BOREHOLE LOG - ROTARY

RC4007

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 3
Start	04/02/2020	**Coordinates**	E 435354.73 N 399542.81	**Scale**	1:50
End	05/02/2020	**Ground Level**	145.13m AOD	**Total Depth**	26.80m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
0.00			D	0.10		144.93	(0.20)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to medium subangular to subrounded mudstone and sandstone. (TOPSOIL/MADE GROUND)			
			ES				0.20				
	100 0 0		D	0.50			(0.60)				
			ES			144.33	0.80	Firm greyish brown and orange gravelly CLAY. Gravel is fine to coarse angular to subrounded mudstone, sandstone and coal. (MADE GROUND - OPENCAST BACKFILL)			
			D	1.00				Firm greyish brown very gravelly CLAY. Gravel is fine to coarse angular to subrounded mudstone, sandstone and coal. (MADE GROUND - OPENCAST BACKFILL)			
			S		N = 8						
1.45			B	1.45							
	100 0 0						(2.90)				
			D	2.45							
			S		N = 10						
2.90											
	100 0 0										
						141.43	3.70	Stiff to very stiff orangish brown gravelly CLAY. Gravel is fine to coarse angular to subangular sandstone, mudstone and coal. (MADE GROUND - OPENCAST BACKFILL)			
3.90			D	3.90			(0.55)				
	100 0 0		S		N = 9						
			D	4.00		140.88	4.25	Black semi-dull durain COAL. Extremely weathered. Cleats 1-3mm width. (PENNINE MIDDLE COAL MEASURES FORMATION)			
			D	4.40			(0.30)				
			D	4.50		140.58	4.55				
4.65			S		N >50	140.48	(0.10)	Stiff to very stiff orangish grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and coal. (PENNINE MIDDLE COAL MEASURES FORMATION)			
							4.65				
	100 59 0							Extremely weak interbedded light grey SILTSTONE and grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced planar rough. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 5..35m and 6.70m bgl: very weak strength.*			
							(2.05)				
5.80											
	93 69 23										
						138.43	6.70	Extremely weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION) *At 6.75m bgl: fracture at 90 degrees dip planar smooth.*			
			C	6.97 - 7.06							
7.30		NI 90 350									
			C	7.65 - 7.73							
	100 75 19										
			C	8.57 - 8.69				*At 8.50m bgl: fracture at 90 degrees dip planar smooth.*			
8.80							(4.20)				
	83 71 35							*At 9.45m bgl: fracture at 90 degrees dip planar smooth.*			
			C	9.82 - 9.90							
								Continued next sheet			

Installation: 50mm diameter standpipe installed to 3.00m bgl.

Remarks: Dynamic sampling to 4.60m bgl, rotary cored from 4.60m to 26.80m bgl. Air mist flush used. Borehole cased to 4.60m bgl.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
8.80	5.60	Medium seepage	4.60	
12.62	12.62	Start of shift	4.60	
13.40	13.40	End of shift	4.60	

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 4.60m
123mm to 26.80m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4007

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	2 of 3
Start	04/02/2020	**Coordinates**	E 435354.73 N 399542.81	**Scale**	1:50
End	05/02/2020	**Ground Level**	145.13m AOD	**Total Depth**	26.80m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
10.30								Extremely weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
	100 72 36		C	11.31 - 11.41		134.23	10.90 (0.30)	*Between 10.80m and 10.90m bgl: dark grey in colour.* Black semi-bright vitrain COAL. Slightly weathered. Cleats 1-10mm width.			
						133.93	11.20	(PENNINE MIDDLE COAL MEASURES FORMATION)			
							(0.75)	Extremely weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating rough.			
11.80						133.18	11.95	(PENNINE MIDDLE COAL MEASURES FORMATION)			
						132.98	(0.20)	*Between 11 20m and 11.30m bgl: dark grey in colour.*			
	100 87 56		C	12.77 - 12.96			12.15 (1.45)	Weak light grey SILTSTONE. Slightly weathered. No fractures observed. (PENNINE MIDDLE COAL MEASURES FORMATION) Very weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced planar rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
13.30								*At 12.70m bgl: fracture at 70 degrees dip undulating rough.* *At 13 00m bgl: fracture at 45 degrees dip undulating rough.* *Between 13.35m and 13.60m bgl: fracture at 90 degree dip undulating rough.*			
						131.53	13.60	Very weak interbedded light grey SILTSTONE and grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees closely to medium spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
	100 85 26		C	14.25 - 14.51				*At 13.70m bgl: fracture at 70 degree dip undulating rough.*			
		NI 130 260					(2.15)				
14.80			C	14.90 - 14.98							
	93 77 37										
			C	15.80 - 15.97		129.38	15.75	*At 15 65m bgl: fracture at 45 degree dip undulating smooth.* Weak medium bedded light grey and grey SILTSTONE. Slightly weathered. Fractures dip <5 degrees very closely to medium spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
16.30								*Between 16.30m and 16.72m bgl: fracture at 90 degree dip undulating rough.*			
							(1.85)				
	100 91 17		C	16.94 - 17.20				*Between 17.30m and 17.60m bgl: fracture at 90 degree dip undulating rough.*			
						127.53	17.60	Very weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
17.80			C	17.98 - 18.15				*At 18 20m bgl: fracture at 45 degree dip undualting rough.* *Between 18.47m and 19.00m bgl: interbedded with light grey siltstone.*			
	100 85 56										
			C	18.80 - 18.97							
19.30			C	19.38 - 19.50							

Continued next sheet

Installation: 50mm diameter standpipe installed to 3.00m bgl.
Remarks: Dynamic sampling to 4.60m bgl, rotary cored from 4.60m to 26.80m bgl. Air mist flush used. Borehole cased to 4.60m bgl.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
8.80	5.60	Medium seepage	4.60	
12.62	12.62	Start of shift	4.60	
13.40	13.40	End of shift	4.60	

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 4.60m
123mm to 26.80m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4007

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	3 of 3
Start	04/02/2020	**Coordinates**	E 435354.73 N 399542.81	**Scale**	1:50
End	05/02/2020	**Ground Level**	145.13m AOD	**Total Depth**	26.80m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
	100 83 25		C	20.59 - 20.74			(5.50)	Very weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
20.80			C	20.88 - 21.00				*Between 20.95m and 21.10m bgl: fracture at 90 degree dip planar rough.*			
	100 79 33							*Between 21.20m and 21.30m bgl: recovered as fine to coarse angular to subangular mudstone, coal gravel in clay matrix.* *Between 21.45m and 21.60m bgl: interbedded with light grey siltstone.* *Between 21.45m and 21.60m bgl: fractures at 90 degree dip undulating rough.*			
			C	22.09 - 22.24							
22.30		NI 75 180						*Between 22.55m and 22.60m bgl: recovered as fine to coarse angular to subangular mudstone, coal gravel in clay matrix.* *Between 22.60m and 23.10m bgl: dark grey in colour.*			
	100 83 23		C	22.95 - 23.06		122.03	23.10	Black semi-bright clarain COAL. Slightly weathered. (PENNINE MIDDLE COAL MEASURES FORMATION)			
							(0.97)	*Between 23.15m and 23.30m bgl: fracture at 80 degree dip planar smooth.*			
23.80								*Between 23.80m and 23.95m bgl: recovered as fine to coarse angular to subangular gravel of coal.*			
						121.06	24.07	*Between 24.03m and 24.07m bgl: recovered as fine to coarse angular to subangular gravel of coal.*			
							(0.33)				
	100 43 33					120.73 120.60	24.40 (0.13)	Extremely weak thinly bedded dark grey MUDSTONE. Slightly weathered. Fractures dip 5 degrees very closely to closely spaced planar smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
							24.53 (0.47)				
			C	24.95 - 25.12		120.13	25.00	*Between 24.07m and 24.25m bgl: recovered as gravel of fine to coarse angular to subangular mudstone and coal in a clay matrix.*			
25.30								Black semi-bright clarain COAL. Slightly weathered. Recovered as gravel of fine to coarse angular to subangular coal. (PENNINE MIDDLE COAL MEASURES FORMATION)			
	100 100 77	25 150 400					(1.80)	Extremely weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
			C	26.30 - 26.53				*Between 24.53m and 24.60m bgl: recovered as gravel of fine to coarse angular to subangular mudstone and coal in a clay matrix.*			
			C	26.60 - 26.75							
26.80						118.33	26.80	Very weak interbedded light grey SILTSTONE and grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
								At 26.52m bgl: fracture at 45 degrees dip undulating rough.			
								End of Borehole at 26.80m			

Installation: 50mm diameter standpipe installed to 3.00m bgl.
Remarks: Dynamic sampling to 4.60m bgl, rotary cored from 4.60m to 26.80m bgl. Air mist flush used. Borehole cased to 4.60m bgl.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
8.80	5.60	Medium seepage	4.60	
12.62	12.62	Start of shift	4.60	
13.40	13.40	End of shift	4.60	

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 4.60m
123mm to 26.80m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4008

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 2
Start	27/01/2020	**Coordinates**	E 435420.51 N 399615.59	**Scale**	1:50
End	29/01/2020	**Ground Level**	147.55m AOD	**Total Depth**	13.20m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
0.00			D	0.10		147.40	(0.15)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. (TOPSOIL/MADE GROUND)			
			ES				0.15				
	90 0 0		D	0.30		147.10	(0.30)				
							0.45	Firm to stiff greyish brown and orange slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded mudstone. (MADE GROUND - OPENCAST BACKFILL)			
1.00			D	1.00				Greyish brown very clayey GRAVEL of fine to coarse angular to subrounded mudstone. (MADE GROUND - OPENCAST BACKFILL)			
			S		N = 9						
	100 0 0										
			D	2.00							
			D	2.50							
			S		N >50						
2.90							(5.35)				
	100 0 0		D	3.40							
			D	3.90							
			S		N = 49						
4.35											
	95 0 0		D	4.85							
			ES								
			D	5.35							
			S		N = 47						
5.80			B	5.80		141.75	5.80	Grey and brown very clayey GRAVEL of fine to coarse angular to subrounded mudstone and sandstone. (MADE GROUND - OPENCAST BACKFILL)			
	100 0 0										
			D	6.80							
			S		N = 26		(2.10)				
7.25											
	100 0 0										
			D	7.80							
7.90			S		N >50	139.65	7.90	Very weak interbedded light grey SILTSTONE and dark grey MUDSTONE. Fractures dip <5 degrees closely to medium spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 7.90m and 8.50m bgl: distinctly weathered. Between 8.50m and 9 80m bgl: slightly weathered. At 8.73m bgl: undulating rough fracture at 75 degrees dip.* *Between 9.16m and 9 20m bgl: recovered as gravel of fine to coarse angular to subangular mudstone.*			
			C	7.99 - 8.21							
	100 86 71										
8.90			C	8.97 - 9.14			(1.90)				
	100 84 54										
						137.75	9.80	Extremely weak thinly bedded grey MUDSTONE locally			

Continued next sheet

Installation:

Remarks: Dynamic sampling to 7.90m bgl, rotary cored from 7.90m to 13.20m bgl. Air mist flush used. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 7.90m
123mm to 13.20m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4008

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	2 of 2
Start	27/01/2020	**Coordinates**	E 435420.51 N 399615.59	**Scale**	1:50
End	29/01/2020	**Ground Level**	147.55m AOD	**Total Depth**	13.20m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
			C	10.08 - 10.19				Extremely weak thinly bedded grey MUDSTONE locally recovered as clayey fine to medium subangular gravel. Slightly weathered. Fractures dip <5 degrees closely to medium spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
10.40											
	97 79 26							*Between 11.10m and 11.27m bgl: undulating smooth fracture at 90 degree dip.*			
		NI 128 230	C	11.45 - 11.59			(3.40)	*At 11.70m bgl: undulating smooth fracture at 45 degree dip.*			
11.90			C	11.90 - 12.04							
	95 76 21							*At 12.52m bgl: undulating smooth fracture at 45 degree dip.*			
13.20						134.35	13.20	End of Borehole at 13.20m			

Installation:

Remarks: Dynamic sampling to 7.90m bgl, rotary cored from 7.90m to 13.20m bgl. Air mist flush used. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 7.90m
123mm to 13.20m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4009

Project	Hoyland Common, Barnsley	**Project No.**	AG3080-19
Client	Newlands Developments	**Sheet**	1 of 3
Start	12/02/2020	**Coordinates**	E 435806.97 N 399306.09
End	14/02/2020	**Ground Level**	118.22m AOD
		Scale	1:50
		Total Depth	21.00m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
0.00			D	0.15			(0.25)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded sandstone and			
			ES			117.97	0.25				
	85 0 0		D	0.30		117.82	(0.15)	mudstone. (TOPSOIL/MADE GROUND)			
							0.40	Firm brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded sandstone and mudstone.			
							(0.90)	(MADE GROUND - OPENCAST BACKFILL)			
			D	1.00							
			S		N = 10						
						116.92	1.30	Firm to stiff orangish brown and grey slightly fusain gravelly CLAY. Gravel is fine to coarse subangular to subrounded			
1.50			D	1.50			(0.50)	mudstone and coal. (MADE GROUND - OPENCAST BACKFILL)			
			ES								
	100 0 0		D	2.00		116.42	1.80	Very stiff grey and brown gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone. (MADE GROUND - OPENCAST BACKFILL)			
								Very stiff grey and orange slightly gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone.			
			D	2.50							
			S		N = 43		(1.60)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
3.00											
						114.82	3.40	Extremely weak thinly bedded grey MUDSTONE locally recovered as clayey fine to coarse subangular gravel. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced planar smooth. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 3.40m and 4.50m bgl: frequent iron oxide staining.*			
	100 70 0										
4.50											
		NI 55 90					(3.30)	*Below 5 35m bgl: locally recovered as fine to coarse angular to subangular gravel of mudstone in clay matrix.*			
	57 33 0										
6.00								*Between 6.40m and 6.50m bgl: fracture at 90 degree dip undulating smooth.*			
						111.52	6.70				
	100 87 49						(0.30)	Black semi bright clarain COAL. Distinctly weathered. Cleats up to 20mm width.			
						111.22	7.00	(PENNINE MIDDLE COAL MEASURES FORMATION)			
7.50			C	7.50 - 7.73				Very weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 7.00m and 7.50m bgl: extremely weak. Between 7.45m and 7.50m bgl: mussel horizon. Between 7.70m and 7 85m bgl: light grey siltstone.*			
			C	7.94 - 8.04							
	100 100 55						(2.75)				
			C	8.85 - 8.96				*Between 8.60m and 8 80m bgl: fracture at 90 degrees undulating smooth.*			
9.00											
	100 89 58		C	9.35 - 9.48							
						108.47	9.75	Very weak interbedded light grey SILTSTONE and grey			
								Continued next sheet			

Installation: 19mm diameter standpipe piezometer installed to 14.50m bgl.
Remarks: Dynamic sampling to 3.00m bgl, rotary cored from 3.00m to 21.00m bgl. Air mist flush used. Borehole cased to 1.50m bgl.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
14.50	9 80			

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 3.00m
123mm to 21.00m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4009

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	2 of 3
Start	12/02/2020	**Coordinates**	E 435806.97 N 399306.09	**Scale**	1:50
End	14/02/2020	**Ground Level**	118.22m AOD	**Total Depth**	21.00m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
			C	10.34 - 10.43				Very weak interbedded light grey SILTSTONE and grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to medium spaced planar rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
10.50								*At 10 80m bgl: fracture at 60 degrees dip undualting rough.*			
	100 98 44		C	11.32 - 11.44							
		NI 100 410					(3.85)				
12.00								*At 11.90m bgl: fracture at 90 degrees dip planar rough. Between 12.00m and 12.10m bgl: recovered as gravel of fine to coarse angular to subangular mudstone and siltstone. Between 12.15m and 12.35m bgl: fracture at 90 degrees dip undulating rough.*			
	97 87 53		C	12.46 - 12.86							
13.50			C	13.59 - 13.83		104.62	13.60	Very weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced planar rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
	90 77 61		C	14.26 - 14.41							
15.00								*Between 15.28m and 16.01m bgl: locally recovered as clayey fine to coarse subangular gravel.*			
	100 83 48		C	15.56 - 15.71							
							(4.90)				
			C	16.34 - 16.50							
16.50		NI 90 240									
	87 53 0							*Below 17.30m bgl: locally recovered as gravel of fine to coarse angular to subangular mudstone.*			
18.00											
	100 92 36					99.72	18.50	Black bright vitrain COAL. Slightly weathered. Cleats up to 25mm width. (PENNINE MIDDLE COAL MEASURES FORMATION)			
							(1.00)				
19.50						98.72	19.50				
						98.55	(0.17)	Extremely weak thinly bedded dark grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely spaced undulating smooth.			
						98.34	19.67 (0.21)				

Continued next sheet

Installation: 19mm diameter standpipe piezometer installed to 14.50m bgl.
Remarks: Dynamic sampling to 3.00m bgl, rotary cored from 3.00m to 21.00m bgl. Air mist flush used. Borehole cased to 1.50m bgl.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
14.50	9 80			

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 3.00m
123mm to 21.00m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4009

Project	Hoyland Common, Barnsley	**Project No.**	AG3080-19
Client	Newlands Developments	**Sheet**	3 of 3
Start	12/02/2020	**Coordinates**	E 435806.97 N 399306.09
End	14/02/2020	**Ground Level**	118.22m AOD
		Scale	1:50
		Total Depth	21.00m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
	100 70 19		C	20.10 - 20.26			19.88 (1.12)	Extremely weak thinly bedded dark grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
21.00			C	20.91 - 21.00		97.22	21.00	Black bright vitrain COAL. Slightly weathered. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 19.67m and 19.72m bgl: recovered as gravel of fine to coarse angular to subangular vitrain coal.* *Between 19.84m and 19.88m bgl: recovered as gravel of fine to coarse angular to subangular vitrain coal.*			
								Extremely weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. Brown horizontal elongate nodules throughout up to 30mm. (PENNINE MIDDLE COAL MEASURES FORMATION)			
								End of Borehole at 21.00m			

Installation: 19mm diameter standpipe piezometer installed to 14.50m bgl.
Remarks: Dynamic sampling to 3.00m bgl, rotary cored from 3.00m to 21.00m bgl. Air mist flush used. Borehole cased to 1.50m bgl.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
14.50	9 80			

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 3.00m
123mm to 21.00m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4010

Project	Hoyland Common, Barnsley	**Project No.**	AG3080-19
Client	Newlands Developments	**Sheet**	1 of 3
Start	14/02/2020	**Coordinates**	E 435913.54 N 399528.20
End	20/02/2020	**Ground Level**	127.04m AOD
		Scale	1:50
		Total Depth	21.40m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
0.00	100 0 0		D ES D	0.10		126.84	(0.20) 0.20	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded mudstone and sandstone. (TOPSOIL/MADE GROUND)			
				0.40		126.49	(0.35) 0.55	Firm orangish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone and sandstone. (MADE GROUND - OPENCAST BACKFILL)			
			D D ES S	1.00	N = 9		(1.05)	Firm to stiff greyish brown gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone. (MADE GROUND - OPENCAST BACKFILL)			
1.50	100 0 0		B	2.00		125.44	1.60	Very stiff brownish grey very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone. (MADE GROUND - OPENCAST BACKFILL)			
			D S	2.50	N = 25						
3.00	100 0 0		D S	4.00	N = 14						
4.50	100 0 0		D ES	5.00			(6.40)	*From 4.60m to 4.75m bgl: recovered as gravel of fine to coarse angular to subangular mudstone.* *From 4.95m to 5.05m bgl: recovered as gravel of fine to coarse angular to subangular mudstone.*			
			D S	5.50	N = 29						
6.00	85 0 0		B	6.00				*Between 7.00m and 7 60m bgl: possible boulder.*			
7.60	100					119.04	8.00	No recovery - open hole drilling.	NR NR		
			D S	8.50	N = 34						
							(2.80)				
			D	10.00				Continued next sheet			

Installation: 19mm diameter standpipe piezometer installed to 10.80m bgl.
Remarks: Dynamic sampling to 8.00m bgl, open hole drilling from 8.00m to 10.80m bgl and rotary cored from 10.80m to 21.40m bgl. Air mist flush used. Unable to progress casing through boulders/cobbles requiring open hole technique to be used.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
7.60	7.60	End of shift		

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 8.00m
123mm to 10.80m
123mm to 21.40m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4010

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	2 of 3
Start	14/02/2020	**Coordinates**	E 435913.54 N 399528.20	**Scale**	1:50
End	20/02/2020	**Ground Level**	127.04m AOD	**Total Depth**	21.40m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
			S		N = 23			No recovery - open hole drilling.	NR NR NR NR NR NR NR NR		
						116.24	10.80				
11.00			C	11.10 - 11.28				Very weak interbedded grey MUDSTONE and light grey SILTSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION) *From 10.80m to 11 00m bgl: no recovery, open hole techniques. From 11.55m to 11.60m bgl: recovered as gravel of fine to coarse angular to subangular mudstone in a clay matrix.*			
	100 93 68						(1.80)				
12.40								*From 12.40m to 12.50m bgl: recovered as gravel of fine to coarse angular to subangular mudstone and siltstone.*			
						114.44	12.60	Extremely weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 13.15m to 13.75m bgl: recovered locally clayey fine to coarse subangular gravel.*			
	100 73 25		C	13.02 - 13.17							
		NI 110 200									
13.90											
							(3.50)				
	43 20 7		C	14.72 - 14.82							
15.40								*Between 15.80m and 15.90m bgl: fracture at 90 degree dip planar smooth.*			
	93 81 23					110.94	16.10				
						110.74	(0.20)	Black bright vitrain COAL. Cleats up to 20mm in width. (PENNINE MIDDLE COAL MEASURES FORMATION)			
							16.30	Very weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to medium spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 16.30m and 16.40m bgl: recovered as dark grey gravelly clay. Gravel is fine to coarse angular to subangular mudstone and vitrain coal. Between 16.75m and 17.15m bgl: light grey siltstone.*			
			C	16.76 - 16.90							
16.90			C	16.90 - 17.20							
			C	17.20 - 17.33							
	100 100 81		C	17.53 - 17.83							
							(3.05)				
		NI 140 420	C	17.90 - 18.08							
18.40											
	87 63 45										
			C	19.43 - 19.71		107.69	19.35				
							(0.50)	Weak thickly bedded light grey SILTSTONE. Slightly weathered. Fractures dip <5 degrees closely spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
19.90			C	19.90 - 20.20		107.19	19.85				

Continued next sheet

Installation: 19mm diameter standpipe piezometer installed to 10.80m bgl.
Remarks: Dynamic sampling to 8.00m bgl, open hole drilling from 8.00m to 10.80m bgl and rotary cored from 10.80m to 21.40m bgl. Air mist flush used. Unable to progress casing through boulders/cobbles requiring open hole technique to be used.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
7.60	7.60	End of shift		

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 8.00m
123mm to 10.80m
123mm to 21.40m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4010

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	3 of 3
Start	14/02/2020	**Coordinates**	E 435913.54 N 399528.20	**Scale**	1:50
End	20/02/2020	**Ground Level**	127.04m AOD	**Total Depth**	21.40m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
	100 100 73		C	21.17 - 21.35			(1.55)	Very weak interbedded grey MUDSTONE and light grey SILTSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION) *Between 20.22m and 20.32m bgl: fracture at 45 degrees dip planar rough.* *Between 20.50m and 20.60m bgl: fracture at 90 degrees dip undulating rough.*			
21.40						105.64	21.40	End of Borehole at 21.40m			

Installation: 19mm diameter standpipe piezometer installed to 10.80m bgl.
Remarks: Dynamic sampling to 8.00m bgl, open hole drilling from 8.00m to 10.80m bgl and rotary cored from 10.80m to 21.40m bgl. Air mist flush used. Unable to progress casing through boulders/cobbles requiring open hole technique to be used.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed
7.60	7.60	End of shift		

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 8.00m
123mm to 10.80m
123mm to 21.40m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4011

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 2
Start	20/02/2020	**Coordinates**	E 435463.80 N 399428.28	**Scale**	1:50
End	21/02/2020	**Ground Level**	136.77m AOD	**Total Depth**	10.80m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
			D	0.15			(0.25)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and coal.			
			ES			136.52	0.25	(TOPSOIL)			
0.50	85 0 0		D	0.70				Firm to stiff orange and grey slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded mudstone and sandstone.			
			D	1.00			(1.40)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
			S		N = 16						
1.50	100		D	1.70		135.12	1.65	Black locally dark grey semi bright clarain COAL, recovered as slightly clayey fine to medium subangular clarain gravel.			
			D	1.80			(0.45)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
			S		N = 37	134.67	2.10	Stiff to very stiff brownish grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular clarain coal and mudstone.			
2.30	100 0 0						(0.70)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
			D	2.70		133.97	2.80	*From 2.10m to 2.35m bgl: dark grey.*			
2.80	0 0 0					133.67	(0.30) 3.10	Black semi bright vitrain COAL, recovered as angular subangular fine to coarse gravel.			
							(0.40)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
3.50						133.27	3.50	*Between 2.80m and 3 00m bgl: assumed zone of core loss.*			
			D	3.70				Very stiff brownish grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular clarain coal and mudstone.			
	100 73 23		C	4.21 - 4.29				(PENNINE MIDDLE COAL MEASURES FORMATION)			
								Extremely weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures are extremely closely to closely spaced <5 degrees dip undulating smooth.			
5.00								(PENNINE MIDDLE COAL MEASURES FORMATION)			
								Between 3.50m and 3 80m bgl: assumed zone of core loss.			
								From 4.60m to 4.75m bgl: recovered as firm brownish grey slightly gravelly clay. Gravel is fine to coarse angular to subangular mudstone.			
	73 43 16							*From 5.40m to 5.80m bgl: recovered as very stiff grey very gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
		NI 65 140					(5.85)	*From 6.40m to 6.50m bgl: recovered as very stiff grey very gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
6.50								*From 6.60m to 6.75m bgl: recovered as gravel of fine to coarse angular to subangular mudstone.*			
	80 67 0							*At 6.85m bgl: fracture at 90 degrees dip undulating smooth.*			
8.00											
	77 50 15										
								From 9.15m to 9.35m bgl: dark grey colour.			
		NI 110 290				127.42	9.35	Black bright vitrain COAL. Cleats up to 20mm width.			
9.50						127.17	(0.25) 9.60	(PENNINE MIDDLE COAL MEASURES FORMATION)			
			C	9.86 - 10.08				Extremely weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely			

Continued next sheet

Installation:

Remarks: Dynamic sampling to 2.30m bgl, rotary cored from 2.30m to 10.80m bgl. Air mist flush used. Borehole cased to 4.60m bgl. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 2.30m
123mm to 10.80m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4011

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	2 of 2
Start	20/02/2020	**Coordinates**	E 435463.80 N 399428.28	**Scale**	1:50
End	21/02/2020	**Ground Level**	136.77m AOD	**Total Depth**	10.80m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
	100 88 74		C	10.27 - 10.40			(1.20)	Extremely weak thinly bedded grey MUDSTONE. Slightly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. Light brown ironstone nodules up to 35mm present throughout. (PENNINE MIDDLE COAL MEASURES FORMATION) *From 9.60m to 9.75m bgl: recovered as very stiff grey very gravelly clay. Gravel is fine to coarse angular to subangular mudstone.* *From 10.35m to 10.80m bgl: very weak.*			
10.80						125.97	10.80	End of Borehole at 10.80m			

Installation:

Remarks: Dynamic sampling to 2.30m bgl, rotary cored from 2.30m to 10.80m bgl. Air mist flush used. Borehole cased to 4.60m bgl. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 2.30m
123mm to 10.80m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4012

Project	Hoyland Common, Barnsley	**Project No.**	AG3080-19
Client	Newlands Developments	**Sheet**	1 of 1
Start	24/02/2020 **Coordinates** E 435520.13 N 399535.11	**Scale**	1:50
End	**Ground Level** 140.63m AOD	**Total Depth**	9.20m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
0.00			D	0.10		140.43	(0.20)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded sandstone and mudstone.			
			ES				0.20	(TOPSOIL/MADE GROUND)			
	100 0 0		D	0.50			(0.55)	Firm to stiff greyish brown gravelly CLAY. Gravel is fine to coarse angular to subrounded mudstone, sandstone and clarain coal.			
			ES			139.88	0.75	(MADE GROUND - OPENCAST BACKFILL)			
			D	1.00			(0.80)	Very stiff grey very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone.			
			D					(MADE GROUND - OPENCAST BACKFILL)			
1.50			ES		N = 47	139.08	1.55	Very stiff grey and orangish brown slightly gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone, fusain and clarain coal.			
	100 0 0		S					(PENNINE MIDDLE COAL MEASURES FORMATION)			
			D	2.00			(0.95)				
2.50			D	2.50		138.13	2.50	No recovery, open hole technique	NR NR		
			S		N >50						
	0 0 0						(1.50)				
4.00						136.63	4.00	Very weak thickly bedded light grey SILTSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating rough.			
	60 33 0		C	4.36 - 4.44			(1.00)	(PENNINE MIDDLE COAL MEASURES FORMATION) *At 4.50m bgl: calcite veining at 90 degrees dip (<15mm width).*			
5.00						135.63	5.00	Extremely weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth.			
	60 31 17							(PENNINE MIDDLE COAL MEASURES FORMATION) *From 5.00m to 5.30m bgl: recovered as stiff slightly gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
6.50		NI 80 200					(3.00)	*From 6.50m to 6.70m bgl: recovered as gravel of fine to coarse angular to subangular mudstone.*			
	100 71 23		C	7.13 - 7.23							
8.00						132.63	8.00	Black bright vitrain COAL. Recovered as gravel of fine to coarse angular to subangular vitrain coal. Cleats up to 25mm width.			
						132.43	(0.20)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
	96 33 22						8.20	Extremely weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely o closely spaced undulating smooth.			
							(1.00)	(PENNINE MIDDLE COAL MEASURES FORMATION)			
			C	8.91 - 9.05				*From 8.27m to 8.32m bgl: black bright vitrain coal.* *From 8.43m to 8.80m bgl: recovered as stiff gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
9.20						131.43	9.20	End of Borehole at 9.20m			

Installation:

Remarks: Dynamic sampling to 2.50m bgl, open hole drilling from 2.50m to 4.00m and rotary cored from 4.00m to 9.20m bgl. Air mist flush used. Borehole cased to 1.50m bgl. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 2.50m
123mm to 9.20m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4013

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 2
Start	25/02/2020	**Coordinates**	E 435618.02 N 399658.28	**Scale**	1:50
End	26/02/2020	**Ground Level**	140.16m AOD	**Total Depth**	16.50m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
0.00			D	0.15			(0.25)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded sandstone and mudstone.			
			ES			139.91	0.25	(TOPSOIL/MADE GROUND)			
	90 0 0		D ES	0.60			(0.70)	Firm to stiff orangish brown gravelly CLAY. Gravel is fine to coarse angular to subrounded mudstone and sandstone.			
			D	1.00		139.21	0.95	(MADE GROUND - OPENCAST BACKFILL)			
			S		N = 8			Firm locally stiff, locally friable, grey and brown very gravelly CLAY. Gravel is fine to coarse angular to subangular mudstone and siltstone.			
1.50								(MADE GROUND - OPENCAST BACKFILL)			
	100 0 0		B	2.00							
			D	2.50							
			S		N = 21						
3.00											
	90 0 0							*From 3.65m to 3.80m bgl: gravel of fine to coarse angular to subangular mudstone and siltstone.*			
			D	4.00							
			S		N = 27						
4.50											
	90 0 0		D	5.00							
			ES				(8.45)				
			D	5.50							
			S		N = 25						
6.00			B	6.00							
	100 0 0										
			D	7.00							
			S		N = 20						
7.50											
	100 0 0										
			D	8.50							
			S		N = 36						
9.00											
	100		D	9.30							
			ES			130.76	9.40	No recovery, open hole technique.	NR NR NR NR NR NR		

Continued next sheet

Installation: 50mm diameter standpipe installed to 5.00m bgl.

Remarks: Dynamic sampling to 9.40m bgl, open hole drilling due to coarse probable cobbles and boulders from 9.40m to 11.80m bgl and rotary cored from 11.80m to 16.50m bgl. Air mist flush used. Borehole cased to 4.60m bgl. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd

Logged: JW

Checked: SD

Diameter: 140mm to 9.40m
123mm to 16.50m

APPLiED GEOLOGY

BOREHOLE LOG - ROTARY

RC4013

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	2 of 2
Start	25/02/2020	**Coordinates**	E 435618.02 N 399658.28	**Scale**	1:50
End	26/02/2020	**Ground Level**	140.16m AOD	**Total Depth**	16.50m

Depth (m)	TCR SCR RQD	If	Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
							(2.40)	No recovery, open hole technique.	NR NR		
11.80						128.36	11.80				
	100 74 41		C	11.95 - 12.05				Very weak interbedded grey MUDSTONE and light grey SILTSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating rough. (PENNINE MIDDLE COAL MEASURES FORMATION)			
12.50			C	12.40 - 12.50				*From 11.80m to 11.90m bgl: recovered as stiff gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
			C	12.77 - 12.95			(1.75)				
	93 90 25							*From 13.25m to 13.55m bgl: fracture at 90 degrees dip undulating rough.*			
						126.61	13.55				
14.00		NI 100 195						Extremely weak thinly bedded grey MUDSTONE. Distinctly weathered. Fractures dip <5 degrees very closely to closely spaced undulating smooth. (PENNINE MIDDLE COAL MEASURES FORMATION)			
								From 13.55m to 13.85m bgl: fracture at 90 degree dip undulating smooth.			
	100 83 40		C	14.50 - 14.59				*From 14.60m to 14.70m bgl: recovered as gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
							(2.95)	*From 14.95m to 15.05m bgl: recovered as gravelly clay. Gravel is fine to coarse angular to subangular mudstone.*			
			C	15.35 - 15.45							
15.50											
	85 60 20										
16.50						123.66	16.50	End of Borehole at 16.50m			

Installation: 50mm diameter standpipe installed to 5.00m bgl.
Remarks: Dynamic sampling to 9.40m bgl, open hole drilling due to coarse probable cobbles and boulders from 9.40m to 11.80m bgl and rotary cored from 11.80m to 16.50m bgl. Air mist flush used. Borehole cased to 4.60m bgl. Borehole backfilled with bentonite grout on completion.

Groundwater Strikes

Depth Strike	Rise	Remarks	Cased	Sealed

Drilled: Ace Drilling Services Ltd
Logged: JW
Checked: SD

Diameter: 140mm to 9.40m
123mm to 16.50m

APPLiED GEOLOGY

Rotary Cored



Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	D95
Test Date:	03/04/2019
Report Date:	03/04/2019
File Name:	D95.spt
Test Operator:	TS

Instrumented Rod Data

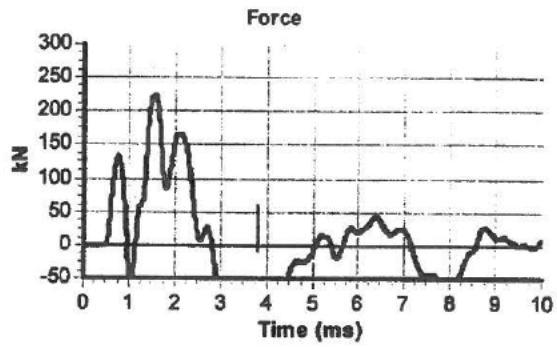
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	9603
Accelerometer No.2:	6457

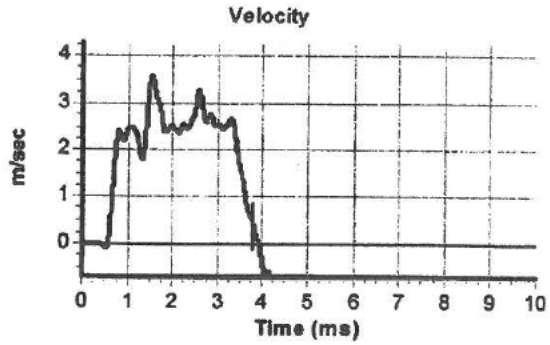
Hammer Information

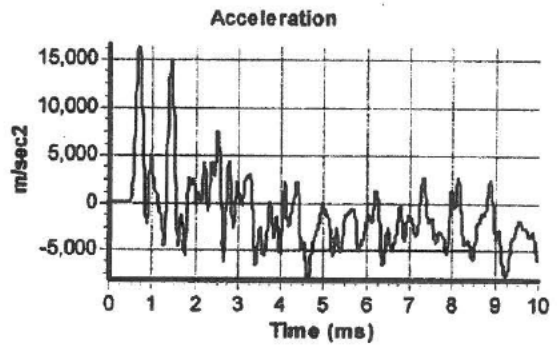
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

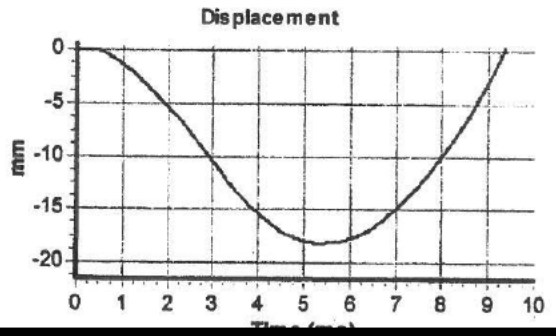
Comments / Location

Hammer tested at Dynamic samplings yard.









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	390

Energy Ratio E_r (%): **82**

[redacted]

Title: Associate Director.

The recommended calibration interval is 12 months

SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010

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HOYLAND COMMON, BARNSLEY

SOIL INVESTIGATION

CPT REPORT

Cone penetration test
Geotechnical data interpretation

Project ref.: P-107408-1






PROJECT:	Hoyland Common, Barnsley

CLIENT:	Applied Geology

FIELDWORK

CPT rig(s)	18.5-tonne rubber-tracked CPT unit (UK8)
Date fieldwork started	14th February 2020
Date fieldwork completed	21st February 2020
Lankelma's representative	Paul Dimelow
Client's representative	Adam Perks

REPORT

Status	Revision	Action	Date	Name
Final	00	**Completed**	28/02/20	Chris Player
		Checked	28/02/20	Emma Stickland
		Approved	28/02/20	Joseph Hobbs

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APPENDIX C	**CONE PENETRATION TEST RESULTS**
APPENDIX D	**STANDARD INTERPRETATION RESULTS - SET 1**
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1 INTRODUCTION

At the request of Applied Geology, a soils investigation was carried out on project *Hoyland Common, Barnsley*.

Site location (in the general region of):

Sheffield Road
Hoyland Common
Barnsley
S74 0DP

2 DISCLAIMER

The investigation information, raw data and interpretations provided in this report are for the sole benefit of the Client identified at the front of the report.

Lankelma has exercised reasonable skill, care and diligence in the fieldwork and preparation of this report. This report has been completed based on information available to Lankelma at the time of preparation. The measurement and interpreted data in this report do not constitute recommendations for design purposes. An appropriately qualified person must review and interpret the data given in this report, together with any assumptions we have made that affect the data, before using the data for design or recommendation.

Lankelma accepts no responsibility for the accuracy or appropriateness of any assumptions, derived soil parameters, soil descriptions or soil unit boundaries contained in this report.

3 COMPLETED WORKS

- 22 nr. cone penetration tests (CPTu) with piezo measurement; and
- Factual report plus additional geotechnical data interpretation.

The *Summary Tables* section contains tabulated summaries of the works completed together with analysis results where necessary.

4 FIELDWORK GENERAL

Fieldwork was performed with an 18.5-tonne rubber-tracked CPT unit (UK8) equipped with a 15-tonne capacity hydraulic ram set.

The Client was responsible for the positioning and re-survey of all investigative locations.

The target depth for the investigation was between 5 m and 15 m below ground level. Table 1 details the final test depths and reasons for test termination (*refusal factor). W*here penetration

refusal was encountered the termination depth was advised to, and agreed with, the Client's on-site representative.

5 CONE PENETRATION TESTS

Cone penetration testing was carried out in general accordance with BS ISO 22476-1:2012.

Penetrometer measurements included cone tip resistance, friction sleeve resistance and dynamic pore water pressure sampled at a 10 mm resolution.

The penetrometer was calibrated in accordance with BS8422:2003 and ASTM E74-13a. The management of calibration records is in accordance with ISO 10012. Copies of all calibration certificates for the cones used are provided in Appendix B.

The piezometer filter element was in the u_2 position and was vacuum saturated. The pore pressure system was saturated with de-aired 10000 cSt silicone oil.

5.1 GLOSSARY OF CPT TERMS AND SYMBOLS

SYMBOLS & ABBREVIATIONS

q_c :-	**Cone resistance.** The total force acting on the cone Q_c, divided by the projected area of the cone, A_c; **($q_c=Q_c/A_c$)**.
q_t :-	**Corrected cone resistance.** The cone resistance q_c corrected for pore water pressure on the cone shoulder.
f_s :-	**Friction sleeve resistance.** The total frictional force acting on the friction sleeve, F_s, divided by its surface area, A_s. **$f_s= F_s/A_s$**.
u_2 or u_1	**Water pressure. Water pressure measured at the shoulder position (u_2) or cone face (u_1)..**
R_f :-	**Friction ratio** The ratio, expressed as a percentage, of the sleeve friction, f_s, to the cone resistance, q_c, both measured at the same depth; **[$R_f= (f_s/q_c)$ · 100].**
γ	**Unit weight of soil.**
γ_w	**Unit weight of water.**
σ_v:-	**Total overburden stress**
σ'_v:-	**Effective overburden stress**
σ_{atm}, or, P_a	**Reference atmospheric stress = 100kPa**
$q_{t\text{-}net}$:-	**Net cone resistance = ($q_t - \sigma_v$).** Where q_t is unavailable q_c is applied.
Q_t :-	**Normalised cone resistance** (Method 1) **= ($q_c - \sigma_v$)/σ'_v**
q_{t1}:-	**Normalised cone resistance** (Method 2) **= $(q_t)/(\sigma'_v)^{0.5}$**
F_r:-	**Normalised friction sleeve resistance = f_s /($q_c - \sigma_v$)**

I_c:- **Soil Behaviour Type Index**

SBT or SBTn: **Soil behaviour type classification**

B_q :- **Pore pressure ratio.** The net pore pressure normalized with respect to the net cone resistance. = **$(u_2 - u_0)/(q_t - \sigma_v)$**

TERMS

Cone (or tip): - The conical tip of the cone penetrometer.

Friction sleeve: - The section of the cone penetrometer upon which the sleeve friction is measured, located behind the cone tip.

Piezocone: - A cone penetrometer with a pore pressure sensor (u_2 / u_1)

Dynamic pore pressure: - The pore pressure measured during penetration (u_2 / u_1).

Soil behaviour type: - Soil classification scheme or classified soil type according to Robertson (1990, 2016) often abbreviated to SBT or SBTn.

5.2 CPT DATA REDUCTION AND PRESENTATION

The CPT results are presented in Appendix C. The corrected cone resistance (q_t), local side friction (f_s), dynamic pore water pressure (u_2), friction ratio (R_f) and inclination are all presented against depth and elevation in accordance BS ISO 22476-1:2012. CPT data and the associated derived geotechnical parameters are included in the AGS 3.1 and 4.0 data files provided.

The cone tip resistance and sleeve force measurements were converted to pressures using the nominal dimensions of the penetrometer.

For piezocone tests the corrected tip resistance was calculated according to the formula:

$$q_t = q_c + u_2 \times (1 - a)$$

Where a is the 'area ratio' and (1- a) is the proportion of cross-sectional area between the cone tip and cone body where pore pressures (positive or negative) can act to add or subtract from the total external axial force on the tip. The difference between measured and corrected values is largest in low strength soils with large excess pore pressures. The percentage adjustment is described by the curves in the following chart for alpha factor of 0.8:

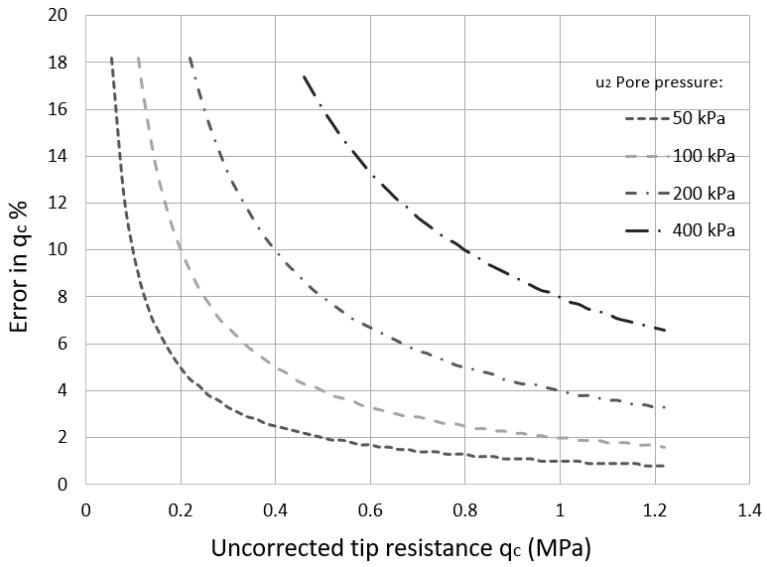


Figure 5-1 Uncorrected tip with measured tip resistance

Penetration length readings were corrected for inclination and sleeve readings were depth corrected for the dimensional offset between cone tip and sleeve during post processing. An additional shift of -80 mm was applied to the sleeve to account for tip failure zone offset (see 'CPT Interpretation Notes'). 'Rod spikes', artefacts of the pause for push rod addition, were filtered from the cone tip and sleeve data.

The raw (or corrected) data are presented in Appendix C.

Geotechnical parameters appropriate for drained and undrained cone penetration conditions were derived for corresponding drained and undrained derived soil behaviour types (SBTs) respectively, however, to account for uncertainty in the SBT correlation with drainage behaviour, all parameters were derived over a range of transitional soils within the range $2.4 < Ic < 2.7$ (see section 6.3).

In general, the engineering parameters derived are intended for non-cemented predominantly silicate soils.

5.3 IN-SITU STRESS CONDITIONS

An estimate of the vertical in-situ stress states is necessary as they are applied in many derived parameters obtained from the CPT and dissipation test.

The total vertical stress with depth was calculated as the sum of the calculated soil unit weight above a given depth. See section 5.4 for information on the empirical estimate of soil unit weight.

The depth of the principal phreatic surface applied in the calculation of effective stress was assumed at an arbitrary value of 3.0 mBGL for parameter calculations.

Note: The term phreatic surface is used here, however when it is based on piezocone measurements it is assumed that the piezometric level (under hydrostatic conditions) and

groundwater table coincide. The phreatic or piezometric surface reported is intended to provide information about the assumed pore pressure distribution for calculation of relevant derived parameters from the CPT and may not represent the true position of the groundwater table or perched water bodies. Complex groundwater pressure distributions, if they are observed from the measurements, will be applied to relevant derived parameters.

5.4 SOIL UNIT WEIGHT

The soil unit weight was estimated using the following method proposed by Robertson (2010).

$$\frac{y}{y_w} = 0.27\ Log(R_f) + 0.36\ (Log(q_t/R_f)) + 1.236$$

Throughout pre-drilled zones (inspection pits or drill-out) the soil unit weight was assumed as 18 kN/m^3.

For depths where the friction sleeve measurement falls below zero, the friction sleeve was substituted with an artificial nominal 1.0 kPa resistance for the purpose of obtaining an approximate soil unit weight necessary for estimation of total vertical stress over the entire profile.

5.5 SOIL BEHAVIOUR TYPE

The soil behaviour type (SBT) was interpreted using the Robertson (1990) classification system based on the normalised cone resistance (Qt) and normalised friction sleeve resistance (Fr) for silicate soils.

While the classification based on normalised parameters is considered more accurate, particularly at depths exceeding 15-20 m, the classification is often significantly in error (artificially granular/drained) at very shallow depth (< 1-3 m). The error at shallow depth is associated with the potentially large difference between the estimated vertical effective stress (applied in normalisation) and the unknown horizontal stress influencing penetration resistance.

Robertson (2010) proposed a non-normalised version of the 1990 chart which uses dimensionless cone resistance (q_c/Pa) and friction ratio, Rf. The classification according to this chart can be more reliable at shallow depth and has been plotted as an approximate SBT index (discussed below) for comparison to the normalised classification.

The SBT chart is provided in Appendix B – *General Information,* titled 'CPT Soil Behaviour Type Chart'.

It should be noted that the SBT classification provides the general soil 'type' which typically provides a similar CPT measurement range of q_c and f_s. Correspondingly, it will also show biased towards the soil fraction that dominates the mechanical behaviour. While the repeatability and behavioural bias of the SBT is usually beneficial, the classification is not always an appropriate substitute for classification based on grain-size distribution.

The results are presented on the plots of Appendix D.

5.6 SOIL BEHAVIOUR TYPE INDEX – I_C

The main trend in soil behaviour type (SBT) variation can be expressed a continuous index, I_C, proposed by Robertson and Wride (1998) based on a similar index proposed by Jefferies and Davies (1993). The index provides a continuous profile of SBT variation with depth for end-user analysis of soil units and variation within units.

The equivalent non-normalised version, as proposed by Robertson (2010), is provided for comparison.

The basis of I_c and its approximation of the original chart classification zones may be seen from Appendix B figure 'CPT Soil Behaviour Type Chart'. The method does not identify zones 1 (*sensitive fine grained)* and zones 8 & 9 (*overconsolidated or cemented*).

Normalised SBT index I_C (Robertson and Wride, 1998)*:*

$$I_c = [(3.47 - \log Q_t)^2 + (logF_r + 1.22)^2]^{0.5}$$

Non-normalised SBT index I_C (Robertson, 2010)*:*

$$I_c = \left[\left(3.47 - \log\left(\frac{q_c}{\sigma_{atm}}\right)\right)^2 + (logR_f + 1.22)^2\right]^{0.5}$$

The results are presented on the plots of Appendix D.

5.7 RELATIVE DENSITY

The relative density of sands was calculated based on an empirical relationship proposed by Jamiolkowski *et al.* (2001) based on a large database of undisturbed frozen samples and calibration chamber tests. The expected accuracy may be evaluated from the figures presented below.

$$D_r = 100\left[0.268 \cdot \ln\left(\frac{q_t/\sigma_{atm}}{\sqrt{\sigma_{vo}'/\sigma_{atm}}}\right) - k\right]$$

k = Compressibility dependant constant can be taken as -0.675 for medium compressibility (applied value in our interpretation), <= 1 for high compressibility and >= 2 for compressible sands.

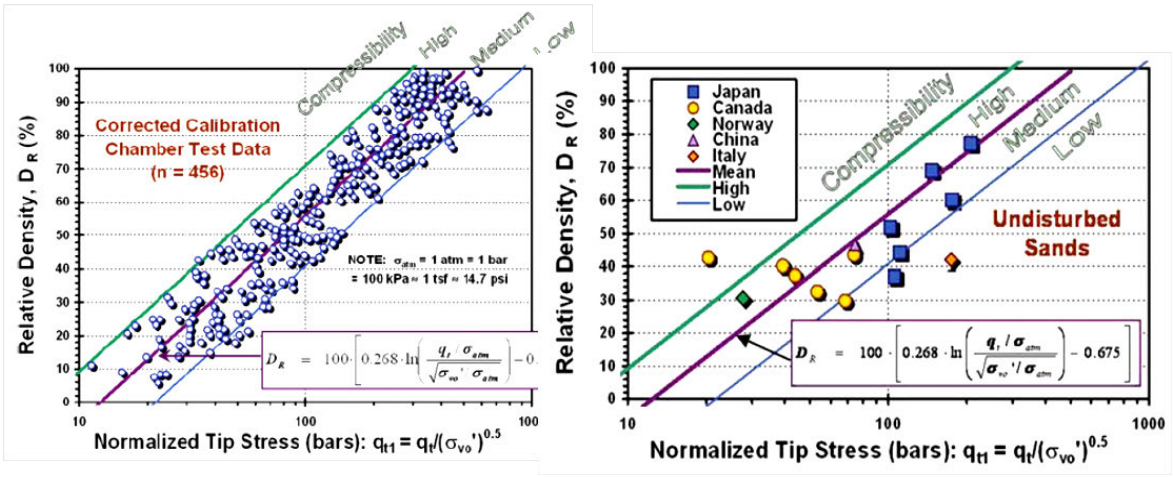


Figure 5-2 Relative density with normalised tip stress and sand compressibility from calibration chamber tests (left) and undisturbed frozen samples (right). Jamiolkowski *et al.* (2001). Reproduced from Mayne (2007).

The results are presented on the plots of Appendix E– *Standard interpretation results (set 2)*.

5.8 UNDRAINED SHEAR STRENGTH

The undrained shear strength s_u is usually estimated as a factor of net cone tip resistance (Lunne *et al*, 1981):

$$s_u = \frac{q_c - \sigma_{v0}}{N_k}$$

where N_k is an empirical cone factor which varies with soil type, stress history, structure/fabric, plasticity and the mode of shearing.

Mayne and Peuchen (2018) performed and evaluation of 407 high-quality triaxial compression tests against net tip resistance and proposed N_{kt} factors with regression analysis details for five categories of clays shown in Table 1.

Table 1 Summary of CAUC s_u versus q_{net} for clays. Reproduced from Mayne and Peuchen (2018).

Clay Group	Number of sites	No. Data	Correlation Coefficient r_2	Factor N_{kt}	Mean Pore Pressure Parameter B_q
Offshore NC-LOC	17	115	0.98	12.32	0.51
Onshore NC-LOC	30	191	0.867	12	0.53
Sensitive NC-LOC	5	43	0.507	10.33	0.84
OC Intact	5	36	0.862	13.57	0.49
OC Fissured	5	22	0.393	22.47	-0.01
All clays	62	407	0.923	13.33	0.55

Alternatively, a variable N_{kt} factor can be estimated for the profile as a function of the pore pressure parameter B_q, applicable for B_q values of > -0.01. The following equation proposed by Mayne and Peuchen is based on the same database evaluation:

$$N_{kt} = 10.5 - 4.6 \cdot \ln(B_q + 0.1)$$

Where the pore pressure parameter B_q is the ratio of excess pore pressure to net tip resistance:

$$B_q = \frac{u_2 - u_0}{q_t - \sigma_{v0}}$$

The N_{kt} estimate has a standard error of 2.4 N_k and correlation coefficient of 0.645.

The estimate based on B_q is presented as 's_u5' on the parameter plots and is only suitable for tests that have a high-quality pore pressure data, often indicated by a positive, repeatable and dynamic response. For tests that have a reliable pore pressure response throughout, the evaluation on a point by point basis is warranted. For projects with variable response quality and with possible piezo desaturation (for example in the unsaturated zone or by dilation/cavitation) it is preferable to identify zones with reliable pore pressure response for representative soils and select a characteristic value of B_q for evaluation of N_{kt}. Lankelma are not always in view of the effort that has been made in preparation of the test location to maintain saturation of the piezo sensor.

Note: N_{kt} (with subscript 't') indicates a N_k factor that has been established using the corrected tip resistance q_t. N_{kt} can be applied to the uncorrected tip resistance q_c (non-piezocone tests) but results in a slightly lower estimate of s_u depending on the correction magnitude (q_c - q_t) in lower strength soils.

Undrained shear strengths corresponding to selected values of N_k are presented on the plots of Appendix D. *'s_u3'* on the logs (N_k = 15) has been included as a reference for comparison to traditional arbitrary N_k values of 15 and 20.

5.9 OVERCONSOLIDATION RATIO

The preconsolidation stress σ_p' was calculated based on the method proposed by Mayne et al (2009):

$$\sigma_p' = k \cdot (q_t - \sigma_{vo})^{m'}$$

$$OCR = \sigma_p'/\sigma'_{v0}'$$

Mayne *et al* found that the trend with mean grain size followed a power law through the addition of exponent m' and that its value can be estimated by relation to soil behaviour type index I_c:

$$m' = 1 - \frac{0.28}{1 + \left(\frac{I_c}{2.65}\right)^{25}}$$

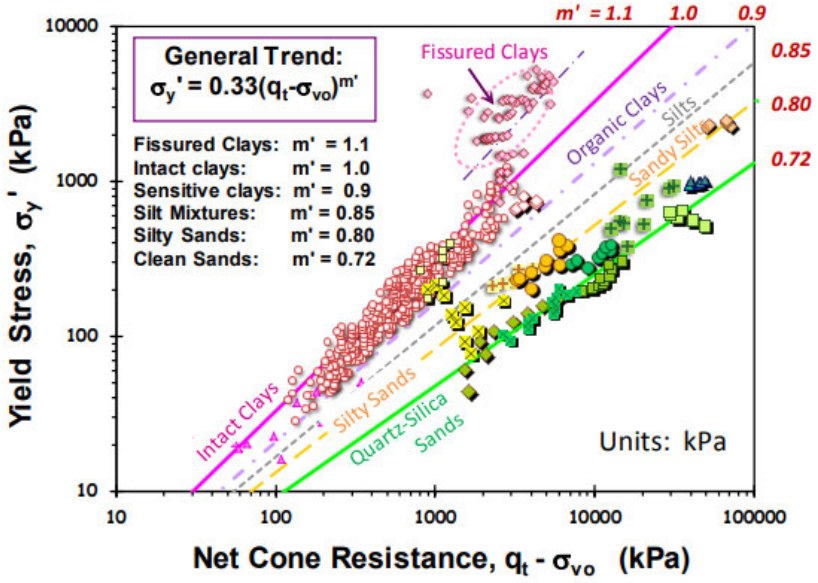


Figure 5-3 Preconsolidation stress with net cone resistance power law, reproduced from Mayne (2014).

An additional σ_p' and OCR was calculated for m' = 1.1 to reflect the upper trend for over consolidated fissured clays not captured by the soil behaviour type index I_c

5.10 SPT N60 VALUES

Equivalent SPT N60 values, defined as the non-normalised SPT blow count over a 30 cm interval, were derived for two correlations and are presented together in the results section for comparison.

Method 1 - Lunne *et al.* (1997)

$$N_{60} = \frac{q_t}{8.5 \cdot \sigma_{atm} \cdot \left(1 - \frac{I_c}{4.6}\right)}$$

Method 2 - Robertson (2012)

$$\frac{\left(\frac{q_t}{p_a}\right)}{N_{60}} = 10^{(1.268-0.2817I_c)}$$

The correlations are intended for clays, silts and sands and not for carbonates or cemented geo-materials.

The results are presented in Appendix D.

5.11 FRICTION ANGLE

Sands

The peak friction angle of granular materials was calculated using the Kulhawy and Mayne (1990) method and is an empirical relationship as a function of stress normalised cone tip resistance. The relationship is based on a calibration chamber database from 24 sands of varying mineralogy. The relationship has the form:

$$\phi' = 17.6 + 11.0 \cdot \log\left(q_{t1}\right)$$

Where:

ϕ' = Peak friction angle (degrees)

q_{t1} = stress normalised cone resistance =

$$\left(\frac{q_t}{\sigma_{atm}}\right) / \left(\frac{\sigma_{v0'}}{\sigma_{atm}}\right)^{0.5}$$

The presence of compressible minerals tends to reduce tip resistance resulting in lower estimate of friction angle, while very coarse (sand) or larger grain size tends to increase tip resistance resulting in higher estimate.

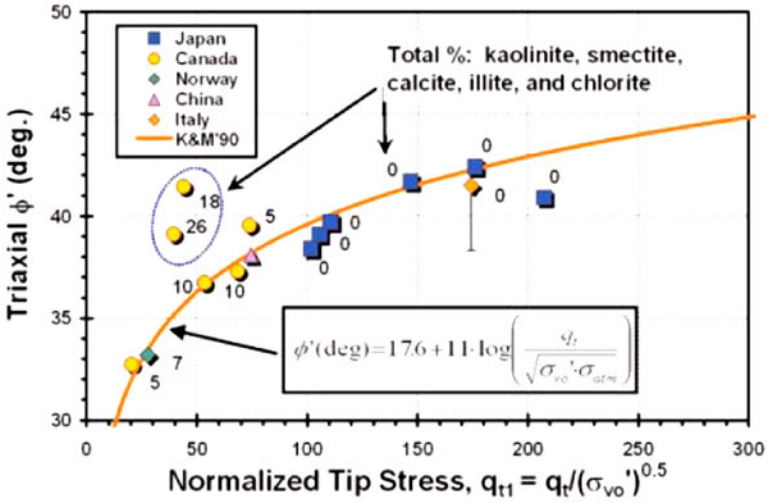


Figure 5-4 Peak triaxial friction angle from undisturbed sands with normalised cone resistance.

Fine grained soils

The effective friction angle for fine grained soils was calculated based on the Senneset *et al.* (1988, 1989) method by applying the approximate closed form solution by Mayne & Campanella (2005) as a direct function of the pore pressure parameter Bq and normalised tip resistance Q. The method is applicable where $0.1 < B_q < 1.0$ and $20° < \phi' < 45°$ and generally appropriate for non-cemented NC-LOC soils.

$$\phi' = 29.5° \, B_q^{0.121} [0.256 + 0.336 \, B_q + \log Q]$$

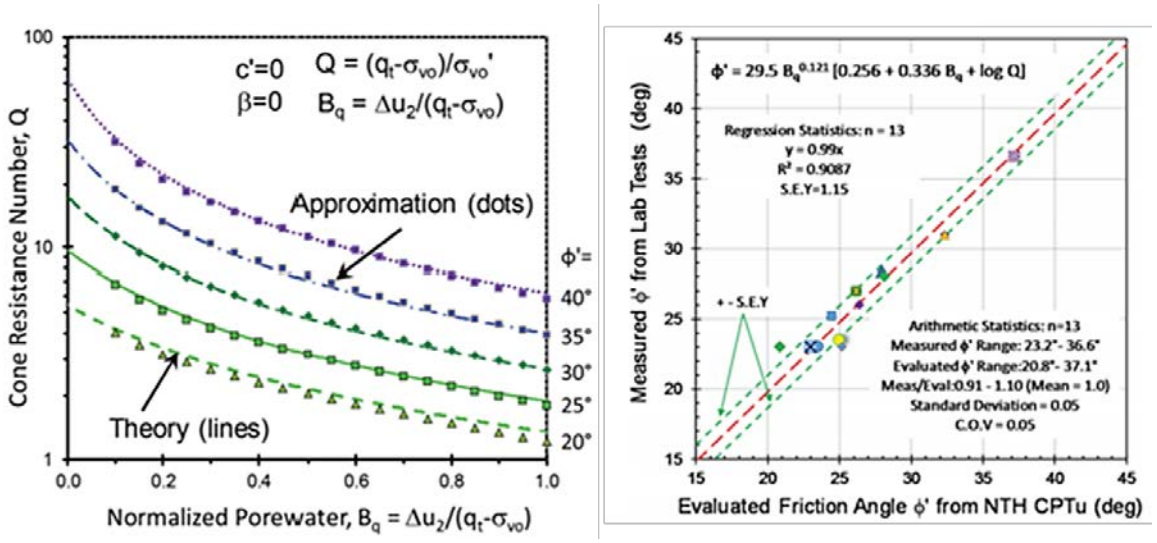


Figure 5-5 [Left] Theoretical curves with function approximation (dots) overlay [Right] calibration data from geotechnical centrifuge tests for a variety of soils. Redrawn from Ouyang & Mayne (2018).

The results are presented in Appendix E.

5.12 COEFFICIENT OF VOLUME CHANGE

Coefficient of volume change (m_v) defined as the inverse of the constrained modulus (M), is evaluated for all soil types using the constrained modulus method proposed by Mayne (2006) cited in Mayne (2007) applicable to the present state of vertical effective stress up to the pre-consolidation stress.

$$m_v = \frac{1}{M}$$

Where:

$$M = \alpha \cdot (q_t - \sigma_v)$$

$$\alpha = 5$$

An alpha factor of 8.25 reported by Kulhawy & Mayne (1990) for fine grained soils appears to provide a better fit through the data for intact non-organic clays, reducing to around 1 to 2 for organic plastic clays.

