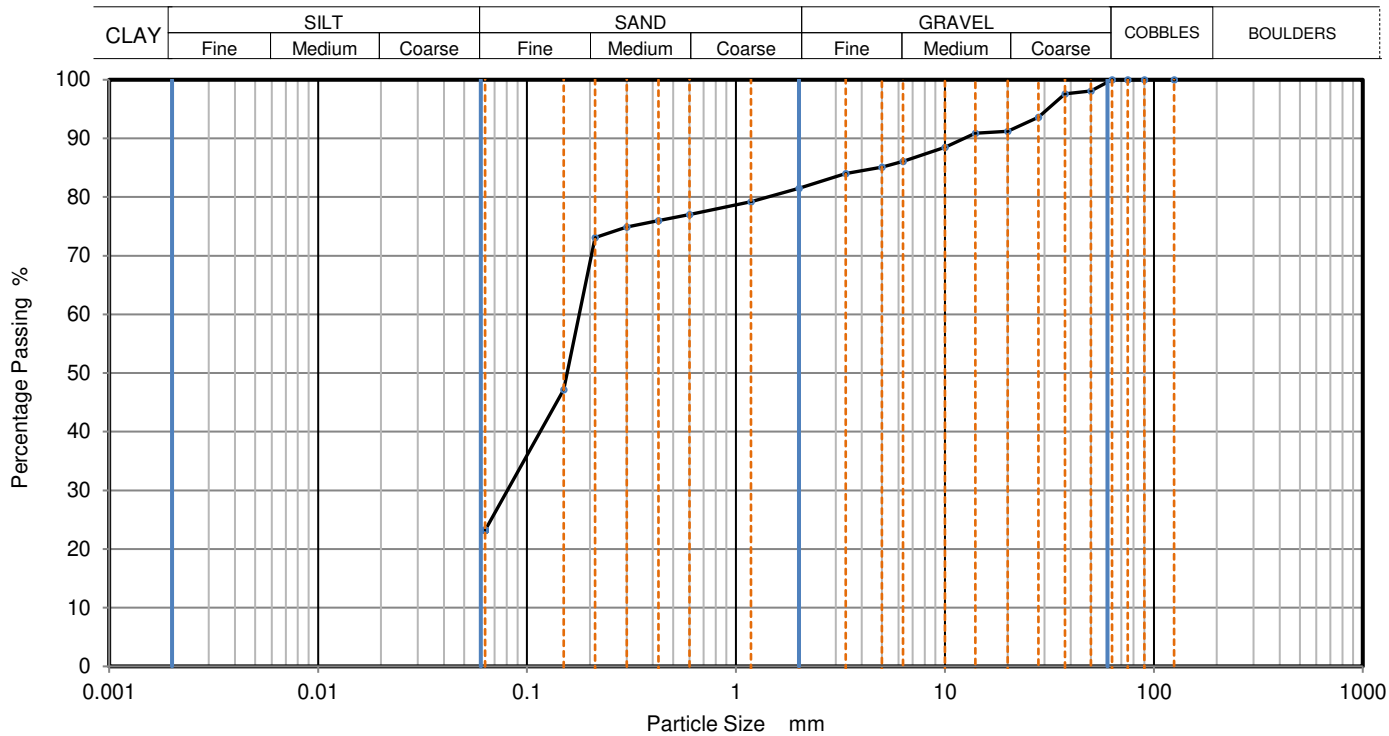
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	3.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204014	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	98		
28	94		
20	91		
14	91		
10	89		
6.3	86		
5	85		
3.35	84		
2	82		
1.18	79		
0.6	77		
0.425	76		
0.3	75		
0.212	73		
0.15	47		
0.063	23		

Dry Mass of sample, g		7038
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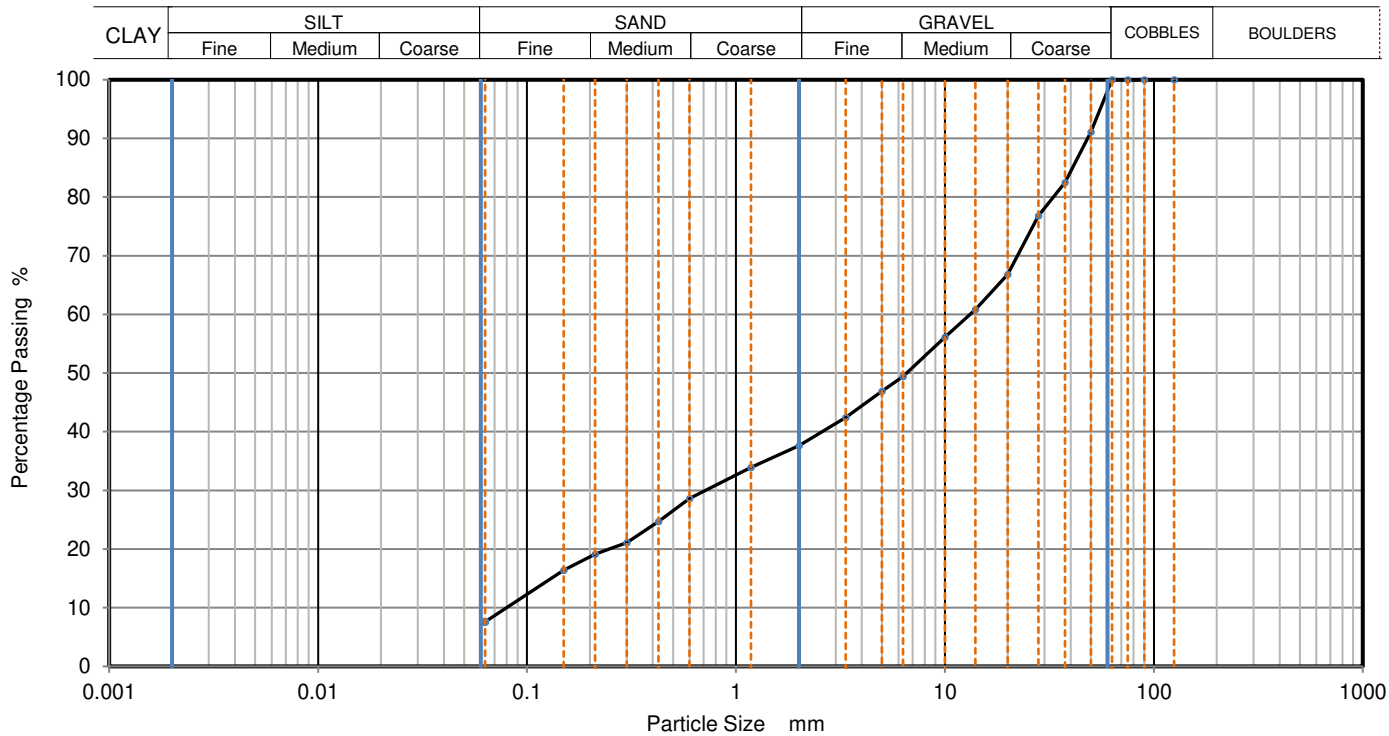
Sample Proportions		% dry mass
Very coarse		0
Gravel		19
Sand		58
Fines <0.063mm		23

