East Midlands Gateway
Phase 2 (EMG2)

Document DCO 6.14F/MCO 6.14F (Part 3 of 6)
ENVIRONMENTAL STATEMENT

Technical Appendices

Appendix 14F

Preliminary Sources Study Affecting National Highways

October 2025

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The East Midlands Gateway Phase 2
and Highway Order 202X and The East Midlands Gateway
Rail Freight and Highway (Amendment) Order 202X

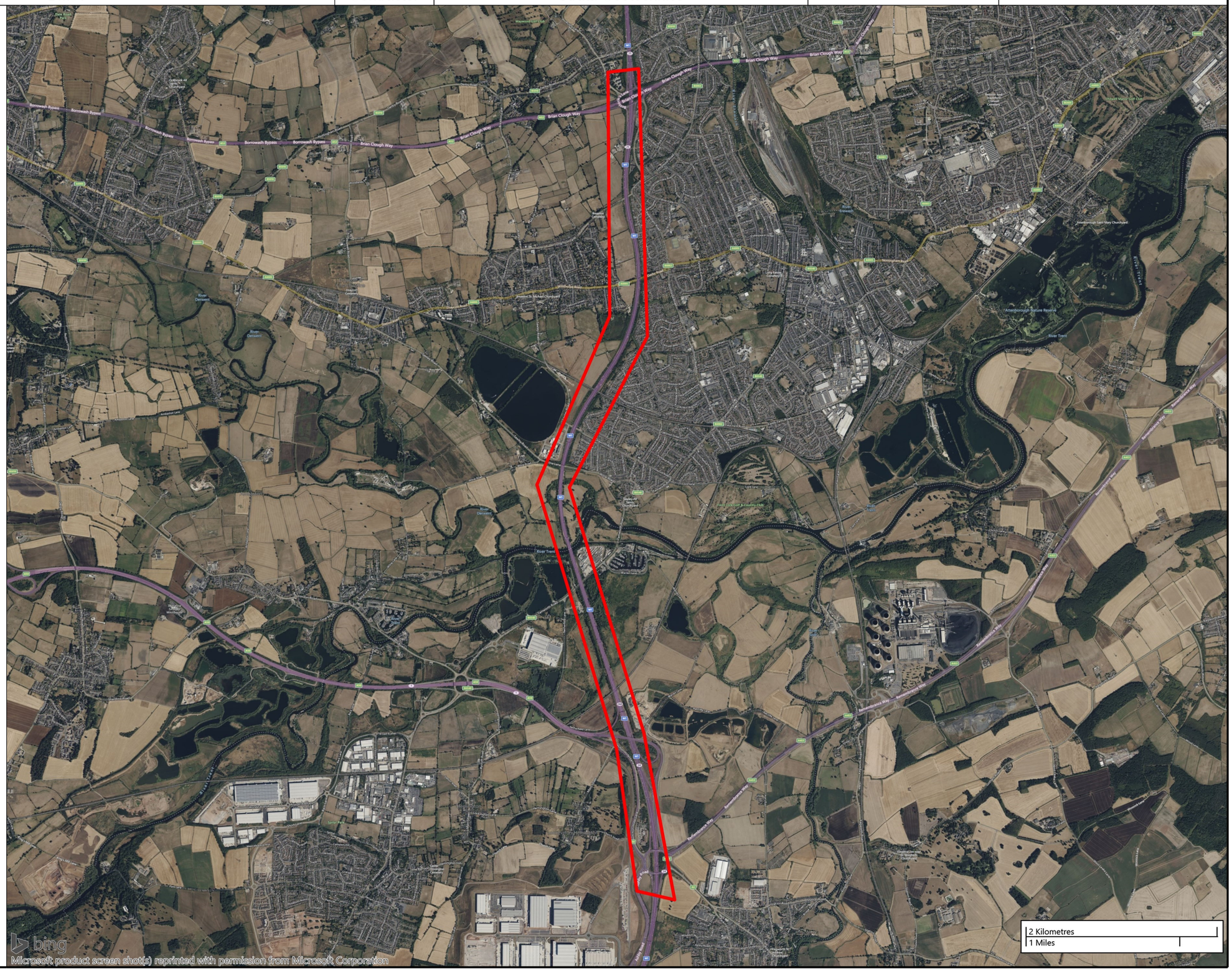
SEGRO.COM/SLPEMG2

SEGRO

Project ID:	G230600	Title	Site Plan
Project Title:	M1 J23A-J25	Scale	1:40000
Location:		Engineer	[redacted]
Client:	BMJV	Contractor	Strata Geotechnics

Legend Key

Project Bounds - Project Bounds



Project ID:	G230600	Title	Site Plan
Project Title:	M1 J23A-J25	Scale	1:40000
Location:		Engineer	[redacted]
Client:	BMJV	Contractor	Strata Geotechnics

Legend Key

- Locations By Type - WLS
- Locations By Type - WS+RC

Project ID:	G230600	Title	Site Plan
Project Title:	M1 J23A-J25	Scale	1:9500
Location:	M1 J23A-J25	Engineer	[redacted]
Client:	BMJV	Contractor	Strata Geotechnics

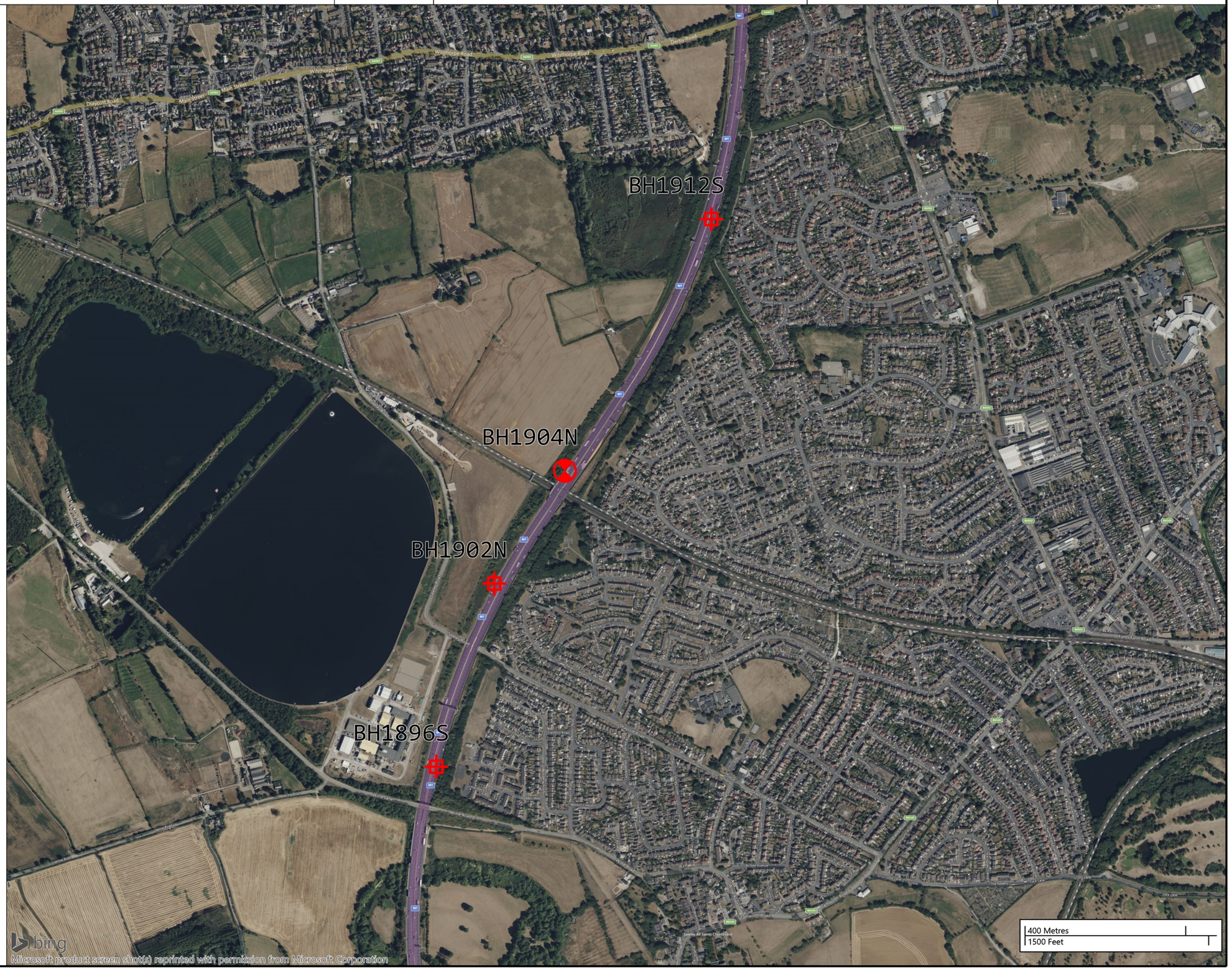
Legend Key

- Locations By Type - WLS
- Locations By Type - WS+RC

Project ID:	G230600	Title	Site Plan
Project Title:	M1 J23A-J25	Scale	1:9500
Location:	M1 J23A-J25	Engineer	[redacted]
Client:	BMJV	Contractor	Strata Geotechnics

Legend Key

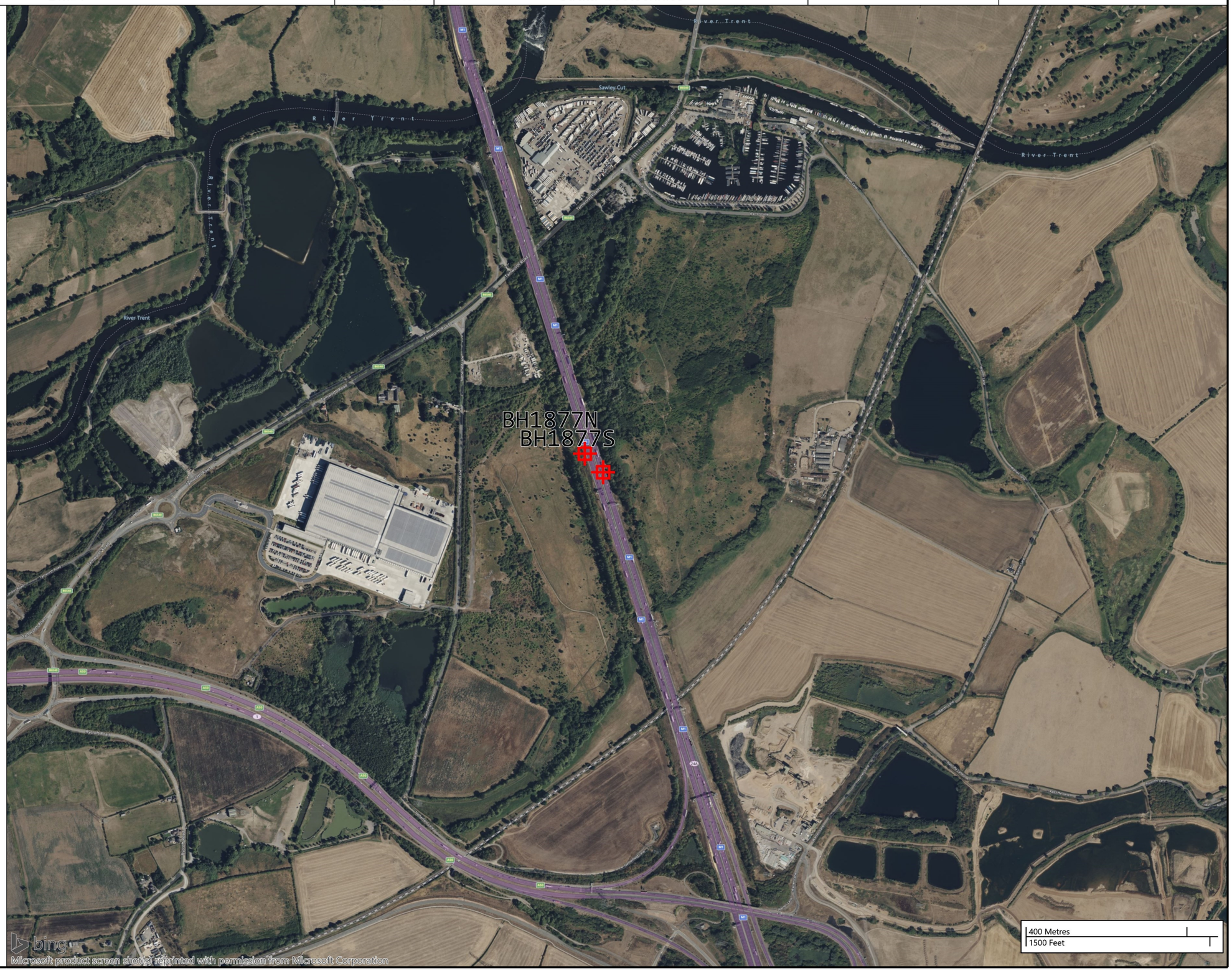
- Locations By Type - WLS
- Locations By Type - WS+RC



Project ID:	G230600	Title	Site Plan
Project Title:	M1 J23A-J25	Scale	1:9500
Location:	M1 J23A-J25	Engineer	[redacted]
Client:	BMJV	Contractor	Strata Geotechnics

Legend Key

- Locations By Type - WLS
- Locations By Type - WS+RC



Project ID:	G230600	Title	Site Plan
Project Title:	M1 J23A-J25	Scale	1:9500
Location:	M1 J23A-J25	Engineer	[redacted]
Client:	BMJV	Contractor	Strata Geotechnics

Legend Key

- Locations By Type - WLS
- Locations By Type - WS+RC

Appendix B: Exploratory Hole Records

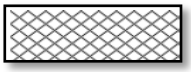
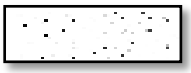
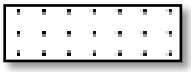
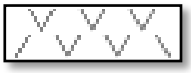
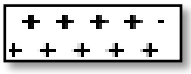
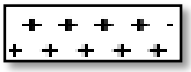
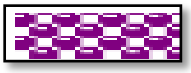
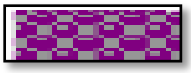
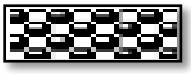
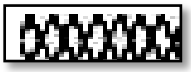
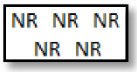
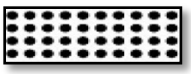
Legends:

U	Undisturbed driven tube sample, 100mm nominal diameter unless noted
UT	Undisturbed thin wall tube sample, 100mm nominal diameter unless noted
P	Undisturbed pushed piston sample, 100mm nominal diameter unless noted
CBR	CBR mould sample
BLK	Block sample
D	Small disturbed sample
B	Disturbed bulk sample
SD	Standard Penetration Test liner sample
ES	Soil sample for environmental testing
W	Water sample
L	Liner, dynamic/windowless sample
C	Core sample
CSS	Core sub sample

Test results

N (S)	Standard penetration test, split spoon sampler (uncorrected)
N (C)	Standard penetration test, solid cone (uncorrected)
K	Field permeability test, kFH indicates falling head, kPI indicates packer injection
HV	Hand vane test [peak/residual], kPa, Undrained Shear Strength
I_a or I_d	Point load strength quoted for axial (a) and diameter (d), MPa Point Load Index
PP	Pocket Penetrometer, kPa, Unconfined Compressive Strength
LMP	Lump sample for laboratory testing
Non-Intact	Core recovered in sections less than one full diameter without signs of weathering

Soil, Rock and Backfill Legends:

Topsoil		**MADE GROUND**	
Concrete		**Bituminous Material**	
Clay		**Silt**	
Sand		**Gravel**	
Cobbles		**Peat**	
Sandstone		**Mudstone**	
Siltstone		**Coal**	
Breccia		**Fine grained Igneous**	
Limestone		**Medium grained Igneous**	
Conglomerate		**Coarse grained Igneous**	
Clean Ballast		**Fine grained Metamorphic**	
Slightly dirty Ballast		**Medium grained Metamorphic**	
Dirty Ballast		**Coarse grained Metamorphic**	
Broken Ground		**No Recovery**	
Cement Bentonite		**Bentonite**	
Arisings		**Grout**	

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV				Borehole ID: BH1851S
	Contract Number: G230600	Date Started: 28/06/2023	Date Completed: 30/06/2023	Logged: PB	Checked: JB	Status: FINAL	Sheet 1 of 1
Dynamic Sample Drilling Log	Easting: 447553.8	Northing: 327409.2	Ground Level: 39.54m (OD)	Plant Used: Comacchio 305		Print Date: 04/09/2023	Scale: 1:50
Weather: Showers+Fine	Rig Crew: Ian Mountain	Termination: Refusal		SPT Hammer: AR666 Energy Ratio: 65%			

Samples & In Situ Testing							Strata Details				Groundwater	
Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 0.80	CC6						39.41	0.13		MADE GROUND: Bituminous material. [MADE GROUND]		
										MADE GROUND: Concrete bound material. [MADE GROUND]		
								(1.17)				
		SPT(C) 1.20m, N=31 (8,8/9,7,7,8)					38.24	1.30				
1.20 - 2.00	L11							(0.40)		Soft to firm orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse angular to sub-rounded quartz, chert and rare sandstone. [Edwalton Member]		
							37.84	1.70				
2.00 - 2.45	D1	SPT(S) 2.00m, N=19 (5,5/4,4,6,5)								Firm orangish brown mottled greyish brown sandy CLAY. Sand is fine to medium. [Edwalton Member]		
2.00 - 2.45	ES20											
2.00 - 3.00	L12											
3.00 - 3.45	D2	SPT(S) 3.00m, N=20 (3,3/4,4,6,6)						(2.50)				
3.00 - 4.00	L13											
4.00 - 4.45	D3	SPT(S) 4.00m, N=21 (4,4/4,4,6,7)										
							35.34	4.20		Firm greyish brown very sandy friable CLAY. Sand is fine to medium. [Edwalton Member]		
4.00 - 5.00	L14							(0.70)				
							34.64	4.90		Stiff orangish brown mottled greyish brown sandy friable CLAY. Sand is fine to medium. [Edwalton Member]		
5.00 - 5.45	D4	SPT(S) 5.00m, N=24 (4,4/4,5,7,8)										
5.00 - 6.00	L15											
6.00 - 6.45	D5	SPT(S) 6.00m, N=24 (4,5/5,5,7,7)										
6.00 - 7.00	L16											
7.00 - 7.45	D7	SPT(S) 7.00m, N=37 (10,10/10,10,8,9)										
7.00 - 8.00	B17							(4.88)				
8.00 - 8.45	D8	SPT(S) 8.00m, N=42 (9,9/11,10,10,11)										
8.00 - 9.00	B18											
9.00 - 9.22	D9	SPT(S) 9.00m, 50 (25 for 76mm/50 for 144mm)										
9.00 - 9.60	B19											
9.60 - 9.78	D10	SPT(S) 9.60m, 50 (25 for 79mm/50 for 100mm)					29.76	9.78		End of Borehole at 9.78m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
28-06-23	20:00			
28-06-23	23:55	7.00	3.00	
29-06-23	20:00	7.00	3.00	
29-06-23	23:55	9.78	3.00	

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
9.78	101

Casing Diameter

Depth (m)	Dia (mm)

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV			Borehole ID: BH1877N
	Contract Number: G230600	Date Started: 01/06/2023	Date Completed: 02/06/2023	Logged: JN/ASH	Checked: JB	Status: FINAL — Sheet 1 of 1
Dynamic Sample Drilling Log	Easting: 446863.5	Northing: 330029.2	Ground Level: 33.71m (OD)	Plant Used: Comacchio 305	Print Date: 04/09/2023	Scale: 1:50
Weather: Fine	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth		SPT Hammer: AR935 Energy Ratio: 63.5%		

Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	CC1						33.51	0.20		MADE GROUND: Black bituminous material. [MADE GROUND]		
								(0.30)		MADE GROUND: Concrete bound material.		
0.50	D13						33.21	0.50		[MADE GROUND]		
0.50	ES11							(0.50)		MADE GROUND: Grey slightly sandy GRAVEL, Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of quartzite.		
1.00	ES12						32.71	1.00		[MADE GROUND]		
1.20 - 1.65	D2	SPT(S) 1.20m, N=19 (10,4/4,5,5,5)					32.51	1.20		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is sub-rounded to rounded fine to medium of quartzite. [Hemmington Member]		
1.40 - 1.50	D14											
1.50 - 1.70	ES15							(1.00)		Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone.		
2.00 - 3.00	D16											
2.00 - 3.00	ES17	SPT(S) 2.20m, N=30 (8,8/9,8,8,5)					31.51	2.20		[Hemmington Member]		
2.20 - 2.65	D3									Dense dark brown clayey sandy angular fine to coarse GRAVEL of quartz and siltstone. Sand is fine to coarse. [Hemmington Member]		
3.00 - 3.41	D4	SPT(S) 3.00m, N=31 (25 for 110mm/14,6,6,5)										
3.00 - 4.00	B19											
3.00 - 4.00	D18							(2.30)				
4.00 - 4.20	D20	SPT(S) 4.00m, N=30 (7,8/2,9,9,10)										
4.00 - 4.45	D5											
4.50 - 4.70	D21						29.21	4.50				
4.70 - 5.00	D22						29.01	4.70		Stiff greyish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-rounded to rounded fine to coarse of quartz and mudstone.		
								(0.30)		[Hemmington Member]		
5.00 - 5.45	D6	SPT(S) 5.00m, N=35 (3,8/8,8,8,11)					28.71	5.00		Reddish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to rounded fine to coarse of quartz and sandstone.		
5.00 - 6.00	D23							(1.00)		[Hemmington Member]		
6.00 - 6.45	D7	SPT(S) 6.00m, N=27 (5,6/6,6,7,8)					27.71	6.00		Dense dark brown clayey gravelly fine to coarse SAND. Gravel is sub-angular to rounded fine to coarse of quartz and sandstone. [Hemmington Member]		
										Medium dense to dense dark brown clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of quartz and sandstone. [Hemmington Member]		
7.00 - 7.45	D8	SPT(S) 7.00m, N=21 (8,9/4,4,6,7)								*7.00 - 8.00: Very sandy*		
7.00 - 8.00	B25											
7.00 - 8.00	D24							(4.00)				
8.00 - 8.45	D9	SPT(S) 8.00m, N=22 (1,4/7,7,5,3)										
8.00 - 9.00	D26											
9.00 - 10.00	D27	SPT(S) 9.00m, N=45 (5,8/9,11,13,12)										
9.00 - 9.45	D10											
							23.71	10.00		End of Borehole at 10.00m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
01-06-23	20:00			
01-06-23	23:55	0.00		

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
3.00	101
7.00	87
10.00	77

Casing Diameter

Depth (m)	Dia (mm)
1.20	152

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV				Borehole ID: BH1877S
	Contract Number: G230600	Date Started: 14/06/2023	Date Completed: 15/06/2023	Logged: PB/ASH	Checked: JB	Status: FINAL	Sheet 1 of 1
Dynamic Sample Drilling Log	Easting: 446908.7	Northing: 329983.3	Ground Level: 33.52m (OD)	Plant Used: Comacchio 305		Print Date: 04/09/2023	Scale: 1:50
Weather: Fine	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth				SPT Hammer: AR935 Energy Ratio: 63.5%	

Samples & In Situ Testing							Strata Details				Groundwater	
Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	CC1						33.32	0.20		MADE GROUND: Bituminous material. [MADE GROUND]		
										MADE GROUND: Concrete bound material. [MADE GROUND]		
								(1.00)				
		SPT(C) 1.00m, 50 (2,16/50 for 90mm)										
							32.32	1.20		Very stiff dark brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of sandstone and mudstone.		
1.50 - 1.60	D2											
1.80 - 2.00	ES3							(1.30)				
		SPT(C) 2.00m, 50 (9,13/50 for 150mm)								[Hemmington Member]		
2.50 - 2.60	D4						31.02	2.50		Firm to stiff reddish brown sandy gravelly CLAY. Gravel is angular fine to coarse of sandstone and mudstone.		
2.70 - 3.00	ES5							(0.50)				
		SPT(C) 3.00m, 50 (25 for 75mm/50 for 75mm)					30.52	3.00		[Hemmington Member] Gravels with boulders [Driller's Description] [Hemmington Member]		
		SPT(C) 4.00m, 50 (25 for 145mm/50 for 150mm)										
		SPT(C) 5.00m, 50 (25 for 75mm/50 for 80mm)										
		SPT(C) 6.00m, 50 (25 for 70mm/50 for 75mm)										
								(7.00)				
		SPT(C) 7.00m, 50 (25 for 115mm/50 for 65mm)										
		SPT(C) 8.00m, 50 (25 for 75mm/50 for 75mm)										
		SPT(C) 9.00m, 50 (25 for 75mm/50 for 75mm)										
							23.52	10.00		End of Borehole at 10.00m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
14-06-23	20:00			
14-06-23	23:55	5.00	1.00	4.00
15-06-23	20:00	5.00	1.00	4.00
15-06-23	23:55	0.00		

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.
Rotary Open Hole from 3.00m BGL to 10m BGL due to very dense strata.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
2.00	101
10.00	87

Casing Diameter

Depth (m)	Dia (mm)
1.00	152
10.00	101

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV				Borehole ID: BH1896S
	Contract Number: G230600	Date Started: 12/06/2023	Date Completed: 13/06/2023	Logged: PB	Checked: JB	Status: FINAL	Sheet 1 of 1
Dynamic Sample Drilling Log	Easting: 446549.2	Northing: 331847.6	Ground Level: 33.91m (OD)	Plant Used: Comacchio 305		Print Date: 04/09/2023	Scale: 1:50
Weather: Fine	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth		SPT Hammer: AR935 Energy Ratio: 63.5%			

Samples & In Situ Testing							Strata Details				Groundwater	
Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	CC1						33.71	0.20		MADE GROUND: Bituminous material. [MADE GROUND]		
								(1.00)		MADE GROUND: Concrete bound material. [MADE GROUND]		
		SPT(S) 1.00m, 50 (25 for 100mm/50 for 115mm)										
1.20 - 1.30	D2						32.71	1.20				
1.30 - 1.40	D3						32.61	1.30		Very stiff dark brown mottled grey gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of sandstone and mudstone.		
1.50 - 1.70	ES4							(0.60)				
1.90 - 2.00	D5						32.01	1.90		[Hemmington Member]		
2.00 - 3.00	ES11	SPT(C) 2.00m, 50 (9,16/50 for 225mm)					31.91	2.00		Very stiff reddish brown silty sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone.		
								(1.00)		[Hemmington Member]		
3.00 - 4.00	ES12	SPT(C) 3.00m, 50 (25 for 100mm/50 for 95mm)					30.91	3.00		Orange brown slightly sandy sub-angular to rounded fine to coarse GRAVEL of quartz. Sand is medium to coarse. [Hemmington Member]		
								(1.30)		Very dense dark brown sandy sub-angular to rounded fine to coarse GRAVEL of quartz. Sand is fine to coarse. [Hemmington Member]		
4.00 - 4.20	D6	SPT(C) 4.00m, 50 (8,15/50 for 150mm)								Very dense orange brown slightly gravelly fine to coarse SAND. Gravel is sub-angular to rounded fine to medium of quartz and sandstone. [Hemmington Member]		
4.20 - 4.30	D7											
4.30 - 4.40	D8						29.61	4.30		Orange brown slightly clayey slightly gravelly fine to coarse SAND. [Hemmington Member]		
4.40 - 4.80	ES9											
4.60 - 5.00	B10							(0.70)				
		SPT(C) 5.00m, 50 (25 for 65mm/50 for 80mm)					28.91	5.00		Gravelly CLAY. [Driller's Description] [Hemmington Member]		
		SPT(C) 6.00m, 50 (25 for 75mm/50 for 75mm)						(2.00)				
		SPT(C) 7.00m, 50 (4,19/50 for 150mm)					26.91	7.00		SAND and GRAVEL. [Driller's Description] [Hemmington Member]		
		SPT(C) 8.00m, 50 (25 for 75mm/50 for 75mm)						(2.20)				
		SPT(C) 9.00m, 50 (25 for 75mm/50 for 75mm)								Very dense ark brown sandy GRAVEL. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of quartz. [Hemmington Member]		
9.20 - 9.40	D13						24.71	9.20				
								(0.40)				
							24.31	9.60		Very stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone. [Edwalton Member]		
9.80 - 10.00	D14							(0.40)				
							23.91	10.00		End of Borehole at 10.00m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
12-06-23	20:00			
12-06-23	23:55	7.00	1.00	2.00
13-06-23	20:00	7.00	1.00	3.00
13-06-23	23:55	0.00		

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.
Rotary Open Hole from 5.00m BGL to 9.2m BGL due to very dense strata.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
3.00	101
7.00	87
10.00	77

Casing Diameter

Depth (m)	Dia (mm)
1.00	152

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV			Borehole ID: BH1902N
	Contract Number: G230600	Date Started: 30/05/2023	Date Completed: 31/05/2023	Logged: JN/ASH	Checked: JB	Status: FINAL — Sheet 1 of 1
Dynamic Sample Drilling Log	Easting: 446689.2	Northing: 332306.1	Ground Level: 40.40m (OD)	Plant Used: Comacchio 305	Print Date: 04/09/2023	Scale: 1:50
Weather: Drizzle+Cloudy	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth		SPT Hammer: AR935 Energy Ratio: 63.5%		

Samples & In Situ Testing							Strata Details				Groundwater	
Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.20	CC1						40.15	0.25		MADE GROUND: Black Bituminous Material. [MADE GROUND]		
								(0.35)		MADE GROUND: Concrete bound material. [MADE GROUND]		
							39.80	0.60		MADE GROUND: Brown clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded to rounded fine to medium of quartz and quartzite. [MADE GROUND]		
1.00	ES11							(0.60)				
1.20 - 1.30	B12	SPT(S) 1.20m, N=11 (1,1/2,3,3,3)					39.20	1.20		Medium dense reddish brown slightly clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone. [Hemmington Member]		
1.20 - 1.65	D2											
1.40 - 1.50	D13											
1.50 - 1.70	ES14							(1.30)				
2.20 - 2.65	D3	SPT(S) 2.20m, N=10 (2,1/1,2,3,4)										
2.50 - 2.70	ES15						37.90	2.50				
								(0.30)		Loose dark brown sightly sandy angular fine to coarse GRAVEL of quartz and mudstone. Sand is fine to coarse. [Hemmington Member]		
2.90 - 3.00	D16						37.60	2.80		Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone. [Edwalton Member]		
3.00 - 3.45	D4	SPT(S) 3.00m, N=18 (3,3/4,5,4,5)						(1.20)				
3.60 - 3.70	D17											
4.00 - 4.45	D5	SPT(S) 4.00m, N=24 (3,4/5,6,6,7)					36.40	4.00		Medium dense dark brown silty gravelly fine to coarse SAND. Gravel is angular fine to coarse of quartz and mudstone. [Edwalton Member]		
							36.20	4.20		Very stiff reddish brown mottled grey sandy gravelly CLAY. Gravel is angular fine to coarse of mudstone. [Edwalton Member]		
4.50 - 4.70	D18											
5.00 - 5.45	D6	SPT(S) 5.00m, N=25 (2,5/5,6,7,7)										
6.00 - 6.45	D7	SPT(S) 6.00m, N=35 (3,5/8,8,9,10)										
6.50 - 6.70	D19											
7.00 - 7.45	D8	SPT(S) 7.00m, N=33 (5,3/7,8,8,10)						(5.80)				
7.50 - 7.70	D20											
8.00 - 8.45	D9	SPT(S) 8.00m, N=37 (3,6/6,7,11,13)								*8.00 - 9.00: Stiff to very stiff.*		
8.50 - 8.70	D21											
9.00 - 9.45	D10	SPT(S) 9.00m, N=45 (2,12/10,10,11,14)										
9.50 - 9.70	D22											
							30.40	10.00		End of Borehole at 10.00m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
30-05-23	20:00			
30-05-23	23:55	1.20	1.20	0.00
31-05-23	20:00	1.20	1.20	0.20
31-05-23	23:55	0.00		

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
3.00	101
10.00	87

Casing Diameter

Depth (m)	Dia (mm)
1.20	152

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV	Borehole ID: BH1904N
	Contract Number: G230600	Date Started: 02/05/2023	Date Completed: 11/05/2023	Logged: PB/ASH / Checked: JB / Status: FINAL
Dynamic Sample Borehole Log	Easting: 446863.9	Northing: 332589.3	Ground Level: 39.20m (OD)	Plant Used: Comacchio 305 / Print Date: 04/09/2023 / Scale: 1:50
Weather: Fine+Showers	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth	SPT Hammer: AR935 Energy Ratio: 63.5%	Sheet 1 of 3

Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Strata Description	Progress Window Run	Groundwater Water Strike	Groundwater Backfill/ Installation
0.00 - 0.60	CC1		39.05	0.15	MADE GROUND: Bituminous material. [MADE GROUND]			
				(0.45)	MADE GROUND: Concrete. [MADE GROUND]			
0.60	ES19		38.60	0.60	MADE GROUND: Type 1. [MADE GROUND]			
			38.30	0.90				
1.00	ES20			(0.30)	Reddish brown clayey sandy GRAVEL, with medium cobble content. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse mudstone. Cobbles are sub-angular to rounded of mudstone. [Hemmington Member]	1		
1.00 - 1.10	B21	SPT(S) 1.20m, N=25 (3,13/10,7,4,4)	38.00	1.20				
2.00 - 2.45	D2	SPT(S) 2.00m, N=15 (1,3/3,3,3,6)			Very stiff reddish brown mottled grey slightly gravelly silty sandy CLAY. Gravel is angular fine to coarse of mudstone. [Edwalton Member]	2		
3.00 - 3.45	D3	SPT(S) 3.00m, N=17 (2,2/4,4,5,4)				3		
4.00 - 4.45	D4	SPT(S) 4.00m, N=25 (3,6/5,5,5,10)			4.00 - 4.40: AZCL	4		
				(6.30)				
5.00 - 5.45	D5	SPT(S) 5.00m, N=25 (4,3/5,5,7,8)			5.00 - 6.35: AZCL	5		
6.00 - 6.45	D6	SPT(S) 6.00m, N=28 (3,4/6,7,7,8)				6		
7.00 - 7.45	D7	SPT(S) 7.00m, N=30 (2,6/6,7,7,10)			7.00 - 7.50: AZCL	7		
			31.70	7.50	Very stiff reddish brown clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-angular to angular fine to coarse of mudstone. [Edwalton Member]			
8.00 - 8.40	D8	Recovery = 80%		(0.50)		8		
8.00 - 9.50	C6	50/2 2/50 for 245mm)	31.20	8.00	Very soft reddish brown mottled grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone. [Edwalton Member]			
8.00 - 9.50		33 / 20 / 0		(1.20)	8.00 - 9.00: AZCL			
			30.00	9.20	Very stiff reddish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular fine to coarse of mudstone. [Edwalton Member]	9		
9.50		N=49 (1,7/9,12,13, 15)	29.70	(0.30) 9.50	Very stiff dark brown sandy gravelly CLAY, with low cobble content. Sand is fine to coarse. Gravel is sub-rounded to rounded fine to coarse quartz. Cobbles are sub-rounded of quartz. [Edwalton Member]			
	Fracture	TCR / SCR / RQD						

Progress by Time

Date	Time	Depth	Casing	Water
02-05-23	20:30			
02-05-23	23:55	0.00		
03-05-23	20:00	0.00		
03-05-23	23:55	6.00	1.20	2.00
04-05-23	20:30	6.00	1.20	2.00
04-05-23	23:55	8.00	6.00	2.00
09-05-23	20:00	8.00	6.00	2.00
09-05-23	23:55	11.00	6.00	5.00
10-05-23	20:00	11.00	6.00	4.00
10-05-23	23:55	17.00	17.00	0.30
11-05-23	20:00	17.00	17.00	3.00

Borehole Diameter

Depth	Diameter
4.00	101
6.00	87
11.00	146
20.00	146

Casing Diameter

Depth	Diameter
1.20	152
17.00	146

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR	Client: BMJV		Borehole ID: BH1904N
	Contract Number: G230600	Date Started: 02/05/2023	Date Completed: 11/05/2023	Logged: PB/ASH / Checked: JB / Status: FINAL
				Sheet 2 of 3
Rotary Core Drilling Log	Easting: 446863.9	Northing: 332589.3	Ground Level: 39.20m (OD)	Plant Used: Comacchio 305 / Print Date: 04/09/2023 / Scale: 1:50
Weather: Fine+Showers	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth		SPT Hammer: AR935 Energy Ratio: 63.5%

Samples & In Situ Testing					Strata Details				Groundwater	
Depth	Test Result / FI	TCR	SCR	RQD	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
9.50 - 11.00		13	0	0				Very stiff dark brown sandy gravelly CLAY, with low cobble content. Sand is fine to coarse. Gravel is sub-rounded to rounded fine to coarse quartz. Cobbles are sub-rounded of quartz. [Edwalton Member]		
						(2.20)		*9.50 - 10.80: AZCL*		
11.00	50 (2,10/50 for 165mm)							*11.00 - 11.70: AZCL*		
11.00 - 12.00		30	0	0						
					27.50	11.70		Orange brown silty fine to coarse SAND.		
12.00	50 (9,13/50 for 200mm)				27.30	11.90		[Edwalton Member]		
					27.20	12.00		Firm reddish brown slightly gravelly sandy CLAY. Gravel is angular fine to coarse of mudstone. [Edwalton Member]		
12.00 - 13.50		33	0	0				Very dense dark brown sub-rounded to rounded medium to coarse GRAVEL of quartz.		
								[Edwalton Member]		
						(2.85)		*12.00 - 13.00: AZCL*		
13.50	50 (10,15/50 for 140mm)							*13.50 - 14.70: AZCL*		
13.50 - 15.00		20	10	0						
					24.35	14.85		Very stiff reddish brown sandy CLAY.		
15.00	50 (25 for 110mm/50 for 150mm)							[Edwalton Member]		
15.00 - 16.00		20	0	0		(1.15)		*15.00 - 15.80: AZCL*		
16.00	50 (8,15/50 for 150mm)				23.20	16.00		Very weak grey MUDSTONE. [Edwalton Member]		
16.00 - 17.00		100	80	0		(0.90)				
17.00	FI = 3 If = 20/20/30 50 (25 for 75mm/50 for 125mm)				22.30	16.90		Medium strong to strong grey fine to coarse SANDSTONE. Discontinuities are 0-10 extremely closely to closely planar smooth clean.		
17.00 - 18.50		13	0	0				[Edwalton Member]		
								17.00 - 18.30: AZCL		
18.50	50 (25 for 70mm/50 for 65mm)					(3.10)		*18.50 - 19.50: AZCL*		
18.50 - 19.50		0	0	0						
	FI = 8 If = 50/150/150									
19.50 - 20.00		40	40	30						

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
11-05-23	23:55	0.00		

Flush Information

Top	Base	Return %	Flush Type
8.00	9.50	90	Water
9.50	11.00	80	Water
11.00	12.00	100	Water
12.00	13.50	100	Water
13.50	15.00	100	Water
15.00	16.00	100	Water

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Borehole Diameter

Depth (m)	Dia (mm)
4.00	101
6.00	87
11.00	146

Casing Diameter

Depth (m)	Dia (mm)
1.20	152
17.00	146

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type
8.00	9.50	107	Geobore S
9.50	11.00	107	(146)
11.00	12.00	102	SWF