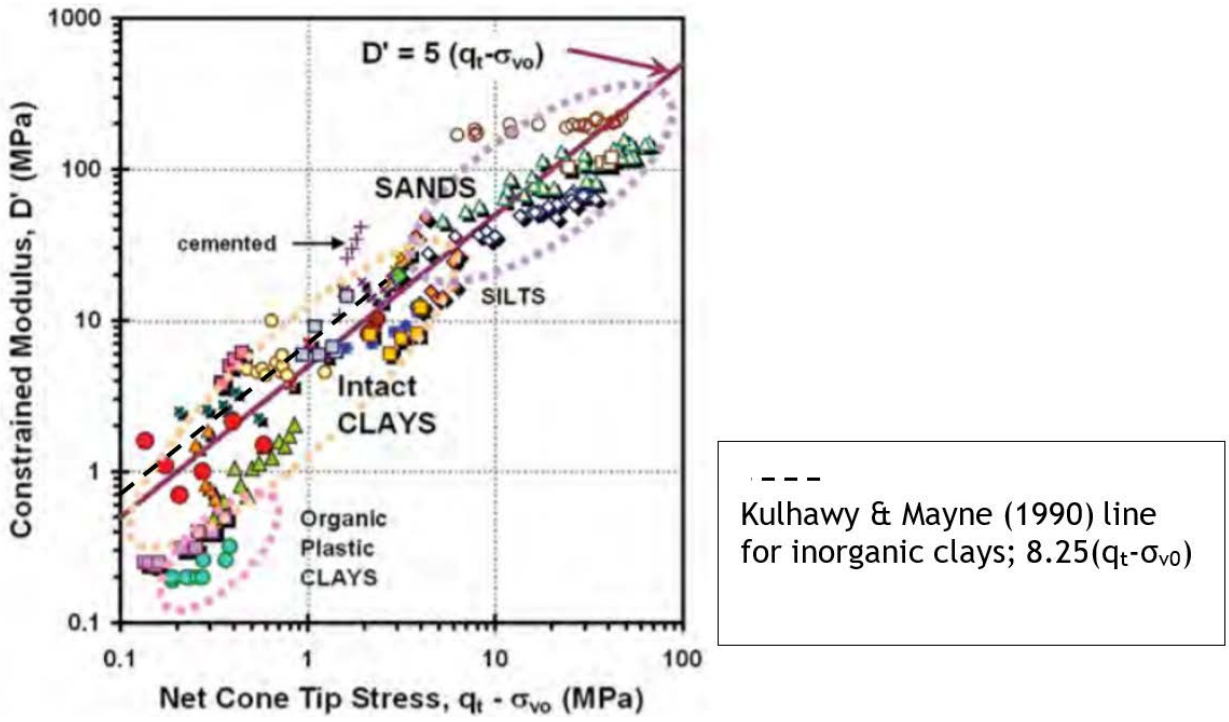


Figure 5-6 Constrained modulus of Mayne (2006). Annotated/redrawn from NCHRP Synthesis 368 (2007).

The results are presented on the plots of Appendix D.

5.13 YOUNG'S MODULUS

The Young's modulus at 25% mobilised shear strength (FOS = 4) was calculated according to the method proposed by Robertson (2009):

$E' = \alpha(q_t - \sigma_v)$
Where:

$\alpha = 0.015(10^{0.55Ic+1.68})$

The method described by Robertson may be adapted to estimate E' for loading at different percentages of yield stress.

The results are presented in Appendix E.

6 CPT INTERPRETATION NOTES

Provided below is a non-exhaustive set of notes on interpretation of the acquired CPT data with reference to examples within the dataset where appropriate.

DRAINED AND UNDRAINED SOIL BEHAVIOUR

Geotechnical parameters appropriate for drained and undrained cone penetration conditions are derived for drained and undrained soil behaviour types (SBTs) respectively, however, to help mitigate the uncertainty in the SBT correlation with drainage behaviour, all parameters are derived over the Soil Behaviour Type range 2.4 < I_c < 2.7. For partially drained conditions, error will be introduced within derived parameters.

Piezocone dynamic pore pressure and dissipation tests may be used to identify drainage conditions. Dissipation t_{50} values exceeding 50 seconds indicate undrained penetration behaviour based on the findings of Kim *et al.* (2008).

In partially drained materials the friction sleeve resistance may rise significantly immediately following a pause in penetration due to consolidation and increased effective stress on the friction sleeve.

DYNAMIC PORE PRESSURE (CPTu)

While the piezo system is saturated before use, testing through unsaturated soils may result in some degree of desaturation leading to a less accurate and more 'sluggish' pore pressure response. Desaturation can also occur during penetration due to suction during dilative shear at the cone shoulder. Dissipation tests that are undertaken following desaturation are likely to have a more pronounced initial rise and some degree of error will be present in the analysis.

If the system becomes desaturated it may or may not re-saturate at higher excess pressures later in the test. The pore pressure response in saturated contractive soils normally have a dynamic 'peaky' appearance.

The tip resistance in lower strength contractive soils without pore pressure measurement in the u_2 position is likely to be significantly lower than the equivalent corrected tip resistance depending on the magnitude of pore pressure acting in the gap between cone tip and cone body.

CONE TIP AND SLEEVE OFFSET

The accuracy of the SBT over thin layers and at layer boundaries is sensitive to offset error in the friction ratio often resulting in sharp peaks or troughs at boundaries. The friction ratio is often inaccurate in heavily disturbed soils with a 'blocky' macro fabric.

For this investigation a friction sleeve depth shift of -80mm was applied together with a 2-point (40 mm) moving average on the friction ratio to minimise the influence of this effect.

FRICTION SLEEVE DATA

There are two common causes of artificially low or negative friction sleeve measurement; 1) Sudden unequal pore pressure effects at strata boundaries often resulting in a negative spike and 2) very sensitive soils where the measured resistance falls to zero or lower due to instrument limitations or temperature effects. The latter can often be mitigated by temperature stabilisation during the test and at the time of zero output measurement.

CONE TYPE

The reference cone type has a 10 cm^2 projected cone tip area and 150 cm^2 friction sleeve area, however it is common to use the larger 15 cm^2 cone with 225 cm^2 friction sleeve area for improved sensitivity and penetration depth potential. Use of the 15 cm^2 cone will produce more pronounced transitions zones and thin layer effects (larger zone of influence and failure zone).

TRANSITION ZONES AND THIN LAYER EFFECTS

During penetration at the boundary between soils of contrasting stiffness, a transition zone is often evident prior to mobilisation of the true soil stiffness. These should be cautiously ignored in assessment of soil behaviour type and parameter evaluation. Where the stiff layer is thin (<~0.75 m) mobilised resistance may be significantly less than that of an equivalent thick layer. The effect for thin low stiffness layers is less significant. Procedures for thin-layer effect correction are provided by Robertson and Wride (1998).

GRAVELS

The presence of gravel or larger clasts in a soil is often characterised by short peaks in the CPT tip and sleeve readings, possibly with associate inclinometer 'shake' and/or sharp reductions in pore water readings due to dilation effects. Frequent gravels in soft or loose soils may generate localised erroneous friction ratio values.

7 REFERENCES

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APPENDICES

APPENDIX A SUMMARY TABLES

Table 1 CPT summary

Test ID	Final depth (mBGL)	**Cone ID {C=**Cone tip; **F=**Friction Sleeve**; I=** Inclination**; P =** Piezo**; S=**Subtraction cone**; 15/10** = cone projected area (cm2))}	CPT rig	Pre-drilled / inspection pit (m)	Refusal factor	Dissipations	Seismic cone	Easting	Northing	Elevation (m)	Date of test	Remarks
CPT5001	8.56	S15-CFIP.1819	UK8		Tip load						14/02/2020	
CPT5002	10.28	S15-CFIP.1819	UK8		Tip load						14/02/2020	
CPT5003	7.80	S15-CFIP.1819	UK8		Tip load						14/02/2020	
CPT5004	10.68	S15-CFIP.1819	UK8		Target depth						14/02/2020	
CPT5005	7.02	S15-CFIP.1819	UK8		Tip load						14/02/2020	
CPT5006	7.26	S15-CFIP.1819	UK8		Target depth						14/02/2020	
CPT5007	6.90	S15-CFIP.1819	UK8		Target depth						14/02/2020	
CPT5008	5.08	S15-CFIP.1819	UK8		Target depth						14/02/2020	
CPT5009	10.46	S15-CFIP.1819	UK8		Tip load						14/02/2020	
CPT5010	11.68	S15-CFIP.1819	UK8		Target depth						14/02/2020	
CPT5011	3.16	S15-CFIP.1819	UK8		Lateral support						21/02/2020	
CPT5012	2.42	S15-CFIP.1819	UK8		Lateral support						21/02/2020	
CPT5012A	3.00	S15-CFIP.1819	UK8		Lateral support						21/02/2020	
CPT5013	2.74	S15-CFIP.1819	UK8		Lateral support						21/02/2020	
CPT5014	1.32	S15-CFIP.1819	UK8		Inclination						21/02/2020	
CPT5014A	10.14	S15-CFIP.1819	UK8		Target depth						21/02/2020	
CPT5015	4.90	S15-CFIP.1819	UK8		Inclination						21/02/2020	
CPT5015A	10.12	S15-CFIP.1819	UK8		Lateral support						21/02/2020	
CPT5016	4.24	S15-CFIP.1819	UK8		Lateral support						21/02/2020	
CPT5017	7.88	S15-CFIP.1819	UK8		Inclination						21/02/2020	
CPT5018	2.10	S15-CFIP.1819	UK8		Inclination						21/02/2020	
CPT5018A	9.54	S15-CFIP.1819	UK8		Target depth						21/02/2020	

CPT test plots are presented in Appendix C.

APPENDIX B GENERAL INFORMATION

LIST OF FIGURES

Description	Pages included
Cone calibration certificate: S15-CFIP.1819	1
Data sheet: 18.5-tonne rubber-tracked CPT unit (UK8)	1
CPT soil behaviour type chart	1

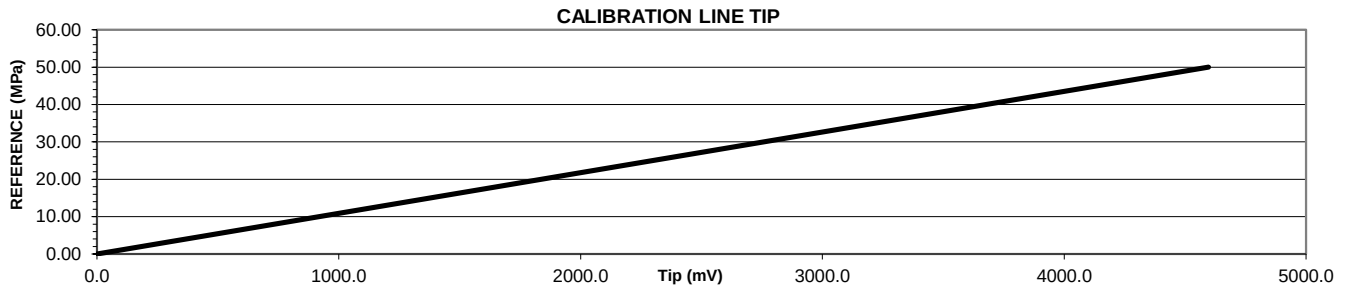
LANKELMA

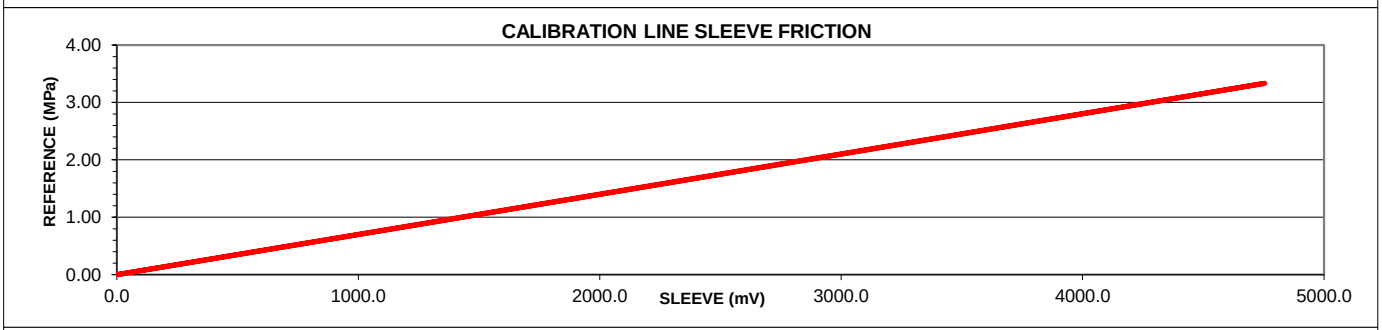
CALIBRATION CERTIFICATE

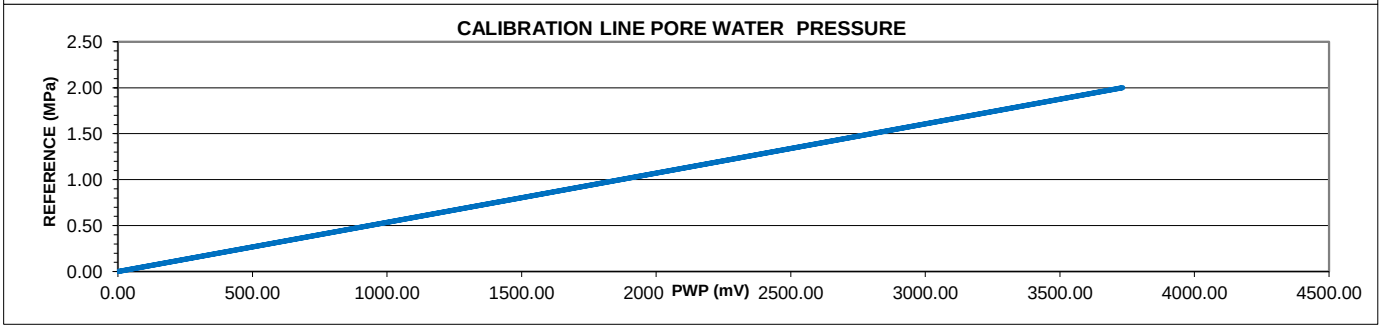
Geopoint-S15-150kN-5MPa

Cone Serial Number: S15-CFIIP.1819

REFERENCE INSTRUMENTS:	CONE END RESISTANCE	SLEEVE FRICTION	PORE WATER PRESSURE
ID	51998	51998	4009509
TYPE	AM DSCC-100kN	AM DSCC-100kN	Druck DPI 104
UNCERTAINTY (±%)	0.01	0.01	0.05
Nominal pressure (MPa,MPa,MPa)	50.00	3.33	2.00
Maximum pressure (MPa,MPa,MPa)	100.00	6.67	5.00
Area (cm²)	15	225	N/A
Sensitivity (mV/MPa)	91.94	1425 96	1866.24
Calibration file scaling factor:			
Nominal cal force (kN, kN, BAR)	75	75	20
Calibration number (mV)	4597	4753	3732
Zero point (mV)	241	245	243
Sensitivity (mV/kN, mV/kN, mV/BAR)	61.291	63.376	186.624
Inclination factors (mV)	X -20°= 384, 0°= 2474, 20°= 4462	/ Y -20°= 379, 0°= 2487, 20°= 4538	
Measured alpha factor:	0.80		
Uncertainty (%):			
Reproducibility	0.05	0.03	0.02
Linearity	0.16	0.07	0.11
Hysteresis	0.16	0.17	0.06
Combined expanded (k=2)	0.34	0.68	0.26
Application class	1	1	1







Instrument:	**S15-150kN**	**Location:**	**Lankelma Calibration Laboratory**
Serial Number:	**S15-CFIIP.1819**	**Temperature(° C)**	**18.4**
Manufacturer:	**Geopoint**	**Calibration Engineer**	**A Harman**
Date of calibration:	**06/01/2020**	**Calibration Expiry**	**05/04/2020**

Calibration signed and dated by:	Calibration checked and dated by:
[redacted]	[redacted]

UK8
Tracked crawler



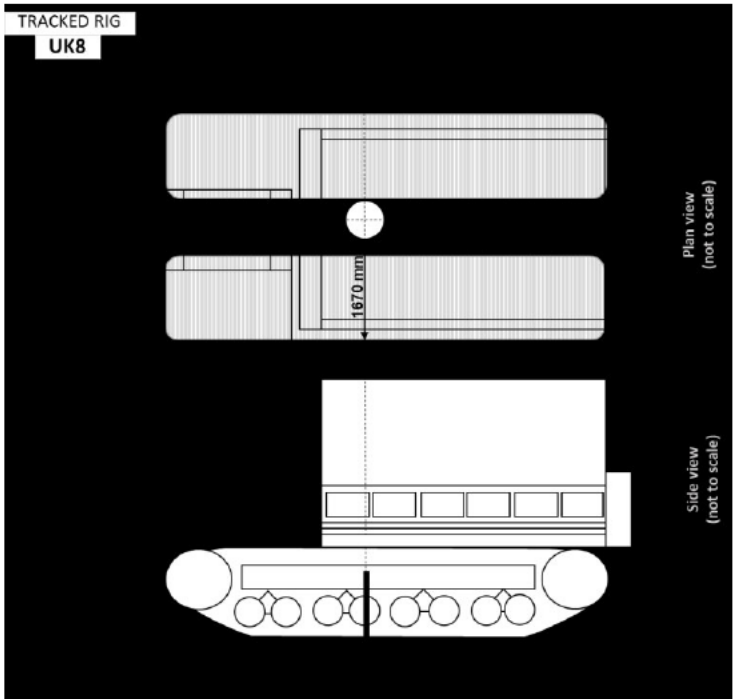
Rig weight	18.5 T
Max. operating ram capacity	15 T
Max. travelling speed	15 km/h
Track material	Rubber
Track length	3.40 m
Track width	0.75 m
Max. ground clearance on jacks	0.21 m
Max. ground bearing pressure	Tracking/pushing – 35 kPa Pulling – 63 kPa
Max. testing gradient	Flat – no self levelling
Max. traversing gradient	35 degrees (operator assessed)
Noise output at 2 m	Testing – 74 dBA Driving – 95 dBA
Clamp arrangement	36/55 push-pull clamp
Ram stroke	0.70 m
Max. casing size	55 mm
Fuel type	Biodegradable diesel
Typical production	100m+ of standard CPTu testing per day (depending on site conditions and access)

The low ground bearing pressures, large footprint and high ground clearance of our 'bogskipper' tracked crawler makes it perfect for working on sites with boggy or very soft ground conditions.

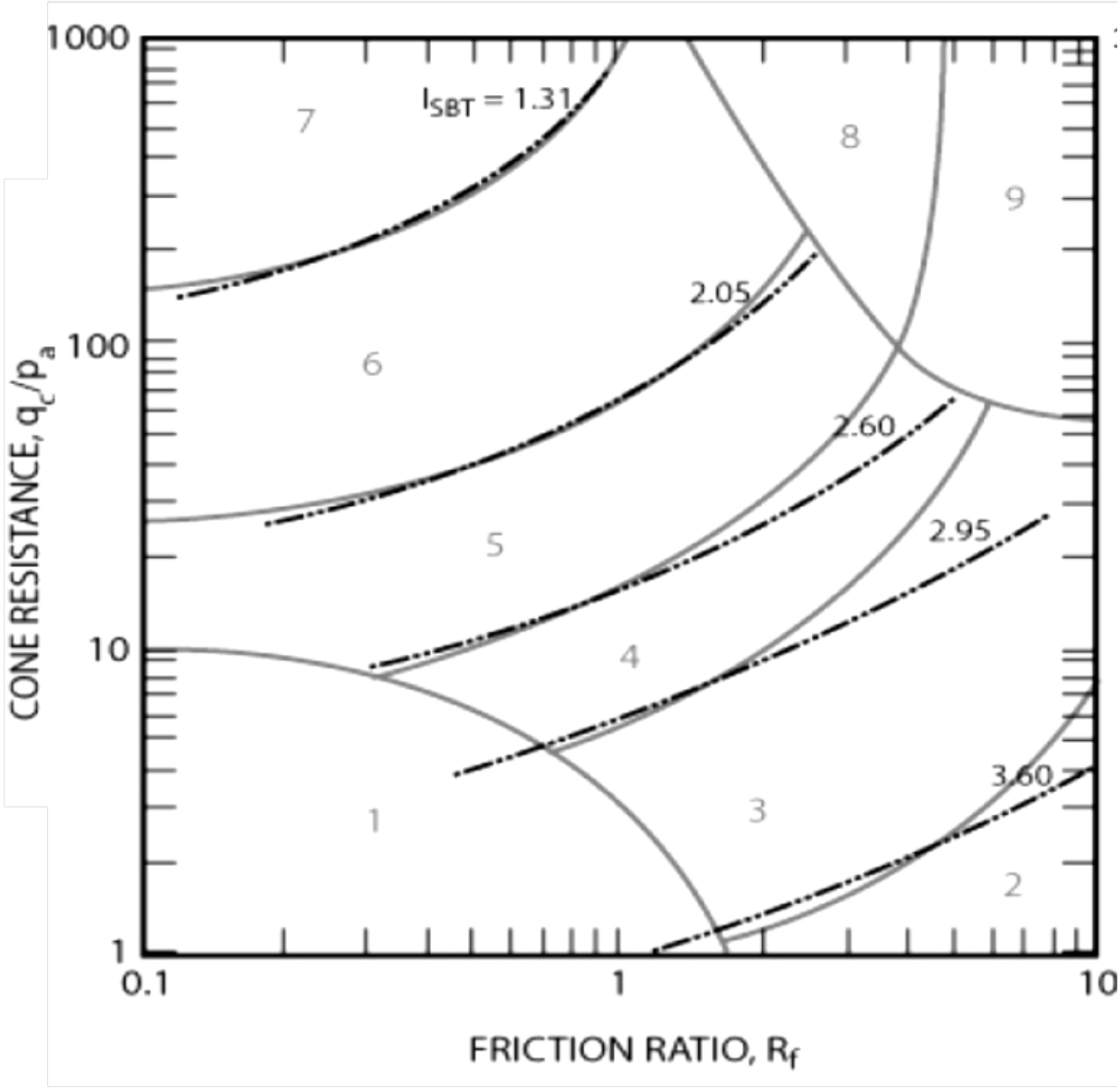
This unique rig has experience working on intertidal projects, peat bogs and weight-sensitive sites.

The rubber tracks minimize the potential for any damage to delicate infrastructure, such as a sea wall.

Biodegradable diesel and hydraulic oil for working on environmentally sensitive sites.



CPT SOIL BEHAVIOUR TYPE CHART



Non-normalised SBT chart by Robertson *et al.* (2010) based on dimensionless cone resistance (qc/Pa) and friction ration, Rf, showing contours of *Ic* index. The chart is also applicable to normalised tip/sleeve values Q_t and F_r.

Zone	Soil Behaviour Type (SBT)		
1	Sensitive fine-grained	6	Sands: clean sand to sandy silt
2	Clay – organic soil	7	Dense sand to gravelly sand
3	Clays: Clay to silty clay	8	Stiff sand to clayey sand*
4	Silt mixtures: clayey silt to silty clay	9	Stiff fine grained*
5	Sand mixtures: Silty sand to sandy silt	*Overconsolidated or cemented	

APPENDIX C CONE PENETRATION TEST RESULTS

RAW DATA PLOTS

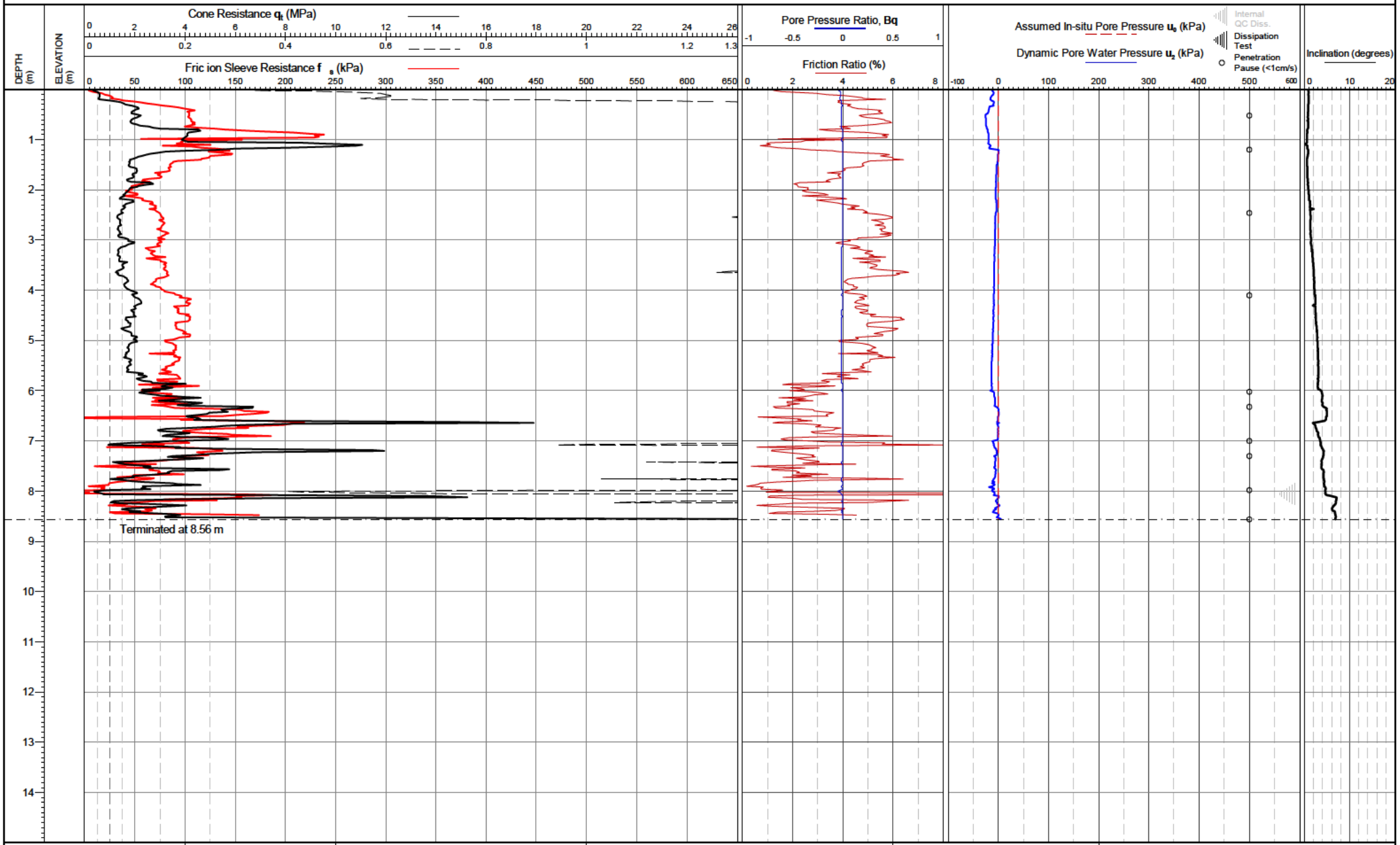
LIST OF FIGURES:

Location ID	Pages included
CPT5001	1
CPT5002	1
CPT5003	1
CPT5004	1
CPT5005	1
CPT5006	1
CPT5007	1
CPT5008	1
CPT5009	1
CPT5010	1
CPT5011	1
CPT5012	1
CPT5012A	1
CPT5013	1
CPT5014	1
CPT5014A	1
CPT5015	1
CPT5015A	1
CPT5016	1
CPT5017	1
CPT5018	1
CPT5018A	1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 09:49 00

Zero drift (Pre/post test)
q_c (kPa): 21.8
f_s (kPa): 1 3 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -7.5

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Tip load

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

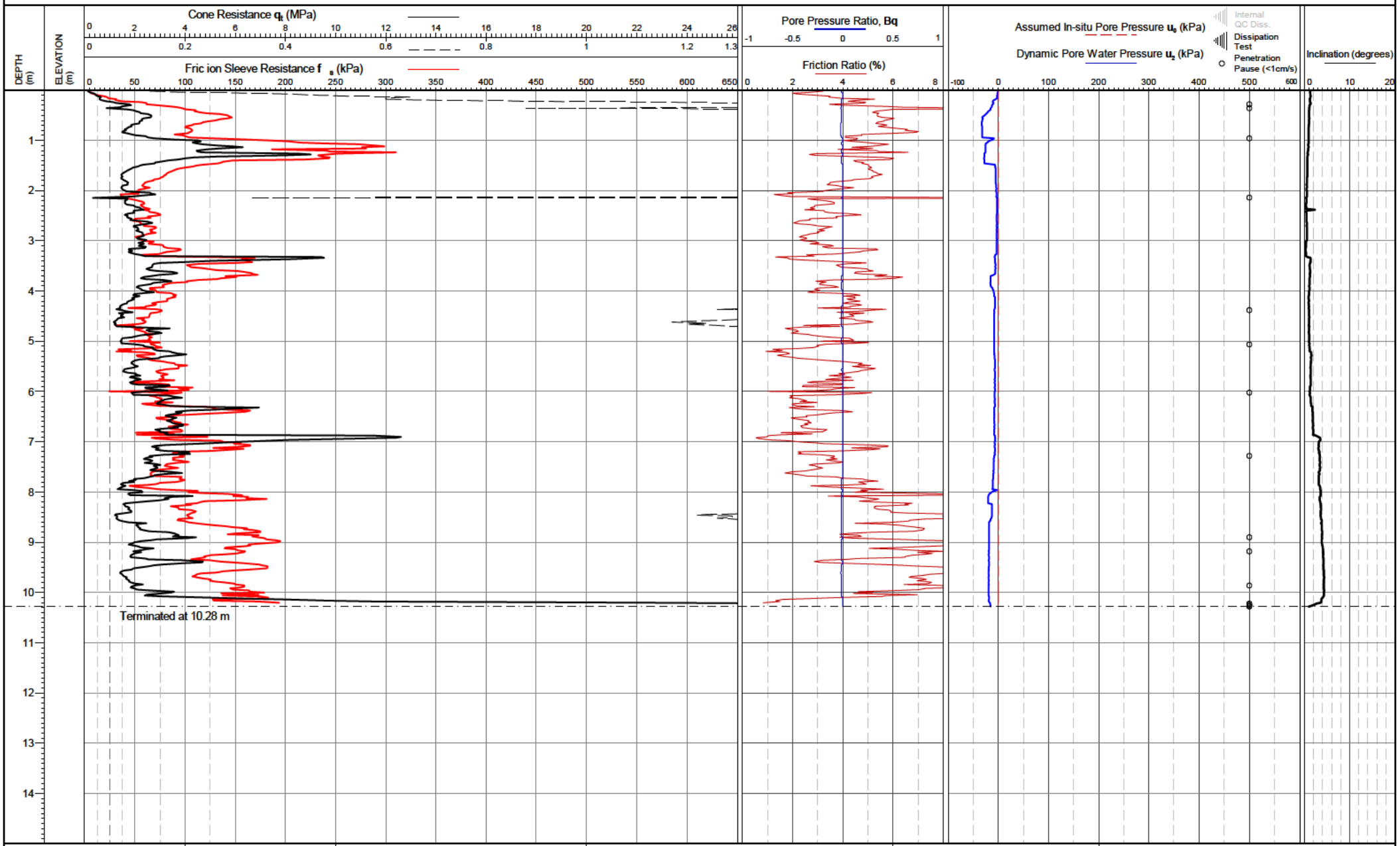
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TEST ID: CPT5001

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

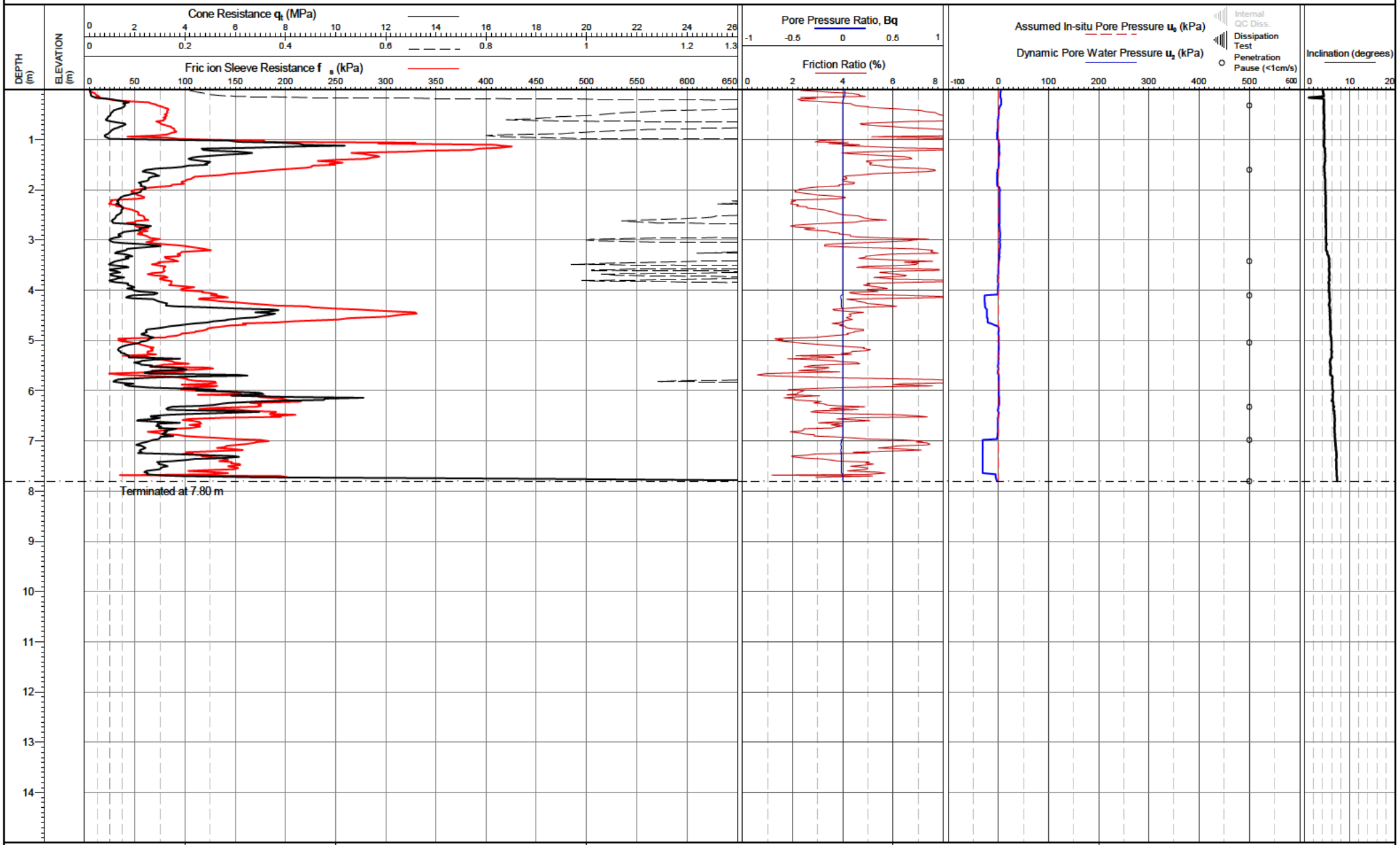


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Jamie Butterworth Rig Used: UK8 Date of test: 14/02/2020 10 39 00	Zero drift (Pre/post test) q_c (kPa): -21 8 f_s (kPa): -0 6 (f_{start} - q_{cart}) U_2 (kPa): -4.3	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Tip load	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5002** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 13 21 00

Zero drift (Pre/post test)
q_c (kPa): -32 6
f_s (kPa): 0.1 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -2.7

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Tip load

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

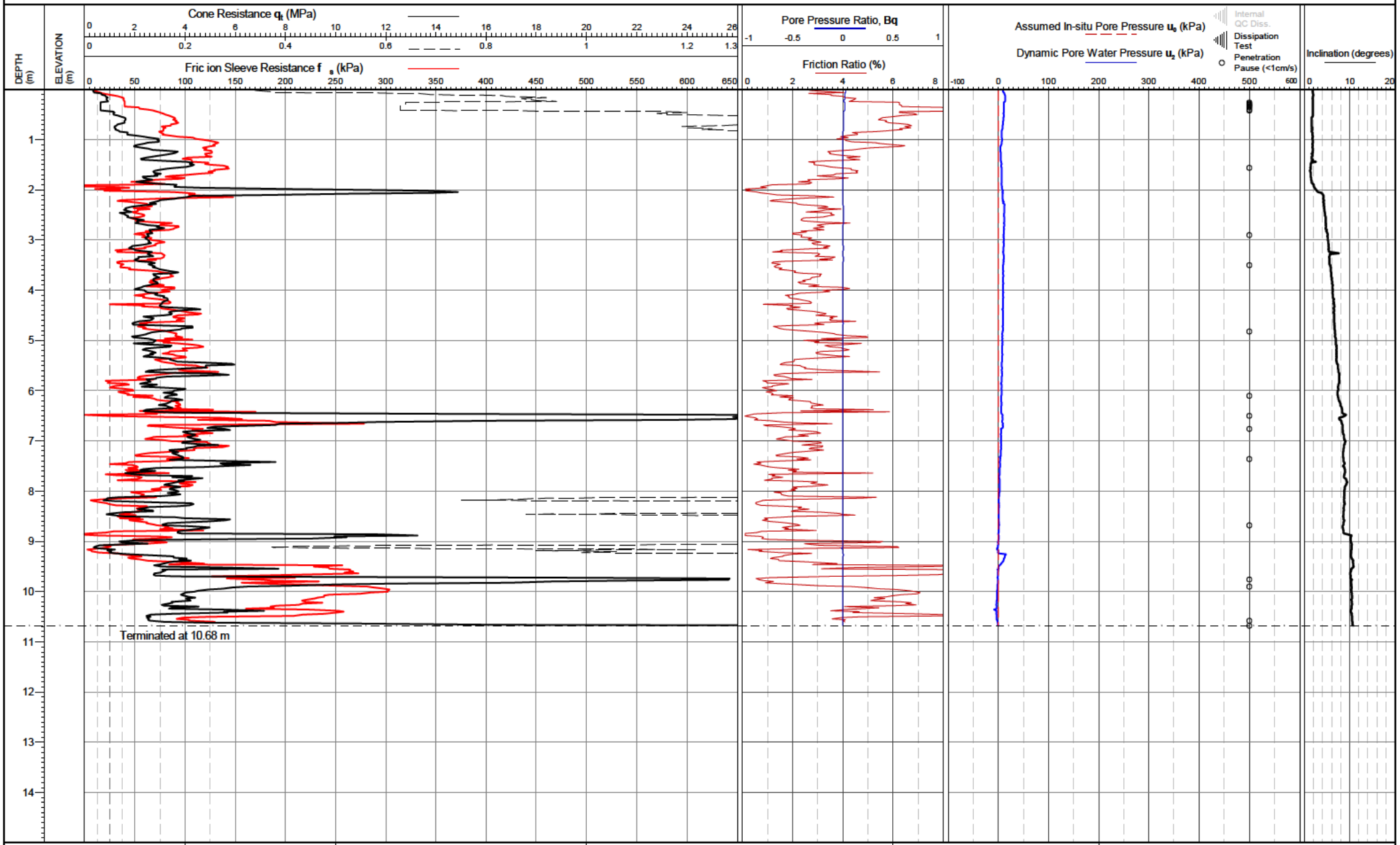
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TEST ID: CPT5003

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 13 52 00

Zero drift (Pre/post test)
q_c (kPa): 10.9
f_s (kPa): -0.7 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): 4.3

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Target depth

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

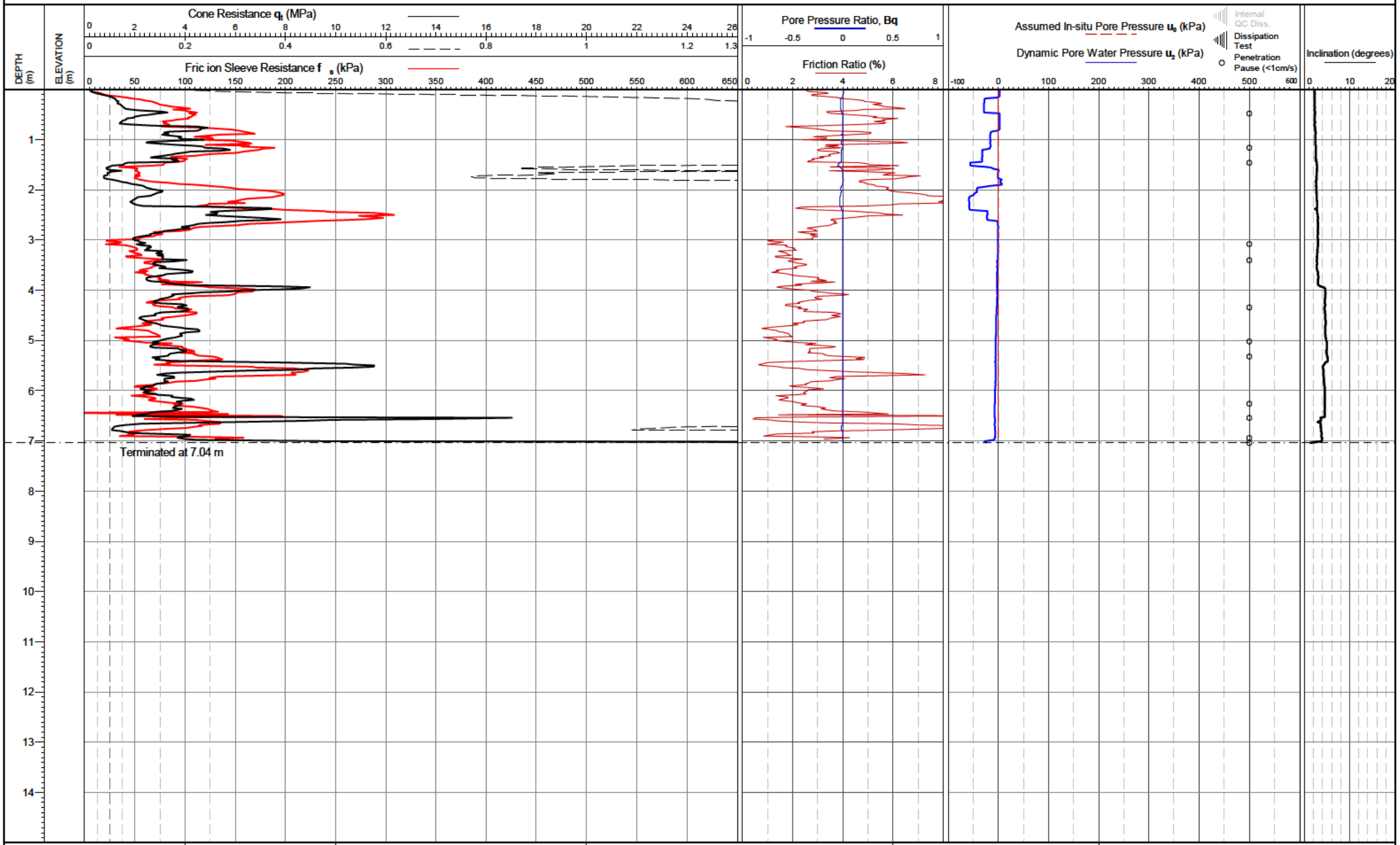
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TEST ID: CPT5004

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

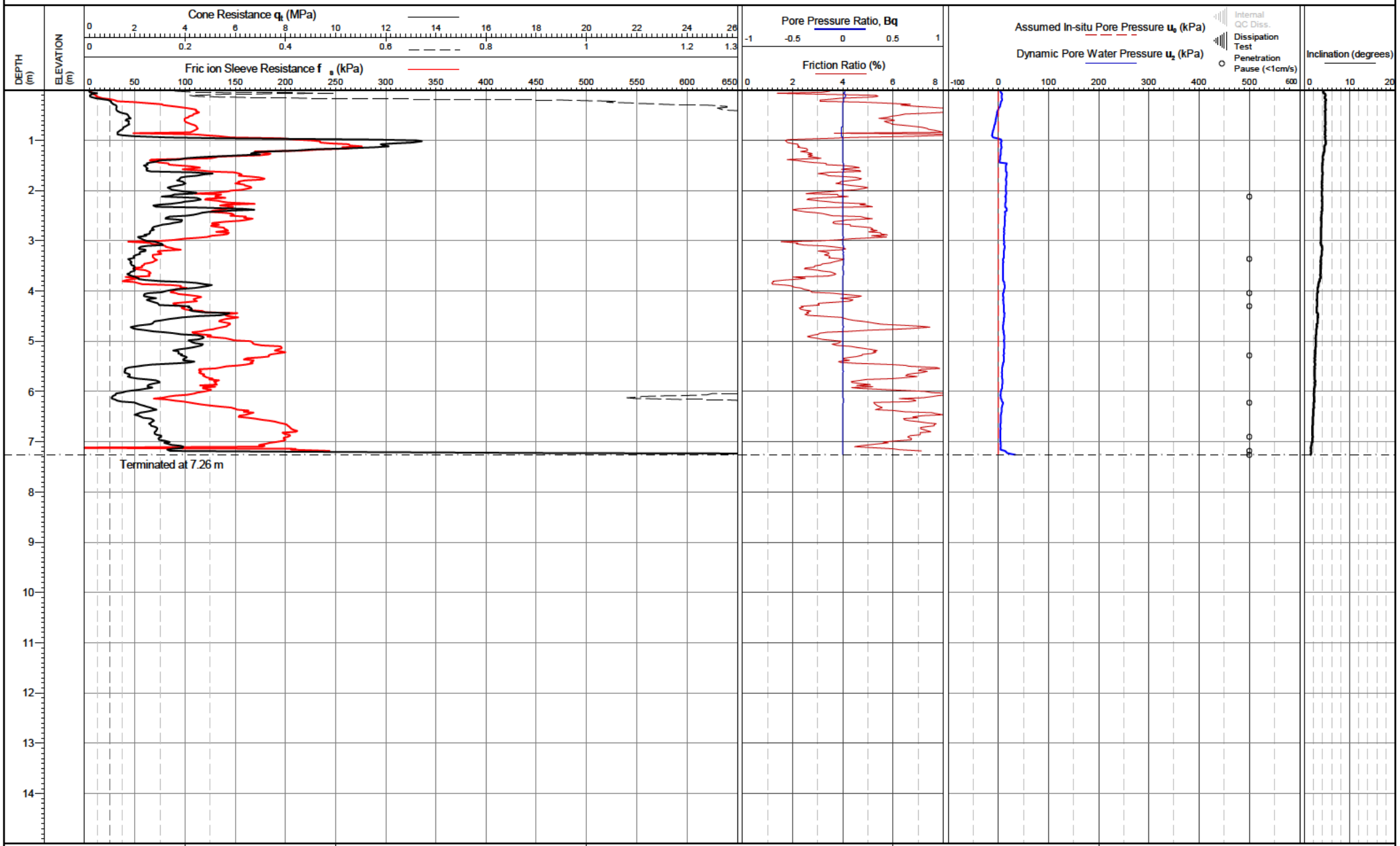


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Jamie Butterworth Rig Used: UK8 Date of test: 14/02/2020 11 24 00	Zero drift (Pre/post test) q_c (kPa): 0 0 f_s (kPa): -0.7 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): 0.0	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Tip load	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5005** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

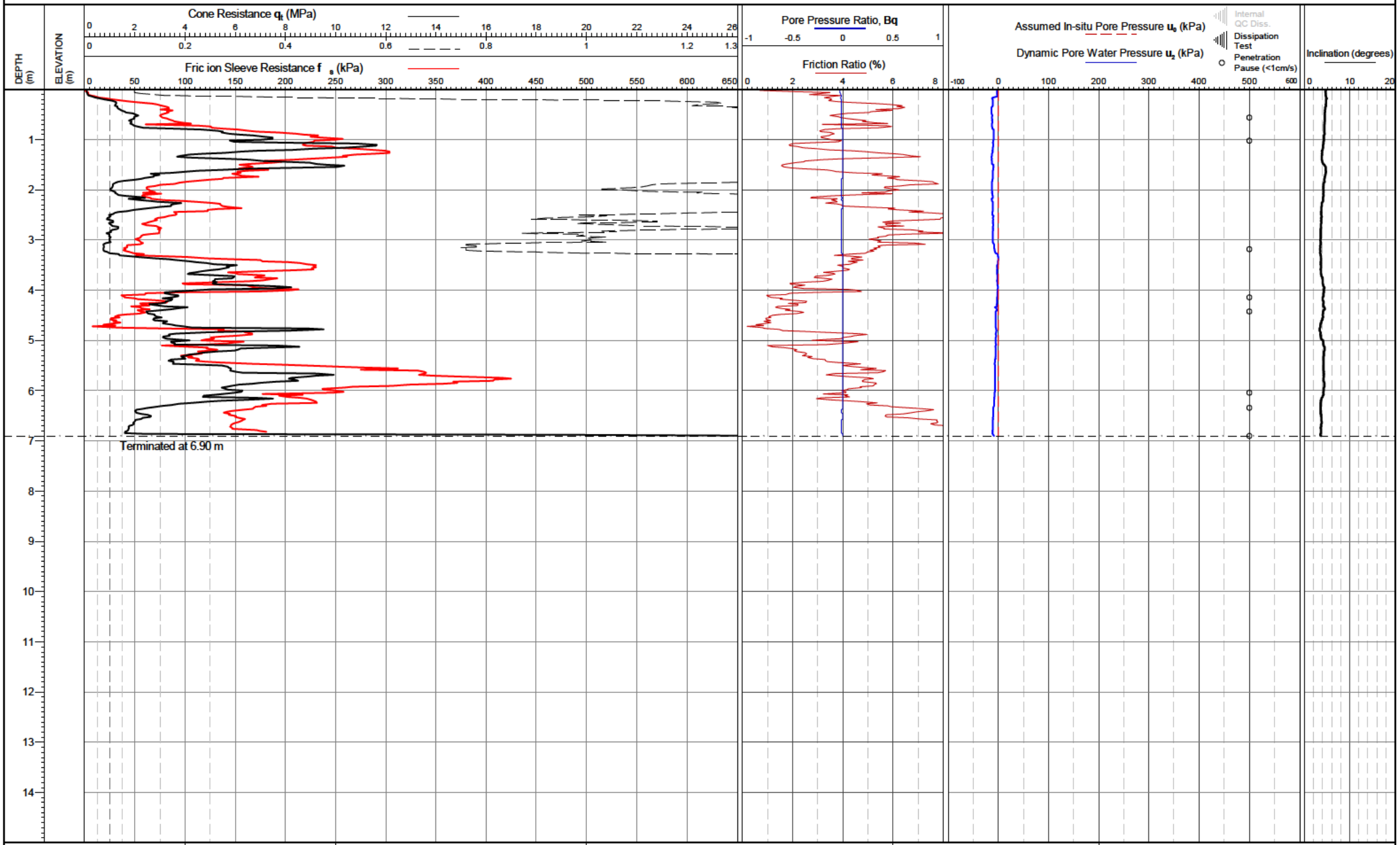


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Jamie Butterworth Rig Used: UK8 Date of test: 14/02/2020 12 52 00	Zero drift (Pre/post test) q_c (kPa): 0 0 f_s (kPa): 1.4 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): 0.0	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Target depth	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5006** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 12 25 00

Zero drift (Pre/post test)
q_c (kPa): 32.6
f_s (kPa): -2 9 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -10.2

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Target depth

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

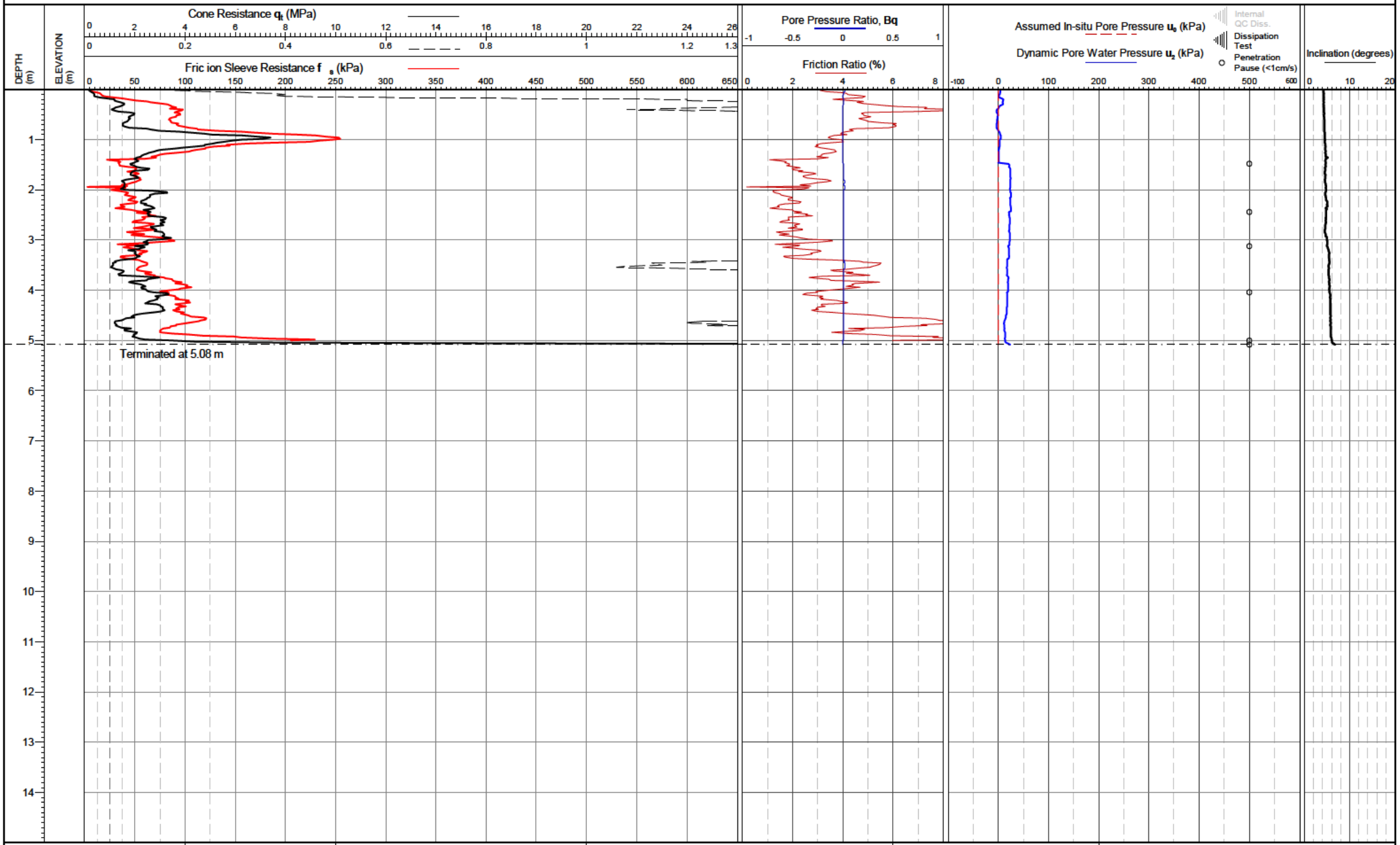
Checked by: Chris Player

TEST ID: CPT5007

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 12 01 00

Zero drift (Pre/post test)
q_c (kPa): -10 9
f_s (kPa): 1.4 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): 5.9

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Target depth

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

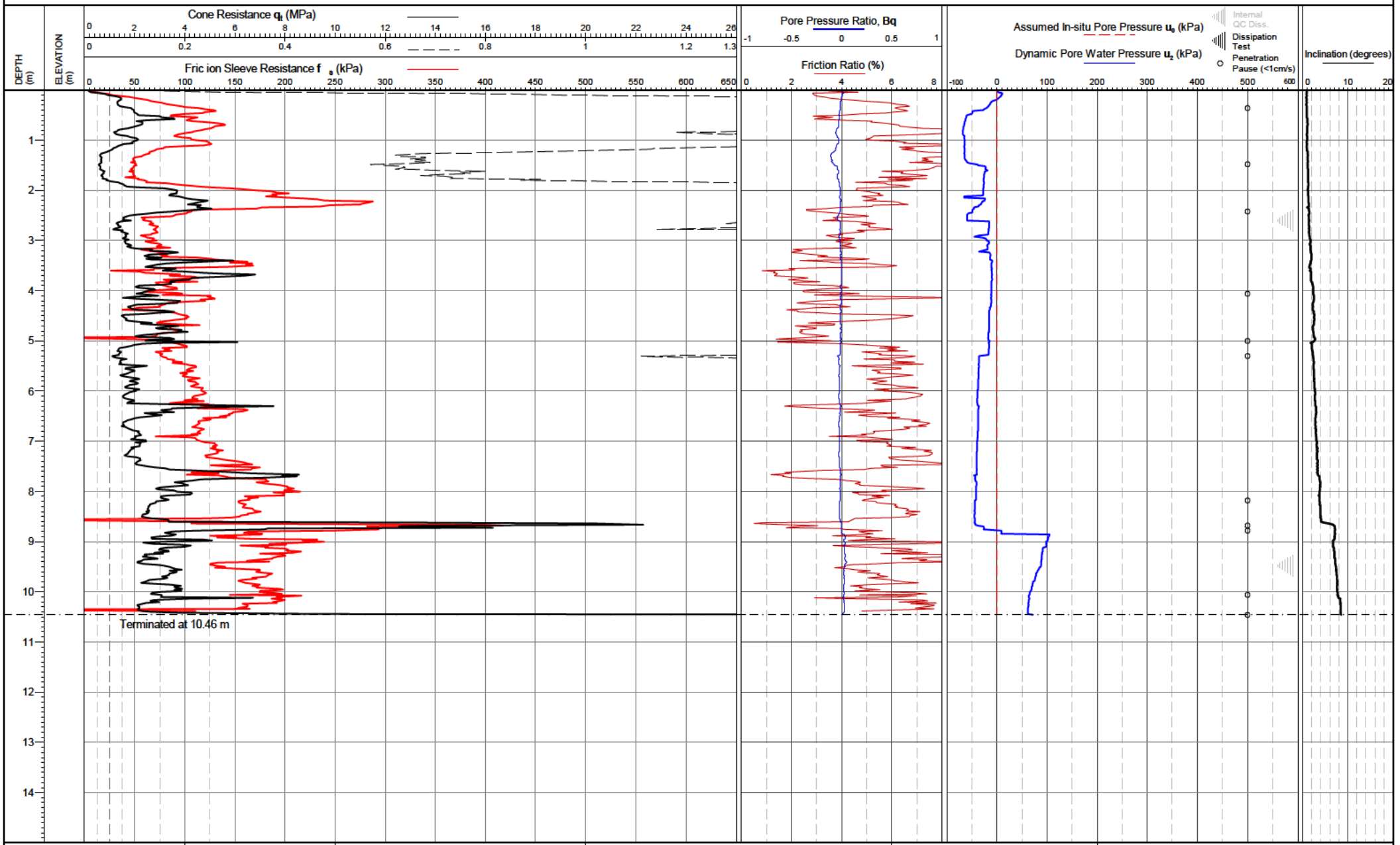
Checked by: Chris Player

TEST ID: CPT5008

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

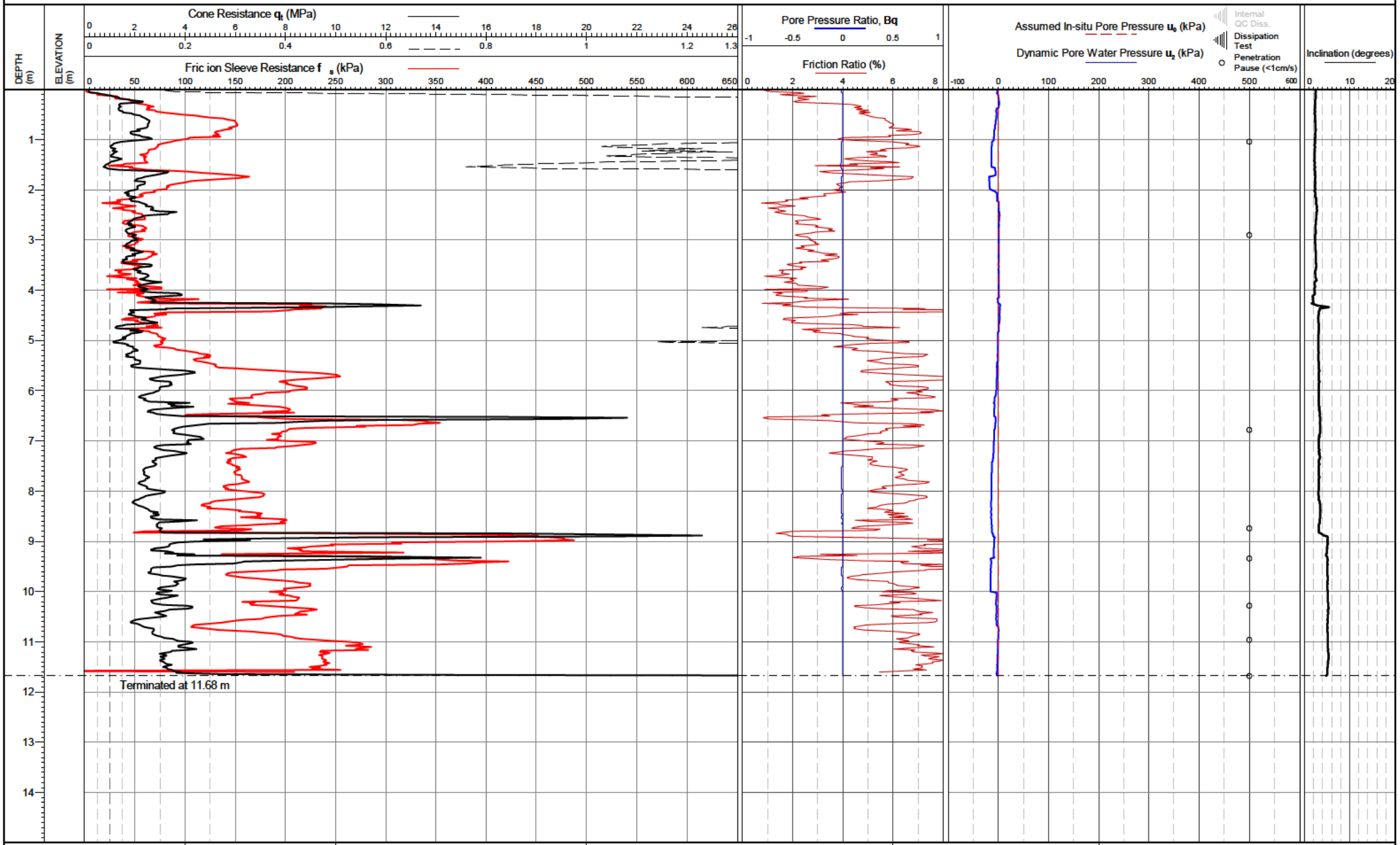


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Jamie Butterworth Rig Used: UK8 Date of test: 14/02/2020 08 55 00	Zero drift (Pre/post test) q_c (kPa): -32 6 f_s (kPa): 0 8 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): 5.9	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Tip load	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5009** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