Grading Analysis		
D100	mm	
D60	mm	0.178
D30	mm	0.0804
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	6.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204015	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	83		
28	77		
20	67		
14	61		
10	56		
6.3	49		
5	47		
3.35	42		
2	38		
1.18	34		
0.6	29		
0.425	25		
0.3	21		
0.212	19		
0.15	16		
0.063	8		

Dry Mass of sample, g		11437
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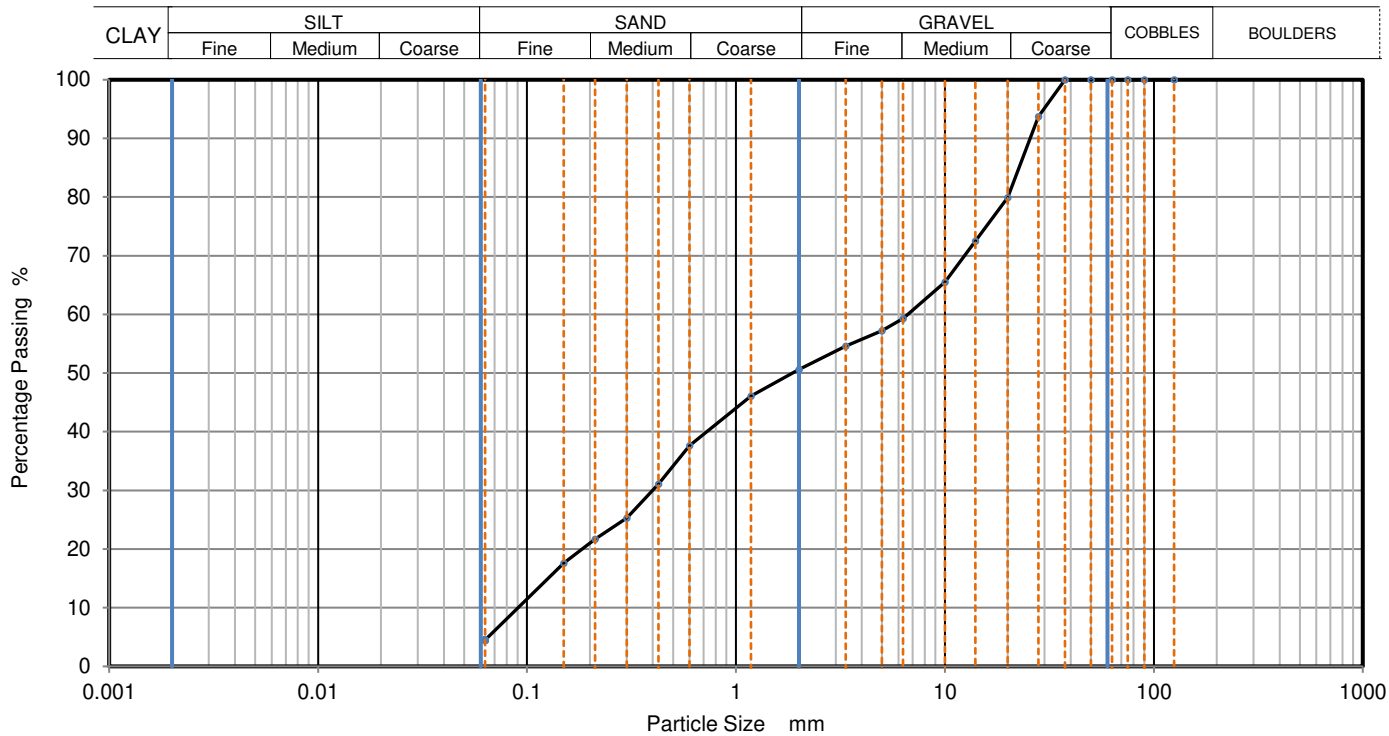
Sample Proportions		% dry mass
Very coarse		0
Gravel		62
Sand		30
Fines <0.063mm		8

Grading Analysis		
D100	mm	
D60	mm	13.2
D30	mm	0.72
D10	mm	0.0801
Uniformity Coefficient		170
Curvature Coefficient		0.49

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	7.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204016	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	94		
20	80		
14	73		
10	66		
6.3	59		
5	57		
3.35	55		
2	51		
1.18	46		
0.6	38		
0.425	31		
0.3	25		
0.212	22		
0.15	18		
0.063	5		