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV			Borehole ID: BH1904N
	Contract Number: G230600	Date Started: 02/05/2023	Date Completed: 11/05/2023	Logged: PB/ASH	Checked: JB	Status: FINAL
						Sheet 3 of 3
Rotary Core Drilling Log	Easting: 446863.9	Northing: 332589.3	Ground Level: 39.20m (OD)	Plant Used: Comacchio 305	Print Date: 04/09/2023	Scale: 1:50
Weather: Fine+Showers	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth		SPT Hammer: AR935 Energy Ratio: 63.5%		

Samples & In Situ Testing					Strata Details				Groundwater	
Depth	Test Result / FI	TCR	SCR	RQD	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
					19.20	20.00		Medium strong to strong grey fine to coarse SANDSTONE. Discontinuities are 0-10 extremely closely to closely planar smooth clean. [Edwalton Member] End of Borehole at 20.000m		

20
21
22
23
24
25
26
27
28
29

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Flush Information

Top	Base	Return %	Flush Type
16.00	17.00	100	Water
17.00	18.50	80	Water
18.50	19.50	50	Water
19.50	20.00	50	Water

Remarks:
No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
20.00	146

Casing Diameter

Depth (m)	Dia (mm)

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type
8.00	9.50	107	Geobore S
9.50	11.00	107	(146)
11.00	12.00	102	SWF

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV	Borehole ID: BH1912S
	Contract Number: G230600	Date Started: 16/06/2023	Date Completed: 19/06/2023	Logged: PB/ASH / Checked: JB / Status: FINAL
Dynamic Sample Drilling Log	Easting: 447225.4	Northing: 333221.0	Ground Level: 33.65m (OD)	Plant Used: Comacchio 305 / Print Date: 04/09/2023 / Scale: 1:50
Weather: Fine	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth	SPT Hammer: AR935 Energy Ratio: 63.5%	Sheet 1 of 1

Samples & In Situ Testing							Strata Details				Groundwater	
Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	CC1						33.35	(0.30) 0.30		MADE GROUND: Bituminous material. [MADE GROUND]		
								(0.70)		MADE GROUND: Concrete bound material. [MADE GROUND]		
1.00 - 2.00	D6	SPT(S) 1.00m, 50 (3,20/50 for 90mm)					32.65	1.00		Very stiff reddish brown grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse sandstone and mudstone. [Edwalton Member]		
1.00 - 2.00	ES5							(1.20)				
2.00 - 2.20	D7	SPT(S) 2.00m, N=52 (5,10/13,12,12,15)								*2.00 - 2.20: Dark brown.*		
2.00 - 2.45	D2						31.45	2.20		Firm to stiff reddish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse sandstone and mudstone. [Edwalton Member]		
2.50 - 2.70	ES8											
2.70 - 2.80	D9											
3.00 - 3.38	D3	SPT(S) 3.00m, 50 (2,9/50 for 225mm)										
3.00 - 4.00	D11											
3.00 - 4.00	ES10							(2.80)				
4.00 - 4.45	D4	SPT(S) 4.00m, N=52 (5,6/10,13,14,15)										
4.00 - 5.00	D13											
4.00 - 5.00	ES12											
		SPT(C) 5.00m, 50 (25 for 85mm/50 for 125mm)					28.65	5.00		Gravelly CLAY. [Driller's Description] [Edwalton Member]		
		SPT(C) 6.00m, 50 (25 for 75mm/50 for 85mm)										
		SPT(C) 7.00m, 50 (25 for 75mm/50 for 115mm)										
								(5.00)				
		SPT(C) 8.00m, 50 (25 for 80mm/50 for 135mm)										
		SPT(C) 9.00m, 50 (25 for 75mm/50 for 75mm)										
							23.65	10.00		End of Borehole at 10.00m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
16-06-23	20:00			
16-06-23	23:55	5.00	1.00	
19-06-23	20:00	5.00	1.00	
19-06-23	23:55	0.00		

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.
Rotary Open Hole from 5.00m BGL to 10.00m BGL due to very dense strata.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
10.00	87

Casing Diameter

Depth (m)	Dia (mm)
1.00	152
10.00	115

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR	Client: BMJV		Borehole ID: BH1920N
	Contract Number: G230600	Date Started: 02/05/2023	Date Completed: 10/05/2023	Logged: JN/ASH / Checked: JB / Status: FINAL
				Sheet 1 of 2
Dynamic Sample Borehole Log	Easting: 447250.8	Northing: 333971.2	Ground Level: 35.74m (OD)	Plant Used: Comacchio 305 / Print Date: 04/09/2023 / Scale: 1:50
Weather: Dry	Rig Crew: JK&JK	Termination: Scheduled Depth		SPT Hammer: AR3653 Energy Ratio: 63%

Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Strata Description	Progress Window Run	Groundwater Water Strike	Groundwater Backfill/ Installation
			35.64	0.10	MADE GROUND: Vegetation over firm dark grey slightly gravelly sandy CLAY, with frequent plants/ rootlets (6x15). Sand is fine to coarse. Gravel is sub-rounded to rounded fine to coarse of quartzite.			
0.30	ES							
0.30	ES1			(0.60)				
0.50	D2							
			35.04	0.70				
1.00	ES3			(0.50)				
1.20	D4	SPT(S) 1.20m, N=15	34.54	1.20	[MADE GROUND]			
1.20 - 1.30	B5	(3,3/4,3,4,4)		(0.40)		1.20 - 1.65		
1.20 - 1.40	ES10	Recovery = 100%			MADE GROUND: Firm dark grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-rounded to rounded fine to medium of quartzite.	100% rec		
1.20 - 1.65	D26	Recovery = 100%	34.14	1.60		1.20 - 2.20		
1.20 - 2.20	L24					100% rec		
1.60 - 1.70	D11							
1.80 - 1.90	ES12							
2.20 - 2.80	UT22	Recovery = 50%				2.20 - 2.80 50% rec		
				(2.00)	[MADE GROUND]			
2.80 - 3.00	ES13	Recovery = 100%			MADE GROUND: Firm to stiff yellowish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is sub-rounded to rounded of fine to medium of quartzite.			
2.80 - 3.80	L23					2.80 - 3.80 100% rec		
3.00 - 3.20	D14							
3.60 - 3.80	D15		32.14	3.60				
3.80 - 4.80	L25	SPT(S) 3.80m, N=36		(0.30)	[MADE GROUND]			
3.90 - 4.10	ES16	(7,8/8,9,9,10)	31.84	3.90	MADE GROUND: Medium dense friable dark brown slightly clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of quartz.			
4.10 - 4.20	D17	Recovery = 100%		(0.30)				
4.20 - 4.40	D18		31.54	4.20	[MADE GROUND]	3.80 - 4.80 100% rec		
4.80 - 5.00	UT6	Recovery = 0%			MADE GROUND: Dark brown slightly clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of quartz and sandstone.	4.80 - 5.00 0% rec		
5.00 - 6.00	L7	Recovery = 100%		(1.40)				
5.10 - 5.20	D19				[MADE GROUND]			
5.60 - 5.70	D20		30.14	5.60	MADE GROUND: Dense orangish brown silty gravelly fine to coarse SAND. Gravel is sub-angular to rounded fine to coarse of quartz and sandstone.	5.00 - 6.00 100% rec		
6.00 - 7.00	C8	SPT(C) 6.00m, N=44 (10,14/14,16,12,2) Recovery = 30%			[MADE GROUND]			
				(1.40)	Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse quartz and sandstone. [Gunthorpe Member]	6.00 - 7.00 30% rec		
7.00 - 7.10	D21	SPT(C) 7.00m, 50	28.74	7.00	Stiff reddish brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone and sandstone.			
7.00 - 8.00	L9	(16,9/17,18,15,) Recovery = 100%						
				(1.29)	[Gunthorpe Member]	7.00 - 8.00 100% rec		
8.00	50 (20,5/20,21, 9,)	SPT(C) 8.00m, 50 (20,5/20,21,9,)	27.45	8.29	Stiff reddish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to angular fine to coarse of mudstone. [Gunthorpe Member] 6.00 - 6.70: AZCL Very weak reddish brown MUDSTONE. Discontinuities (0-20) are extremely closely spaced planar with clay infill. [Gunthorpe Member]			
					End of Borehole at 8.290m			

Fracture | TCR | SCR | RQD

Progress by Time

Date	Time	Depth	Casing	Water

Borehole Diameter

Depth	Diameter
8.29	140

Casing Diameter

Depth	Diameter
5.00	150

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV				Borehole ID: BH1920N
	Contract Number: G230600	Date Started: 02/05/2023	Date Completed: 10/05/2023	Logged: JN/ASH	Checked: JB	Status: FINAL	Sheet 2 of 2
Rotary Core Drilling Log	Easting: 447250.8	Northing: 333971.2	Ground Level: 35.74m (OD)	Plant Used: Comacchio 305		Print Date: 04/09/2023	Scale: 1:50
Weather: Dry	Rig Crew: JK&JK	Termination: Scheduled Depth		SPT Hammer: AR3653 Energy Ratio: 63%			

Samples & In Situ Testing					Strata Details				Groundwater	
Depth	Test Result / FI	TCR	SCR	RQD	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation

10
11
12
13
14
15
16
17
18
19

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Flush Information

Top	Base	Return %	Flush Type
6.00	7.00	100	Air/Mist

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
8.29	140

Casing Diameter

Depth (m)	Dia (mm)
5.00	150

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type
6.00	7.00		

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV			Borehole ID: BH1933S
	Contract Number: G230600	Date Started: 24/05/2023	Date Completed: 25/05/2023	Logged: JN/ASH	Checked: JB	Status: FINAL — Sheet 1 of 1
Dynamic Sample Drilling Log	Easting: 447207.5	Northing: 335441.9	Ground Level: 48.27m (OD)	Plant Used: Comacchio 305	Print Date: 04/09/2023	Scale: 1:50
Weather: Fine	Rig Crew: Adrian Foulstone	Termination: Scheduled Depth		SPT Hammer: AR935 Energy Ratio: 63.5%		

Depth	Sample	Test Result	TCR	SCR	RQD	FI/If	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.20	CC1						48.12	0.15		MADE GROUND: Black Bituminous Material. [MADE GROUND]		
0.40	ES11						47.87	0.40		MADE GROUND: Concrete bound material. [MADE GROUND]		
								(0.70)		MADE GROUND: Greyish brown slightly sandy GRAVEL, with low cobble content. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse quartz and quartzite. Cobbles are angular to sub-angular of quartz.		
1.00	ES13						47.17	1.10				
1.20 - 1.30	B12	SPT(S) 1.20m, N=26 (1,5/6,6,7,7)					47.07	1.20		[MADE GROUND]		
1.20 - 1.30	B`1											
1.20 - 1.30	D15							(0.50)		Firm reddish brown slightly sandy very gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of quartz and quartzite.		
1.20 - 1.65	D2											
1.30 - 1.40	ES14						46.57	1.70		[Gunthorpe Member]		
1.70 - 1.90	ES16											
1.90 - 2.00	D17							(0.70)		Firm to stiff reddish brown sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone and quartz.		
2.20 - 2.65	D3	SPT(S) 2.20m, N=28 (3,5/6,8,7,7)					45.87	2.40		[Gunthorpe Member]		
2.80 - 2.90	D18											
3.10 - 3.20	CSS19									Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone.		
3.20 - 3.65	D4	SPT(S) 3.20m, N=34 (3,6/8,8,9,9)								[Gunthorpe Member]		
										2.00 - 2.10: Firm grey		
4.00 - 4.10	CSS20									Very stiff reddish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of mudstone. [Gunthorpe Member]		
4.10 - 4.20	D21											
4.20 - 4.65	D5	SPT(S) 4.20m, N=42 (2,8/9,10,10,13)						(4.80)				
5.00 - 5.10	CSS22											
5.10 - 5.20	D23											
5.20 - 5.65	D6	SPT(S) 5.20m, N=32 (3,3/7,7,8,10)										
6.00 - 6.10	CSS24											
6.10 - 6.20	D25											
6.20 - 6.65	D7	SPT(S) 6.20m, N=37 (1,7/8,10,10,9)										
7.00 - 7.10	CSS26											
7.10 - 7.20	D27											
7.20 - 7.60	D8	SPT(S) 7.20m, 50 (1,1/50 for 245mm)					41.07	7.20		Firm to stiff reddish brown mottled bluish grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to angular fine to coarse of mudstone. [Gunthorpe Member]		
8.20 - 8.65	D9	SPT(S) 8.20m, N=49 (5,9/10,12,12,15)						(2.80)				
9.20 - 9.65	D10	SPT(S) 9.20m, N=48 (3,10/10,10,13,15)										
							38.27	10.00		End of Borehole at 10.00m		

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)
24-05-23	20:00			
24-05-23	23:55	7.20	1.50	3.00
25-05-23	20:00	7.20	1.50	2.00
25-05-23	23:55	0.00		

Flush Return Information

Top	Base	Min %	Max %	Type	Colour

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Borehole Diameter

Depth (m)	Dia (mm)
3.20	101
10.00	87

Casing Diameter

Depth (m)	Dia (mm)
1.50	152

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %. Hand vane (HV) reports Undrained Shear Strength (Su). Pocket penetrometer (PP) reports Unconfined Compressive Strength (UCS)

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV	Borehole ID: BH1937N
	Contract Number: G230600	Date Started: 03/07/2023	Date Completed: 04/07/2023	Logged: PB / Checked: JB / Status: FINAL
				Sheet 1 of 2
Dynamic Sample Borehole Log	Easting: 447173.2	Northing: 335788.3	Ground Level: 51.20m (OD)	Plant Used: Comacchio 305 / Print Date: 04/09/2023 / Scale: 1:50
Weather: Fine	Rig Crew: Ian Mountain	Termination: Scheduled Depth	SPT Hammer: AR666 Energy Ratio: 65%	

Depth	Sample ID	Test Result	Fracture	TCR	SCR	RQD	Level (mAOD)	Depth (m) (Thickness)	Strata Description	Progress Window Run	Water Strike	Backfill/ Installation
0.00 - 0.60	CC1						51.00	0.20	MADE GROUND: Bituminous material. [MADE GROUND]			
									MADE GROUND: Concrete bound material. [MADE GROUND]			
								(1.00)	Soft to firm reddish brown silty slightly gravelly CLAY. Gravel is angular, fine to medium of mudstone.	1		
1.20 - 2.00		SPT(C) 1.20m, N=52					50.00	1.20	[Gunthorpe Member]			
1.20 - 2.00	B11	(9,6/17,17,8,10)						(0.80)	Soft to firm light grey and orangish brown sandy slightly gravelly CLAY. Sand is fine. Gravel is angular to subangular, fine to coarse of quartzite and sandstone. [Gunthorpe Member]			
2.00 - 2.45	D18	SPT(S) 2.00m, N=17					49.20	2.00	2.00 - 2.20: AZCL.	2		
2.00 - 2.45	D2	(4,4/4,4,4,5)						(0.32)				
2.00 - 2.45	SD18						48.88	2.32	Firm to stiff orangish brown mottled dark grey slightly sandy gravelly CLAY. Sand is fine. Gravel is angular to subangular, fine to coarse of sandstone and mudstone. [Gunthorpe Member]			
2.00 - 3.00	L12											
2.40 - 2.60	ES22							(0.68)				
3.00 - 3.45	D3	SPT(S) 3.00m, N=21					48.20	3.00	Orangish brown silty slightly clayey angular to subangular, fine to coarse GRAVEL of sandstone and mudstone. [Gunthorpe Member]	3		
3.00 - 3.45	SD19	(3,4/4,5,6,6)						(0.30)				
3.00 - 3.50	L13						47.90	3.30				
3.20 - 3.30	ES23								Weak to locally medium strong greenish grey thinly laminated SANDSTONE. Fracture is 0-10° planar rough, very closely to closely spaced with orangish brown silt and clay infill. [Gunthorpe Member]			
3.50 - 4.00	L14											
3.50 - 4.00			100	80	60			(0.80)				
4.00	50 (25 for 67mm/50 for 59mm)						47.10	4.10	3.65 - 3.70: Non intact recovered as slightly clayey angular to subangular, fine to coarse GRAVEL of sandstone.	4		
4.00 - 5.00			60	30	25			(0.70)	Non intact recovered as orangish brown and greenish grey clayey angular to subangular, fine to coarse GRAVEL of sandstone. [Gunthorpe Member]			
							46.40	4.80	4.68 - 4.85: AZCL.			
5.00	50 (25 for 79mm/50 for 87mm)						46.20	5.00	Very weak orangish brown MUDSTONE. [Gunthorpe Member]	5		
5.00 - 6.00			0	0	0			(1.00)	AZCL. [Gunthorpe Member]			
6.00	50 (25 for 44mm/50 for 19mm)						45.20	6.00	Very weak to weak orangish brown clayey MUDSTONE. Fractures are 0-10° planar smooth, closely to very closely spaced, tight to partly open with no infill. [Gunthorpe Member]	6		
6.00 - 7.00			94	90	50			(0.85)	6.42 - 6.47: Non intact recovered as slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of mudstone.			
							44.35	6.85				
7.00	50 (25 for 24mm/50 for 16mm)						44.10	7.10	Non intact recovered as orangish brown silty slightly clayey angular to subangular, fine to coarse GRAVEL of mudstone. [Gunthorpe Member]	7		
								(0.40)	Weak greenish grey and orangish brown MUDSTONE. [Gunthorpe Member]			
7.00 - 8.00			94	83	30		43.70	7.50	Very weak to locally weak orangish brown MUDSTONE. Fracture is 0-5° planar rough and open with slight silt and sand infill. [Gunthorpe Member]			
								(0.50)				
8.00	50 (25 for 10mm/50 for 9mm)						43.20	8.00	7.70: 60° fracture. 7.75 - 7.95: 80-90° fracture, stepped rough with no infill.	8		
								(0.40)				
8.00 - 9.00			100	60	0		42.80	8.40	Non intact recovered as orangish brown sightly clayey slightly sandy angular to subangular, fine to coarse GRAVEL of mudstone. [Gunthorpe Member]			
9.00	50 (25,0/50 for 14mm)								Very weak to locally weak orangish brown mottled greenish slightly clayey MUDSTONE. Fractures are 60-90° planar rough, partly open with no infill. [Gunthorpe Member]	9		
								(1.60)				
9.00 - 10.00			100	65	10				9.30 - 9.60: Non intact recovered as orangish brown slightly sandy angular to subangular, fine to coarse gravel of mudstone.			

Progress by Time

Date	Time	Depth	Casing	Water
03-07-23	20:00			
03-07-23	23:55	7.04	3.00	
04-07-23	19:45	7.00	3.00	
04-07-23	23:55	0.00		

Borehole Diameter

Depth	Diameter
3.50	101
10.00	146

Casing Diameter

Depth	Diameter

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: M1 J23A-J25 NEAR		Client: BMJV				Borehole ID: BH1937N
	Contract Number: G230600	Date Started: 03/07/2023	Date Completed: 04/07/2023	Logged: PB	Checked: JB	Status: FINAL	Sheet 2 of 2
Rotary Core Drilling Log	Easting: 447173.2	Northing: 335788.3	Ground Level: 51.20m (OD)	Plant Used: Comacchio 305		Print Date: 04/09/2023	Scale: 1:50
Weather: Fine	Rig Crew: Ian Mountain	Termination: Scheduled Depth		SPT Hammer: AR666 Energy Ratio: 65%			

Samples & In Situ Testing					Strata Details				Groundwater	
Depth	Test Result / FI	TCR	SCR	RQD	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
					41.20	10.00		Very weak to locally weak orangish brown mottled greenish slightly clayey MUDSTONE. Fractures are 60-90° planar rough, partly open with no infill. [Gunthorpe Member]		
								End of Borehole at 10.000m		

10 11 12 13 14 15 16 17 18 19

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Flush Information

Top	Base	Return %	Flush Type
0.00	3.50	100	
3.50	4.00	90	Air/Mist
4.00	5.00	95	Air/Mist
5.00	6.00	100	Air/Mist
6.00	7.00	90	Air/Mist
7.00	8.00	100	Air/Mist

Borehole Diameter

Depth (m)	Dia (mm)
3.50	101
10.00	146

Casing Diameter

Depth (m)	Dia (mm)

Coring Information

Top (m)	Base (m)	Dia (mm)	Barrel Type
3.50	4.00	107	SWF
4.00	5.00	107	
5.00	6.00	107	

Remarks:

No groundwater encountered during drilling.
Backfilled with bentonite, concrete and bituminous material.

Water Strike

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture Index (FI) - Fractures per meter, Fracture Spacing (If) - reported in mm as Min, Average and Max values. TCR, SCR and RQD reported as %

Appendix C: Laboratory results

[redacted]
Kirkby Lane
Pinxton
Nottinghamshire
NG16 6JA

t: [redacted]
e: [redacted]

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: [redacted]
[redacted]
e: [redacted]

Analytical Report Number : 23-34122

Project / Site name:	M1-J23A-J25	**Samples received on:**	09/05/2023
Your job number:	G230600	**Samples instructed on/ Analysis started on:**	17/05/2023
Your order number:	VE297658	**Analysis completed by:**	23/05/2023
Report Issue Number:	1	**Report issued on:**	23/05/2023
Samples Analysed:	1 soil sample		

Signed: [redacted]

[redacted]
Group Customer Services Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-34122
Project / Site name: M1-J23A-J25
Your Order No: VE297658

Lab Sample Number				2681469
Sample Reference				BH1920N
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				02/05/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	10
Total mass of sample received	kg	0.001	NONE	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.023
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.5

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.9
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9
Barium (aqua regia extractable)	mg/kg	1	MCERTS	270
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	86
Iron (aqua regia extractable)	mg/kg	40	MCERTS	26000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	99
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	860
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	1.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	190

Analytical Report Number: 23-34122
Project / Site name: M1-J23A-J25
Your Order No: VE297658

Lab Sample Number				2681469
Sample Reference				BH1920N
Sample Number				None Supplied
Depth (m)				0.30
Date Sampled				02/05/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Monoaromatics & Oxygenates				
Benzene	µg/kg	5	NONE	< 5.0
Toluene	µg/kg	5	NONE	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0
p & m-xylene	µg/kg	5	NONE	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	16
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	18
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	12
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	17

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

Analytical Report Number : 23-34122
Project / Site name: M1-J23A-J25

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2681469	BH1920N	None Supplied	0.3	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 23-34122
Project / Site name: M1-J23A-J25

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

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

Analytical Report Number : 23-34122
Project / Site name: M1-J23A-J25

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 23-34122

Project / Site name: M1-J23A-J25

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1920N	None Supplied	S	2681469	c	Free cyanide in soil	L080-PL	c
BH1920N	None Supplied	S	2681469	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
BH1920N	None Supplied	S	2681469	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 23-38573

Project / Site name:	M1 J23a-J25	**Samples received on:**	05/06/2023
Your job number:	G230600	**Samples instructed on/ Analysis started on:**	12/06/2023
Your order number:	VE299170	**Analysis completed by:**	19/06/2023
Report Issue Number:	1	**Report issued on:**	19/06/2023
Samples Analysed:	3 soil samples		

Signed: [redacted]

PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-38573
Project / Site name: M1 J23a-J25
Your Order No: VE299170

Lab Sample Number				2708875	2708876	2708877
Sample Reference				BH1877N	BH1877N	BH1877N
Sample Number				11	12	15
Depth (m)				0.50	1.00	1.50
Date Sampled				02/06/2023	02/06/2023	02/06/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	99	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	0.39	11	14
Total mass of sample received	kg	0.001	NONE	1.7	1.7	1
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	KWB	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.3	8.7	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.054	0.082
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.2	0.4	0.3

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2	6.4	5.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	460	130	220
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.11	0.92	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.3	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.4	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	3.8	24	28
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	3.8	24	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5.4	22	15
Iron (aqua regia extractable)	mg/kg	40	MCERTS	3200	28000	31000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	9.5	8.4
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	170	580	380
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	< 0.25	0.64	0.51
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	4	26	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	7.2	26	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	36	53	79

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	-

Analytical Report Number: 23-38573
Project / Site name: M1 J23a-J25
Your Order No: VE299170

Lab Sample Number				2708875	2708876	2708877
Sample Reference				BH1877N	BH1877N	BH1877N
Sample Number				11	12	15
Depth (m)				0.50	1.00	1.50
Date Sampled				02/06/2023	02/06/2023	02/06/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	-
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	13	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	NONE	22	< 10	-

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

Analytical Report Number : 23-38573
Project / Site name: M1 J23a-J25

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2708875	BH1877N	11	0.5	Non Soil**
2708876	BH1877N	12	1	Brown clay.
2708877	BH1877N	15	1.5	Brown clay.

Analytical Report Number : 23-38573
Project / Site name: M1 J23a-J25

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

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

Analytical Report Number : 23-38573
Project / Site name: M1 J23a-J25

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

**Unaccredited sample matrix.

Sample Deviation Report

Analytical Report Number : 23-38573
Project / Site name: M1 J23a-J25

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1877N	11	S	2708875	c	Free cyanide in soil	L080-PL	c
BH1877N	11	S	2708875	c	Total cyanide in soil	L080-PL	c
BH1877N	12	S	2708876	c	Free cyanide in soil	L080-PL	c
BH1877N	12	S	2708876	c	Total cyanide in soil	L080-PL	c
BH1877N	15	S	2708877	c	Free cyanide in soil	L080-PL	c
BH1877N	15	S	2708877	c	Total cyanide in soil	L080-PL	c

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Herts,
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e: [redacted]

Analytical Report Number : 23-38608

Project / Site name:	G230600 Env 02	**Samples received on:**	26/05/2023
Your job number:	G230600	**Samples instructed on/ Analysis started on:**	12/06/2023
Your order number:	VE299170	**Analysis completed by:**	19/06/2023
Report Issue Number:	1	**Report issued on:**	19/06/2023
Samples Analysed:	3 soil samples		

Signed: [redacted]

[redacted]
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-38608
Project / Site name: G230600 Env 02
Your Order No: VE299170

Lab Sample Number				2709160	2709161	2709162
Sample Reference				BH1933S	BH1933S	BH1933S
Sample Number				11	13	14
Depth (m)				0.40	1.00	1.30-1.50
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	91	81	< 0.1
Moisture Content	%	0.01	NONE	1.2	0.98	11
Total mass of sample received	kg	0.001	NONE	1.7	1.7	1.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	KWB	KWB	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.7	9.6	9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.022	0.032
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	< 0.1	< 0.1	0.1

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.6	2.4	4.4
Barium (aqua regia extractable)	mg/kg	1	MCERTS	130	730	360
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.11	0.19	0.93
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	0.2	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.1	3.5	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	3.3	4.7	36
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	3.4	4.8	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6.8	16	14
Iron (aqua regia extractable)	mg/kg	40	MCERTS	2100	4800	32000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	28	9.1
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	130	190	460
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.26	< 0.25	< 0.25
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	4.2	4.6	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	4.9	7.7	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	24	48	51

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0##	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0##	< 5.0	-
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	-

Analytical Report Number: 23-38608
Project / Site name: G230600 Env 02
Your Order No: VE299170

Lab Sample Number				2709160	2709161	2709162
Sample Reference				BH1933S	BH1933S	BH1933S
Sample Number				11	13	14
Depth (m)				0.40	1.00	1.30-1.50
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	-

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

Analytical Report Number : 23-38608
Project / Site name: G230600 Env 02

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2709160	BH1933S	11	0.4	Non Soil^^
2709161	BH1933S	13	1	Non Soil^^
2709162	BH1933S	14	1.30-1.50	Brown clay.

Analytical Report Number : 23-38608
Project / Site name: G230600 Env 02

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

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

Analytical Report Number : 23-38608
Project / Site name: G230600 Env 02

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

^^UNACCREDITED SAMPLE MATRIX
##Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

Sample Deviation Report

Analytical Report Number : 23-38608

Project / Site name: G230600 Env 02

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1933S	11	S	2709160	c	Free cyanide in soil	L080-PL	c
BH1933S	11	S	2709160	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
BH1933S	11	S	2709160	c	Total cyanide in soil	L080-PL	c
BH1933S	13	S	2709161	c	Free cyanide in soil	L080-PL	c
BH1933S	13	S	2709161	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
BH1933S	13	S	2709161	c	Total cyanide in soil	L080-PL	c
BH1933S	14	S	2709162	c	Free cyanide in soil	L080-PL	c
BH1933S	14	S	2709162	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 23-40742

Project / Site name:	M1 J23a J25	**Samples received on:**	16/06/2023
Your job number:	G230600	**Samples instructed on/ Analysis started on:**	22/06/2023
Your order number:	VE299764	**Analysis completed by:**	27/06/2023
Report Issue Number:	1	**Report issued on:**	28/06/2023
Samples Analysed:	2 soil samples		

Signed: [redacted]

[redacted]
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-40742
Project / Site name: M1 J23a J25
Your Order No: VE299764

Lab Sample Number				2722564	2722565
Sample Reference				BH1877S	BH1896S
Sample Number				3	4
Depth (m)				1.80-2.00	1.50-1.70
Date Sampled				15/06/2023	12/06/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	19
Total mass of sample received	kg	0.001	NONE	0.6	1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7	8.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.025	0.034
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.3	< 0.1

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.7	2.6
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	6.8
Barium (aqua regia extractable)	mg/kg	1	MCERTS	96	120
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	39	29
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	39	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	21
Iron (aqua regia extractable)	mg/kg	40	MCERTS	820	3500
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.7	10
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	660	500
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.28	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	32
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	59	67

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	-
Ethylbenzene	µg/kg	5	NONE	< 5.0#	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0	-
o-xylene	µg/kg	5	MCERTS	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	2.4	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	5.4	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	12	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	35	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	54	-

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	-

Analytical Report Number: 23-40742
Project / Site name: M1 J23a J25
Your Order No: VE299764

Lab Sample Number				2722564	2722565
Sample Reference				BH1877S	BH1896S
Sample Number				3	4
Depth (m)				1.80-2.00	1.50-1.70
Date Sampled				15/06/2023	12/06/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	-

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

Analytical Report Number : 23-40742
Project / Site name: M1 J23a J25

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2722564	BH1877S	3	1.80-2.00	Brown clay.
2722565	BH1896S	4	1.50-1.70	Brown clay.

Analytical Report Number : 23-40742
Project / Site name: M1 J23a J25

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Cations in soil by ICP-OES	Determination of cations in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 23-40742
Project / Site name: M1 J23a J25

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

- Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

Analytical Report Number : 23-40742
Project / Site name: M1 J23a J25

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1896S	4	S	2722565	c	Free cyanide in soil	L080-PL	c
BH1896S	4	S	2722565	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 23-40930

Project / Site name:	M1 J23a-J25	**Samples received on:**	20/06/2023
Your job number:	G230600	**Samples instructed on/ Analysis started on:**	22/06/2023
Your order number:	VE299764	**Analysis completed by:**	29/06/2023
Report Issue Number:	1	**Report issued on:**	29/06/2023
Samples Analysed:	1 soil sample		

Signed: [redacted]

[redacted]
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-40930
Project / Site name: M1 J23a-J25
Your Order No: VE299764

Lab Sample Number				2723883
Sample Reference				BH1912S
Sample Number				5
Depth (m)				1.00-2.00
Date Sampled				20/06/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	13
Total mass of sample received	kg	0.001	NONE	2

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.03
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.2

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	30
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14
Iron (aqua regia extractable)	mg/kg	40	MCERTS	34000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	590
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.46
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	4.3
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	12

Analytical Report Number: 23-40930
Project / Site name: M1 J23a-J25
Your Order No: VE299764

Lab Sample Number				2723883
Sample Reference				BH1912S
Sample Number				5
Depth (m)				1.00-2.00
Date Sampled				20/06/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10

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

Analytical Report Number : 23-40930
Project / Site name: M1 J23a-J25

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2723883	BH1912S	5	1.00-2.00	Brown clay with gravel.

Analytical Report Number : 23-40930
Project / Site name: M1 J23a-J25

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Cations in soil by ICP-OES	Determination of cations in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Analytical Report Number : 23-40930
Project / Site name: M1 J23a-J25

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

LABORATORY REPORT

Contract Number: PSL23/4670

Report Date: 02 August 2023

Client's Reference: G230600

Client Name: Strata Geotechnics
Kirkby Lane
Pinxton
Nottinghamshire
NG16 6JA

For the attention of: [redacted]

Contract Title: M1 J23a-J25

Date Received: 15/6/2023
Date Commenced: 15/6/2023
Date Completed: 2/8/2023

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

Checked and Approved Signatories:

[redacted] (Director)

[redacted] (Quality Manager)

[redacted] (Laboratory Manager)

[redacted] (Assistant Laboratory Manager)

[redacted] (Senior Technician)

[redacted] (Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: [redacted]

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1904N	21	B	1.00	1.10	Reddish brown sandy silty GRAVEL with many cobbles.
BH1904N	2	D	2.00	2.45	Reddish brown gravelly sandy CLAY.
BH1904N	3	D	3.00	3.45	Reddish brown gravelly sandy CLAY.
BH1904N	4	D	4.00	4.45	Reddish brown gravelly sandy CLAY.
BH1904N	5	D	5.00	5.45	Reddish brown gravelly sandy CLAY.
BH1904N	6	D	6.00	6.45	Reddish brown gravelly sandy CLAY.
BH1904N	7	D	7.00	7.45	Reddish brown gravelly sandy CLAY.
BH1904N	8	D	8.00	8.40	Reddish brown gravelly sandy CLAY.
BH1904N	9	C	8.00	9.50	Reddish brown gravelly sandy CLAY.
BH1904N	10	D	9.50	9.95	Reddish brown very sandy clayey GRAVEL.
BH1904N	11	C	9.50	11.00	Reddish brown gravelly sandy CLAY with some cobbles.
BH1904N	12	C	11.00	12.00	Reddish brown gravelly sandy CLAY.
BH1904N	13	C	12.00	13.50	Brown GRAVEL.
BH1904N	14	C	13.50	15.00	Reddish brown gravelly sandy CLAY.
BH1904N	15	C	15.00	16.00	Reddish brown gravelly sandy CLAY.
BH1904N	16	C	16.00	17.00	Grey highly weathered MUDSTONE.
BH1904N	17	C	17.00	18.50	Grey highly weathered MUDSTONE.
BH1904N	18	C	19.50	20.00	Dark brown SANDSTONE.
BH1920N	4	D	1.20		Brown very sandy slightly clayey GRAVEL.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/4670
Client Ref:
G230600

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1920N	5	B	1.20	1.30	Brown very sandy slightly clayey GRAVEL.
BH1920N	24	L	1.20	2.20	Brown very sandy slightly clayey GRAVEL.
BH1920N	11	D	1.60	1.70	Brown very sandy slightly clayey GRAVEL.
BH1920N	22	UT	2.20	2.80	Brown very gravelly clayey SAND.
BH1920N	23	L	2.80	3.80	Brown very sandy slightly clayey GRAVEL.
BH1920N	14	D	3.00	3.20	Brown very sandy slightly clayey GRAVEL.
BH1920N	25	L	3.80	4.80	Reddish brown gravelly sandy CLAY.
BH1920N	17	D	4.10	4.20	Reddish brown gravelly sandy CLAY.
BH1920N	7	L	5.00	6.00	Reddish brown gravelly sandy CLAY.
BH1920N	19	D	5.10	5.20	Reddish brown gravelly sandy CLAY.
BH1920N	8	C	6.00	7.00	Reddish brown gravelly sandy CLAY.
BH1920N	21	D	7.00	7.10	Reddish brown gravelly sandy CLAY.
BH1920N	9	L	7.00	8.00	Reddish brown gravelly sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/4670
Client Ref:
G230600

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
BH1904N	21	B	1.00	1.10	7.8				NP			
BH1904N	3	D	3.00	3.45	14			39	19	20	80	Intermediate Plasticity CI
BH1904N	6	D	6.00	6.45	22			41	20	21	85	Intermediate Plasticity CI
BH1904N	8	D	8.00	8.40	20			40	20	20	78	Intermediate Plasticity CI
BH1904N	10	D	9.50	9.95	3.1							
BH1904N	12	C	11.00	12.00	19							
BH1904N	14	C	13.50	15.00	21							
BH1904N	15	C	15.00	16.00	23			36	18	18	88	Intermediate Plasticity CI
BH1920N	5	B	1.20	1.30	7.0				NP			
BH1920N	11	D	1.60	1.70	5.4				NP			
BH1920N	23	L	2.80	3.80	5.8				NP			
BH1920N	14	D	3.00	3.20	6.6				NP			
BH1920N	25	L	3.80	4.80	18			35	18	17	80	Intermediate Plasticity CI
BH1920N	19	D	5.10	5.20	22			37	19	18	100	Intermediate Plasticity CI
BH1920N	21	D	7.00	7.10	17							

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

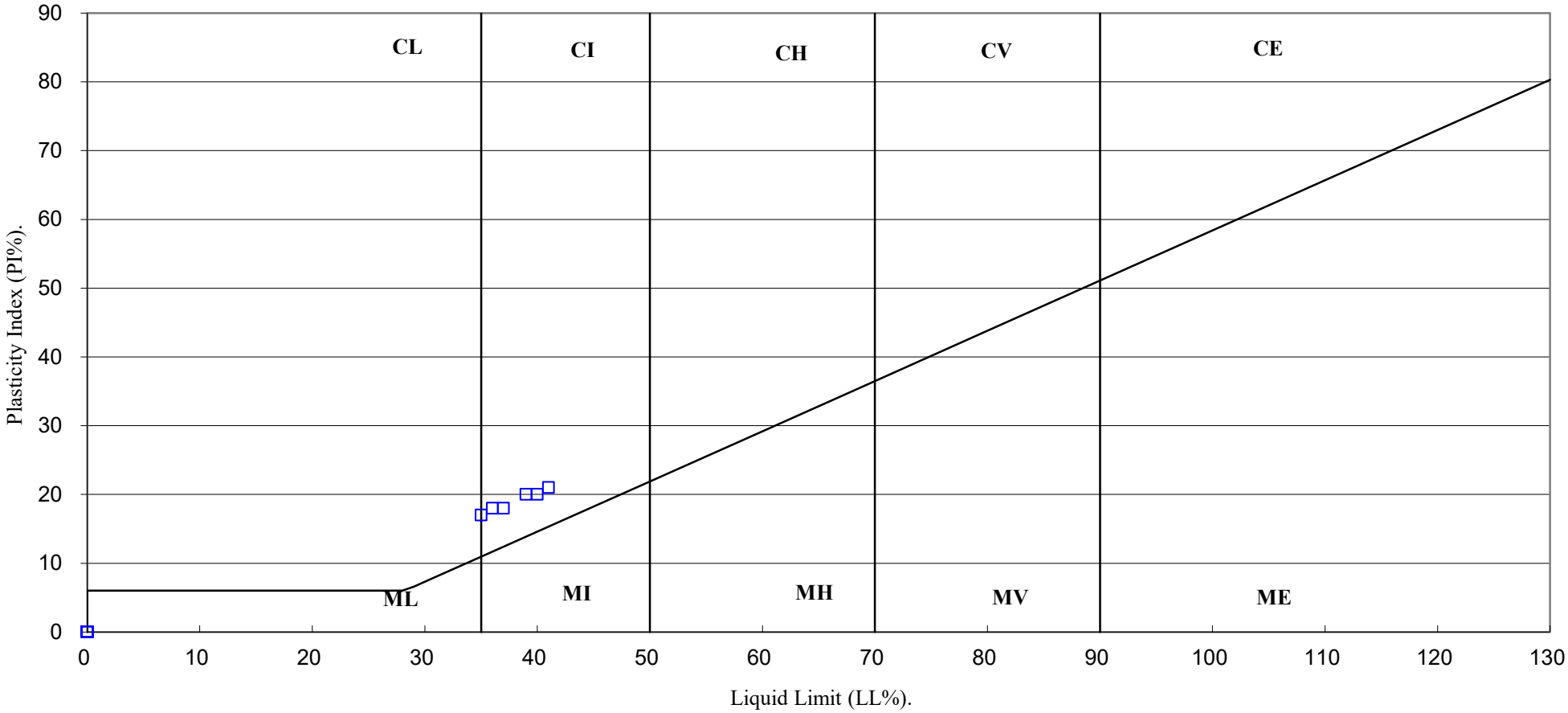
UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/4670
Client Ref:
G230600