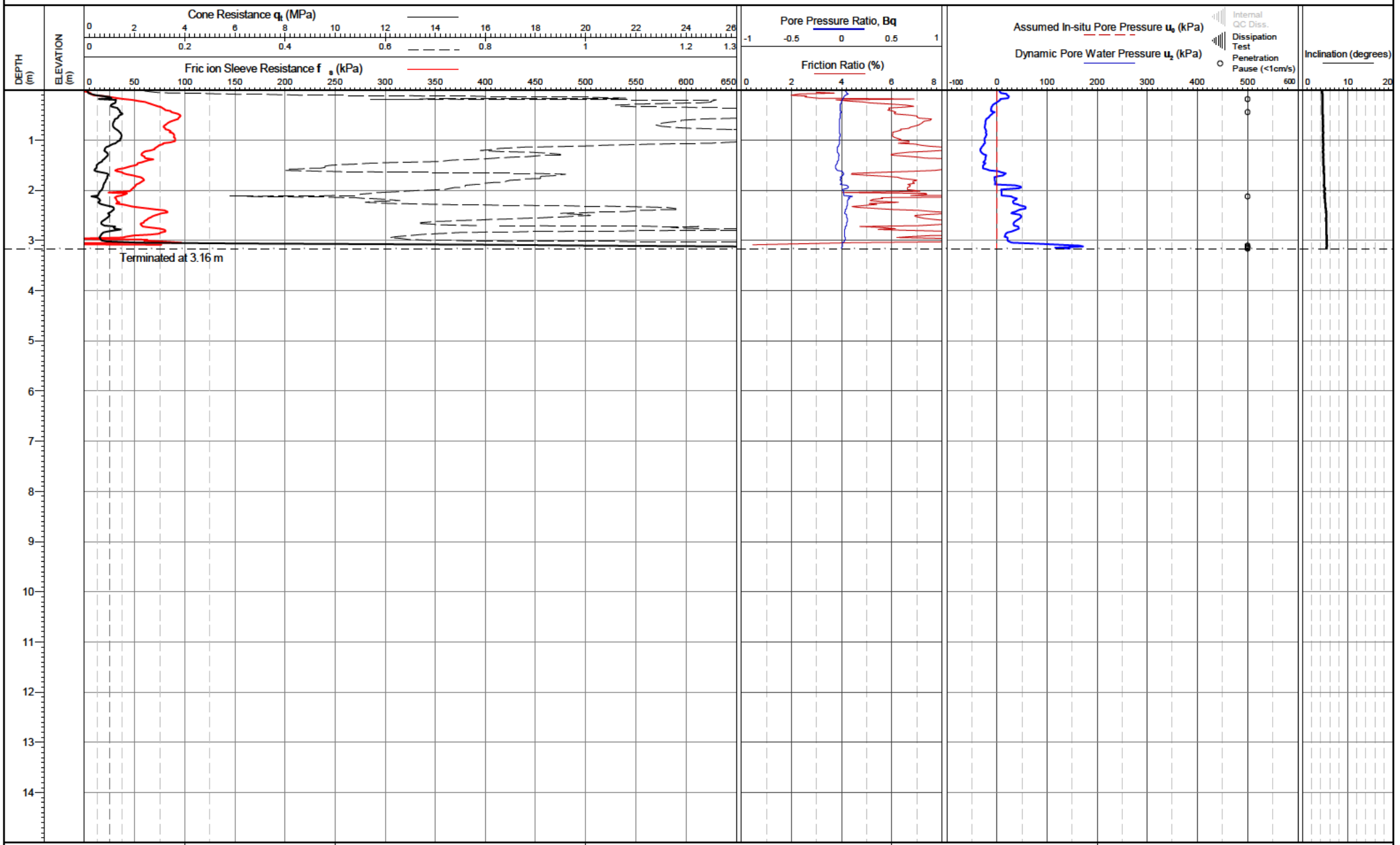


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Jamie Butterworth Rig Used: UK8 Date of test: 14/02/2020 14 54 00	Zero drift (Pre/post test) q_c (kPa): 10.9 f_s (kPa): -4 9 (f_{start} - q_{cart}) U_2 (kPa): -2.1	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Target depth	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5010** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



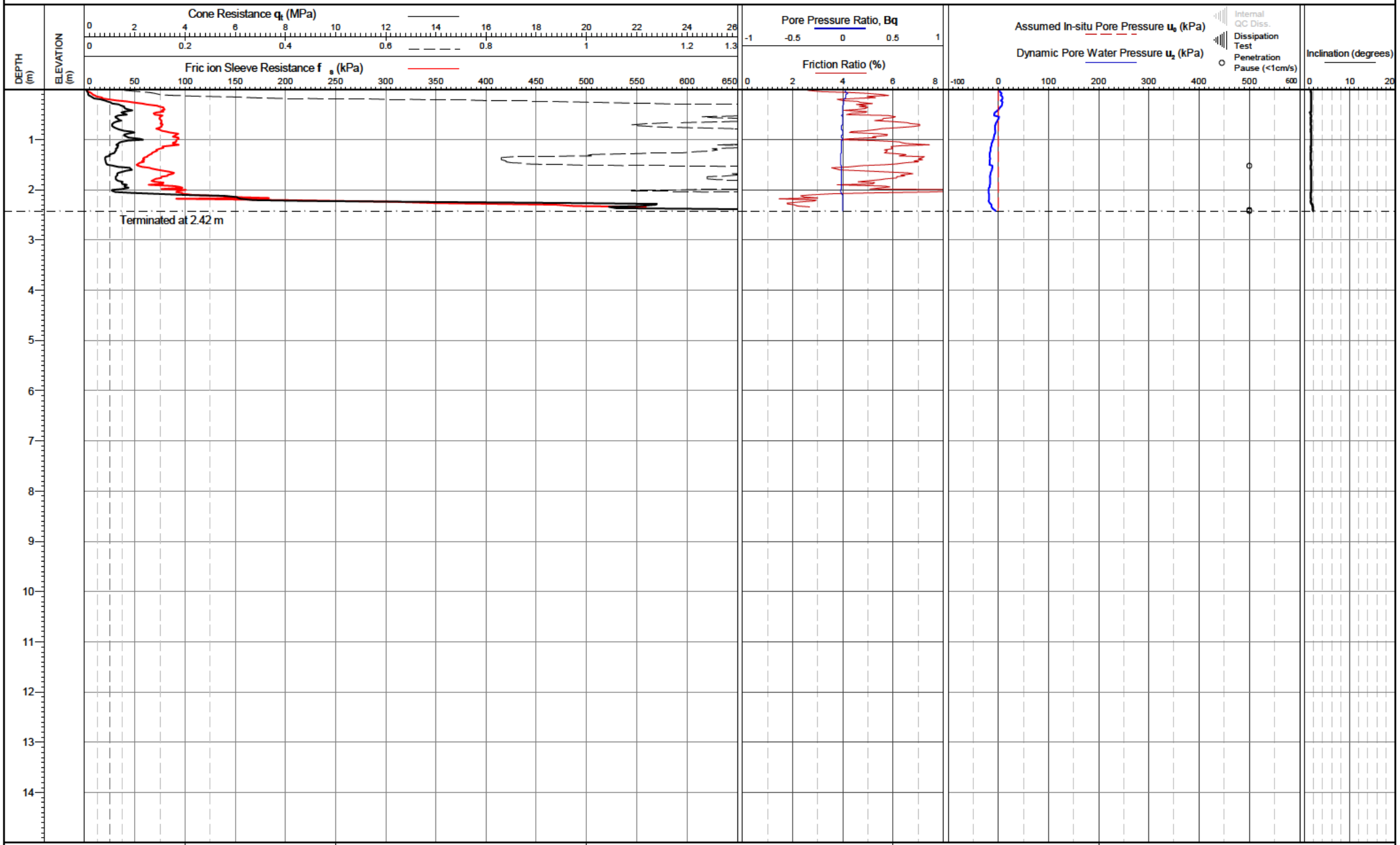
Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Phillip Case Rig Used: UK8 Date of test: 21/02/2020 09 09 00	Zero drift (Pre/post test) q_c (kPa): 21.8 f_s (kPa): 0 6 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): -7.0	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Lateral support	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1

TEST ID: CPT5011

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 09 32 00

Zero drift (Pre/post test)
q_c (kPa): -10 9
f_s (kPa): 0.7 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -0.5

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Lateral support

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

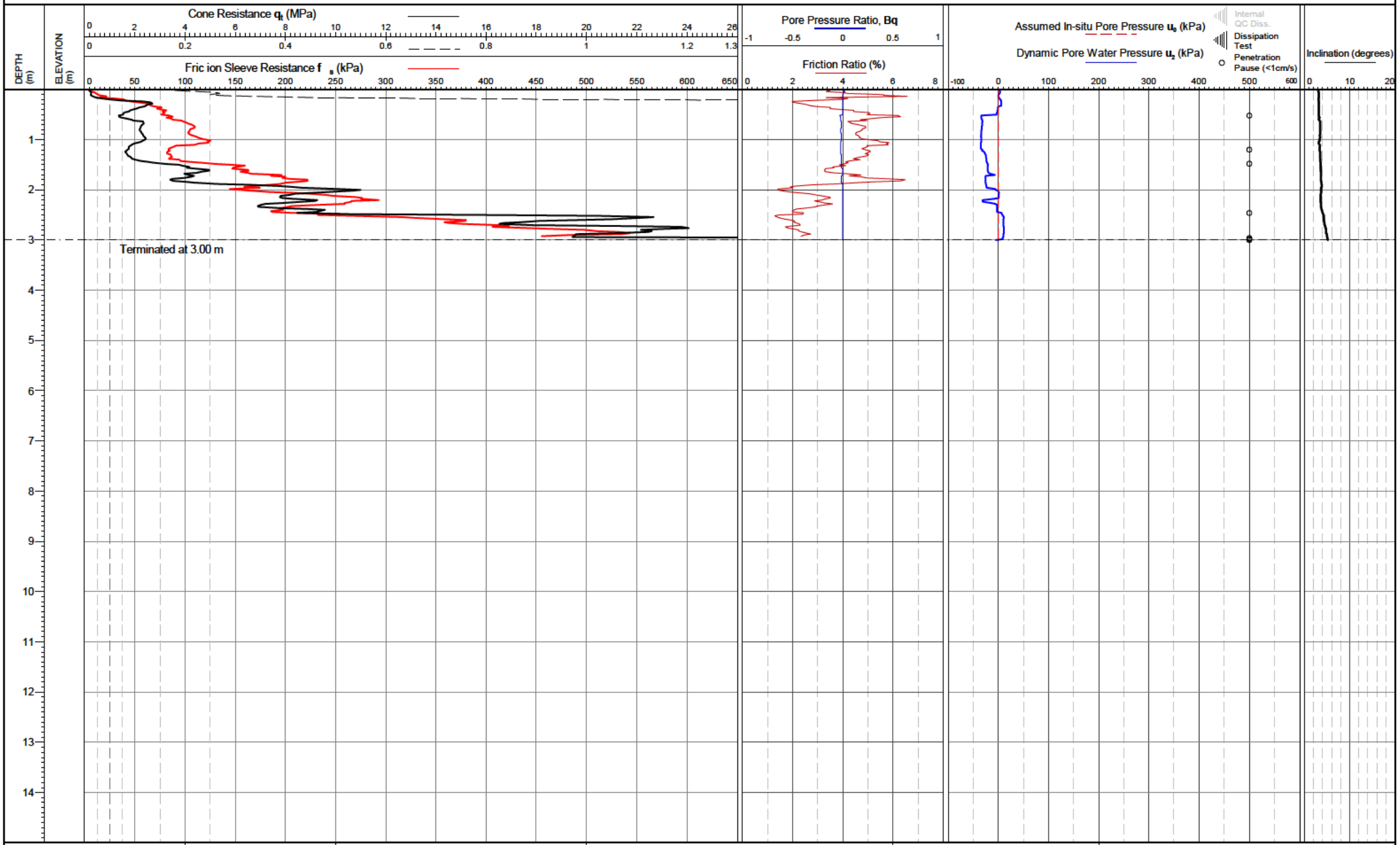
Checked by: Chris Player

TEST ID: CPT5012

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 10:14 00

Zero drift (Pre/post test)
q_c (kPa): -21 8
f_s (kPa): -0 6 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -5.9

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Lateral support

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

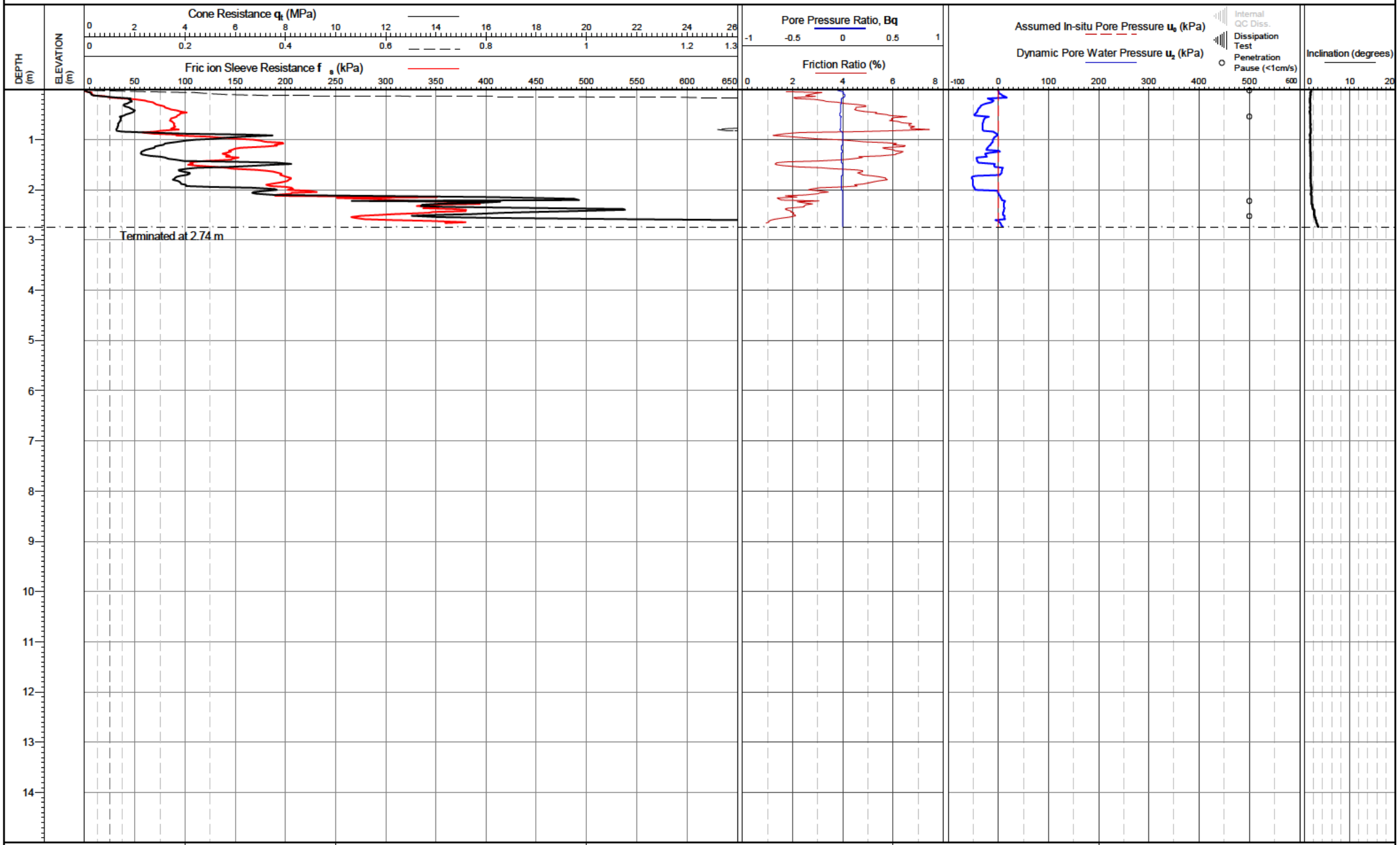
Checked by: Chris Player

TEST ID: CPT5012A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

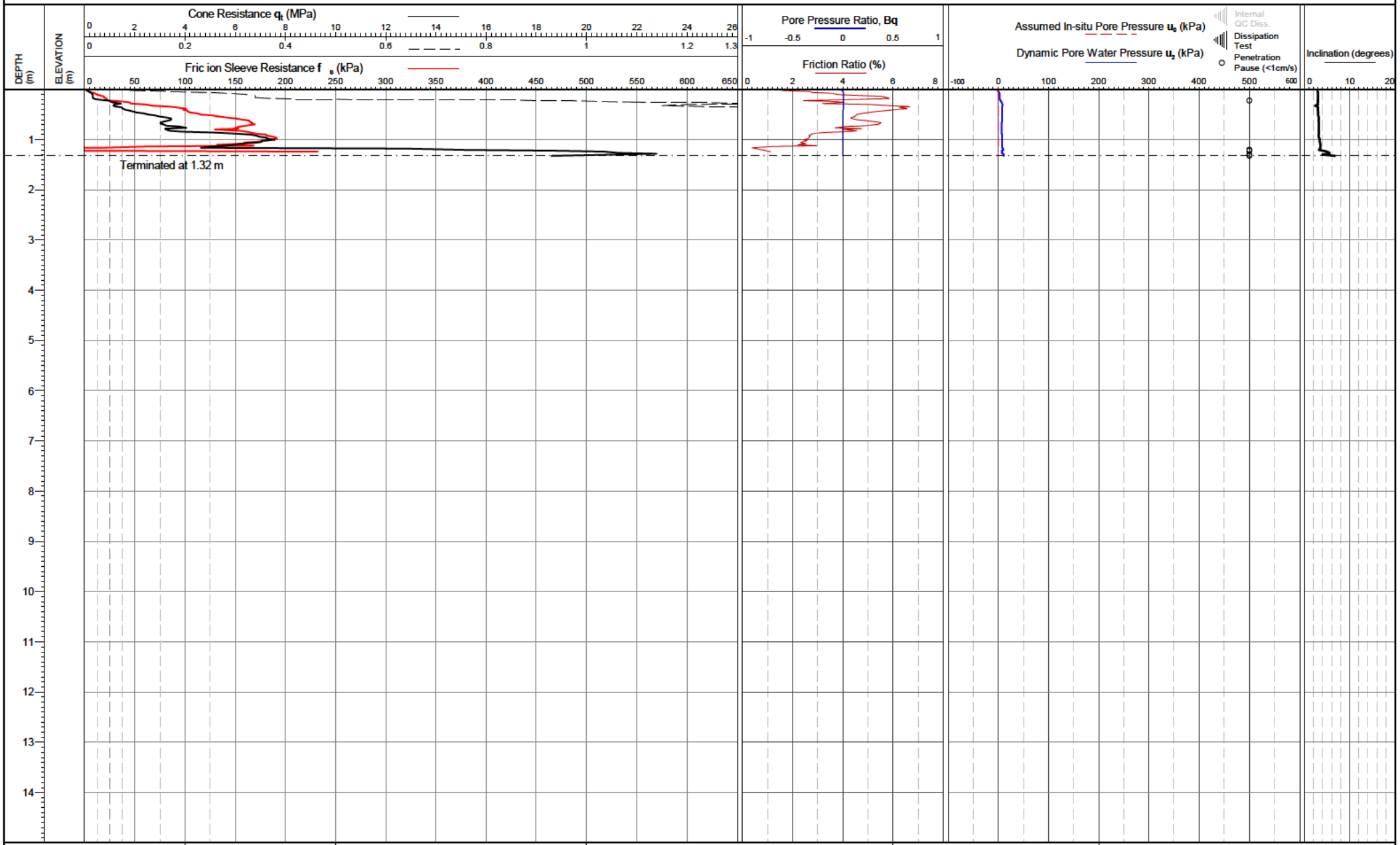


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Phillip Case Rig Used: UK8 Date of test: 21/02/2020 09 59 00	Zero drift (Pre/post test) q_c (kPa): -21 8 f_s (kPa): -0 6 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): 0.0	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Lateral support	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5013** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 12 58 00

Zero drift (Pre/post test)
q_c (kPa): 10.9
f_s (kPa): -2.1 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -0.5

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Inclination

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

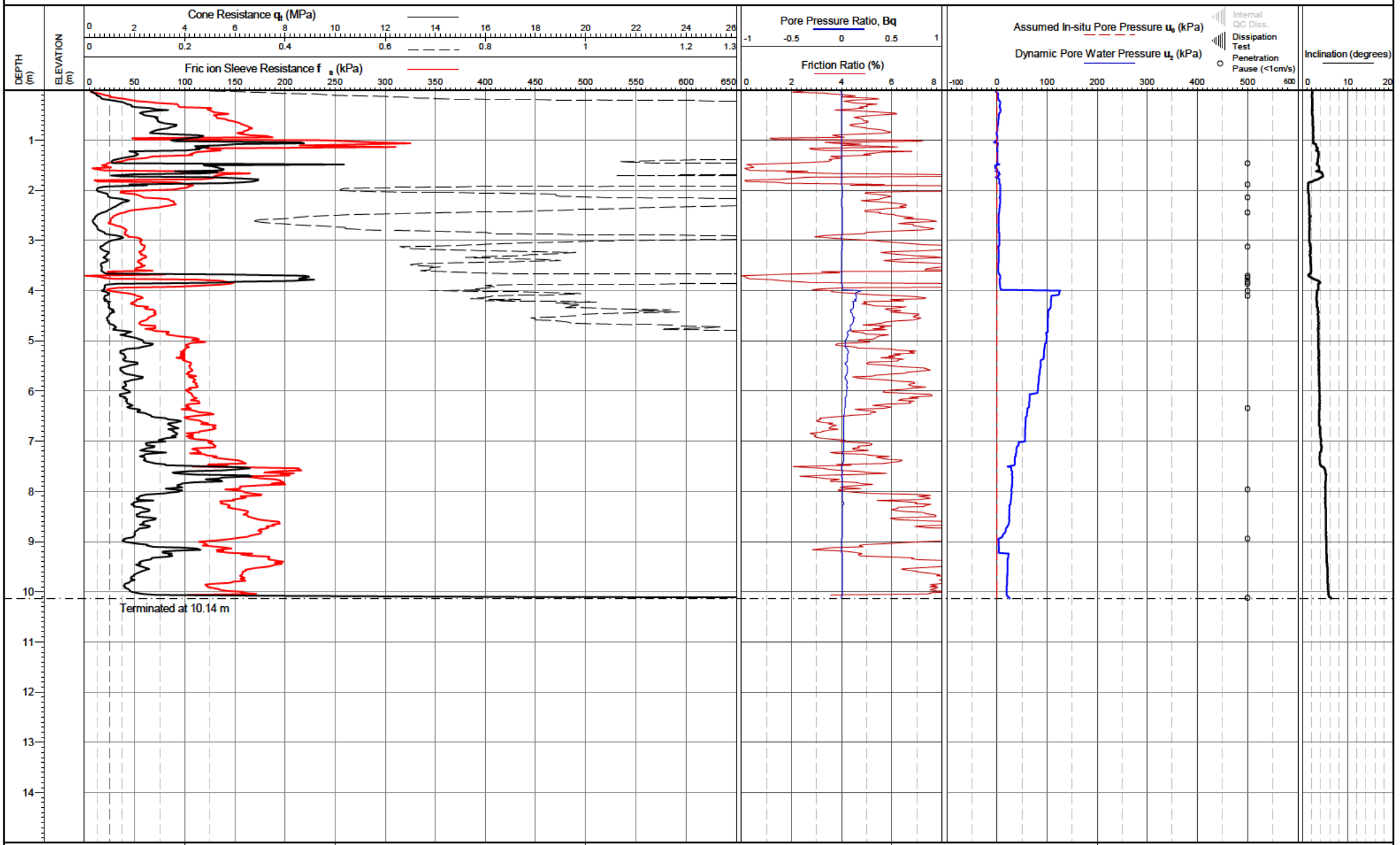
Checked by: Chris Player

TEST ID: CPT5014

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 13:12 00

Zero drift (Pre/post test)
q_c (kPa): -21 8
f_s (kPa): -0 6 (f_{start} - $q_{c\,drft}$)
U_2 (kPa): -4.3

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Target depth

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

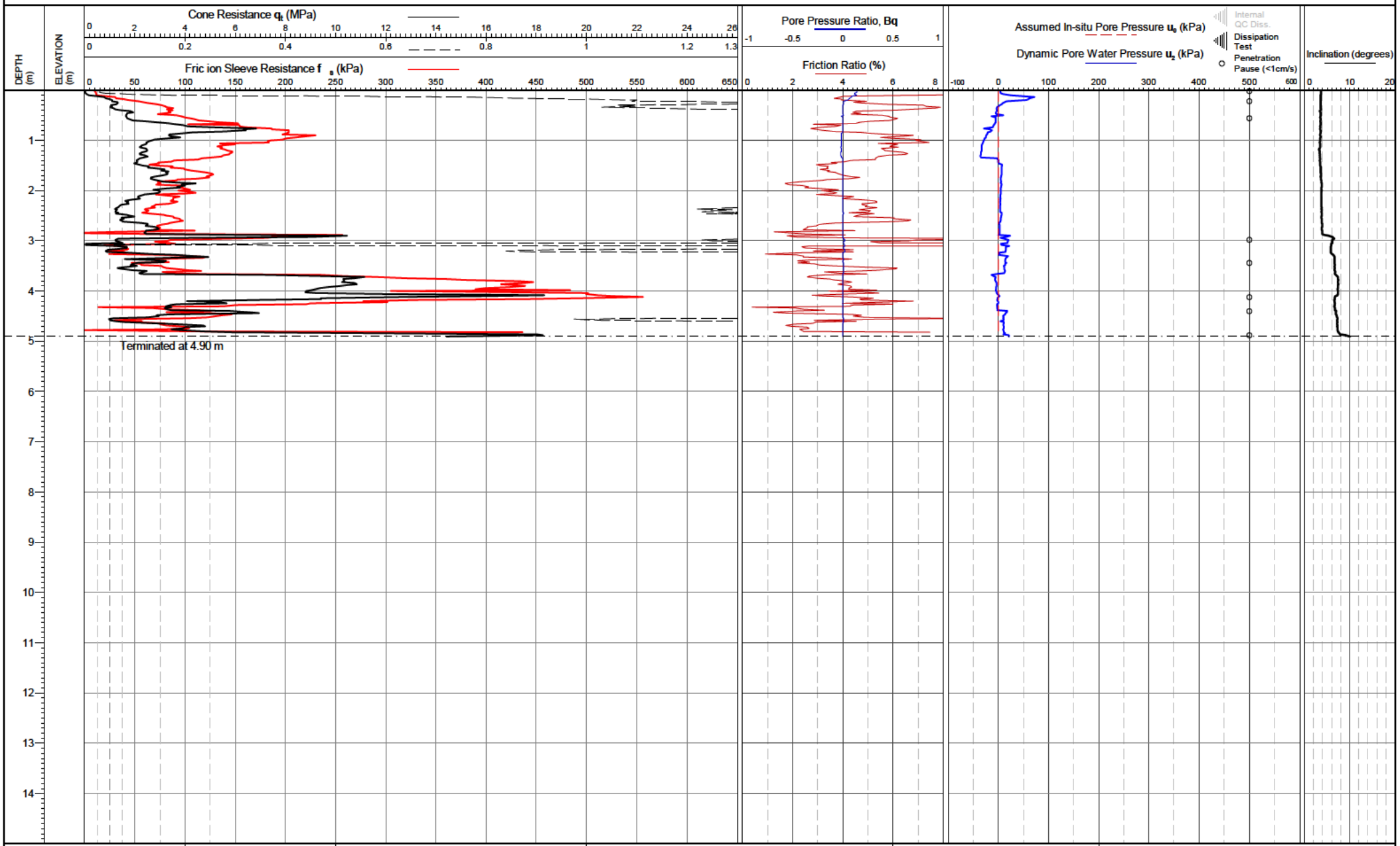
Checked by: Chris Player

TEST ID: CPT5014A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



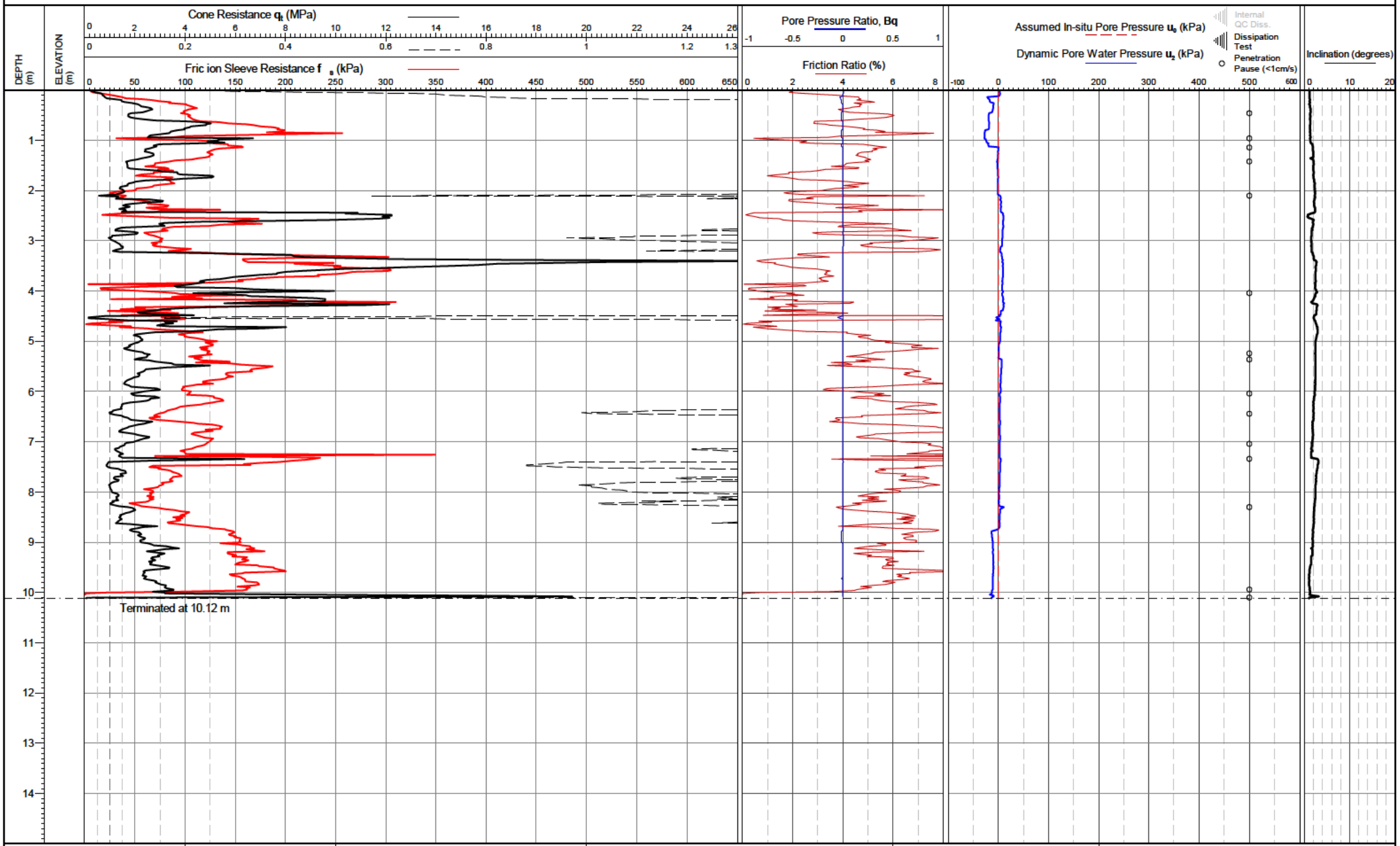
Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Phillip Case Rig Used: UK8 Date of test: 21/02/2020 12:14 00	Zero drift (Pre/post test) q_c (kPa): -32 6 f_s (kPa): 2 9 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): 1.1	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Inclination	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1

TEST ID: CPT5015

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 13:43 00

Zero drift (Pre/post test)
q_c (kPa): 0 0
f_s (kPa): -0.7 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): -4.3

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Lateral support

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

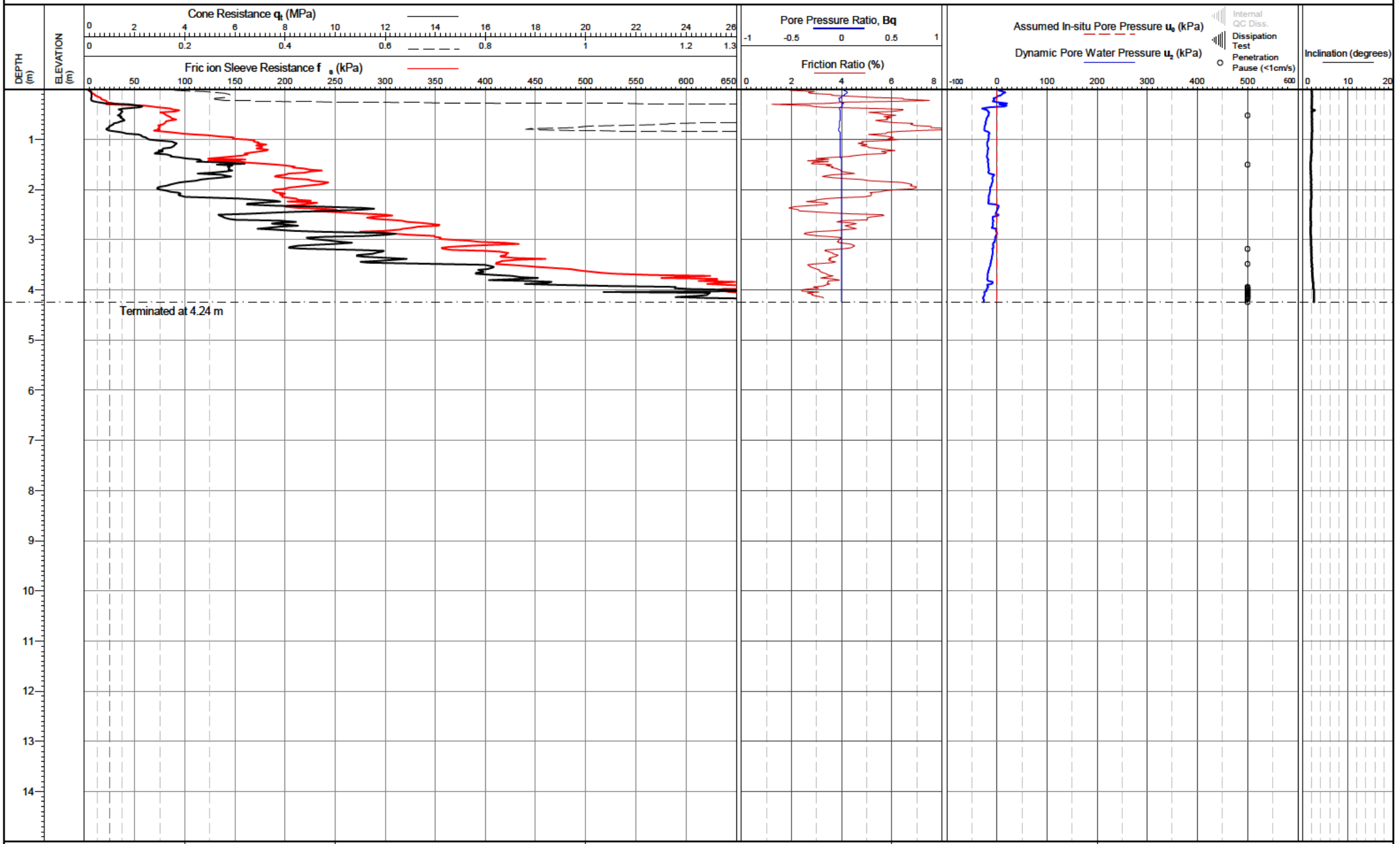
Checked by: Chris Player

TEST ID: CPT5015A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY

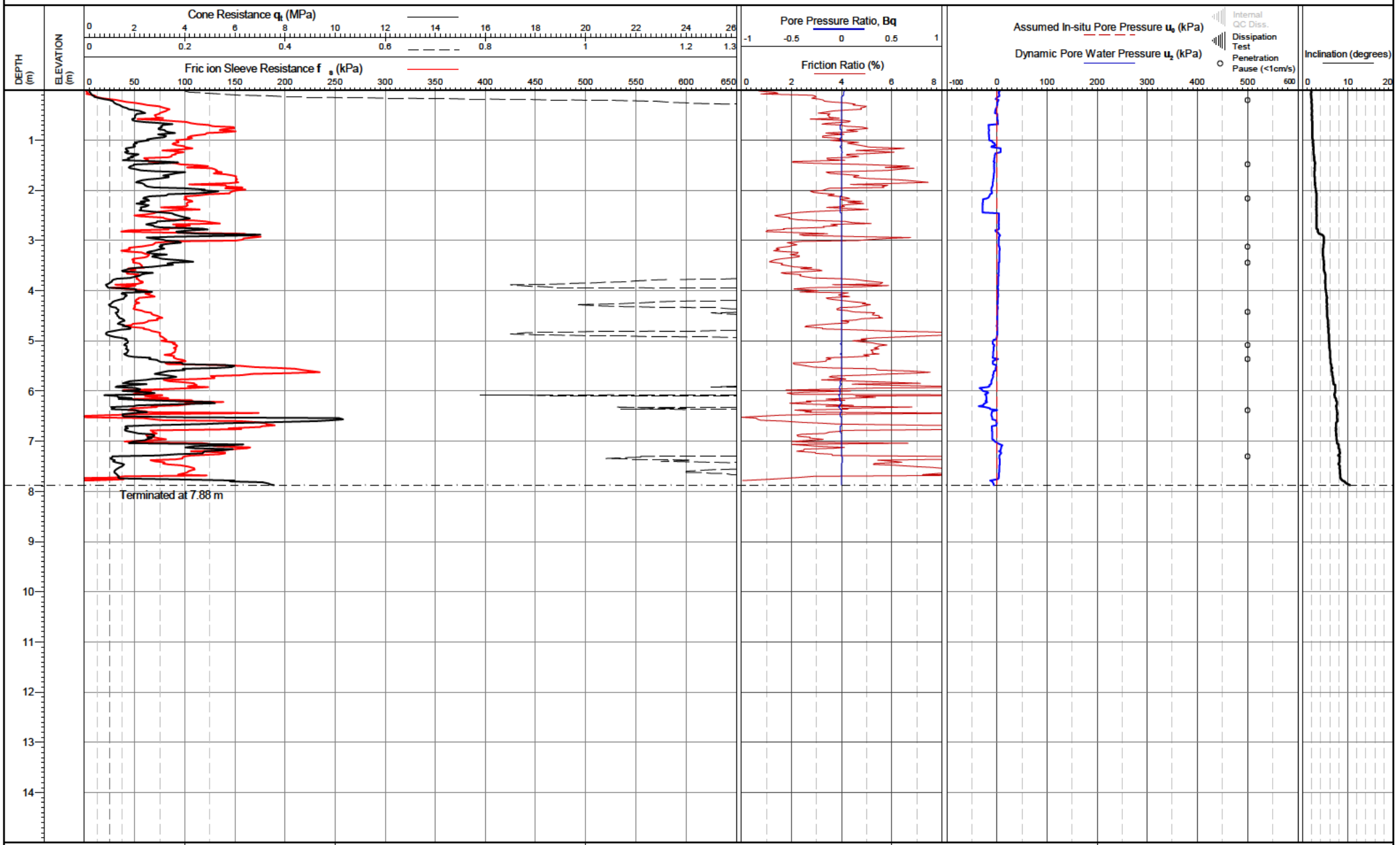


Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Phillip Case Rig Used: UK8 Date of test: 21/02/2020 11 50 00	Zero drift (Pre/post test) q_c (kPa): 0 0 f_s (kPa): -1.4 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): -2.7	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Lateral support	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5016** Page 1 of 1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 11 22 00

Zero drift (Pre/post test)
q_c (kPa): 43.5
f_s (kPa): -1 5 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): 0.5

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Inclination

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

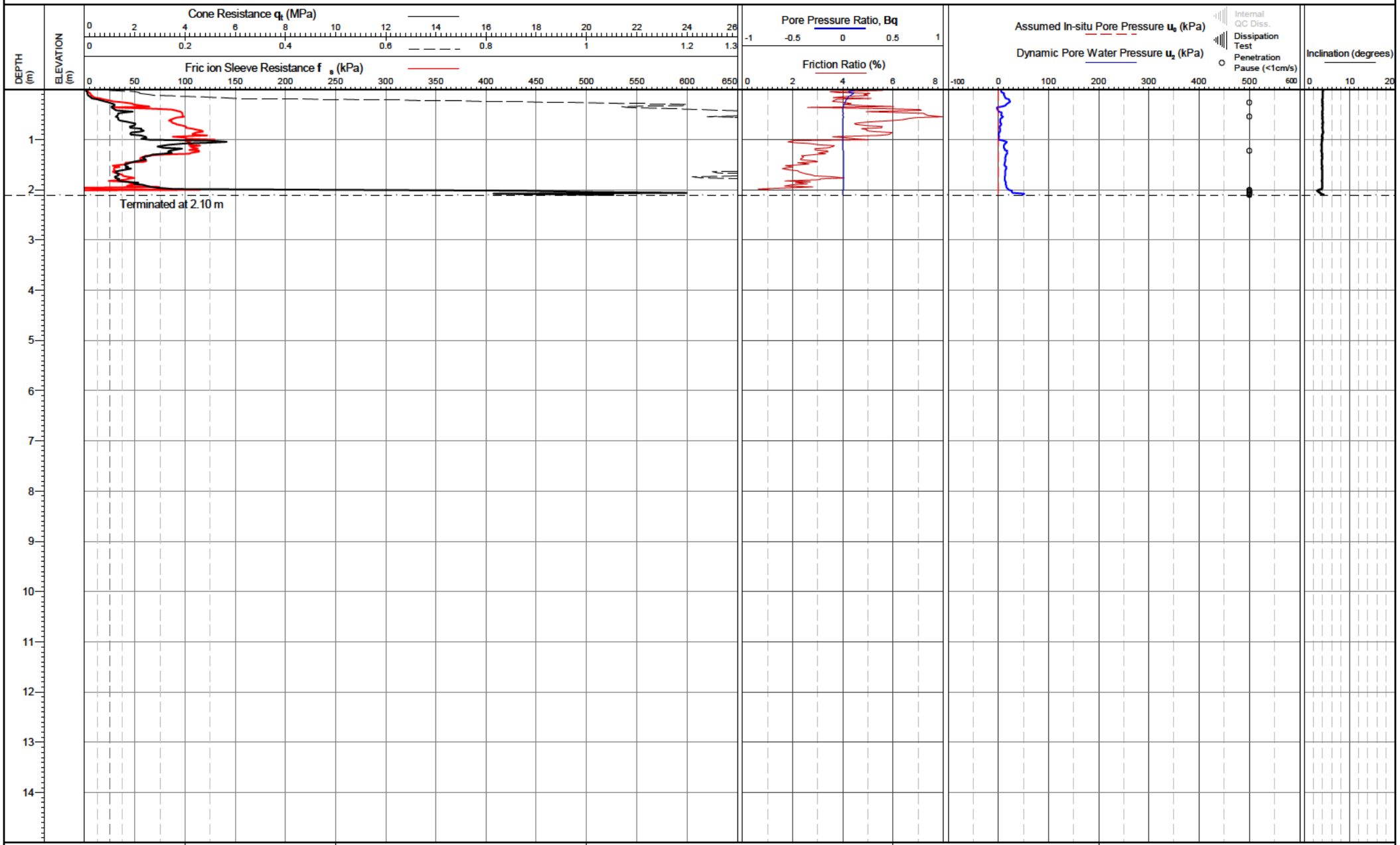
Checked by: Chris Player

TEST ID: CPT5017

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 10 32 00

Zero drift (Pre/post test)
q_c (kPa): -21 8
f_s (kPa): 1 5 ($f_{s\,drft}$ - $q_{c\,drft}$)
U_2 (kPa): 10.7

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks:
*Phreatic surface origin: Estimate as advised by client

Termination Remark: Inclination

Date of plot: 24-02-20

Lankelma Project Ref: P-107408-1

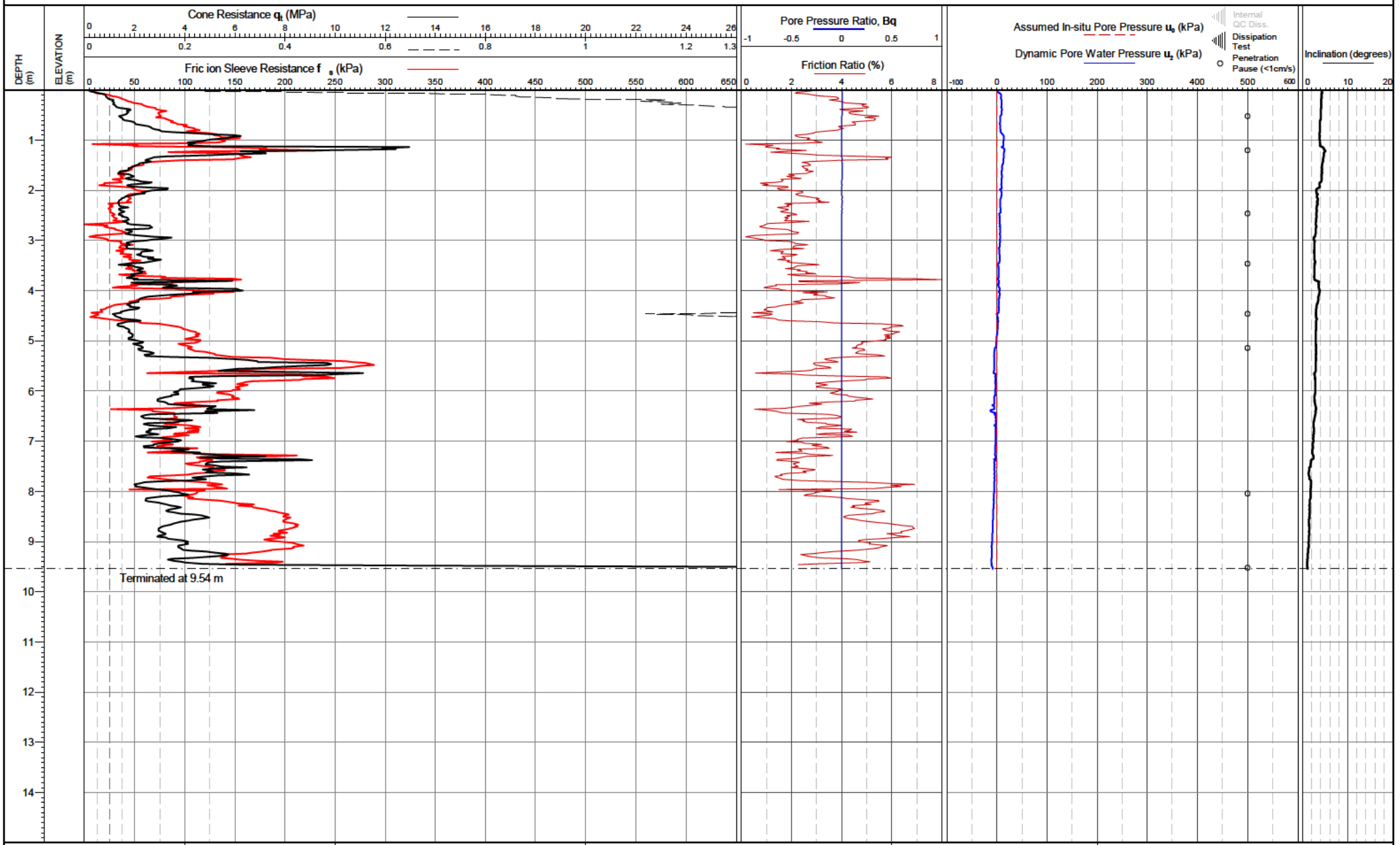
Checked by: Chris Player

TEST ID: CPT5018

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500 Cone D: S15-CFIP.1819 Operator: Phillip Case Rig Used: UK8 Date of test: 21/02/2020 10 53 00	Zero drift (Pre/post test) q_c (kPa): -32 6 f_s (kPa): 0.1 ($f_{s\,drft}$ - $q_{c\,drft}$) U_2 (kPa): -9.1	Location: South Yorkshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Estimate as advised by client Termination Remark: Target depth	Date of plot: 24-02-20 Checked by: Chris Player	Lankelma Project Ref: P-107408-1	**TEST ID: CPT5018A** Page 1 of 1

APPENDIX D STANDARD INTERPRETATION RESULTS - SET 1

UNDRAINED SHEAR STRENGTH
COEFFICIENT OF VOLUME CHANGE
OVERCONSOLIDATION RATIO
SOIL BEHAVIOUR TYPE (SBT) DESCRIPTIONS

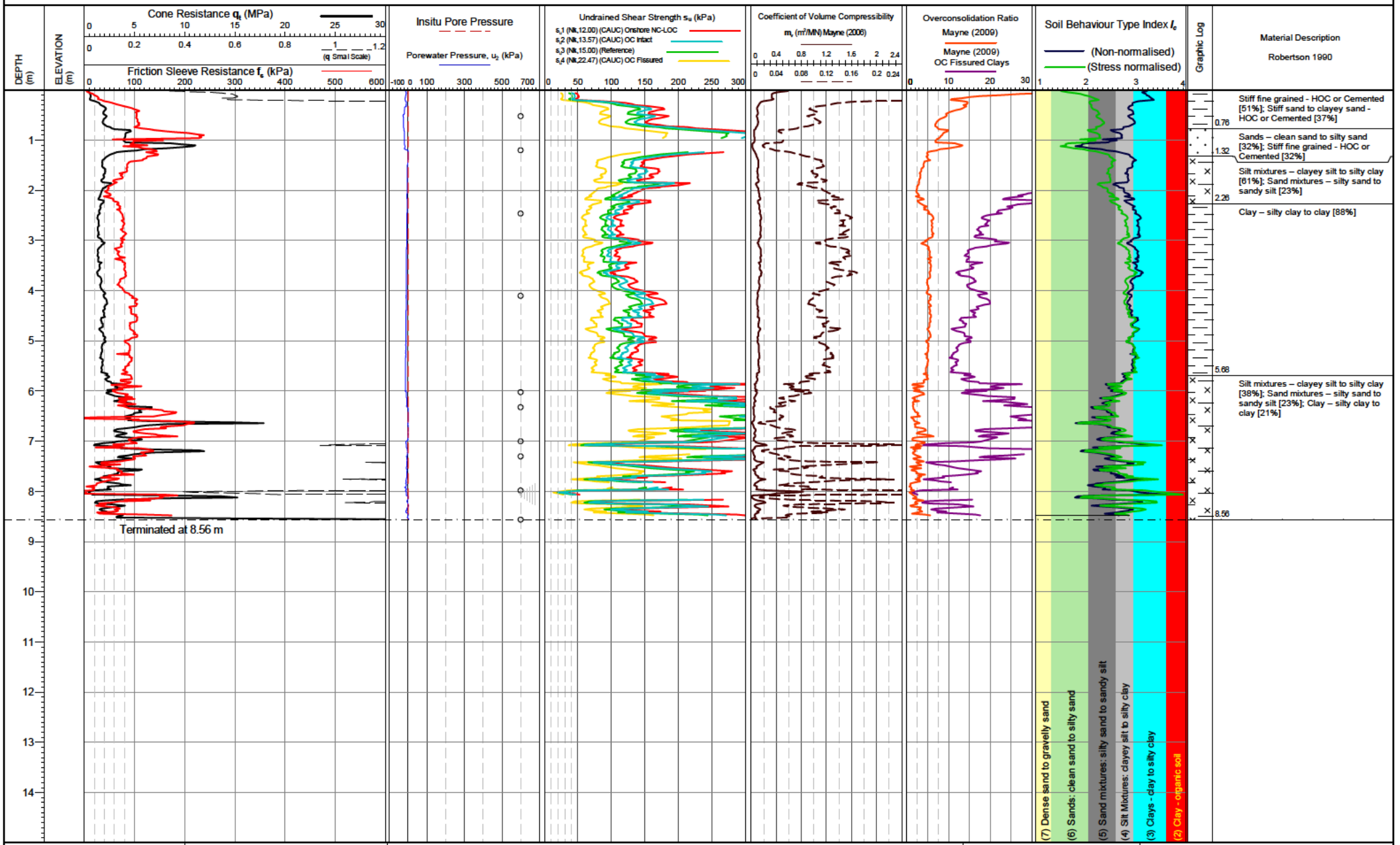
LIST OF FIGURES:

Location ID	Pages included
CPT5001	1
CPT5002	1
CPT5003	1
CPT5004	1
CPT5005	1
CPT5006	1
CPT5007	1
CPT5008	1
CPT5009	1
CPT5010	1
CPT5011	1
CPT5012	1
CPT5012A	1
CPT5013	1
CPT5014	1
CPT5014A	1
CPT5015	1
CPT5015A	1
CPT5016	1
CPT5017	1
CPT5018	1
CPT5018A	1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 09:49 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Tip load

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

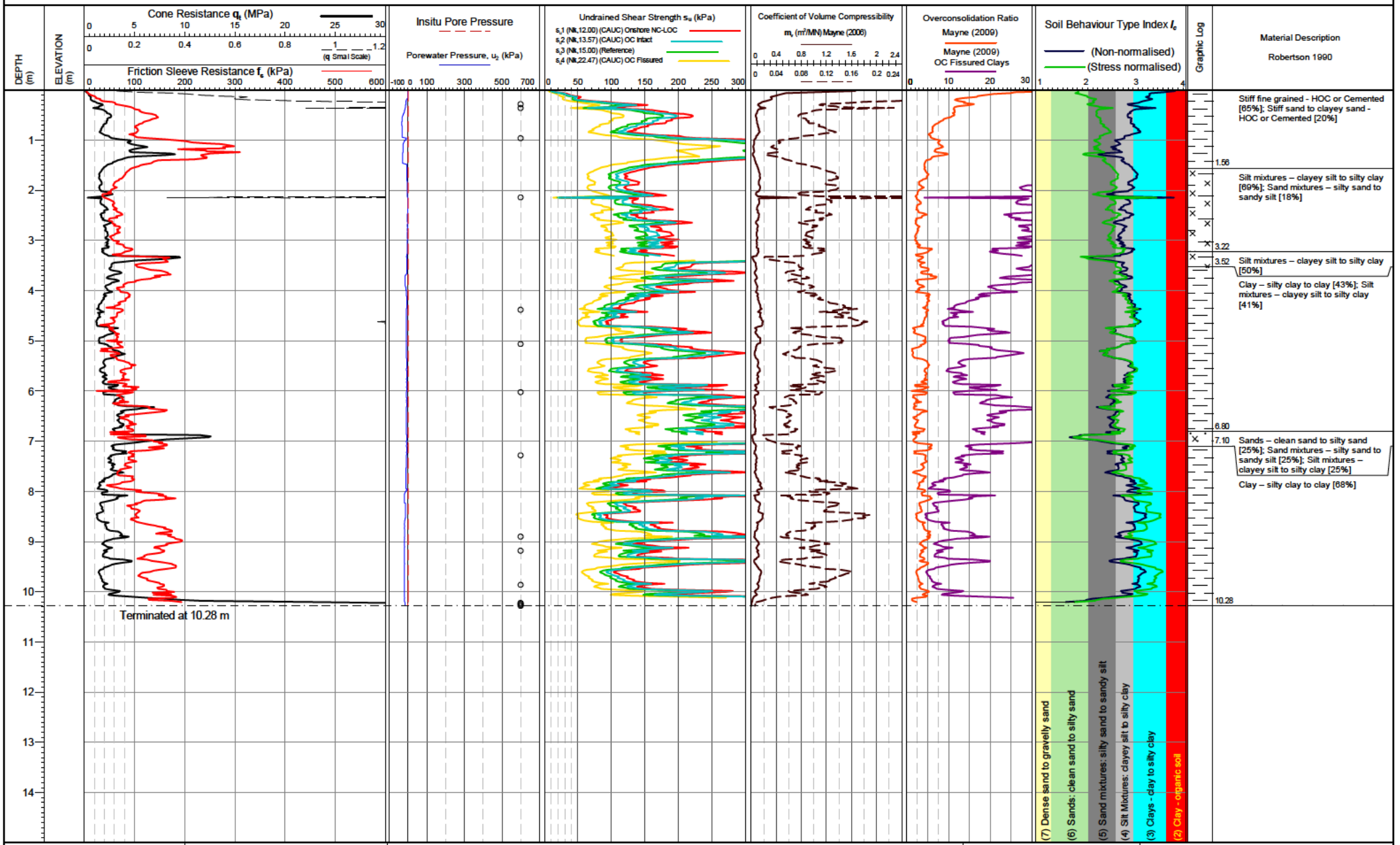
Lankelma Project Ref: P-107408-1

TEST ID: CPT5001

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 10 39 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Tip load

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

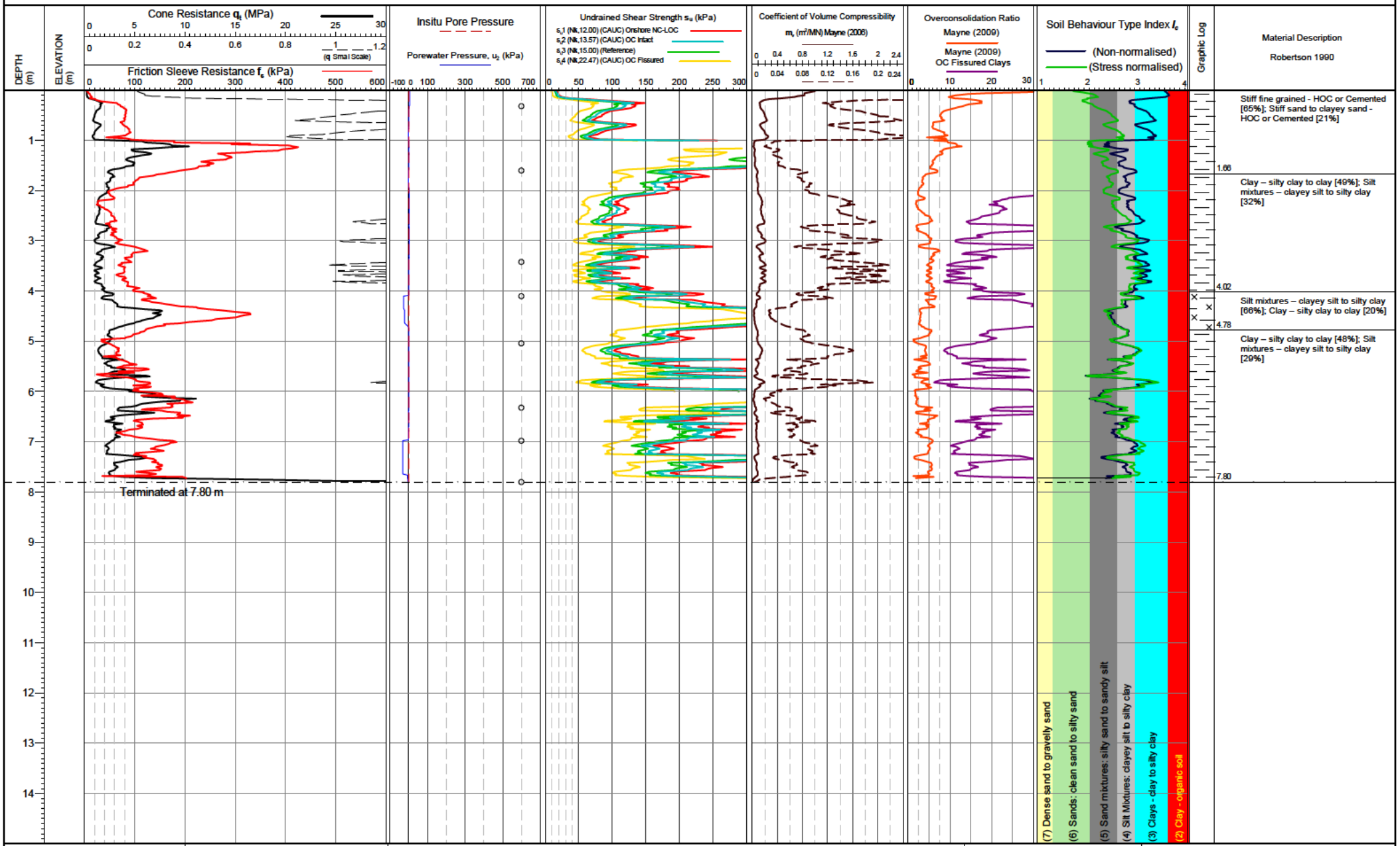
Lankelma Project Ref: P-107408-1

TEST ID: CPT5002

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 13 21 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Tip load

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

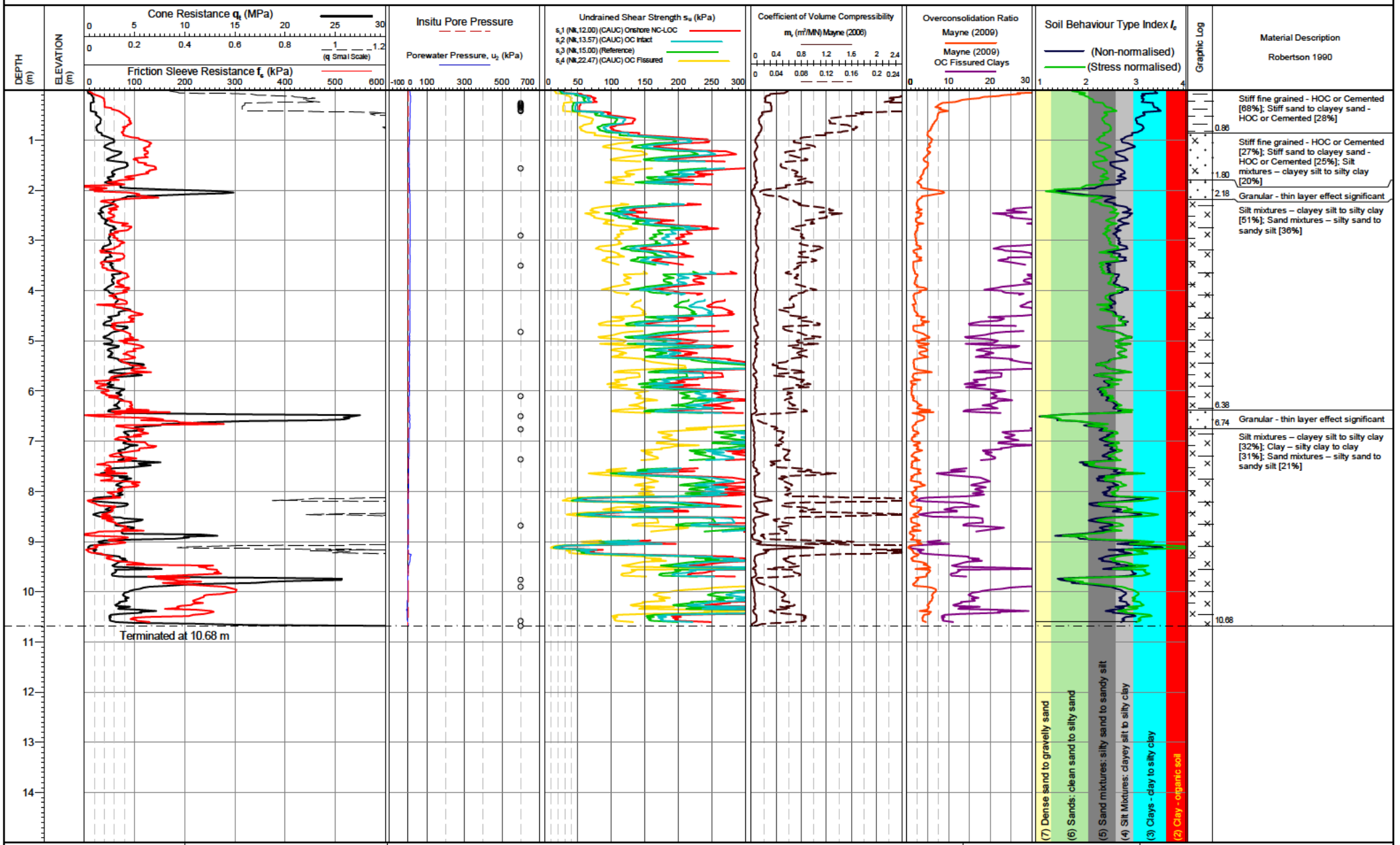
Lankelma Project Ref: P-107408-1

TEST ID: CPT5003

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 13 52 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