Dry Mass of sample, g		11076
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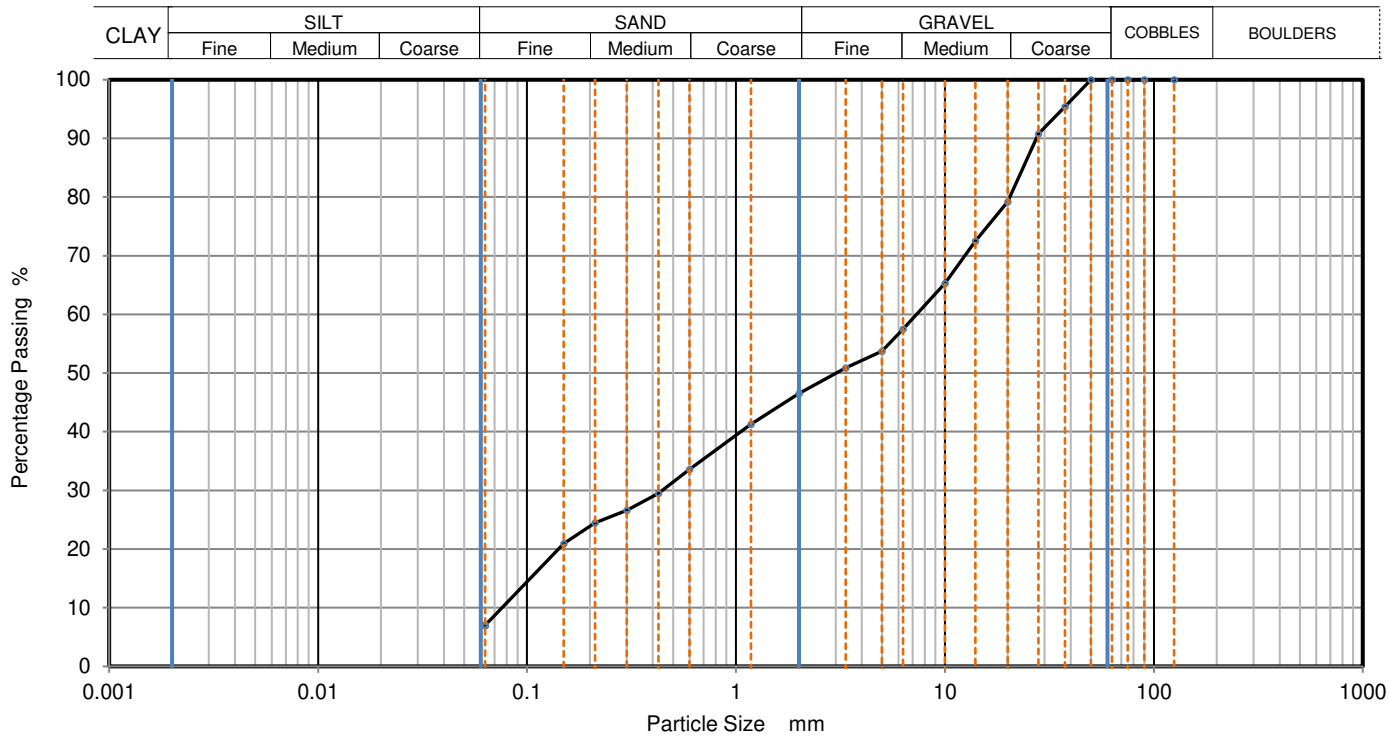
Sample Proportions		% dry mass
Very coarse		0
Gravel		49
Sand		46
Fines <0.063mm		5

Grading Analysis		
D100	mm	
D60	mm	6.62
D30	mm	0.399
D10	mm	0.0906
Uniformity Coefficient		73
Curvature Coefficient		0.27

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH02	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	8.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204017	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	91		
20	79		
14	73		
10	65		
6.3	58		
5	54		
3.35	51		
2	47		
1.18	41		
0.6	34		
0.425	30		
0.3	27		
0.212	25		
0.15	21		
0.063	7		

Dry Mass of sample, g		12260
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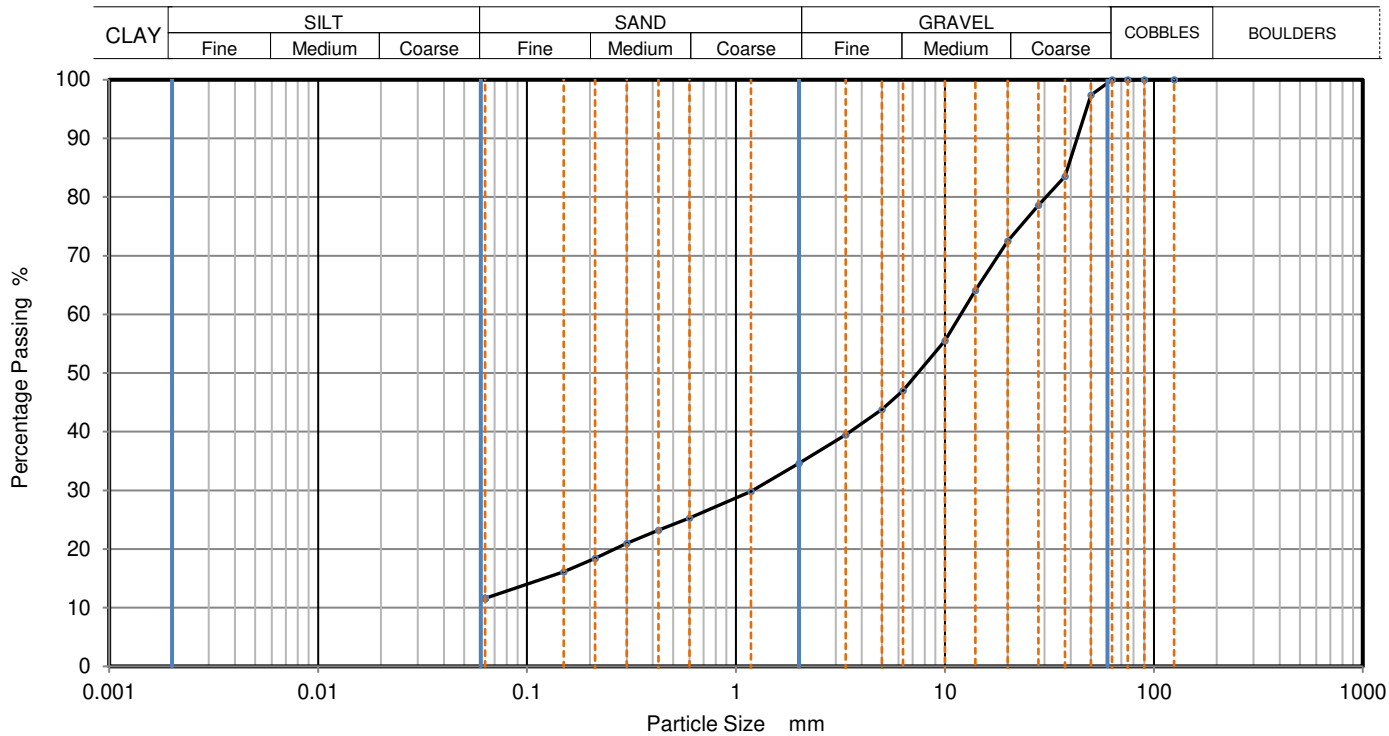
Sample Proportions		% dry mass
Very coarse		0
Gravel		54
Sand		40
Fines <0.063mm		7