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**

Contract No:
PSL23/4670
Client Ref:
G230600

SUMMARY OF SOIL DENSITY RELATED TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Retained 20mm %	Retained 37.5mm %	Method of compaction kg	Maximum Dry Density Mg/m^3	Minimum Dry Density Mg/m^3	Remarks
BH1904N	2	D	2.00	2.45	17	2.14	1.83						
BH1904N	5	D	5.00	5.45	15	2.15	1.87						
BH1904N	8	D	8.00	8.40	20	2.05	1.71						
BH1904N	12	C	11.00	12.00	19	2.07	1.74						
BH1904N	16	C	16.00	17.00	21	2.06	1.70						
BH1904N	18	C	19.50	20.00	6.3	2.33	2.19						
BH1920N	24	L	1.20	2.20	12	2.20	1.96						
BH1920N	22	UT	2.20	2.80	7.5	2.18	2.02						
BH1920N	8	C	6.00	7.00	22	2.02	1.66						
BH1920N	9	L	7.00	8.00	13	2.18	1.93						

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:

PSL23/4670

Client Ref:

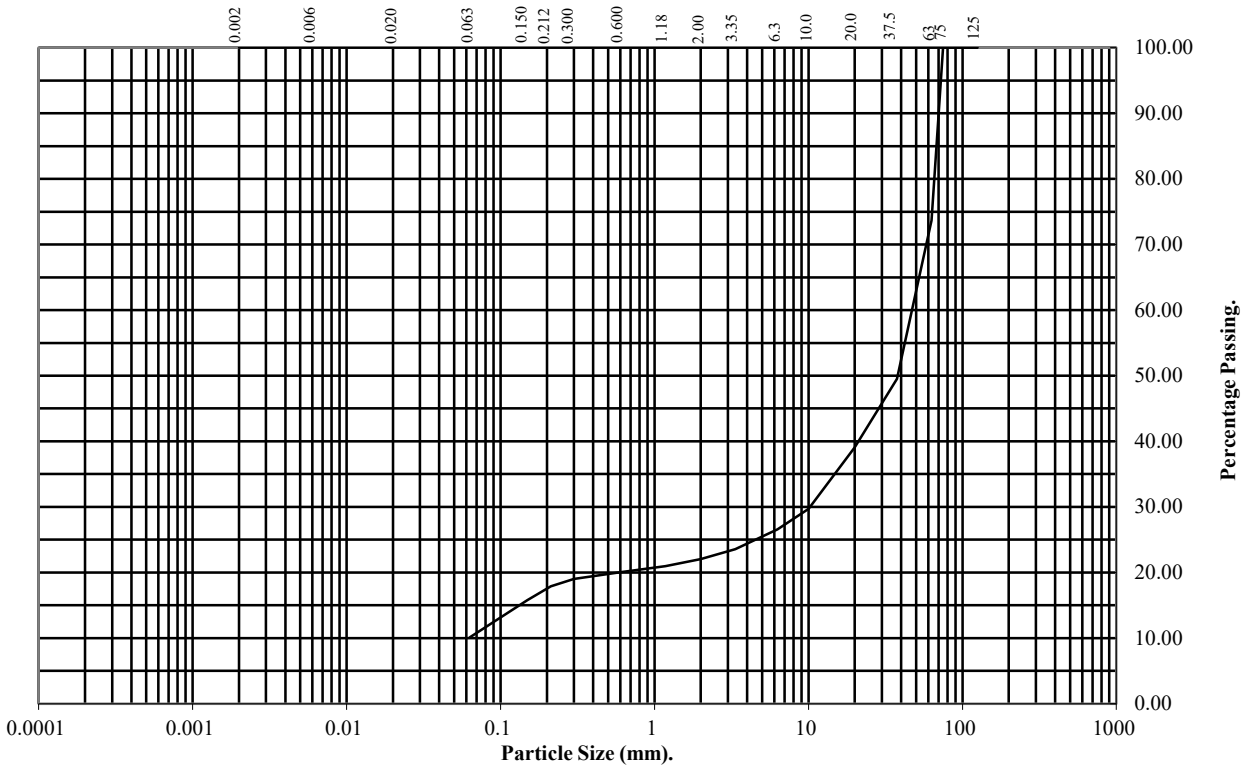
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**1.00**
Sample Number:	**21**	**Base Depth(m):**	**1.10**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	74
37.5	49
20	39
10	30
6.3	27
3.35	24
2	22
1.18	21
0.6	20
0.3	19
0.212	18
0.15	16
0.063	10

Soil Fraction	Total Percentage
Cobbles	26
Gravel	52
Sand	12
Silt/Clay	10

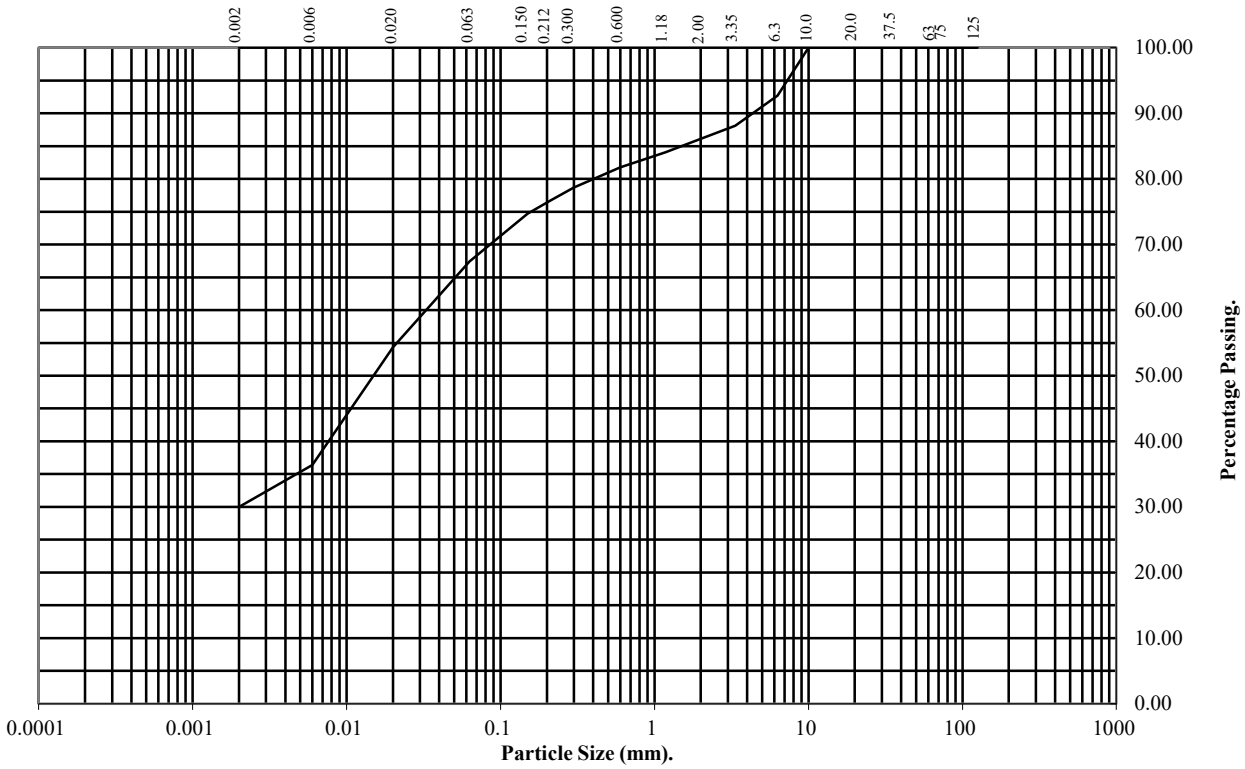
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH1904N**	**Top Depth (m):**	**3.00**
Sample Number:	**3**	**Base Depth(m):**	**3.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	93
3.35	88
2	86
1.18	84
0.6	82
0.3	79
0.212	77
0.15	75
0.063	67

Particle Diameter	Percentage Passing
0.02	54
0.006	36
0.002	30

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	19
Silt	37
Clay	30

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

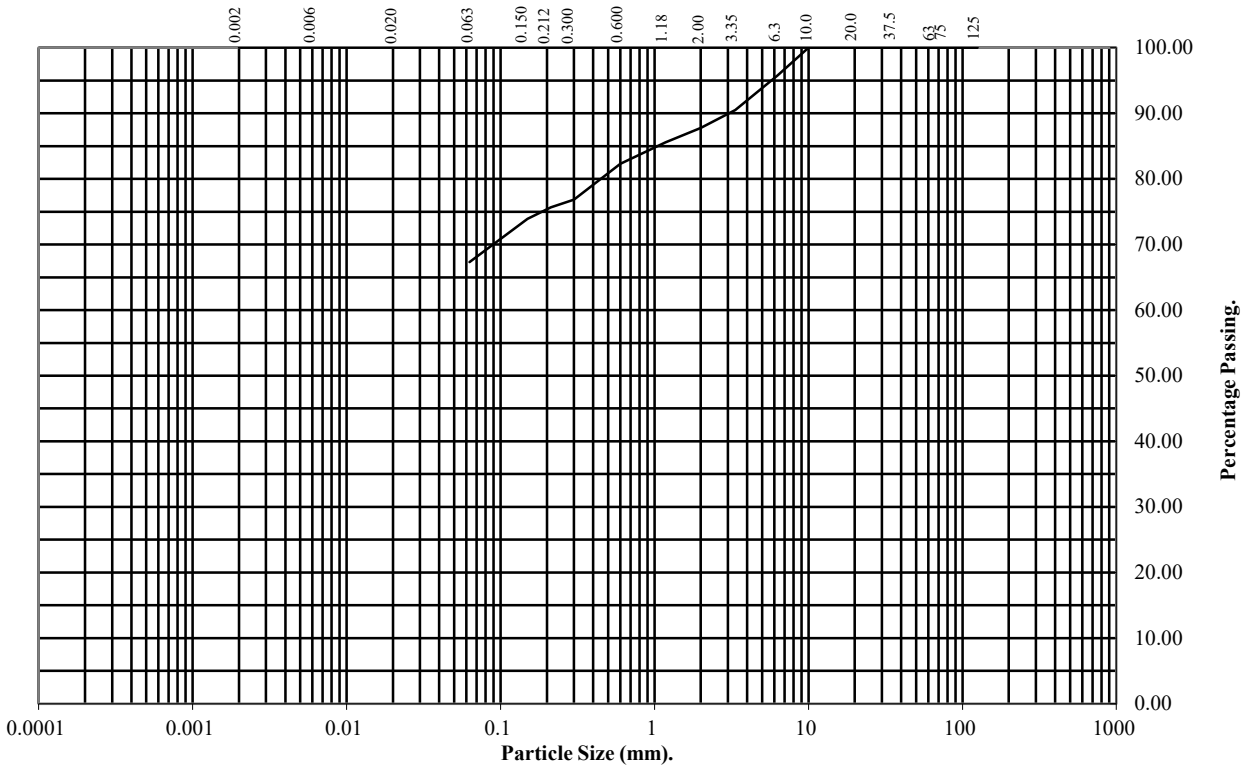
Contract No:
PSL23/4670
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**4.00**
Sample Number:	**4**	**Base Depth(m):**	**4.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	96
3.35	90
2	88
1.18	86
0.6	82
0.3	77
0.212	76
0.15	74
0.063	67

Soil Fraction	Total Percentage
Cobbles	0
Gravel	12
Sand	21
Silt/Clay	67

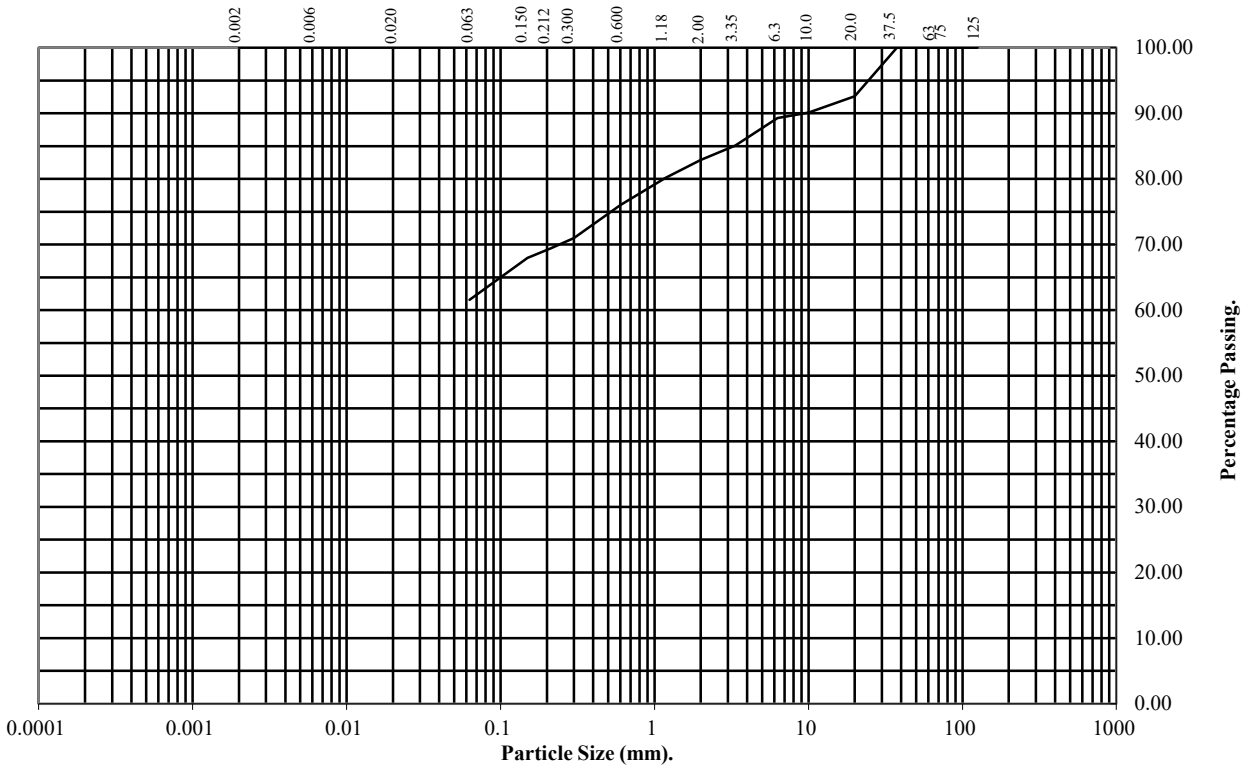
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**7.00**
Sample Number:	**7**	**Base Depth(m):**	**7.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	93
10	90
6.3	89
3.35	85
2	83
1.18	80
0.6	76
0.3	71
0.212	69
0.15	68
0.063	62

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	21
Silt/Clay	62

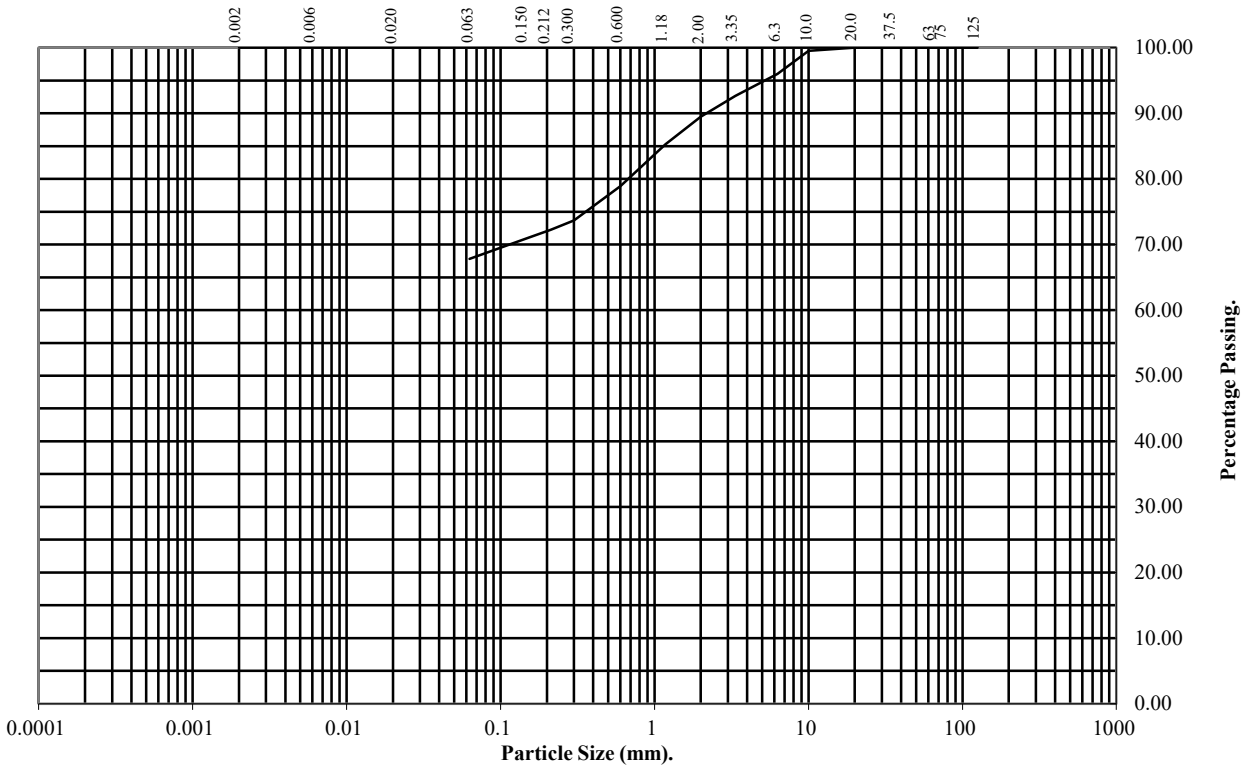
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**8.00**
Sample Number:	**9**	**Base Depth(m):**	**9.50**
Sample Type:	**C**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	96
3.35	93
2	89
1.18	85
0.6	79
0.3	74
0.212	72
0.15	71
0.063	68

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	21
Silt/Clay	68

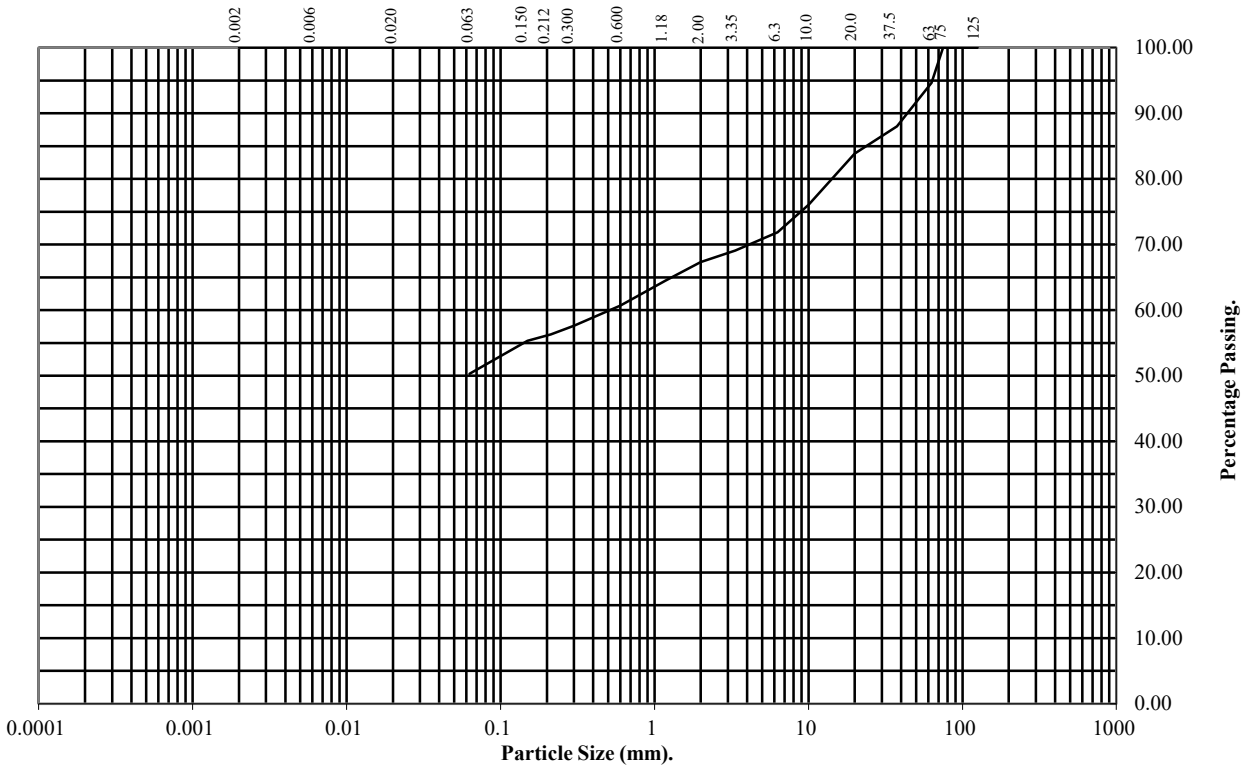
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**9.50**
Sample Number:	**11**	**Base Depth(m):**	**11.00**
Sample Type:	**C**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	95
37.5	88
20	84
10	76
6.3	72
3.35	69
2	67
1.18	64
0.6	61
0.3	58
0.212	56
0.15	55
0.063	50

Soil Fraction	Total Percentage
Cobbles	5
Gravel	28
Sand	17
Silt/Clay	50

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

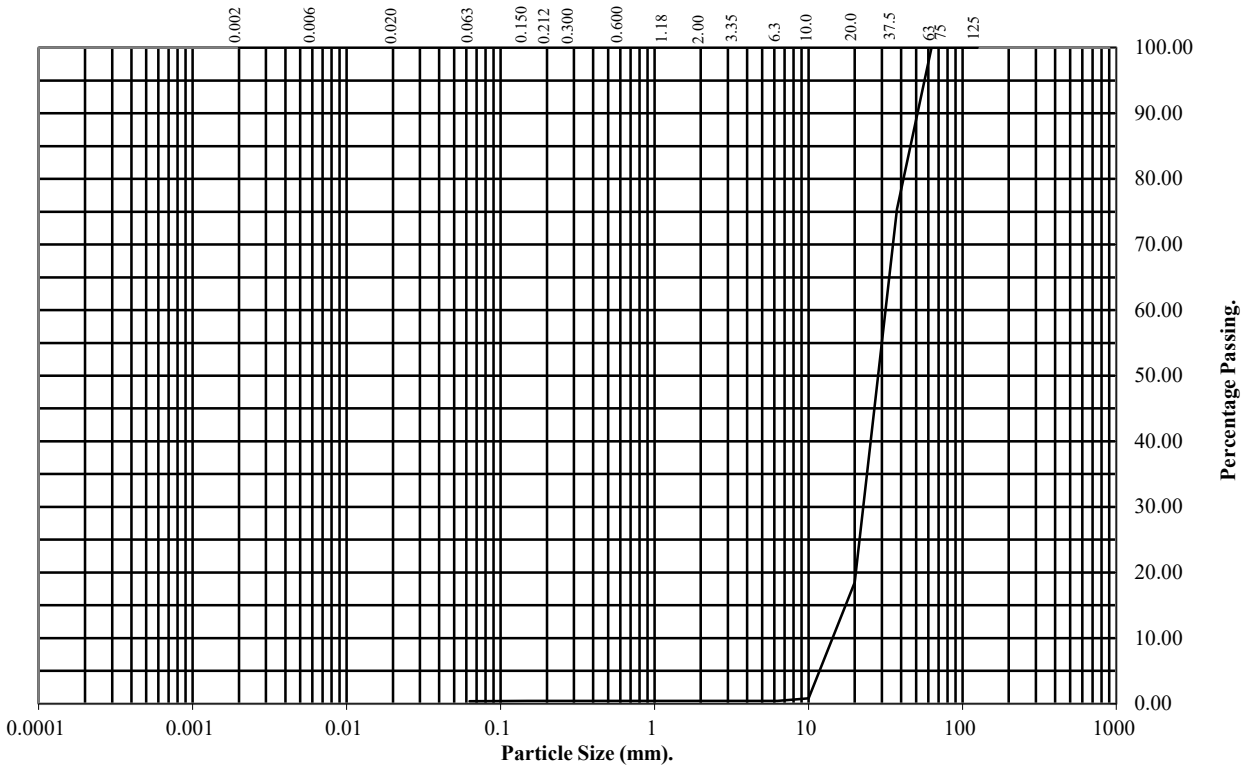
Contract No:
PSL23/4670
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**12.00**
Sample Number:	**13**	**Base Depth(m):**	**13.50**
Sample Type:	**C**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	75
20	18
10	1
6.3	0
3.35	0
2	0
1.18	0
0.6	0
0.3	0
0.212	0
0.15	0
0.063	0

Soil Fraction	Total Percentage
Cobbles	0
Gravel	100
Sand	0
Silt/Clay	0

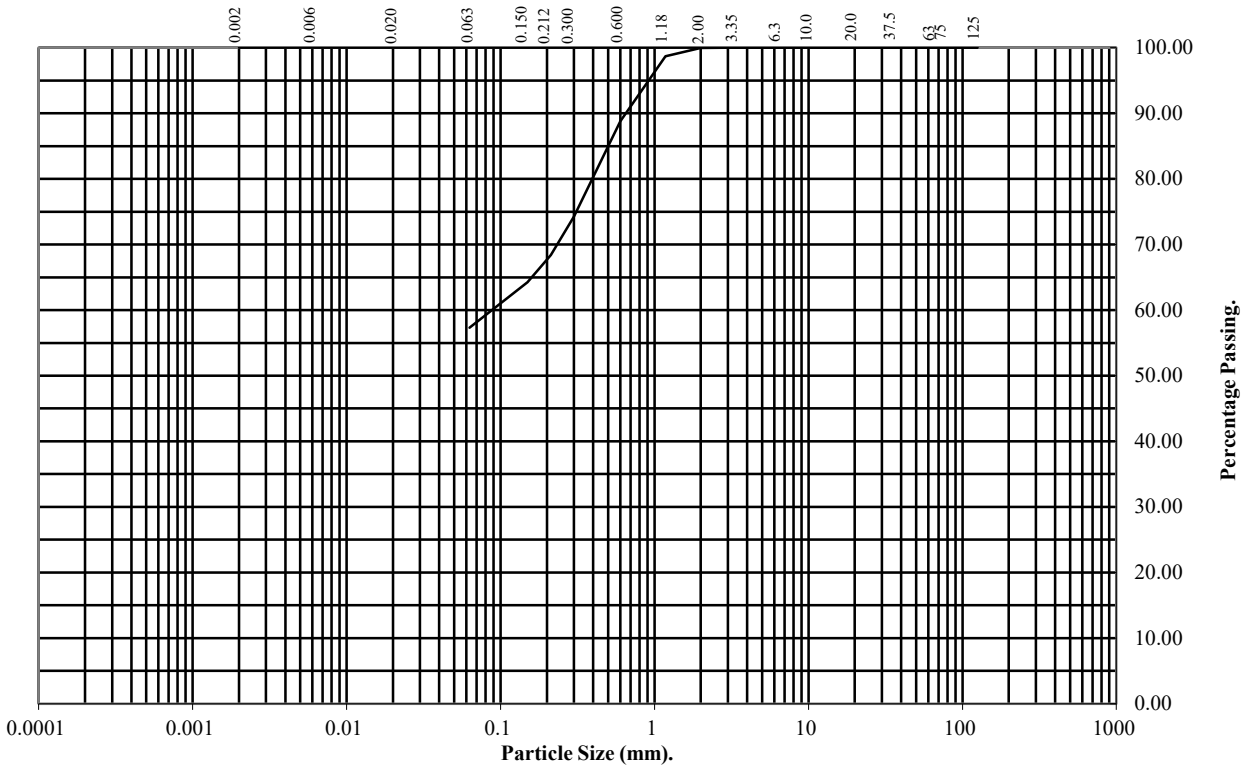
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**16.00**
Sample Number:	**16**	**Base Depth(m):**	**17.00**
Sample Type:	**C**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	89
0.3	74
0.212	68
0.15	64
0.063	57

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	43
Silt/Clay	57

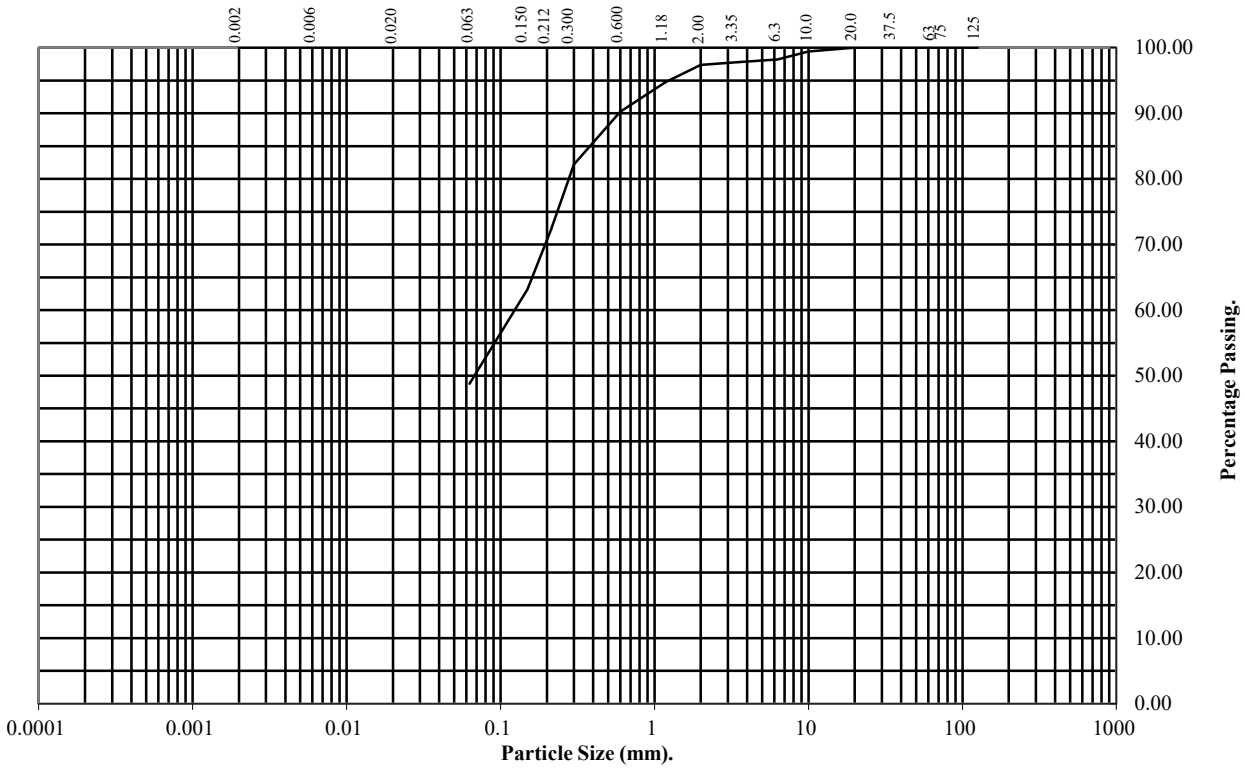
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1904N**	**Top Depth (m):**	**17.00**
Sample Number:	**17**	**Base Depth(m):**	**18.50**
Sample Type:	**C**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	98
2	97
1.18	95
0.6	90
0.3	82
0.212	72
0.15	63
0.063	49

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	48
Silt/Clay	49

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

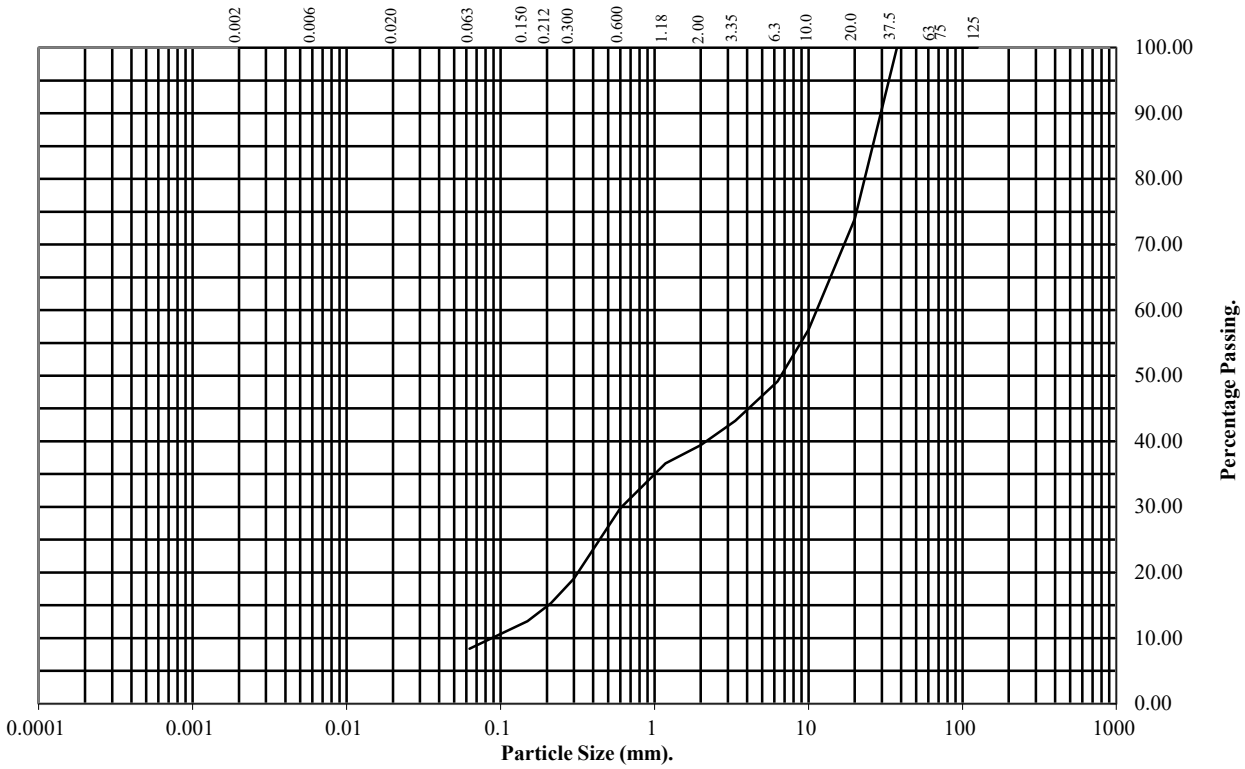
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH1920N **Top Depth (m):** 1.20

Sample Number: 4 **Base Depth(m):**

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	74
10	57
6.3	49
3.35	43
2	39
1.18	37
0.6	30
0.3	19
0.212	15
0.15	13
0.063	8

Soil Fraction	Total Percentage
Cobbles	0
Gravel	61
Sand	31
Silt/Clay	8

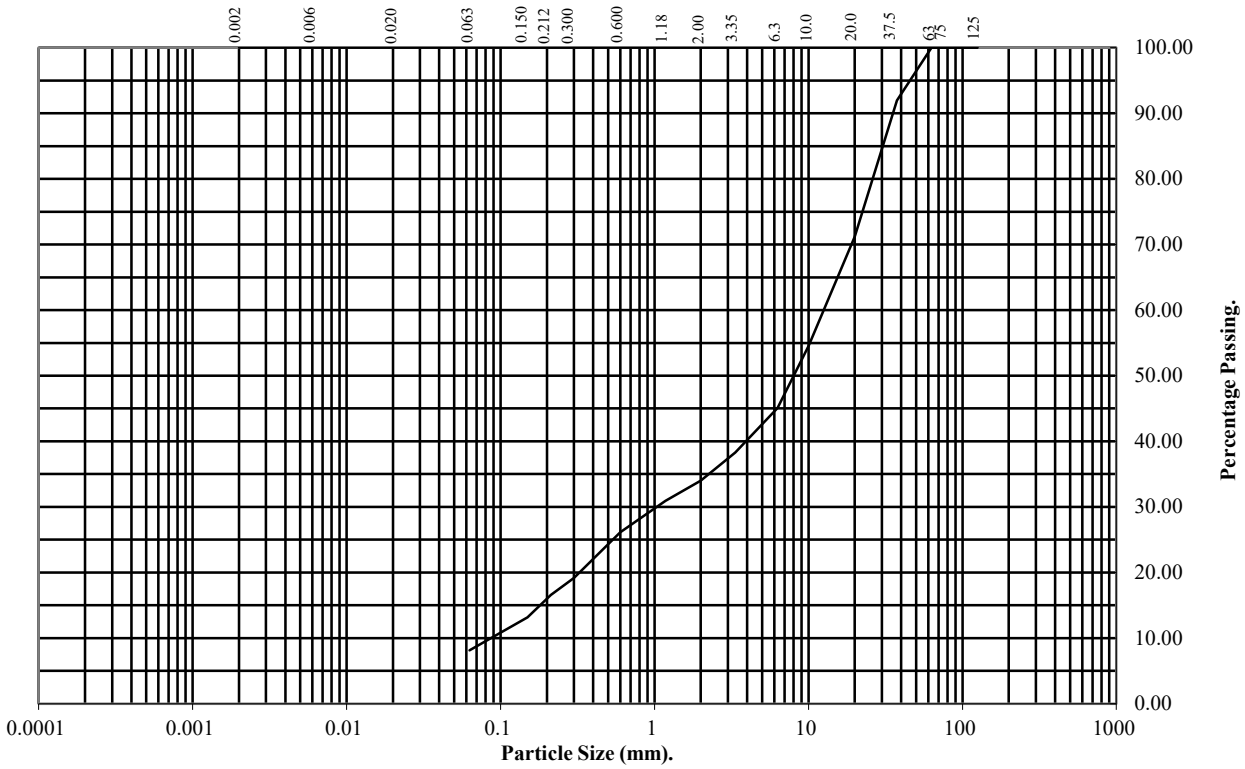
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1920N**	**Top Depth (m):**	**1.20**
Sample Number:	**24**	**Base Depth(m):**	**2.20**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	92
20	71
10	55
6.3	45
3.35	38
2	34
1.18	31
0.6	26
0.3	19
0.212	17
0.15	13
0.063	8