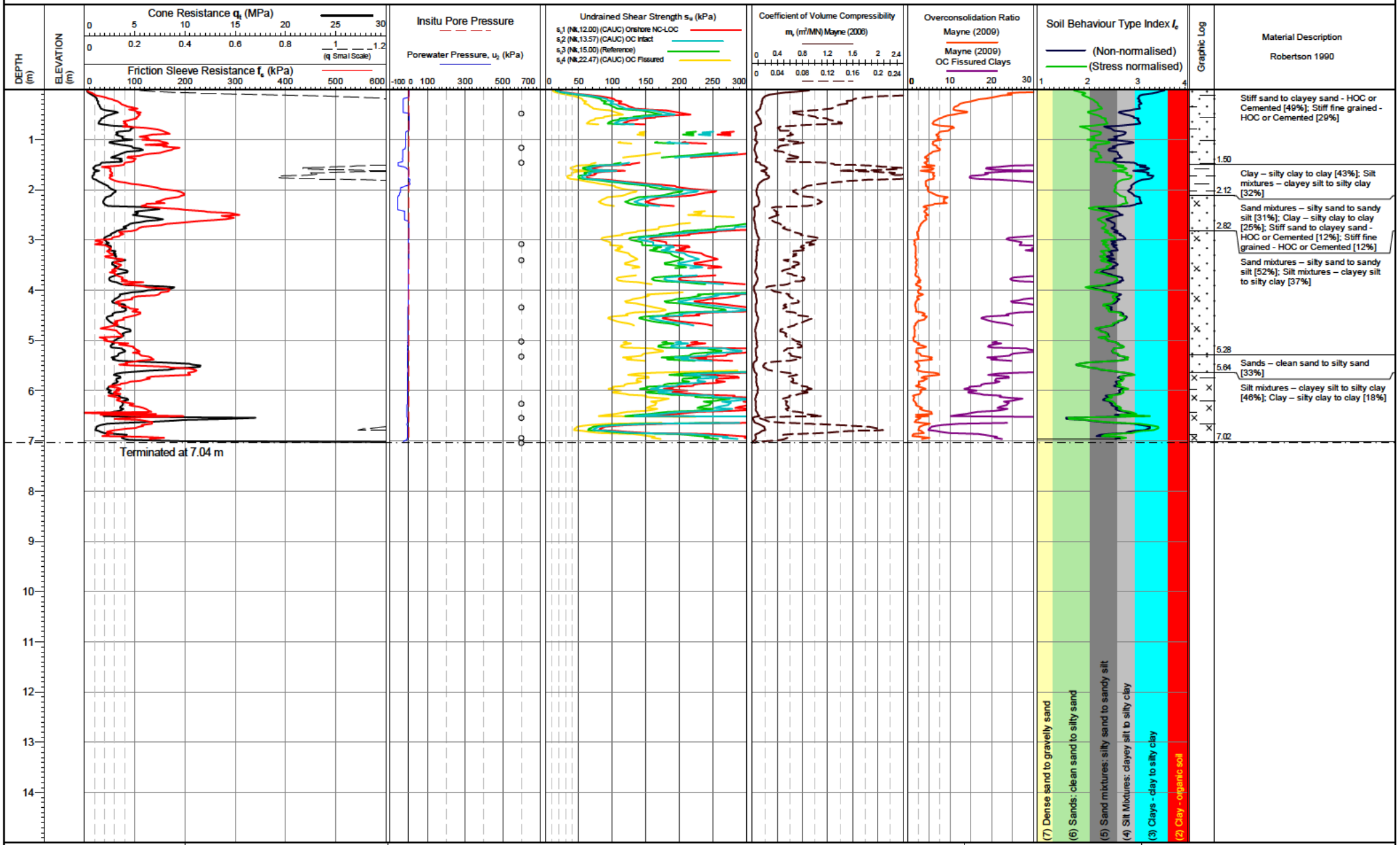
Lankelma Project Ref: P-107408-1

TEST ID: CPT5004

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 11 24 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Tip load

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

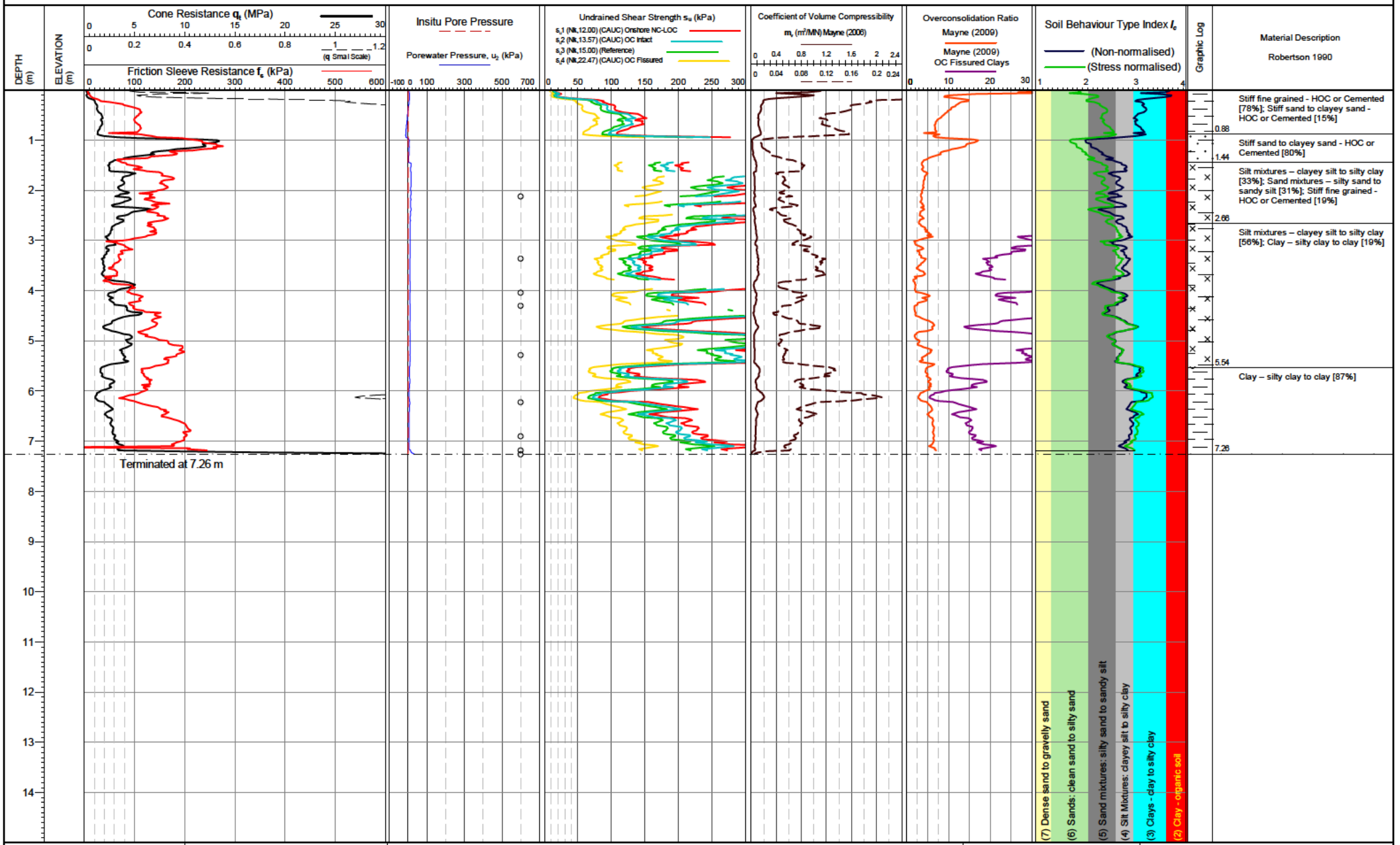
Lankelma Project Ref: P-107408-1

TEST ID: CPT5005

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 12 52 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

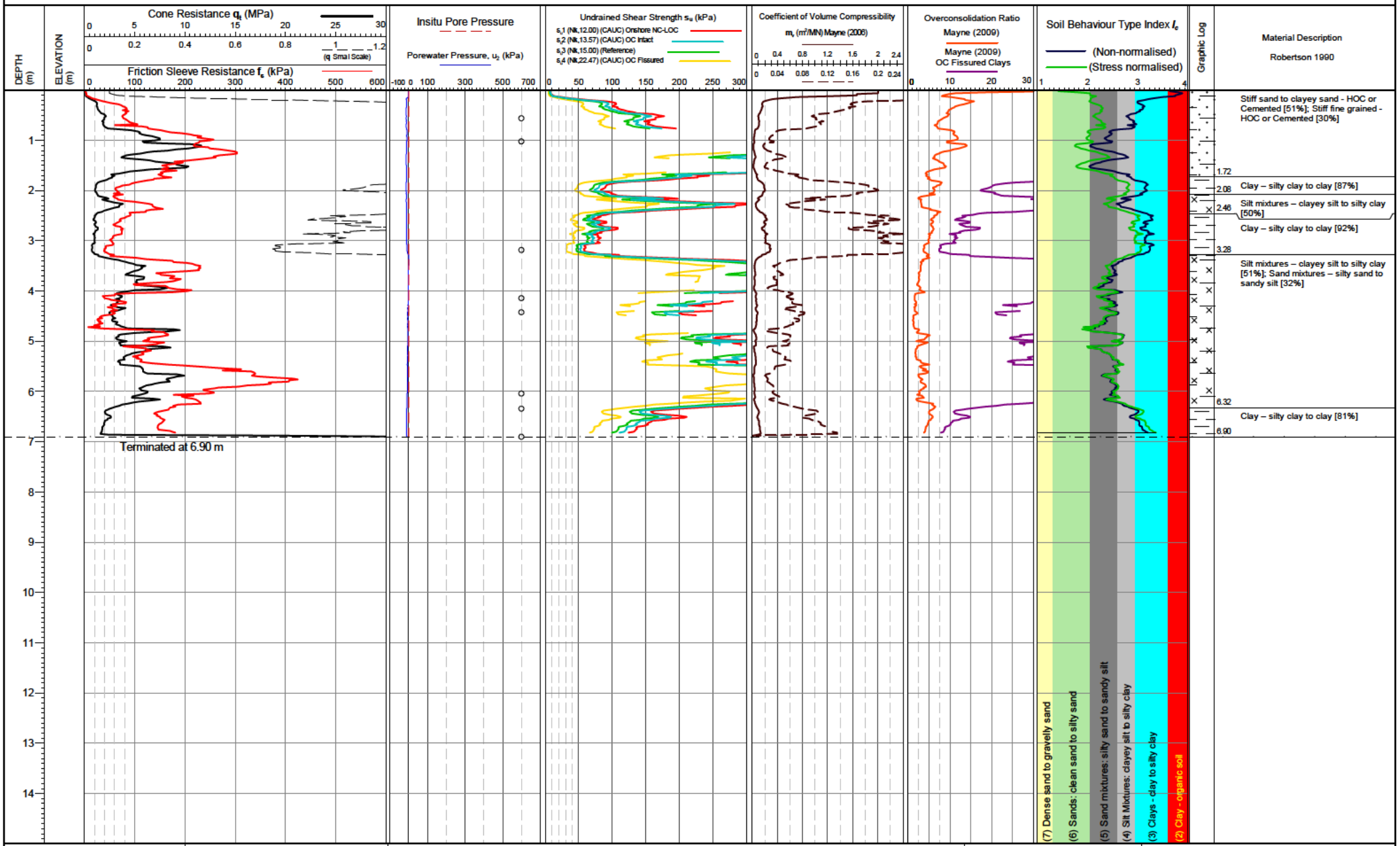
Lankelma Project Ref: P-107408-1

TEST ID: CPT5006

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 12 25 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

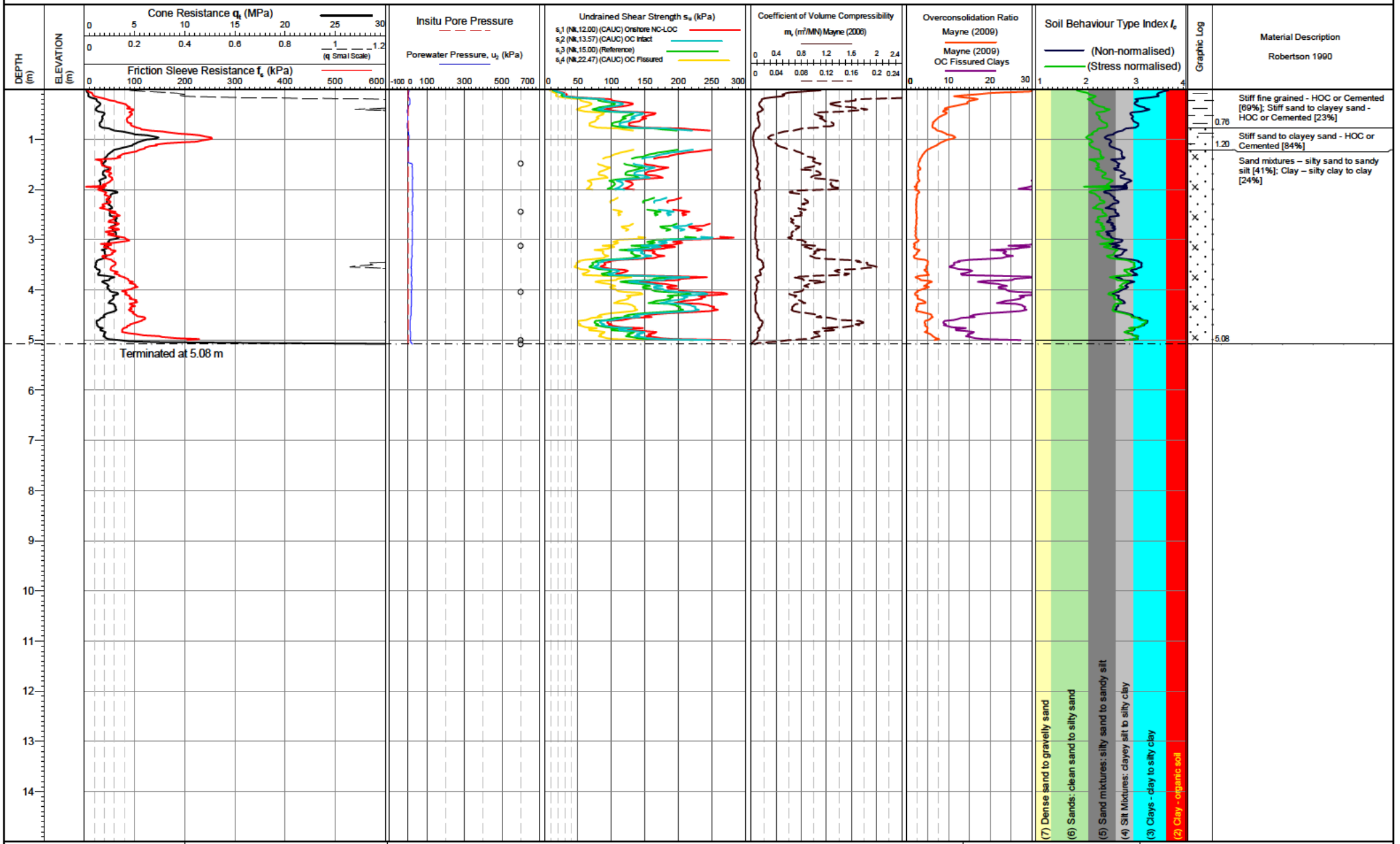
Lankelma Project Ref: P-107408-1

TEST ID: CPT5007

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 12 01 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

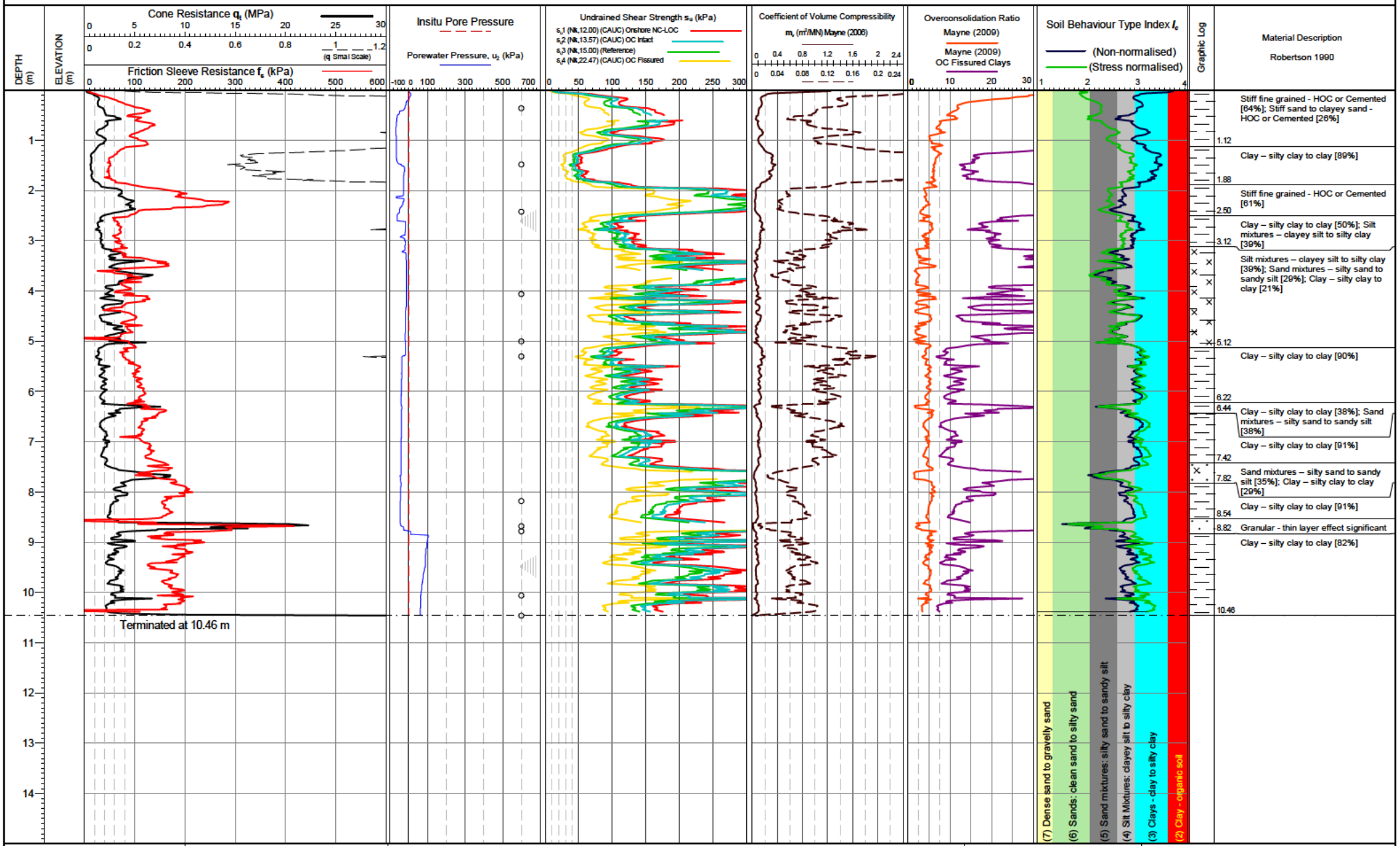
Lankelma Project Ref: P-107408-1

TEST ID: CPT5008

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 08 55 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Tip load

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

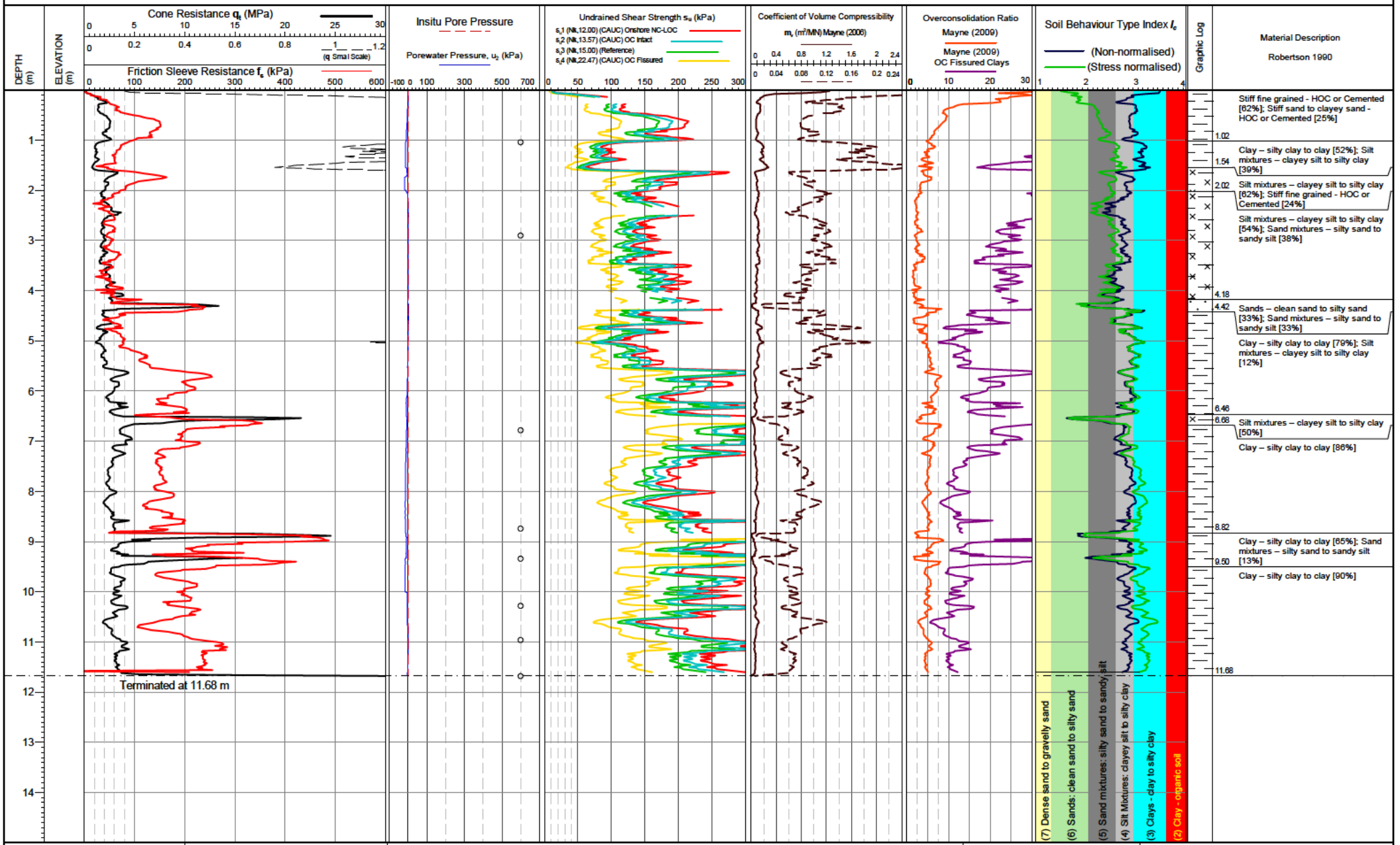
Lankelma Project Ref: P-107408-1

TEST ID: CPT5009

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Jamie Butterworth
Rig Used: UK8
Date of test: 14/02/2020 14 54 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

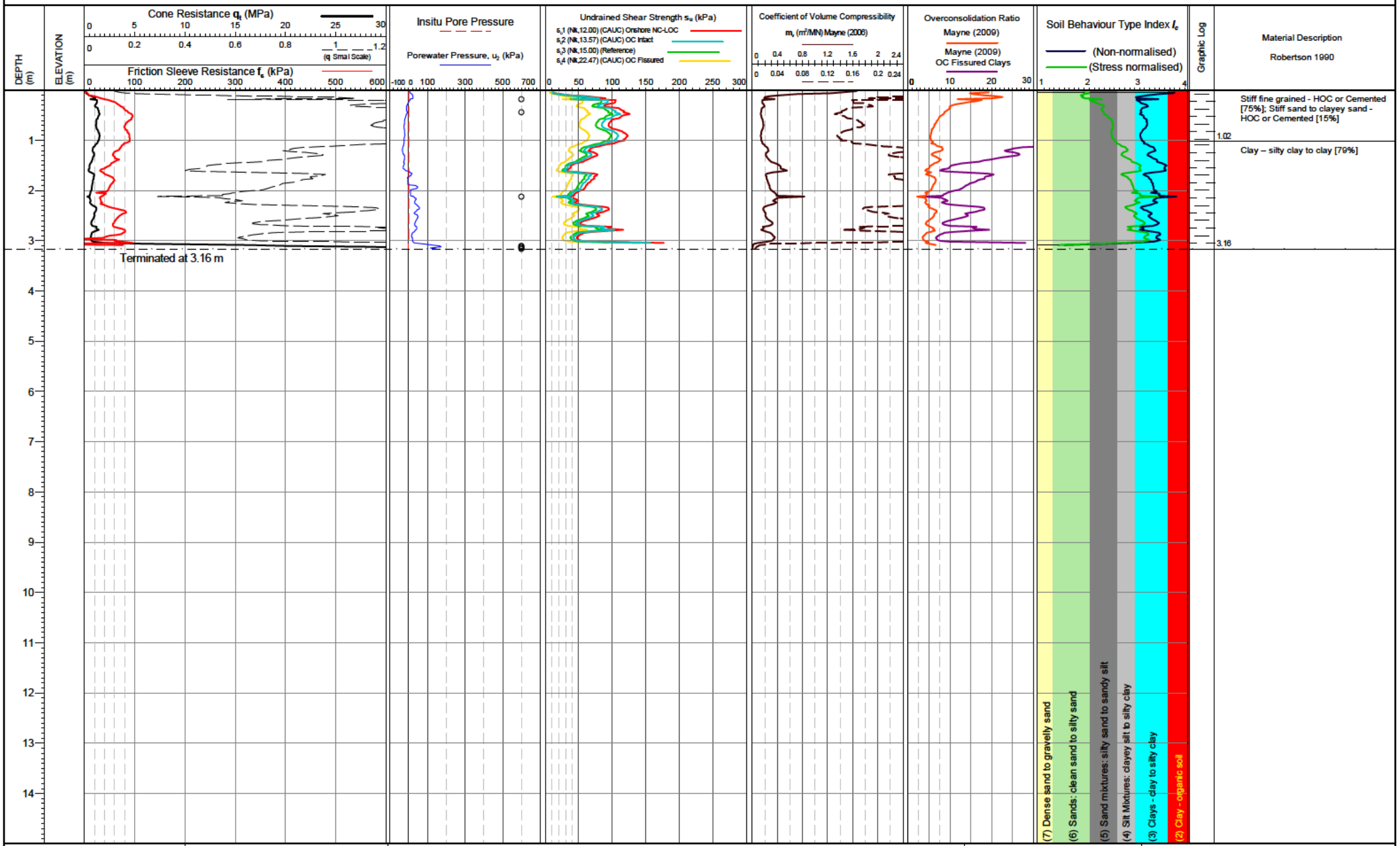
Lankelma Project Ref: P-107408-1

TEST ID: CPT5010

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 09 09 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Lateral support

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

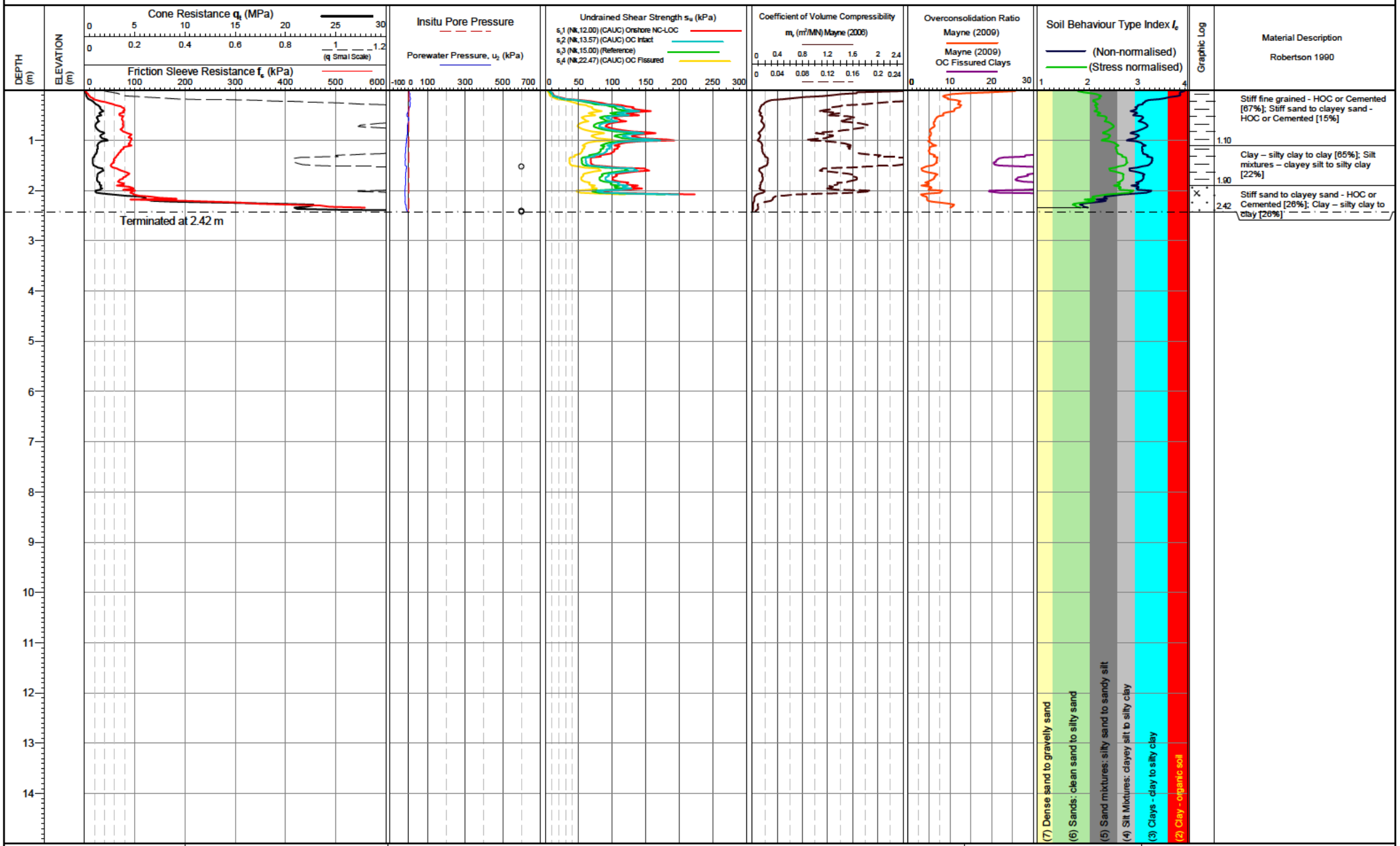
Lankelma Project Ref: P-107408-1

TEST ID: CPT5011

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 09 32 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Lateral support

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

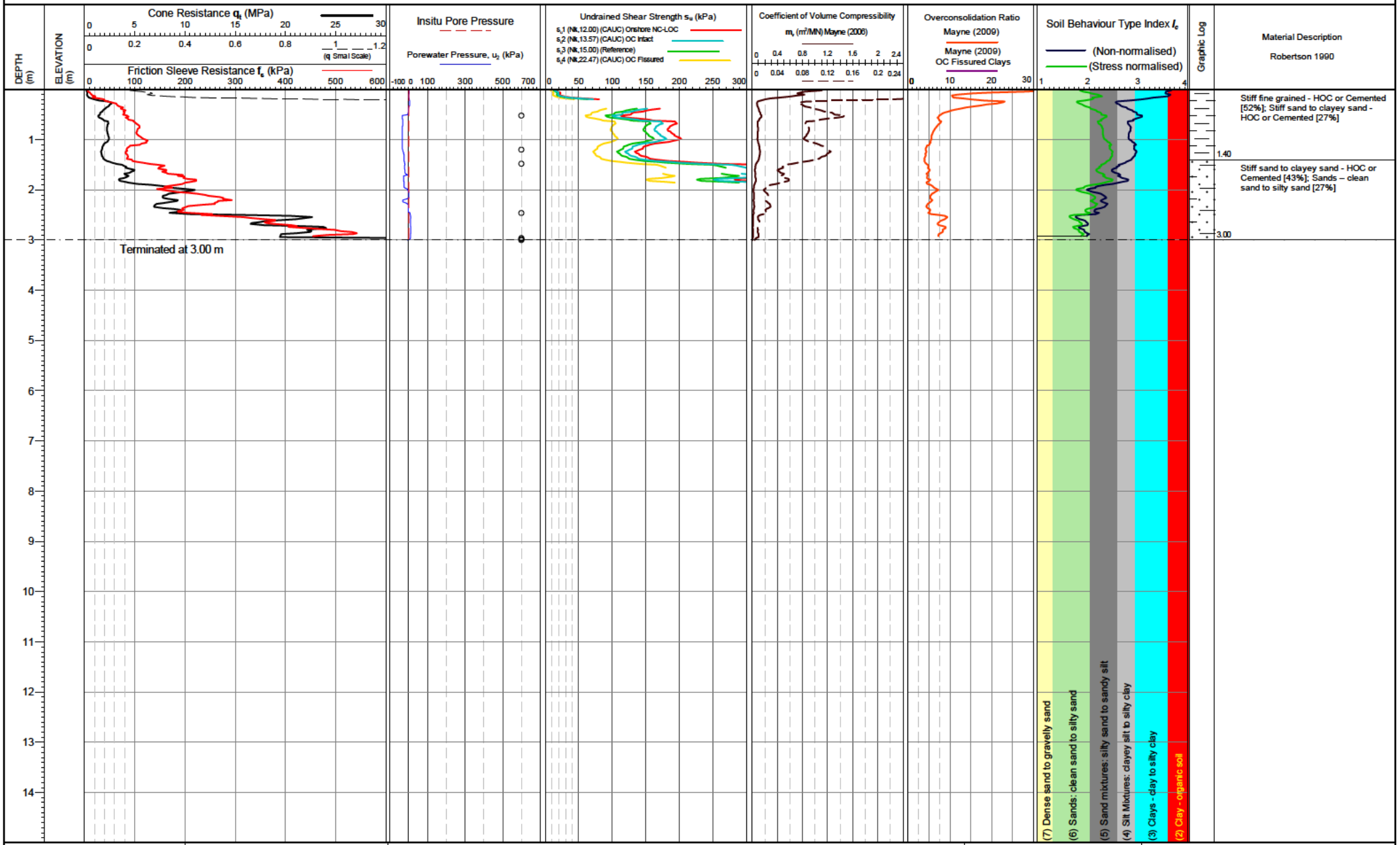
Lankelma Project Ref: P-107408-1

TEST ID: CPT5012

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 10:14 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Lateral support

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

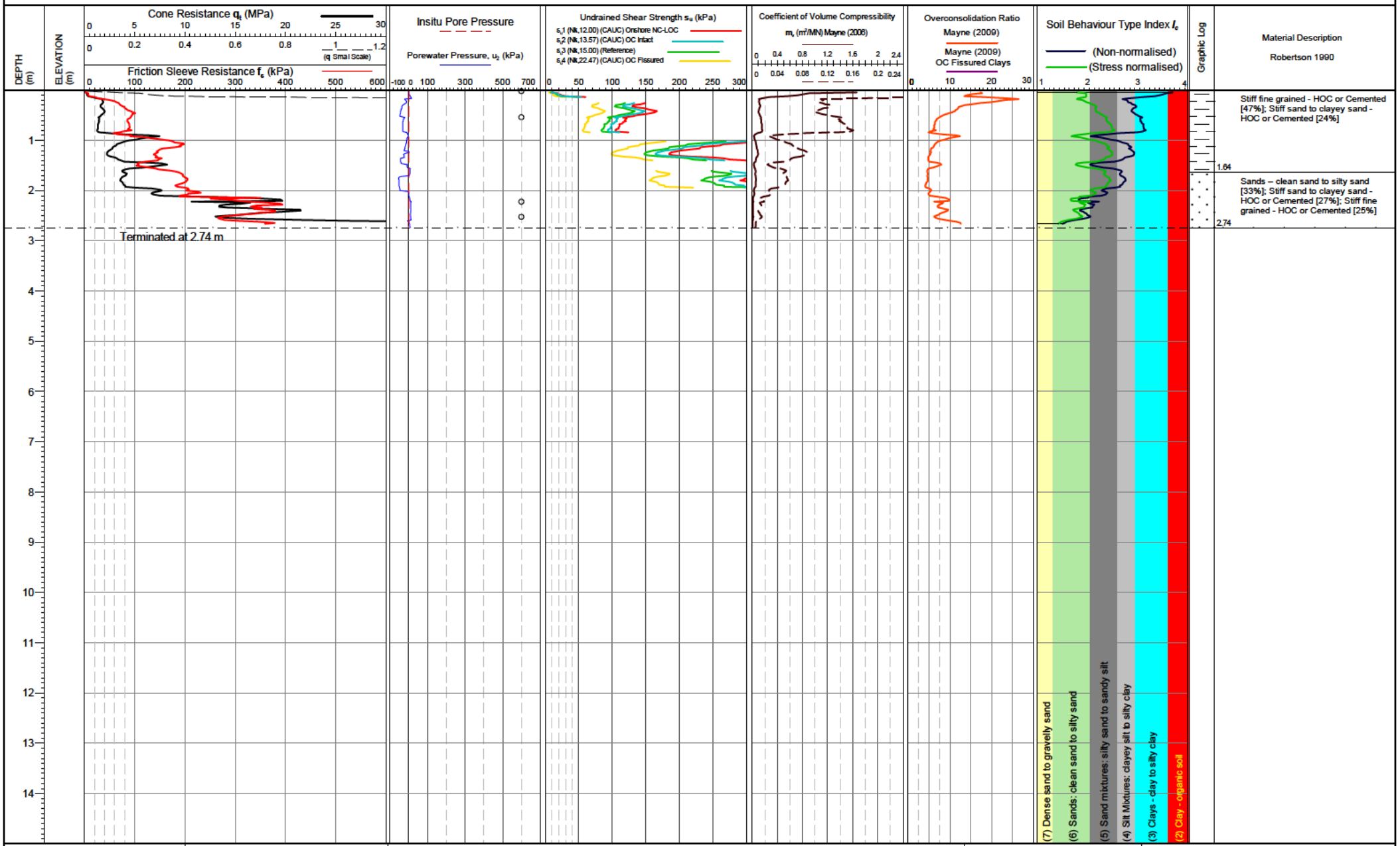
Lankelma Project Ref: P-107408-1

TEST ID: CPT5012A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 09 59 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Lateral support

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

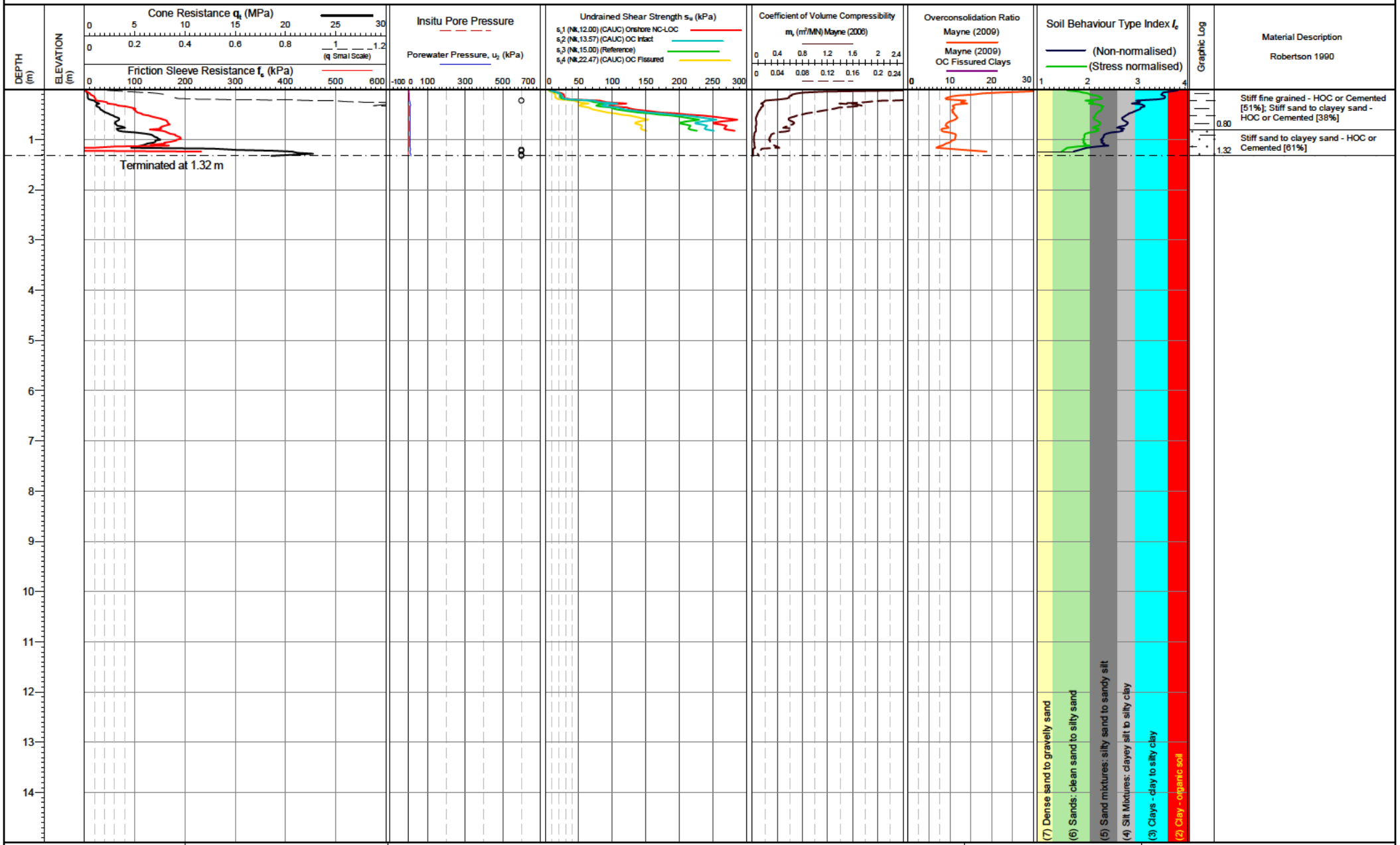
Lankelma Project Ref: P-107408-1

TEST ID: CPT5013

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 12 58 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Inclination

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

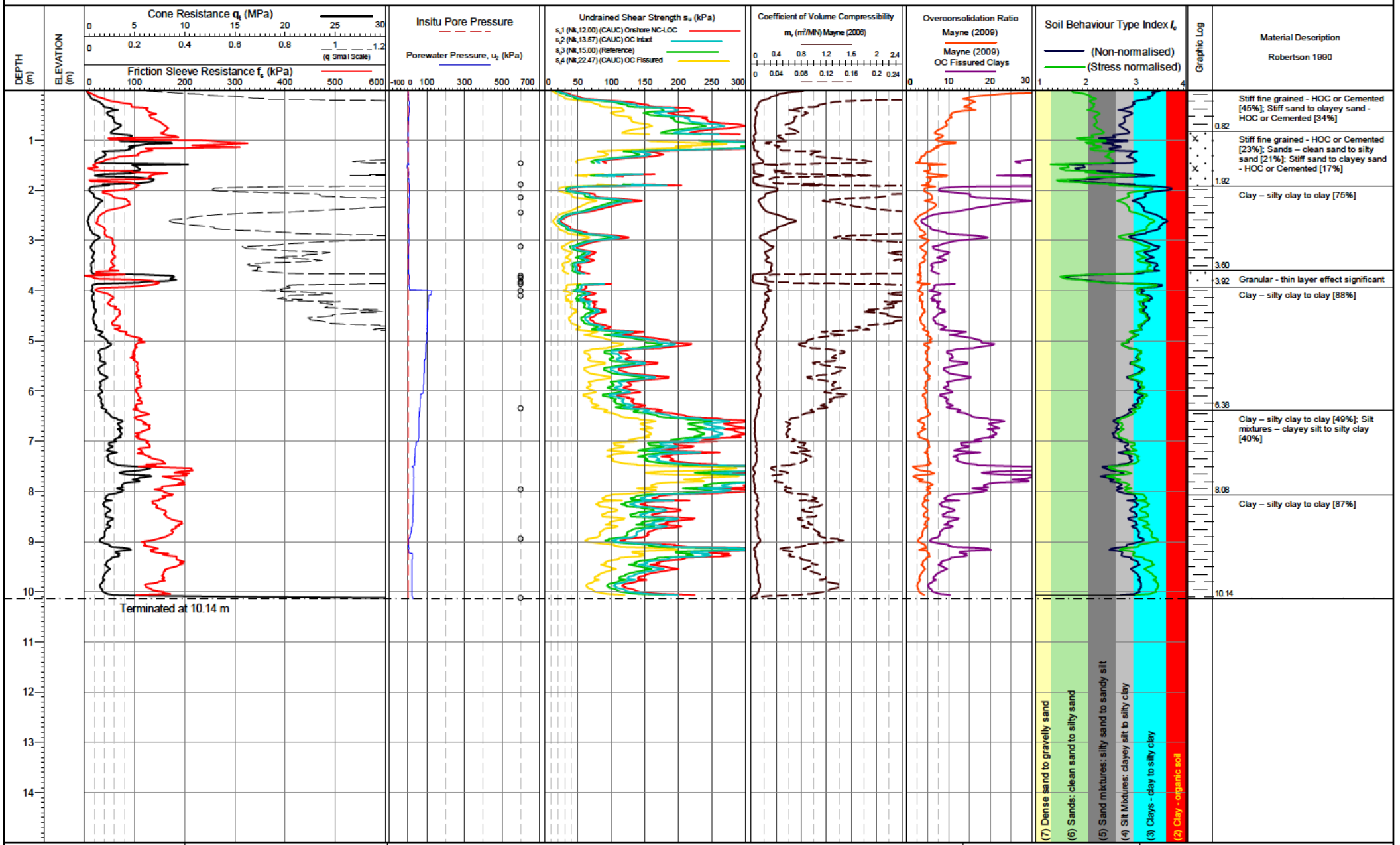
Lankelma Project Ref: P-107408-1

TEST ID: CPT5014

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 13:12 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

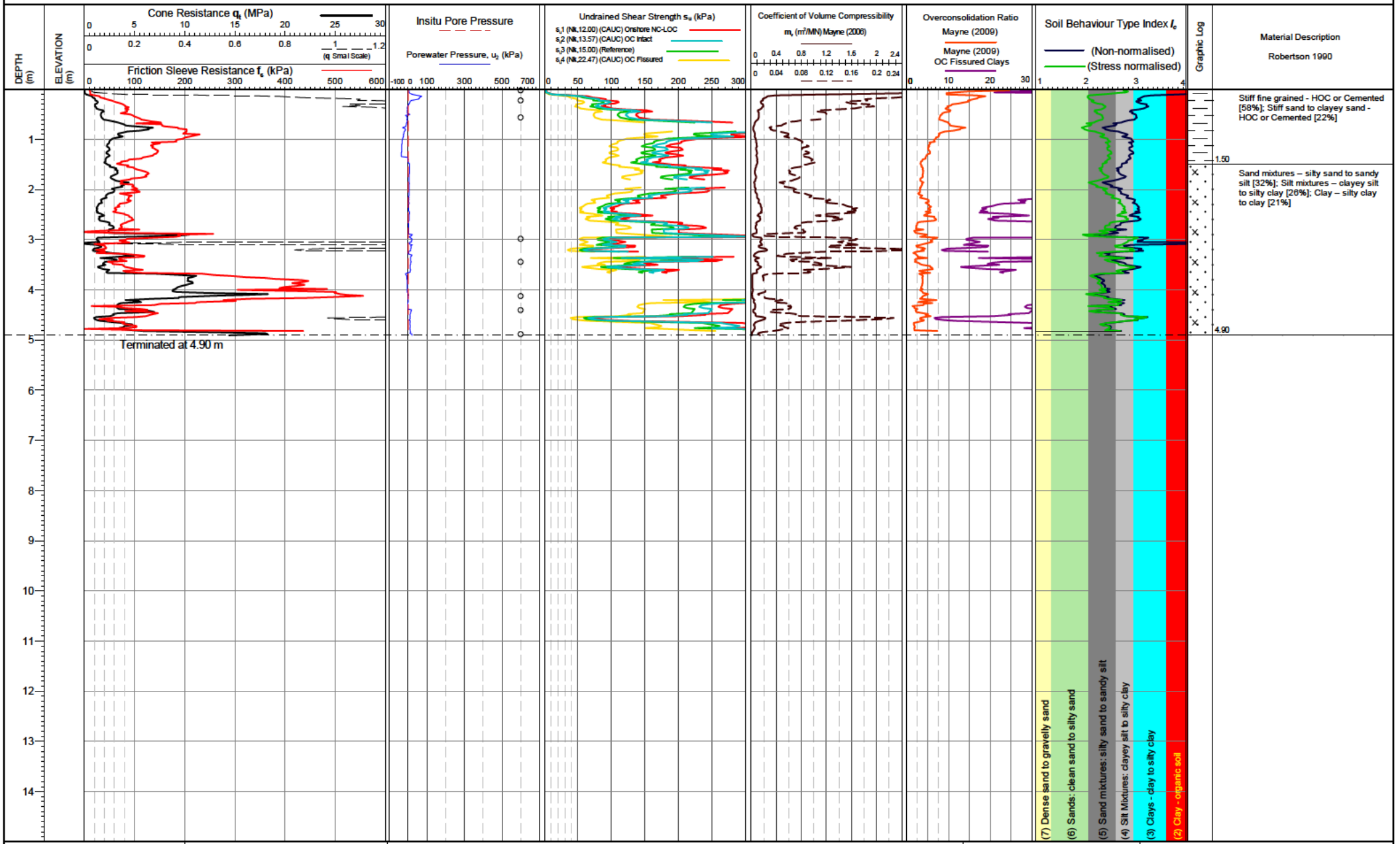
Lankelma Project Ref: P-107408-1

TEST ID: CPT5014A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 12:14 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Inclination

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

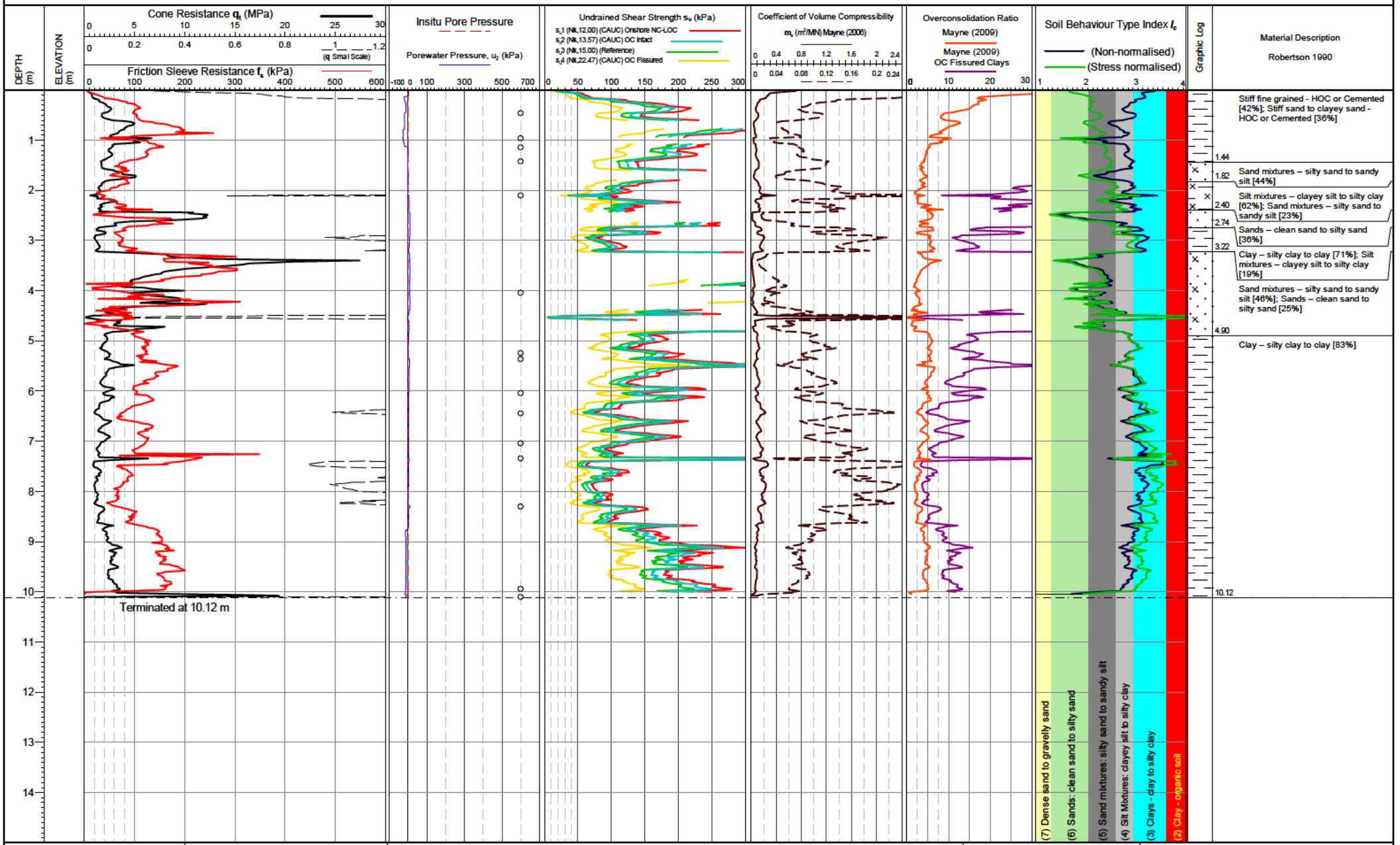
Lankelma Project Ref: P-107408-1

TEST ID: CPT5015

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 13:43 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Lateral support

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

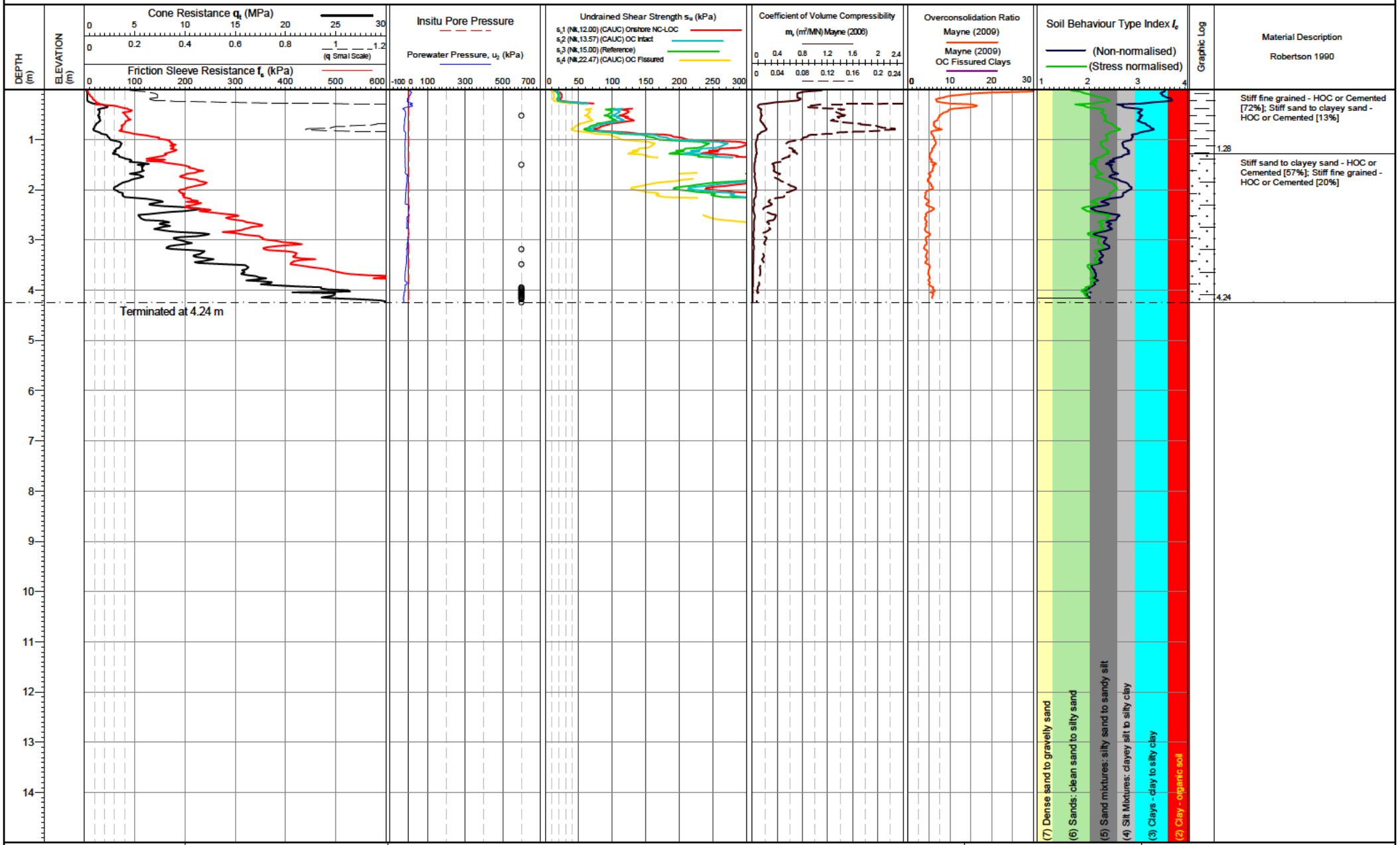
Lankelma Project Ref: P-107408-1

TEST ID: CPT5015A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 11 50 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Lateral support

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

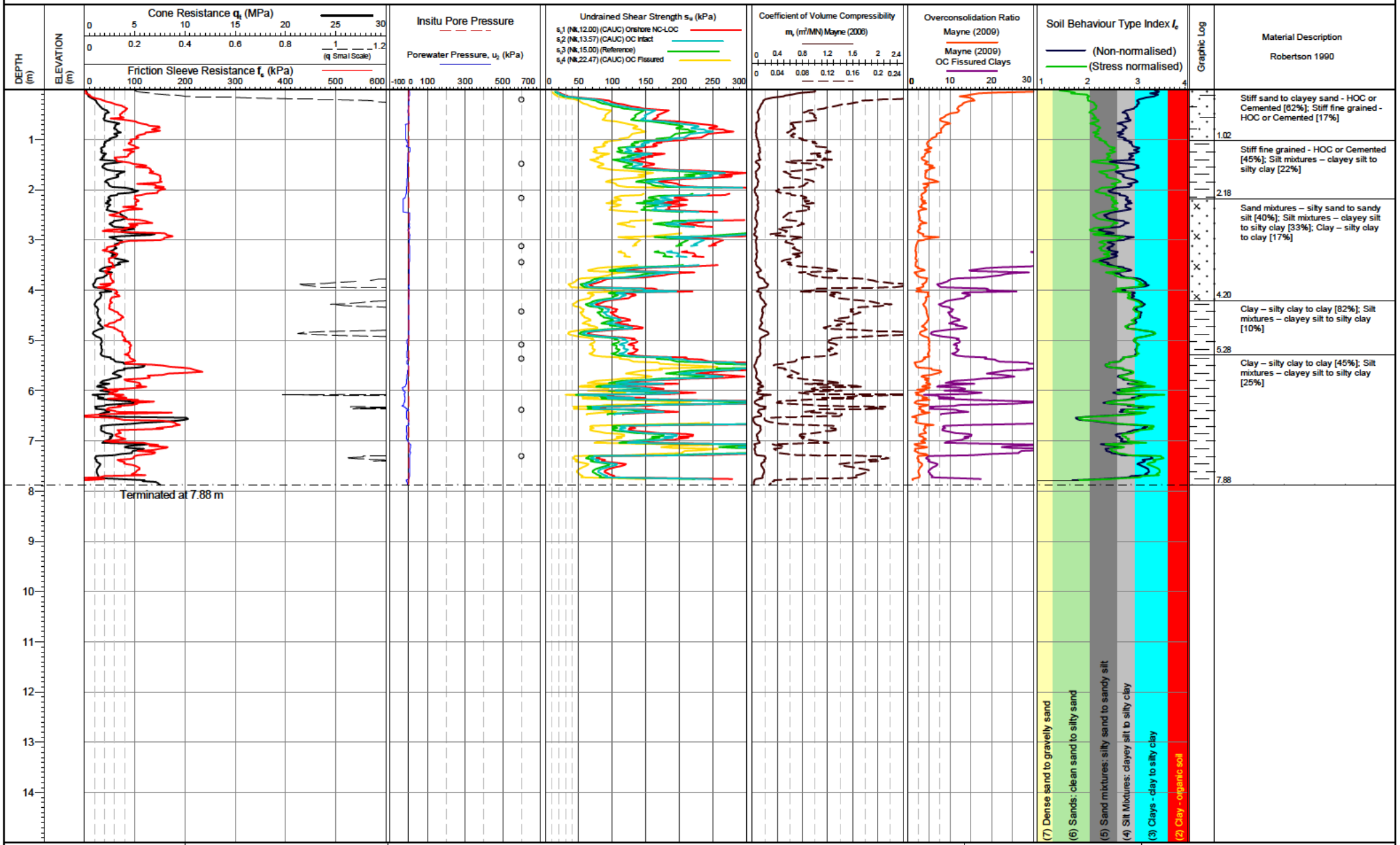
Lankelma Project Ref: P-107408-1

TEST ID: CPT5016

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 11 22 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Inclination

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

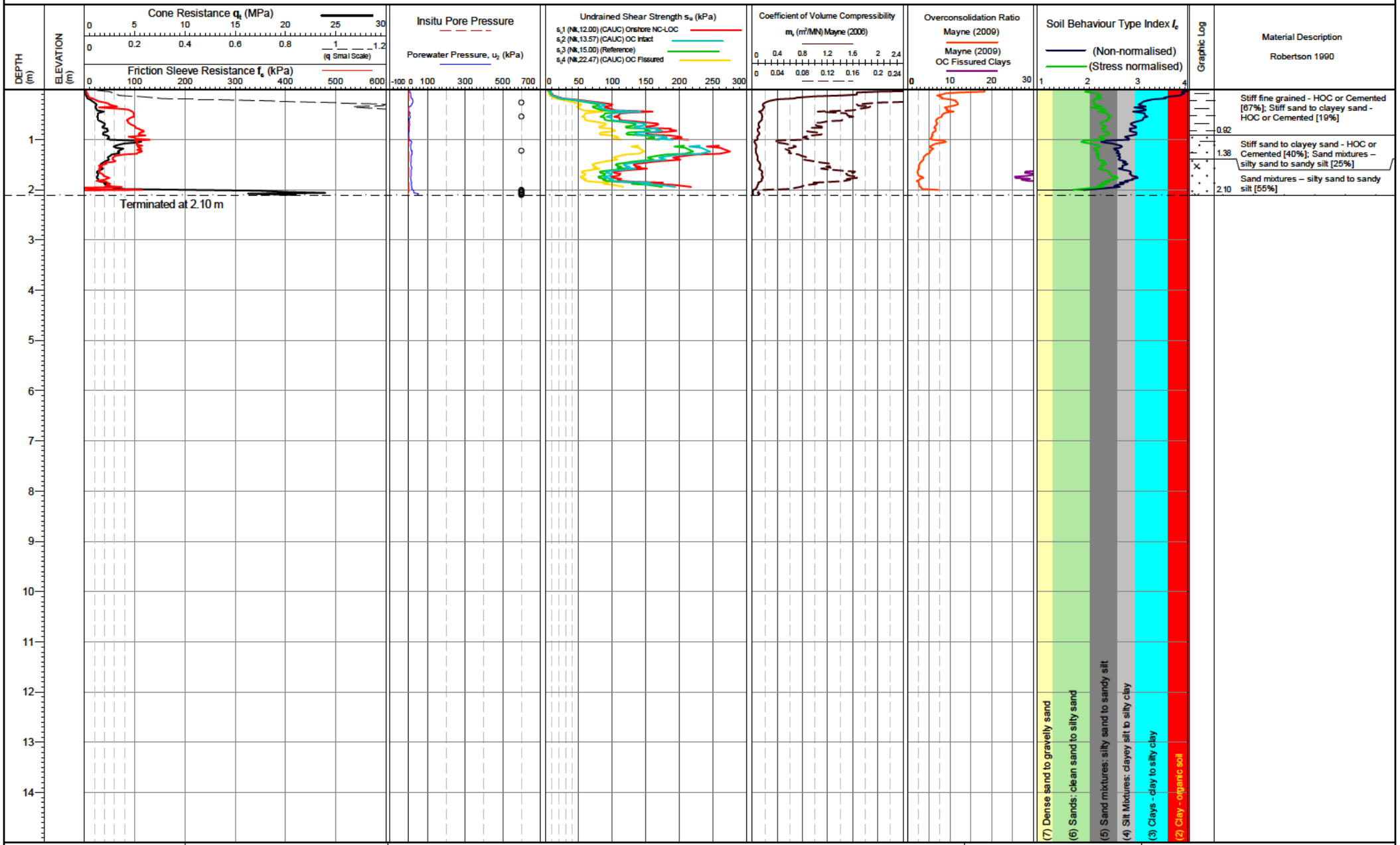
Lankelma Project Ref: P-107408-1

TEST ID: CPT5017

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 10 32 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Inclination