Grading Analysis		
D100	mm	
D60	mm	7.29
D30	mm	0.442
D10	mm	0.0758
Uniformity Coefficient		96
Curvature Coefficient		0.35

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH03	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	0.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_202204018	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	84		
28	79		
20	73		
14	64		
10	56		
6.3	47		
5	44		
3.35	40		
2	35		
1.18	30		
0.6	25		
0.425	23		
0.3	21		
0.212	18		
0.15	16		
0.063	12		

Dry Mass of sample, g		9521
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Sample Proportions		% dry mass
Very coarse		0
Gravel		65
Sand		23
Fines <0.063mm		12

Grading Analysis		
D100	mm	
D60	mm	11.9
D30	mm	1.2
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
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PARTICLE SIZE DISTRIBUTION

Job Ref

2071916

Borehole/Pit No.

BH03

Site Name

Cardigan GI

Sample No.

Soil Description

Depth, m

0.50

Specimen
ReferenceSpecimen
Depth

m

Sample Type

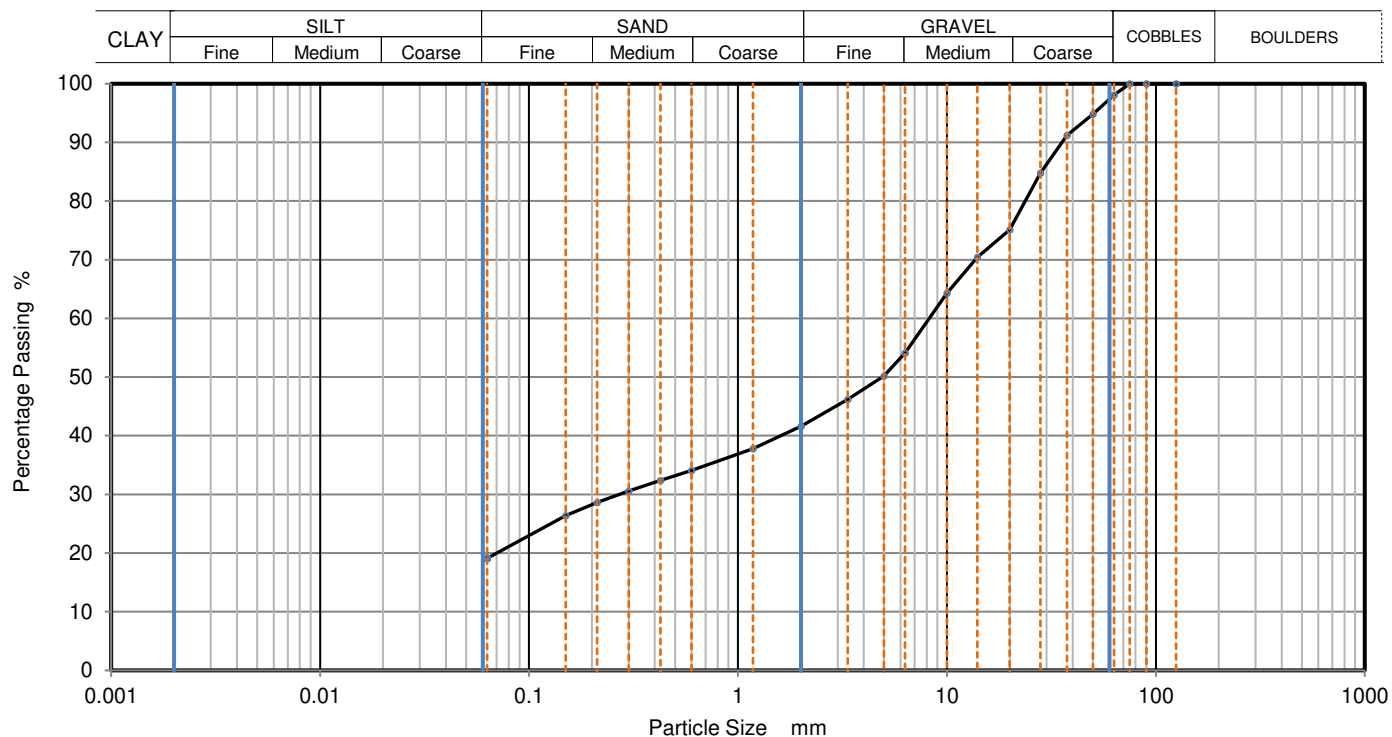
B

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CJA_202204019



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	98		
50	95		
37.5	91		
28	85		
20	75		
14	70		
10	64		
6.3	54		
5	50		
3.35	46		
2	42		
1.18	38		
0.6	34		
0.425	32		
0.3	31		
0.212	29		
0.15	26		
0.063	19		

Dry Mass of sample, g

10888

Sample Proportions	% dry mass
Very coarse	2
Gravel	57
Sand	23
Fines <0.063mm	19

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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PARTICLE SIZE DISTRIBUTION

Job Ref

2071916

Borehole/Pit No.

BH03

Site Name

Cardigan GI

Sample No.