Soil Fraction	Total Percentage
Cobbles	0
Gravel	66
Sand	26
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

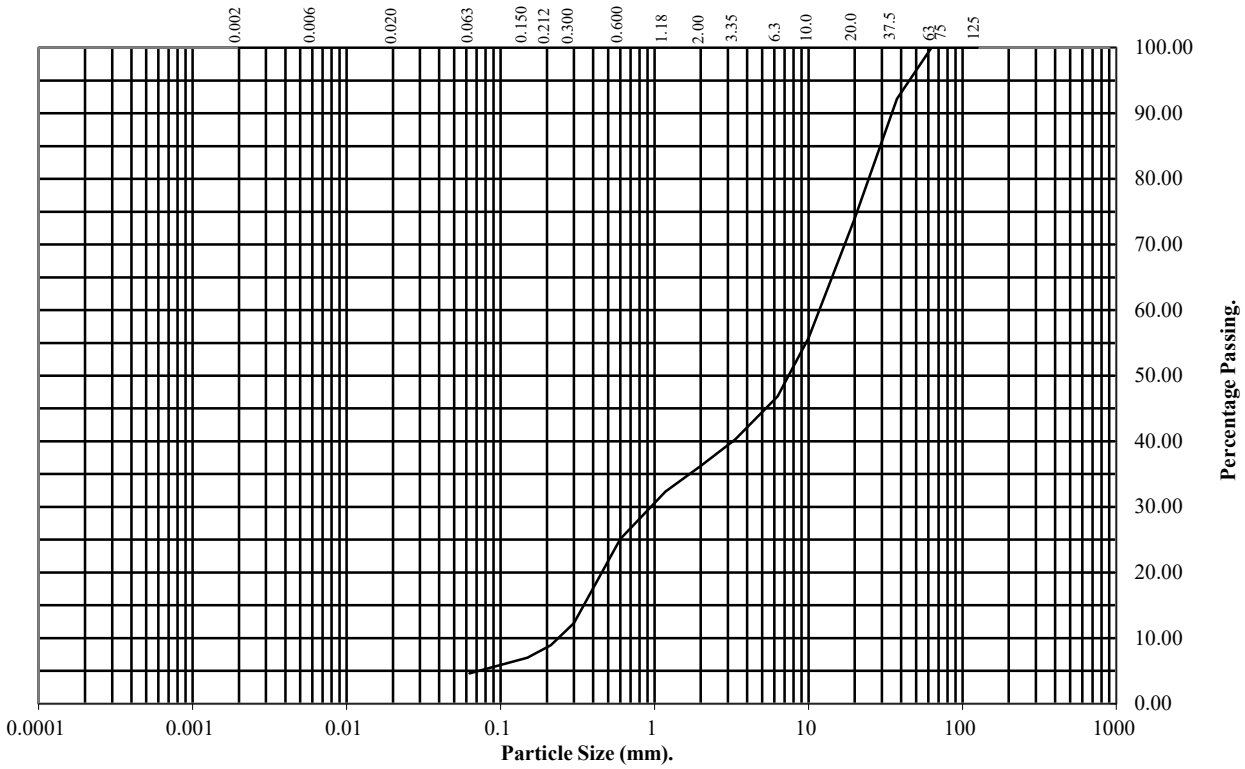
Contract No:
PSL23/4670
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1920N**	**Top Depth (m):**	**2.80**
Sample Number:	**23**	**Base Depth(m):**	**3.80**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	92
20	74
10	56
6.3	47
3.35	40
2	36
1.18	32
0.6	25
0.3	12
0.212	9
0.15	7
0.063	5

Soil Fraction	Total Percentage
Cobbles	0
Gravel	64
Sand	31
Silt/Clay	5

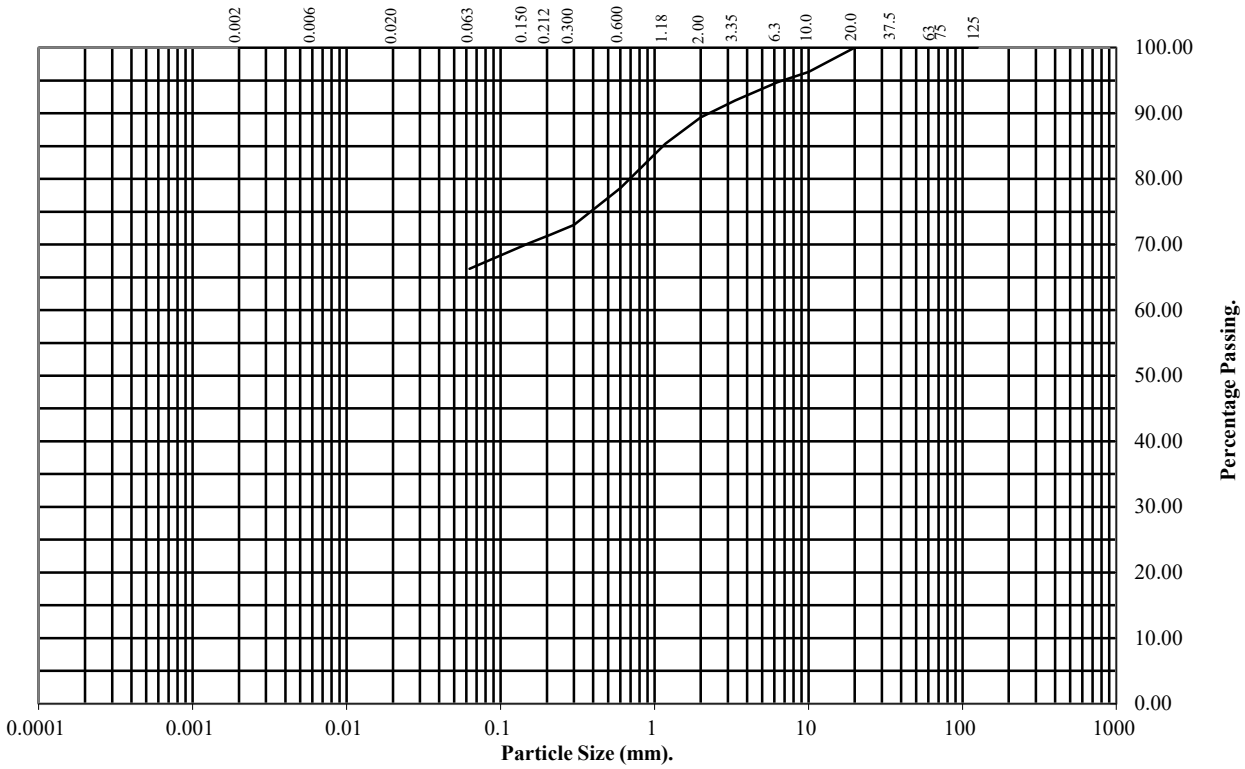
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1920N**	**Top Depth (m):**	**4.10**
Sample Number:	**17**	**Base Depth(m):**	**4.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	96
6.3	95
3.35	92
2	89
1.18	85
0.6	79
0.3	73
0.212	72
0.15	70
0.063	66

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	23
Silt/Clay	66

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

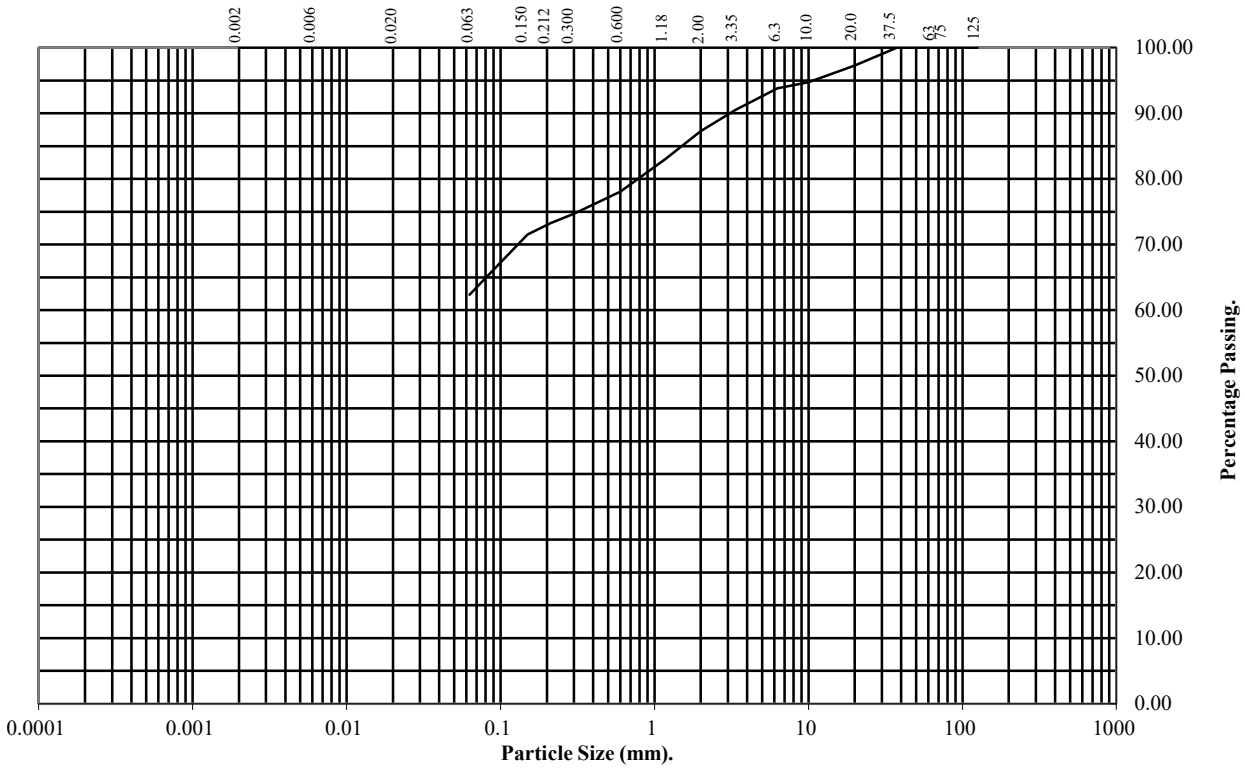
Contract No:
PSL23/4670
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1920N**	**Top Depth (m):**	**5.00**
Sample Number:	**7**	**Base Depth(m):**	**6.00**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	95
6.3	94
3.35	91
2	87
1.18	83
0.6	78
0.3	75
0.212	73
0.15	72
0.063	62

Soil Fraction	Total Percentage
Cobbles	0
Gravel	13
Sand	25
Silt/Clay	62

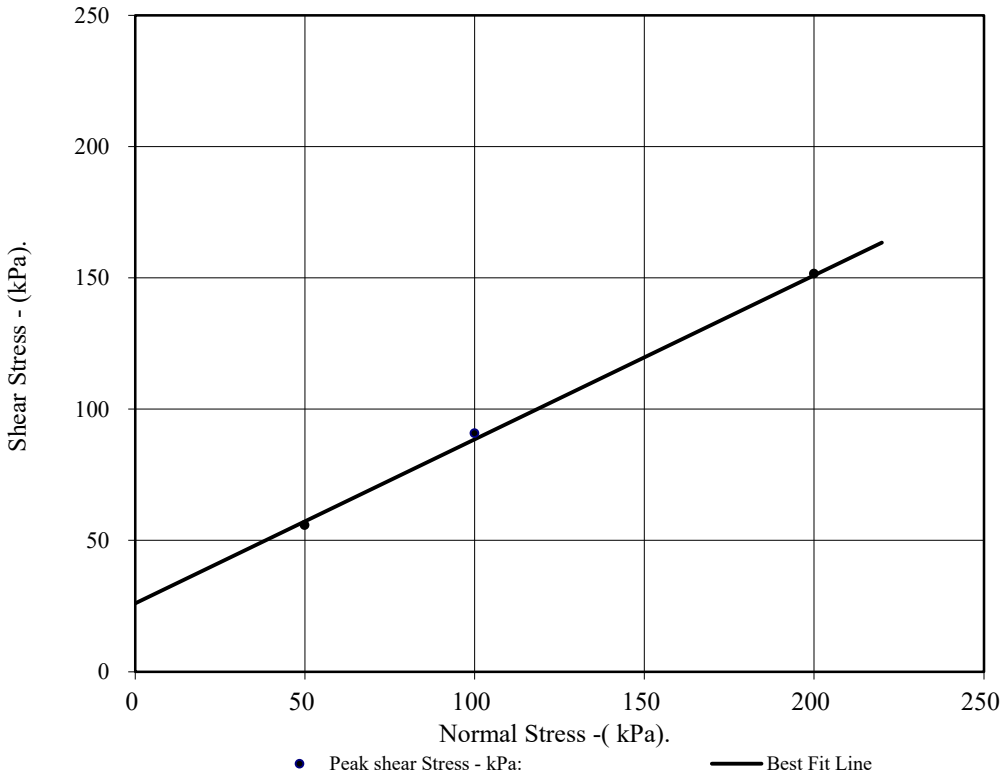
Remarks:
See Summary of Soil Descriptions

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1904N**		Top Depth:	**9.50**
Sample Number:	**11**		Base Depth:	**11.00**
Sample Conditions:	Submerged		Sample Type	**C**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.05	20.05	20.05
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	22	22	22
Bulk Density - Mg/m3:	2.08	2.07	2.08
Dry Density - Mg/m3:	1.71	1.70	1.71
Voids Ratio:	0.549	0.555	0.553
Normal Pressure- kPa	50	100	200
Consolidation Stage			
Consolidated Height - mm:	18.35	17.78	17.18
Shearing Stage			
Rate of Strain - mm/min	0.055	0.055	0.055
Displacement at peak shear stress - mm	10.19	5.71	8.10
Peak shear Stress - kPa:	56	91	152
Final Consolidated Conditions			
Moisture Content - %:	25	24	24
Bulk Density - Mg/m3:	2.27	2.34	2.42
Dry Density - Mg/m3:	1.82	1.88	1.95
Peak			
Angle of Shearing Resistance:(~~θ~~)	**32**		
Effective Cohesion - kPa:	**26**		

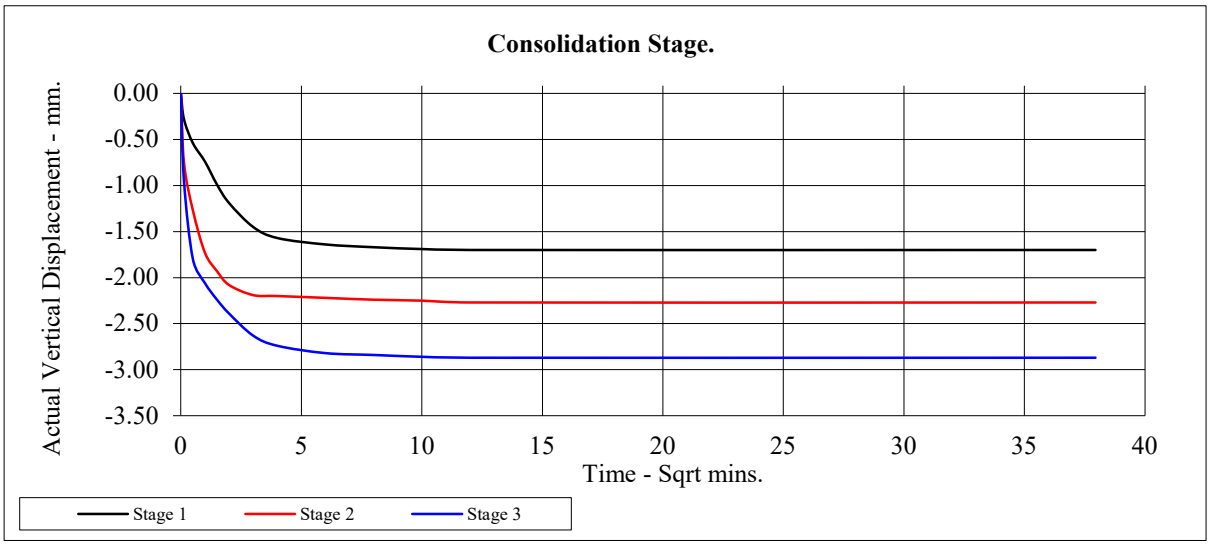


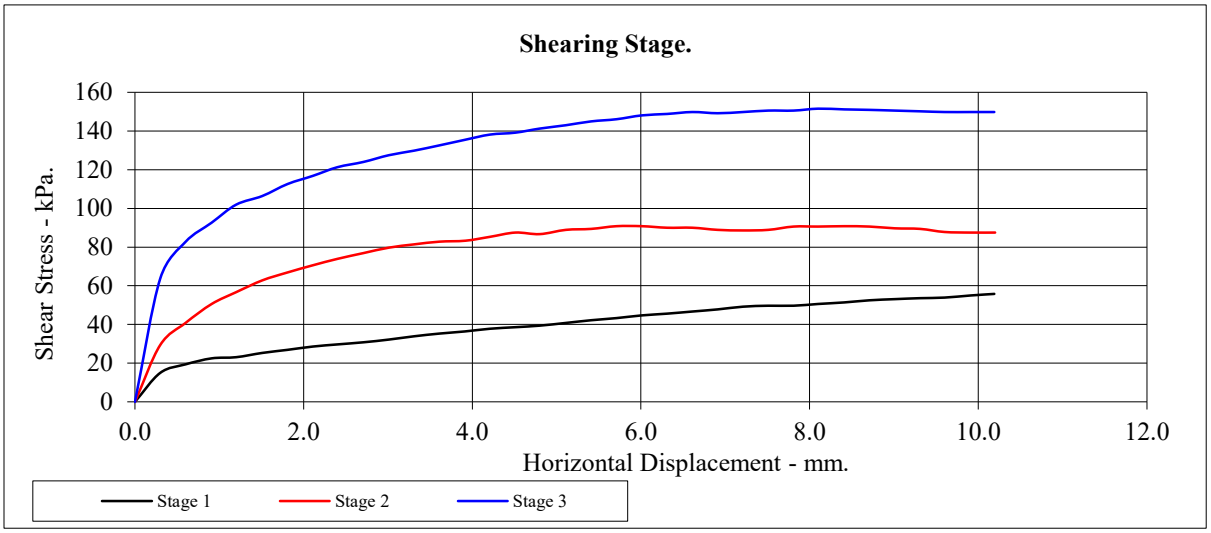
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/4670 **Client Ref:** G230600

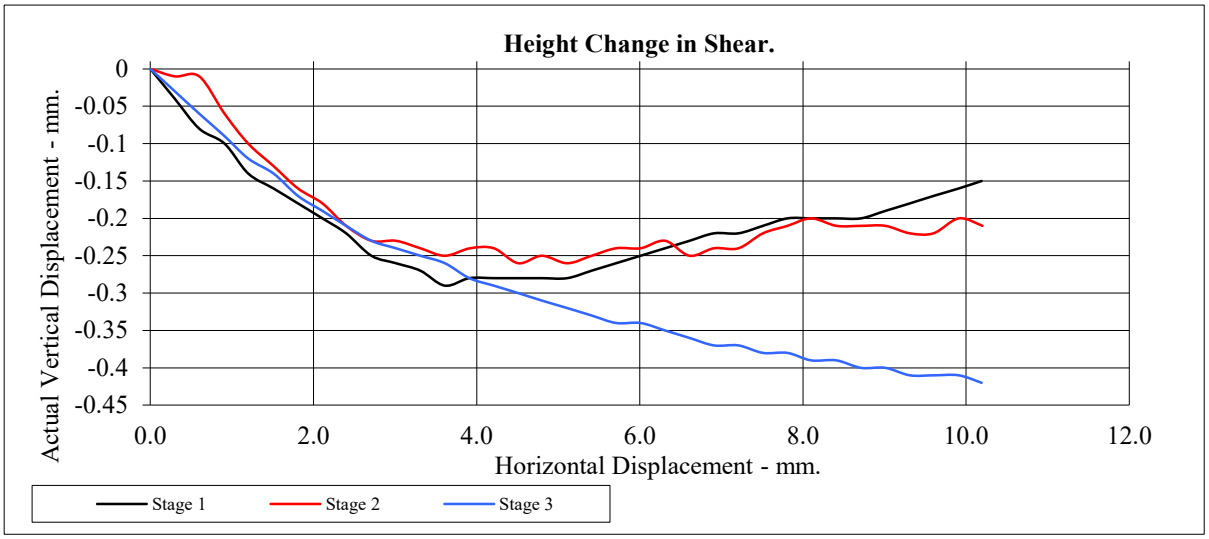
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1904N**	Top Depth:	**9.50**
Sample Number:	**11**	Base Depth:	**11.00**







UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

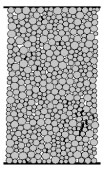
Contract No:
PSL23/4670
Client Ref:
G230600

Effective Stress Triaxial Compression

Consolidated Undrained

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			2.20-2.80m
Description			See summary of soil descriptions.
Type			Undisturbed, vertical orientation.
Initial Sample Length	L_0	(mm)	140.0
Initial Sample Diameter	D_0	(mm)	69.5
Initial Sample Weight	W_0	(gr)	1156.3
Initial Bulk Density	ρ_0	(Mg/m3)	2.18
Particle Density	ρ_s	(Mg/m3)	2.66

Initial Conditions			Stage 1	2	3	4
Initial Cell Pressure	σ_{3i}	(kPa)	850	900	1000	
Initial Back Pressure	U_{bi}	(kPa)	800	800	800	
Membrane Thickness	m_b	(mm)	0.400			
Displacement Input	L_{IP}	(mm)	CH 2			
Load Input	N_{IP}	(N)	CH 1			
Pore Water Pressure Input	u_{pwp}	(kPa)	CH 3			
Sample Volume	V	(cc)	CH 2			
Initial Moisture	ω_i	(%)	7.53			
Initial Dry Density	ρ_{di}	(Mg/m3)	2.02			
Initial Voids Ratio	e_i	.	0.314			
Initial Degree of Saturation	S_i	(%)	64			
B Value	B	.	0.98			

Final Conditions						
Final Moisture	ω_f	(%)	13			
Final Dry Density	ρ_{df}	(Mg/m3)	2.07			
Final Voids Ratio	e_f	.	0.287			
Final Degree of Saturation	S_f	(%)	100.0			
			Stage 1	2	3	4
Failure Criteria		.	Max. Dev.	Max. Dev.	Max. Dev.	
Strain At Failure	ε_f	(%)	1.99	3.71	10.31	
Stress At Failure	$(\sigma_1-\sigma_3)$	(kPa)	184.4	302.5	541.9	
Minor Stress At Failure	σ_3'	(kPa)	33.0	65.0	133.0	
Major Stress At Failure	σ_1'	(kPa)	217.4	367.5	674.9	
Principal Stress Ratio At Failure	σ_1'/σ_3'		6.587	5.653	5.075	
PwP At Failure Criteria	u_f		817.0	835.0	867.0	

Notes

Compound

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

UKAS TESTING 4043

Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH1920N 2.20-2.80m UT22
		Test Date	03/07/2023
		Borehole	BH1920N
Jobfile	M1 J23a-J25	Sample	2.20-2.80m UT22
Client	Strata Geotechnics	Depth	2.20-2.80m

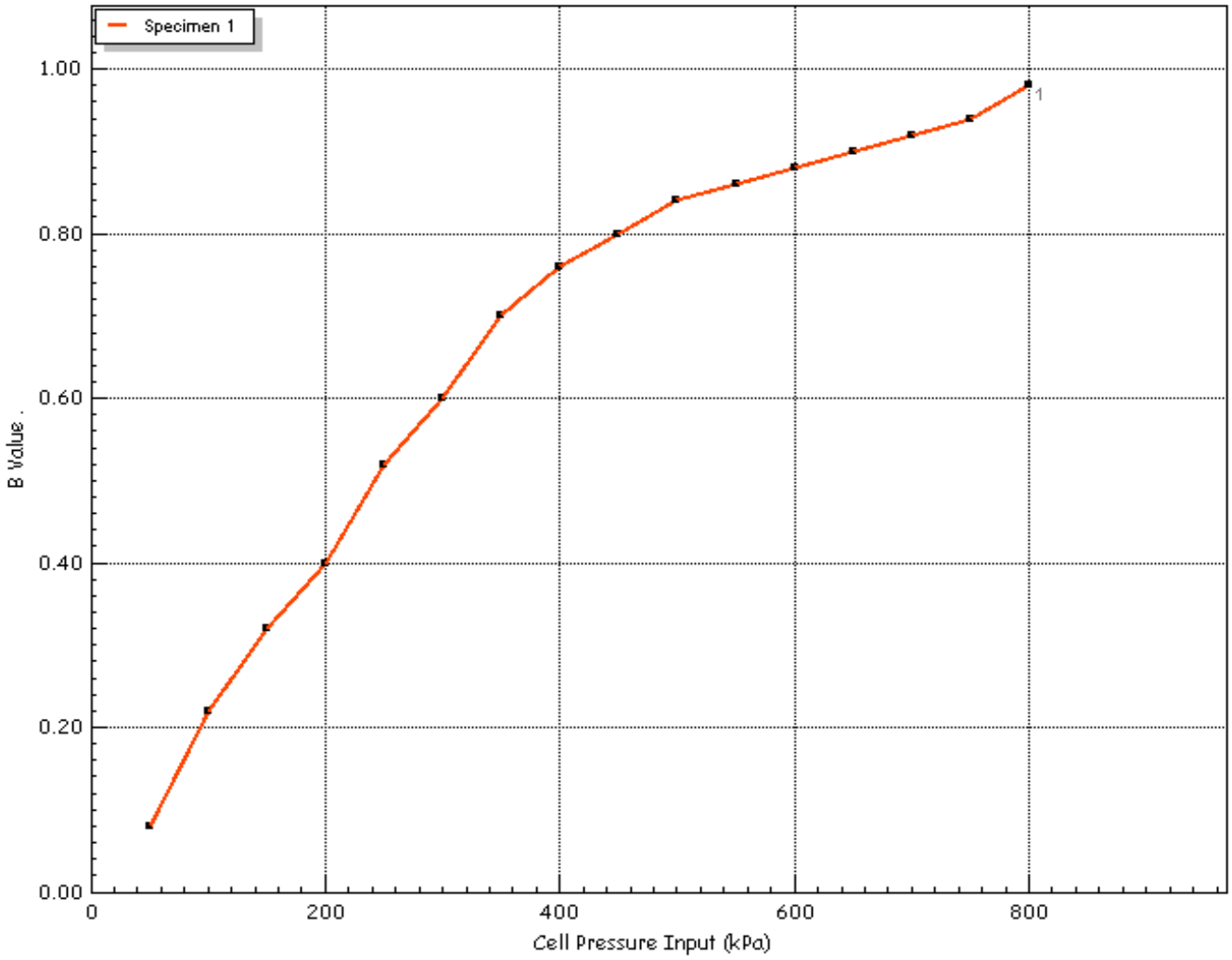
Operator [redacted] Checked [redacted] Approved [redacted]

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Plots

Saturation Method			Stepped
Cell Pressure Input	σ	(kPa)	800
Pore Water Pressure Input	u pwp	(kPa)	775
B Value	B	.	0.98



PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY
UKAS TESTING 4043

Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH1920N 2.20-2.80m UT22
		Test Date	03/07/2023
		Borehole	BH1920N
Jobfile	M1 J23a-J25	Sample	2.20-2.80m UT22
Client	Strata Geotechnics	Depth	2.20-2.80m

Operator	[redacted]	Checked	[redacted]	Approved	[redacted]

Effective Stress Triaxial Compression

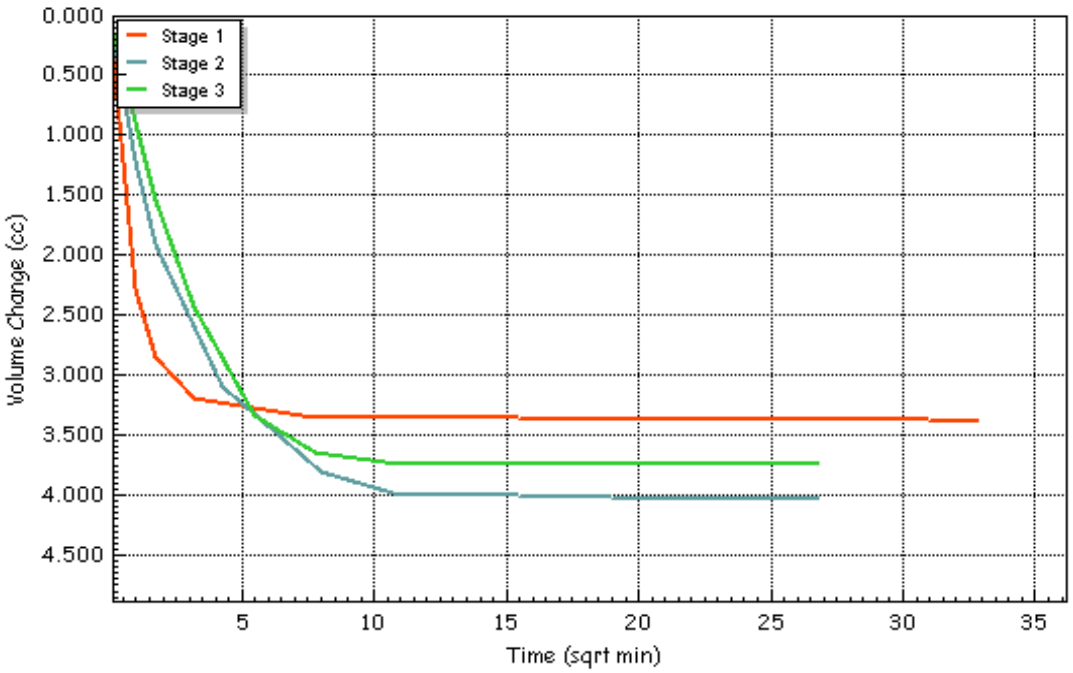
Consolidated Undrained

Consolidation Plots

Initial Conditions			Stage 1	2	3
Initial Cell Pressure	σ_3	(kPa)	850	900	1000
Initial Back Pressure	u_{bi}	(kPa)	800	800	800
Pore Water Pressure Input	u_{pwp}	(kPa)	813	821	823
Drainage Method			Radial+One End		

Final Conditions			Stage 1	2	3
PWP Dissipation %	U%	(%)	100.00	100.00	100.00
Volumetric Strain	ε_v%	(%)	0.64	0.76	0.70
Corrected Length	L_c	(mm)	139.7	136.4	133.4
Corrected Area	A_c	(cm2)	37.78	38.40	38.97
Corrected Volume	V_c	(cc)	527.736	523.703	519.967
t100	t_{100}	(min)	6.60	27.84	27.84
Consolidation	c_v	(m2/year)	0.150	0.036	0.037
Compressibility	m_v	(m2/MN)	0.489	0.362	0.306
Test Time	t_F	(h:m:s)	02:00:00	02:00:00	02:00:00
Estimated Strain to Failure	ε%	(%)	5.0	5.0	5.0
Shear Machine Speed	d_r	(mm/min)	0.05821	0.05821	0.05821

Notes



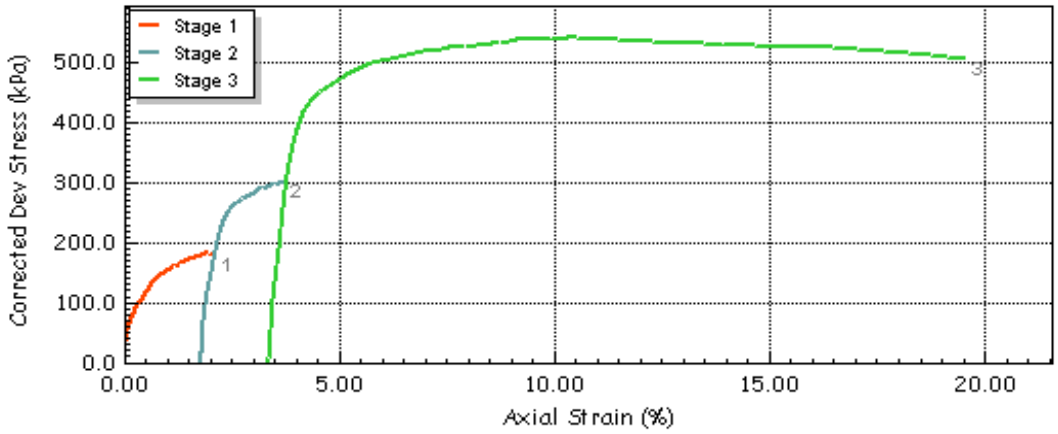
PSL PROFESSIONAL SOILS LABORATORY — UKAS TESTING 4043

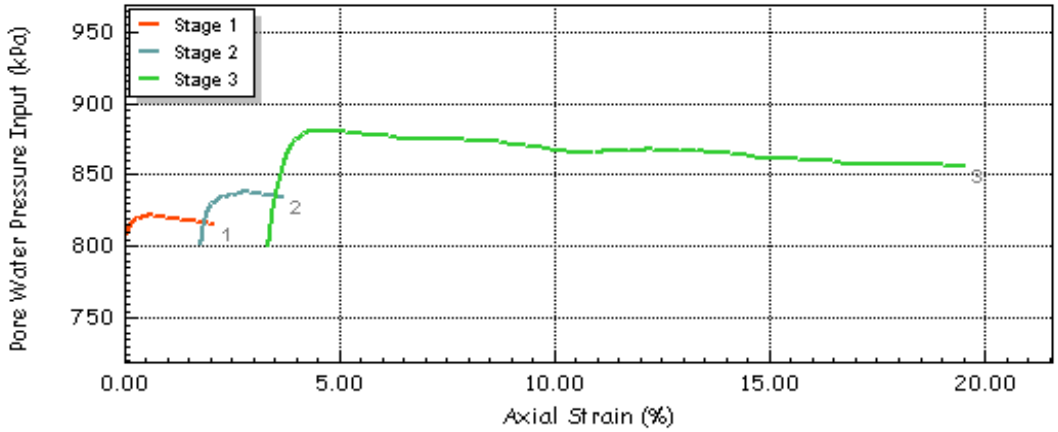
Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH1920N 2.20-2.80m UT22
		Test Date	03/07/2023
		Borehole	BH1920N
Jobfile	M1 J23a-J25	Sample	2.20-2.80m UT22
Client	Strata Geotechnics	Depth	2.20-2.80m
Operator	[redacted]	Checked	[redacted]
		Approved	[redacted]

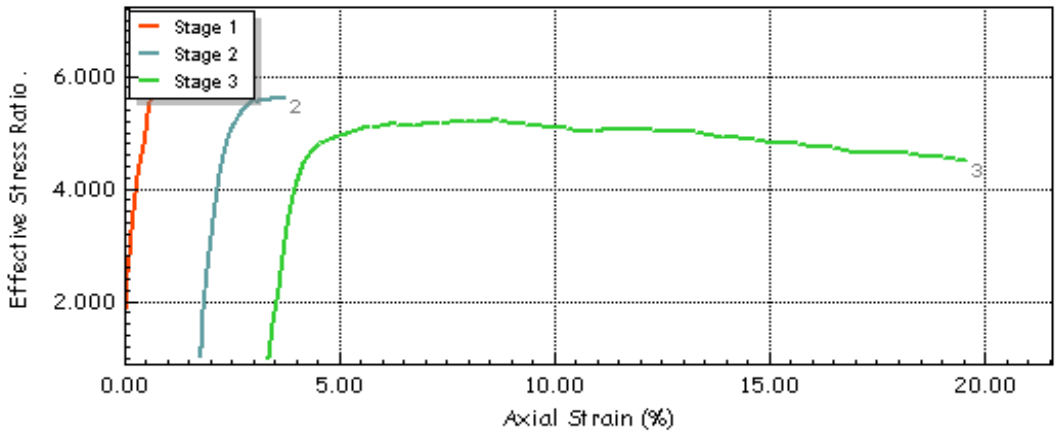
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots







Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH1920N 2.20-2.80m UT22
		Test Date	03/07/2023
		Borehole	BH1920N
Jobfile	M1 J23a-J25	Sample	2.20-2.80m UT22
Client	Strata Geotechnics	Depth	2.20-2.80m
Operator	[redacted]	Checked	[redacted]
		Approved	[redacted]

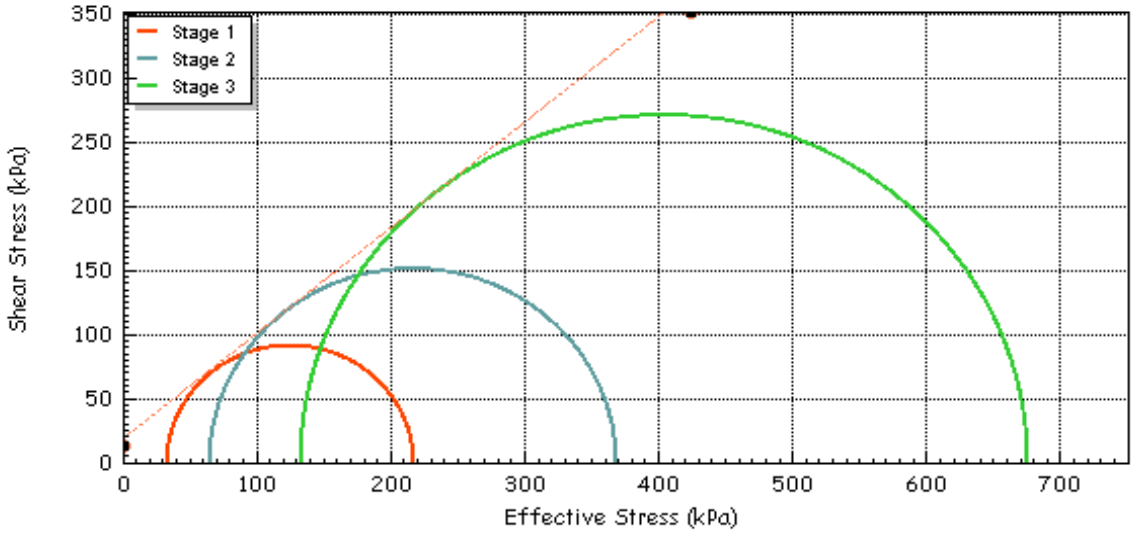
PSL PROFESSIONAL SOILS LABORATORY
A PHENNA GROUP COMPANY
UKAS TESTING 4043

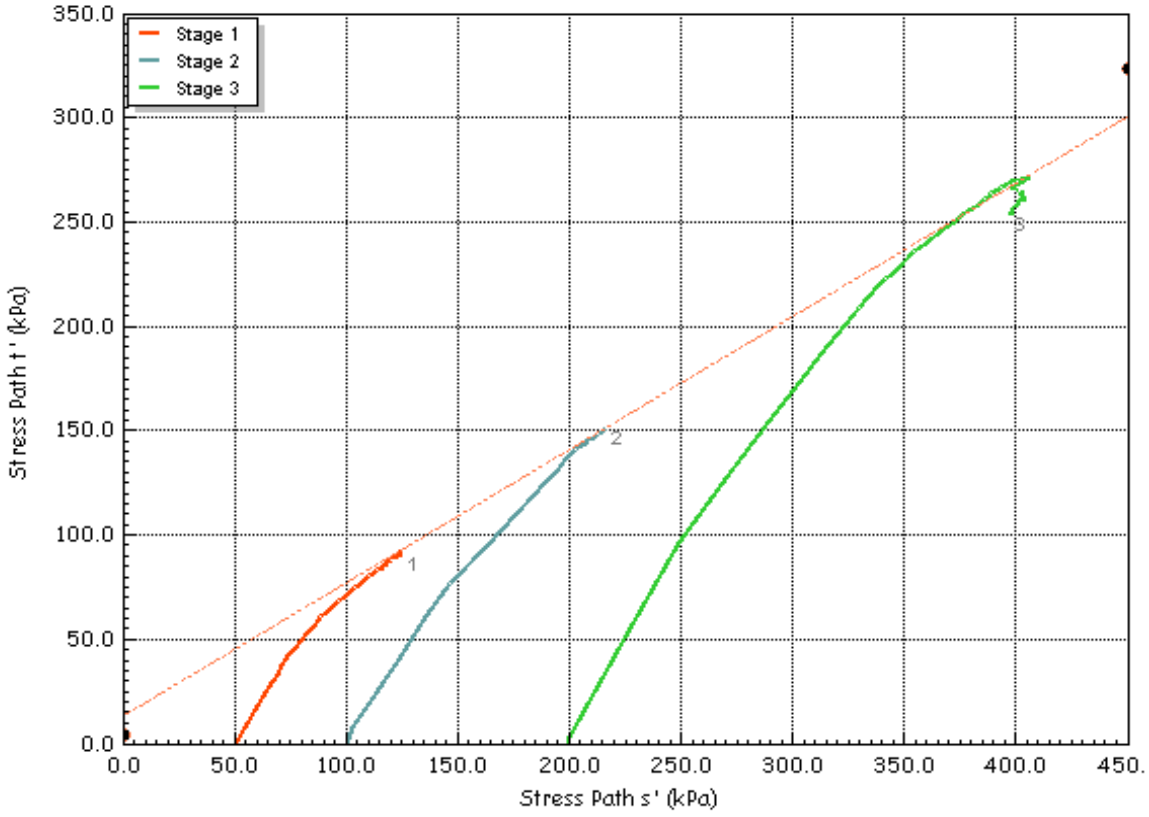
Effective Stress Triaxial Compression

Consolidated Undrained

Shear Stage Plots

Effective	c'	(kPa)	17.29	Effective Cohesion	c'	(kPa)	17.29
Effective Friction	ϕ'	(deg)	39.7	Effective Friction	ϕ'	(deg)	39.7