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

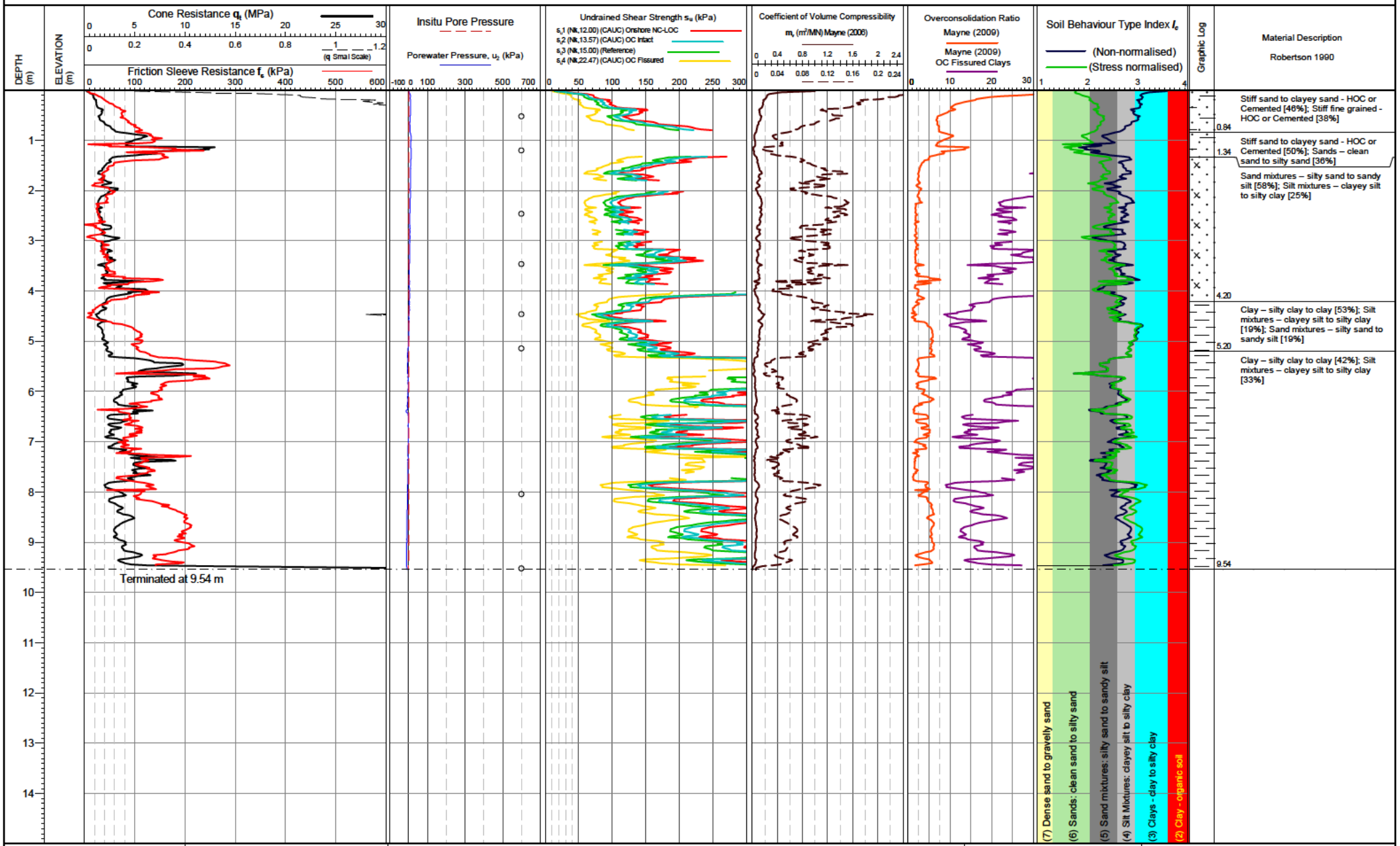
Lankelma Project Ref: P-107408-1

TEST ID: CPT5018

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
ConeID: S15-CF P.1819
Operator: Phillip Case
Rig Used: UK8
Date of test: 21/02/2020 10 53 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Remarks: *Phreatic surface origin: Estimate as advised by client

Termination Remark:
Target depth

Internal QA Diss.
Dissipation Test
Penetration Pause (<1cm/s)

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

Lankelma Project Ref: P-107408-1

TEST ID: CPT5018A

APPENDIX E STANDARD INTERPRETATION RESULTS - SET 2

EQUIVALENT SPT N60
PEAK FRICTION ANGLE
RELATIVE DENSITY
YOUNG'S MODULUS

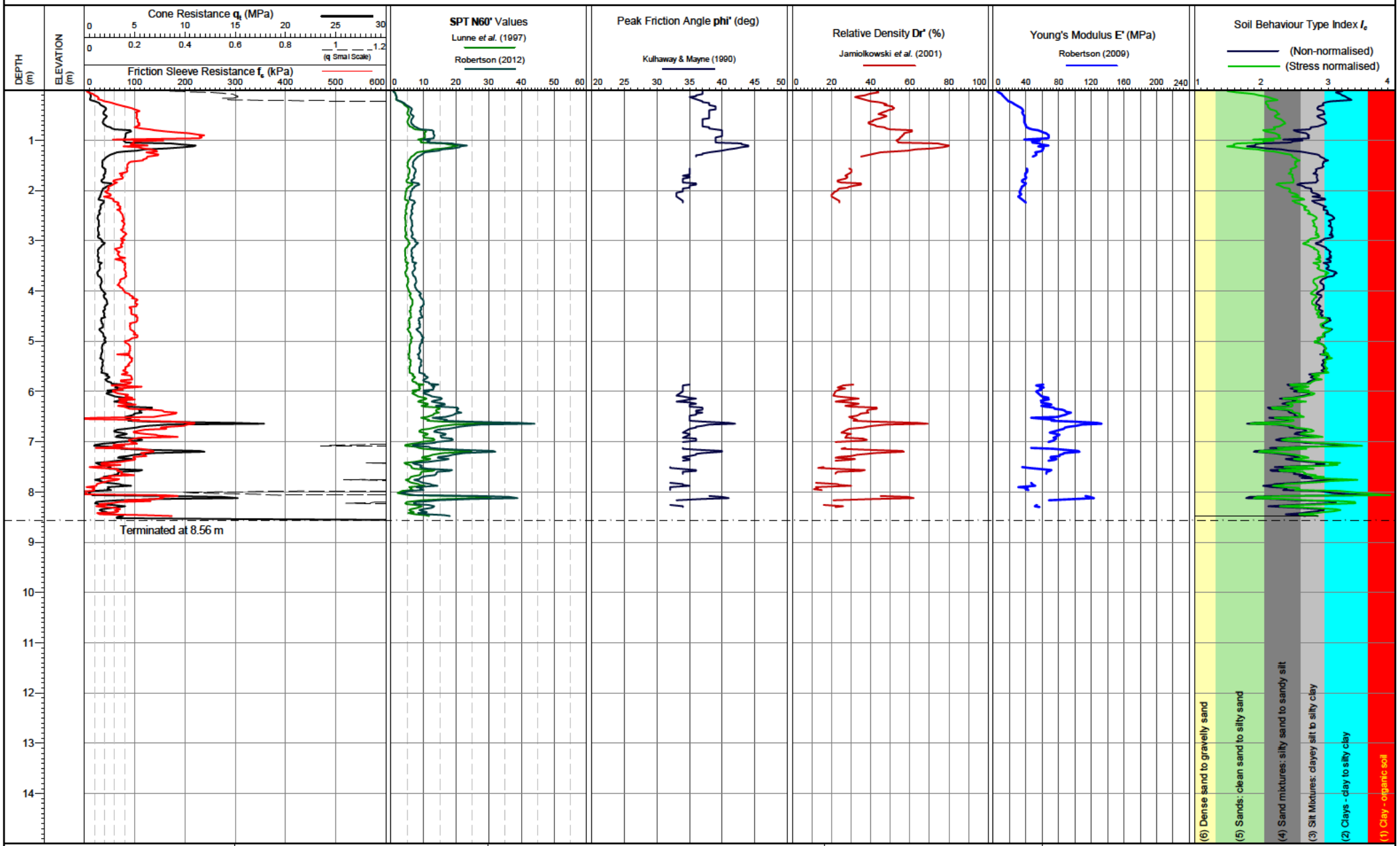
LIST OF FIGURES:

Location ID	Pages included
CPT5001	1
CPT5002	1
CPT5003	1
CPT5004	1
CPT5005	1
CPT5006	1
CPT5007	1
CPT5008	1
CPT5009	1
CPT5010	1
CPT5011	1
CPT5012	1
CPT5012A	1
CPT5013	1
CPT5014	1
CPT5014A	1
CPT5015	1
CPT5015A	1
CPT5016	1
CPT5017	1
CPT5018	1
CPT5018A	1

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 09:49 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

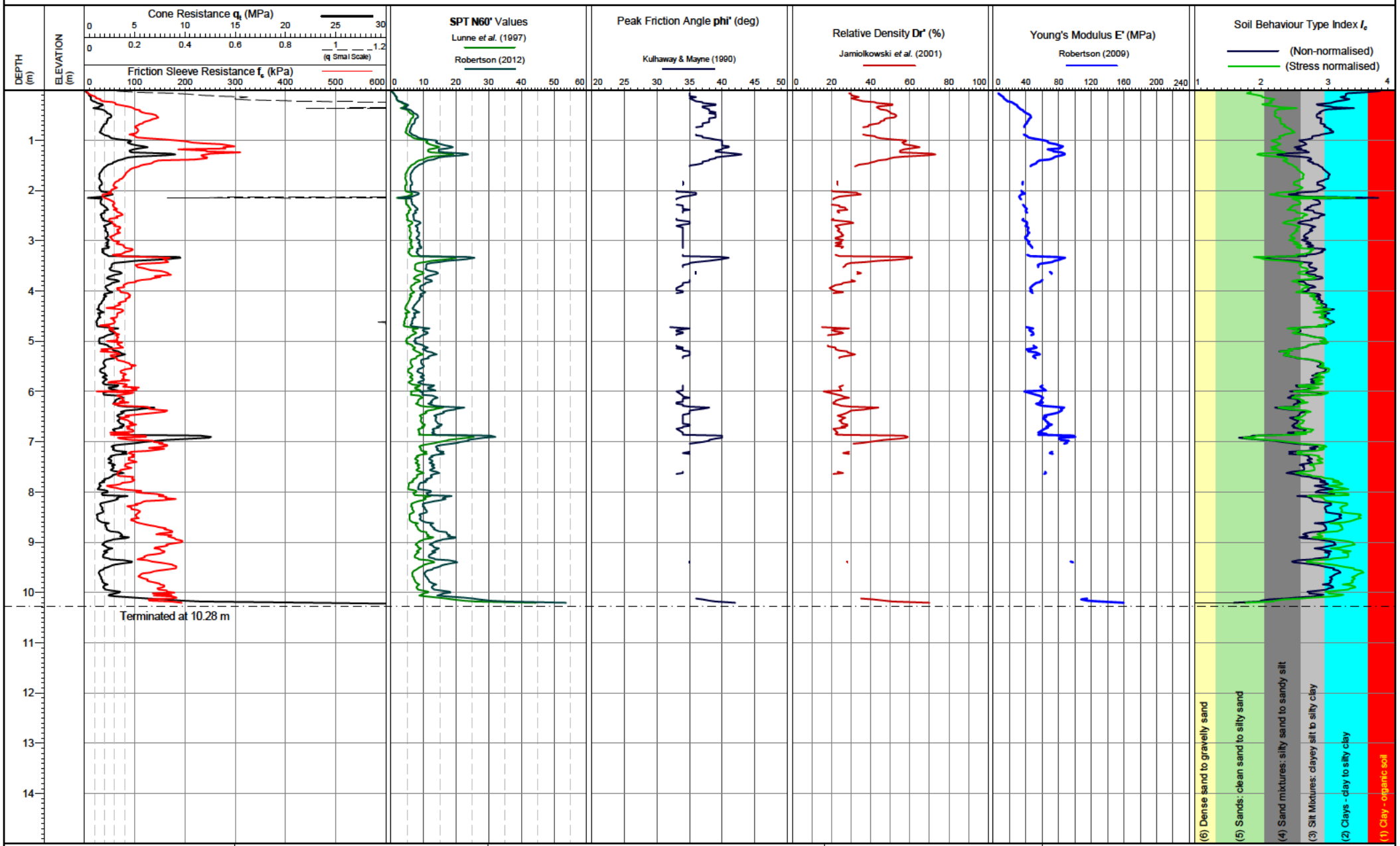
Lankelma Project Ref: P-107408-1

TEST ID: CPT5001

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 10 39 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

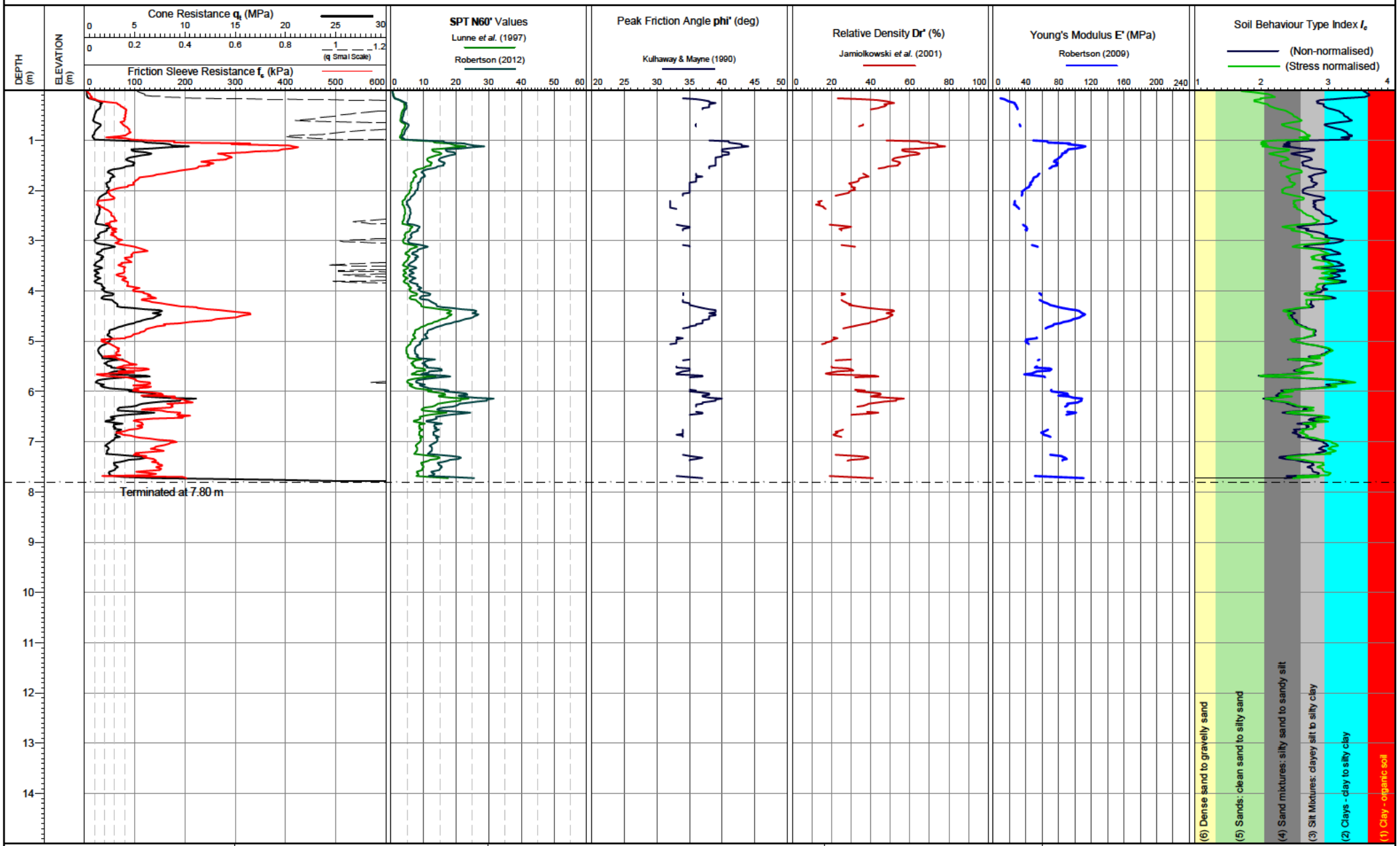
Lankelma Project Ref: P-107408-1

TEST ID: CPT5002

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 13 21 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

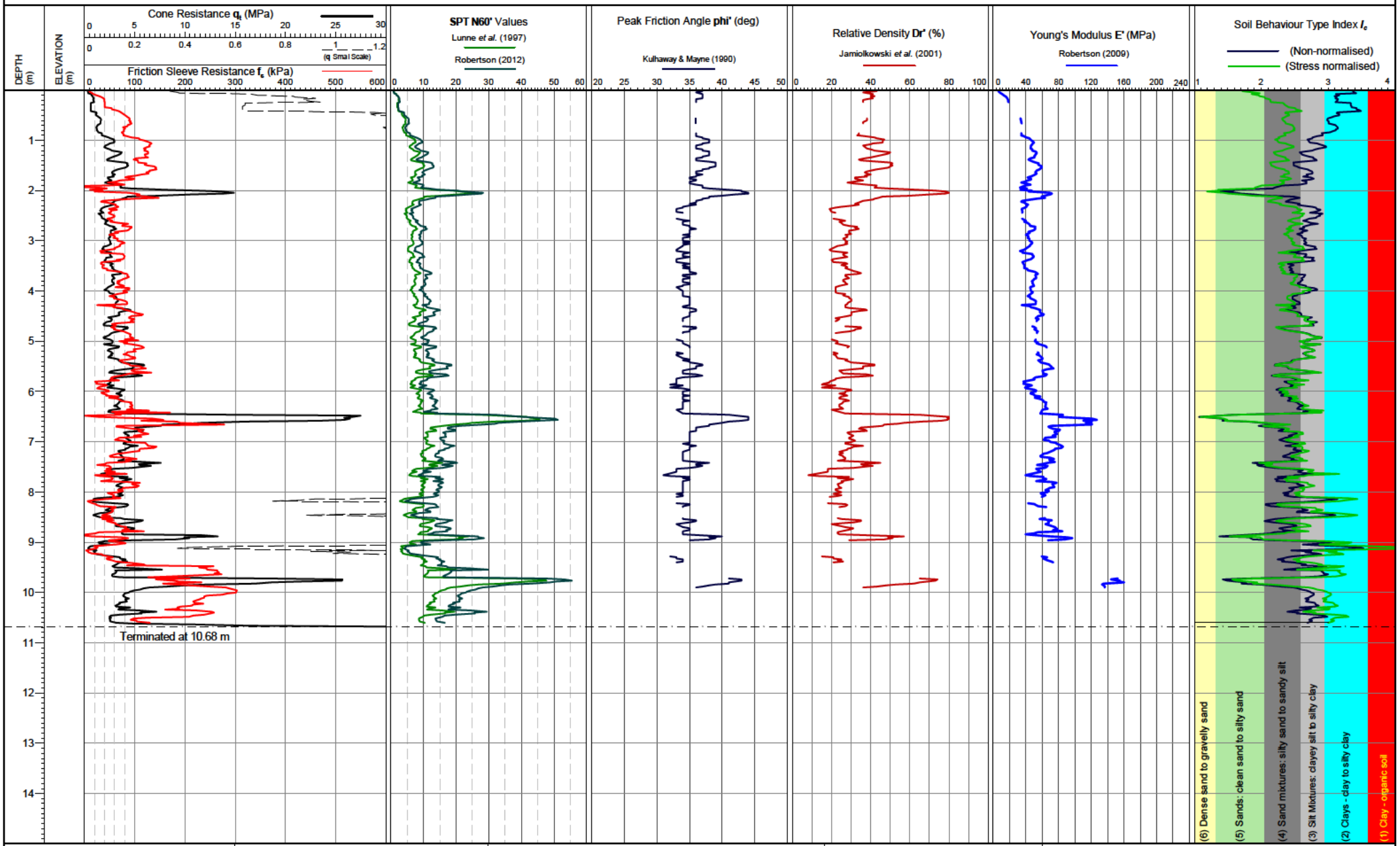
Lankelma Project Ref: P-107408-1

TEST ID: CPT5003

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 13 52 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

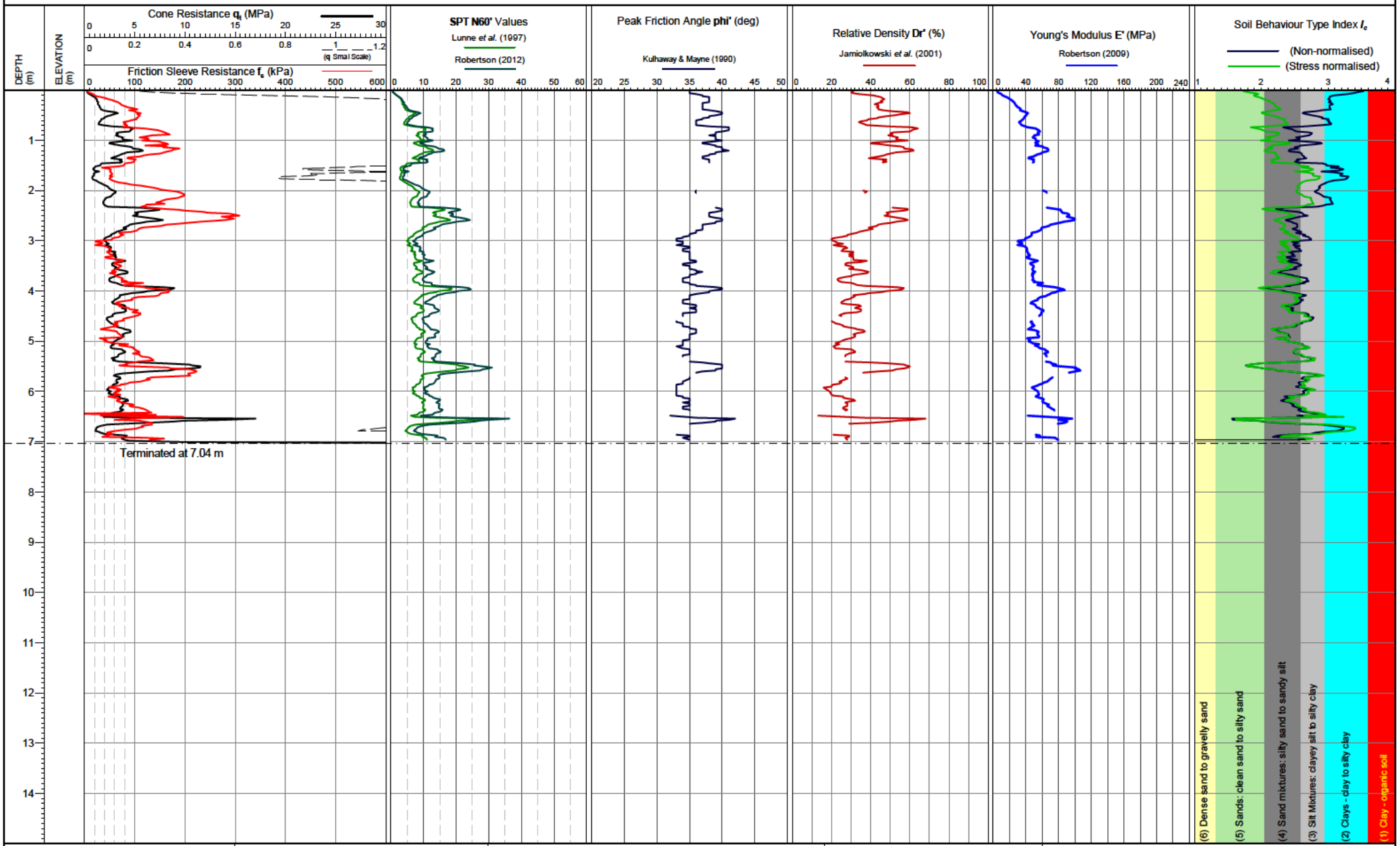
Lankelma Project Ref: P-107408-1

TEST ID: CPT5004

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 11 24 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

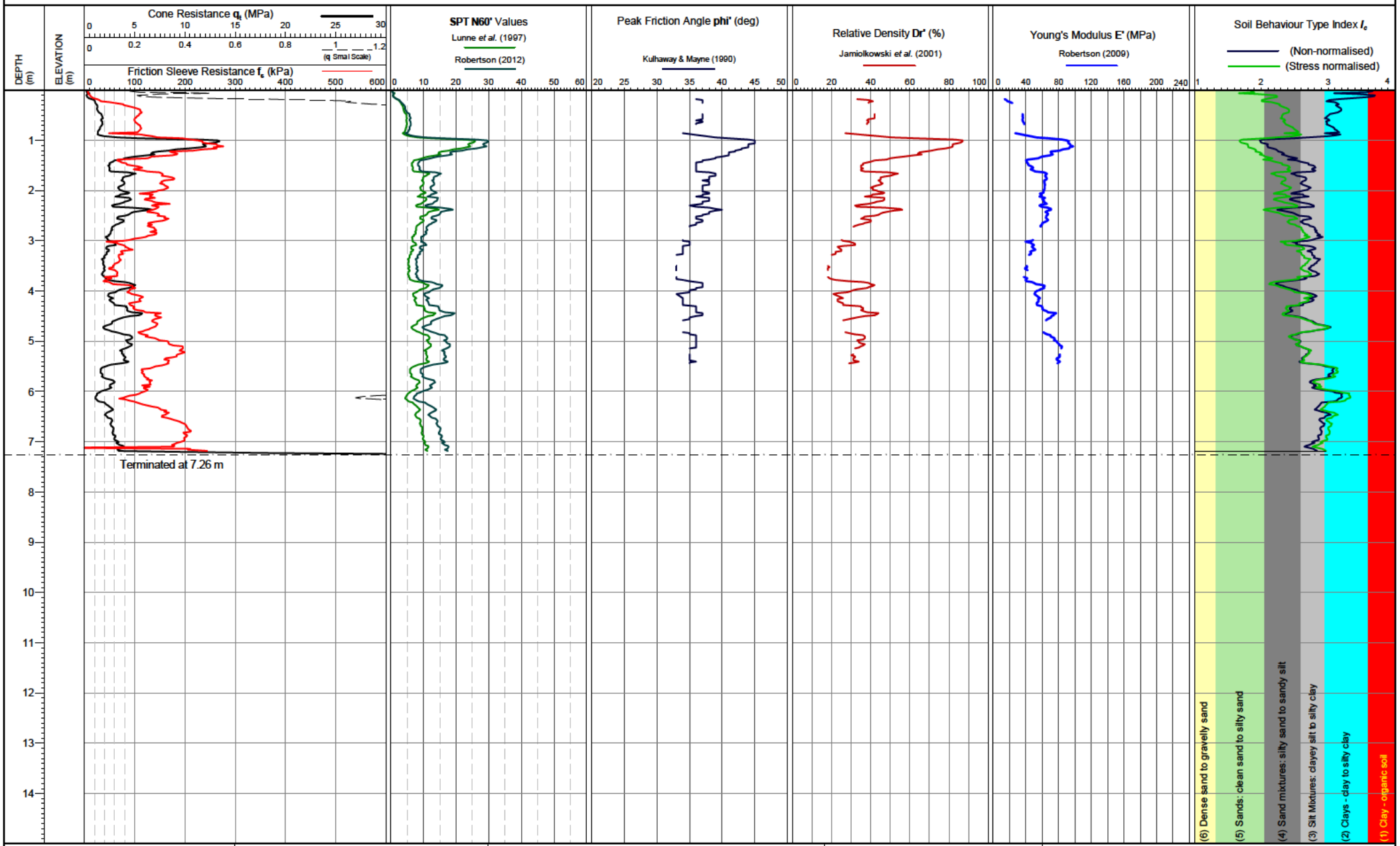
Lankelma Project Ref: P-107408-1

TEST ID: CPT5005

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 12 52 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

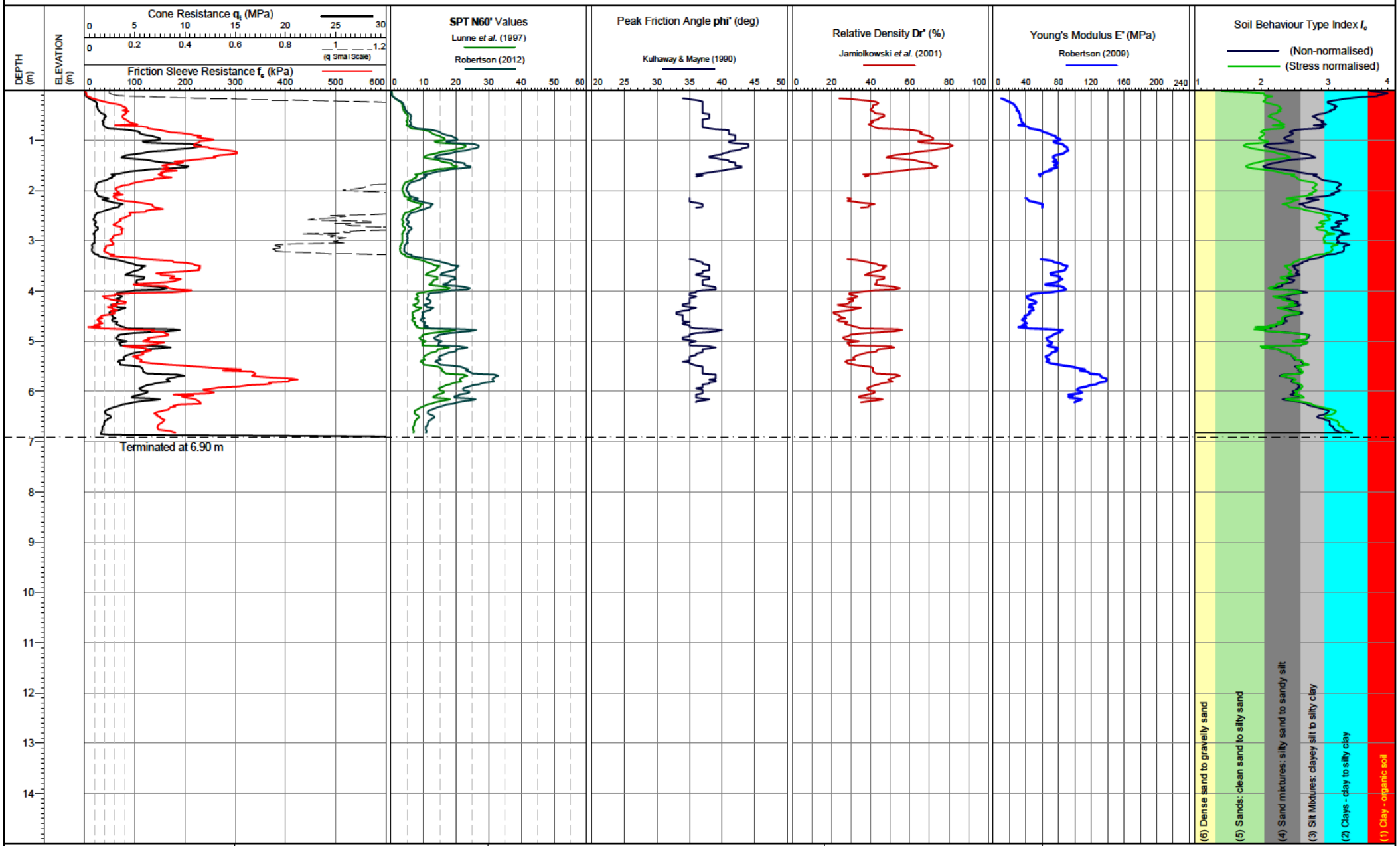
Lankelma Project Ref: P-107408-1

TEST ID: CPT5006

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 12 25 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

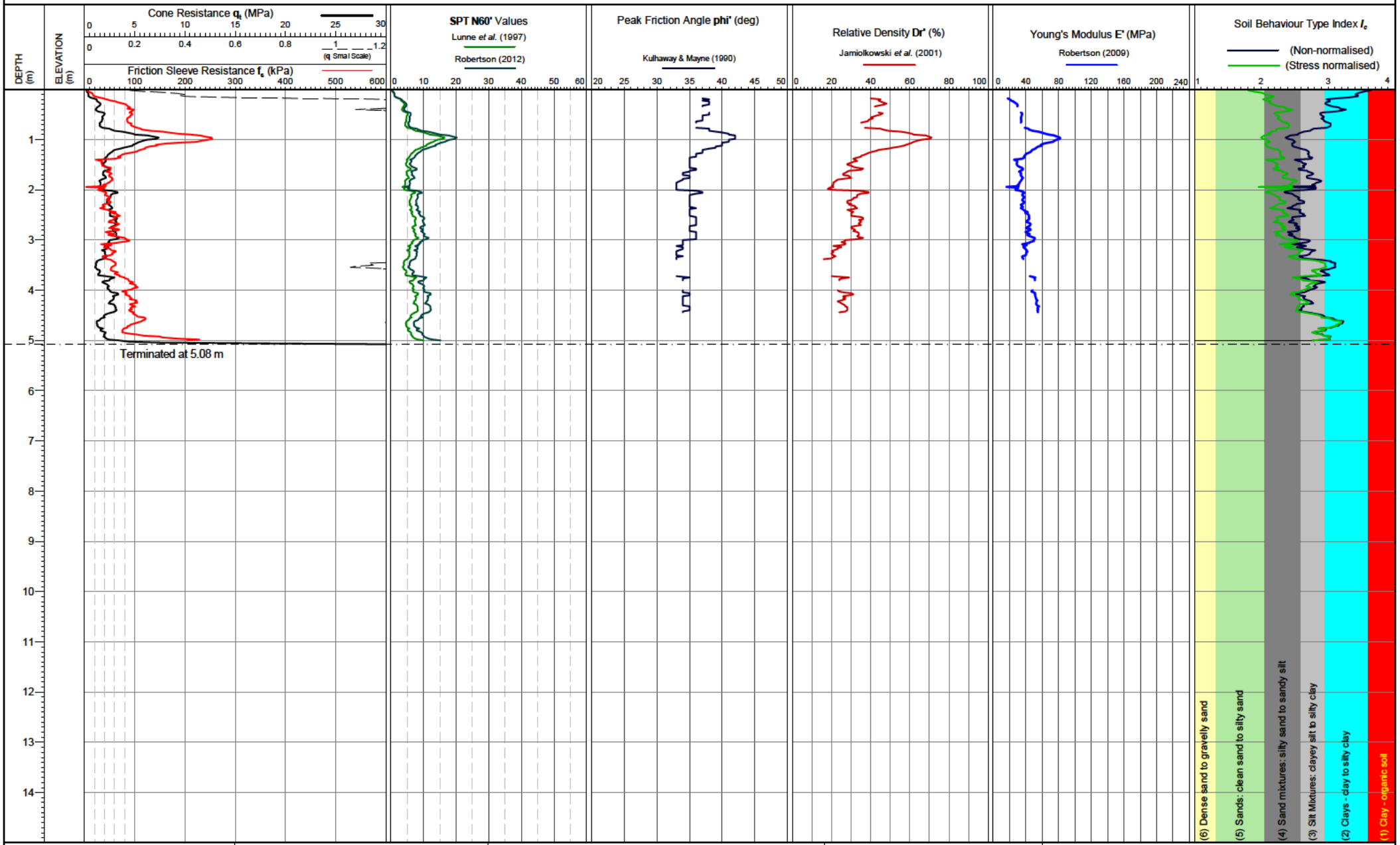
Lankelma Project Ref: P-107408-1

TEST ID: CPT5007

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 12 01 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

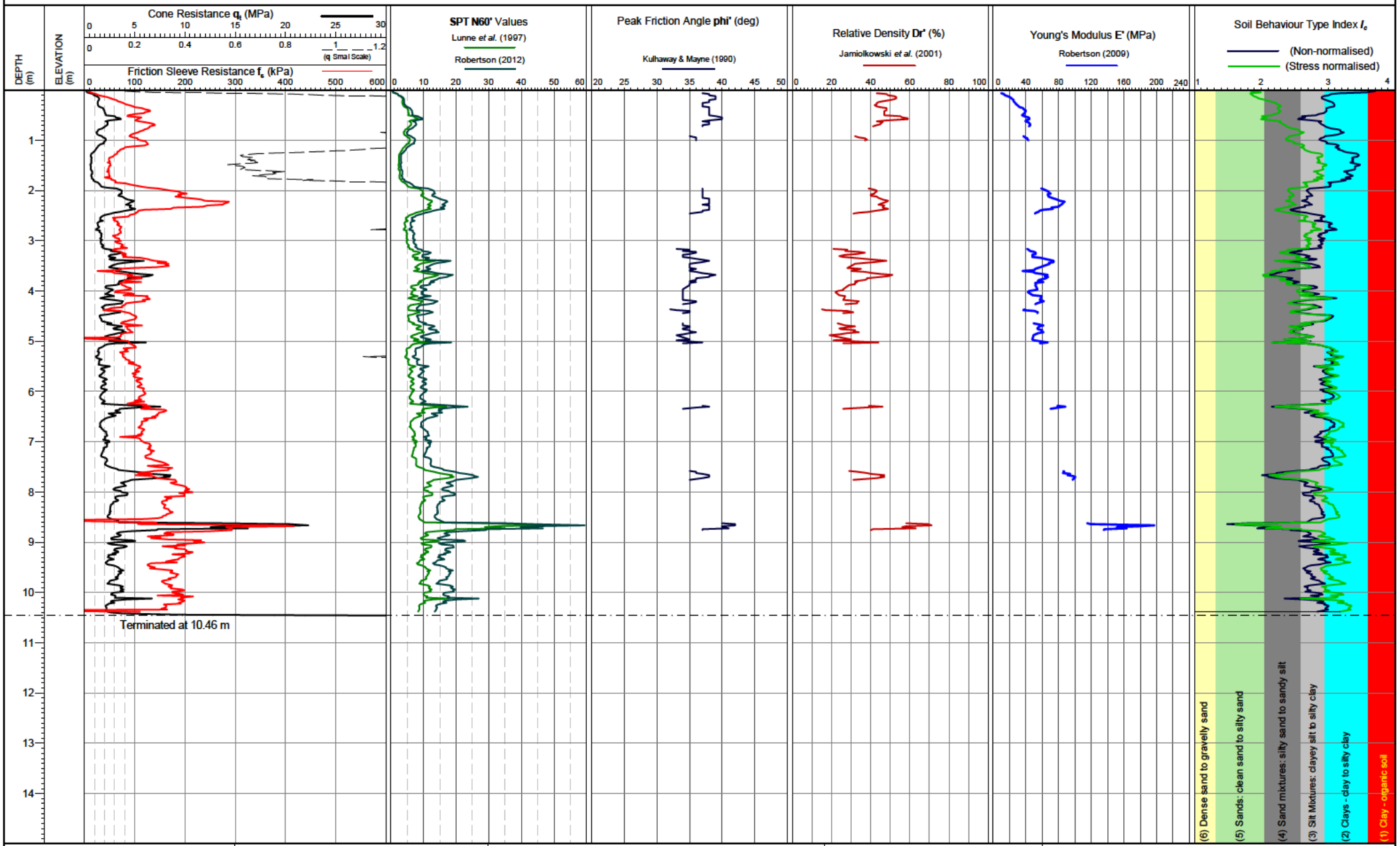
Lankelma Project Ref: P-107408-1

TEST ID: CPT5008

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 08 55 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

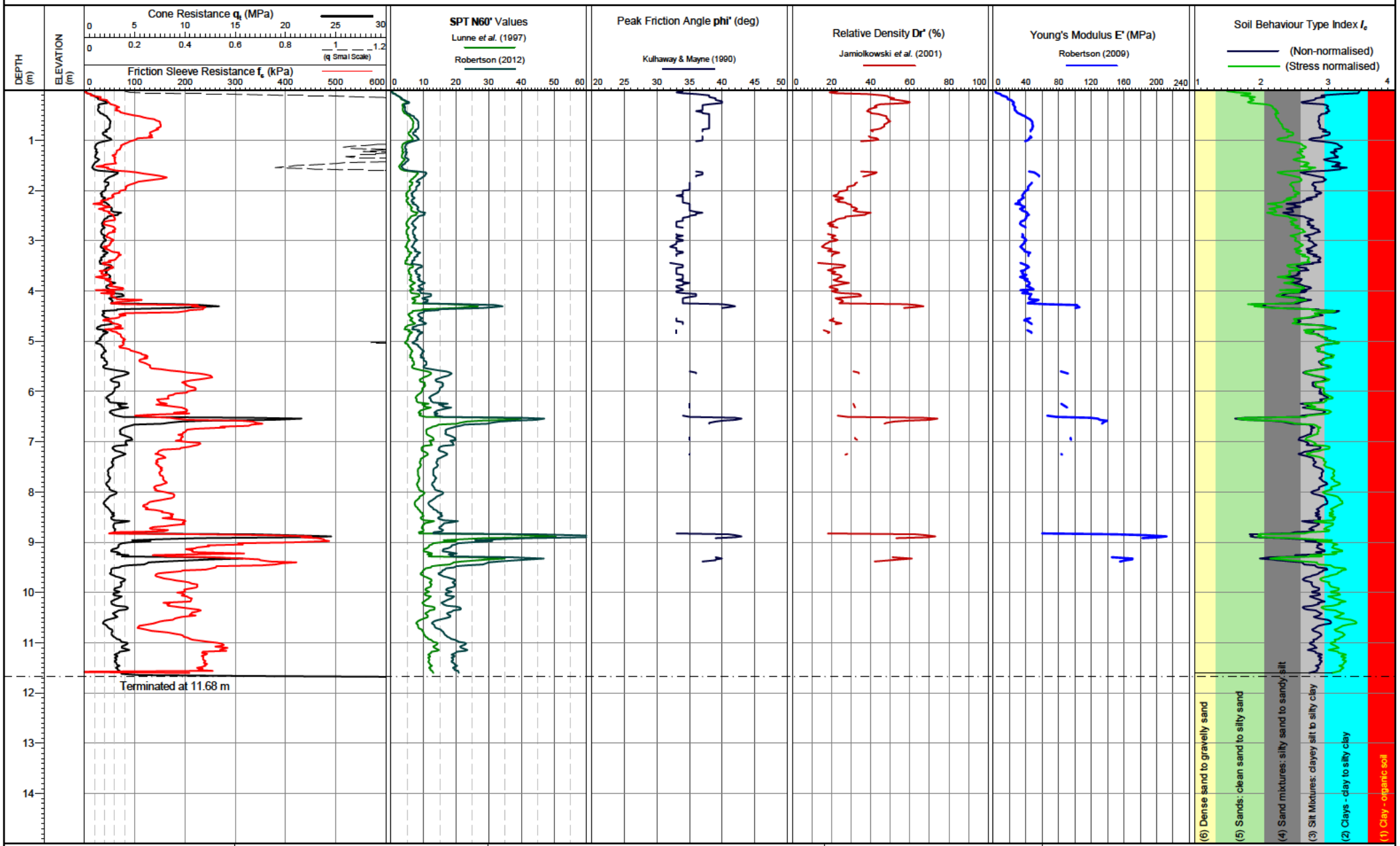
Lankelma Project Ref: P-107408-1

TEST ID: CPT5009

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Jamie Butterworth
Date of test: 14/02/2020 14 54 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

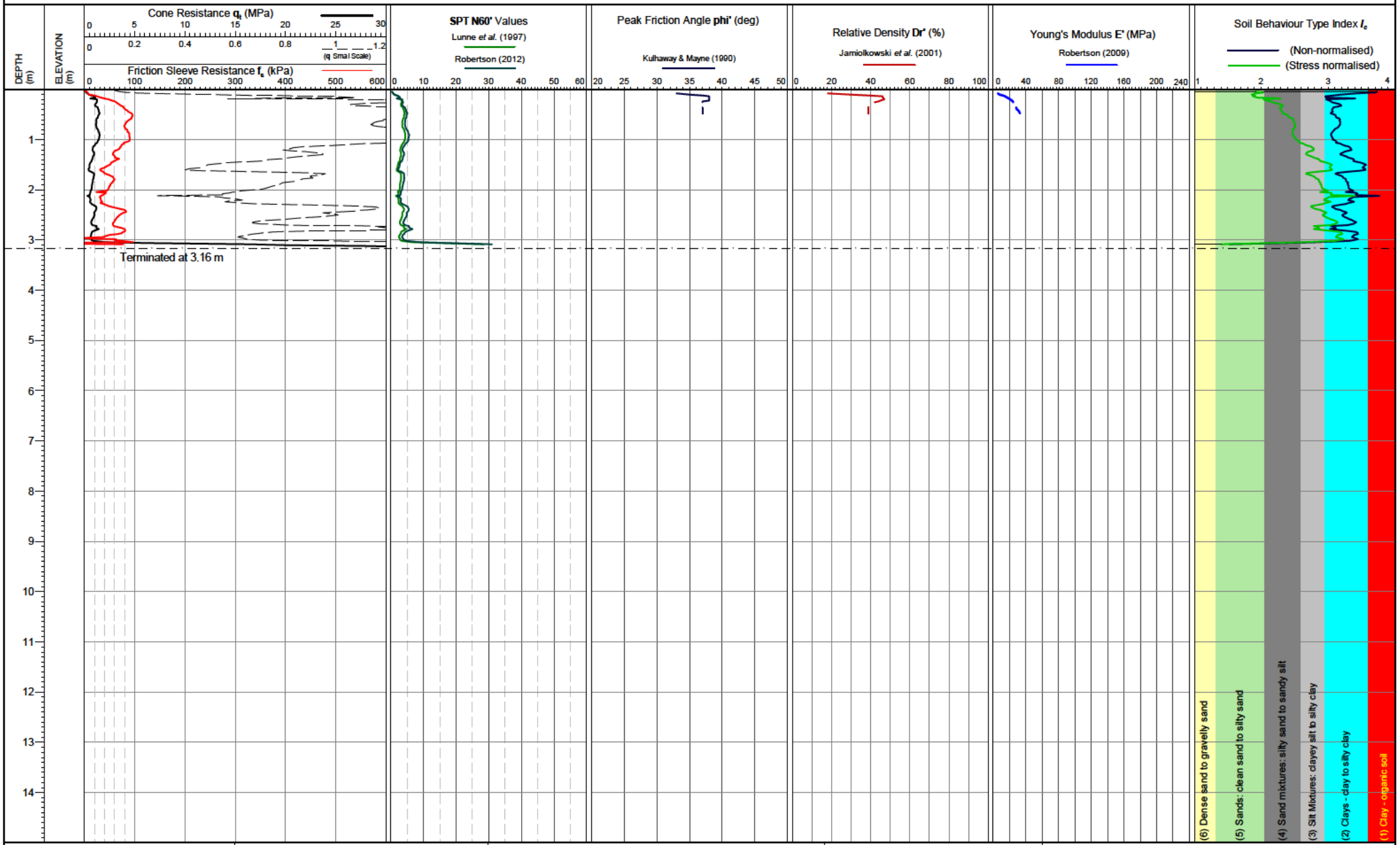
Lankelma Project Ref: P-107408-1

TEST ID: CPT5010

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 09 09 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

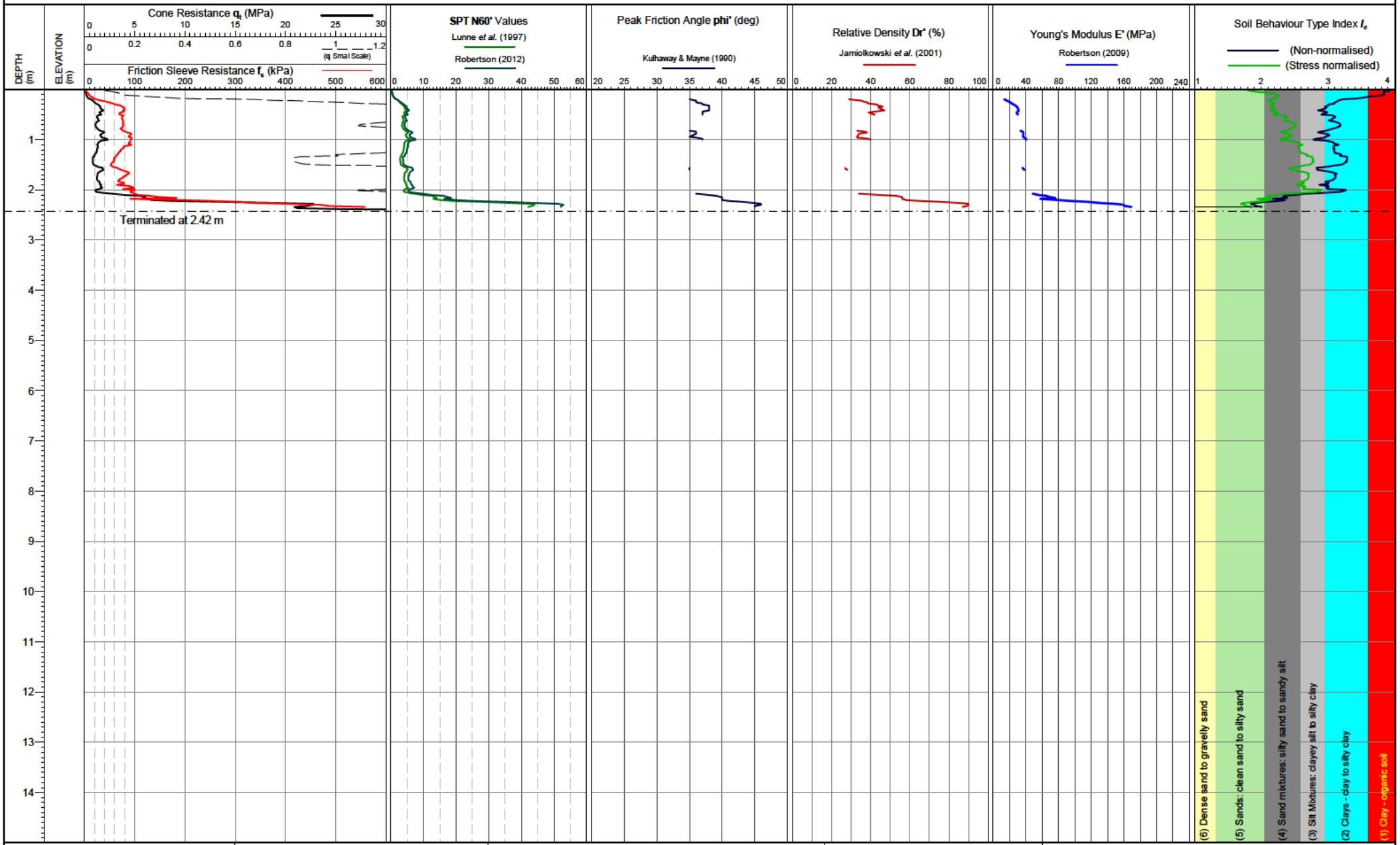
Lankelma Project Ref: P-107408-1

TEST ID: CPT5011

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 09 32 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

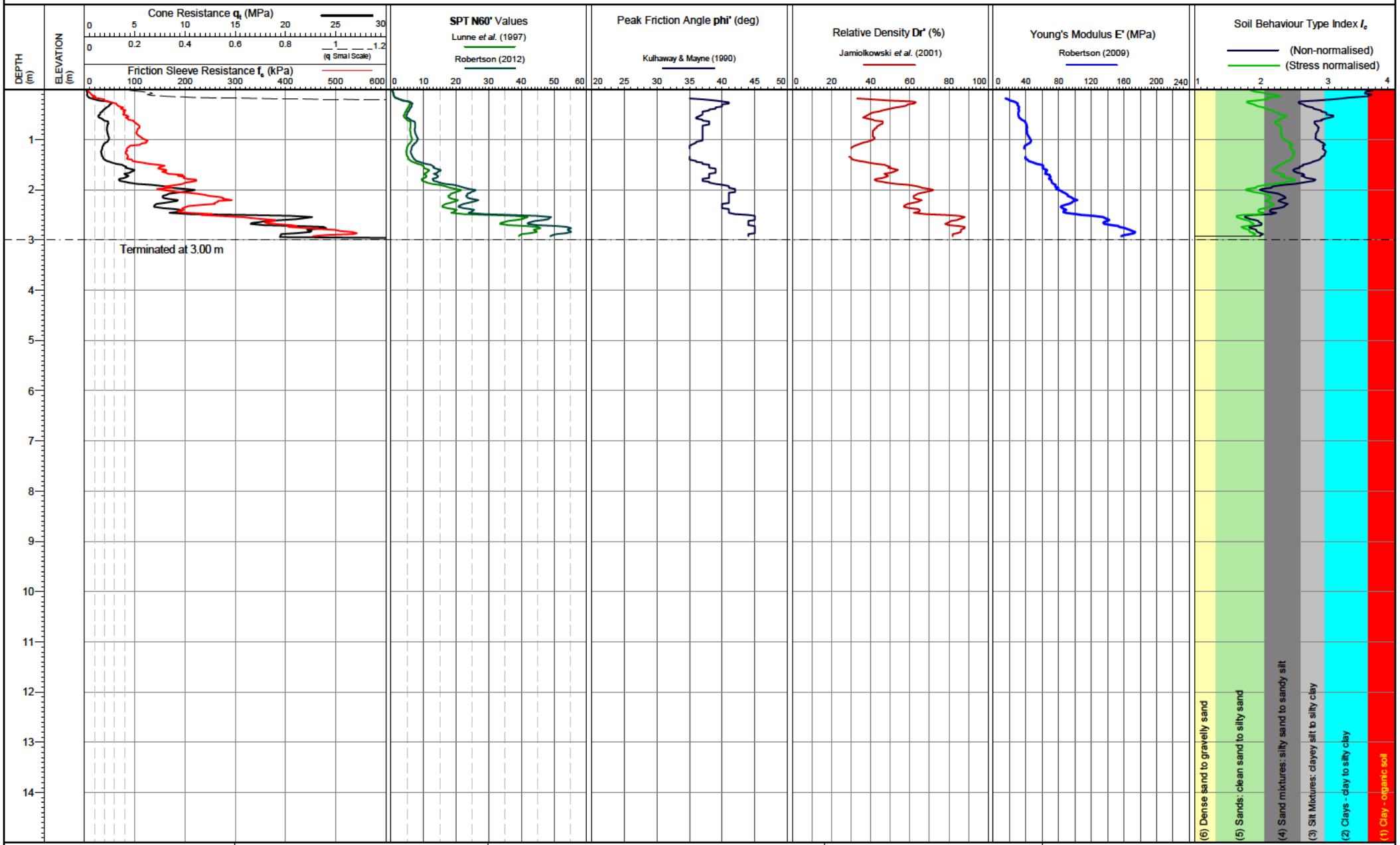
Lankelma Project Ref: P-107408-1

TEST ID: CPT5012

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 10:14 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section Interpretive Data' for methods and discussion of parameter evaluation.