Soil Description

Depth, m

1.20

Specimen
ReferenceSpecimen
Depth

m

Sample Type

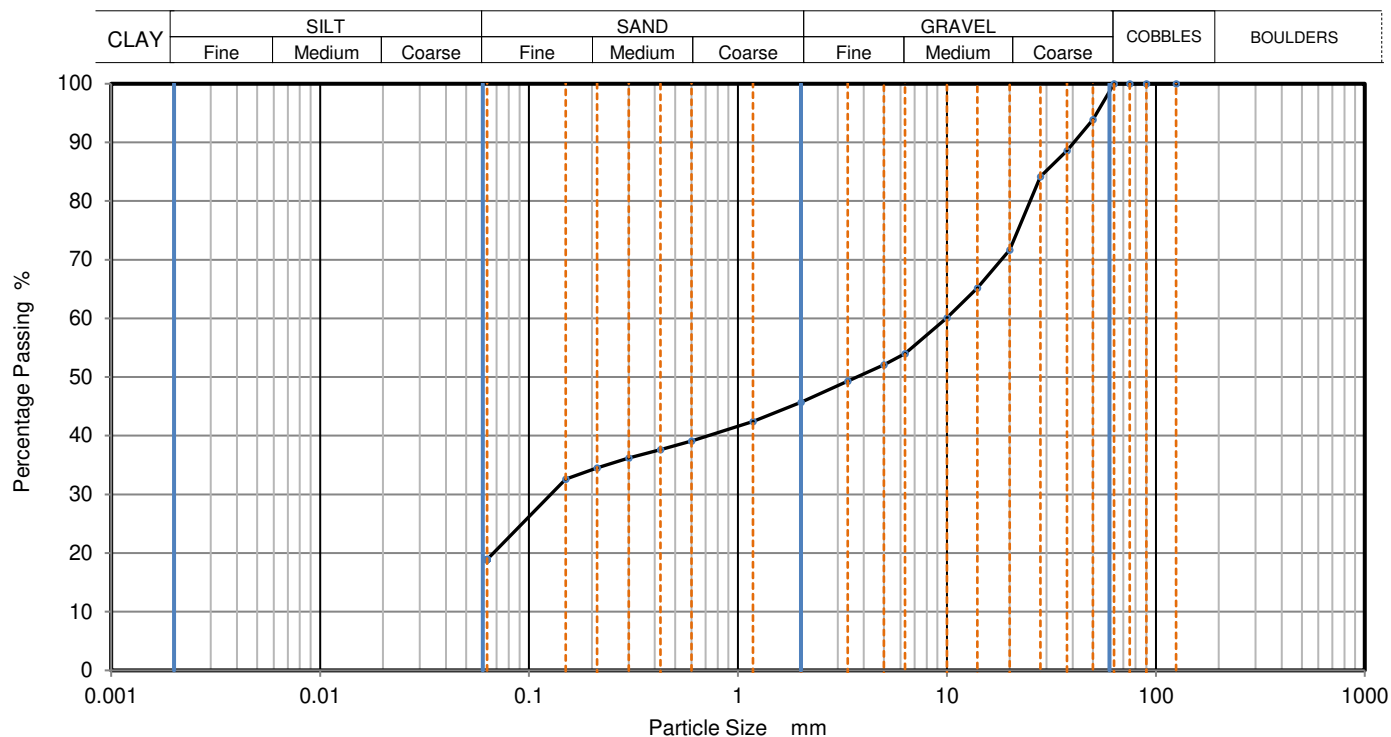
B

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CJA_2022040110



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	89		
28	84		
20	72		
14	65		
10	60		
6.3	54		
5	52		
3.35	49		
2	46		
1.18	42		
0.6	39		
0.425	38		
0.3	36		
0.212	35		
0.15	33		
0.063	19		

Dry Mass of sample, g

5052

Sample Proportions	% dry mass
Very coarse	0
Gravel	54
Sand	27
Fines <0.063mm	19

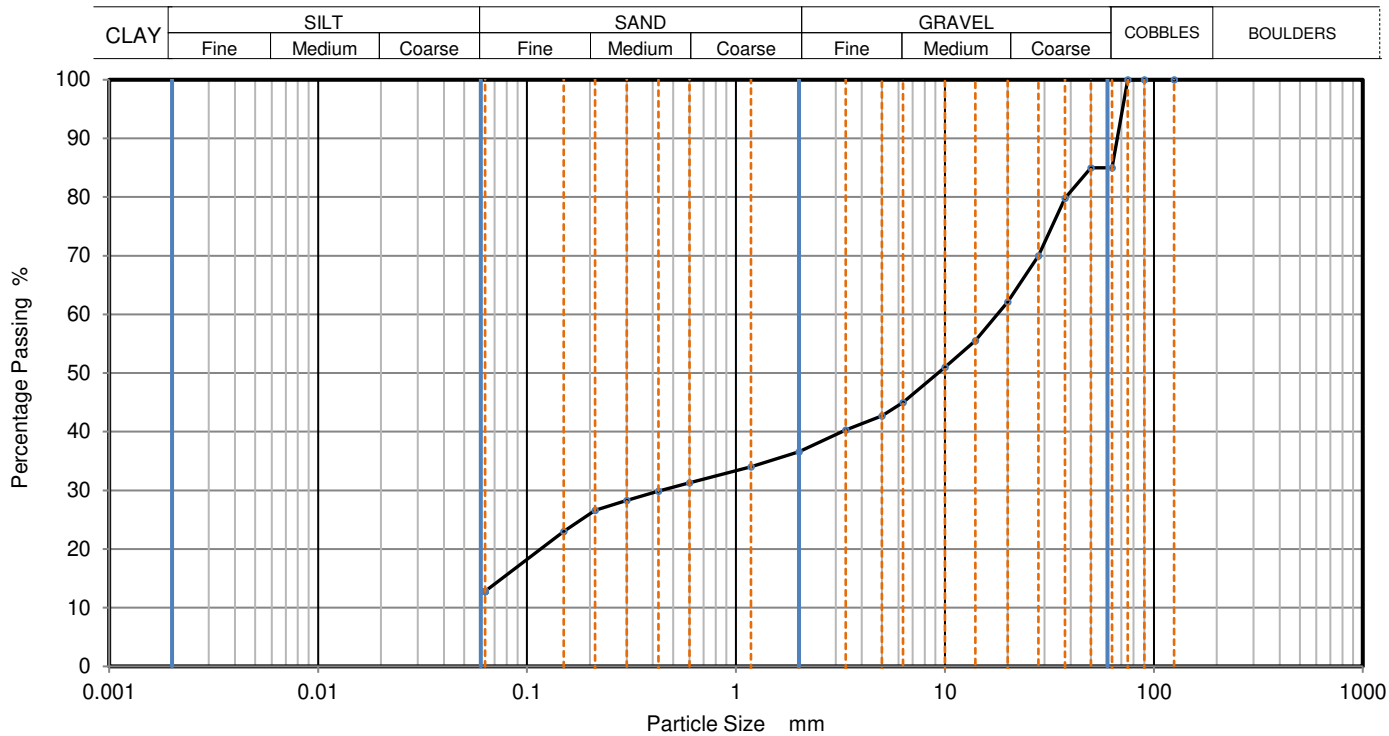
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2071916	
			Borehole/Pit No.	BH03	
Site Name	Cardigan GI		Sample No.		
Soil Description			Depth, m	1.70	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	CJA_2022040111	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	85		
50	85		
37.5	80		
28	70		
20	62		
14	56		
10	51		
6.3	45		
5	43		
3.35	40		
2	37		
1.18	34		
0.6	31		
0.425	30		
0.3	28		
0.212	27		
0.15	23		
0.063	13		