PSL PROFESSIONAL SOILS LABORATORY	Test Method	BS1377-8 : 1990 : Clause 7	Test Name	BH1920N 2.20-2.80m UT22	
			Test Date	03/07/2023	
	Jobfile	M1 J23a-J25	Borehole	BH1920N	
	Client	Strata Geotechnics	Sample	2.20-2.80m UT22	
UKAS TESTING 4043	Operator	[redacted]	Depth	2.20-2.80m	
	Checked	[redacted]	Approved	[redacted]	

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH1904N	16.00	16	A	Perp	100	30	3000	3819.72	61.80	-	0.28	0.07	1.100	0.08	Valid	
BH1904N	16.00	16	A	Perp	100	40	4000	5092.96	71.36	-	0.37	0.07	1.174	0.09	Valid	
BH1904N	16.00	16	A	Perp	100	32	3200	4074.37	63.83	-	0.22	0.05	1.116	0.06	Valid	
BH1904N	16.00	16	A	Perp	100	40	4000	5092.96	71.36	-	0.91	0.18	1.174	0.21	Valid	
BH1904N	16.00	16	A	Perp	100	30	3000	3819.72	61.80	-	0.61	0.16	1.100	0.18	Valid	
BH1904N	16.00	16	A	Perp	100	28	2800	3565.07	59.71	-	0.84	0.24	1.083	0.26	Valid	
BH1904N	16.00	16	A	Perp	100	31	3100	3947.04	62.83	-	0.93	0.24	1.108	0.26	Valid	
BH1904N	16.00	16	A	Perp	100	34	3400	4329.01	65.80	-	0.45	0.10	1.131	0.12	Valid	
BH1904N	16.00	16	A	Perp	100	36	3600	4583.66	67.70	-	0.52	0.11	1.146	0.13	Valid	
BH1904N	16.00	16	A	Perp	100	30	3000	3819.72	61.80	-	0.55	0.14	1.100	0.16	Valid	
BH1904N	19.50	18	A	Perp	100	60	6000	7639.44	87.40	-	8.26	1.08	1.286	1.39	Valid	
BH1904N	19.50	18	A	Perp	100	41	4100	5220.28	72.25	-	7.52	1.44	1.180	1.70	Valid	
BH1904N	19.50	18	A	Perp	100	31	3100	3947.04	62.83	-	13.11	3.32	1.108	3.68	Valid	
BH1904N	19.50	18	A	Perp	100	30	3000	3819.72	61.80	-	11.88	3.11	1.100	3.42	Valid	
BH1904N	19.50	18	A	Perp	100	36	3600	4583.66	67.70	-	8.12	1.77	1.146	2.03	Valid	
BH1904N	19.50	18	A	Perp	100	40	4000	5092.96	71.36	-	11.08	2.18	1.174	2.55	Valid	
BH1904N	19.50	18	A	Perp	100	45	4500	5729.58	75.69	-	9.27	1.62	1.205	1.95	Valid	
BH1904N	19.50	18	A	Perp	100	34	3400	4329.01	65.80	-	7.45	1.72	1.131	1.95	Valid	
BH1904N	19.50	18	A	Perp	100	36	3600	4583.66	67.70	-	8.65	1.89	1.146	2.16	Valid	
BH1904N	19.50	18	A	Perp	100	41	4100	5220.28	72.25	-	9.78	1.87	1.180	2.21	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:

PSL23/4670

Client Ref:

G230600

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH1920N	7.00	9	A	Perp	100	58	5800	7384.79	85.93	-	0.28	0.04	1.276	0.05	Valid	
BH1920N	7.00	9	A	Perp	100	31	3100	3947.04	62.83	-	0.31	0.08	1.108	0.09	Valid	
BH1920N	7.00	9	A	Perp	100	40	4000	5092.96	71.36	-	0.29	0.06	1.174	0.07	Valid	
BH1920N	7.00	9	A	Perp	100	56	5600	7130.14	84.44	-	0.51	0.07	1.266	0.09	Valid	
BH1920N	7.00	9	A	Perp	100	30	3000	3819.72	61.80	-	0.41	0.11	1.100	0.12	Valid	
BH1920N	7.00	9	A	Perp	100	38	3800	4838.31	69.56	-	0.33	0.07	1.160	0.08	Valid	
BH1920N	7.00	9	A	Perp	100	40	4000	5092.96	71.36	-	0.27	0.05	1.174	0.06	Valid	
BH1920N	7.00	9	A	Perp	100	31	3100	3947.04	62.83	-	0.25	0.06	1.108	0.07	Valid	
BH1920N	7.00	9	A	Perp	100	33	3300	4201.69	64.82	-	0.40	0.10	1.124	0.11	Valid	
BH1920N	7.00	9	A	Perp	100	28	2800	3565.07	59.71	-	0.37	0.10	1.083	0.11	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:

PSL23/4670

Client Ref:

G230600

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/03923/PSL - 23-35883

Your Project Reference:	**PSL23/4670 M1 J23a-J25**		
Your Order Number:	PSL	Samples Received / Instructed:	28/07/2023 / 28/07/2023
Report Issue Number:	1	Sample Tested:	28/07 to 03/08/2023
Samples Analysed:	2 soil samples	Report issued:	03/08/2023

[redacted]
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 26.07.23

Issued by: J. Gane

Issue No: 4

Rev No: 2

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03923/PSL - 23-35883

Project Reference - PSL23/4670 M1 J23a-J25

Analytical Test Results - Chemical Analysis

Lab Reference			307130	307131
Client Sample ID			-	-
Client Sample Location			BH1904N	BH1920N
Client Sample Type			C	B
Client Sample Number			14	5
Depth - Top (m)			13.50	1.20
Depth - Bottom (m)			15.00	1.30
Date of Sampling			-	-
Time of Sampling			-	-
Sample Matrix			Clay	Sand
Determinant	**Units**	**Accreditation**		
Water soluble sulphate (as SO_4)	(mg/l)	u	39	18
Acid Soluble Sulphate	(%)	u	0.05	0.02
Total Sulphur	(%)	UKAS	0.02	0.02
pH Value	pH Units	MCERTS	8.7	8.4

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Leicester
LE1 4DH

L23/03923/PSL - 23-35883

Project Reference - PSL23/4670 M1 J23a-J25

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
307130	-	BH1904N	C	14	Mottled orange grey silty clay	-	-	45
307131	-	BH1920N	B	5	Mottled brown grey gravelly silty sand	-	-	45

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L23/03923/PSL - 23-35883

Project Reference - PSL23/4670 M1 J23a-J25

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
307130	-	BH1904N	C	14	
307131	-	BH1920N	B	5	

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7 - 11 Harding Street
Leicester
LE1 4DH

L23/03923/PSL - 23-35883

Project Reference - PSL23/4670 M1 J23a-J25

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

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7 - 11 Harding Street
Leicester
LE1 4DH

L23/03923/PSL - 23-35883

Project Reference - PSL23/4670 M1 J23a-J25

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whist in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
307130	-	BH1904N	C	14		A
307131	-	BH1920N	B	5		A

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LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/04024/PSL - 23-36539

Your Project Reference:	**PSL23/4670**		
Your Order Number:	PSL	Samples Received / Instructed:	03/08/2023 / 03/08/2023
Report Issue Number:	1	Sample Tested:	03/08 to 11/08/2023
Samples Analysed:	7 soil samples	Report issued:	11/08/2023

[redacted]
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 26.07.23

Issued by: J. Gane

Issue No: 4

Rev No: 2

CTS Group
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L23/04024/PSL - 23-36539

Project Reference - PSL23/4670

Analytical Test Results - Chemical Analysis

Lab Reference			310592	310593	310594	310595	310596	310597	310598
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			BH1904N	BH1904N	BH1904N	BH1904N	BH1920N	BH1920N	BH1920N
Client Sample Type			-	-	-	-	-	-	-
Client Sample Number			21	5	10	18	15	18	20
Depth - Top (m)			1.00	5.00	9.50	19.50	3.60	4.20	5.60
Depth - Bottom (m)			1.10	5.45	9.95	20.00	3.80	4.40	5.70
Date of Sampling			-	-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-	-
Sample Matrix			Sand	Clay	Clay	Sand	Sand	Sand	Sand
Determinant	**Units**	**Accreditation**							
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Acid Soluble Sulphate	(%)	u	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Sulphur	(%)	UKAS	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
pH Value	pH Units	MCERTS	8.2	7.6	7.3	7.5	7.4	6.4	6.1

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L23/04024/PSL - 23-36539

Project Reference - PSL23/4670

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
310592	-	BH1904N	B	21	Reddish brown sandy gravel	-	-	28
310593	-	BH1904N	D	5	Reddish brown slightly gravelly slightly sandy clay	-	-	88
310594	-	BH1904N	D	10	Reddish brown gravelly slightly sandy clay	-	-	41
310595	-	BH1904N	C	18	Brown sandstone gravel	-	-	100
310596	-	BH1920N	D	15	Reddish brown slightly gravelly slightly sandy clay	-	-	29
310597	-	BH1920N	D	18	Reddish brown slightly gravelly slightly sandy clay	-	-	90
310598	-	BH1920N	D	20	Reddish brown slightly gravelly slightly sandy clay	-	-	81

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L23/04024/PSL - 23-36539

Project Reference - PSL23/4670

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
310592	-	BH1904N	B	21	
310593	-	BH1904N	D	5	
310594	-	BH1904N	D	10	
310595	-	BH1904N	C	18	
310596	-	BH1920N	D	15	
310597	-	BH1920N	D	18	
310598	-	BH1920N	D	20	

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L23/04024/PSL - 23-36539

Project Reference - PSL23/4670

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

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L23/04024/PSL - 23-36539

Project Reference - PSL23/4670

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whist in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
310592	-	BH1904N	B	21		A
310593	-	BH1904N	D	5		A
310594	-	BH1904N	D	10		A
310595	-	BH1904N	C	18		A
310596	-	BH1920N	D	15		A
310597	-	BH1920N	D	18		A
310598	-	BH1920N	D	20		A

LABORATORY REPORT

Contract Number: PSL23/6014

Report Date: 08 August 2023

Client's Reference: G230600

Client Name: Strata Geotechnics
Kirkby Lane
Pinxton
Nottinghamshire
NG16 6JA

For the attention of: [redacted]

Contract Title: M1 J23a-J25

Date Received: 21/7/2023
Date Commenced: 21/7/2023
Date Completed: 8/8/2023

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:

[redacted] (Director)

[redacted] (Quality Manager)

[redacted] (Laboratory Manager)

[redacted] (Assistant Laboratory Manager)

[redacted] (Senior Technician)

[redacted] (Senior Technician)

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

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1851S	11	L	1.20	2.00	Brown very gravelly very sandy CLAY.
BH1851S	2	D	3.00	3.45	Brown slightly sandy CLAY.
BH1851S	4	D	5.00	5.45	Brown mottled grey sandy CLAY
BH1851S	15	L	5.00	6.00	Brown mottled grey slightly gravelly slightly sandy CLAY.
BH1851S	5	D	6.00	6.45	Brown sandy CLAY.
BH1851S	16	L	6.00	7.00	Brown slightly sandy CLAY.
BH1851S	8	D	8.00	8.45	Brown slightly gravelly slightly sandy CLAY.
BH1851S	10	D	9.60	9.78	Brown mottled grey sandy CLAY.
BH1937N	11	B	1.20	2.00	Brown very gravelly sandy CLAY.
BH1937N	18	SD	2.00	2.45	Brown slightly gravelly sandy CLAY.
BH1937N	12	L	2.00	3.00	Brown slightly gravelly slightly sandy CLAY.
BH1937N	3	D	3.00	3.45	Brown slightly gravelly very sandy CLAY.
BH1937N	13	L	3.00	3.50	Brown very gravelly slightly sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6014
Client Ref:
G230600

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
BH1851S	11	L	1.20	2.00	14			24	14	10	70	Low Plasticity CL
BH1851S	2	D	3.00	3.45	37			50	24	26	99	High Plasticity CH
BH1851S	4	D	5.00	5.45	30			36	18	18	100	Intermediate Plasticity CI
BH1851S	5	D	6.00	6.45	26			43	21	22	100	Intermediate Plasticity CI
BH1851S	8	D	8.00	8.45	26			53	25	28	95	High Plasticity CH
BH1851S	10	D	9.60	9.78	20			44	21	23	100	Intermediate Plasticity CI
BH1937N	11	B	1.20	2.00	14			36	18	18	72	Intermediate Plasticity CI
BH1937N	18	SD	2.00	2.45	16			37	18	19	96	Intermediate Plasticity CI

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

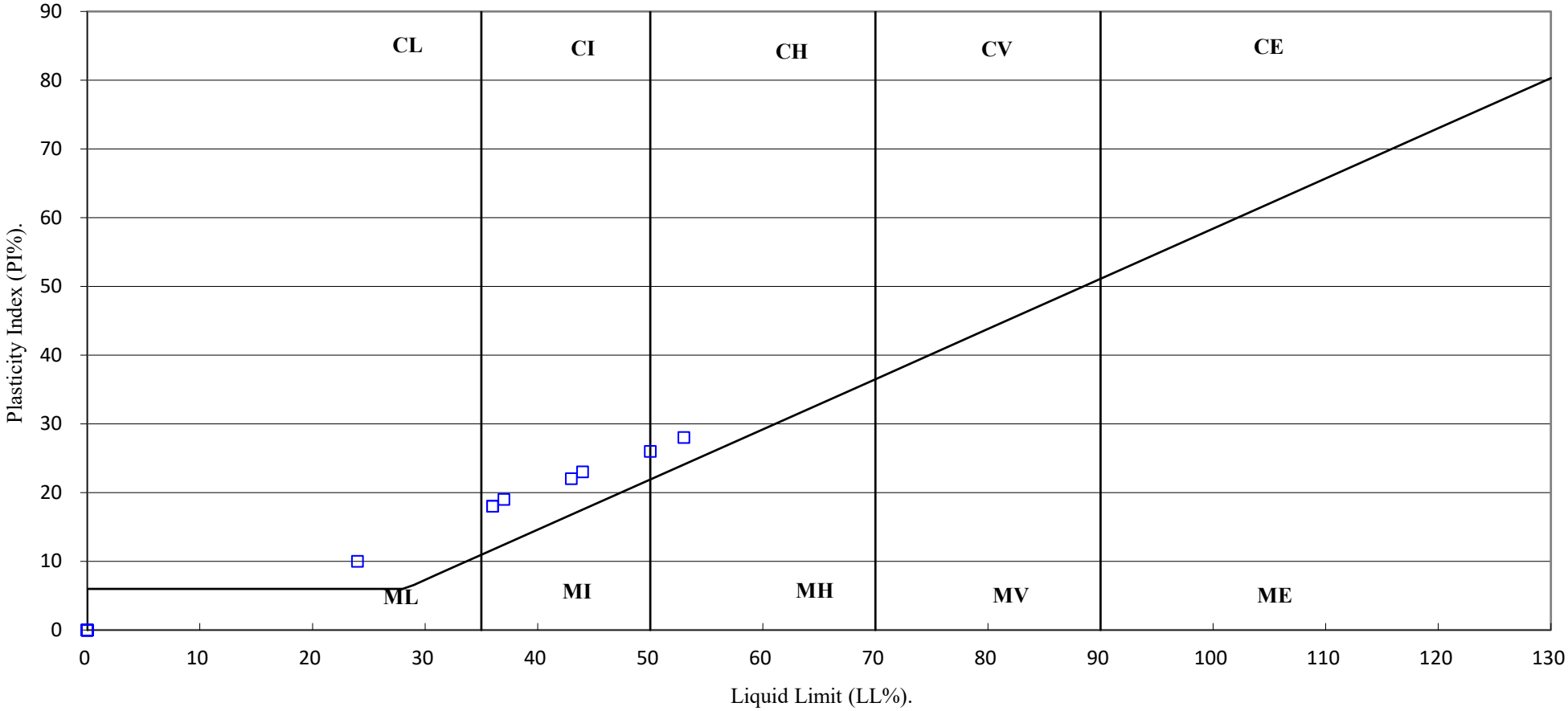
UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6014
Client Ref:
G230600

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**

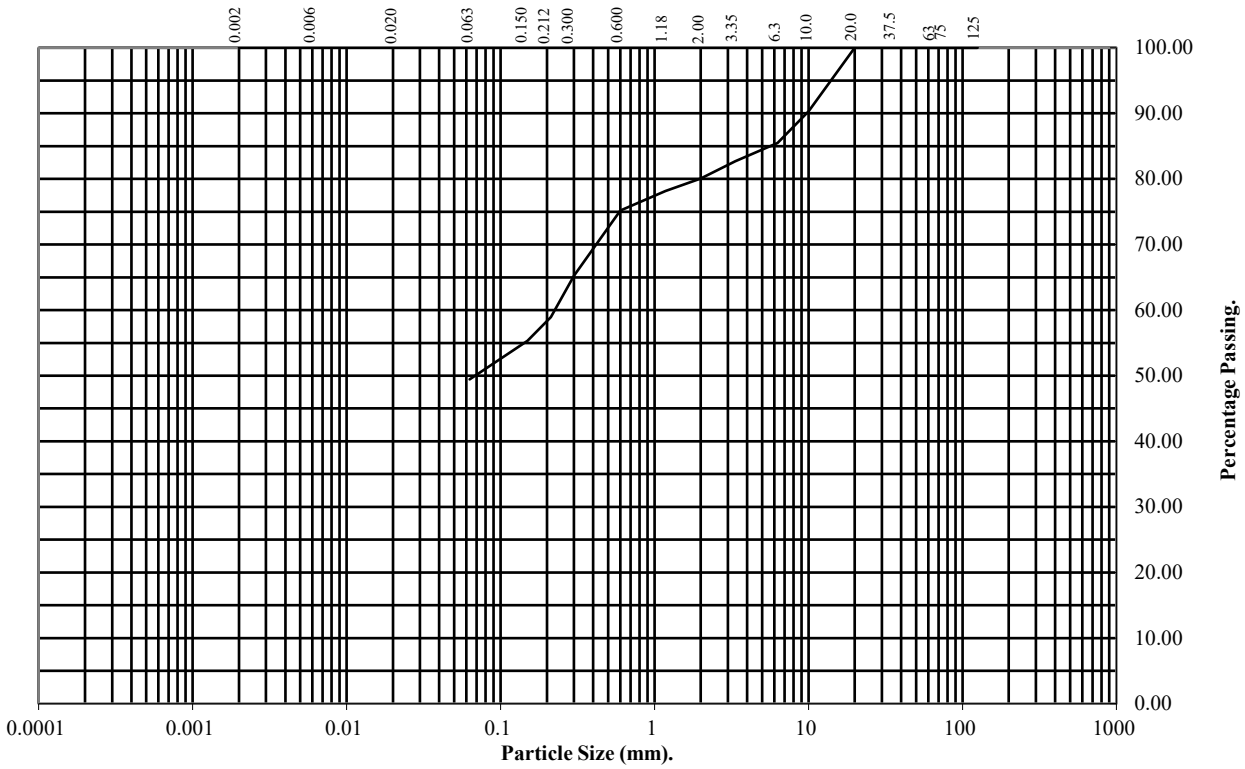
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1851S**	**Top Depth (m):**	**1.20**
Sample Number:	**11**	**Base Depth(m):**	**2.00**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	90
6.3	85
3.35	83
2	80
1.18	78
0.6	75
0.3	65
0.212	59
0.15	55
0.063	49

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	31
Silt/Clay	49

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

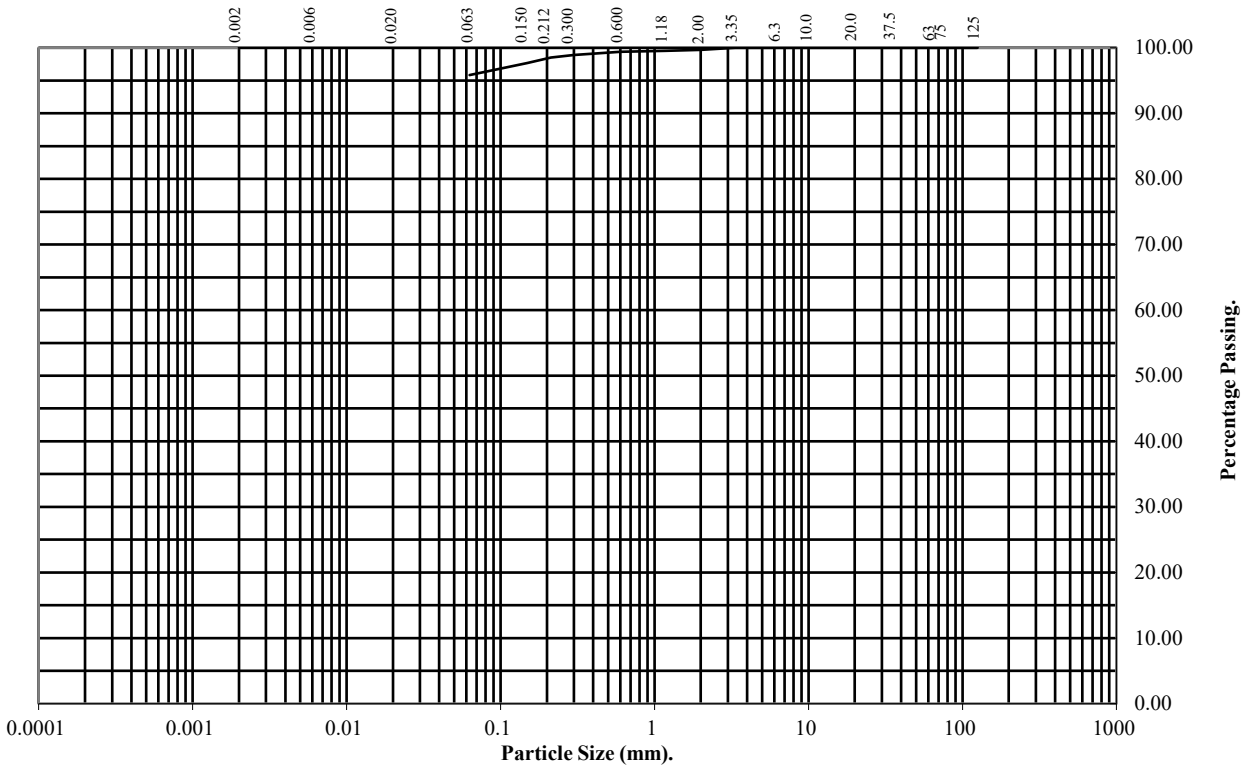
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1851S**	**Top Depth (m):**	**3.00**
Sample Number:	**2**	**Base Depth(m):**	**3.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	99
0.212	98
0.15	98
0.063	96

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	4
Silt/Clay	96

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

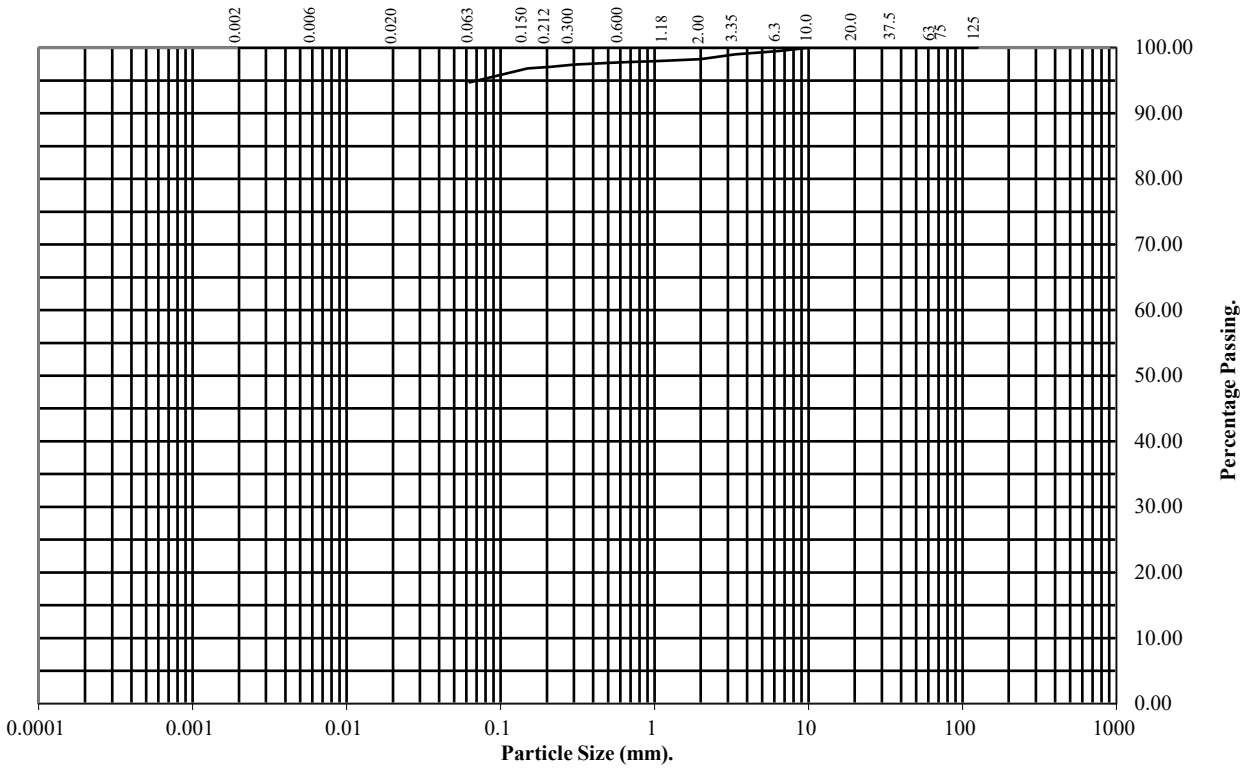
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1851S**	**Top Depth (m):**	**5.00**
Sample Number:	**15**	**Base Depth(m):**	**6.00**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	98
1.18	98
0.6	98
0.3	97
0.212	97
0.15	97
0.063	95

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	3
Silt/Clay	95

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

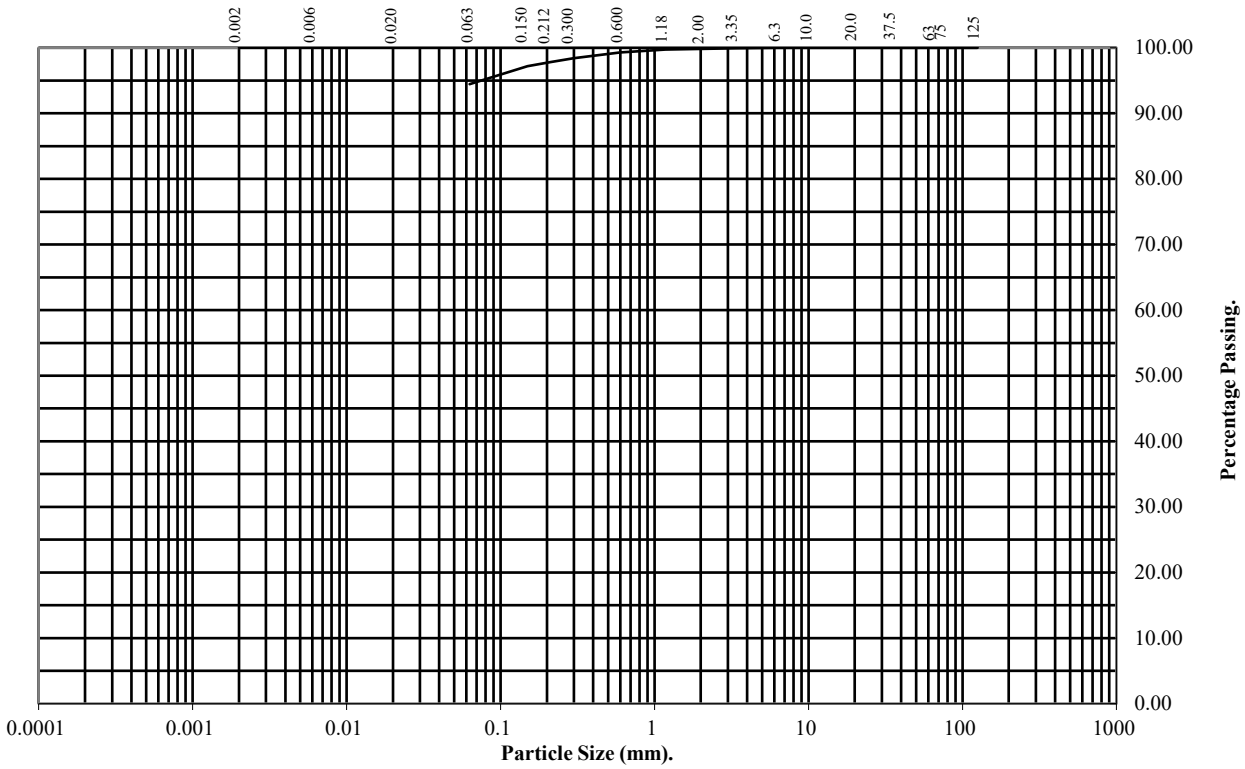
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1851S**	**Top Depth (m):**	**6.00**
Sample Number:	**16**	**Base Depth(m):**	**7.00**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	98
0.212	98
0.15	97
0.063	94

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	6
Silt/Clay	94

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

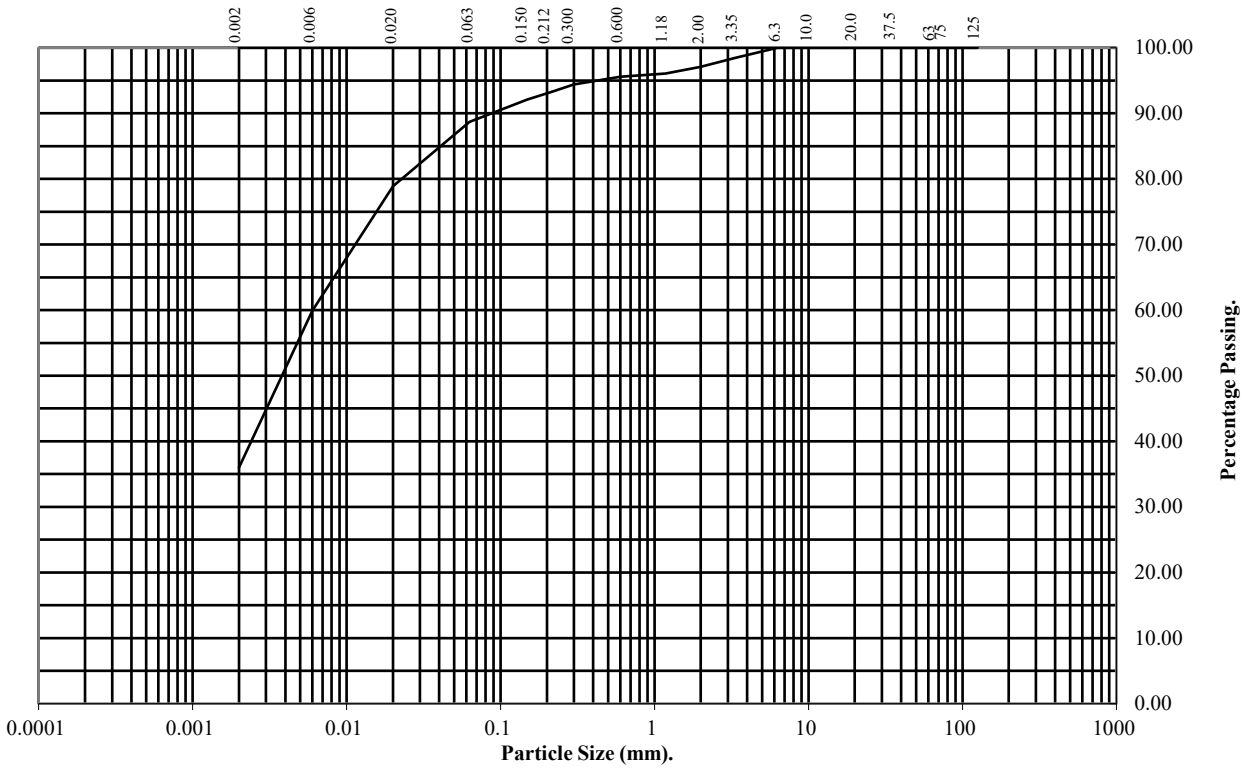
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH1851S**	**Top Depth (m):**	**8.00**
Sample Number:	**8**	**Base Depth(m):**	**8.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	98
2	97
1.18	96
0.6	96
0.3	94
0.212	93
0.15	92
0.063	89

Particle Diameter	Percentage Passing
0.02	79
0.006	60
0.002	36

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	8
Silt	53
Clay	36

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

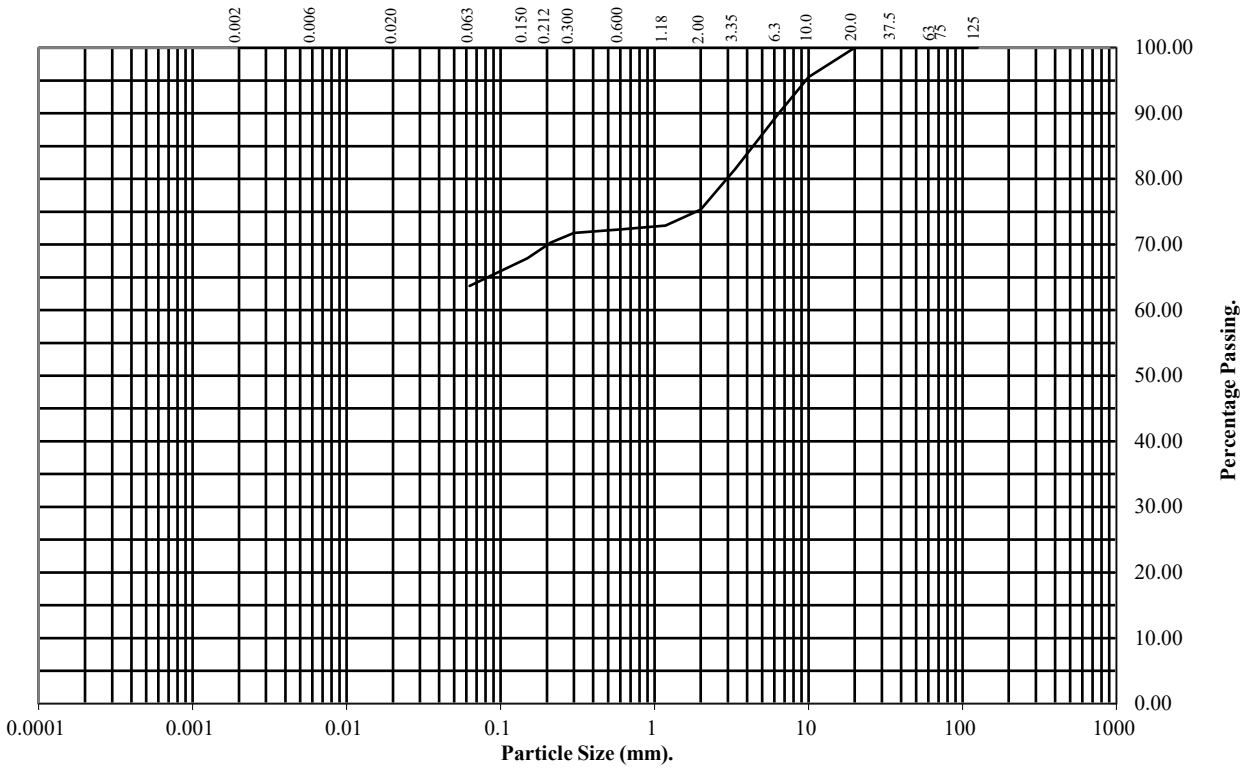
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1937N**	**Top Depth (m):**	**1.20**
Sample Number:	**11**	**Base Depth(m):**	**2.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	96
6.3	90
3.35	82
2	75
1.18	73
0.6	72
0.3	72
0.212	70
0.15	68
0.063	64