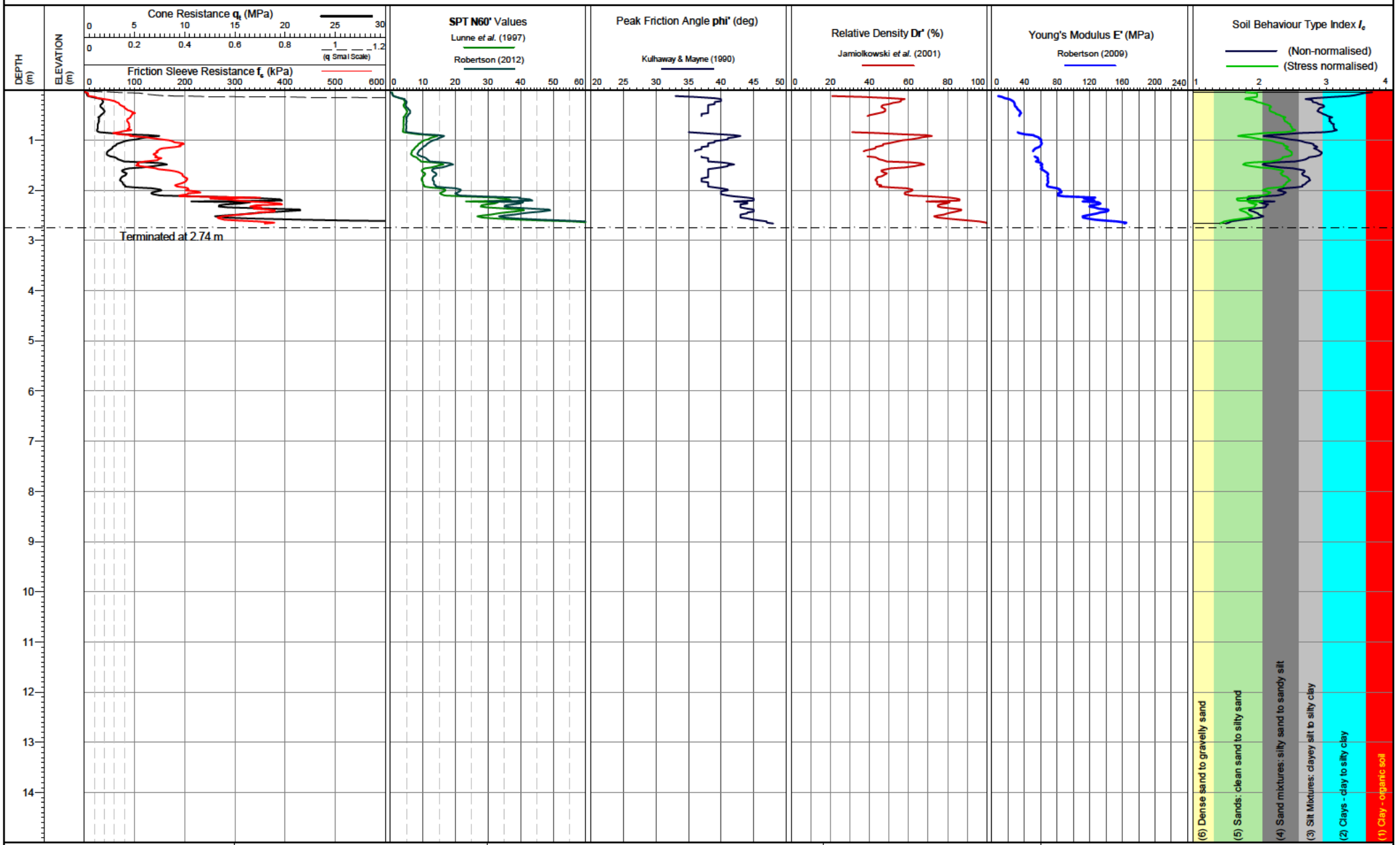
Date of plot: 24-02-20
Checked by: Chris Player
Lankelma Project Ref: P-107408-1

TEST ID: CPT5012A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 09 59 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

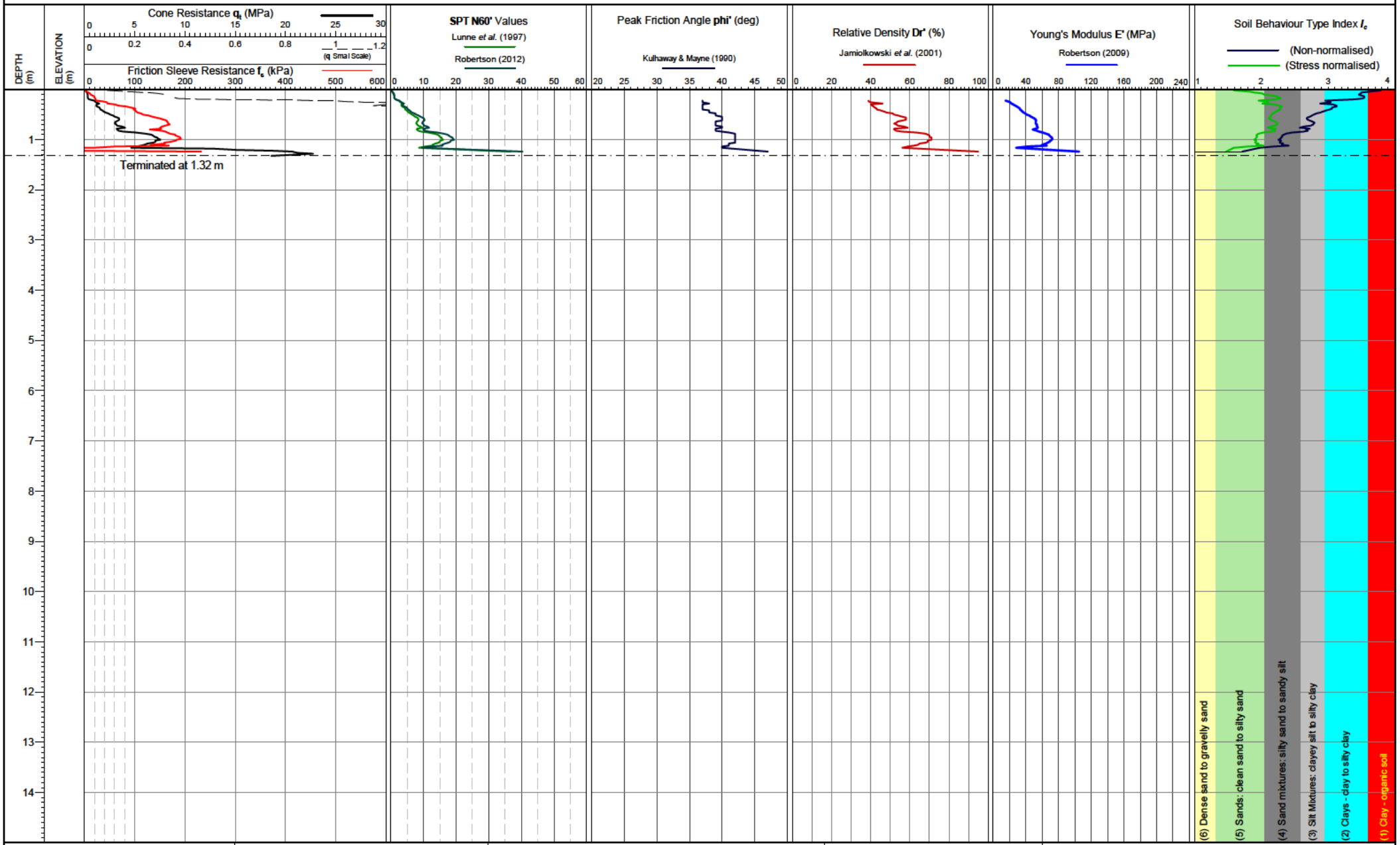
Lankelma Project Ref: P-107408-1

TEST ID: CPT5013

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 12 58 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

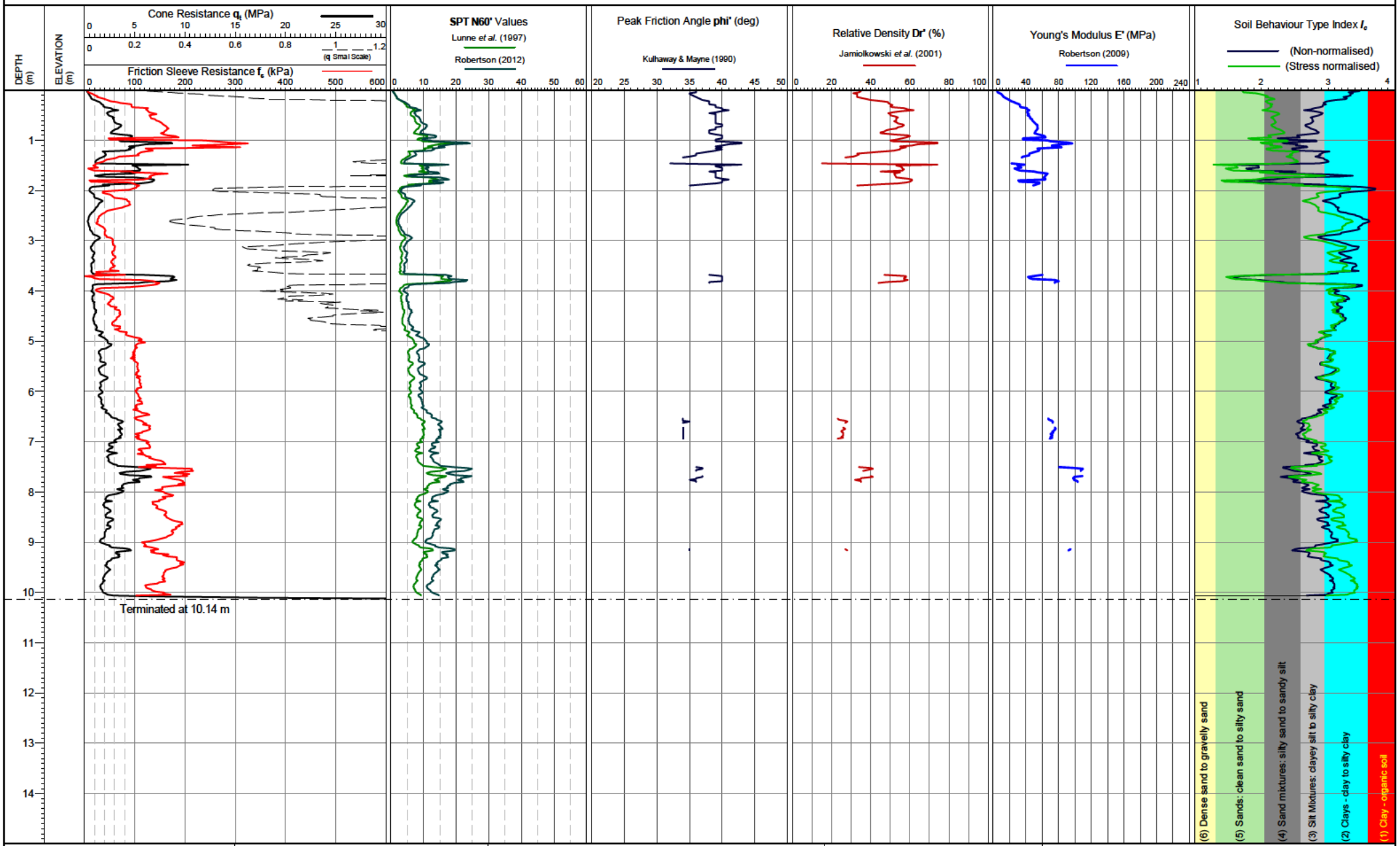
Date of plot: 24-02-20
Checked by: Chris Player
Lankelma Project Ref: P-107408-1

TEST ID: CPT5014

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 13:12 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

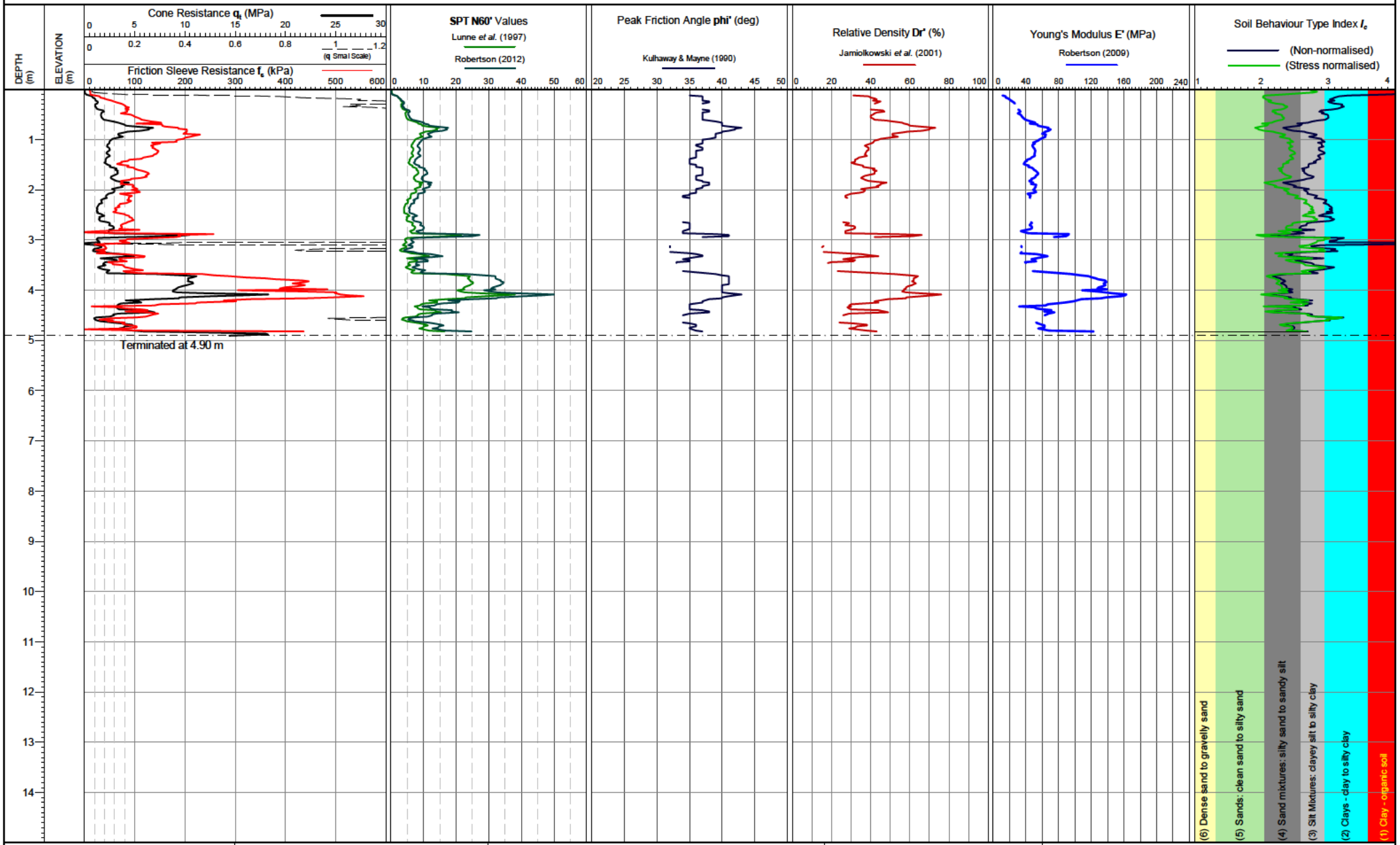
Lankelma Project Ref: P-107408-1

TEST ID: CPT5014A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 12:14 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

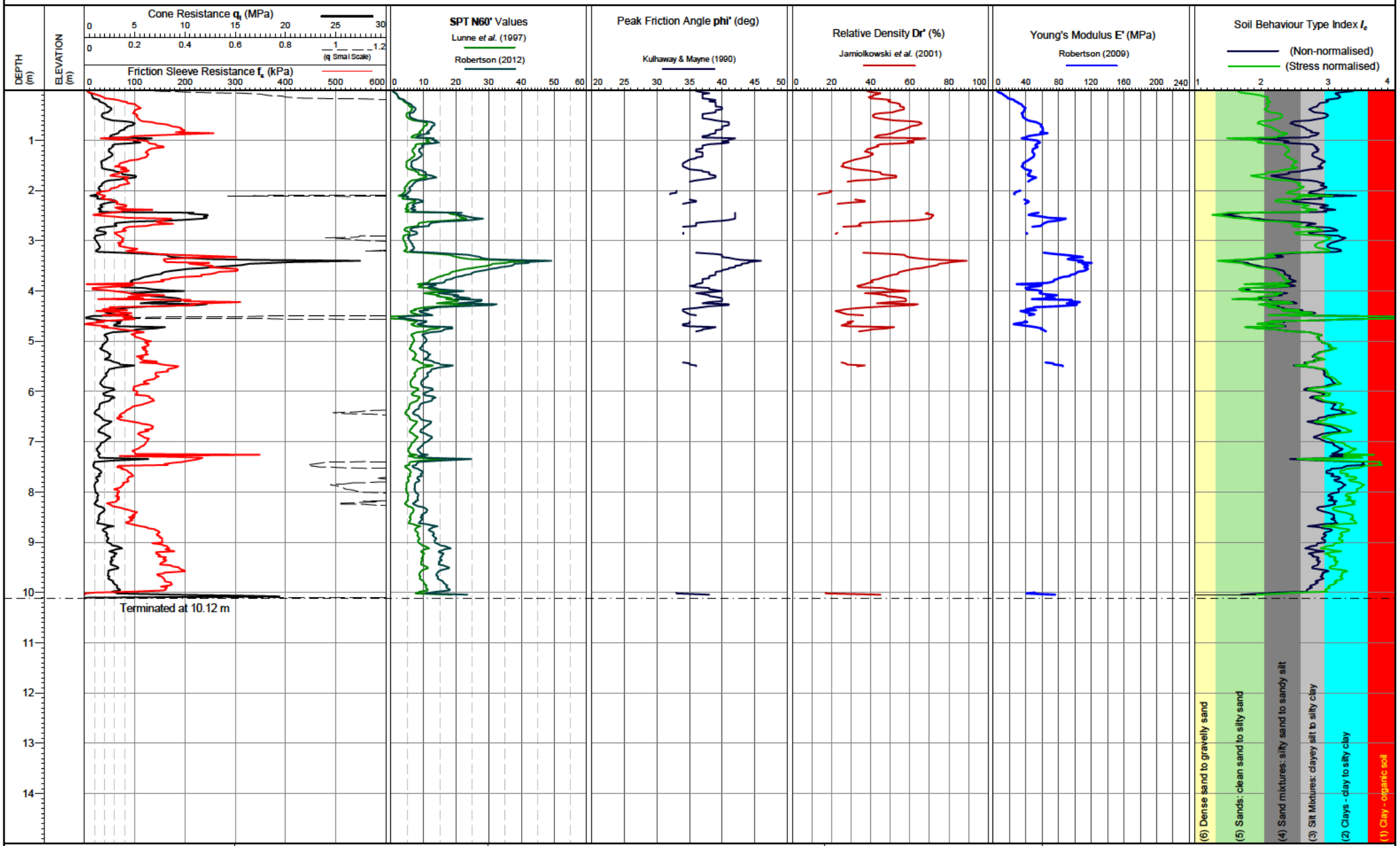
Lankelma Project Ref: P-107408-1

TEST ID: CPT5015

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 13:43 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

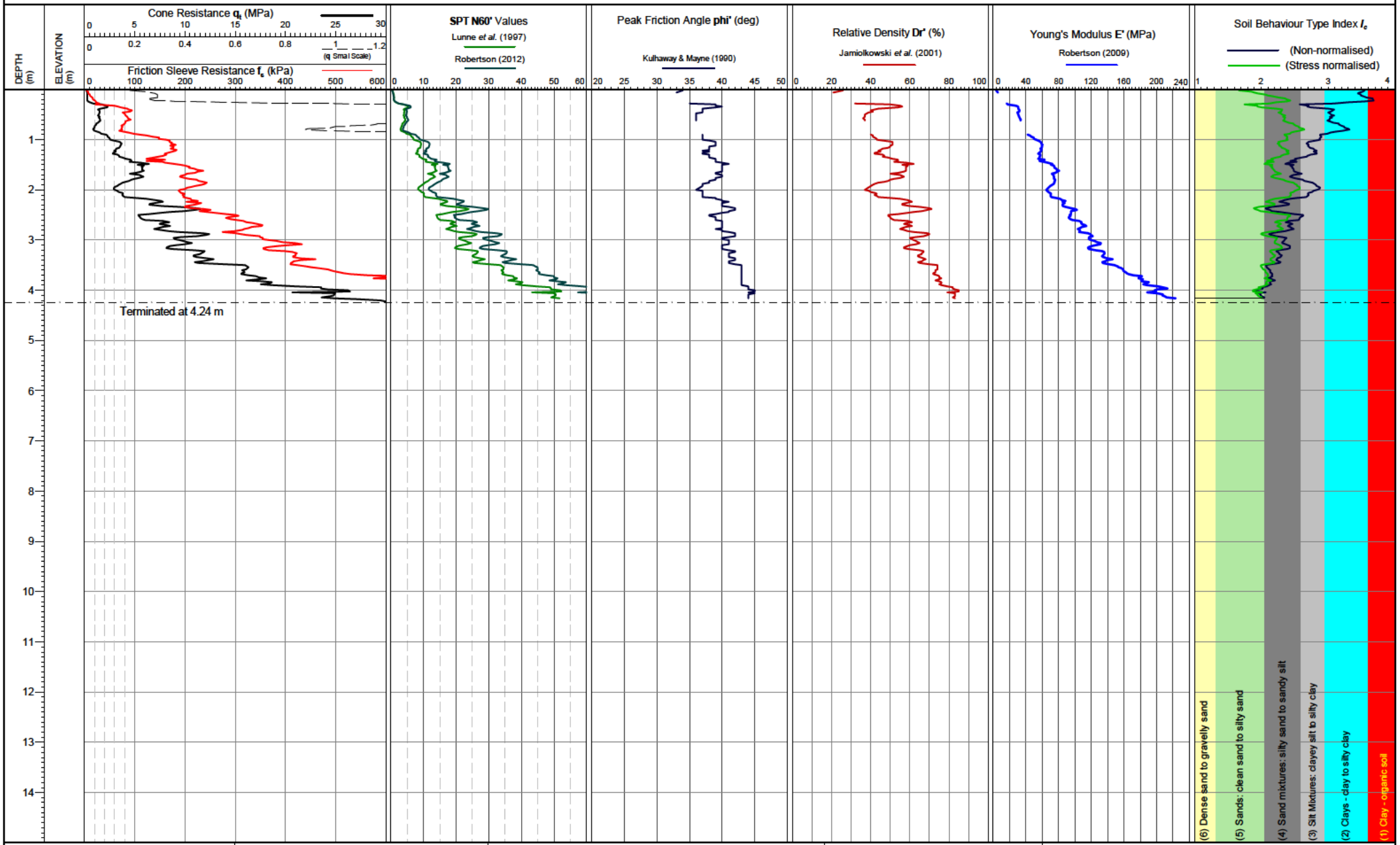
Lankelma Project Ref: P-107408-1

TEST ID: CPT5015A

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 11 50 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

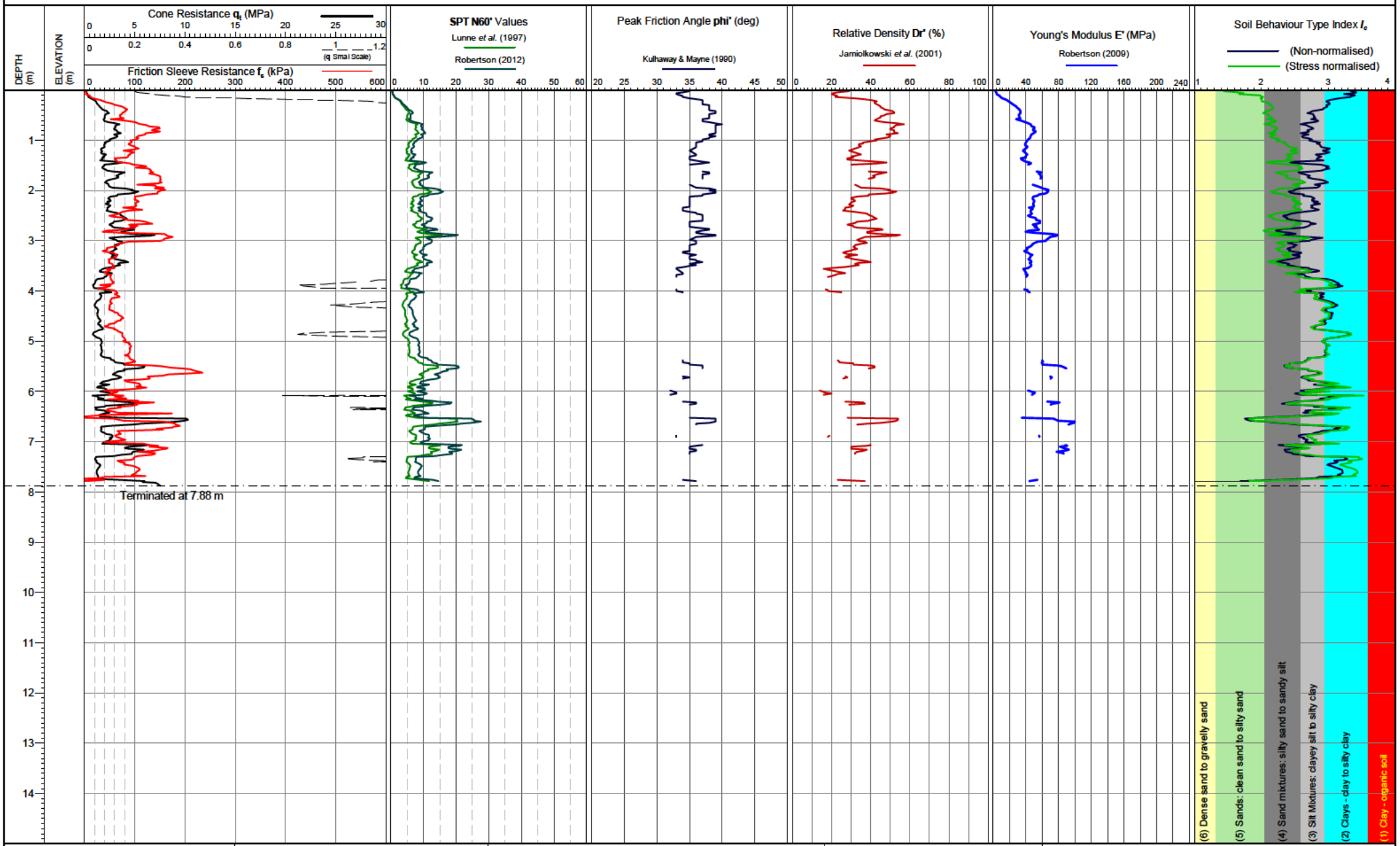
Lankelma Project Ref: P-107408-1

TEST ID: CPT5016

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 11 22 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player

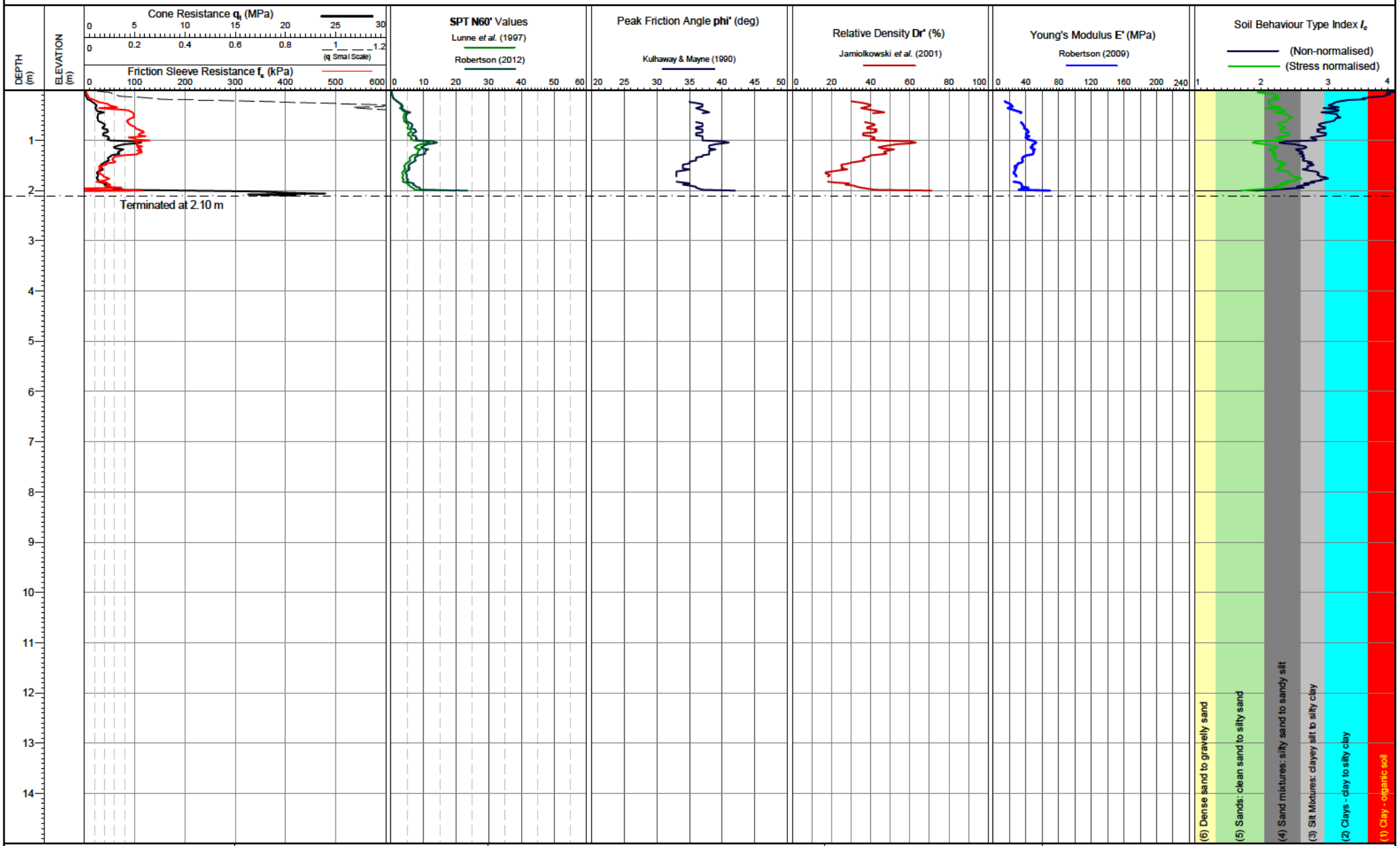
Lankelma Project Ref: P-107408-1

TEST ID: CPT5017

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 10 32 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20

Checked by: Chris Player

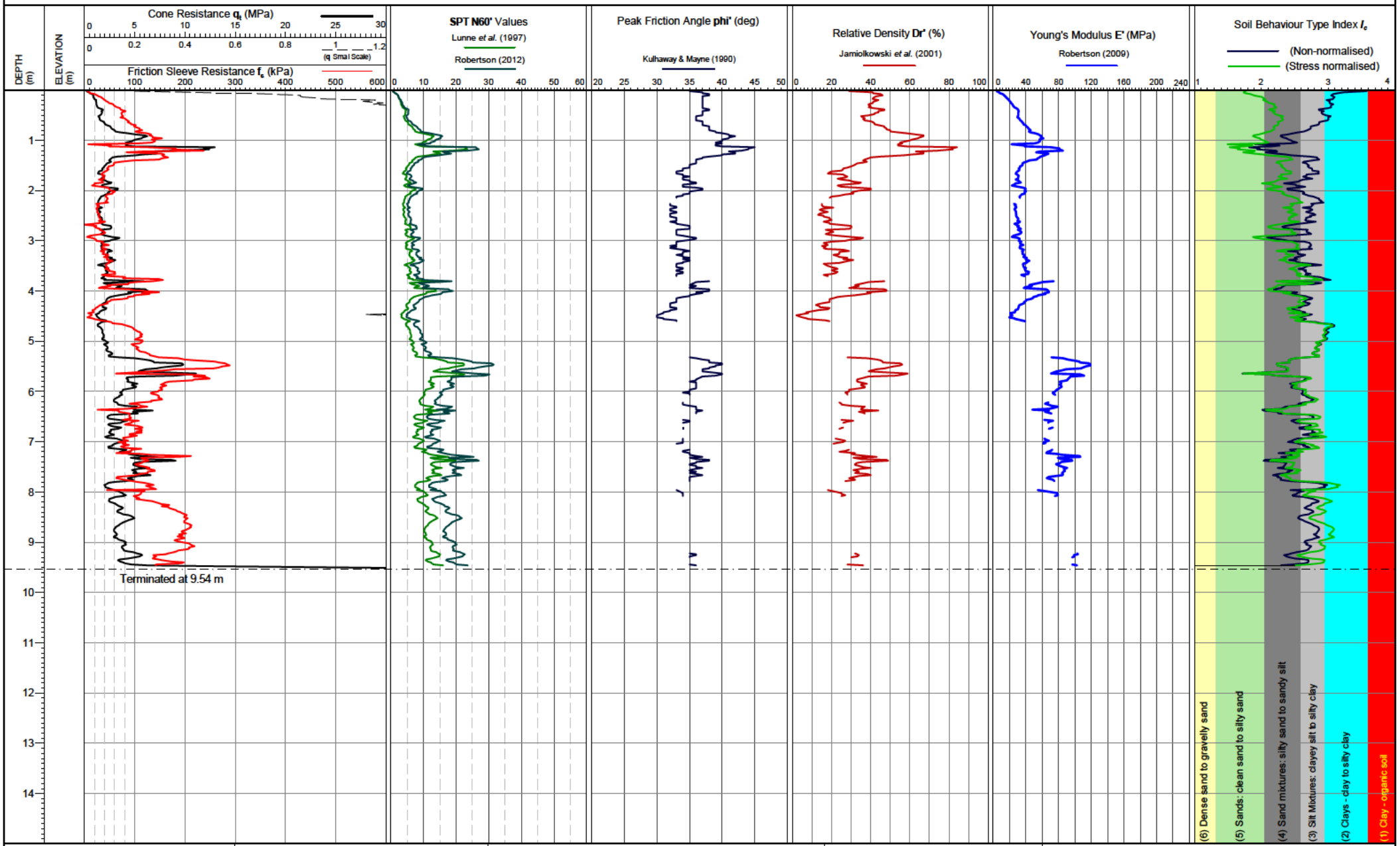
Lankelma Project Ref: P-107408-1

TEST ID: CPT5018

LANKELMA

Project: HOYLAND COMMON, BARNSLEY

Client: APPLIED GEOLOGY



Cone area (mm2):1500
Cone D: S15-CFIP.1819
Operator: Phillip Case
Date of test: 21/02/2020 10 53 00

Location: South Yorkshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report section 'Drained and Undrained Behaviour' for discussion.
See report section 'Interpretive Data' for methods and discussion of parameter evaluation.

Date of plot: 24-02-20
Checked by: Chris Player
Lankelma Project Ref: P-107408-1

TEST ID: CPT5018A

BOREHOLE LOG - DRIVEN CONTINUOUS SAMPLING

DCS6001

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 1
Start	02/03/2020	**Coordinates**	E 435208.34 N 400174.54	**Scale**	1:25
End	02/03/2020	**Ground Level**	148.91m AOD	**Total Depth**	3.43m

Sample / Test Type	Depth (m)	Result	Dia./ Rec.	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	0.10				(0.20)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to medium angular to subrounded brick and mudstone.			
ES	0.10			148.71	0.20	(TOPSOIL/MADE GROUND)			
					(0.40)	Firm to stiff greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone and coal. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	0.50								
ES	0.50			148.31	0.60	Stiff to very stiff grey and orange slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	1.00				(0.70)				
S	1.20	N >50							
				147.61	1.30	Very stiff grey CLAY. (PENNINE MIDDLE COAL MEASURES FORMATION)			
			92mm /100%						
					(1.00)				
D	2.00								
S	2.00	N = 20							
				146.61	2.30	Extremely weak grey and brown MUDSTONE recovered as of fine to coarse angular to subangular gravel. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	2.50		79mm /90%						
					(1.13)				
D	3.00								
S	3.00	N >50							
				145.48	3.43	End of Borehole at 3.43m			

Installation:
Remarks: Borehole backfilled with arisings on completion.

Groundwater Strikes

Depth Strike	Rose to	Remarks	Cased	Sealed

Drilled: DH

Logged: JW

Checked: SD

Exploratory hole logs to be read in conjunction with key sheet

APPLiED GEOLOGY

BOREHOLE LOG - DRIVEN CONTINUOUS SAMPLING

DCS6002

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 1
Start	02/03/2020	**Coordinates**	E 435175.65 N 400126.63	**Scale**	1:25
End	02/03/2020	**Ground Level**	148.33m AOD	**Total Depth**	3.40m

Sample / Test Type	Depth (m)	Result	Dia./ Rec.	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	0.10				(0.20)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded mudstone and sandstone. (TOPSOIL)			
ES	0.10			148.13	0.20				
D	0.50					Firm to stiff orange and grey slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone and coal. (PENNINE MIDDLE COAL MEASURES FORMATION)			
					(1.40)	*Between 0.92m and 0.96m bgl: semi-bright black clarain coal.*			
S	1.20	N = 8							
D	1.50		101mm /100%	146.73	1.60	Very stiff brownish grey CLAY with frequent fine to coarse angular to subangular mudstone lithorelicts. (PENNINE MIDDLE COAL MEASURES FORMATION)			
S	2.00	N = 21							
					(1.20)				
D	2.30		92mm /100%						
				145.53	2.80	Extremely weak grey MUDSTONE, recovered as fine to coarse angular to subangular gravel. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	3.00								
S	3.00	N >50			(0.60)				
				144.93	3.40	End of Borehole at 3.40m			

Installation: 50mm diameter standpipe installed 3.00m bgl.
Remarks:

Groundwater Strikes

Depth Strike	Rose to	Remarks	Cased	Sealed

Drilled: DH
Logged: JW
Checked: SD

Exploratory hole logs to be read in conjunction with key sheet

APPLiED GEOLOGY

BOREHOLE LOG - DRIVEN CONTINUOUS SAMPLING

DCS6003

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 1
Start	02/03/2020	**Coordinates**	E 435194.47 N 400083.64	**Scale**	1:25
End	02/03/2020	**Ground Level**	148.32m AOD	**Total Depth**	2.94m

Sample / Test Type	Depth (m)	Result	Dia./ Rec.	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	0.10				(0.20)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse subangular to subrounded mudstone and sandstone.			
ES	0.10			148.12	0.20	(TOPSOIL)			
						Firm to stiff brownish grey and orange slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone and coal. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	0.60				(1.15)				
S	1.20	N = 7							
				146.97	1.35	Very stiff to stiff grey and light brown CLAY with occasional fine to medium angular to subangular mudstone lithorelicts. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	1.50		101mm /100%						
					(1.05)				
S	2.00	N = 50							
D	2.30								
			79mm /100%	145.92	2.40	Extremely weak grey and brown MUDSTONE, recovered as fine to coarse angular to subangular gravel. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	2.60								
S	2.65	N >50			(0.54)				
				145.38	2.94	End of Borehole at 2.94m			

Installation:
Remarks: Borehole backfilled with arisings on completion.

Groundwater Strikes

Depth Strike	Rose to	Remarks	Cased	Sealed

Drilled: DH

Logged: JW

Checked: SD

Exploratory hole logs to be read in conjunction with key sheet

APPLiED GEOLOGY

BOREHOLE LOG - DRIVEN CONTINUOUS SAMPLING

DCS6004

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 1
Start	02/03/2020	**Coordinates**	E 435234.00 N 400096.74	**Scale**	1:25
End	02/03/2020	**Ground Level**	148.74m AOD	**Total Depth**	2.13m

Sample / Test Type	Depth (m)	Result	Dia./ Rec.	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	0.10				(0.20)	Soft brown slightly gravelly CLAY with frequent rootlets. Gravel is fine to coarse angular to subrounded sandstone, mudstone and brick. (TOPSOIL/MADE GROUND)			
ES	0.10			148.54	0.20				
D	0.25			148.44	(0.10)	Black and red sandy GRAVEL of fine to coarse angular to subrounded brick, clinker and sandstone. (MADE GROUND)			
ES	0.25				0.30				
D	0.60				(0.45)	Firm brownish grey gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone and coal. (PENNINE MIDDLE COAL MEASURES FORMATION)			
				147.99	0.75	Firm becoming very stiff brown and orange CLAY with occasional to frequent fine to coarse angular to subangular mudstone lithorelicts. (PENNINE MIDDLE COAL MEASURES FORMATION)			
S	1.20	N = 6							
					(1.20)				
D	1.50		92mm /100%						
				146.79	1.95				
D	2.00				(0.18)	Extremely weak grey MUDSTONE. (PENNINE MIDDLE COAL MEASURES FORMATION)			
S	2.00	N >50		146.61	2.13				
						End of Borehole at 2.13m			

Installation: 50mm diameter standpipe installed to 2.00m bgl.

Remarks:

Groundwater Strikes

Depth Strike	Rose to	Remarks	Cased	Sealed

Drilled: DH

Logged: JW

Checked: SD

Exploratory hole logs to be read in conjunction with key sheet

APPLiED GEOLOGY

BOREHOLE LOG - DRIVEN CONTINUOUS SAMPLING

DCS6005

Project	Hoyland Common, Barnsley			**Project No.**	AG3080-19
Client	Newlands Developments			**Sheet**	1 of 1
Start	02/03/2020	**Coordinates**	E 435246.00 N 400058.01	**Scale**	1:25
End	02/03/2020	**Ground Level**	148.77m AOD	**Total Depth**	3.30m

Sample / Test Type	Depth (m)	Result	Dia./ Rec.	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	0.10				(0.20)	Soft brown slightly gravelly CLAY with fr4equent rootlets. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and brick. (TOPSOIL/MADE GROUND)			
ES	0.10			148.57	0.20				
D	0.50					Firm to stiff orangish brown and grey slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded coal and mudstone. (PENNINE MIDDLE COAL MEASURES FORMATION)			
					(1.60)				
S	1.20	N = 8							
D	1.50		92mm /100%						
				146.97	1.80				
S	2.00	N = 21				Very stiff grey CLAY with occasional to frequent fine to coarse angular to subangular mudstone lithorelicts. (PENNINE MIDDLE COAL MEASURES FORMATION)			
					(1.00)				
D	2.50		79mm /70%						
				145.97	2.80				
S	2.90	N >50				Extremely weak grey MUDSTONE recovered as fine to coarse subangular gravel. (PENNINE MIDDLE COAL MEASURES FORMATION)			
D	3.00				(0.50)				
				145.47	3.30	End of Borehole at 3.30m			

Installation:
Remarks: Borehole backfilled with arisings on completion.

Groundwater Strikes

Depth Strike	Rose to	Remarks	Cased	Sealed

Drilled: DH

Logged: JW

Checked: SD

Exploratory hole logs to be read in conjunction with key sheet

APPLiED GEOLOGY

SPT SUMMARY SHEET

Project: Hoyland Common, Barnsley
Client: Newlands Developments
Project No: AG3080-19

Borehole No.	Borehole depth (m)	Bottom depth (m)	Casing depth (m)	Water Level (m)	Equipment ref.	Seating Drive				Test Drive								Total Pen (mm)	Test Type	N Value
						Blows		Pen (mm)		Blows				Pen (mm)						
DCS6001	1.20	1.61			110.119	2	7	75	75	12	13	15	10	75	75	75	30	255	S	>50
DCS6001	2.00	2.45			110.119	4	6	75	75	5	6	5	4	75	75	75	75	300	S	20
DCS6001	3.00	3.43			110.119	11	11	75	75	10	15	15	10	75	75	75	50	275	S	>50
DCS6002	1.20	1.65			110.119	1	1	75	75	2	2	2	2	75	75	75	75	300	S	8
DCS6002	2.00	2.45			110.119	2	4	75	75	4	5	5	7	75	75	75	75	300	S	21
DCS6002	3.00	3.40			110.119	15	8	75	75	10	15	17	8	75	75	75	20	245	S	>50
DCS6003	1.20	1.65			110.119	1	1	75	75	2	1	2	2	75	75	75	75	300	S	7
DCS6003	2.00	2.45			110.119	5	4	75	75	4	7	17	22	75	75	75	75	300	S	50
DCS6003	2.65	2.94			110.119	10	15	75	40	18	24	8		75	75	20		170	S	>50
DCS6004	1.20	1.65			110.119	1	0	75	75	1	1	2	2	75	75	75	75	300	S	6
DCS6004	2.00	2.28			110.119	4	18	75	75	24	26			75	50			125	S	>50
DCS6005	1.20	1.65			110.119	1	1	75	75	2	2	2	2	75	75	75	75	300	S	8
DCS6005	2.00	2.45			110.119	3	4	75	75	4	6	5	6	75	75	75	75	300	S	21
DCS6005	2.90	3.30			110.119	10	13	75	75	13	15	15	7	75	75	75	20	245	S	>50
RC4001	1.00	1.45			D95	2	2	75	75	4	7	8	7	75	75	75	75	300	S	26
RC4001	2.50	2.95			D95	1	1	75	75	2	5	4	2	75	75	75	75	300	S	13
RC4001	3.20	3.28			D95	10	15	75	0										S	>50
RC4001	10.60	11.05			D95	1	2	75	75	3	5	9	7	75	75	75	75	300	S	24
RC4002	1.00	1.45			D95	2	4	75	75	4	5	7	10	75	75	75	75	300	S	26
RC4002	2.50	2.58			D95	5	20	75	0										S	>50
RC4003	1.00	1.45			D95	1	1	75	75	1	1	1	2	75	75	75	75	300	S	5
RC4003	2.50	2.95			D95	10	15	75	75	11	9	13	17	75	75	75	75	300	S	50
RC4005	1.00	1.45			D95	1	1	75	75	2	2	2	2	75	75	75	75	300	S	8
RC4005	2.50	2.77			D95	12	13	75	45	16	34			75	75			150	S	>50
RC4006	1.00	1.45			D95	1	1	75	75	1	1	1	1	75	75	75	75	300	S	4
RC4006	2.50	2.95			D95	1	1	75	75	1	1	1	1	75	75	75	75	300	S	4
RC4006	4.00	4.45			D95	1	1	75	75	2	2	1	2	75	75	75	75	300	S	7
RC4006	5.50	5.95			D95	1	2	75	75	2	2	2	2	75	75	75	75	300	S	8
RC4006	7.00	7.00			D95	9		0											S	>50
RC4007	1.00	1.45			D95	1	3	75	75	2	2	2	2	75	75	75	75	300	S	8
RC4007	2.45	2.90			D95	2	3	75	75	3	2	2	3	75	75	75	75	300	S	10
RC4007	3.90	4.35			D95	1	1	75	75	2	3	2	2	75	75	75	75	300	S	9
RC4007	4.50	4.65			D95	3	10	75	75										S	>50
RC4008	1.00	1.45			D95	1	1	75	75	1	2	3	3	75	75	75	75	300	S	9

Notes:
1. Test carried out in general accordance with BS EN ISO 22476-3:2005
2. N values have not been subjected to any correction.
3. Test carried out using split spoon S, or solid cone C.

APPLiED GEOLOGY

SPT SUMMARY SHEET

Project: Hoyland Common, Barnsley
Client: Newlands Developments
Project No: AG3080-19

Borehole No.	Borehole depth (m)	Bottom depth (m)	Casing depth (m)	Water Level (m)	Equipment ref.	Seating Drive		Test Drive			Test Type	N Value
						Blows	Pen (mm)	Blows	Pen (mm)	Total Pen (mm)		
RC4008	2.50	2.87			D95	2 7	75 75	10 15 25	75 75 70	220	S	>50
RC4008	3.90	4.35			D95	3 6	75 75	10 14 12 13	75 75 75 75	300	S	49
RC4008	5.35	5.80			D95	1 1	75 75	5 9 16 17	75 75 75 75	300	S	47
RC4008	6.80	7.25			D95	4 2	75 75	6 5 7 8	75 75 75 75	300	S	26
RC4008	7.80	7.90			D95	25	75	50	25	25	S	>50
RC4009	1.00	1.45			D95	2 1	75 75	2 2 2 4	75 75 75 75	300	S	10
RC4009	2.50	2.95			D95	9 8	75 75	9 10 11 13	75 75 75 75	300	S	43
RC4010	1.00	1.45			D95	1 1	75 75	1 2 3 3	75 75 75 75	300	S	9
RC4010	2.50	2.95			D95	4 4	75 75	7 7 6 5	75 75 75 75	300	S	25
RC4010	4.00	4.45			D95	1 2	75 75	2 2 3 7	75 75 75 75	300	S	14
RC4010	5.50	5.95			D95	3 3	75 75	5 8 6 10	75 75 75 75	300	S	29
RC4010	8.50	8.95			D95	4 5	75 75	6 9 9 10	75 75 75 75	300	S	34
RC4010	10.00	10.45			D95	1 1	75 75	3 5 5 10	75 75 75 75	300	S	23
RC4011	1.00	1.45			D95	2 3	75 75	3 4 4 5	75 75 75 75	300	S	16
RC4011	1.80	2.25			D95	8 9	75 75	9 10 9 9	75 75 75 75	300	S	37
RC4012	1.00	1.45			D95	5 8	75 75	9 10 12 16	75 75 75 75	300	S	47
RC4012	2.50	2.88			D95	3 4	75 75	7 7 36	75 75 75	225	S	>50
RC4013	1.00	1.45			D95	1 1	75 75	2 2 2 2	75 75 75 75	300	S	8
RC4013	2.50	2.95			D95	2 2	75 75	3 5 5 8	75 75 75 75	300	S	21
RC4013	4.00	4.45			D95	5 8	75 75	10 7 5 5	75 75 75 75	300	S	27
RC4013	5.50	5.95			D95	2 4	75 75	4 6 6 9	75 75 75 75	300	S	25
RC4013	7.00	7.45			D95	3 4	75 75	5 5 5 5	75 75 75 75	300	S	20
RC4013	8.50	8.95			D95	3 5	75 75	7 8 10 11	75 75 75 75	300	S	36
RS3001	1.00	1.45			110.119	2 2	75 75	2 2 2 3	75 75 75 75	300	S	9
RS3001	2.00	2.26			110.119	15 10	75 50	22 28	75 60	135	S	>50
RS3002	5.00	5.45			TD34	2 1	75 75	2 2 2 3	75 75 75 75	300	S	9
RS3002	6.50	6.95			TD34	2 2	75 75	2 2 2 3	75 75 75 75	300	S	9
RS3003	1.50	1.95			TD34	2 2	75 75	2 2 2 2	75 75 75 75	300	S	8
RS3003	3.00	3.45			TD34	1 2	75 75	2 2 5 2	75 75 75 75	300	S	11
RS3003	4.50	4.95			TD34	1 1	75 75	1 2 2 1	75 75 75 75	300	S	6
RS3003	6.00	6.11			TD34	15	75	35	30	30	S	>50
RS3004	1.50	1.95			TD34	2 2	75 75	2 2 2 2	75 75 75 75	300	S	8
RS3004	3.00	3.45			TD34	1 1	75 75	1 2 2 2	75 75 75 75	300	S	7
RS3004	4.50	4.95			TD34	1 2	75 75	2 2 2 2	75 75 75 75	300	S	8

Notes:
1. Test carried out in general accordance with BS EN ISO 22476-3:2005
2. N values have not been subjected to any correction.
3. Test carried out using split spoon S, or solid cone C.

APPLiED GEOLOGY

SPT SUMMARY SHEET

Project: Hoyland Common, Barnsley
Client: Newlands Developments
Project No: AG3080-19

Borehole No.	Borehole depth (m)	Bottom depth (m)	Casing depth (m)	Water Level (m)	Equipment ref.	Seating Drive		Test Drive			Test Type	N Value
						Blows	Pen (mm)	Blows	Pen (mm)	Total Pen (mm)		
RS3004	6.00	6.03			TD34	50	25				S	>50
RS3004	7.50	7.95			TD34	2 2	75 75	3 3 2 3	75 75 75 75	300	S	11
RS3004	9.00	9.45			TD34	5 5	75 75	4 6 5 5	75 75 75 75	300	S	20
RS3009	2.95	3.28			TD34	6 12	75 75	11 15 7	75 75 25	175	S	>50
RS3010	1.50	1.95			TD34	1 2	75 75	3 3 3 4	75 75 75 75	300	S	13
RS3010	3.00	3.33			TD34	6 9	75 75	11 16 8	75 75 30	180	S	>50
RS3010	4.50	4.86			TD34	1 10	75 75	14 15 10	75 75 55	205	S	>50
RS3022	4.50	4.68			TD34	8 17	75 75	25	25	25	S	>50
RS3023	3.50	3.51			TD34	50	10				S	>50
RS3025	1.00	1.45				2 1	75 75	3 2 3 3	75 75 75 75	300	S	11
RS3025	2.00	2.45				8 10	75 75	5 4 3 4	75 75 75 75	300	S	16
RS3025	3.00	3.27				18 7	75 30	20 21 9	75 75 15	165	S	>50

Notes:
1. Test carried out in general accordance with BS EN ISO 22476-3:2005
2. N values have not been subjected to any correction.
3. Test carried out using split spoon S, or solid cone C.

APPLiED GEOLOGY

Driven Continuous Sampling

Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005



Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	110.119
Test Date:	20/03/2019
Report Date:	20/03/2019
File Name:	110.119.spt
Test Operator:	TS

Instrumented Rod Data

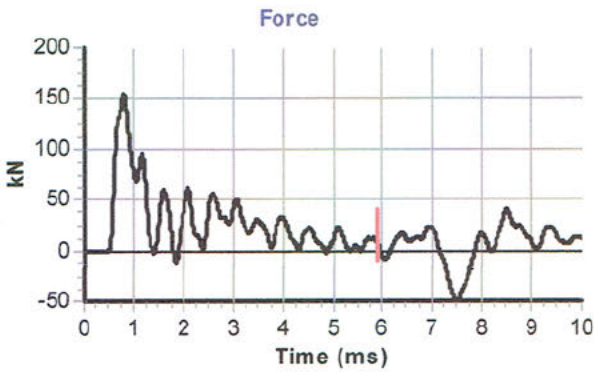
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	9603
Accelerometer No.2:	6457

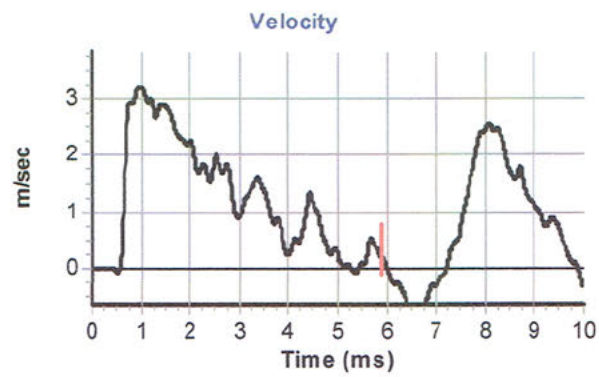
Hammer Information

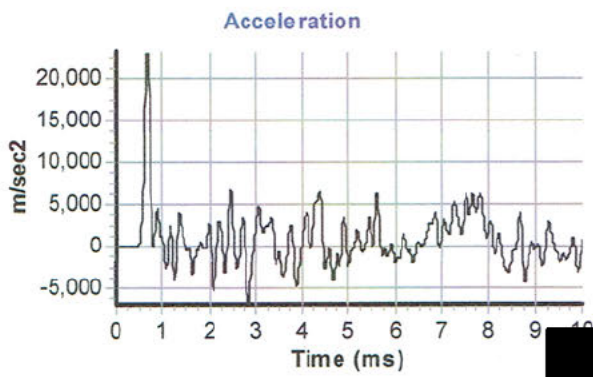
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

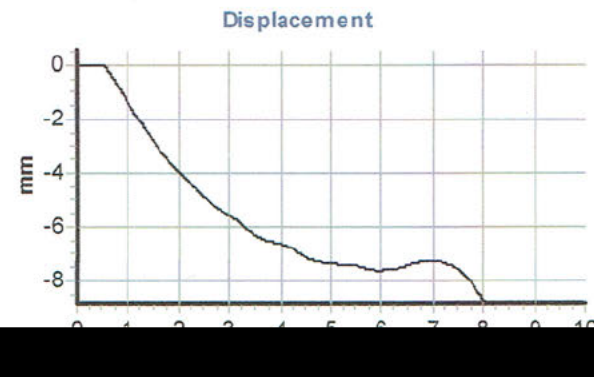
Comments / Location

Applied geology tested at Dynamic samplings yard.









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	373

Energy Ratio E_r (%): **79**

[redacted]

Title: Associate Director.

The recommended calibration interval is 12 months

SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010

Exploratory Hole Log Key Sheet

Sample Notation

D	Small Disturbed sample
B	Bulk Disturbed sample
ES	Environmental sample
U	Undisturbed U100 sample
UT	Undisturbed UT100 sample
C	Core sample
W	Water sample

In Situ Test Notation

S	Standard Penetration Test
S (C)	Standard Penetration Test (cone)
HV	Hand Shear Vane Test
PID	Photoionization Detector Test
MEXE	Mexecone Cone Penetrometer Test
PP	Pocket Penetrometer Test
K	Permeability Test

Results Notation

Cu	Shear Strength	kN/m^2
N	SPT N Value	-
PID	VOC Concentration	ppm
( )	U/UT Blow Count	-

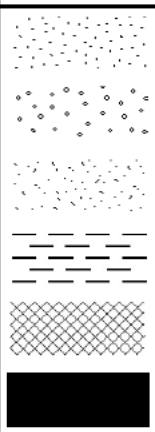
Rotary Core Notation

TCR	Total Core Recovery
SCR	Solid Core Recovery
RQD	Rock Quality Designation
FI	Fracture Index
If	Fracture Spacing
NI	Non Intact
NR	No Recovery
NA	Not Applicable

Ease of Dig

VE	Very Easy
E	Easy
M	Moderate
H	Hard
VH	Very Hard

Backfill Symbols



Sand

Gravel

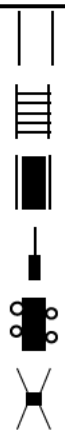
Concrete

Bentonite

Arisings

Grout

Installation Symbols



Plain Standpipe

Slotted Standpipe

Piezometer

Vibrating Wire Piezometer

Inclinometer

Extensometer
(with magnet locations)

Groundwater (GW)



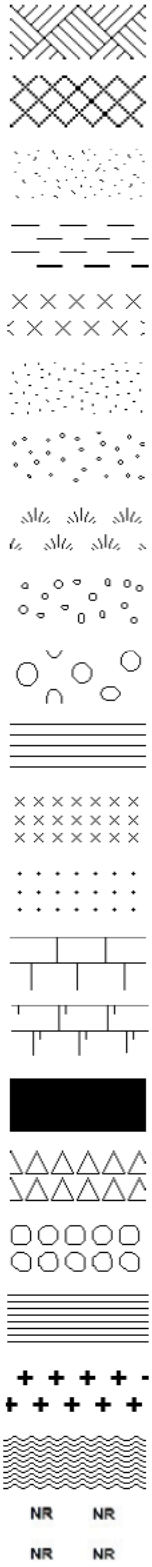
Rise

Groundwater Str ke -
with Recorded Rise

Strike

Groundwater Str ke -
No Recorded Rise

Legend Symbols



Topsoil

Made Ground

Concrete

Clay

Silt

Sand

Gravel

Peat

Cobbles

Boulders

Mudstone

Siltstone

Sandstone

Limestone

Chalk

Coal

Breccia

Conglomerate

Shale

Igenous Rock

Metamorphic Rock

NR NR
NR NR

No Recovery

Note: Most soils comprise a mixture of particle sizes. The soil type is graphically represented on the log and may be a combination of these symbols.

General Notes

1. Details of the standpipe/piezometer are given on the log. The 'Install' column shows a graphical representation of the installed including depth of instruments including slotted section or piezometer depth, and backfill details.

2. Standard Penetration Test is defined in BS EN ISO 17892. Total N value is shown on the logs, full details of the test increments, equipment references, water and casing levels shown on the SPT Summary Sheet.

APPLiED GEOLOGY

APPENDIX C

PHOTOS – ISSUE VIA DROP BOX LINK SEPARATELY

APPENDIX D

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 03/03/2020 11.30am

Phase of Monitoring: 1 of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
DCS6002	<0.1	<0.1	<0.1	6.09	<0.1	<0.1	0.1	0.1	20.9	20.9	50	0.41
DCS6004	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	2.1	2.1	19.9	19.9	50	1.29
RC4001	2.8	1.5	-	7.03	<0.1	<0.1	3.6	3.6	13.4	13.4	50	5.41
RC4004	<0.1	<0.1	<0.1	0.15	<0.1	<0.1	0.6	0.6	20.5	20.5	19	8.16
RC4007	<0.1	<0.1	<0.1	-0.15	<0.1	<0.1	4.2	4.2	6.2	6.2	50	
RC4009												
RC4010	<0.1	<0.1	<0.1	0.41	<0.1	<0.1	2.2	2.2	20.3	20.3	19	8.96

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
DCS6002		<1	<1	
DCS6004		<1	<1	
RC4001		1	<1	
RC4004		22	<1	
RC4007		<1	<1	
RC4009				
RC4010		6	<1	

Borehole specific comments/observations
RC4001- flow steadily falling
RC4007 - bung concreted in, unable to dip
RC4009 - installation flooded, no casing around standpipe

Meterological Data

Atmospheric Pressure (mb)	Start: 982
Atmospheric Pressure (mb)	Finish: 983
Pressure Rising or Falling	Falling
Weather Conditions	50% cloud cover
Atmospheric Oxygen (% vol)	20.8
Wind Speed & Direction	Moderate breeze, W/SW
Ambient Air Temperature (°C)	6.0

Site Data

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G505737
P D Serial Number	
Ground Conditions (vegetation stress, visual contamination):	

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 04/03/2020 10.00am

Phase of Monitoring: 1 of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
RS3002	<0.1	<0.1	<0.1	0.05	<0.1	<0.1	2.0	2.0	14.8	14.8	50	3.12
RS3003	-1.0	-4.0	-	-11.66	<0.1	<0.1	0.5	0.5	20.8	20.8	50	1.85
RS3004	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	0.3	0.3	20.8	20.8	50	3.14
RS3005	<0.1	<0.1	<0.1	-0.34	<0.1	<0.1	0.1	0.1	20.7	20.7	50	3.04
RS3008	<0.1	<0.1	<0.1	-1.11	<0.1	<0.1	2.5	2.5	17.4	17.4	50	0.86
RS3010	-0.2	-1.6	-	-6.21	<0.1	<0.1	1.8	1.8	11.9	11.9	50	1.17
RS3013	<0.1	<0.1	<0.1	0.02	<0.1	<0.1	4.3	4.3	4.5	4.5	50	3.09
RS3015	<0.1	<0.1	<0.1	0.26	<0.1	<0.1	0.1	0.1	20.8	20.8	50	6.47
RS3017	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	2.0	2.0	18.7	18.7	50	4.00
RS3019	<0.1	<0.1	<0.1	-0.09	<0.1	<0.1	18.7	18.6	3.8	3.8	50	Dry
RS3022	<0.1	<0.1	<0.1	2.14	<0.1	<0.1	0.3	0.3	19.7	19.7	50	4.03
RS3025	0.2	0.1	0.1	8.26	<0.1	<0.1	2.9	2.9	16.7	16.7	50	1.08

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
RS3002		<1	<1	
RS3003		6	<1	
RS3004		<1	<1	
RS3005		<1	<1	
RS3008		<1	<1	
RS3010		3	<1	
RS3013		<1	<1	
RS3015		<1	<1	
RS3017		<1	<1	
RS3019		4	<1	
RS3022		<1	<1	
RS3025		32	<1	

Borehole specific comments/observations
RS3003- flow steadily rising
RS3010- low steadily falling
RS3015 - slotted pipe to surface
RS3022 - pipe installed upside down, bung not properly sealed

Site Data

Atmospheric Pressure (mb)	Start: 992
Atmospheric Pressure (mb)	Finish: 994
Pressure Rising or Falling	Rising
Weather Conditions	50% cloud cover
Atmospheric Oxygen (% vol)	20.7
Wind Speed & Direction	Moderate breeze, W/SW
Ambient Air Temperature (°C)	10.0

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G505737
PID Serial Number	

Ground Conditions (vegetation stress, visual contamination):

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 16/03/2020 11.40am

Phase of Monitoring: 2 of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
DCS6002	<0.1	<0.1	<0.1	-9.16	<0.1	<0.1	0.1	0.1	20.1	20.1	50	Dry
DCS6004	<0.1	<0.1	<0.1	-0.14	<0.1	<0.1	0.3	0.3	20.7	20.7	50	0.80
RC4001	2.5	<0.1	<0.1	5.85	<0.1	<0.1	3.3	3.3	13.6	13.6	50	5.40
RC4004	<0.1	-2.2	<0.1	-18.22	<0.1	<0.1	0.6	0.6	20.9	20.9	19	8.41
RC4007	<0.1	<0.1	<0.1	4.58	<0.1	<0.1	0.1	0.1	21.3	21.3	50	
RC4009												
RC4010	<0.1	<0.1	<0.1	0.05	<0.1	<0.1	1.8	1.8	20.4	20.4	50	7.05

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
DCS6002		<1	<1	
DCS6004		<1	<1	
RC4001		3	1	
RC4004		37	<1	
RC4007		1	<1	
RC4009				
RC4010		5	<1	

Borehole specific comments/observations
RC4001 - flow stable after 6 minutes
RC4009 - bailed, but still flooding, so protective pipe positioned around installation

Meterological Data

Atmospheric Pressure (mb)	Start: 982
Atmospheric Pressure (mb)	Finish: 983
Pressure Rising or Falling	Falling
Weather Conditions	50% cloud cover
Atmospheric Oxygen (% vol)	20.8
Wind Speed & Direction	Moderate breeze, W/SW
Ambient Air Temperature (°C)	6.0

Site Data

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G505737
P D Serial Number	

Ground Conditions (vegetation stress, visual contamination):

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 16/03/2020 11.40am

Phase of Monitoring: 2 of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
RS3002	<0.1	<0.1	<0.1	3.89	<0.1	<0.1	9.7	9.7	3.7	3.7	50	3.66
RS3003	8.3	<0.1	<0.1	26.81	<0.1	<0.1	4.0	4.0	18.0	18.0	50	3.22
RS3004	<0.1	<0.1	<0.1	1.53	<0.1	<0.1	2.5	2.5	20.6	20.6	50	3.24
RS3005	<0.1	-0.7	<0.1	-1.91	<0.1	<0.1	2.4	2.4	5.8	5.8	50	3.39
RS3008	<0.1	<0.1	<0.1	11.68	<0.1	<0.1	2.3	2.3	18.2	18.2	50	1.38
RS3010	<0.1	-2.3	<0.1	-5.95	<0.1	<0.1	1.5	1.5	14.6	14.6	50	1.44
RS3013	<0.1	<0.1	<0.1	-0.07	<0.1	<0.1	0.1	0.1	21.4	21.4	50	3.28
RS3015	<0.1	<0.1	<0.1	0.00	<0.1	<0.1	1.8	1.6	20.8	20.9	50	Dry
RS3017	<0.1	<0.1	<0.1	0.03	<0.1	<0.1	7.6	7.6	2.6	2.6	50	Dry
RS3019	<0.1	<0.1	<0.1	0.31	<0.1	<0.1	0.5	0.5	21.2	21.2	50	Dry
RS3022	0.3	0.3	0.3	1.42	<0.1	<0.1	3.1	3.1	14.5	14.5	50	4.16
RS3025	9.8	3.1	3.1	35.33	<0.1	<0.1	5.2	5.2	16.7	16.7	17	1.73

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
RS3002		<1	<1	
RS3003		<1	<1	
RS3004		<1	<1	
RS3005		3	<1	
RS3008		9	<1	
RS3010		2	<1	
RS3013		<1	<1	
RS3015		<1	<1	
RS3017		1	<1	
RS3019		1	<1	
RS3022		2	<1	
RS3025		2	<1	

Borehole specific comments/observations
RS3003 - flow stable after 8 minutes
RS3005 - flow stable after 3 minutes
RS3010 - flow stable after 3 minutes
RS3025 - Diff pressure not stabilising. Rose to 35.33; still rising after several restarts & 15 minutes. Flow stable after 3 minutes and monitored for additional 3, remained stable.

Site Data

Atmospheric Pressure (mb)	Start: 992
Atmospheric Pressure (mb)	Finish: 994
Pressure Rising or Falling	Rising
Weather Conditions	50% cloud cover
Atmospheric Oxygen (% vol)	20.7
Wind Speed & Direction	Moderate breeze, W/SW
Ambient Air Temperature (°C)	10.0

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G505737
PID Serial Number	

Ground Conditions (vegetation stress, visual contamination):

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 30/03/2020 11.15

Phase of Monitoring: 3 of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
DCS6002	<0.1	<0.1	<0.1	1.70	<0.1	<0.1	2.8	1.3	19.1	19.7	50	2.00
DCS6004	<0.1	<0.1	<0.1	-0.07	<0.1	<0.1	1.4	1.4	19.8	19.8	50	1.35
RC4001	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	3.6	3.5	9.7	9.7	50	5.73
RC4004	<0.1	-8.5	<0.1	-30.25	<0.1	<0.1	0.1	0.1	21.9	21.9	19	9.03
RC4007	<0.1	<0.1	<0.1	0.07	<0.1	<0.1	2.6	2.6	15.4	15.4	50	2.80
RC4009											19	
RC4010	<0.1	<0.1	<0.1	0.31	<0.1	<0.1	2.0	2.0	19.2	19.2	19	7.22

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
DCS6002		1	<1	
DCS6004		1	<1	
RC4001		1	<1	
RC4004		<1	<1	
RC4007		1	<1	
RC4009				
RC4010		7	<1	

Borehole specific comments/observations
DCS6002, DCS6004: Monitored on the 06/04/2020 due to access restrictions.
RC4009 still flooded

Meterological Data

Atmospheric Pressure (mb)	Start: 1021
Atmospheric Pressure (mb)	Finish: 1019
Pressure Rising or Falling	Falling
Weather Conditions	Broken cloud, occasional light showers
Atmospheric Oxygen (% vol)	20.9
Wind Speed & Direction	moderate breeze
Ambient Air Temperature (°C)	7.0

Site Data

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G506760
P D Serial Number	
Ground Conditions (vegetation stress, visual contamination):	

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 30/03/2020 11.15

Phase of Monitoring: 3 of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
RS3002	<0.1	<0.1	<0.1	-0.17	<0.1	<0.1	8.3	8.3	9.0	9.0	50	4.13
RS3003	-0.3	-0.3	-0.3	-1.80	<0.1	<0.1	4.3	4.3	18.0	18.0	50	3.13
RS3004	0.1	0.1	0.1	0.07	<0.1	<0.1	3.8	3.8	13.5	13.5	50	3.26
RS3005	<0.1	-0.3	-0.3	-1.49	<0.1	<0.1	2.8	2.8	5.0	5.0	50	3.37
RS3008	<0.1	<0.1	<0.1	0.21	<0.1	<0.1	2.0	2.0	19.5	19.5	50	1.60
RS3010	<0.1	-0.2	-0.2	-2.45	<0.1	<0.1	2.7	2.7	13.5	13.5	50	2.08
RS3013	<0.1	<0.1	<0.1	0.05	<0.1	<0.1	3.4	3.4	8.5	8.5	50	3.53
RS3015	<0.1	<0.1	<0.1	0.02	<0.1	<0.1	6.4	6.4	16.0	16.0	50	Dry
RS3017	<0.1	<0.1	<0.1	0.12	<0.1	<0.1	8.7	8.7	3.7	3.7	50	Dry
RS3019	<0.1	<0.1	<0.1	3.38	<0.1	<0.1	22.1	22.1	1.2	1.2	50	Dry
RS3022	<0.1	<0.1	<0.1	-0.07	<0.1	<0.1	3.7	1.1	17.6	20.8	50	4.39
RS3025	6.8	<0.1	<0.1	28.68	<0.1	<0.1	5.4	5.4	17.7	17.7	50	1.85

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
RS3002		<1	<1	
RS3003		<1	<1	
RS3004		2	<1	
RS3005		1	<1	
RS3008		2	<1	
RS3010		<1	<1	
RS3013		1	<1	
RS3015		<1	<1	
RS3017		1	<1	
RS3019		1	<1	
RS3022		<1	<1	
RS3025		1	<1	

Borehole specific comments/observations
RS3025 - flow took 6 mins to stabilise

Site Data

Atmospheric Pressure (mb)	Start: 1021
Atmospheric Pressure (mb)	Finish: 1019
Pressure Rising or Falling	Falling
Weather Conditions	Broken cloud, occasional light showers
Atmospheric Oxygen (% vol)	20.9
Wind Speed & Direction	moderate breeze
Ambient Air Temperature (°C)	7.0

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G506760
PID Serial Number	

Ground Conditions (vegetation stress, visual contamination):

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 14/04/2020 11.30

Phase of Monitoring: 4a of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
DCS6002												
DCS6004												
RC4001	<0.1	<0.1	<0.1	0.03	<0.1	<0.1	1.6	1.6	17.0	17.0	50	6.17
RC4004	<0.1	-11.0	<0.1	-39.60	<0.1	<0.1	0.1	<0.1	21.2	21.3	50	9.88
RC4007	<0.1	<0.1	<0.1	0.10	<0.1	<0.1	1.0	1.0	19.7	19.7	50	2.82
RC4009	<0.1	<0.1	<0.1	39.29	<0.1	<0.1	0.4	0.4	10.9	10.9	19	1.40
RC4010	<0.1	<0.1	<0.1	1.18	<0.1	<0.1	3.2	3.2	16.2	16.2	19	7.46

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
DCS6002				
DCS6004				
RC4001		2	<1	
RC4004		2	<1	
RC4007		1	<1	
RC4009		<1	<1	
RC4010		8	1	

Borehole specific comments/observations

Meterological Data

Atmospheric Pressure (mb)	Start: 1015
Atmospheric Pressure (mb)	Finish: 1012
Pressure Rising or Falling	Falling
Weather Conditions	Dry, sunny
Atmospheric Oxygen (% vol)	20.9
Wind Speed & Direction	Early light breeze, settling to calm.
Ambient Air Temperature (°C)	10.0

Site Data

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G506760
P D Serial Number	

Ground Conditions (vegetation stress, visual contamination):

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 14/04/2020 11.30

Phase of Monitoring: 4a of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
RS3002	<0.1	<0.1	<0.1	0.07	<0.1	<0.1	7.5	7.5	10.4	10.4	50	4.50
RS3003	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	4.4	4.4	17.8	17.8	50	3.45
RS3004											50	3.34
RS3005	<0.1	-2.5	<0.1	-6.39	<0.1	<0.1	2.7	2.7	5.1	5.1	50	3.56
RS3008	<0.1	<0.1	<0.1	0.03	<0.1	<0.1	2.3	0.4	18.7	20.8	50	1.74
RS3010	<0.1	<0.1	<0.1	0.16	<0.1	<0.1	2.5	2.5	13.0	13.0	50	2.47
RS3013	<0.1	<0.1	<0.1	-0.02	<0.1	<0.1	3.5	3.5	7.5	7.5	50	Dry
RS3015	<0.1	<0.1	<0.1	-0.16	<0.1	<0.1	9.4	9.4	14.1	14.1	50	Dry
RS3017	<0.1	<0.1	<0.1	0.17	<0.1	<0.1	8.6	8.6	4.9	4.9	50	Dry
RS3019	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	2.6	2.6	18.7	18.7	50	Dry
RS3022	<0.1	<0.1	<0.1	-0.03	<0.1	<0.1	0.6	0.3	20.6	20.9	50	4.28
RS3025	<0.1	<0.1	<0.1	-0.12	<0.1	<0.1	5.8	5.8	15.8	15.8	50	1.70

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
RS3002		1	<1	
RS3003		1	<1	
RS3004				
RS3005		1	<1	
RS3008		<1	<1	
RS3010		1	1	
RS3013		1	1	
RS3015		1	<1	
RS3017		3	<1	
RS3019		2	<1	
RS3022		2	1	
RS3025		1	1	

Borehole specific comments/observations
RS3004 - bung missing due to ploughing of field.