Dry Mass of sample, g	3329
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Sample Proportions	% dry mass
Very coarse	15
Gravel	48
Sand	24
Fines <0.063mm	13

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
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PARTICLE SIZE DISTRIBUTION

Job Ref

2071916

Borehole/Pit No.

BH03

Site Name

Cardigan GI

Sample No.

Soil Description

Depth, m

2.00

Specimen
ReferenceSpecimen
Depth

m

Sample Type

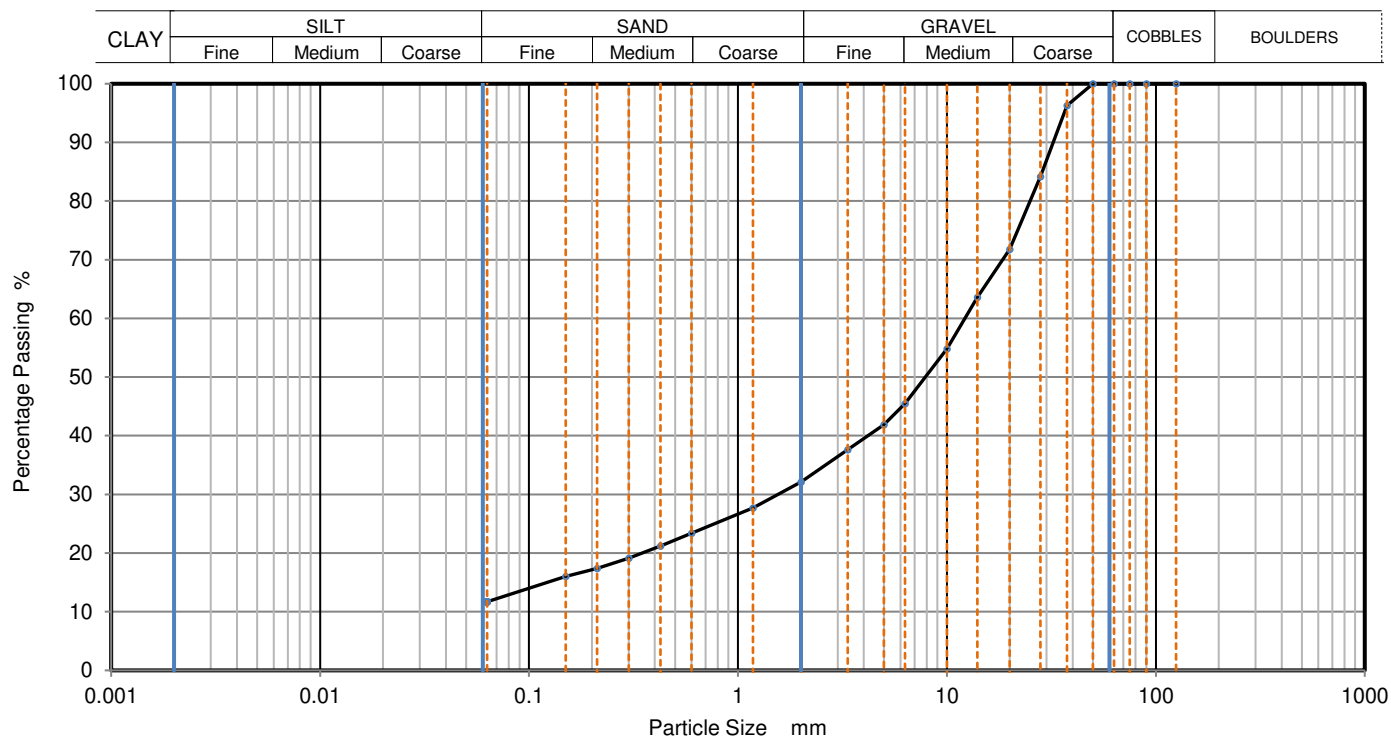
B

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CJA_2022040112



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	84		
20	72		
14	64		
10	55		
6.3	46		
5	42		
3.35	38		
2	32		
1.18	28		
0.6	23		
0.425	21		
0.3	19		
0.212	17		
0.15	16		
0.063	12		

Dry Mass of sample, g

3033

Sample Proportions	% dry mass
Very coarse	0
Gravel	68
Sand	20
Fines <0.063mm	12

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

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PARTICLE SIZE DISTRIBUTION

Job Ref

2071916

Borehole/Pit No.

BH03

Site Name

Cardigan GI

Sample No.