Soil Fraction	Total Percentage
Cobbles	0
Gravel	25
Sand	11
Silt/Clay	64

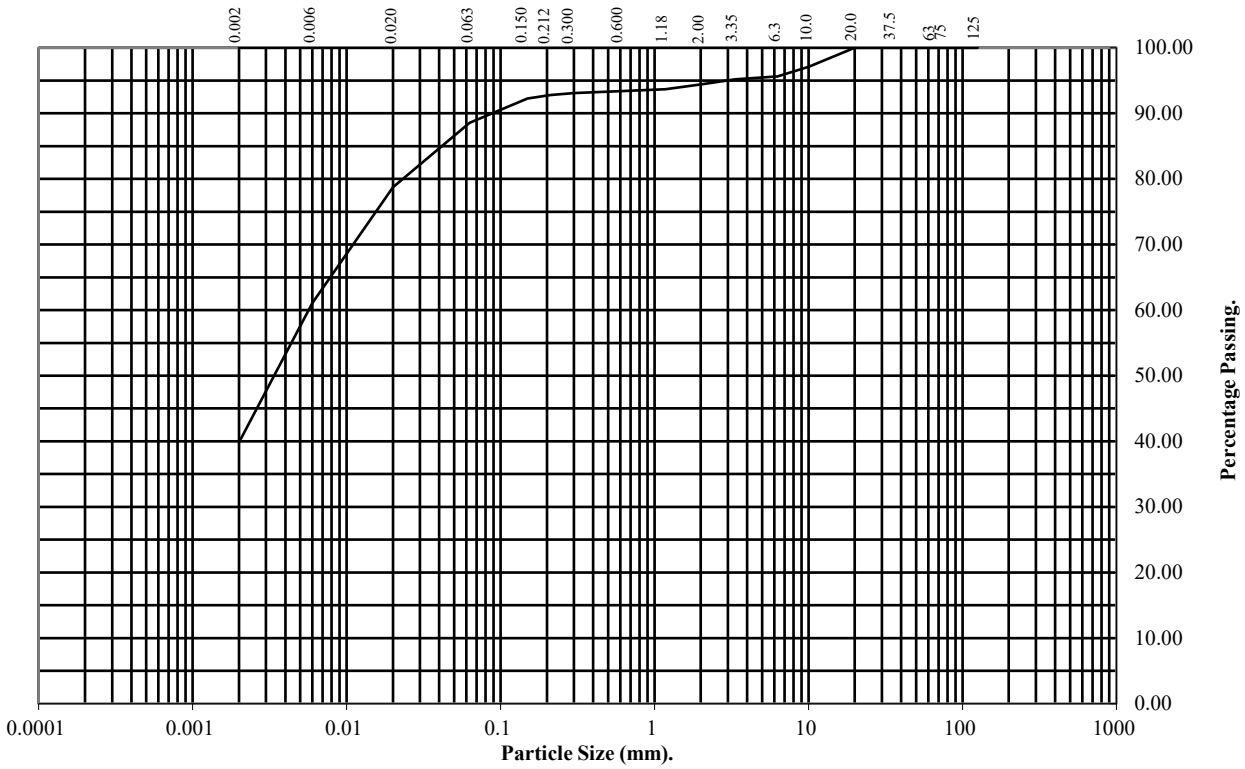
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH1937N**	**Top Depth (m):**	**2.00**
Sample Number:	**12**	**Base Depth(m):**	**3.00**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	96
3.35	95
2	94
1.18	94
0.6	93
0.3	93
0.212	93
0.15	92
0.063	89

Particle Diameter	Percentage Passing
0.02	79
0.006	61
0.002	40

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	5
Silt	49
Clay	40

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

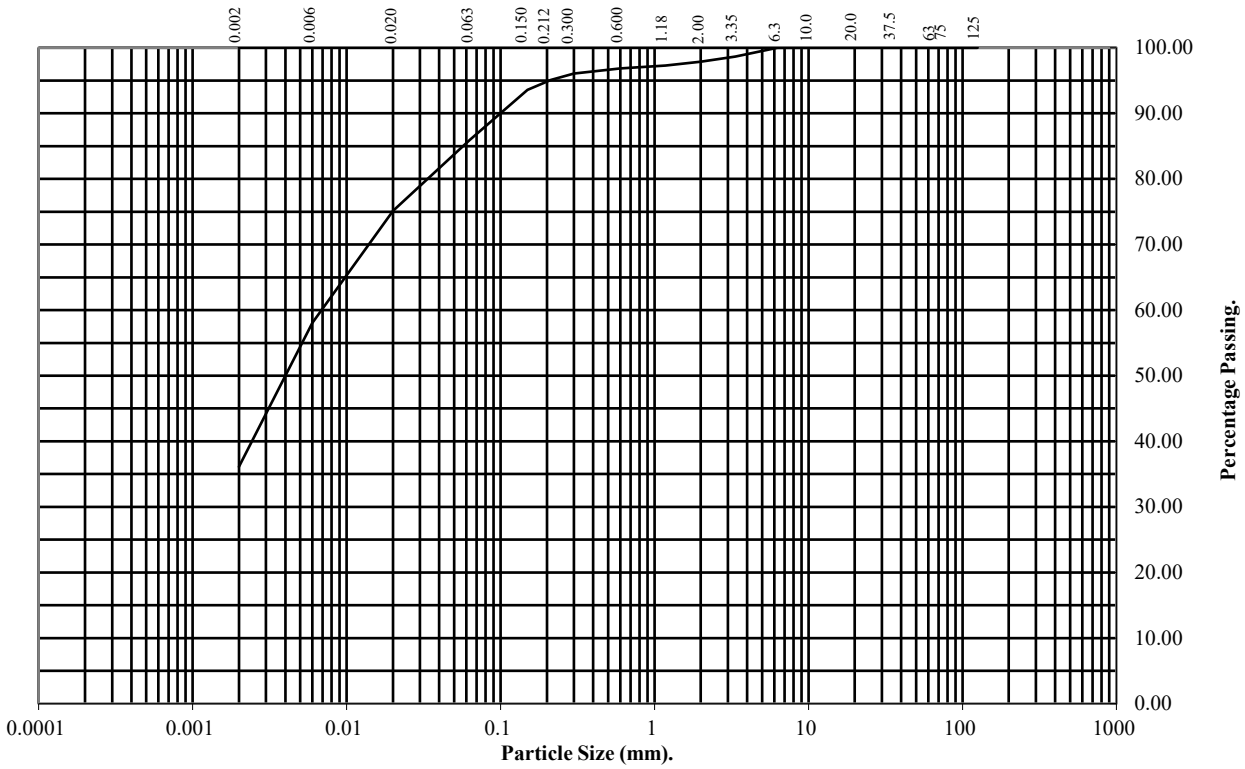
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH1937N**	**Top Depth (m):**	**2.00**
Sample Number:	**18**	**Base Depth(m):**	**2.45**
Sample Type:	**SD**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	98
1.18	97
0.6	97
0.3	96
0.212	95
0.15	94
0.063	86

Particle Diameter	Percentage Passing
0.02	75
0.006	58
0.002	36

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	12
Silt	50
Clay	36

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

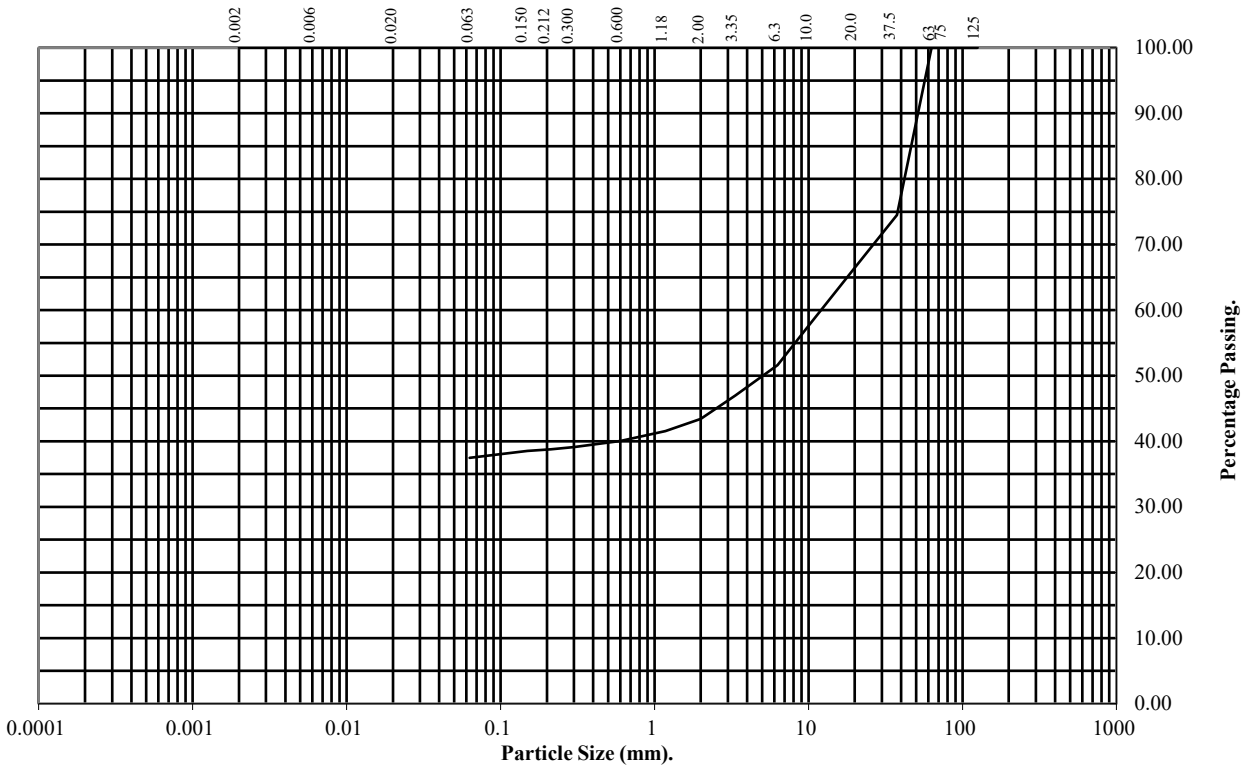
Contract No:
PSL23/6014
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1937N**	**Top Depth (m):**	**3.00**
Sample Number:	**13**	**Base Depth(m):**	**3.50**
Sample Type:	**L**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	75
20	66
10	58
6.3	52
3.35	47
2	43
1.18	42
0.6	40
0.3	39
0.212	39
0.15	39
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	57
Sand	6
Silt/Clay	37

Remarks:
See Summary of Soil Descriptions

SUMMARY OF SOIL DENSITY RELATED TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Retained 20mm %	Retained 37.5mm %	Method of compaction kg	Maximum Dry Density Mg/m^3	Minimum Dry Density Mg/m^3	Remarks
BH1851S	11	L	1.20	2.00	14	2.10	1.84						
BH1851S	2	D	3.00	3.45	37	1.73	1.26						
BH1851S	8	D	8.00	8.45	26	1.89	1.50						
BH1851S	10	D	9.60	9.78	20	1.94	1.62						
BH1937N	18	SD	2.00	2.45	16	1.92	1.66						
BH1937N	3	D	3.00	3.45	15	2.03	1.77						
BH1937N	24	CSS	3.74	3.85	13	2.18	1.93						
BH1937N	26	CSS	4.85	5.00	9.1	2.25	2.06						
BH1937N	28	CSS	6.15	6.35	12	2.21	1.97						
BH1937N	30	CSS	8.52	8.61	13	2.18	1.93						

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6014
Client Ref:
G230600

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH1937N	3.74	CSS	A	Perp	100	32	3200	4074.37	63.83	-	1.22	0.30	1.116	0.33	Valid	
BH1937N	3.74	CSS	A	Perp	100	43	4300	5474.93	73.99	-	1.30	0.24	1.193	0.28	Valid	
BH1937N	3.74	CSS	A	Perp	100	30	3000	3819.72	61.80	-	0.94	0.25	1.100	0.27	Valid	
BH1937N	3.74	CSS	A	Perp	100	40	4000	5092.96	71.36	-	1.26	0.25	1.174	0.29	Valid	
BH1937N	3.74	CSS	A	Perp	100	33	3300	4201.69	64.82	-	1.27	0.30	1.124	0.34	Valid	
BH1937N	4.85	CSS	A	Perp	100	38	3800	4838.31	69.56	-	3.06	0.63	1.160	0.73	Valid	
BH1937N	4.85	CSS	A	Perp	100	43	4300	5474.93	73.99	-	4.06	0.74	1.193	0.88	Valid	
BH1937N	4.85	CSS	I	Perp	45	32	1440	1833.46	42.82	-	0.86	0.47	0.933	0.44	Valid	
BH1937N	4.85	CSS	I	Perp	37	30	1110	1413.30	37.59	-	1.08	0.76	0.880	0.67	Valid	
BH1937N	4.85	CSS	I	Perp	41	28	1148	1461.68	38.23	-	0.92	0.63	0.886	0.56	Valid	
BH1937N	6.15	CSS	A	Perp	100	38	3800	4838.31	69.56	-	1.56	0.32	1.160	0.37	Valid	
BH1937N	6.15	CSS	A	Perp	100	42	4200	5347.61	73.13	-	1.45	0.27	1.187	0.32	Valid	
BH1937N	6.15	CSS	A	Perp	100	32	3200	4074.37	63.83	-	1.14	0.28	1.116	0.31	Valid	
BH1937N	6.15	CSS	A	Perp	100	28	2800	3565.07	59.71	-	0.96	0.27	1.083	0.29	Valid	
BH1937N	6.15	CSS	A	Perp	100	32	3200	4074.37	63.83	-	1.37	0.34	1.116	0.38	Valid	
BH1937N	8.52	CSS	A	Perp	100	36	3600	4583.66	67.70	-	1.33	0.29	1.146	0.33	Valid	
BH1937N	8.52	CSS	I	Perp	48	30	1440	1833.46	42.82	-	1.06	0.58	0.933	0.54	Valid	
BH1937N	8.52	CSS	I	Perp	50	47	2350	2992.11	54.70	-	1.22	0.41	1.041	0.42	Valid	
BH1937N	8.52	CSS	I	Perp	38	30	1140	1451.49	38.10	-	0.74	0.51	0.885	0.45	Valid	
BH1937N	8.52	CSS	I	Perp	45	36	1620	2062.65	45.42	-	0.89	0.43	0.958	0.41	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

A = Axial, D = Diametral, I = Irregular

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:

PSL23/6014

Client Ref:

G230600

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH1937N	3.74	CSS	D	Par	-	100	10000	100.00	-	1.01	0.101	1.366	0.14	Valid	
BH1937N	3.74	CSS	D	Par	-	100	10000	100.00	-	1.06	0.106	1.366	0.14	Valid	
BH1937N	3.74	CSS	D	Par	-	100	10000	100.00	-	0.88	0.088	1.366	0.12	Valid	
BH1937N	3.74	CSS	D	Par	-	100	10000	100.00	-	0.99	0.099	1.366	0.14	Valid	
BH1937N	3.74	CSS	D	Par	-	100	10000	100.00	-	0.87	0.087	1.366	0.12	Valid	
BH1937N	4.85	CSS	D	Par	-	100	10000	100.00	-	2.40	0.240	1.366	0.33	Valid	
BH1937N	4.85	CSS	D	Par	-	100	10000	100.00	-	3.11	0.311	1.366	0.42	Valid	
BH1937N	6.15	CSS	D	Par	-	100	10000	100.00	-	1.12	0.112	1.366	0.15	Valid	
BH1937N	6.15	CSS	D	Par	-	100	10000	100.00	-	1.20	0.120	1.366	0.16	Valid	
BH1937N	6.15	CSS	D	Par	-	100	10000	100.00	-	0.88	0.088	1.366	0.12	Valid	
BH1937N	6.15	CSS	D	Par	-	100	10000	100.00	-	0.77	0.077	1.366	0.11	Valid	
BH1937N	6.15	CSS	D	Par	-	100	10000	100.00	-	1.11	0.111	1.366	0.15	Valid	
BH1937N	8.52	CSS	D	Par	-	100	10000	100.00	-	0.88	0.088	1.366	0.12	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular, U = Random

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:

PSL23/6014

Client Ref:

G230600

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/04156/PSL - 23-36144

Your Project Reference:	**PSL23/6014 M1 J23A-J25**		
Your Order Number:	PSL23/6014	Samples Received / Instructed:	07/08/2023 / 07/08/2023
Report Issue Number:	1	Sample Tested:	07/08 to 14/08/2023
Samples Analysed:	2 soil samples	Report issued:	14/08/2023

[redacted]
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 26.07.23

Issued by: J. Gane

Issue No: 4

Rev No: 2

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/04156/PSL - 23-36144

Project Reference - PSL23/6014 M1 J23A-J25

Analytical Test Results - Chemical Analysis

Lab Reference			308325	308326
Client Sample ID			-	-
Client Sample Location			BH1851S	BH1937N
Client Sample Type			-	-
Client Sample Number			-	-
Depth - Top (m)			1.20	1.20
Depth - Bottom (m)			2.00	2.00
Date of Sampling			-	-
Time of Sampling			-	-
Sample Matrix			Clay	Clay
Determinant	**Units**	**Accreditation**		
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10	41
Acid Soluble Sulphate	(%)	u	0.01	0.04
Total Sulphur	(%)	UKAS	0.01	0.02
pH Value	pH Units	MCERTS	8.3	9.1
Water Soluble Chloride	(mg/l)	u	140	120
Water Soluble Nitrate (As NO_3)	(mg/l)	u	< 1.0	< 1.0
Water Soluble Magnesium	(mg/l)	u	5.0	3.4
Water Soluble Ammonium Ion	(mg/l)	u	< 1.0	< 1.0

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/04156/PSL - 23-36144

Project Reference - PSL23/6014 M1 J23A-J25

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
308325	-	BH1851S	-	-	Dark brown gravelly silty clay	9.1	33	57
308326	-	BH1937N	-	-	Mottled grey red gravelly silty clay	8.7	59	52

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Leicester
LE1 4DH

L23/04156/PSL - 23-36144

Project Reference - PSL23/6014 M1 J23A-J25

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
308325	-	BH1851S	-	-	
308326	-	BH1937N	-	-	

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Leicester
LE1 4DH

L23/04156/PSL - 23-36144

Project Reference - PSL23/6014 M1 J23A-J25

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

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Leicester
LE1 4DH

L23/04156/PSL - 23-36144

Project Reference - PSL23/6014 M1 J23A-J25

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whist in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
308325	-	BH1851S	-	-		A
308326	-	BH1937N	-	-		A

LABORATORY REPORT

Contract Number: PSL23/6015

Report Date: 01 August 2023

Client's Reference: G230600

Client Name: Strata Geotechnics
Kirkby Lane
Pinxton
Nottinghamshire
NG16 6JA

For the attention of: [redacted]

Contract Title: M1 J23a-J25

Date Received: 21/7/2023
Date Commenced: 21/7/2023
Date Completed: 1/8/2023

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

Checked and Approved Signatories:

[redacted] (Director)

[redacted] (Quality Manager)

[redacted] (Laboratory Manager)

[redacted] (Assistant Laboratory Manager)

[redacted] (Senior Technician)

[redacted] (Senior Technician)

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

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1877S	2	D	1.50	1.60	Reddish brown gravelly sandy CLAY.
BH1877S	4	D	2.50	2.60	Reddish brown gravelly sandy CLAY.
BH1896S	2	D	1.20	1.30	Brown gravelly very sandy CLAY.
BH1896S	3	D	1.30	1.40	Reddish brown very gravelly sandy CLAY.
BH1896S	5	D	1.90	2.00	Brown sandy silty GRAVEL.
BH1896S	6	D	4.00	4.20	Brown gravelly slightly silty SAND.
BH1896S	8	D	4.30	4.40	Brown slightly silty SAND.
BH1896S	10	B	4.60	5.00	Brown slightly gravelly slightly silty SAND.
BH1912S	6	D	1.00	2.00	Brown gravelly sandy CLAY.
BH1912S	2	D	2.00	2.45	Reddish brown gravelly sandy CLAY.
BH1912S	11	D	3.00	4.00	Reddish brown gravelly sandy CLAY.
BH1912S	13	D	4.00	5.00	Reddish brown slightly gravelly sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6015
Client Ref:
G230600

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
BH1877S	2	D	1.50	1.60	14			35	18	17	80	Intermediate Plasticity CI
BH1877S	4	D	2.50	2.60	15			36	18	18	78	Intermediate Plasticity CI
BH1896S	2	D	1.20	1.30	14			28	14	14	77	Low Plasticity CL
BH1896S	5	D	1.90	2.00	4.5				NP			
BH1912S	6	D	1.00	2.00	21							

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

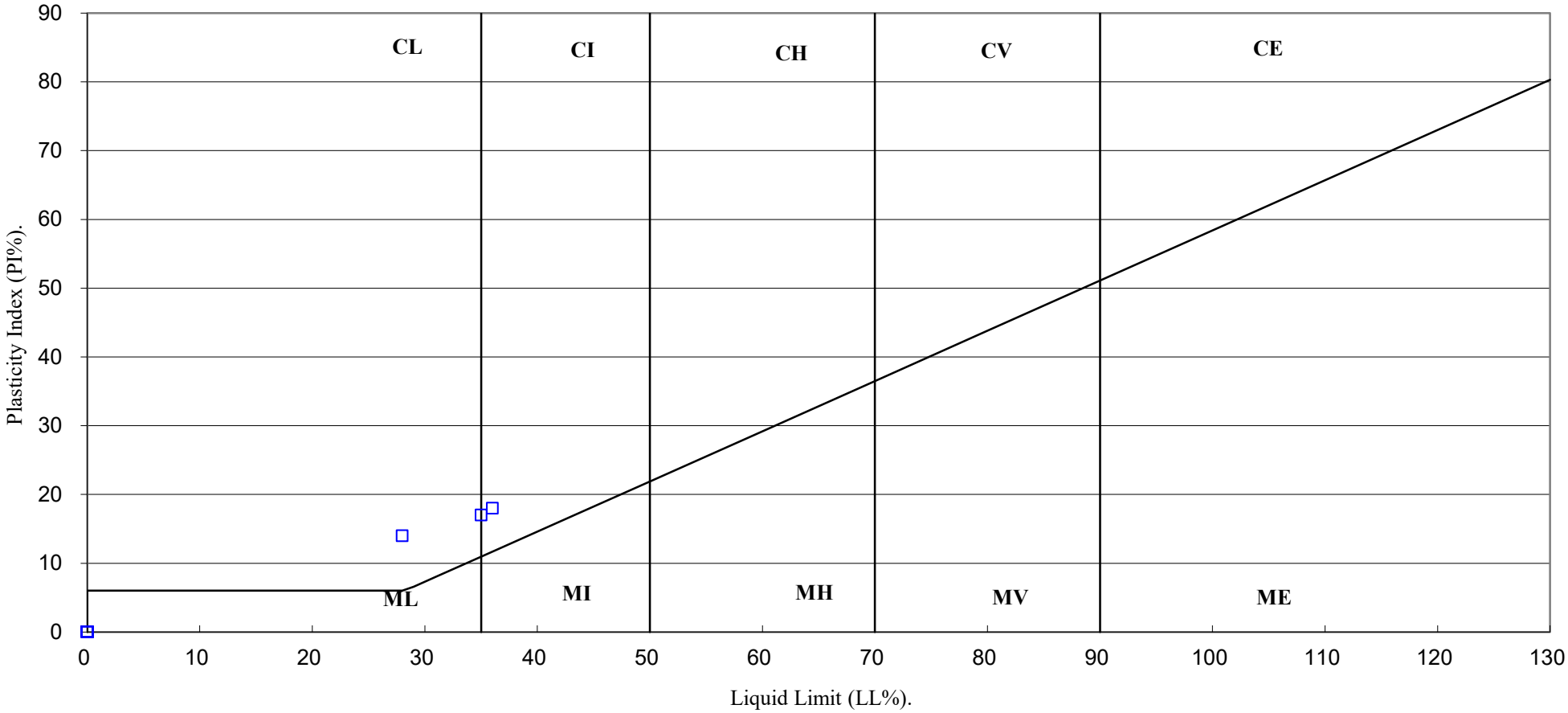
UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6015
Client Ref:
G230600

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	M1 J23a-J25	Contract No: PSL23/6015 Client Ref: G230600

SUMMARY OF SOIL DENSITY RELATED TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Retained 20mm %	Retained 37.5mm %	Method of compaction kg	Maximum Dry Density Mg/m^3	Minimum Dry Density Mg/m^3	Remarks
BH1877S	2	D	1.50	1.60	14	2.16	1.89						
BH1877S	4	D	2.50	2.60	15	2.14	1.86						
BH1896S	2	D	1.20	1.30	14	2.10	1.84						
BH1896S	5	D	1.90	2.00	4.5	2.06	1.97						
BH1912S	6	D	1.00	2.00	21	2.05	1.69						
BH1912S	11	D	3.00	4.00	24	2.00	1.61						

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:

PSL23/6015

Client Ref:

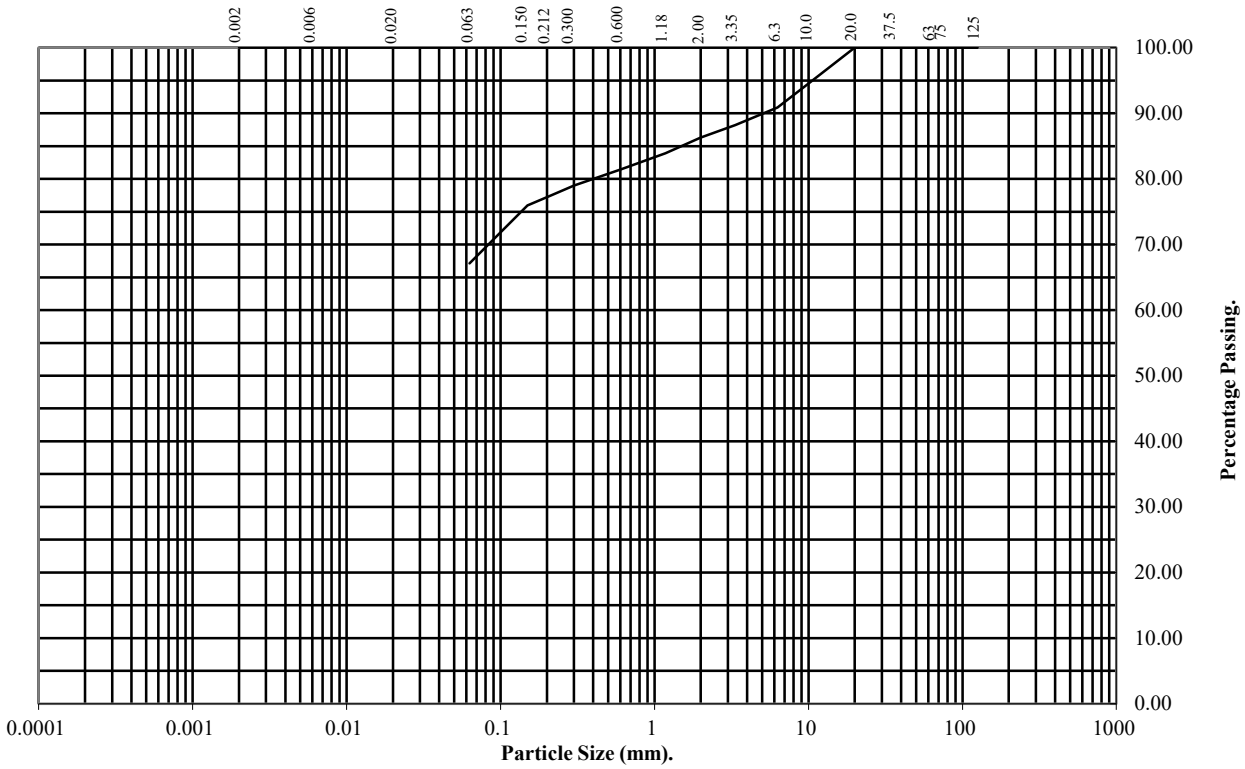
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877S**	**Top Depth (m):**	**1.50**
Sample Number:	**2**	**Base Depth(m):**	**1.60**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	95
6.3	91
3.35	88
2	86
1.18	84
0.6	81
0.3	79
0.212	77
0.15	76
0.063	67

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	19
Silt/Clay	67

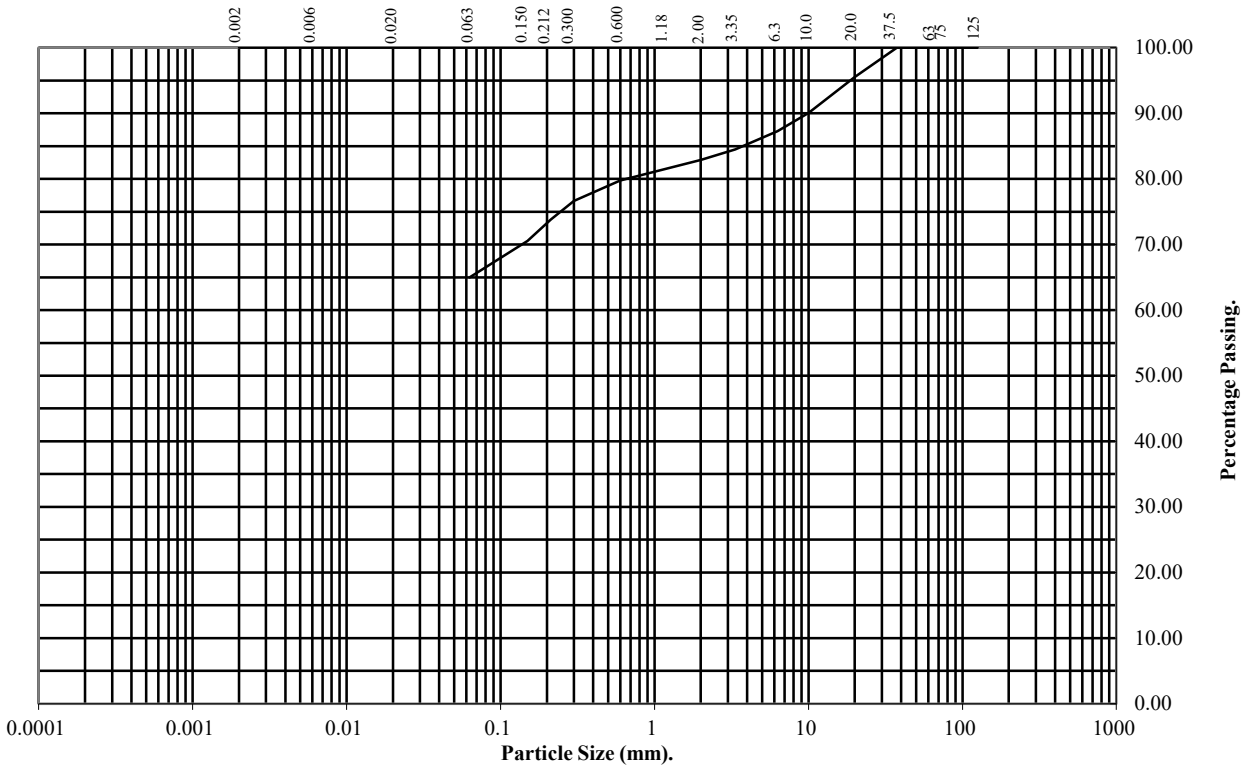
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877S**	**Top Depth (m):**	**2.50**
Sample Number:	**4**	**Base Depth(m):**	**2.60**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	96
10	90
6.3	87
3.35	85
2	83
1.18	82
0.6	80
0.3	77
0.212	74
0.15	71
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	18
Silt/Clay	65

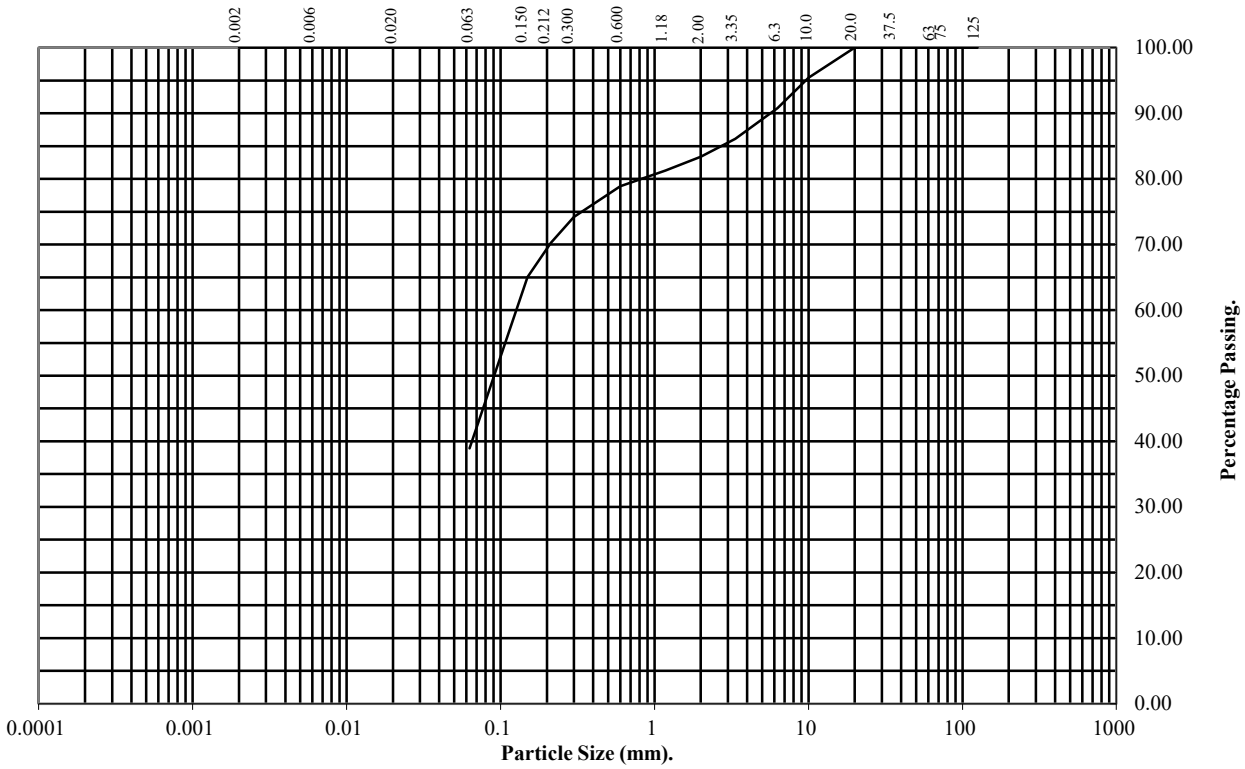
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1896S**	**Top Depth (m):**	**1.20**
Sample Number:	**2**	**Base Depth(m):**	**1.30**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	95
6.3	91
3.35	86
2	83
1.18	81
0.6	79
0.3	74
0.212	70
0.15	65
0.063	39

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	44
Silt/Clay	39

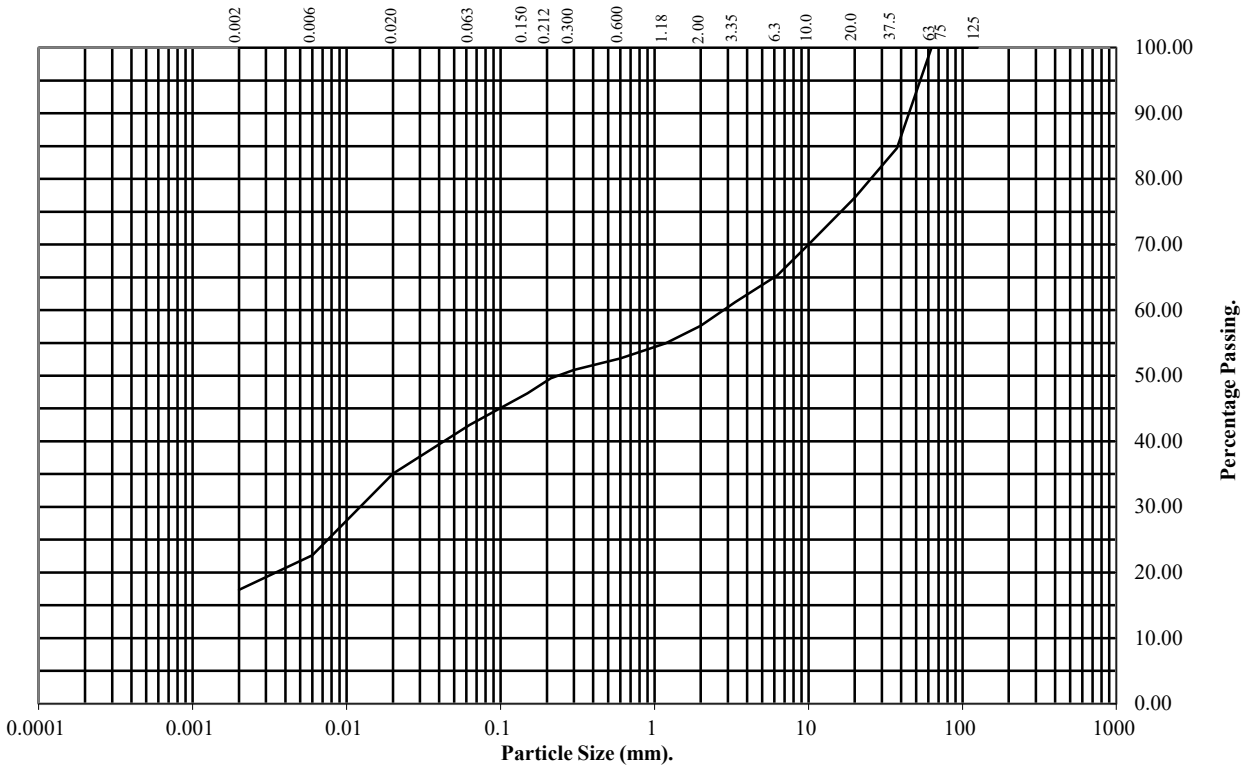
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH1896S**	**Top Depth (m):**	**1.30**
Sample Number:	**3**	**Base Depth(m):**	**1.40**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	85
20	77
10	70
6.3	65
3.35	61
2	58
1.18	55
0.6	53
0.3	51
0.212	50
0.15	47
0.063	42

Particle Diameter	Percentage Passing
0.02	35
0.006	23
0.002	17

Soil Fraction	Total Percentage
Cobbles	0
Gravel	42
Sand	16
Silt	25
Clay	17

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

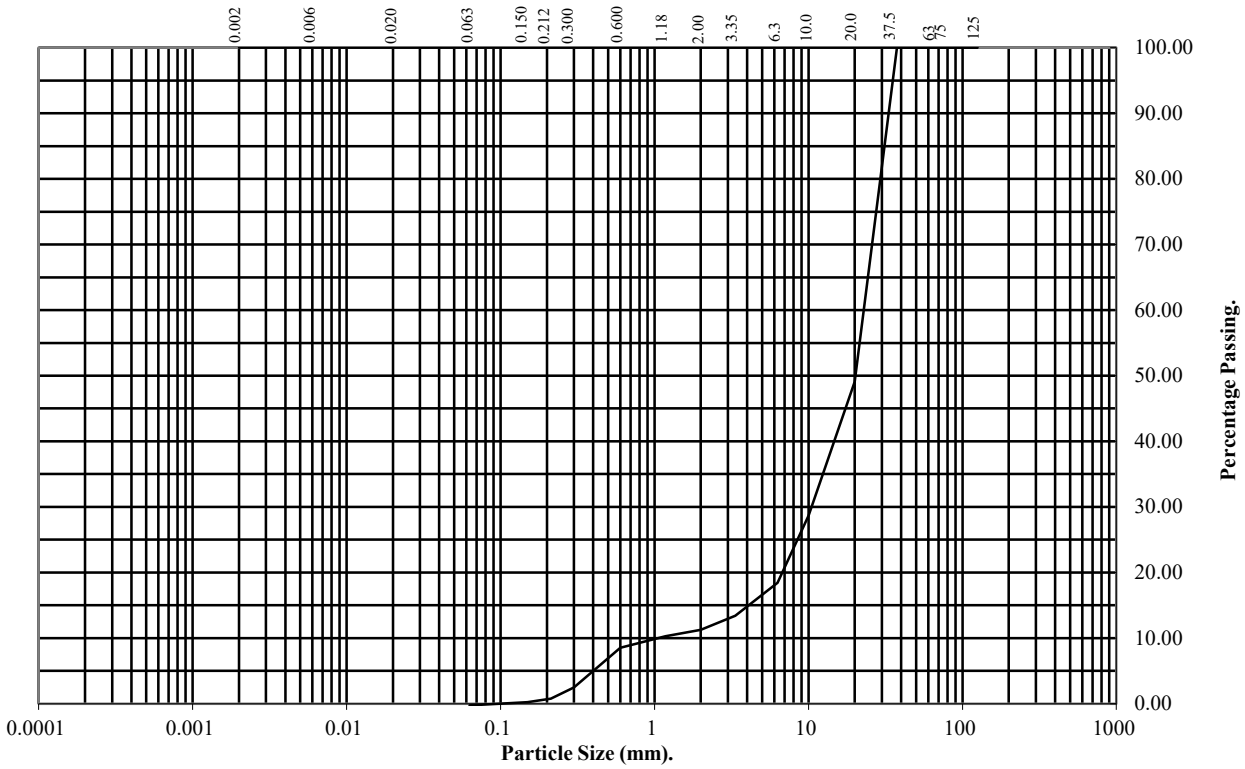
Contract No:
PSL23/6015
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1896S**	**Top Depth (m):**	**1.90**
Sample Number:	**5**	**Base Depth(m):**	**2.00**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	49
10	29
6.3	18
3.35	13
2	11
1.18	10
0.6	9
0.3	2
0.212	1
0.15	0
0.063	0