Site Data

Atmospheric Pressure (mb)	Start: 1015
Atmospheric Pressure (mb)	Finish: 1012
Pressure Rising or Falling	Falling
Weather Conditions	Dry, sunny
Atmospheric Oxygen (% vol)	20.9
Wind Speed & Direction	Early light breeze, settling to calm.
Ambient Air Temperature (°C)	10.0

Monitoring Personnel	Malcolm McGlone
GPS Instrument	
Gasmeter Serial Number	G506760
PID Serial Number	

Ground Conditions (vegetation stress, visual contamination):

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

Ground Gas Monitoring and Flow Results

Project Number: AG3080-19

Project Name: Hoyland Common, Barnsley

Date and Time of Monitoring: 22/04/2020 08:30

Phase of Monitoring: 4b of 4

BH No.	Flow Range (litres/hr over 3 mins)			Differential Pressure (mb)	Methane % v/v		Carbon dioxide % v/v		Oxygen % v/v		Diameter of installation (mm)	Water level (m bgl)
	Max	Min	Avg		Peak	Steady	Peak	Steady	Min	Steady		
DCS6002	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	0.1	0.1	21.1	21.1	50	1.21
DCS6004	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	0.4	0.3	20.9	20.9	50	1.50
RC4001												
RC4004												
RC4007												
RC4009											19	2.30
RC4010											19	7.58

Additional gases (if required)

BH No.	VOCs (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
DCS6002	<0.01			
DCS6004	<0.01			
RC4001				
RC4004				
RC4007				
RC4009				
RC4010				

Borehole specific comments/observations

Meterological Data

Atmospheric Pressure (mb)	Start:	1007
Atmospheric Pressure (mb)	Finish:	1007
Pressure Rising or Falling	Steady	
Weather Conditions	3/8 cloudy	
Atmospheric Oxygen (% vol)	21.0	
Wind Speed & Direction	Gentle Breeze- NE	
Ambient Air Temperature (°C)	8.0	

Site Data

Monitoring Personnel	Carl Sellers
GPS Instrument	
Gasmeter Serial Number	G502550
PID Serial Number	110423
Ground Conditions (vegetation stress, visual contamination):	

General Notes:

1. Instrument specification data and calibration information provided on a separate sheet

APPLiED GEOLOGY

GROUNDWATER SAMPLING RECORD

PROJECT:	Hoyland Common, Barnsley	**PROJECT No:**	AG3080-19
DATE:	16/03/2020	**PHASE OF SAMPLING:**	1
WEATHER:	Light cloud, dry	**AIR TEMP (°C)** 12	**FIELD PERSONNEL:** Malcolm McGlone

Monitoring Well	Standpipe Depth (m bgl)	Standpipe Diameter (mm)	Purging Method*1	Sampling Depth (m bgl)	Groundwater Level Before Purging (m bgl)	Groundwater Level After Purging (m bgl)	Purge Volume (l)	Sample Colour, Odour & Turbidity	Samples Taken *2			LNAPL/ DNAPL *3	Product Thickness (mm)
									P (l)	G (l)	V (no.)		
DCS3025	3.00	50	B	2.28	1.74	2.32	3	Cloudy brown, no odour	1	1	2	N/A	N/A
DCS6004	3.01	50	B	2.03	0.80	2.04	3	Cloudy brown, no odour	1	1	2	N/A	N/A
RS3002	5.40	50	B	3.85	3.67	3.86	4	Cloudy brown, no odour	1	1	2	N/A	N/A
RS3003	5.27	50	B	4.21	3.22	4.25	10	Cloudy brown, no odour	1	1	2	N/A	N/A
RS3004	4.10	50	B	3.49	3.24	3.53	3	Cloudy brown, no odour	1	1	2	N/A	N/A
RC4001	11.35	50	B	5.97	5.40	6.03	10	Slight grey cloud, no odour	1	1	2	N/A	N/A

COMMENTS:
Low purge volumes due to slow recharge

***Notes:**
1. W = Waterra Inertia Tubing, B = Disposable Bailer, P = Downhole Pump.
2. P = Plastic Bottle (l), G = Glass Bottle (l), V = Glass Vial (no.)
3. npd = No Product Detected

See Accompanying Gas Monitoring Sheet: Y

Sample Storage Method: Coolbox

APPLiED GEOLOGY

GROUNDWATER SAMPLING RECORD

PROJECT:	Hoyland Common, Barnsley	**PROJECT No:**	AG3080-19
DATE:	16/03/2020	**PHASE OF SAMPLING:**	1
WEATHER:	Light cloud, dry	**AIR TEMP (°C)** 12	**FIELD PERSONNEL:** Malcolm McGlone

Monitoring Well	Standpipe Depth (m bgl)	Standpipe Diameter (mm)	Purging Method*1	Sampling Depth (m bgl)	Groundwater Level Before Purging (m bgl)	Groundwater Level After Purging (m bgl)	Purge Volume (l)	Sample Colour, Odour & Turbidity	Samples Taken *2			LNAPL/ DNAPL *3	Product Thickness (mm)
									P (l)	G (l)	V (no.)		
RS3008	2.76	50	B	1.85	1.39	1.88	4	Cloudy grey, no odour	1	1	2	N/A	N/A
RS3010	4.45	50	B	1.97	1.44	2.01	6	Cloudy brown, no odour	1	1	2	N/A	N/A
RS3013	4.00	50	B	3.39	3.29	3.72	4	Cloudy brown, no odour	1	1	2	N/A	N/A
RS3022	6.00	50	B	4.66	4.16	4.70	4	Cloudy grey/brown, no odour	1	1	2	N/A	N/A

COMMENTS:
Low purge volumes due to slow recharge. RS3008 - surface water contains oily sheen which entered well when removing bung.

***Notes:**
1. W = Waterra Inertia Tubing, B = Disposable Bailer, P = Downhole Pump.
2. P = Plastic Bottle (l), G = Glass Bottle (l), V = Glass Vial (no.)
3. npd = No Product Detected

See Accompanying Gas Monitoring Sheet: Y

Sample Storage Method: Coolbox

APPLiED GEOLOGY

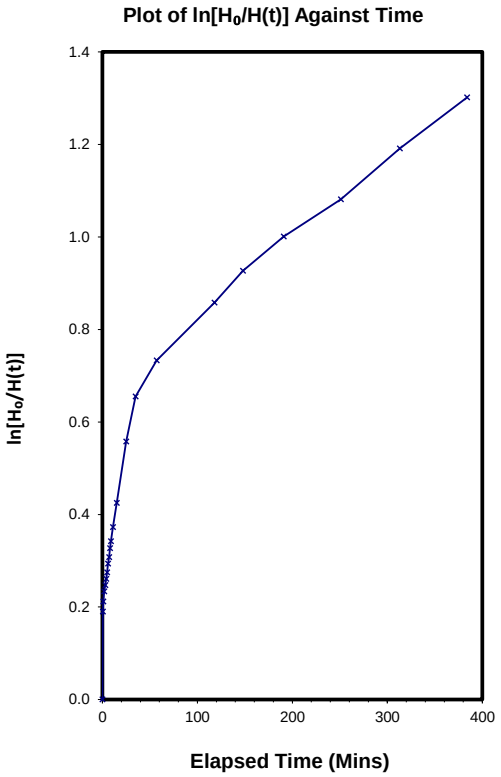
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RC4007	Test No.	1

Date	22/04/2020	Type of Test	FHT
Operator	CS	Ground level (mOD)	145.14
Diameter of response zone, D (mm)	140	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	1.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	2.92	Water level before test, below top of pipe (m)	2.83

Field Data

Elapsed Time (t) (mins)	Dep h to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_0/H(t)$	$\ln[H_0/H(t)]$
0.00	0.00	2.83	1.000	0.000
0.50	0.49	2.34	1.209	0.190
1.00	0.54	2.29	1.236	0.212
2.00	0.59	2.24	1.263	0.234
3.00	0.62	2.21	1.281	0.247
4.00	0.65	2.18	1.298	0.261
5.00	0.68	2.15	1.316	0.275
6.00	0.72	2.11	1.341	0.294
7.00	0.75	2.08	1.361	0.308
8.00	0.79	2.04	1.387	0.327
9.00	0.82	2.01	1.408	0.342
11.00	0.88	1.95	1.451	0.372
15.00	0.98	1.85	1.530	0.425
25.00	1.21	1.62	1.747	0.558
35.00	1.36	1.47	1.925	0.655
57.00	1.47	1.36	2.081	0.733
118.00	1.63	1.20	2.358	0.858
148.00	1.71	1.12	2.527	0.927
191.00	1.79	1.04	2.721	1.001
251.00	1.87	0.96	2.948	1.081
313.00	1.97	0.86	3.291	1.191
384.00	2.06	0.77	3.675	1.302



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	57.00	0.733	$\ln[H_0/H(t)]$
t=	384.00	1.302	$\ln[H_0/H(t)]$

Permeability k= **1.6E-08** m/sec

Client:	Newlands Developments
Project:	Hoyland Common, Barnsley
Project No.	AG3080-19

APPLiED GEOLOGY

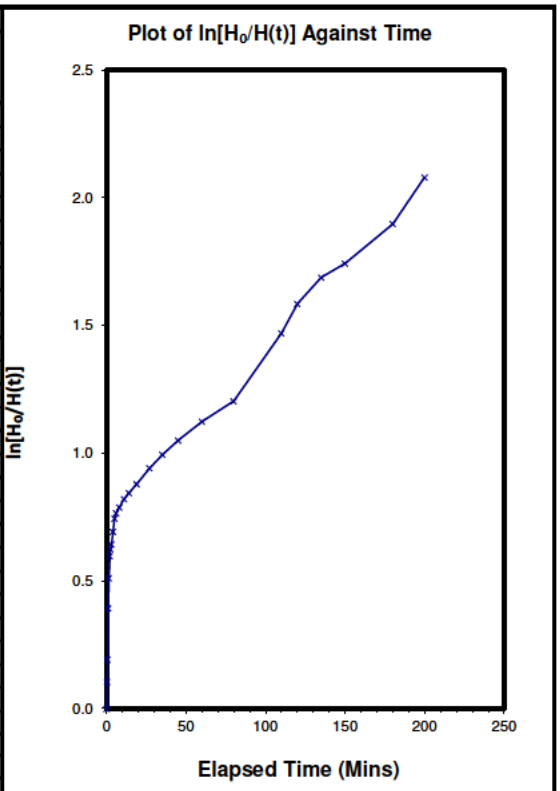
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3002	Test No.	1

Date	18/05/2020	Type of Test	FHT
Operator	JW	Ground level (mOD)	148.00
Diameter of response zone, D (mm)	150	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	2.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	5.00	Water level before test, below top of pipe (m)	5.10

Field Data

Elapsed Time (t) (mins)	Depth to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_0/H(t)$	$\ln[H_0/H(t)]$
0.00	3.10	2.00	1.000	0.000
0.33	3.30	1.80	1.111	0.105
0.66	3.45	1.65	1.212	0.192
1.00	3.75	1.35	1.481	0.393
1.50	3.90	1.20	1.667	0.511
2.00	4.00	1.10	1.818	0.598
2.50	4.03	1.07	1.869	0.625
3.00	4.05	1.05	1.905	0.644
4.00	4.10	1.00	2.000	0.693
5.00	4.15	0.95	2.105	0.744
6.00	4.17	0.93	2.151	0.766
8.00	4.19	0.91	2.198	0.787
11.00	4.22	0.88	2.273	0.821
14.00	4.24	0.86	2.326	0.844
19.00	4.27	0.83	2.410	0.879
27.00	4.32	0.78	2.564	0.942
35.00	4.36	0.74	2.703	0.994
45.00	4.40	0.70	2.857	1.050
60.00	4.45	0.65	3.077	1.124
80.00	4.50	0.60	3.333	1.204
110.00	4.64	0.46	4.348	1.470
120.00	4.69	0.41	4.878	1.585
135.00	4.73	0.37	5.405	1.687
150.00	4.75	0.35	5.714	1.743
180.00	4.80	0.30	6.667	1.897
200.00	4.85	0.25	8.000	2.079
1124.00	5.06	0.04	50.000	3.912



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	5.00	0.744	$\ln[H_0/H(t)]$
t=	1124.00	3.912	$\ln[H_0/H(t)]$

Permeability k= **1.8E-08** m/sec

Client:	Newland Developments
Project:	Hoyland Common
Project No.	AG3080-19

APPLiED GEOLOGY

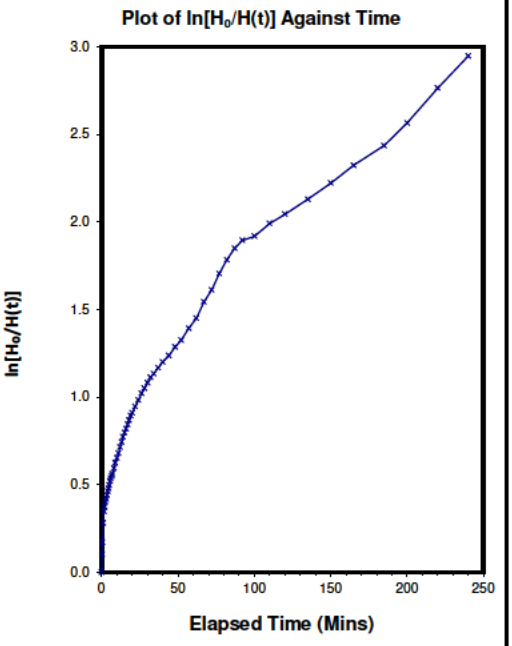
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3003	Test No.	1

Date	19/05/2020	Type of Test	FHT
Operator	JW	Ground level (mOD)	146.77
Dia. of response zone, D (mm)	150	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	2.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	5.00	Water level before test, below top of pipe (m)	2.86

Field Data

Elapsed Time (t) (mins)	Depth to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_o/H(t)$	$\ln[H_o/H(t)]$
0.00	0.00	2.86	1.000	0.000
0.25	0.28	2.58	1.109	0.103
0.50	0.45	2.41	1.187	0.171
1.00	0.70	2.16	1.324	0.281
1.50	0.84	2.02	1.416	0.348
2.00	0.89	1.97	1.452	0.373
2.50	0.95	1.91	1.497	0.404
3.00	0.98	1.88	1.521	0.420
3.50	1.02	1.84	1.554	0.441
4.00	1.06	1.80	1.589	0.463
4.50	1.09	1.77	1.616	0.480
5.00	1.12	1.74	1.644	0.497
5.50	1.16	1.70	1.682	0.520
6.00	1.19	1.67	1.713	0.538
6.50	1.21	1.65	1.733	0.550
7.00	1.23	1.63	1.755	0.562
8.00	1.28	1.58	1.810	0.593
9.00	1.33	1.53	1.869	0.626
10.00	1.37	1.49	1.919	0.652
15.00	1.57	1.29	2.217	0.796
16.00	1.60	1.26	2.270	0.820
17.00	1.63	1.23	2.325	0.844
18.00	1.66	1.20	2.383	0.869
19.00	1.69	1.17	2.444	0.894
20.00	1.71	1.15	2.487	0.911
40.00	2.00	0.86	3.326	1.202
44.00	2.03	0.83	3.446	1.237
48.00	2.07	0.79	3.620	1.287
52.00	2.10	0.76	3.763	1.325
62.00	2.19	0.67	4.269	1.451
67.00	2.25	0.61	4.689	1.545
77.00	2.34	0.52	5.500	1.705
82.00	2.38	0.48	5.958	1.785
87.00	2.41	0.45	6.356	1.849
92.00	2.43	0.43	6.651	1.895
100.00	2.44	0.42	6.810	1.918
110.00	2.47	0.39	7.333	1.992
120.00	2.49	0.37	7.730	2.045
240.00	2.71	0.15	19.067	2.948



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	92.00	1.895	$\ln[H_o/H(t)]$
t=	240.00	2.948	$\ln[H_o/H(t)]$

Permeability k= **4.4E-08** m/sec

Client:	Newland Developments
Project:	Hoyland Common
Project No.	AG3080-19

APPLiED GEOLOGY

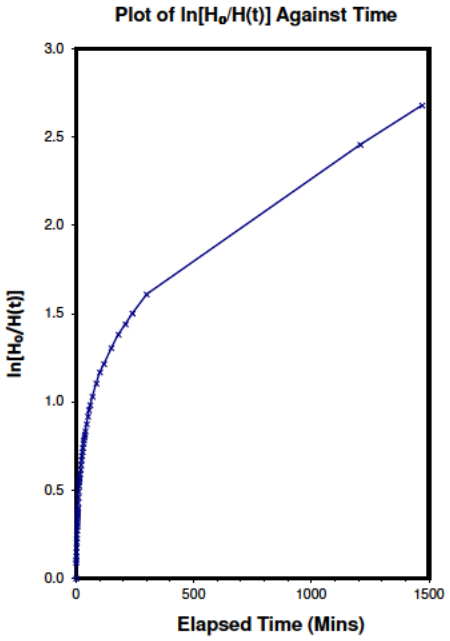
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3004	Test No.	1

Date	18/05/2020	Type of Test	FHT
Operator	JW	Ground level (mOD)	146.69
Diameter of response zone, D (mm)	150	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	1.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	4.00	Water level before test, below top of pipe (m)	3.50

Field Data

Elapsed Time (t) (mins)	Depth to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_0/H(t)$	$\ln[H_0/H(t)]$
0.0	0.00	3.50	1.000	0.000
0.3	0.30	3.20	1.094	0.090
0.5	0.35	3.15	1.111	0.105
6.0	1.00	2.50	1.400	0.336
6.5	1.04	2.46	1.423	0.353
7.0	1.08	2.42	1.446	0.369
7.5	1.12	2.38	1.471	0.386
8.0	1.15	2.35	1.489	0.398
9.0	1.22	2.28	1.535	0.429
10.0	1.29	2.21	1.584	0.460
15.0	1.52	1.98	1.768	0.570
17.0	1.56	1.94	1.804	0.590
19.0	1.61	1.89	1.852	0.616
21.0	1.66	1.84	1.902	0.643
33.0	1.90	1.60	2.188	0.783
35.0	1.93	1.57	2.229	0.802
37.0	1.95	1.55	2.258	0.815
40.0	1.98	1.52	2.303	0.834
45.0	2.04	1.46	2.397	0.874
50.0	2.10	1.40	2.500	0.916
55.0	2.15	1.35	2.593	0.953
60.0	2.19	1.31	2.672	0.983
70.0	2.25	1.25	2.800	1.030
86.0	2.34	1.16	3.017	1.104
101.0	2.41	1.09	3.211	1.167
118.0	2.46	1.04	3.365	1.214
150.0	2.55	0.95	3.684	1.304
180.0	2.62	0.88	3.977	1.381
210.0	2.67	0.83	4.217	1.439
240.0	2.72	0.78	4.487	1.501
300.0	2.80	0.70	5.000	1.609
1208.0	3.20	0.30	11.667	2.457
1470.0	3.26	0.24	14.583	2.680



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

t_o =	150.00	1.304	$\ln[H_0/H(t)]$
t=	1470.00	2.680	$\ln[H_0/H(t)]$

Permeability k= **6.4E-09** m/sec

Client:	Newland Developments
Project:	Hoyland Common
Project No.	AG3080-19

APPLiED GEOLOGY

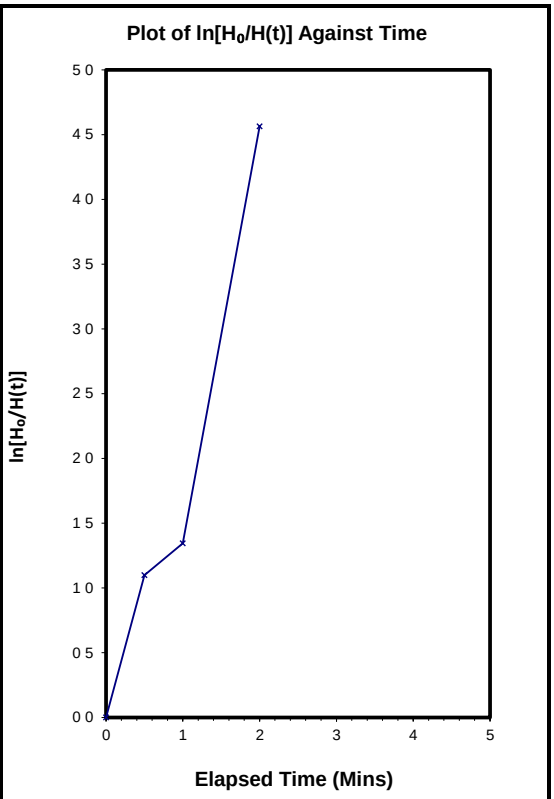
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3013	Test No.	1

Date	22/04/2020	Type of Test	FHT
Operator	CS	Ground level (mOD)	149.64
Diameter of response zone, D (mm)	170	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	1.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	3.86	Water level before test, below top of pipe (m)	DRY (3.86)

Field Data

Elapsed Time (t) (mins)	Dep h to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_0/H(t)$	$\ln[H_0/H(t)]$
0.00	2.90	0.96	1.000	0.000
0.50	3.54	0.32	3.000	1.099
1.00	3.61	0.25	3.840	1.345
2.00	3.85	0.01	96.000	4.564



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	0.00	0.000	$\ln[H_0/H(t)]$
t=	2.00	4.564	$\ln[H_0/H(t)]$

Permeability k= **1.5E-05** m/sec

Client:	Newlands Developments
Project:	Hoyland Common, Barnsley
Project No.	AG3080-19

APPLiED GEOLOGY

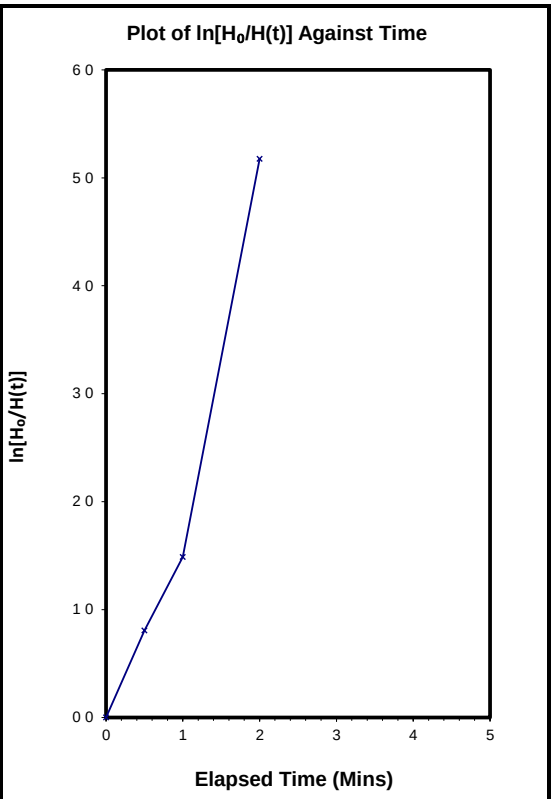
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3015	Test No.	1

Date	22/04/2020	Type of Test	FHT
Operator	CS	Ground level (mOD)	147.92
Diameter of response zone, D (mm)	170	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	2.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	6.47	Water level before test, below top of pipe (m)	DRY (6.47)

Field Data

Elapsed Time (t) (mins)	Dep h to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_0/H(t)$	$\ln[H_0/H(t)]$
0.00	4.70	1.77	1.000	0.000
0.50	5.68	0.79	2.241	0.807
1.00	6.07	0.40	4.425	1.487
2.00	6.46	0.01	177.000	5.176



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	0.00	0.000	$\ln[H_0/H(t)]$
t=	2.00	5.176	$\ln[H_0/H(t)]$

Permeability k= **1.0E-05** m/sec

Client:	Newlands Developments
Project:	Hoyland Common, Barnsley
Project No.	AG3080-19

APPLiED GEOLOGY

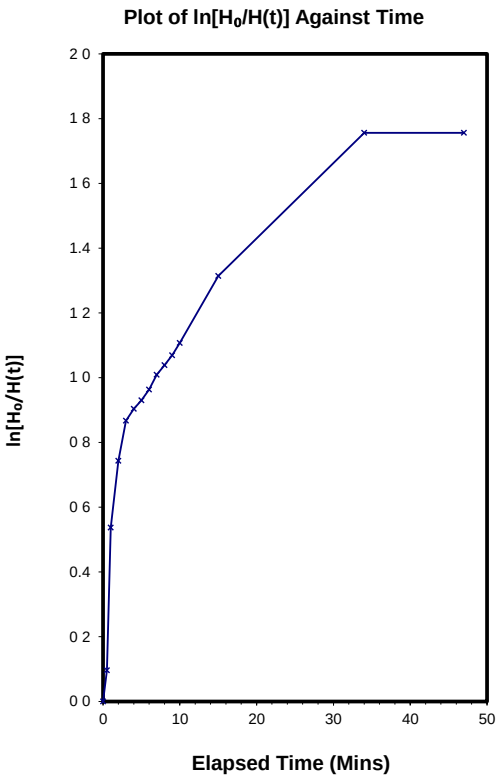
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3017	Test No.	1

Date	22/04/2020	Type of Test	FHT
Operator	CS	Ground level (mOD)	144.50
Diameter of response zone, D (mm)	170	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	2.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	4.69	Water level before test, below top of pipe (m)	DRY (4.69)

Field Data

Elapsed Time (t) (mins)	Dep h to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_0/H(t)$	$\ln[H_0/H(t)]$
0.00	0.00	4.69	1.000	0.000
0.50	0.43	4.26	1.101	0.096
1.00	1.95	2.74	1.712	0.537
2.00	2.46	2.23	2.103	0.743
3.00	2.72	1.97	2.381	0.867
4.00	2.79	1.90	2.468	0.904
5.00	2.84	1.85	2.535	0.930
6.00	2.90	1.79	2.620	0.963
7.00	2.98	1.71	2.743	1.009
8.00	3.03	1.66	2.825	1.039
9.00	3.08	1.61	2.913	1.069
10.00	3.14	1.55	3.026	1.107
15.00	3.43	1.26	3.722	1.314
34.00	3.88	0.81	5.790	1.756
47.00	3.88	0.81	5.790	1.756



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	3.00	0.867	$\ln[H_0/H(t)]$
t=	34.00	1.756	$\ln[H_0/H(t)]$

Permeability k= **1.9E-07** m/sec

Client:	Newlands Developments
Project:	Hoyland Common, Barnsley
Project No.	AG3080-19

APPLiED GEOLOGY

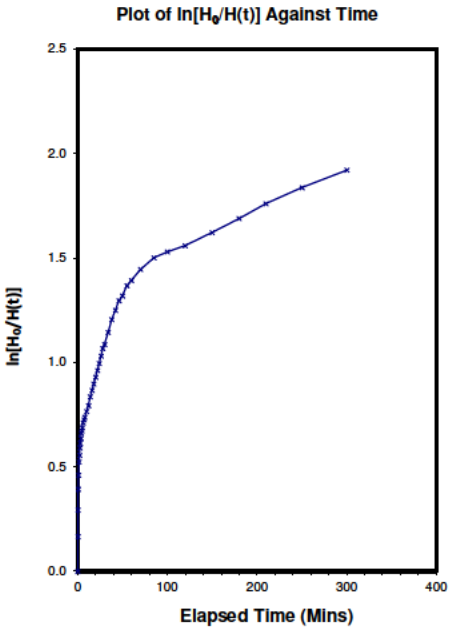
Variable Head Permeability Test - Velocity Graph Method

Borehole No.	RS3019	Test No.	1

Date	21/05/2020	Type of Test	FHT
Operator	JW	Ground level (mOD)	146.69
Diameter of response zone, D (mm)	170	Diameter of standpipe, d (mm)	50.00
Top of response zone (m bgl)	2.00	Height of standpipe above GL (m)	0
Base of response zone (m bgl)	5.00	Water level before test, below top of pipe (m)	3.50

Field Data

Elapsed Time (t) (mins)	Depth to water from top of casing or standpipe (m)	Head (H) (m)	Head Ratio $H_o/H(t)$	$\ln[H_o/H(t)]$
0.0	3.16	1.57	1.000	0.000
0.3	3.40	1.33	1.180	0.166
0.5	3.56	1.17	1.342	0.294
0.8	3.67	1.06	1.481	0.393
1.0	3.74	0.99	1.586	0.461
1.5	3.80	0.93	1.688	0.524
2.0	3.83	0.90	1.744	0.556
2.5	3.86	0.87	1.805	0.590
3.0	3.88	0.85	1.847	0.614
3.5	3.90	0.83	1.892	0.637
4.0	3.92	0.81	1.938	0.662
4.5	3.93	0.80	1.963	0.674
5.0	3.94	0.79	1.987	0.687
6.0	3.96	0.77	2.039	0.712
7.0	3.97	0.76	2.066	0.726
8.0	3.98	0.75	2.093	0.739
10.0	4.00	0.73	2.151	0.766
12.0	4.02	0.71	2.211	0.794
14.0	4.05	0.68	2.309	0.837
16.0	4.07	0.66	2.379	0.867
18.0	4.09	0.64	2.453	0.897
20.0	4.11	0.62	2.532	0.929
30.0	4.20	0.53	2.962	1.086
34.0	4.23	0.50	3.140	1.144
38.0	4.26	0.47	3.340	1.206
42.0	4.28	0.45	3.489	1.250
46.0	4.30	0.43	3.651	1.295
50.0	4.31	0.42	3.738	1.319
55.0	4.33	0.40	3.925	1.367
60.0	4.34	0.39	4.026	1.393
70.0	4.36	0.37	4.243	1.445
85.0	4.38	0.35	4.486	1.501
100.0	4.39	0.34	4.618	1.530
120.0	4.40	0.33	4.758	1.560
150.0	4.42	0.31	5.065	1.622
180.0	4.44	0.29	5.414	1.689
210.0	4.46	0.27	5.815	1.760
250.0	4.48	0.25	6.280	1.837
300.0	4.50	0.23	6.826	1.921



Permeability Results

Using BS EN ISO 22282-2 Equation B.5

$k = \alpha.S/F$ for straight line graph, where α= slope gradient

to =	3.00	0.614	$\ln[H_o/H(t)]$
t=	50.00	1.319	$\ln[H_o/H(t)]$

Permeability k= **9.3E-08** m/sec

Client:	Newland Developments
Project:	Hoyland Common
Project No.	AG3080-19

APPLiED GEOLOGY

APPENDIX E

LABORATORY REPORT

4043

Contract Number: PSL20/1117

Report Date: 25 March 2020

Client's Reference: 15458

Client Name: Applied Geology Limited
Unit 23, Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

For the attention of: Adam Perks

Contract Title: Hoylands Common, Barnsley

Date Received: 21/2/2020
Date Commenced: 21/2/2020
Date Completed: 25/3/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

[redacted]

S Royle (Laboratory Manager)
S Eyre (Senior Technician)
L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP1095		AMAL	1.50	2.00	OC - Brown gravelly slightly sandy CLAY.
TP1092		D	1.80		OC - Brown gravelly sandy CLAY.
TP1091		D	1.20		CM - Brown mottled grey slightly gravelly CLAY.
TP1089		D	1.20		CM - Brown highly weathered MUDSTONE.
TP1086		B	1.50	2.00	OC - Brown highly weathered MUDSTONE.
TP1084		D	2.50		OC - Brown highly weathered MUDSTONE.
TP1083		D	1.00		OC - Brown slightly gravelly sandy CLAY.
TP1082		D	1.30		CM - Brown mottled grey slightly gravelly sandy CLAY.
TP1078		D	1.00		OC - Grey gravelly sandy CLAY.
TP1076		D	2.50		CM - Brown highly weathered MUDSTONE.
TP1072		D	1.00		OC - Brown gravelly slightly sandy CLAY.
TP1072		D	2.80		CM - Brown mottled grey slightly gravelly CLAY.
TP1069		B	2.50		OC - Brown highly weathered MUDSTONE.
TP1064		B	3.00	3.50	OC - Brown highly weathered MUDSTONE.
TP1062		D	2.80		CM - Grey mottled grey CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP1095		AMAL	1.50	2.00	28			58	26	32	82	Intermediate plasticity CI.
TP1092		D	1.80		18			44	22	22	82	Intermediate plasticity CI.
TP1091		D	1.20		31			75	32	43	96	Very high plasticity CV.
TP1089		D	1.20		13			36	20	16	54	Intermediate plasticity CI.
TP1086		B	1.50	2.00	13		2.68	40	21	19	29	Intermediate plasticity CI.
TP1084		D	2.50		14			40	20	20	54	Intermediate plasticity CI.
TP1083		D	1.00		21							
TP1082		D	1.30		18			38	20	18	91	Intermediate plasticity CI.
TP1078		D	1.00		10			36	18	18	71	Intermediate plasticity CI.
TP1076		D	2.50		13			39	21	18	65	Intermediate plasticity CI.
TP1072		D	1.00		25			55	25	30	81	High plasticity CH.
TP1072		D	2.80		30			67	28	39	95	High plasticity CH.
TP1069		B	2.50		12		2.65	41	20	21	27	Intermediate plasticity CI.
TP1064		B	3.00	3.50	12		2.68	40	20	20	26	Intermediate plasticity CI.
TP1062		D	2.80		18			69	29	40	100	High plasticity CH.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

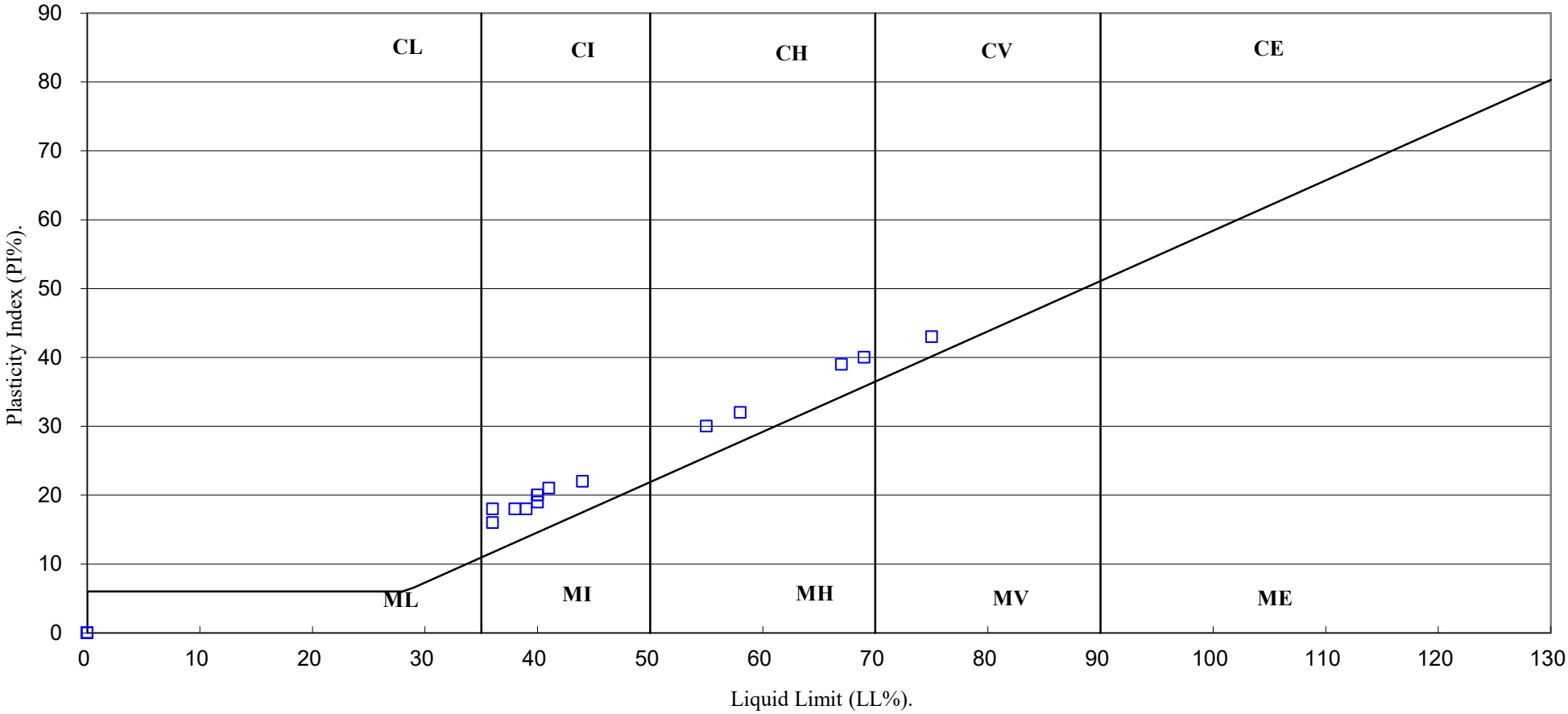
Contract No:

PSL20/1117

Client Ref:

AG3080-19

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No: PSL20/1117
			Client Ref: AG3080-19

PARTICLE SIZE DISTRIBUTION TEST

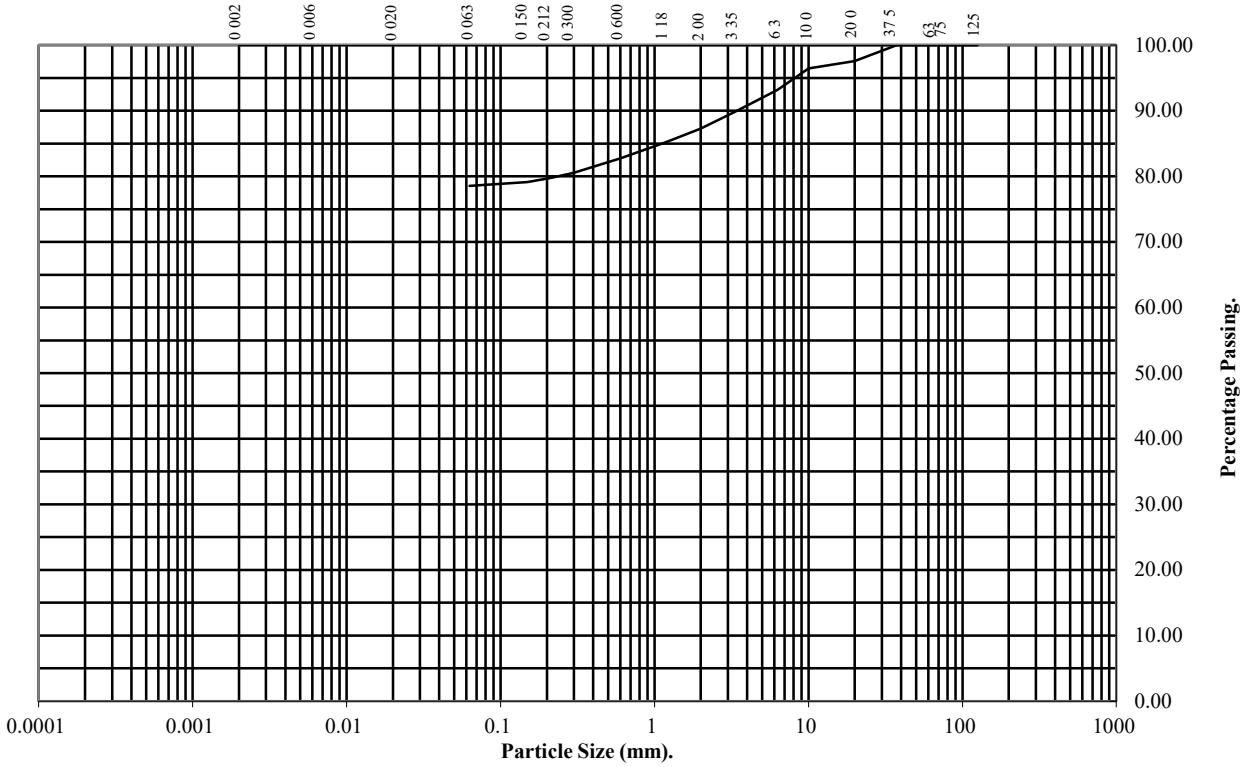
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1095 **Top Depth (m):** 1.50

Sample Number: **Base Depth(m):** 2.00

Sample Type: AMAL



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	98
10	96
6.3	93
3.35	90
2	87
1.18	85
0.6	83
0.3	81
0.212	80
0.15	79
0.063	79

Soil Fraction	Total Percentage
Cobbles	0
Gravel	13
Sand	8
Silt/Clay	79

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

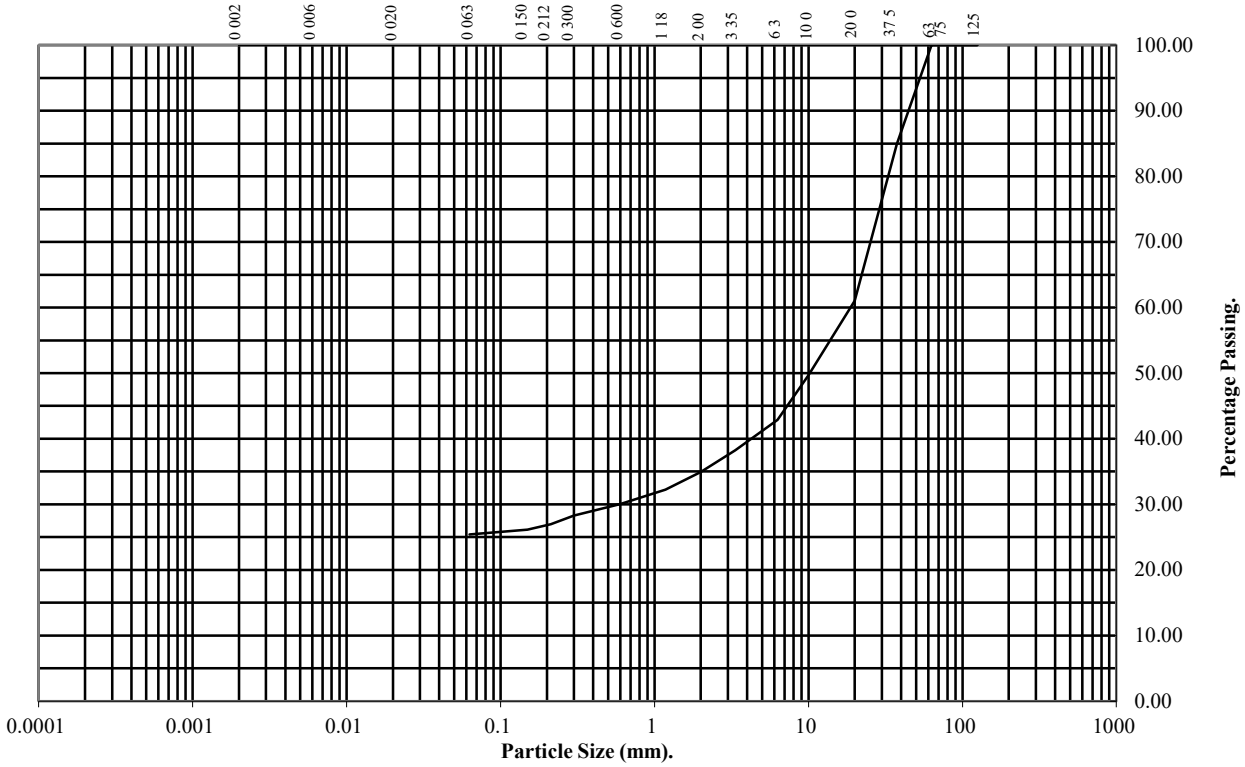
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1086 **Top Depth (m):** 1.50

Sample Number: **Base Depth(m):** 2.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	85
20	61
10	50
6.3	43
3.35	38
2	35
1.18	32
0.6	30
0.3	28
0.212	27
0.15	26
0.063	25

Soil Fraction	Total Percentage
Cobbles	0
Gravel	65
Sand	10
Silt/Clay	25

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

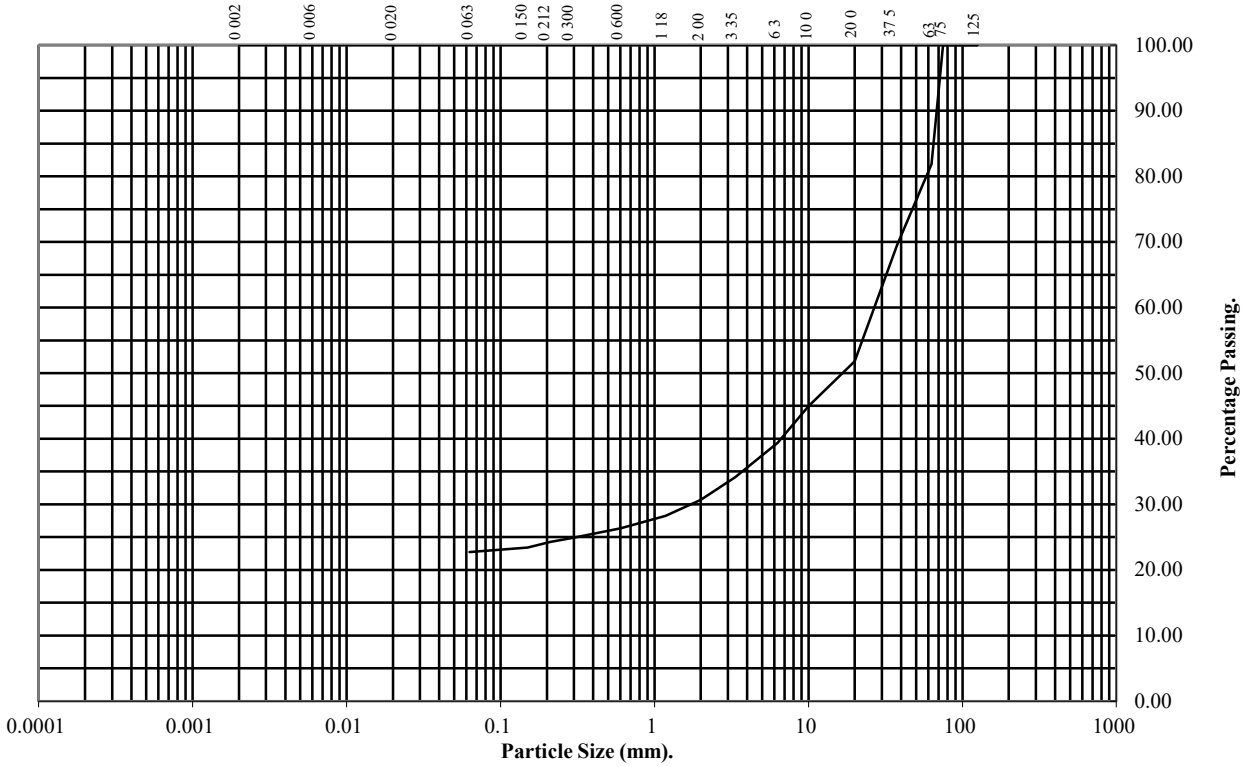
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1069 **Top Depth (m):** 2.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	82
37.5	69
20	52
10	45
6.3	39
3.35	34
2	31
1.18	28
0.6	26
0.3	25
0.212	24
0.15	23
0.063	23

Soil Fraction	Total Percentage
Cobbles	18
Gravel	51
Sand	8
Silt/Clay	23

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

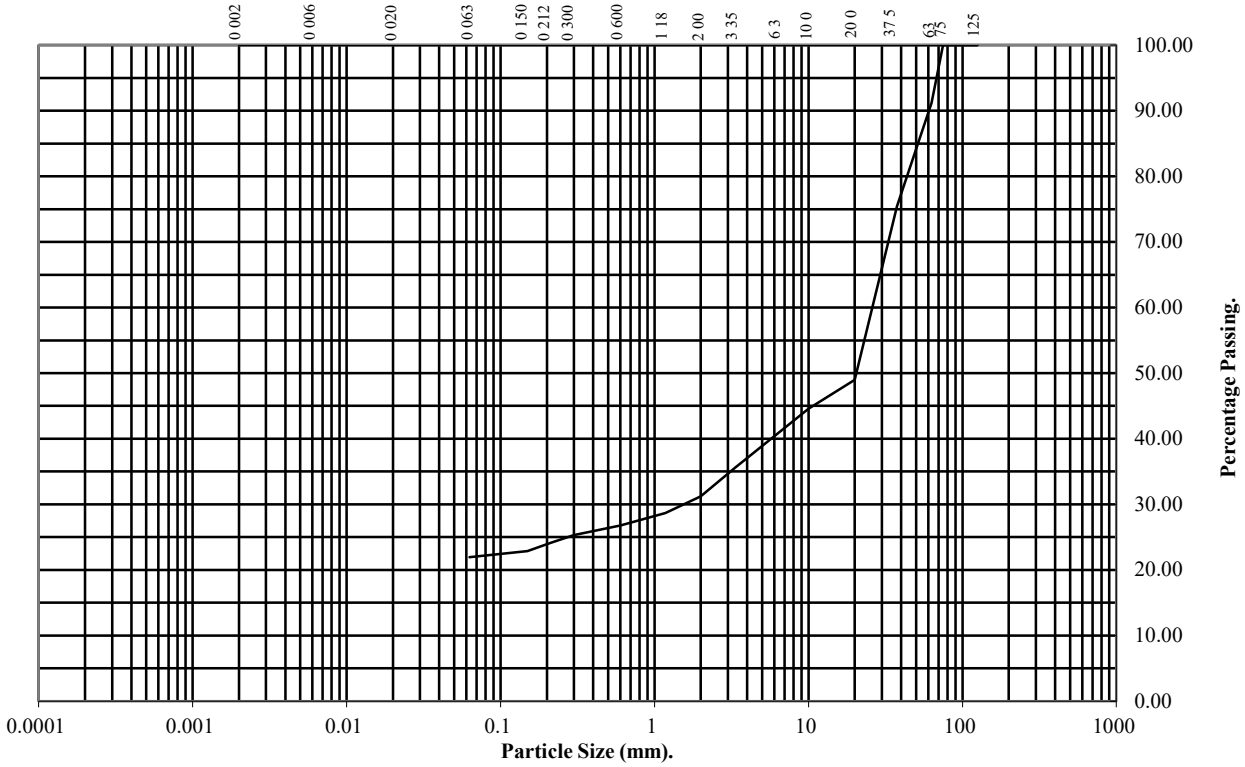
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1064 **Top Depth (m):** 3.00

Sample Number: **Base Depth(m):** 3.50

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	91
37.5	75
20	49
10	45
6.3	41
3.35	36
2	31
1.18	29
0.6	27
0.3	25
0.212	24
0.15	23
0.063	22

Soil Fraction	Total Percentage
Cobbles	9
Gravel	60
Sand	9
Silt/Clay	22

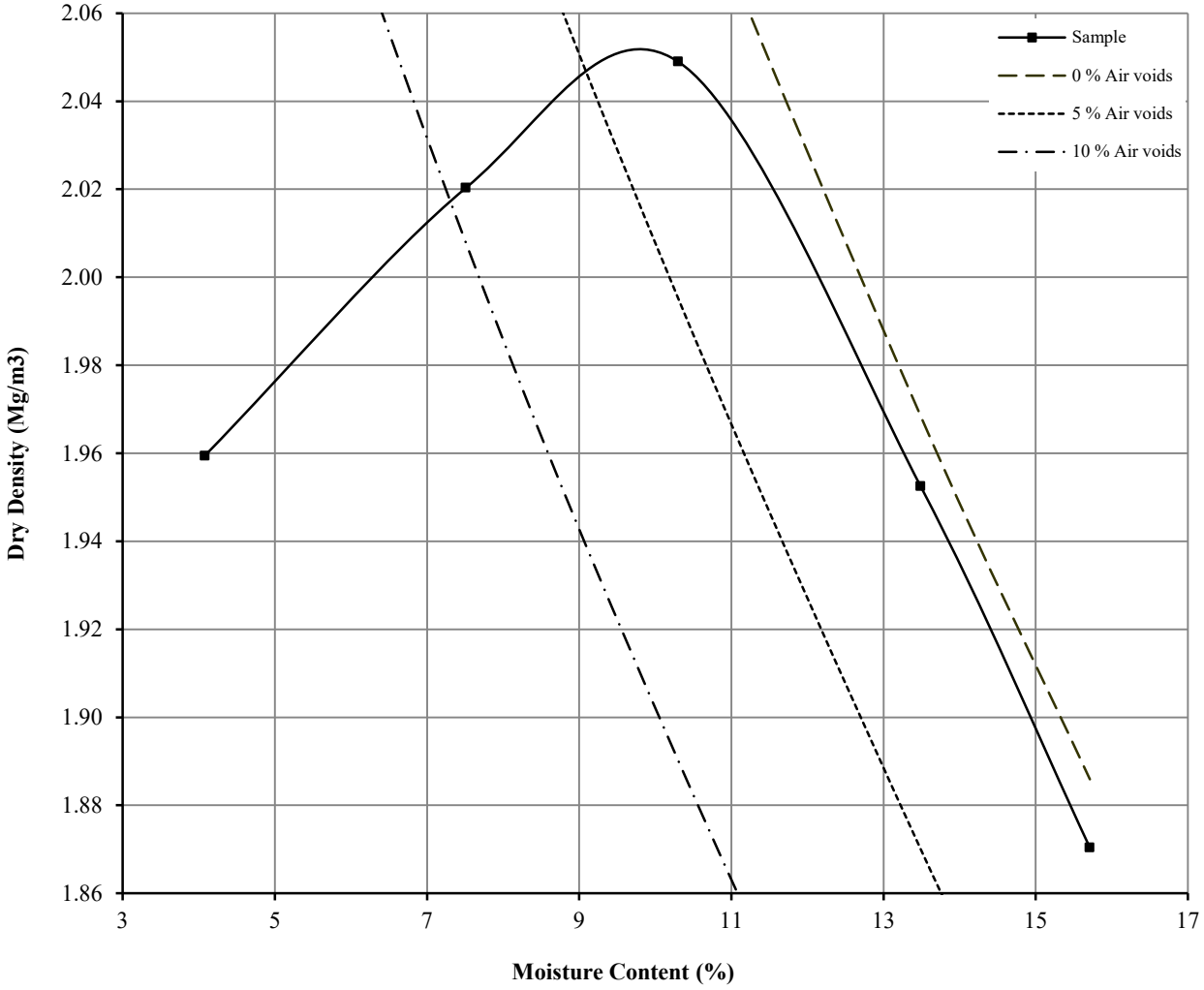
Remarks:

See Summary of Soil Descriptions

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP1086**	**Top Depth (m) :**	**1.50**
Sample Number:		**Base Depth (m) :**	**2.00**
Sample Type:	**B**		



Initial Moisture Content:		13	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.68	Measured	Material Retained on 37.5 mm Test Sieve (%):		15
Maximum Dry Density (Mg/m3):		2.05	Material Retained on 20.0 mm Test Sieve (%):		24
Optimum Moisture Content (%):		10			
Remarks See summary of soil descriptions.					

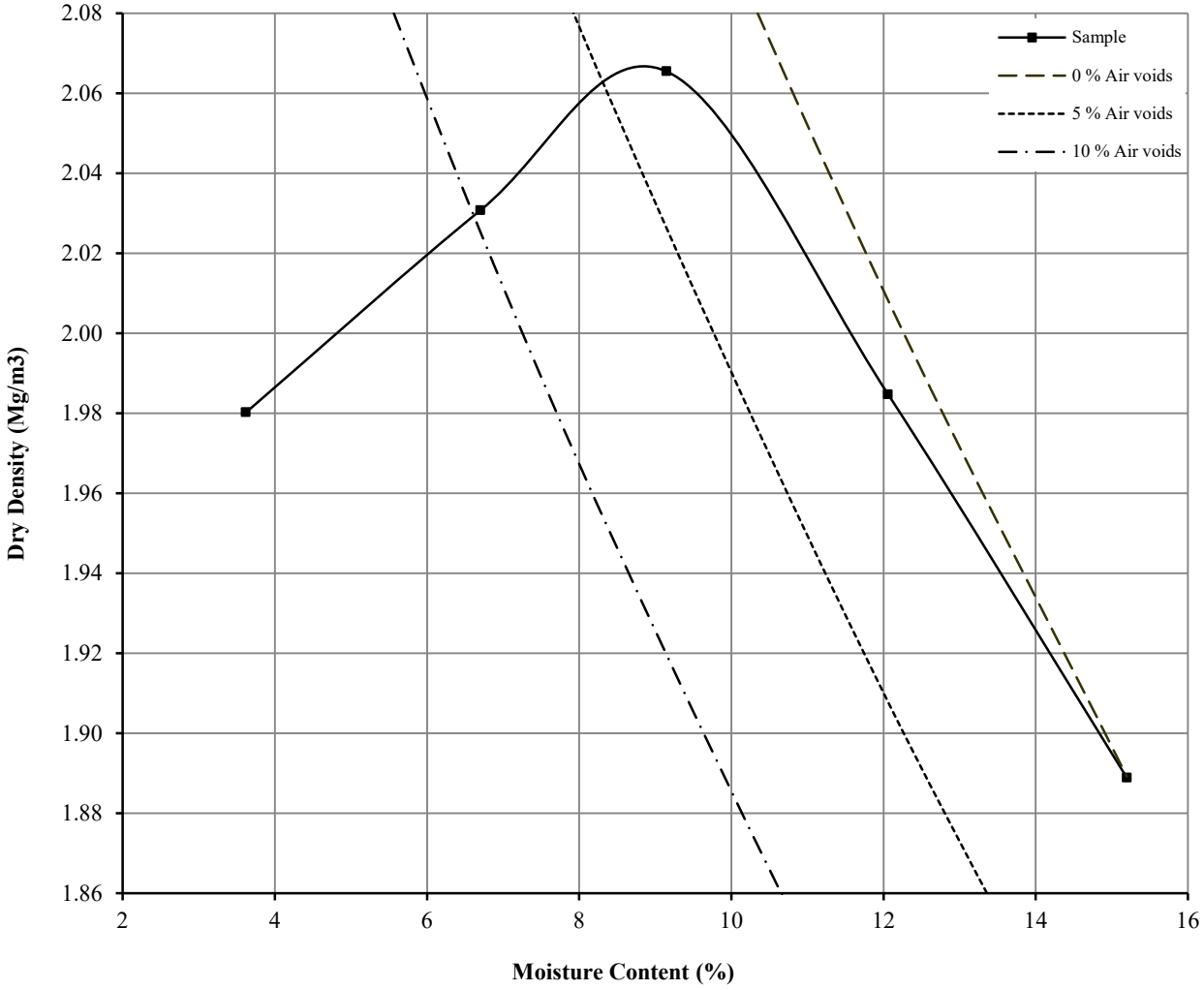
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number: TP1069 **Top Depth (m) :** 2.50

Sample Number: **Base Depth (m) :**

Sample Type: B

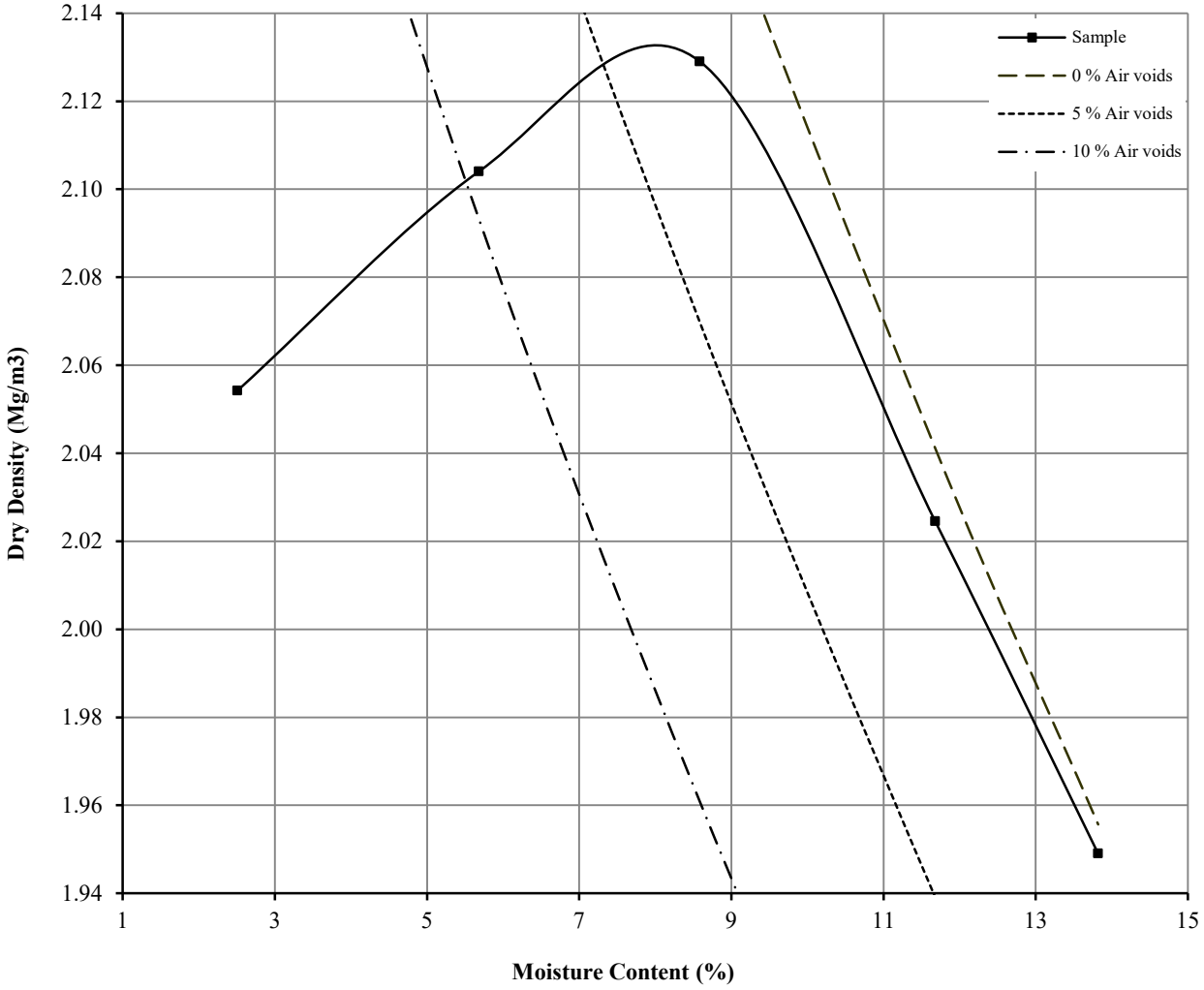


Initial Moisture Content:		12	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Measured	Material Retained on 37.5 mm Test Sieve (%):		31
Maximum Dry Density (Mg/m3):		2.07	Material Retained on 20.0 mm Test Sieve (%):		17
Optimum Moisture Content (%):		9			
Remarks See summary of soil descriptions.					