Soil Description

Depth, m

7.00

Specimen
ReferenceSpecimen
Depth

m

Sample Type

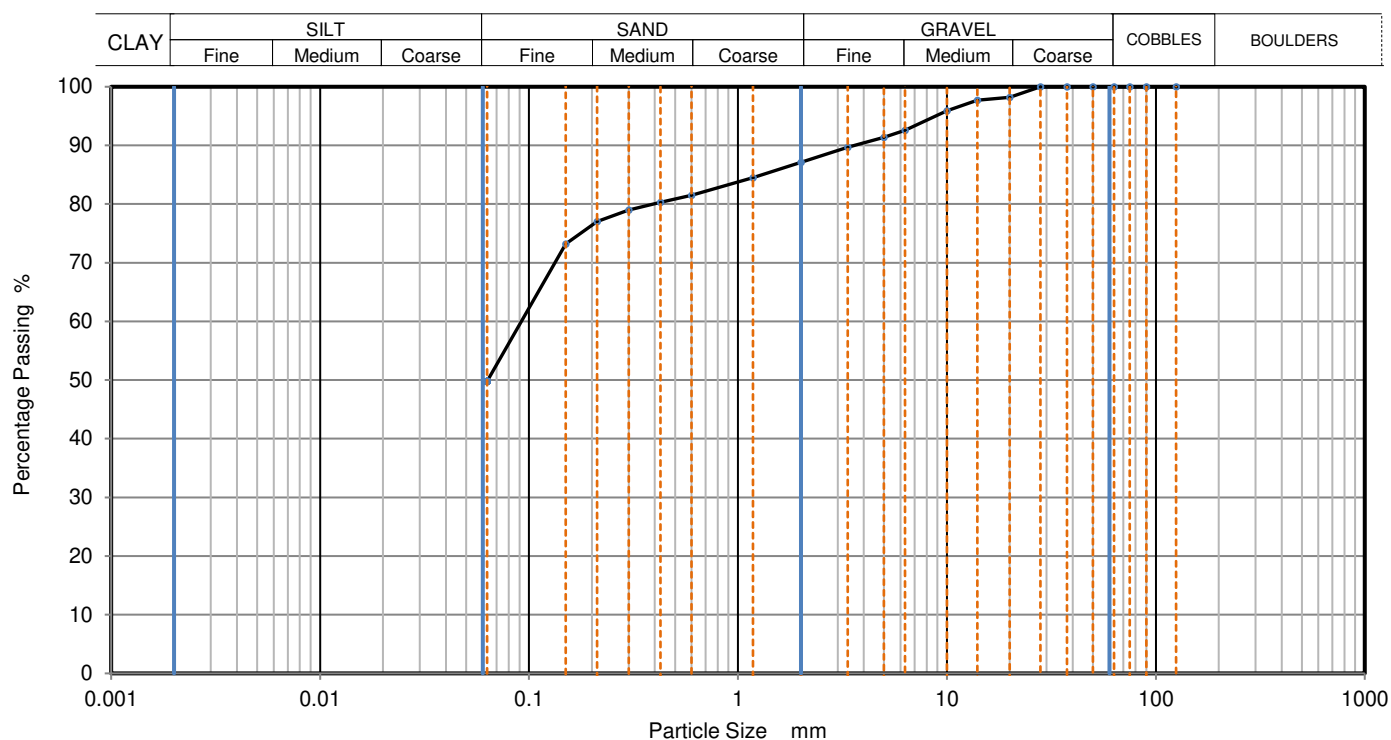
B

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CJA_2022040114



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	98		
10	96		
6.3	93		
5	91		
3.35	90		
2	87		
1.18	85		
0.6	82		
0.425	80		
0.3	79		
0.212	77		
0.15	73		
0.063	50		

Dry Mass of sample, g

4848

Sample Proportions	% dry mass
Very coarse	0
Gravel	13
Sand	37
Fines <0.063mm	50

Grading Analysis	
D10	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

Checked

Approved

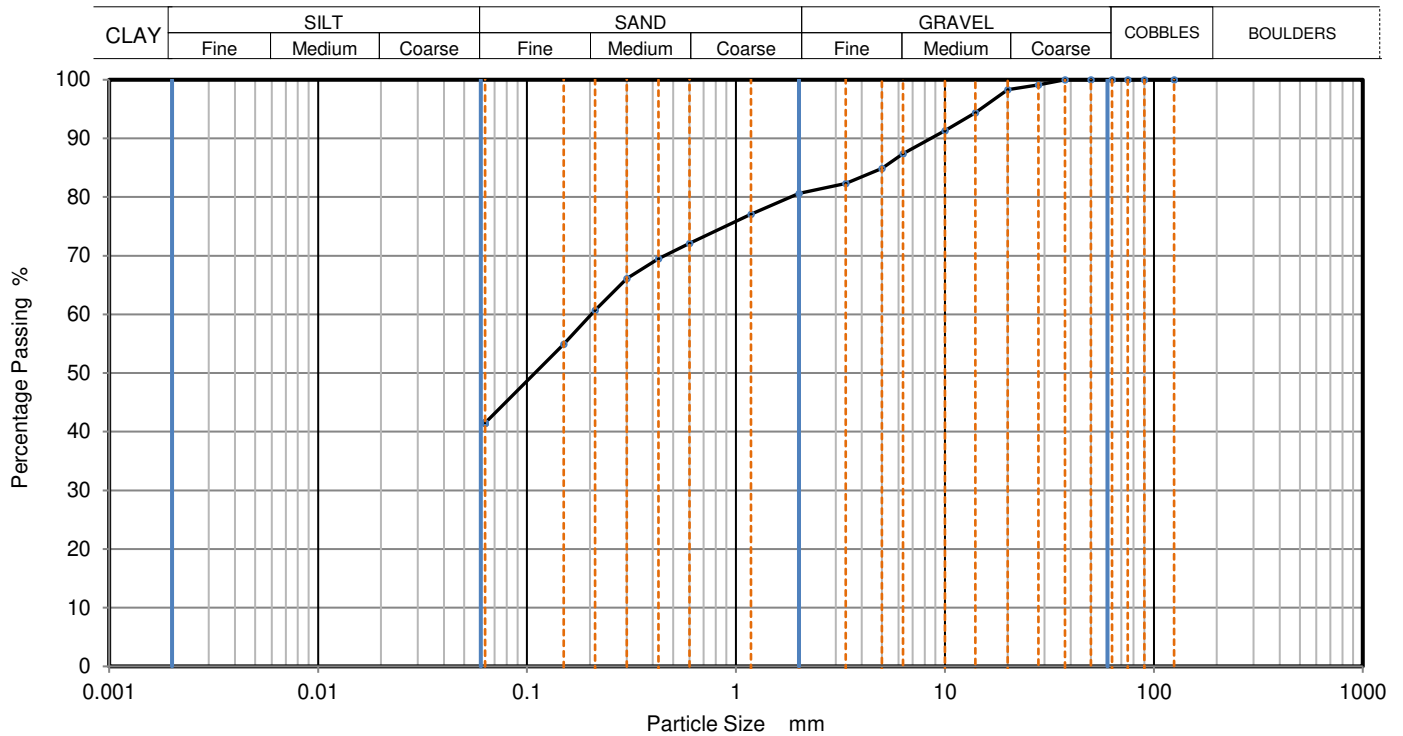
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Fig 1