Soil Fraction	Total Percentage
Cobbles	0
Gravel	89
Sand	11
Silt/Clay	0

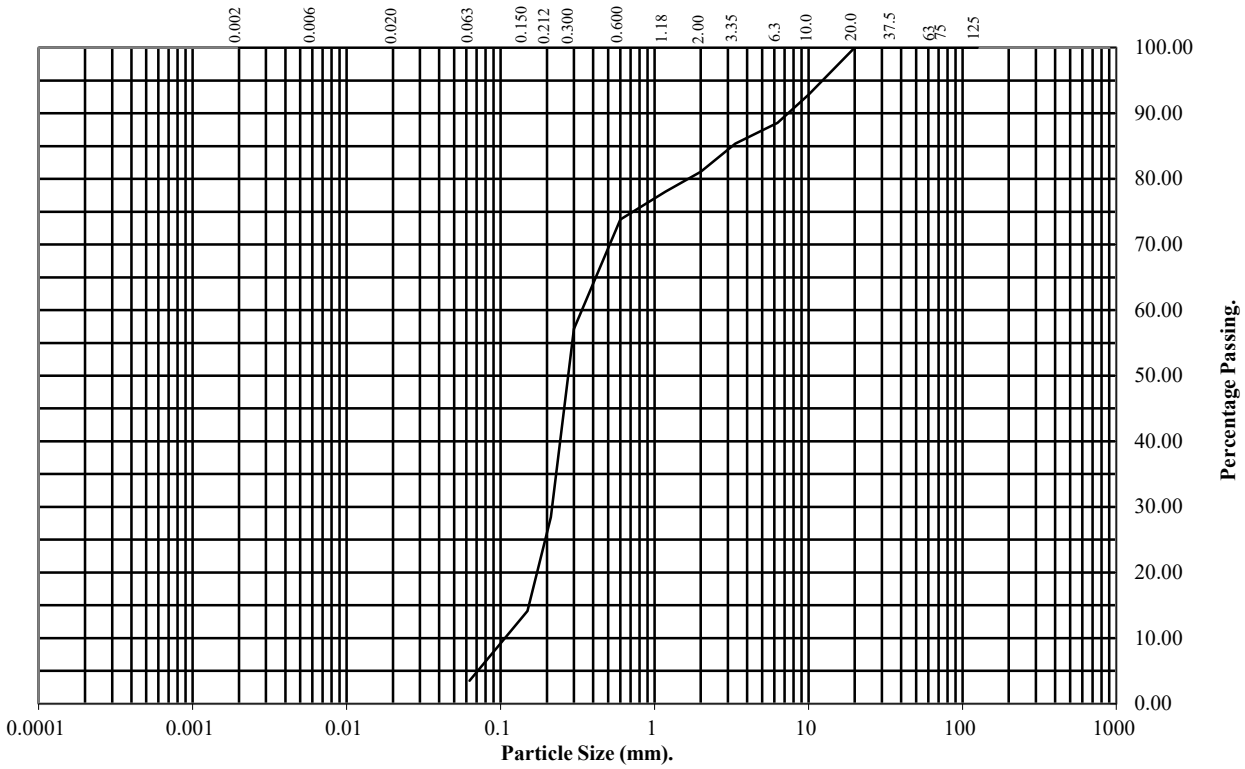
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1896S**	**Top Depth (m):**	**4.00**
Sample Number:	**6**	**Base Depth(m):**	**4.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	93
6.3	89
3.35	85
2	81
1.18	78
0.6	74
0.3	57
0.212	28
0.15	14
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	77
Silt/Clay	4

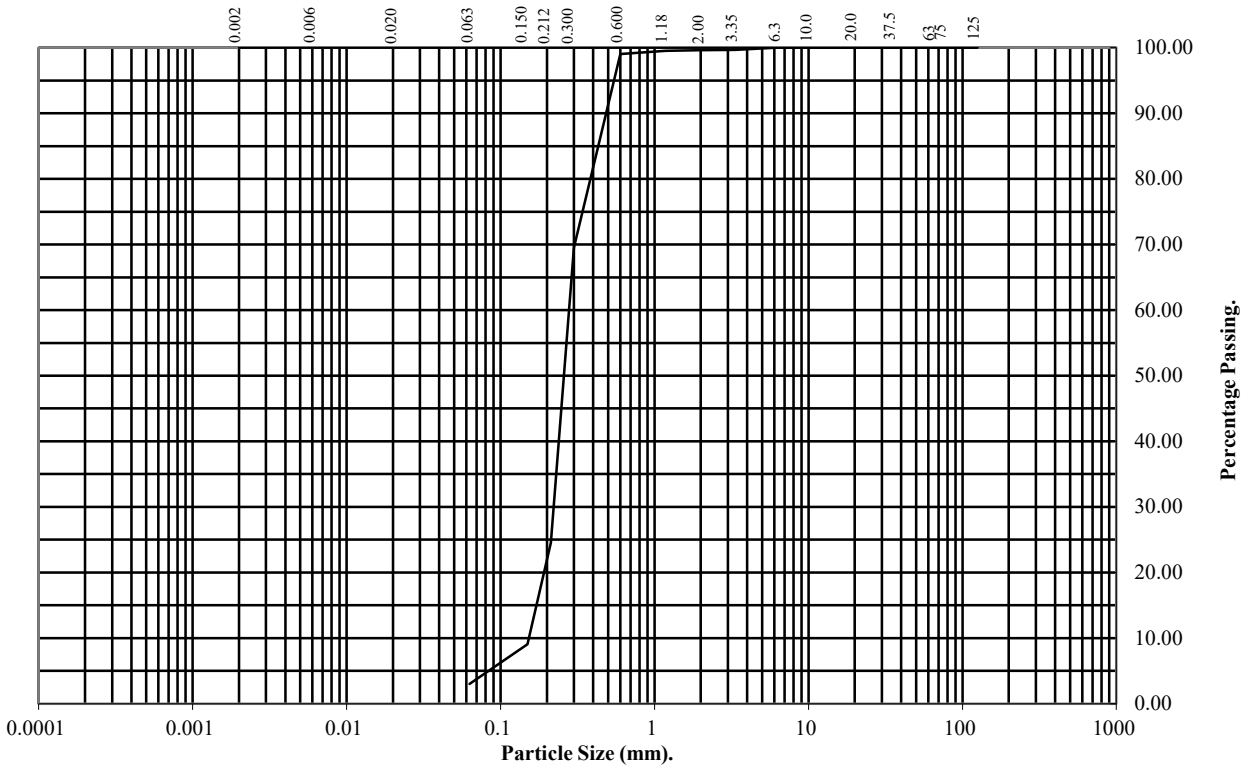
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1896S**	**Top Depth (m):**	**4.30**
Sample Number:	**8**	**Base Depth(m):**	**4.40**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	70
0.212	25
0.15	9
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	97
Silt/Clay	3

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

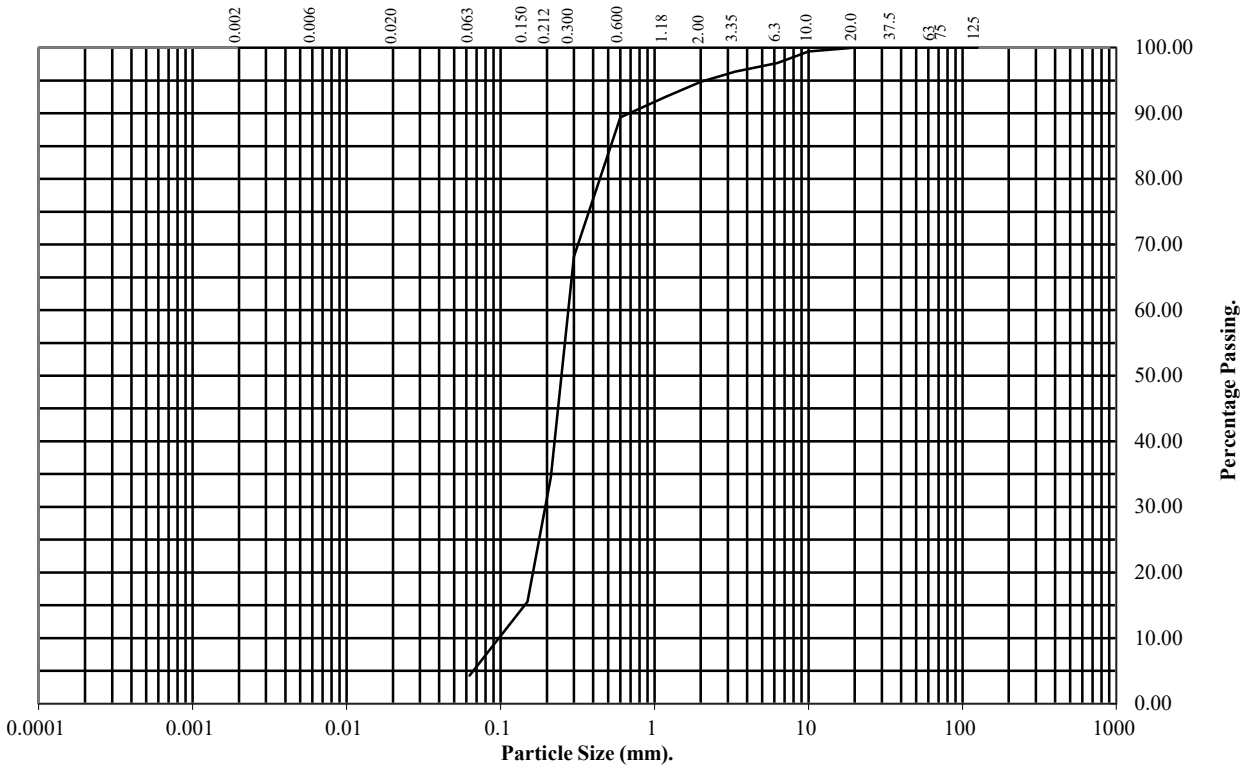
Contract No:
PSL23/6015
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1896S**	**Top Depth (m):**	**4.60**
Sample Number:	**10**	**Base Depth(m):**	**5.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	96
2	95
1.18	92
0.6	89
0.3	68
0.212	35
0.15	16
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	91
Silt/Clay	4

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

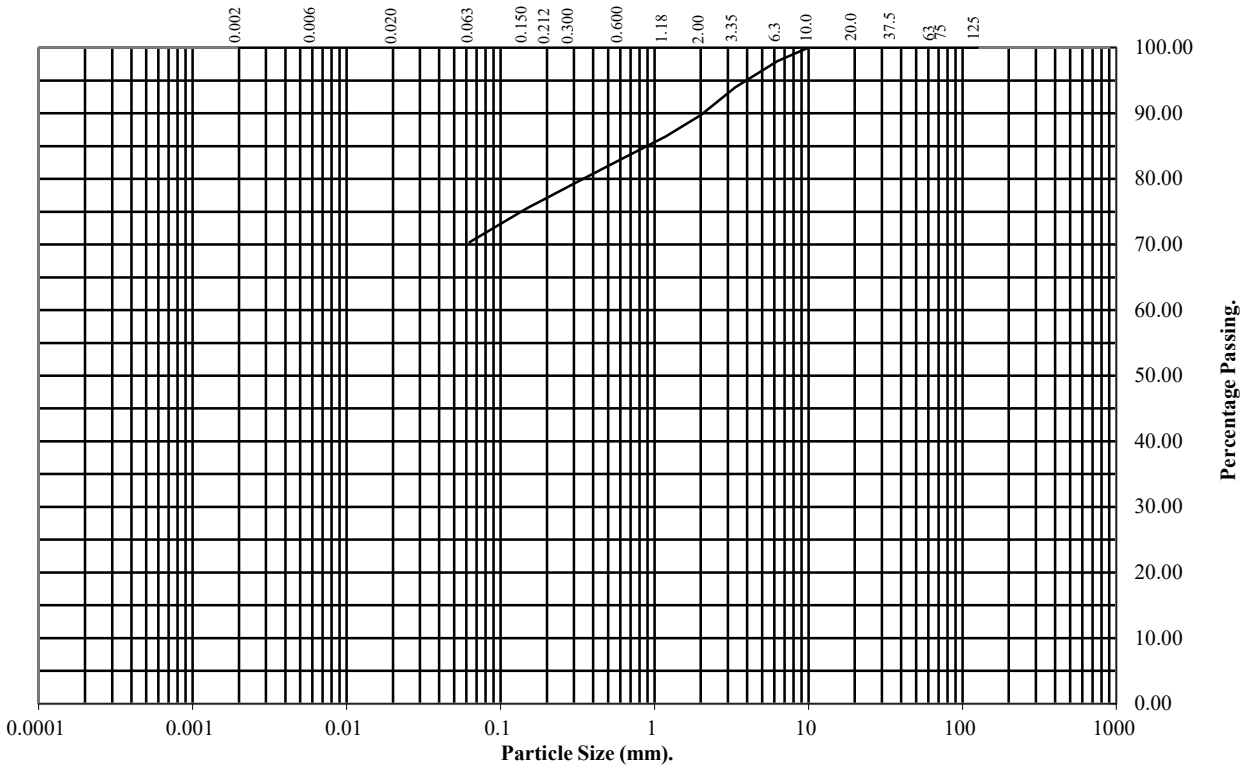
Contract No:
PSL23/6015
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1912S**	**Top Depth (m):**	**1.00**
Sample Number:	**6**	**Base Depth(m):**	**2.00**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	98
3.35	94
2	90
1.18	86
0.6	83
0.3	79
0.212	77
0.15	76
0.063	70

Soil Fraction	Total Percentage
Cobbles	0
Gravel	10
Sand	20
Silt/Clay	70

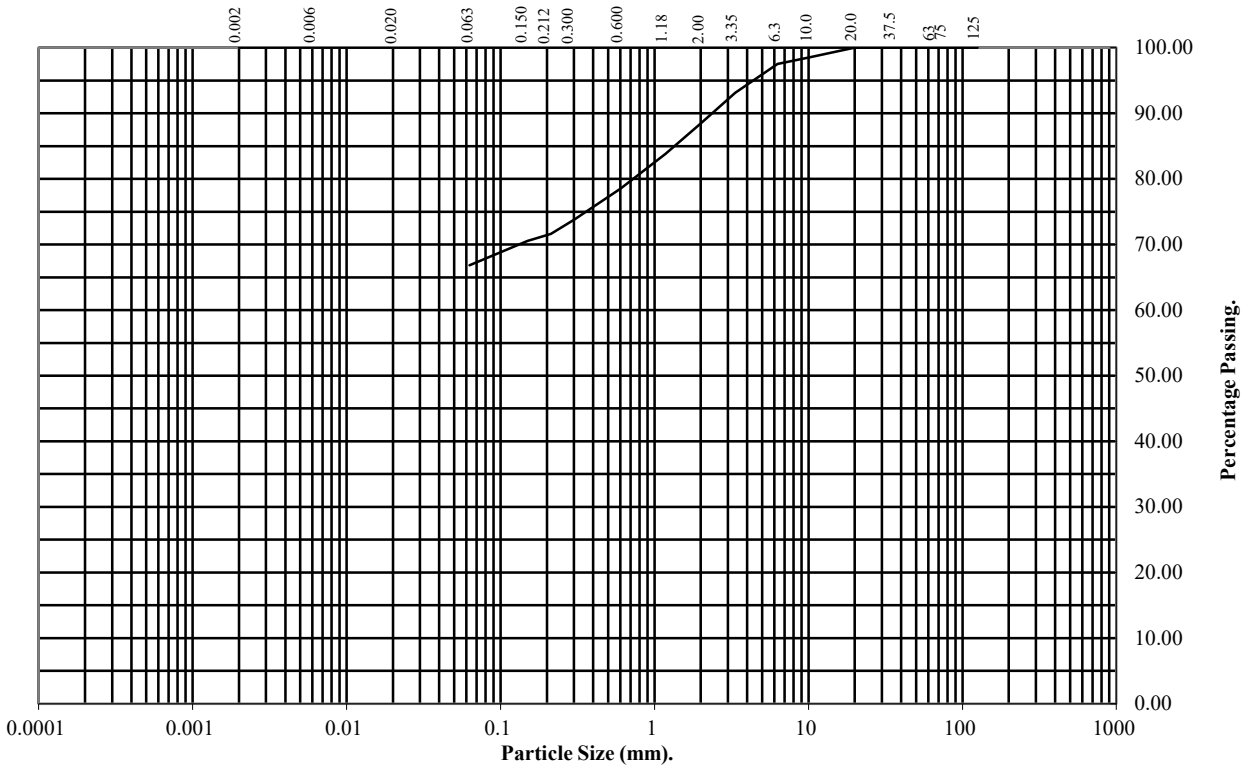
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1912S**	**Top Depth (m):**	**2.00**
Sample Number:	**2**	**Base Depth(m):**	**2.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	98
6.3	98
3.35	93
2	88
1.18	84
0.6	79
0.3	74
0.212	72
0.15	71
0.063	67

Soil Fraction	Total Percentage
Cobbles	0
Gravel	12
Sand	21
Silt/Clay	67

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

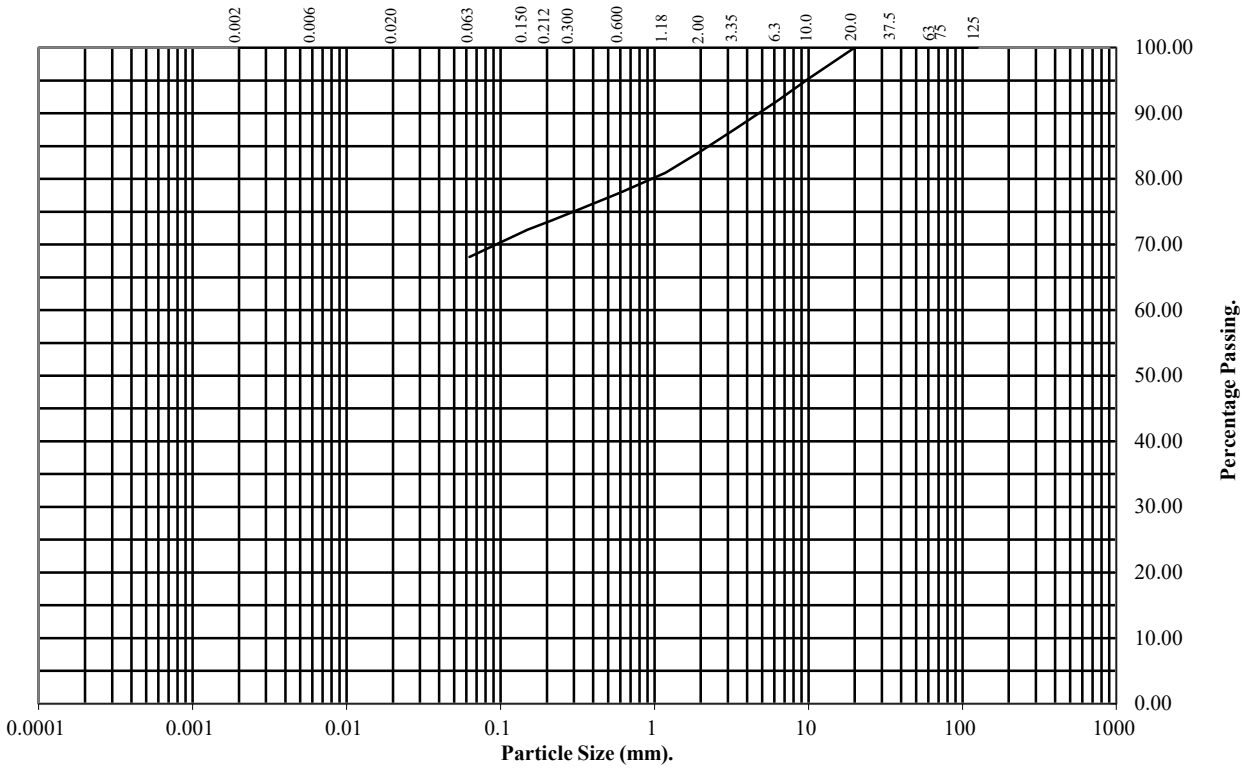
Contract No:
PSL23/6015
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1912S**	**Top Depth (m):**	**3.00**
Sample Number:	**11**	**Base Depth(m):**	**4.00**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	95
6.3	92
3.35	88
2	84
1.18	81
0.6	78
0.3	75
0.212	74
0.15	72
0.063	68

Soil Fraction	Total Percentage
Cobbles	0
Gravel	16
Sand	16
Silt/Clay	68

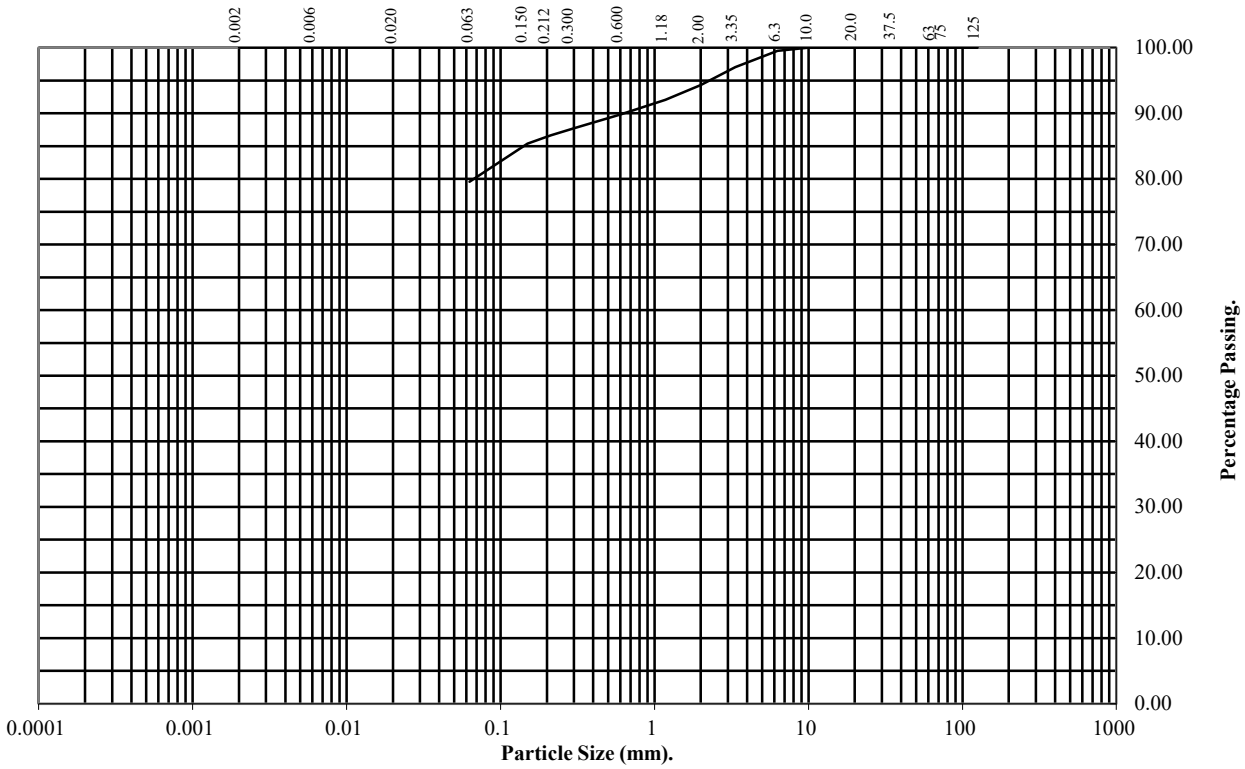
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1912S**	**Top Depth (m):**	**4.00**
Sample Number:	**13**	**Base Depth(m):**	**5.00**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	97
2	94
1.18	92
0.6	90
0.3	88
0.212	87
0.15	85
0.063	80

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	14
Silt/Clay	80

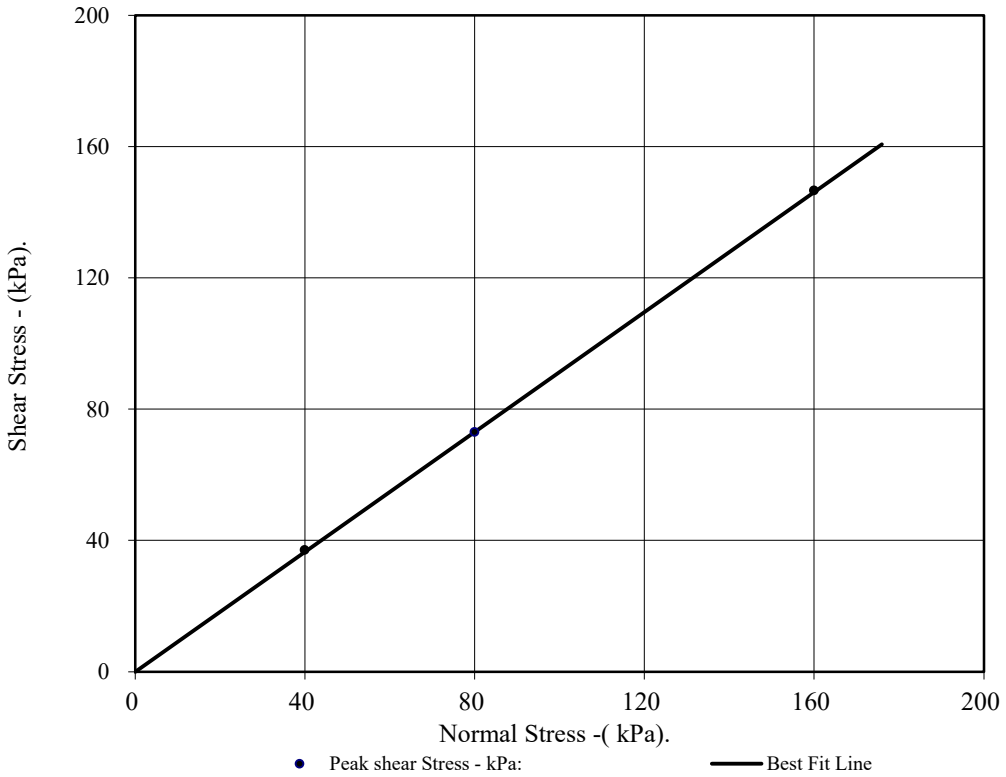
Remarks:
See Summary of Soil Descriptions

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1896S**		Top Depth:	**4.00**
Sample Number:	**6**		Base Depth:	**4.20**
Sample Conditions:	Dry		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using hand tamped effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.01	20.01	20.01
Length - mm:	60.05	60.05	60.05
Moisture Content - %:	14	14	14
Bulk Density - Mg/m3:	2.12	2.12	2.12
Dry Density - Mg/m3:	1.86	1.86	1.86
Voids Ratio:	0.426	0.426	0.426
Normal Pressure- kPa	40	80	160
Consolidation Stage			
Consolidated Height - mm:	19.88	19.71	19.21
Shearing Stage			
Rate of Strain - mm/min	0.60	0.60	0.60
Displacement at peak shear stress - mm	1.81	3.31	3.32
Peak shear Stress - kPa:	37	73	147
Final Consolidated Conditions			
Moisture Content - %:	14	13	13
Bulk Density - Mg/m3:	2.14	2.15	2.21
Dry Density - Mg/m3:	1.87	1.90	1.95
Peak			
Angle of Shearing Resistance:(~~θ~~)	**42**		
Effective Cohesion - kPa:	**0**		



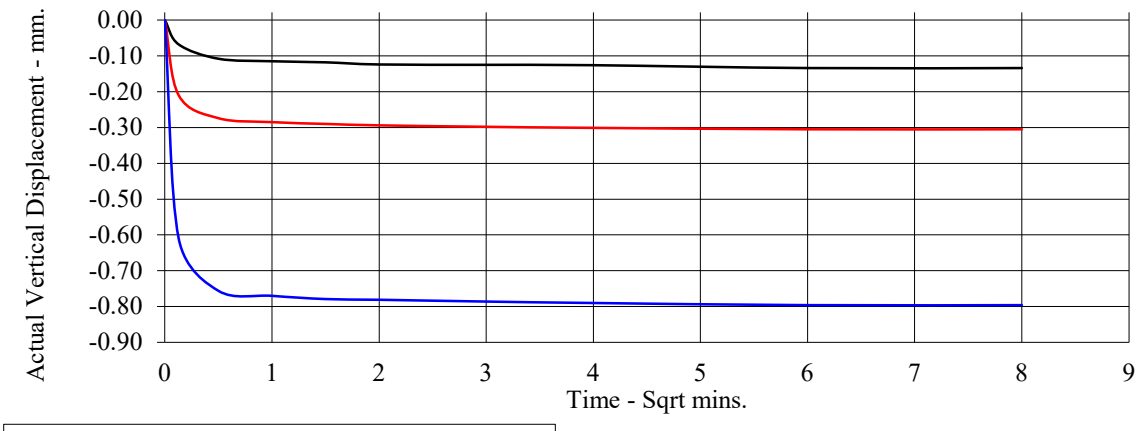
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6015 **Client Ref:** G230600

CONSOLIDATED DRAINED SHEARBOX TEST

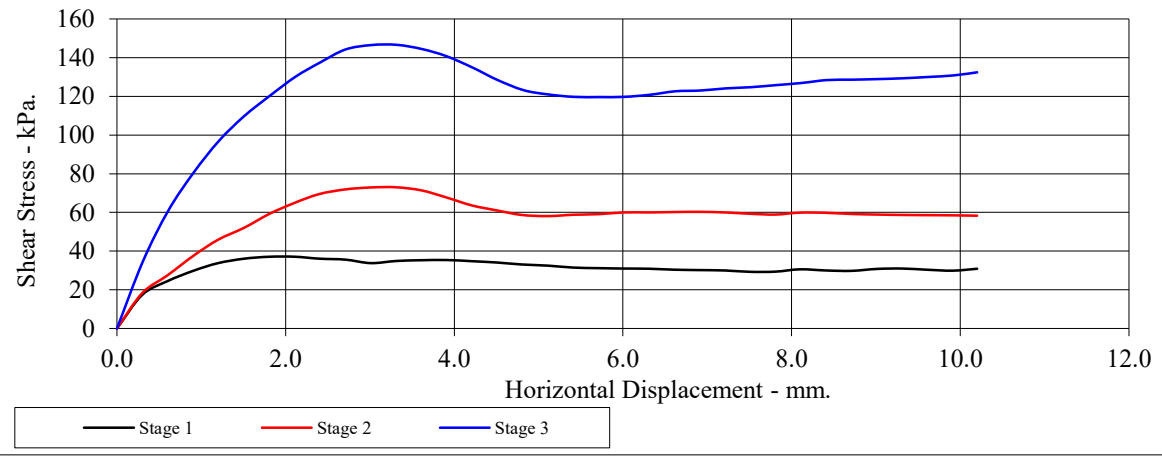
BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1896S**	Top Depth:	**4.00**
Sample Number:	**6**	Base Depth:	**4.20**

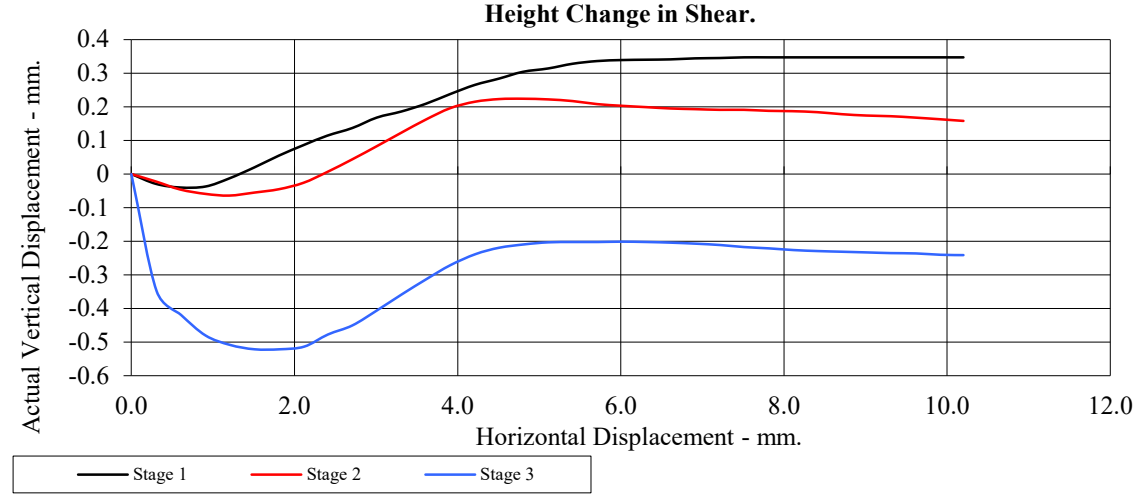
Consolidation Stage.



Shearing Stage.