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

Hole Number:	**TP1064**	**Top Depth (m) :**	**3.00**
Sample Number:		**Base Depth (m) :**	**3.50**
Sample Type:	**B**		



Initial Moisture Content:		12	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.68	Measured	Material Retained on 37.5 mm Test Sieve (%):		25
Maximum Dry Density (Mg/m3):		2.13	Material Retained on 20.0 mm Test Sieve (%):		26
Optimum Moisture Content (%):		8			
Remarks See summary of soil descriptions.					

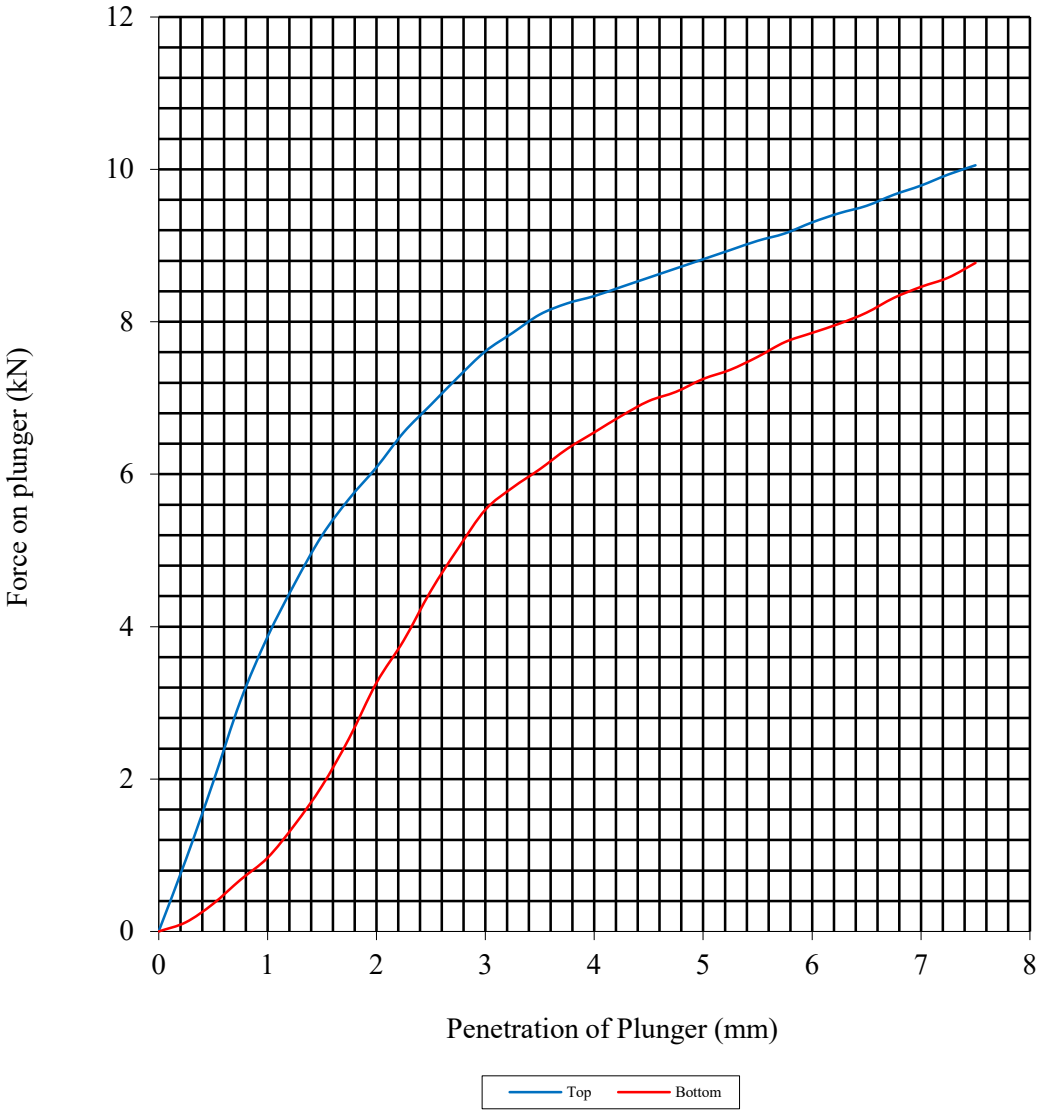
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: TP1086 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):** 2.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	10	Surcharge Kg:	4.20	Sample Top	10	Sample Top	52.4
Bulk Density Mg/m3:	2.26	Soaking Time hrs	0	Sample Bottom	10	Sample Bottom	36.2
Dry Density Mg/m3:	2.05	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			39				
Compaction Conditions		4.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

Contract No: PSL20/1117

Client Ref: AG3080-19

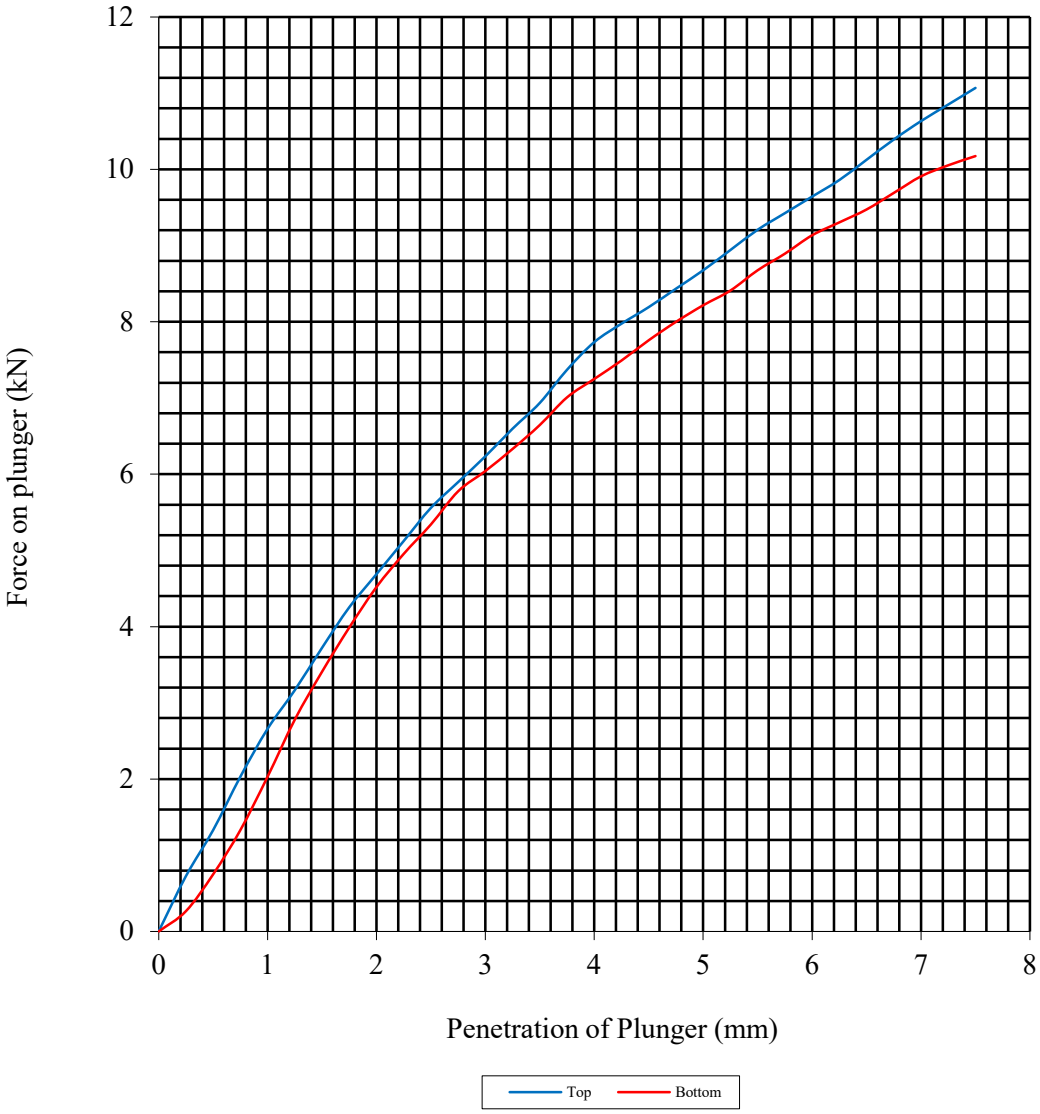
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: TP1069 **Top Depth (m):** 2.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	9.1	Surcharge Kg:	4.20	Sample Top	9.2	Sample Top	43.4
Bulk Density Mg/m3:	2.25	Soaking Time hrs	0	Sample Bottom	9.1	Sample Bottom	41.1
Dry Density Mg/m3:	2.07	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			48				
Compaction Conditions		4.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

Contract No: PSL20/1117

Client Ref: AG3080-19

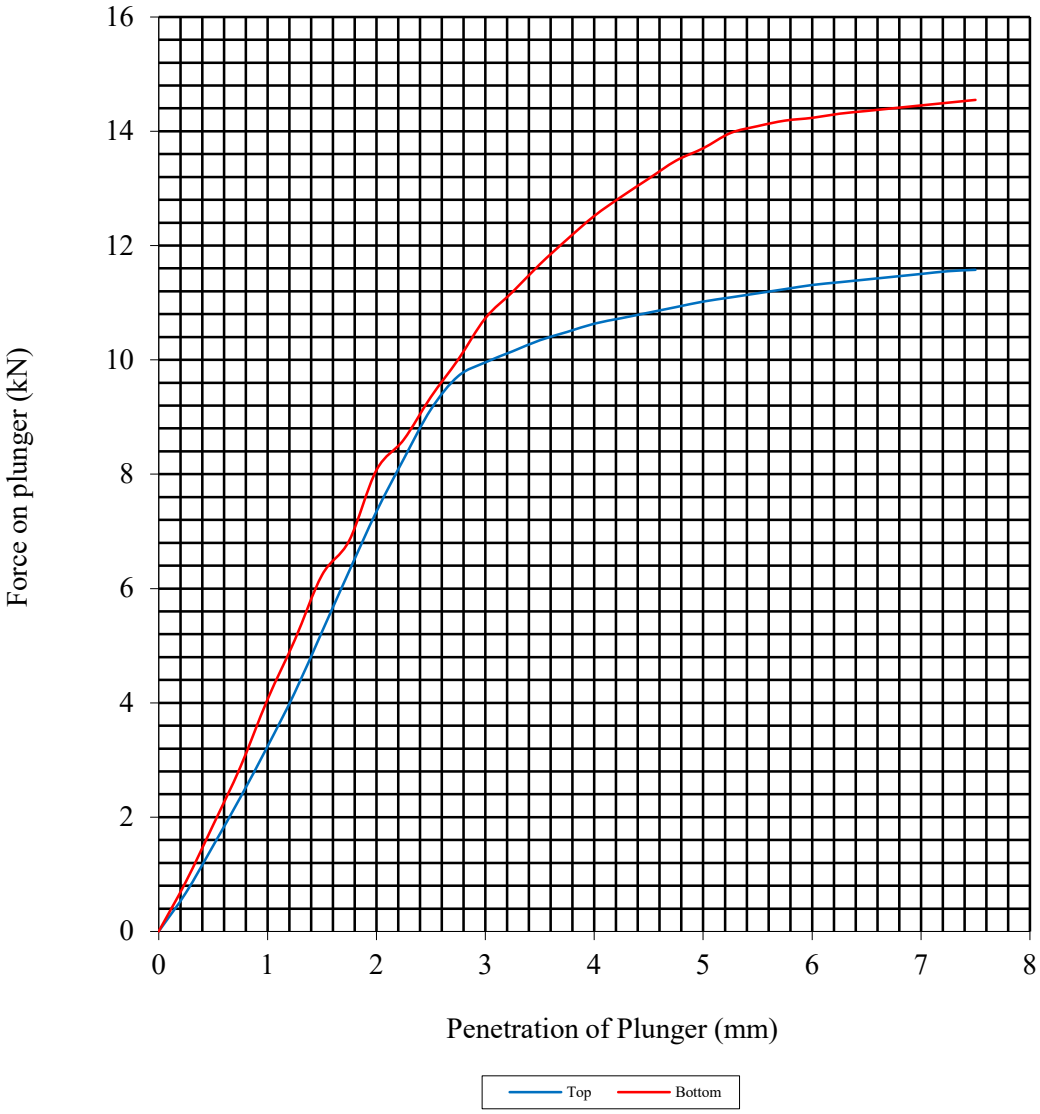
CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

Hole Number: TP1064 **Top Depth (m):** 3.00

Sample Number: **Base Depth (m):** 3.50

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	8.3	Surcharge Kg:	4.20	Sample Top	8.2	Sample Top	69.2
Bulk Density Mg/m3:	2.31	Soaking Time hrs	0	Sample Bottom	8.5	Sample Bottom	70.9
Dry Density Mg/m3:	2.13	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			51				
Compaction Conditions		4.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

Contract No: PSL20/1117

Client Ref: AG3080-19

Certificate of Analysis

Certificate Number 20-04909

12-Mar-20

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 20-04909

Client Reference PSL20/1117

Order No (not supplied)

Contract Title Hoylands Common, Barnsley

Description 3 Soil samples.

Date Received 05-Mar-20

Date Started 05-Mar-20

Date Completed 12-Mar-20

Test Procedures Identified by prefix DETSn (details on request).

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

Approved By [redacted]

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis

Soil Samples

Our Ref 20-04909
Client Ref PSL20/1117
Contract Title Hoylands Common, Barnsley

			Lab No	1650540	1650541	1650542
			Sample ID	TP1095	TP1083	TP1076
			Depth	1.50-2.00	1.00-1.00	2.50-2.50
			Other ID			
			Sample Type	B	D	D
			Sampling Date	21/01/2020	15/01/2020	21/01/2020
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10		< 10
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.0	4.9	
pH	DETSC 2008#		pH	8.8		8.8
Calorific Value	DETSC 5008	1	MJ/kg	< 1.0	< 1.0	
Chloride Aqueous Extract	DETSC 2055	1	mg/l	26		29
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0		< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	50		64
Sulphur as S, Total	DETSC 2320	0.01	%	0.04		0.18
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03		0.04

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 20-04909
Client Ref PSL20/1117
Contract Hoylands Common, Barnsley

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1650540	TP1095 1.50-2.00 SOIL	21/01/20	PT 500ml	pH + Conductivity (7 days)	
1650541	TP1083 1.00-1.00 SOIL	15/01/20	PT 500ml		
1650542	TP1076 2.50-2.50 SOIL	21/01/20	PT 500ml	pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

LABORATORY REPORT

4043

Contract Number: PSL20/1448

Report Date: 07 May 2020

Client's Reference: AG3080-19

Client Name: Applied Geology Limited
Unit 23, Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

For the attention of: Adam Perks

Contract Title: Hoylands Common, Barnsley

Date Received: 6/3/2020
Date Commenced: 6/3/2020
Date Completed: 7/5/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

[redacted]

S Royle (Laboratory Manager)
S Eyre (Senior Technician)
L Knight (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
DCS6001		D	1.00		CM - Brown slightly gravelly CLAY.
DCS6002		D	1.50		CM - Brown mottled grey CLAY.
DCS6003		D	0.60		CM - Brown mottled grey slightly gravelly CLAY.
DCS6004		D	1.50		CM - Brown mottled grey CLAY.
DCS6005		D	0.50		CM - Brown mottled grey CLAY.
RC4001		D	2.50		CM - Brown mottled grey sandy CLAY.
RC4009		D	1.00		OC - Brown mottled grey CLAY.
RC4009		D	2.50		CM - Brown mottled grey highly weathered MUDSTONE.
RS3001		D	0.75		CM - Brown mottled grey slightly gravelly CLAY.
RS3005		UT	1.50	1.95	CM - Firm brown mottled grey sandy CLAY.
RS3007		UT	1.50	1.95	CM - Brown mottled grey highly weathered MUDSTONE.
RS3008		D	4.00		CM - Grey highly weathered MUDSTONE.
RS3009		UT	1.00	1.45	CM - Firm brown mottled grey slightly sandy CLAY.
RS3014		D	7.50		CM - Grey highly weathered MUDSTONE.
RS3022		D	6.00		CM - Grey slightly gravelly sandy CLAY.
RS3022		D	7.00		CM - Grey gravelly sandy CLAY.
TP1001		D	0.50		CM - Brown mottled grey slightly sandy CLAY.
TP1002		B	3.00		OC - Brown highly weathered MUDSTONE..
TP1003		B	2.50		CM - Brown mottled grey highly weathered MUDSTONE.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP1004		B	3.00		OC - Grey highly weathered MUDSTONE.
TP1005		D	1.30		CM - Brown mottled grey slightly sandy CLAY.
TP1007		B	0.60		OC - Brown mottled grey very gravelly sandy CLAY.
TP1008		D	0.80		CM - Brown mottled grey CLAY.
TP1009		B	2.00	3.00	OC - Brown very gravelly sandy CLAY.
TP1010		D	1.50		CM - Brown mottled grey slightly sandy CLAY.
TP1012		B	1.60	4.00	OC - Grey highly weathered MUDSTONE.
TP1014		D	1.50		CM - Brown hightly weathered MUDSTONE.
TP1014		B	2.50		CM - Brown hightly weathered MUDSTONE.
TP1015		B	1.20		CM - Brown mottled grey very gravelly sandy CLAY.
TP1015		D	2.60		CM - Brown mottled grey highly weathered MUDSTONE.
TP1016		D	3.00		CM - Brown mottled grey highly weathered MUDSTONE.
TP1017		B	2.00		CM - Brown hightly weathered MUDSTONE.
TP1018		B	1.00		CM - Brown mottled grey slightly gravelly slightly sandy CLAY.
TP1019		D	4.00		CM - Grey mottled brown highly weathered MUDSTONE.
TP1021		B	3.00		CM - Grey gravelly sandy CLAY.
TP1022		B	0.90		CM - Brown mottled grey very gravelly sandy CLAY.
TP1024		B	1.00		CM - Brown hightly weathered MUDSTONE.
TP1025		D	3.60		CM - Dark grey COLLIERY SPOIL.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP1026		D	1.00		CM - Brown mottled grey CLAY.
TP1027		B	2.50	3.00	OC - Brown hightly weathered MUDSTONE.
TP1029		B	3.00		OC - Brown hightly weathered MUDSTONE.
TP1030		B	2.50	3.00	CM - Brown hightly weathered MUDSTONE.
TP1032		B	0.50	1.50	CM - Brown mottled grey slightly gravelly slightly sandy CLAY.
TP1032		B	2.00	2.50	CM - Brown hightly weathered MUDSTONE.
TP1033		B	2.00	2.50	OC - Brown gravelly sandy CLAY.
TP1033		B	3.50	4.00	CM - Dark grey COLLIERY SPOIL.
TP1034		D	1.00		OC - Brown gravelly sandy CLAY.
TP1034		D	2.00		OC - Brown hightly weathered MUDSTONE.
TP1034		D	3.50		OC - Brown hightly weathered MUDSTONE.
TP1034		D	4.60		CM - Dark grey COLLIERY SPOIL.
TP1036		B	3.00	3.50	OC - Brown hightly weathered MUDSTONE.
TP1040		B	1.00		OC - Brown hightly weathered MUDSTONE.
TP1042		B	3.00		OC - Brown very gravelly sandy CLAY.
TP1043		B	4.00	4.70	OC - Brown hightly weathered MUDSTONE.
TP1045		B	2.50	3.50	OC - Brown mottled grey gravelly sandy CLAY.
TP1047		B	2.50	3.00	OC - Brown hightly weathered MUDSTONE.
TP1048		B	1.50	2.00	OC - Brown hightly weathered MUDSTONE.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP1049		B	1.50	2.00	CM - Brown mottled grey slightly gravelly slightly sandy CLAY.
TP1049		B	3.00	4.00	CM - Brown hightly weathered MUDSTONE.
TP1054		B	2.50		OC - Brown hightly weathered MUDSTONE.
TP1055		B	3.00		OC - Brown hightly weathered MUDSTONE.
TP1056		B	0.50	0.70	OC - Brown mottled grey slightly gravelly slightly sandy CLAY.
TP1063		B	2.00	2.50	OC - Brown hightly weathered MUDSTONE.
TP1068		D	0.50		OC - Brown mottled grey gravelly slightly sandy CLAY.
TP1073		D	2.00		OC - Brown hightly weathered MUDSTONE.
TP1075		D	0.50		CM - Brown mottled grey CLAY.
TP1077		D	1.00		OC - Brown hightly weathered MUDSTONE.
TP1090		D	1.00		CM - Grey mottled brown CLAY.
TP1097		B	1.00		OC - Brown mottled grey very gravelly slightly sandy CLAY.
TP1098		D	1.80		CM - Brown hightly weathered MUDSTONE.
TP1100		D	0.70		CM - Brown mottled grey slightly gravelly slightly sandy CLAY.
TP1101		B	3.00		OC - Brown hightly weathered MUDSTONE.
TP1103		B	2.50		OC - Brown hightly weathered MUDSTONE.
TP1111		B	2.00		OC - Brown hightly weathered MUDSTONE.
TP1113		B	2.50		OC - Brown hightly weathered MUDSTONE.
TP1201		B	0.50		CM - Brown mottled grey slightly gravelly slightly sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP1202		B	0.50		OC - Brown mottled grey slightly gravelly sandy CLAY.
TP1203		D	1.50		CM - Brown mottled grey slightly gravelly slightly sandy CLAY.
TT2009		D	1.00		OC - Grey mottled brown slightly gravelly sandy CLAY.
TT2009		B	2.50		OC - Brown hightly weathered MUDSTONE.
TT2010		D	0.80		CM - Brown mottled grey slightly sandy CLAY.
TT2010		D	2.00		OC - Grey highly weathered MUDSTONE.
TT2031		B	2.00		OC - Brown mottled grey hightly weathered MUDSTONE.
RC4010		B	2.00	4.00	OC - Brown mottled grey hightly weathered MUDSTONE.
RC4010		B	6.00	8.00	OC - Brown mottled grey hightly weathered MUDSTONE.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
DCS6001		D	1.00		36			68	28	40	95	High plasticity CH.
DCS6002		D	1.50		27			57	24	33	100	High plasticity CH.
DCS6003		D	0.60		29			64	27	37	92	High plasticity CH.
DCS6004		D	1.50		30			72	29	43	100	Very high plasticity CV.
DCS6005		D	0.50		20			59	25	34	100	High plasticity CH.
RC4001		D	2.50		25			47	22	25	100	Intermediate plasticity CI.
RC4009		D	1.00		26			64	26	38	100	High plasticity CH.
RC4009		D	2.50		12			46	22	24	90	Intermediate plasticity CI.
RS3001		D	0.75		22			58	25	33	98	High plasticity CH.
RS3005		UT	1.50	1.95	24			45	22	23	100	Intermediate plasticity CI.
RS3007		UT	1.50	1.95	13			48	23	25	85	Intermediate plasticity CI.
RS3008		D	4.00		12			42	19	23	91	Intermediate plasticity CI.
RS3009		UT	1.00	1.45	32			51	24	27	98	High plasticity CH.
RS3014		D	7.50		6.2			46	23	23	72	Intermediate plasticity CI.
RS3022		D	6.00		24			42	20	22	92	Intermediate plasticity CI.
RS3022		D	7.00		21			44	21	23	87	Intermediate plasticity CI.
TP1001		D	0.50		17			54	25	29	100	High plasticity CH.
TP1002		B	3.00		13		2.67	39	19	20	28	Intermediate plasticity CI.
TP1003		B	2.50		11		2.65	41	21	20	28	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

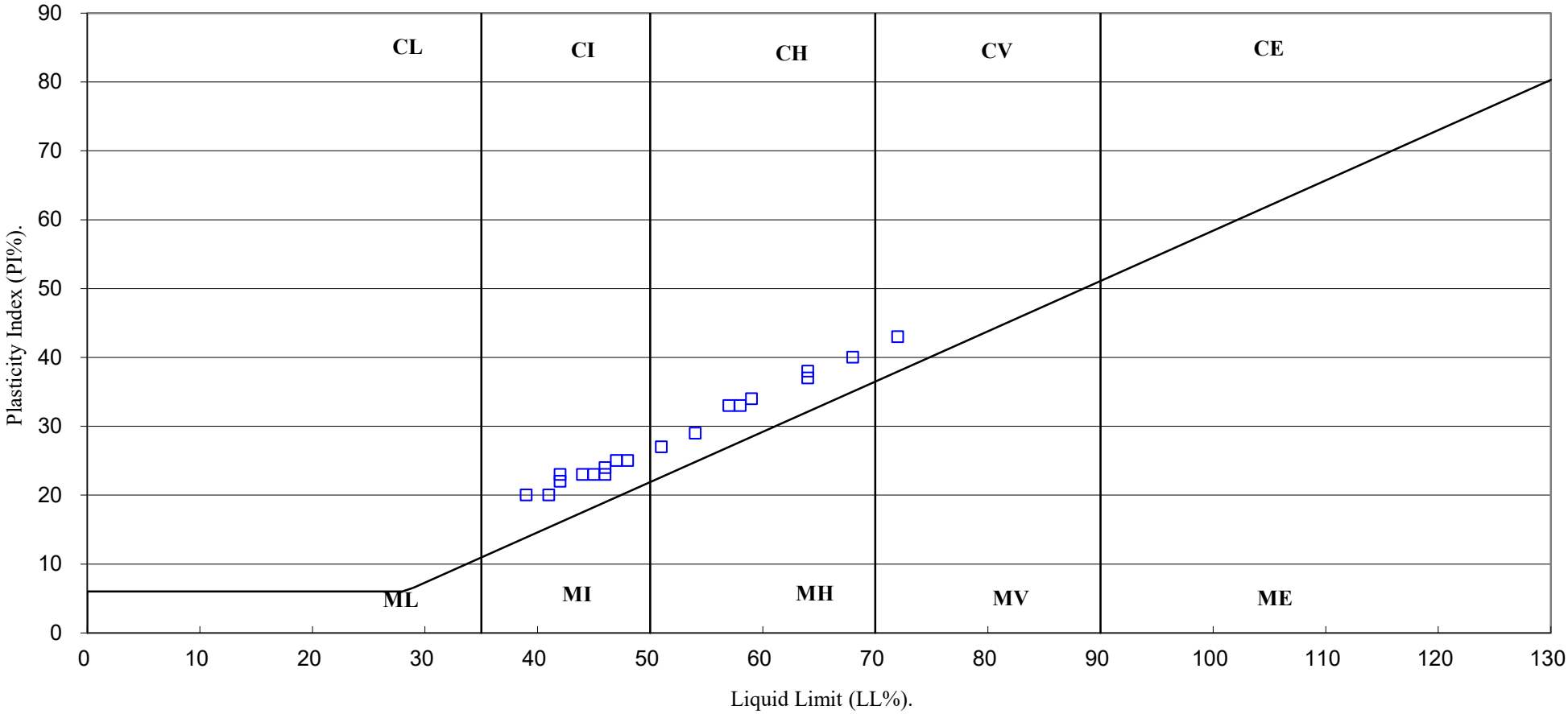
Contract No:

PSL20/1448

Client Ref:

AG3080-19

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No: PSL20/1448
			Client Ref: AG3080-19

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP1004		B	3.00		14		2.68	44	21	23	35	Intermediate plasticity CI.
TP1005		D	1.30		24			54	24	30	100	High plasticity CH.
TP1007		B	0.60		19		2.48	47	22	25	52	Intermediate plasticity CI.
TP1008		D	0.80		30			73	29	44	100	Very high plasticity CV.
TP1009		B	2.00	3.00	20		2.62	49	23	26	61	Intermediate plasticity CI.
TP1010		D	1.50		23			51	23	28	100	High plasticity CH.
TP1012		B	1.60	4.00	13		2.57	40	20	20	46	Intermediate plasticity CI.
TP1014		D	1.50		7.5			45	23	22	60	Intermediate plasticity CI.
TP1014		B	2.50		10			41	20	21	63	Intermediate plasticity CI.
TP1015		B	1.20		21		2.61	46	22	24	62	Intermediate plasticity CI.
TP1015		D	2.60		10			46	23	23	75	Intermediate plasticity CI.
TP1016		D	3.00		12			43	22	21	70	Intermediate plasticity CI.
TP1017		B	2.00		14		2.65	44	22	22	61	Intermediate plasticity CI.
TP1018		B	1.00		27		2.66	61	26	35	94	High plasticity CH.
TP1019		D	4.00		9.6			47	23	24	65	Intermediate plasticity CI.
TP1021		B	3.00		16			39	19	20	82	Intermediate plasticity CI.
TP1022		B	0.90		20		2.60	52	24	28	71	High plasticity CH.
TP1024		B	1.00		13		2.64	42	20	22	53	Intermediate plasticity CI.
TP1025		D	3.60		16				NP			

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

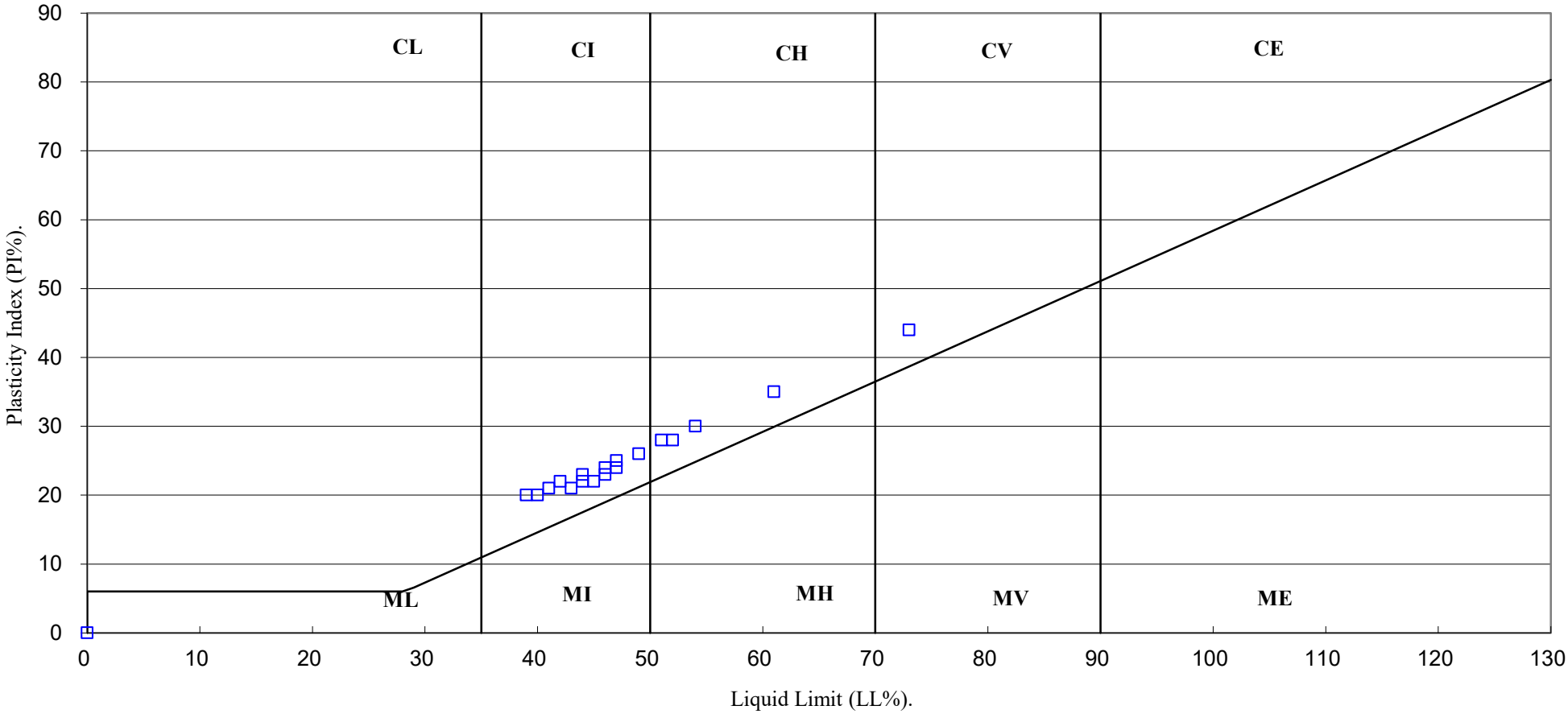
Contract No:

PSL20/1448

Client Ref:

AG3080-19

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No: PSL20/1448
			Client Ref: AG3080-19

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP1026		D	1.00		44			74	30	44	100	Very high plasticity CV.
TP1027		B	2.50	3.00	15		2.66	51	23	28	39	High plasticity CH.
TP1029		B	3.00		18		2.67	44	21	23	46	Intermediate plasticity CI.
TP1030		B	2.50	3.00	12		2.65	42	20	22	30	Intermediate plasticity CI.
TP1032		B	0.50	1.50	23		2.65	52	23	29	95	High plasticity CH.
TP1032		B	2.00	2.50	11		2.60	43	21	22	31	Intermediate plasticity CI.
TP1033		B	2.00	2.50	22		2.65	49	22	27	75	Intermediate plasticity CI.
TP1033		B	3.50	4.00	19		2.21	46	24	22	77	Intermediate plasticity CI.
TP1034		D	1.00		17			41	20	21	81	Intermediate plasticity CI.
TP1034		D	2.00		14			46	22	24	96	Intermediate plasticity CI.
TP1034		D	3.50		13			42	21	21	87	Intermediate plasticity CI.
TP1034		D	4.60		16			39	20	19	100	Intermediate plasticity CI.
TP1036		B	3.00	3.50	10		2.68	45	21	24	29	Intermediate plasticity CI.
TP1040		B	1.00		9.9		2.60	40	20	20	25	Intermediate plasticity CI.
TP1042		B	3.00		19		2.68	48	22	26	60	Intermediate plasticity CI.
TP1043		B	4.00	4.70	8.9		2.65	44	22	22	33	Intermediate plasticity CI.
TP1045		B	2.50	3.50	22		2.62	53	23	30	76	High plasticity CH.
TP1047		B	2.50	3.00	14			43	20	23	82	Intermediate plasticity CI.
TP1048		B	1.50	2.00	14		2.64	48	20	28	32	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

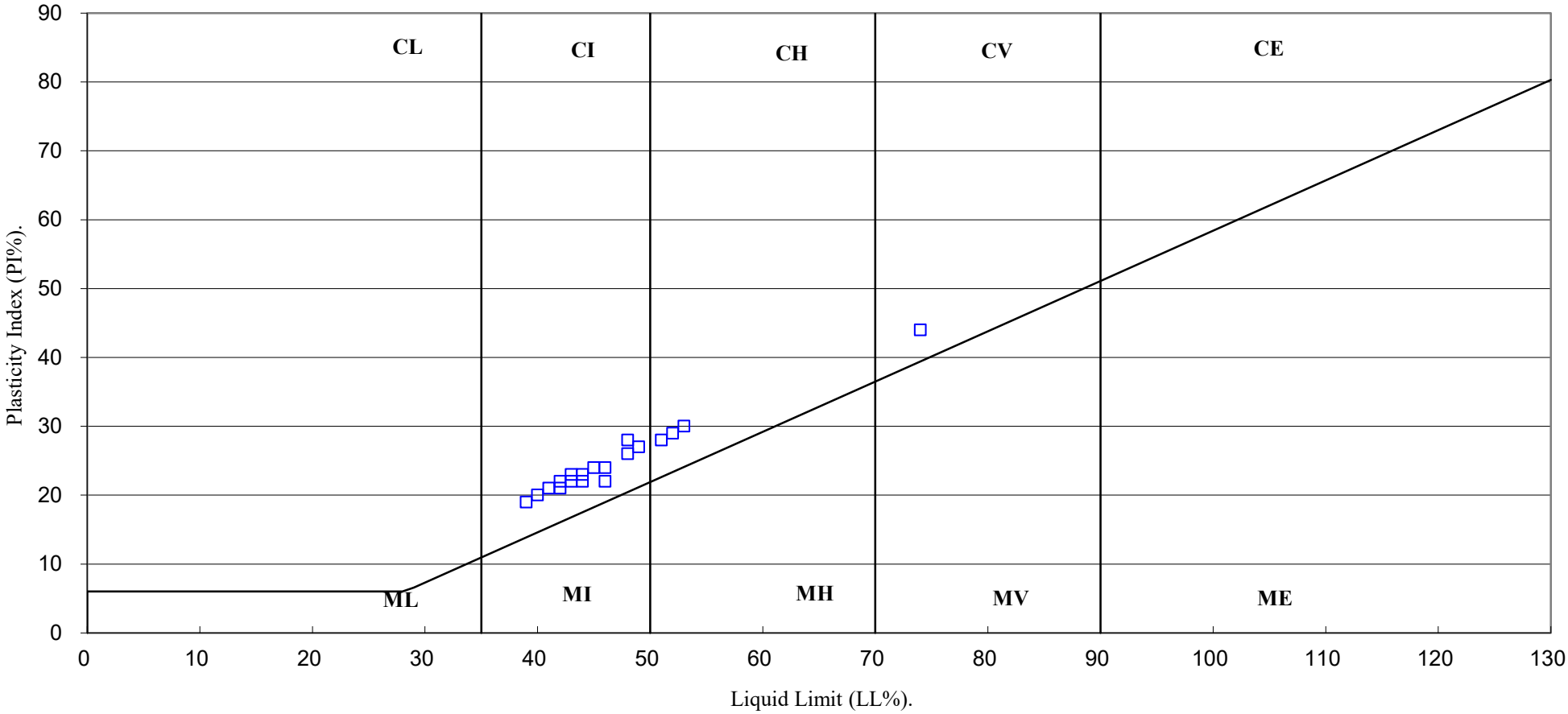
Contract No:

PSL20/1448

Client Ref:

AG3080-19

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No: PSL20/1448
			Client Ref: AG3080-19

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP1049		B	1.50	2.00	20		2.63	52	23	29	95	High plasticity CH.
TP1049		B	3.00	4.00	9.5		2.65	41	19	22	28	Intermediate plasticity CI.
TP1054		B	2.50		11		2.62	42	19	23	47	Intermediate plasticity CI.
TP1055		B	3.00		14		2.66	42	20	22	65	Intermediate plasticity CI.
TP1056		B	0.50	0.70	23		2.61	60	26	34	92	High plasticity CH.
TP1063		B	2.00	2.50	13		2.65	51	22	29	34	High plasticity CH.
TP1068		D	0.50		17			57	24	33	87	High plasticity CH.
TP1073		D	2.00		19			45	21	24	75	Intermediate plasticity CI.
TP1075		D	0.50		27			63	26	37	100	High plasticity CH.
TP1077		D	1.00		15			38	19	19	86	Intermediate plasticity CI.
TP1090		D	1.00		34			66	27	39	100	High plasticity CH.
TP1097		B	1.00		20			59	25	34	75	High plasticity CH.
TP1098		D	1.80		12			41	21	20	71	Intermediate plasticity CI.
TP1100		D	0.70		25			50	22	28	95	High plasticity CH.
TP1101		B	3.00		11			40	20	20	26	Intermediate plasticity CI.
TP1103		B	2.50		18			47	23	24	29	Intermediate plasticity CI.
TP1111		B	2.00		8.2			44	21	23	37	Intermediate plasticity CI.
TP1113		B	2.50		15			42	20	22	38	Intermediate plasticity CI.
TP1201		B	0.50		23		2.60	54	23	31	92	High plasticity CH.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

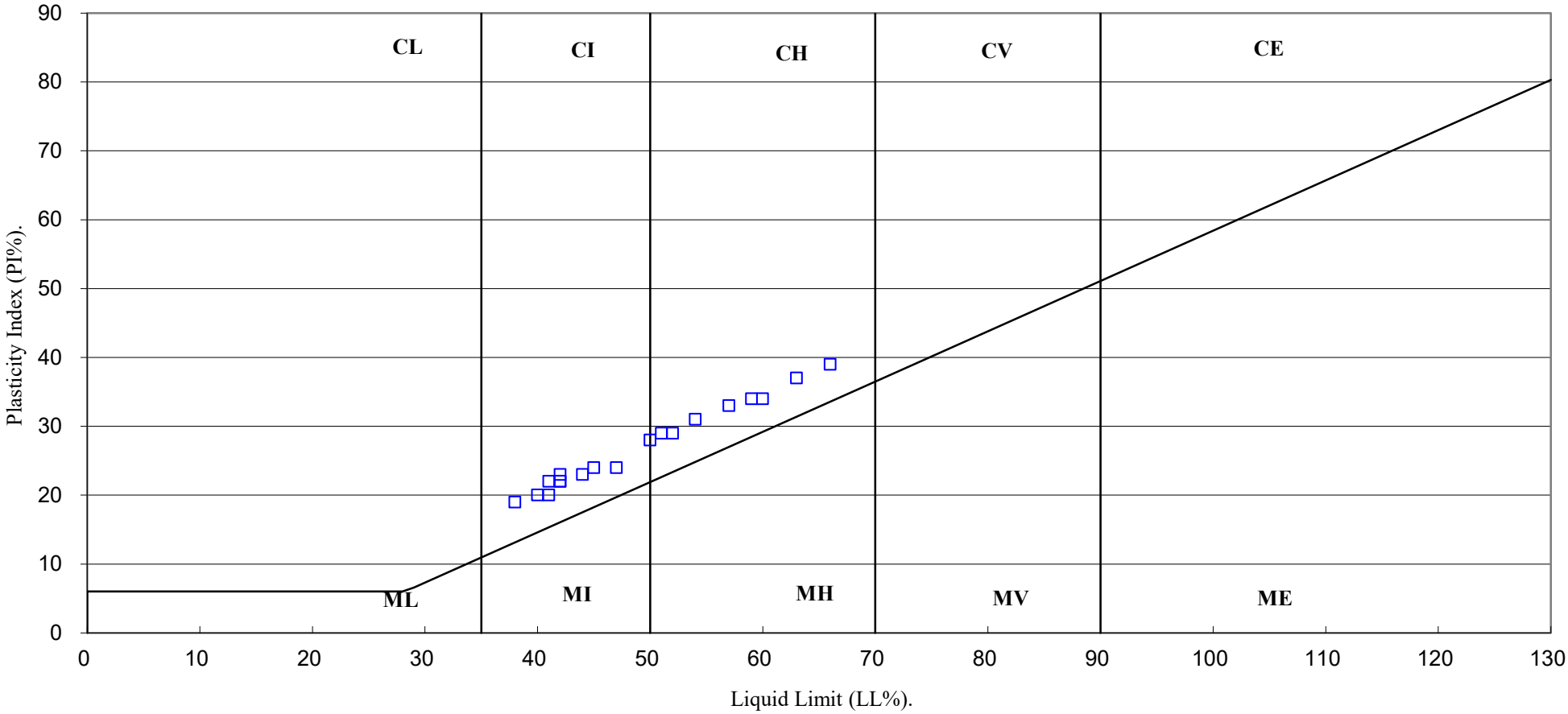
Contract No:

PSL20/1448

Client Ref:

AG3080-19

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No: PSL20/1448
			Client Ref: AG3080-19

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP1202		B	0.50		26		2.63	54	25	29	84	High plasticity CH.
TP1203		D	1.50		26			62	26	36	100	High plasticity CH.
TT2009		D	1.00		21			44	20	24	92	Intermediate plasticity CI.
TT2009		B	2.50		19			42	21	21	34	Intermediate plasticity CI.
TT2010		D	0.80		22			59	25	34	100	High plasticity CH.
TT2010		D	2.00		13			45	22	23	70	Intermediate plasticity CI.
TT2031		B	2.00		15			41	21	20	43	Intermediate plasticity CI.
RC4010		B	2.00	4.00	17			43	22	21	40	Intermediate plasticity CI.
RC4010		B	6.00	8.00	19			42	22	20	50	Intermediate plasticity CI.

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Hoylands Common, Barnsley

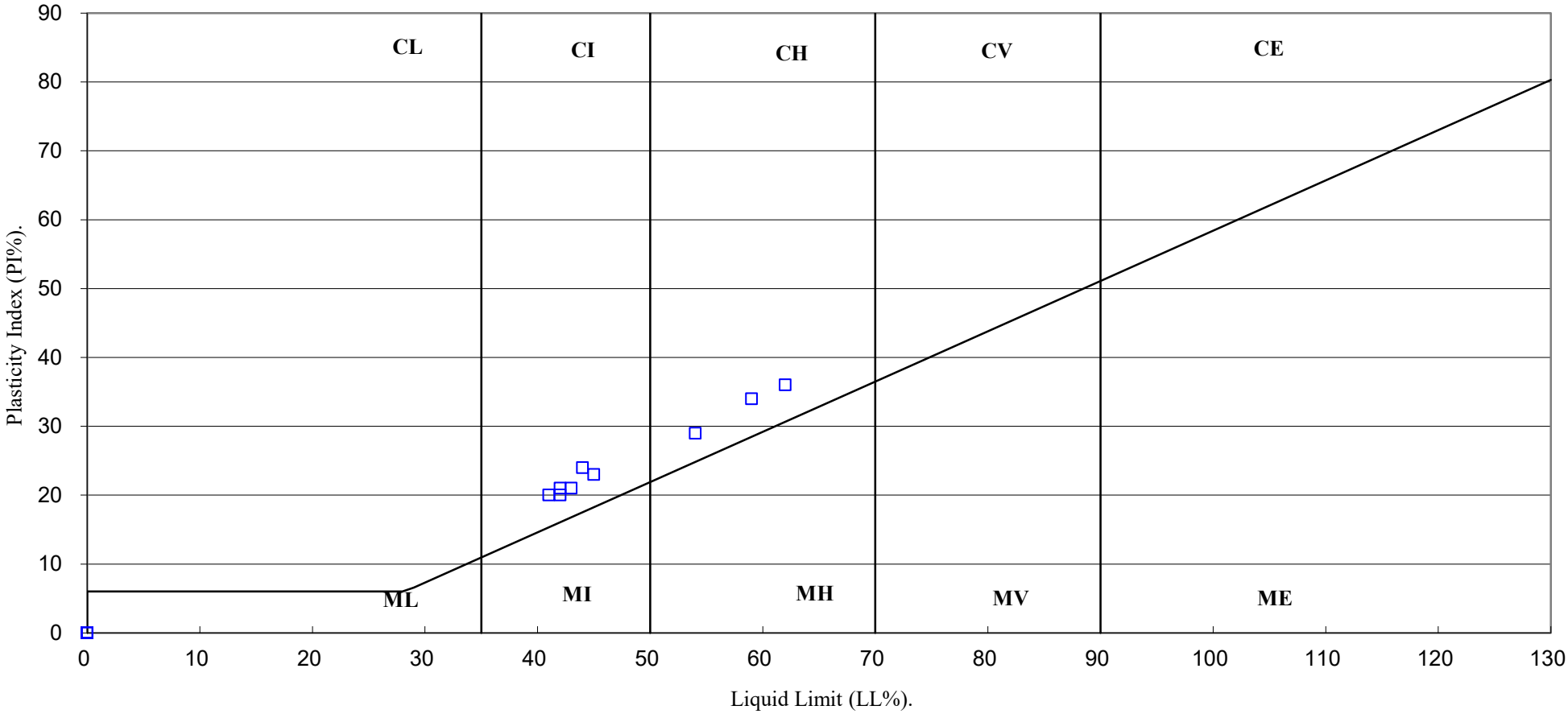
Contract No:

PSL20/1448

Client Ref:

AG3080-19

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No: PSL20/1448
			Client Ref: AG3080-19

SUMMARY OF LABORATORY HAND VANES

(BS1377 : PART 7 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Peak Shear Strength kPa	Residual Shear Strength kPa	Remarks
TP1002		B	3.00		11	>144		
TP1003		B	2.50		9.2	>144		
TP1004		B	3.00		12	>144		
TP1007		B	0.60		13	>144		
TP1009		B	2.00	3.00	20	>144		
TP1012		B	1.60	4.00	10	>144		
TP1015		B	1.20		14	>144		
TP1017		B	2.00		11	>144		
TP1018		B	1.00		18	>144		
TP1022		B	0.90		15	>144		
TP1024		B	1.00		10	>144		
TP1027		B	2.50	3.00	12	>144		
TP1029		B	3.00		18	>144		
TP1030		B	2.50	3.00	12	>144		4.5kg comp
TP1030		B	2.50	3.00	14	124		2.5kg comp
TP1032		B	0.50	1.50	17	>144		4.5kg comp
TP1032		B	0.50	1.50	20	114		2.5kg comp
TP1032		B	2.00	2.50	8.8	>144		4.5kg comp
TP1032		B	2.00	2.50	13	135		2.5kg comp

* This test is out of our UKAS scope

PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No:
		PSL20/1448
		Client Ref:
		AG3080-19

SUMMARY OF LABORATORY HAND VANES

(BS1377 : PART 7 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Peak Shear Strength kPa	Residual Shear Strength kPa	Remarks
TP1033		B	2.00	2.50	16	>144		4.5kg comp
TP1033		B	2.00	2.50	19	120		2.5kg comp
TP1033		B	3.50	4.00	13	>144		
TP1036		B	3.00	3.50	10	>144		
TP1040		B	1.00		6.9	>144		
TP1042		B	3.00		13	>144		
TP1043		B	4.00		8.9	>144		4.5kg comp
TP1043		B	4.00		12	118		2.5kg comp
TP1045		B	2.50	3.50	13	>144		4.5kg comp
TP1045		B	2.50	3.50	16	135		2.5kg comp
TP1048		B	1.50	2.00	9.4	>144		
TP1049		B	1.50	2.00	14	>144		
TP1049		B	3.00	4.00	9.5	>144		
TP1054		B	2.50		8.5	>144		
TP1055		B	3.00		11	>144		
TP1056		B	0.50	0.70	18	>144		
TP1063		B	2.00	2.50	9.7	>144		
TP1201		B	0.50		14	>144		
TP1202		B	0.50		15	>144		

* This test is out of our UKAS scope

PSL Professional Soils Laboratory	Hoylands Common, Barnsley	Contract No:
		PSL20/1448
		Client Ref:
		AG3080-19

PARTICLE SIZE DISTRIBUTION TEST

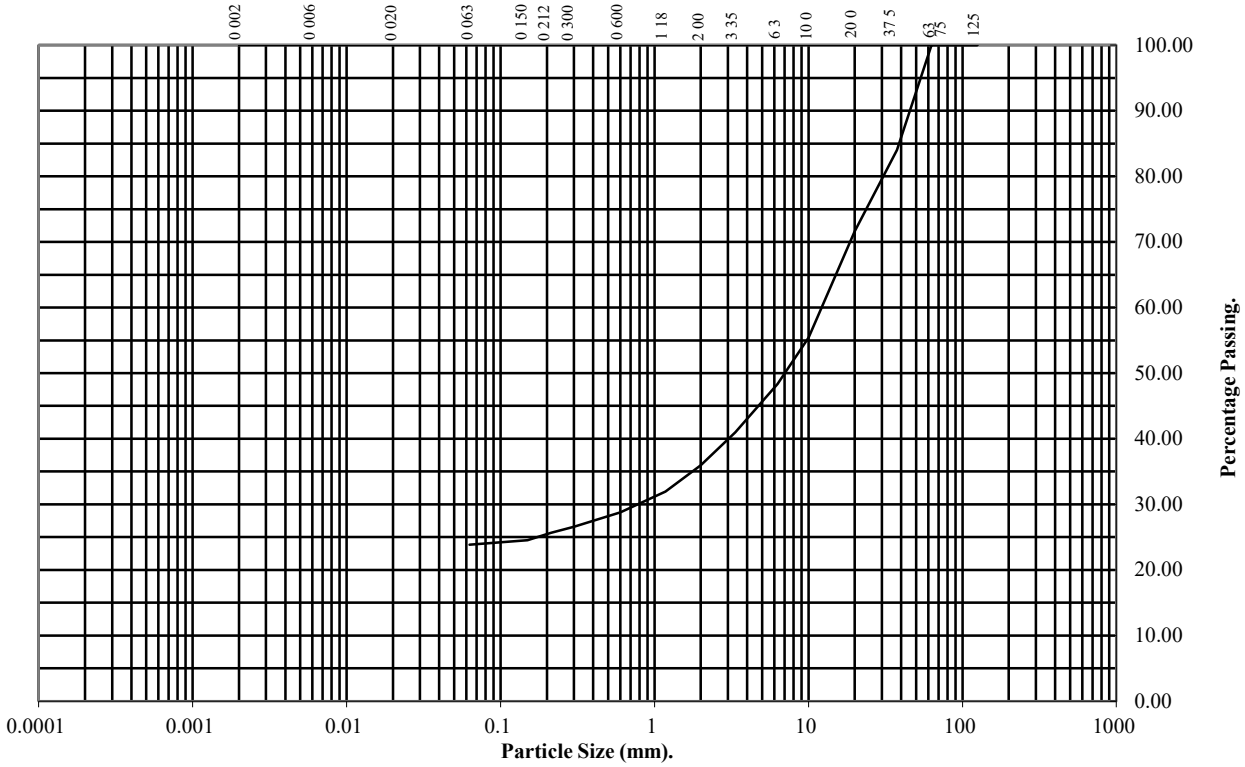
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1002 **Top Depth (m):** 3.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	84
20	72
10	55
6.3	48
3.35	41
2	36
1.18	32
0.6	29
0.3	27
0.212	26
0.15	25
0.063	24

Soil Fraction	Total Percentage
Cobbles	0
Gravel	64
Sand	12
Silt/Clay	24

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

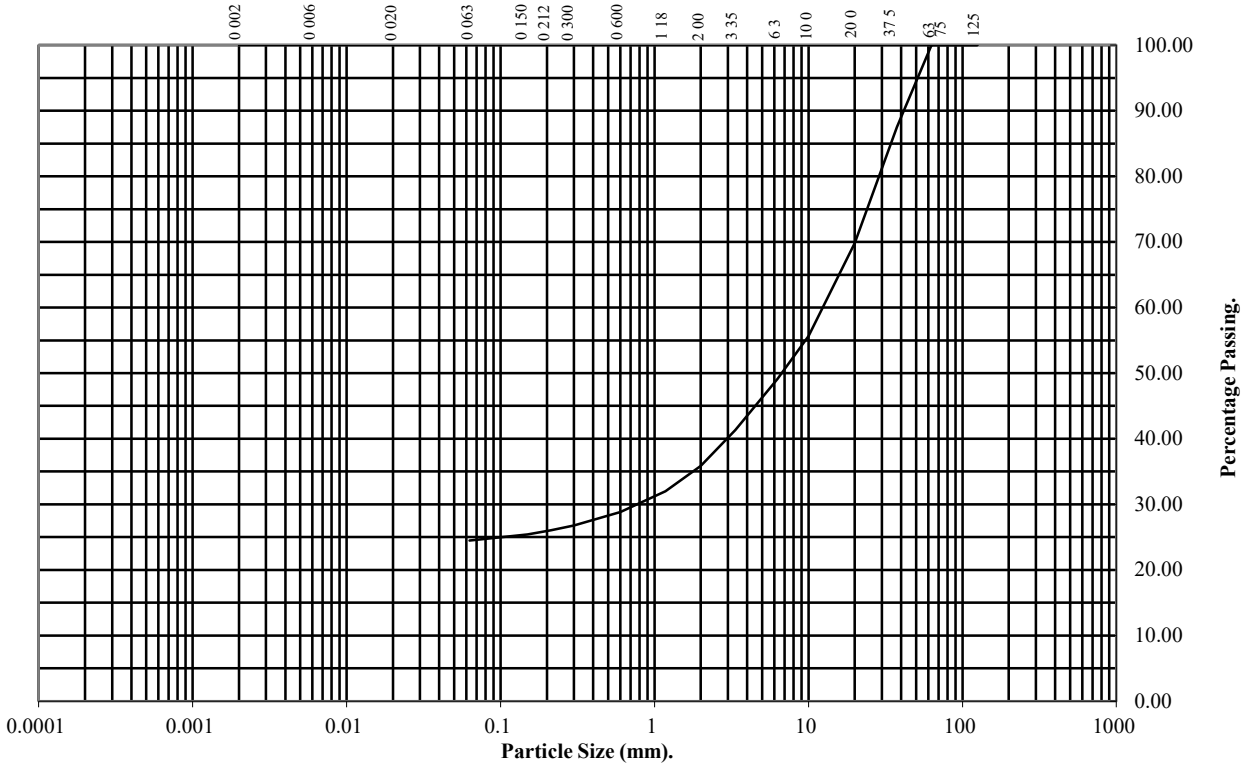
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1003 **Top Depth (m):** 2.50

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	88
20	70
10	56
6.3	49
3.35	41
2	36
1.18	32
0.6	29
0.3	27
0.212	26
0.15	25
0.063	24

Soil Fraction	Total Percentage
Cobbles	0
Gravel	64
Sand	12
Silt/Clay	24

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

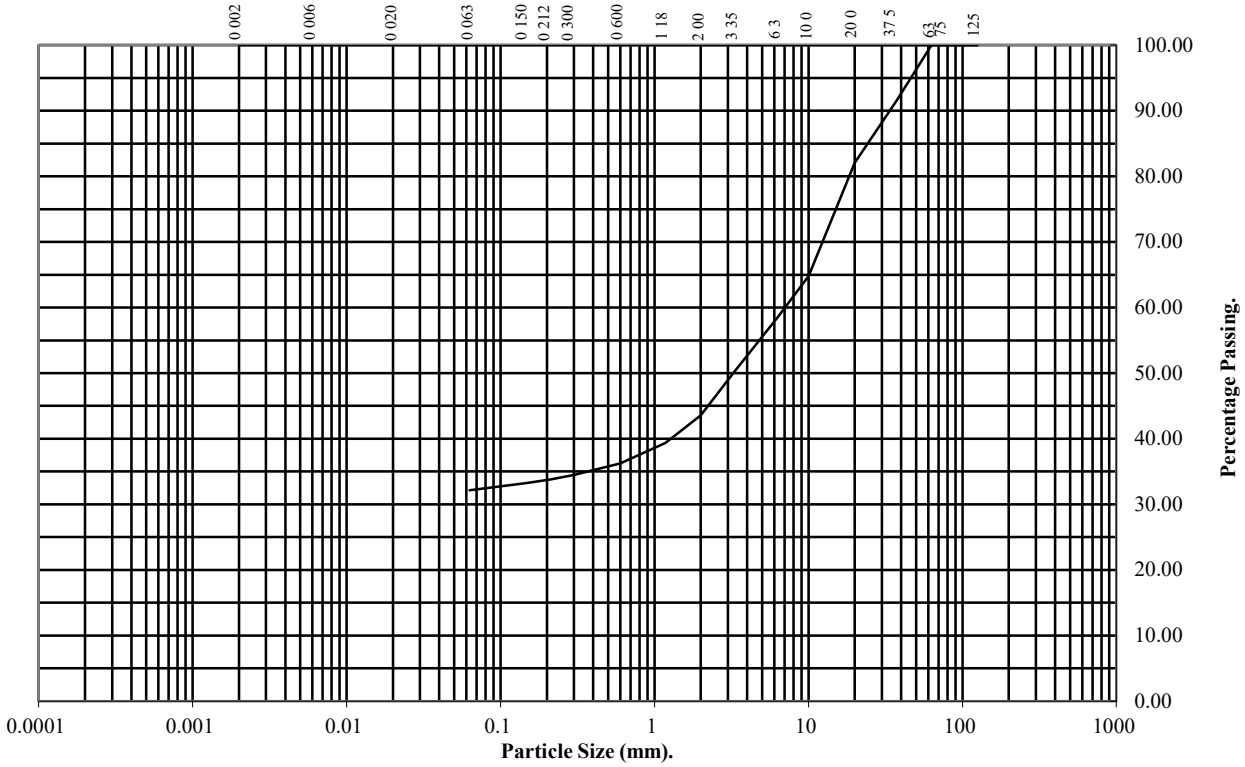
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1004 **Top Depth (m):** 3.00

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	92
20	82
10	65
6.3	58
3.35	50
2	44
1.18	39
0.6	36
0.3	34
0.212	34
0.15	33
0.063	32

Soil Fraction	Total Percentage
Cobbles	0
Gravel	56
Sand	12
Silt/Clay	32

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

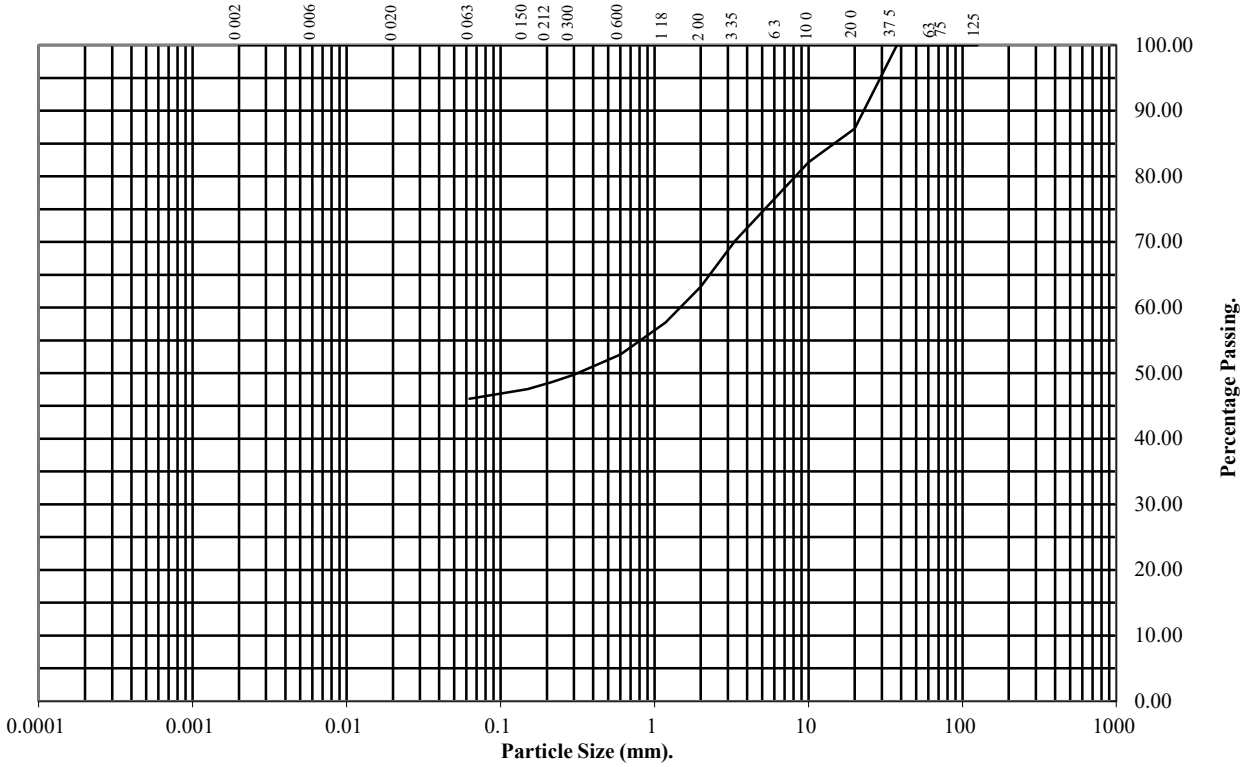
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP1007 **Top Depth (m):** 0.60

Sample Number: **Base Depth(m):**

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	87
10	82
6.3	77
3.35	70
2	63
1.18	58
0.6	53
0.3	50
0.212	49
0.15	48
0.063	46

Soil Fraction	Total Percentage
Cobbles	0
Gravel	37
Sand	17
Silt/Clay	46

Remarks:

See Summary of Soil Descriptions