Sheet

CJAssociates	PARTICLE SIZE DISTRIBUTION			Job Ref	2071916
				Borehole/Pit No.	BH03
Site Name	Cardigan GI			Sample No.	
Soil Description				Depth, m	8.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2			KeyLAB ID	CJA_2022040115



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	98		
14	94		
10	91		
6.3	87		
5	85		
3.35	82		
2	81		
1.18	77		
0.6	72		
0.425	70		
0.3	66		
0.212	61		
0.15	55		
0.063	42		

Dry Mass of sample, g

8408

Sample Proportions	% dry mass
Very coarse	0
Gravel	19
Sand	39
Fines <0.063mm	42

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

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PARTICLE SIZE DISTRIBUTION

Job Ref

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Borehole/Pit No.

BH03

Site Name

Cardigan GI

Sample No.

Soil Description

Depth, m

9.00

Specimen
ReferenceSpecimen
Depth

m

Sample Type

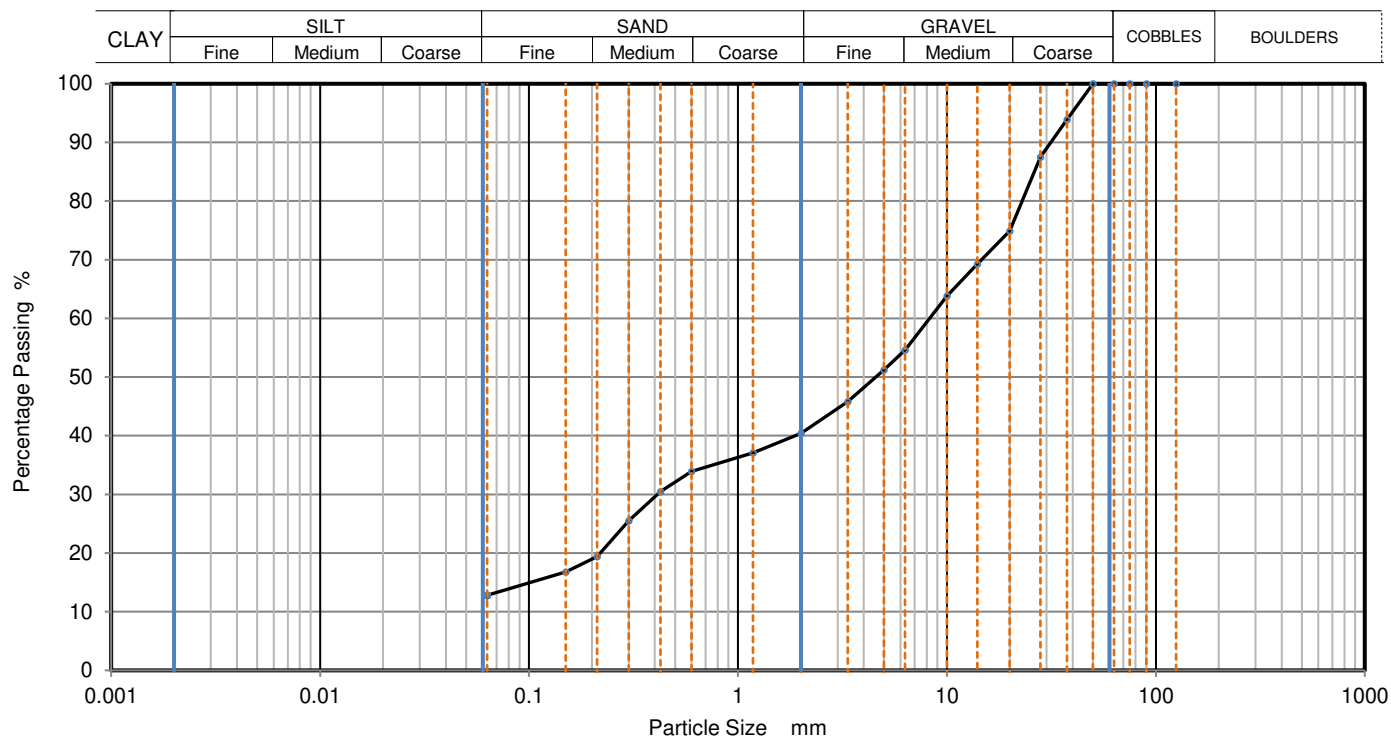
B

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CJA_2022040116



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	88		
20	75		
14	69		
10	64		
6.3	55		
5	51		
3.35	46		
2	40		
1.18	37		
0.6	34		
0.425	31		
0.3	26		
0.212	19		
0.15	17		
0.063	13		

Dry Mass of sample, g

10932

Sample Proportions	% dry mass
Very coarse	0
Gravel	60
Sand	28
Fines <0.063mm	13

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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