Height Change in Shear.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** **PSL23/6015** **Client Ref:** **G230600**

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/03924/PSL - 23-35884

Your Project Reference:	**PSL23/6015 M1 J23a-J25**		
Your Order Number:	PSL	Samples Received / Instructed:	28/07/2023 / 28/07/2023
Report Issue Number:	1	Sample Tested:	28/07 to 03/08/2023
Samples Analysed:	3 soil samples	Report issued:	03/08/2023

[redacted]
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 26.07.23

Issued by: J. Gane

Issue No: 4

Rev No: 2

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03924/PSL - 23-35884

Project Reference - PSL23/6015 M1 J23a-J25

Analytical Test Results - Chemical Analysis

Lab Reference			307132	307133	307134
Client Sample ID			-	-	-
Client Sample Location			BH1877S	BH1896S	BH1912S
Client Sample Type			D	D	D
Client Sample Number			2	2	6
Depth - Top (m)			1.50	1.20	1.00
Depth - Bottom (m)			1.60	1.30	2.00
Date of Sampling			-	-	-
Time of Sampling			-	-	-
Sample Matrix			Clay	Clay	Clay
Determinant	**Units**	**Accreditation**			
Water soluble sulphate (as SO_4)	(mg/l)	u	31	30	-
Acid Soluble Sulphate	(%)	u	0.04	0.03	-
Total Sulphur	(%)	UKAS	0.02	0.02	-
pH Value	pH Units	MCERTS	8.8	9.7	-
Loss on Ignition (BS 1377)	(%)	UKAS	-	-	3.4

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CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03924/PSL - 23-35884

Project Reference - PSL23/6015 M1 J23a-J25

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
307132	-	BH1877S	D	2	Brown slightly sandy silty clay	-	-	69
307133	-	BH1896S	D	2	Mottled grey brown gravelly very sandy silty clay	-	-	64
307134	-	BH1912S	D	6	Brown slightly sandy silty clay	-	-	40

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CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03924/PSL - 23-35884

Project Reference - PSL23/6015 M1 J23a-J25

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
307132	-	BH1877S	D	2	
307133	-	BH1896S	D	2	
307134	-	BH1912S	D	6	

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Leicester
LE1 4DH

L23/03924/PSL - 23-35884

Project Reference - PSL23/6015 M1 J23a-J25

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 LoI	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

4161

7 - 11 Harding Street
Leicester
LE1 4DH

L23/03924/PSL - 23-35884

Project Reference - PSL23/6015 M1 J23a-J25

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whist in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
307132	-	BH1877S	D	2		A
307133	-	BH1896S	D	2		A
307134	-	BH1912S	D	6		A

LABORATORY REPORT

Contract Number: PSL23/6016

Report Date: 01 August 2023

Client's Reference: G230600

Client Name: Strata Geotechnics
Kirkby Lane
Pinxton
Nottinghamshire
NG16 6JA

For the attention of: [redacted]

Contract Title: M1 J23a-J25

Date Received: 21/7/2023
Date Commenced: 21/7/2023
Date Completed: 1/8/2023

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

Checked and Approved Signatories:

[redacted] (Director)

[redacted] (Quality Manager)

[redacted] (Laboratory Manager)

[redacted] (Assistant Laboratory Manager)

[redacted] (Senior Technician)

[redacted] (Senior Technician)

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

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1877N	13	D	0.50		Brown slightly sandy GRAVEL.
BH1877N	2	D	1.20	1.65	Brown slightly gravelly very sandy CLAY.
BH1877N	16	D	2.00	3.00	Brown very sandy slightly clayey GRAVEL.
BH1877N	4	D	3.00	3.41	Brown very sandy slightly clayey GRAVEL.
BH1877N	20	D	4.00	4.20	Brown very sandy very clayey GRAVEL.
BH1877N	21	D	4.50	4.70	Brown gravelly sandy CLAY.
BH1877N	22	D	4.70	5.00	Brown very gravelly slightly silty SAND.
BH1877N	6	D	5.00	5.45	Brown very gravelly slightly silty SAND.
BH1877N	7	D	6.00	6.45	Brown sandy slightly silty GRAVEL.
BH1877N	25	B	7.00	8.00	Brown very sandy slightly silty GRAVEL.
BH1877N	26	D	8.00	9.00	Brown very gravelly slightly silty SAND.
BH1902N	12	B	1.20	1.30	Reddish brown slightly clayey SAND & GRAVEL.
BH1902N	16	D	2.90	3.00	Reddish brown gravelly sandy CLAY.
BH1902N	17	D	3.60	3.70	Reddish brown gravelly sandy CLAY.
BH1902N	18	D	4.50	4.70	Reddish brown gravelly sandy CLAY.
BH1902N	7	D	6.00	6.45	Reddish brown gravelly sandy CLAY.
BH1902N	19	D	6.50	6.70	Reddish brown gravelly sandy CLAY.
BH1902N	20	D	7.50	7.70	Reddish brown gravelly sandy CLAY.
BH1902N	9	D	8.00	8.45	Reddish brown gravelly sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH1902N	10	D	9.00	9.45	Reddish brown gravelly sandy CLAY.
BH1902N	22	D	9.50	9.70	Reddish brown gravelly sandy CLAY.
BH1933S	12	B	1.20	1.30	Reddish brown sandy very clayey GRAVEL.
BH1933S	15	D	1.20	1.30	Reddish brown sandy very clayey GRAVEL.
BH1933S	17	D	1.90	2.00	Reddish brown very gravelly sandy CLAY.
BH1933S	18	D	2.80	2.90	Reddish brown gravelly sandy CLAY.
BH1933S	4	D	3.20	3.65	Reddish brown gravelly sandy CLAY.
BH1933S	21	D	4.10	4.20	Reddish brown gravelly sandy CLAY.
BH1933S	5	D	4.20	4.65	Reddish brown gravelly sandy CLAY.
BH1933S	23	D	5.10	0.20	Reddish brown gravelly sandy CLAY.
BH1933S	24	CSS	6.00	6.10	Reddish brown gravelly sandy CLAY.
BH1933S	7	D	6.20	6.65	Reddish brown gravelly sandy CLAY.
BH1933S	27	D	7.10	7.20	Reddish brown gravelly sandy CLAY.
BH1933S	9	D	8.20	8.65	Grey gravelly very sandy CLAY.
BH1933S	10	D	9.20	9.65	Reddish brown gravelly sandy 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
BH1877N	13	D	0.50		2.7				NP			
BH1877N	2	D	1.20	1.65	15			32	16	16	83	Low Plasticity CL
BH1877N	4	D	3.00	3.41	5.2				NP			
BH1877N	20	D	4.00	4.20	11			34	17	17	36	Low Plasticity CL
BH1877N	22	D	4.70	5.00	8.2				NP			
BH1877N	6	D	5.00	5.45	9.4				NP			
BH1877N	25	B	7.00	8.00	7.4				NP			
BH1877N	26	D	8.00	9.00	12				NP			
BH1902N	12	B	1.20	1.30	11				NP			
BH1902N	16	D	2.90	3.00	13			37	18	19	76	Intermediate Plasticity CI
BH1902N	17	D	3.60	3.70	14			34	17	17	84	Low Plasticity CL
BH1902N	18	D	4.50	4.70	18			35	17	18	79	Intermediate Plasticity CI
BH1902N	7	D	6.00	6.45	17			37	19	18	82	Intermediate Plasticity CI
BH1902N	20	D	7.50	7.70	21			36	18	18	86	Intermediate Plasticity CI
BH1902N	9	D	8.00	8.45	19			41	20	21	76	Intermediate Plasticity CI
BH1902N	10	D	9.00	9.45	11			39	19	20	80	Intermediate Plasticity CI
BH1933S	12	B	1.20	1.30	13			33	17	16	31	Low Plasticity CL
BH1933S	15	D	1.20	1.30	11			31	16	15	50	Low Plasticity CL
BH1933S	17	D	1.90	2.00	11			33	17	16	41	Low Plasticity CL

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

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

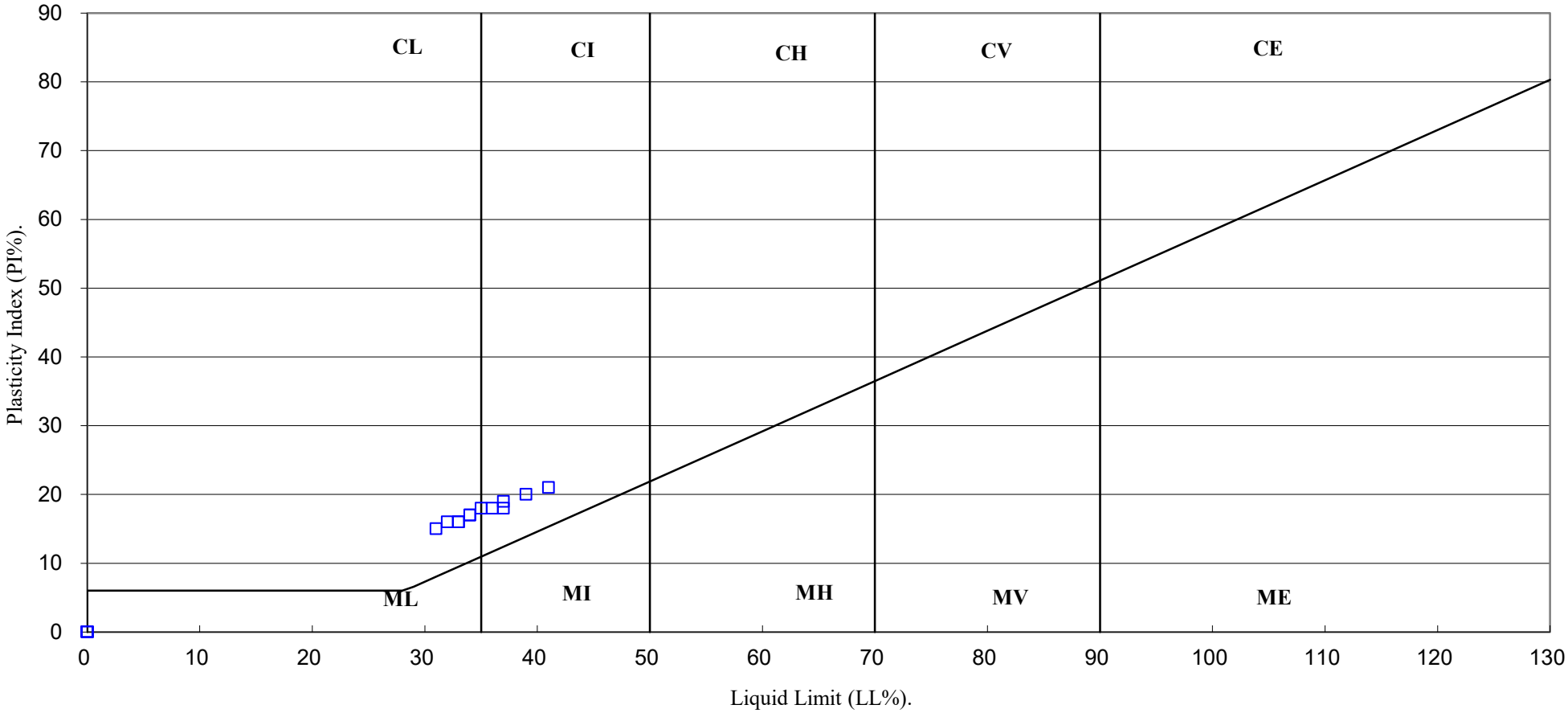
Contract No:

PSL23/6016

Client Ref:

G230600

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	M1 J23a-J25	Contract No: PSL23/6016 Client Ref: G230600

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
BH1933S	18	D	2.80	2.90	24			44	22	22	81	Intermediate Plasticity CI
BH1933S	4	D	3.20	3.65	14			37	18	19	80	Intermediate Plasticity CI
BH1933S	5	D	4.20	4.65	14			35	17	18	85	Intermediate Plasticity CI
BH1933S	23	D	5.10	5.20	14			31	17	14	83	Low Plasticity CL
BH1933S	24	CSS	6.00	6.10	20			36	18	18	87	Intermediate Plasticity CI
BH1933S	7	D	6.20	6.65	12			34	17	17	71	Low Plasticity CL
BH1933S	27	D	7.10	7.20	15			40	20	20	85	Intermediate Plasticity CI
BH1933S	9	D	8.20	8.65	16			36	19	17	62	Intermediate Plasticity CI
BH1933S	10	D	9.20	9.65	11			32	15	17	69	Low Plasticity CL

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

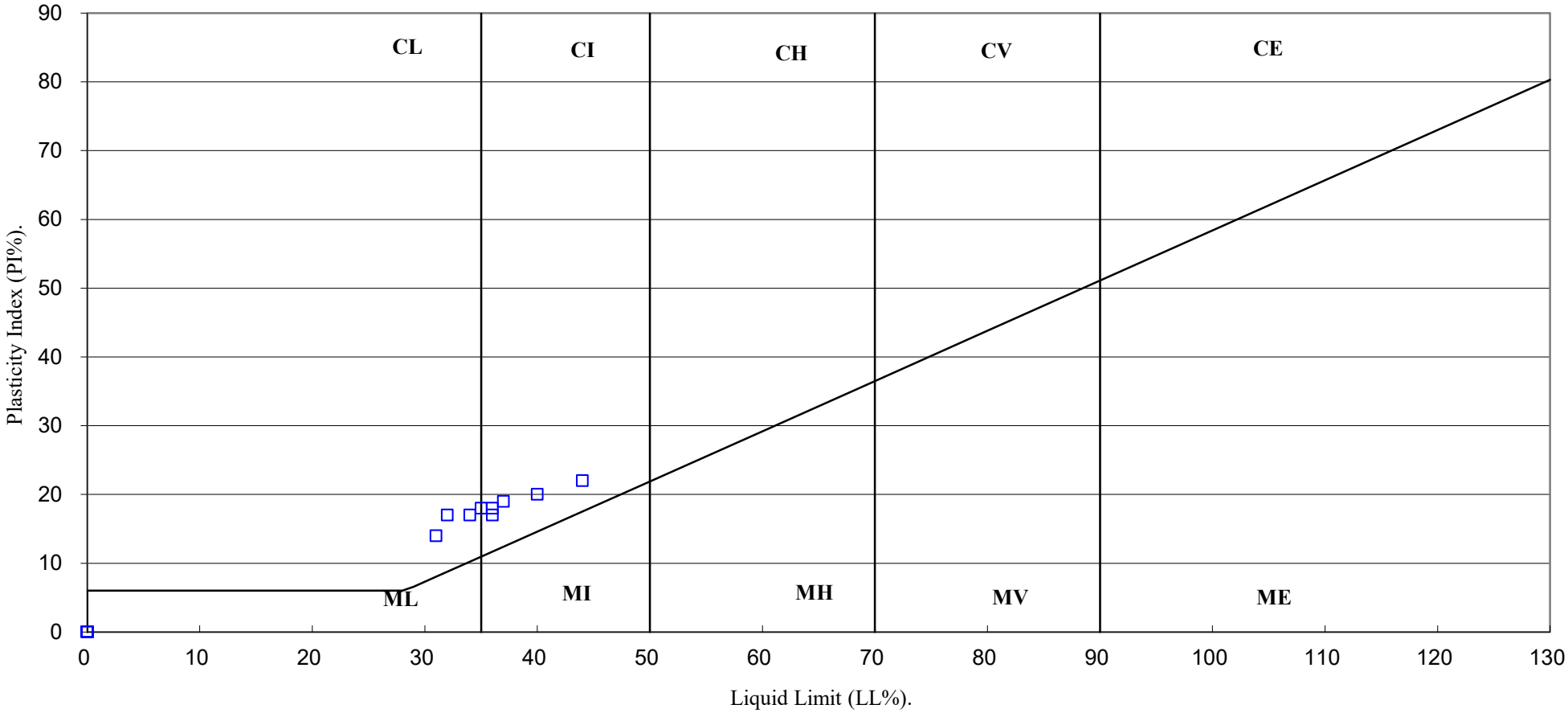
UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6016
Client Ref:
G230600

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	M1 J23a-J25	Contract No: PSL23/6016 Client Ref: G230600

SUMMARY OF SOIL DENSITY RELATED TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Retained 20mm %	Retained 37.5mm %	Method of compaction kg	Maximum Dry Density Mg/m^3	Minimum Dry Density Mg/m^3	Remarks
BH1877N	13	D	0.50		2.7	2.17	2.11						
BH1877N	2	D	1.20	1.65	15	2.15	1.87						
BH1877N	20	D	4.00	4.20	11	2.19	1.97						
BH1877N	6	D	5.00	5.45	9.4	2.14	1.96						
BH1902N	16	D	2.90	3.00	13	2.16	1.91						
BH1902N	18	D	4.50	4.70	18	2.10	1.78						
BH1902N	9	D	8.00	8.45	19	2.07	1.74						
BH1933S	12	B	1.20	1.30	13	2.19	1.94						
BH1933S	15	D	1.20	1.30	11	2.21	1.99						
BH1933S	18	D	2.80	2.90	24	2.00	1.61						
BH1933S	7	D	6.20	6.65	12	2.17	1.94						
BH1933S	9	D	8.20	8.65	16	2.12	1.83						
BH1933S	10	D	9.20	9.65	11	2.15	1.94						

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

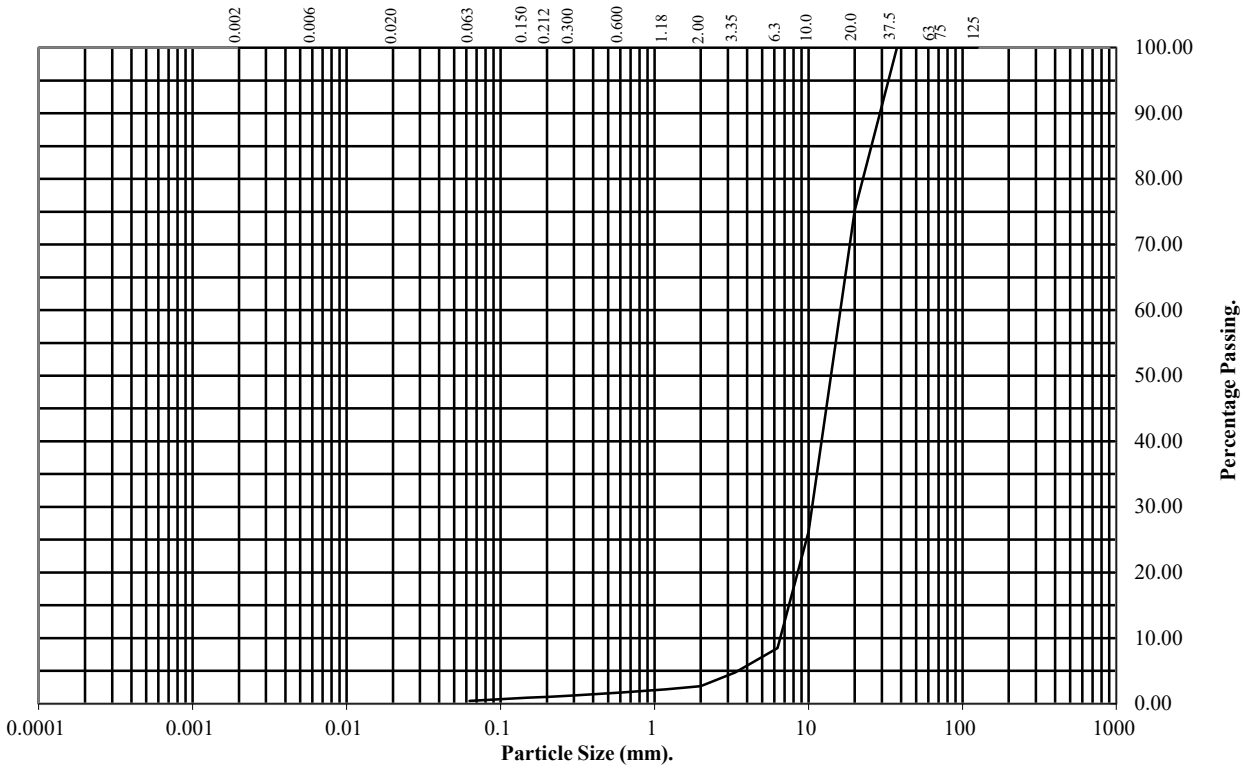
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH1877N **Top Depth (m):** 0.50

Sample Number: 13 **Base Depth(m):**

Sample Type: D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	75
10	26
6.3	8
3.35	5
2	3
1.18	2
0.6	2
0.3	1
0.212	1
0.15	1
0.063	0

Soil Fraction	Total Percentage
Cobbles	0
Gravel	97
Sand	3
Silt/Clay	0

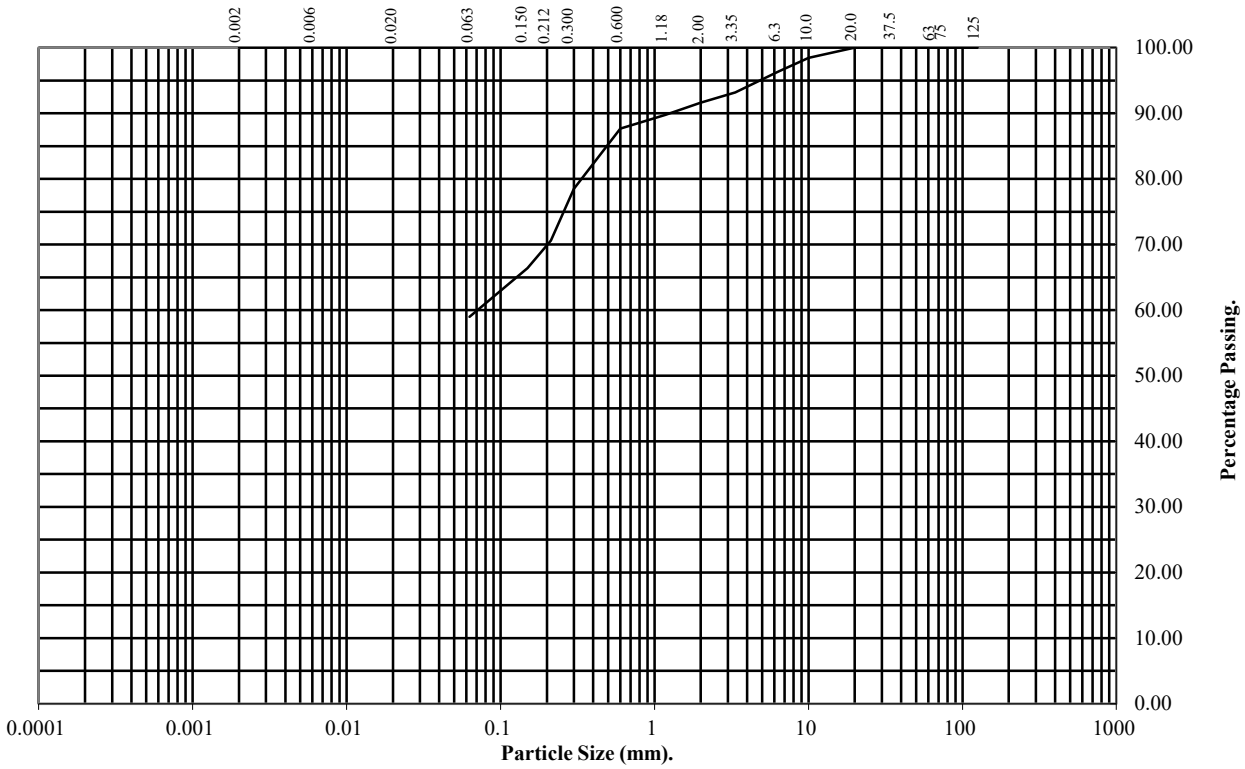
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**1.20**
Sample Number:	**2**	**Base Depth(m):**	**1.65**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	98
6.3	96
3.35	93
2	92
1.18	90
0.6	88
0.3	78
0.212	71
0.15	66
0.063	59

Soil Fraction	Total Percentage
Cobbles	0
Gravel	8
Sand	33
Silt/Clay	59

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

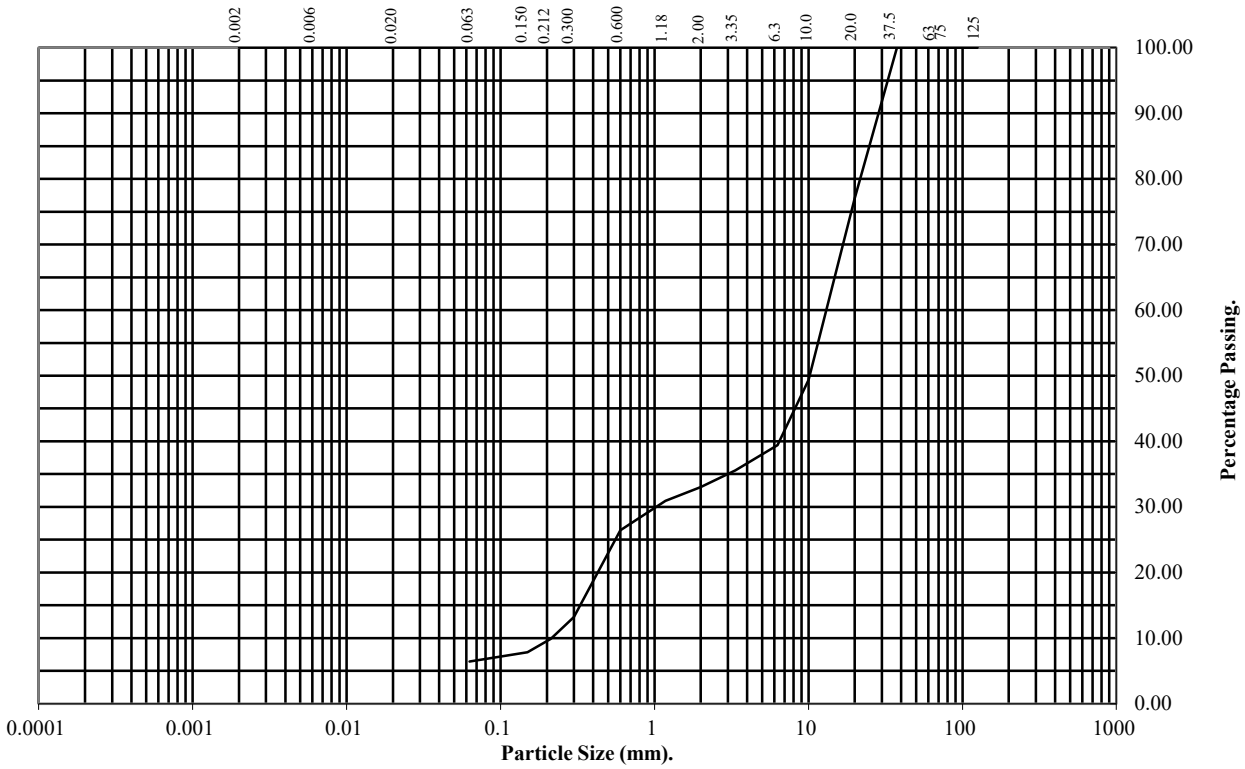
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**2.00**
Sample Number:	**16**	**Base Depth(m):**	**3.00**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	77
10	49
6.3	39
3.35	36
2	33
1.18	31
0.6	26
0.3	13
0.212	10
0.15	8
0.063	6

Soil Fraction	Total Percentage
Cobbles	0
Gravel	67
Sand	27
Silt/Clay	6

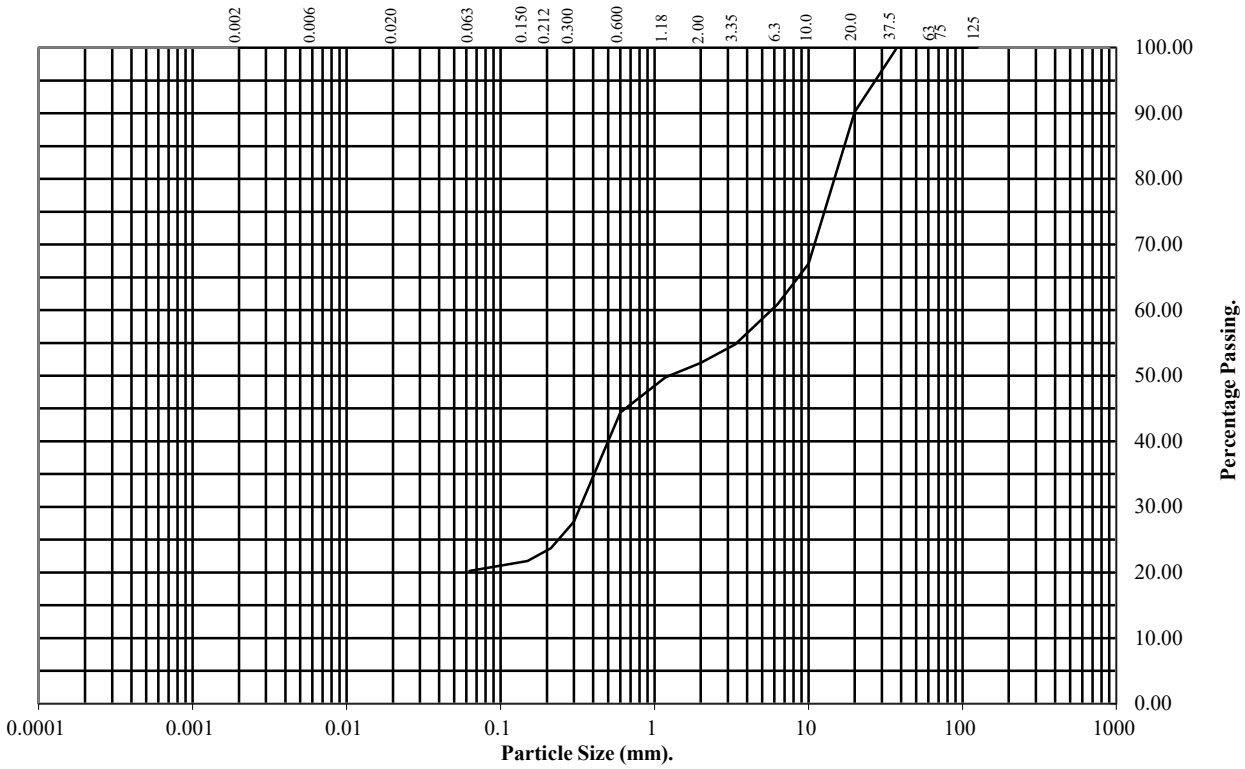
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**4.00**
Sample Number:	**20**	**Base Depth(m):**	**4.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	90
10	67
6.3	61
3.35	55
2	52
1.18	50
0.6	44
0.3	28
0.212	24
0.15	22
0.063	20

Soil Fraction	Total Percentage
Cobbles	0
Gravel	48
Sand	32
Silt/Clay	20

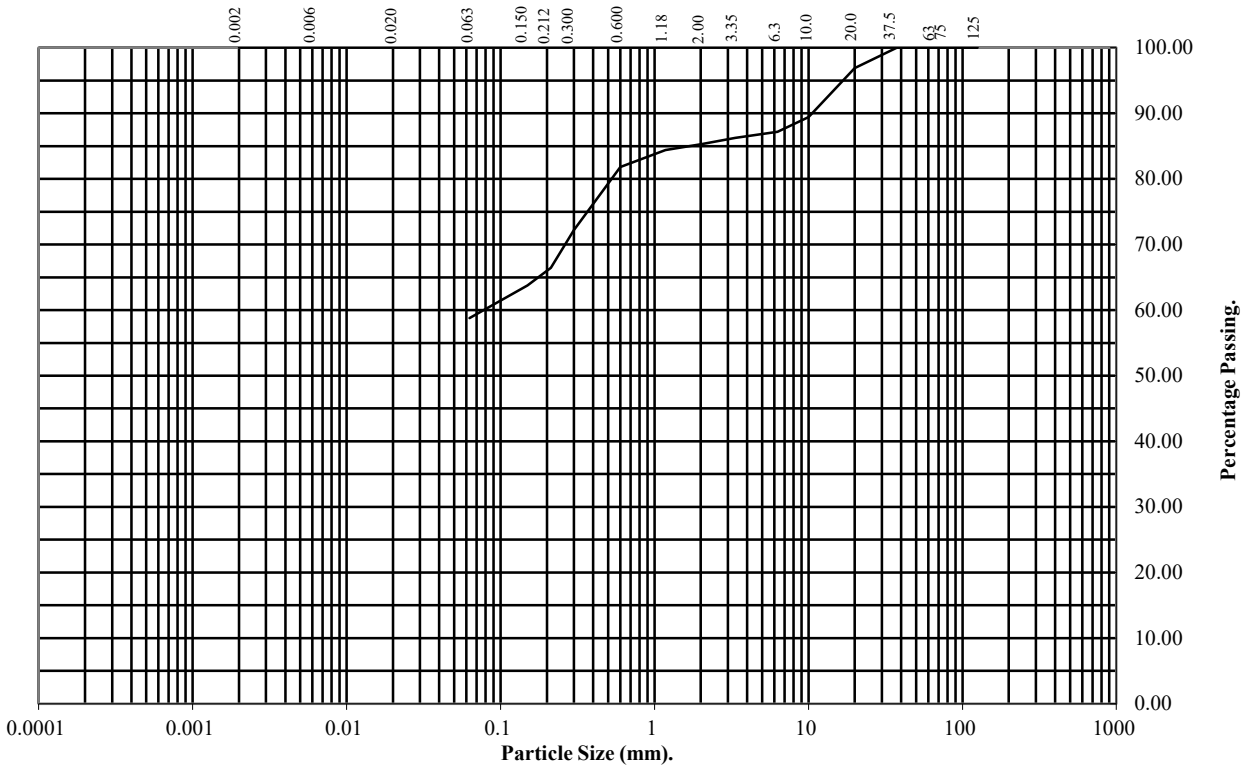
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**4.50**
Sample Number:	**21**	**Base Depth(m):**	**4.70**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	89
6.3	87
3.35	86
2	85
1.18	84
0.6	82
0.3	72
0.212	66
0.15	64
0.063	59

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	26
Silt/Clay	59

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

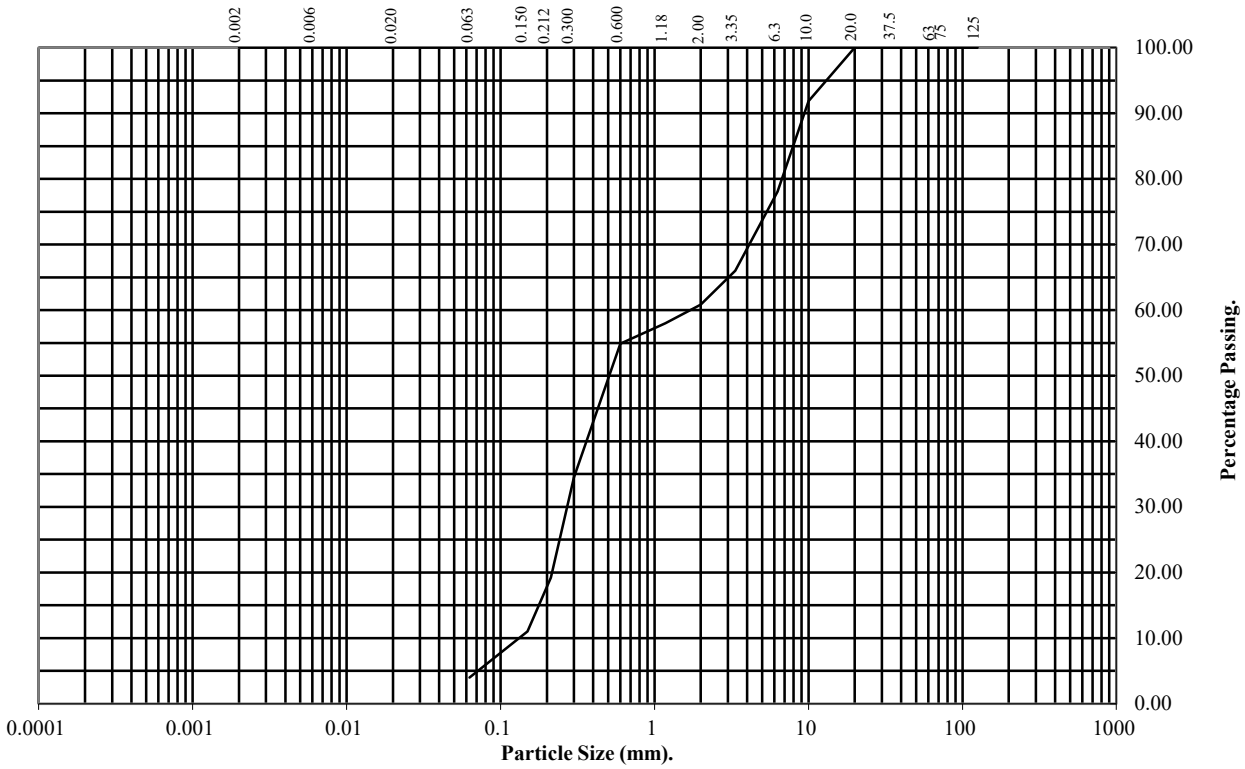
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**5.00**
Sample Number:	**6**	**Base Depth(m):**	**5.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	92
6.3	78
3.35	66
2	61
1.18	58
0.6	55
0.3	34
0.212	19
0.15	11
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	39
Sand	57
Silt/Clay	4

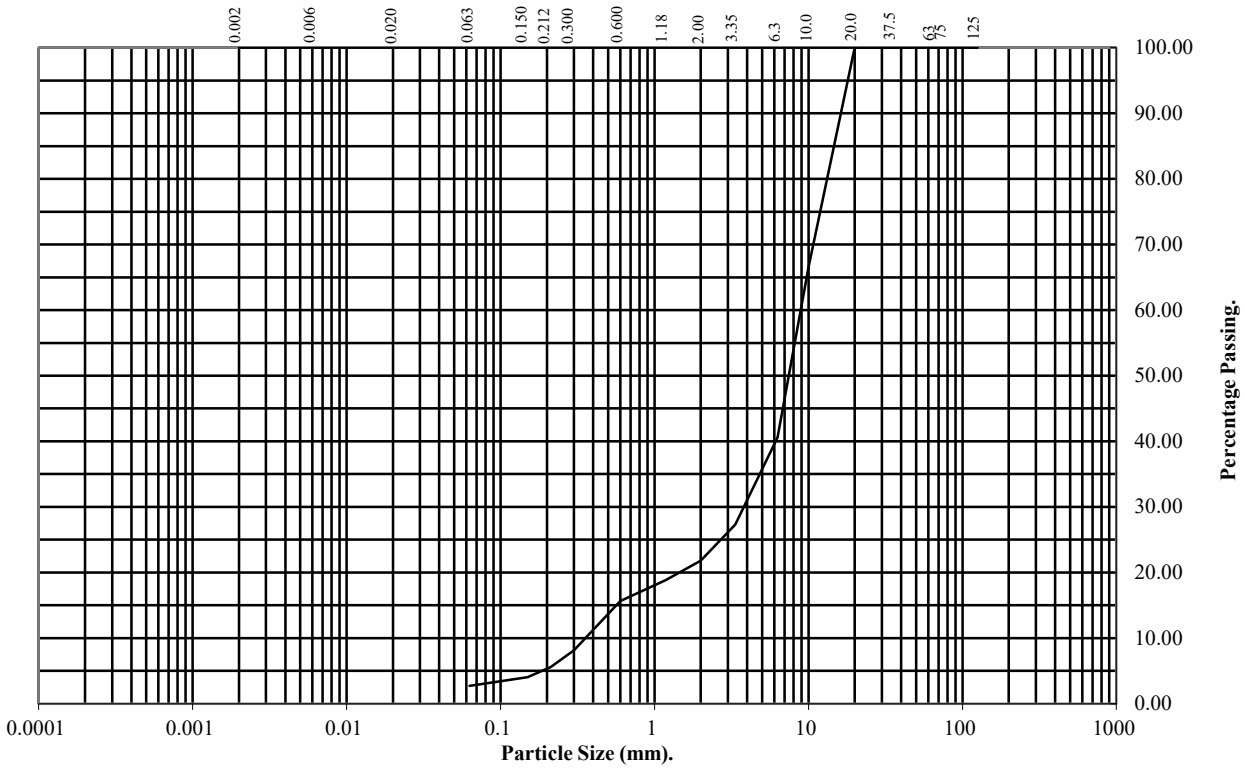
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**6.00**
Sample Number:	**7**	**Base Depth(m):**	**6.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	67
6.3	41
3.35	27
2	22
1.18	19
0.6	16
0.3	8
0.212	6
0.15	4
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	78
Sand	19
Silt/Clay	3

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

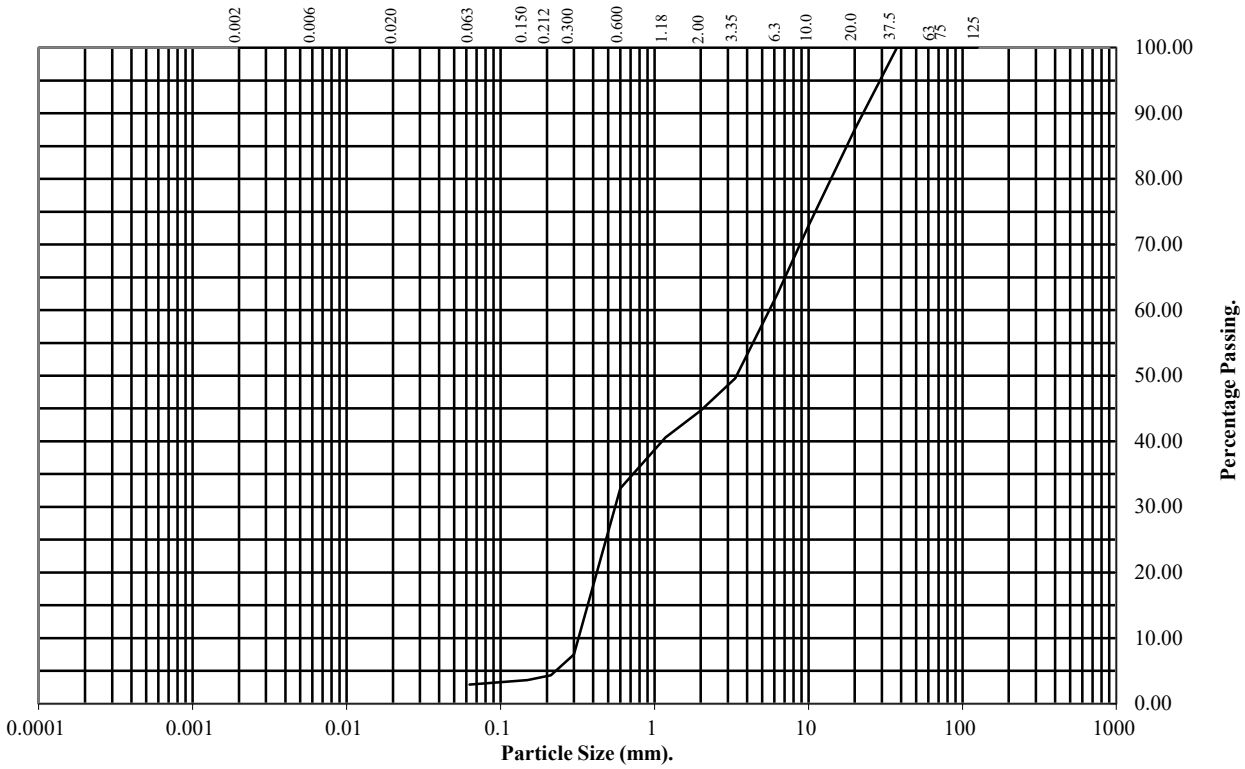
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1877N**	**Top Depth (m):**	**7.00**
Sample Number:	**25**	**Base Depth(m):**	**8.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	88
10	73
6.3	62
3.35	50
2	45
1.18	41
0.6	33
0.3	7
0.212	4
0.15	4
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	55
Sand	42
Silt/Clay	3

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

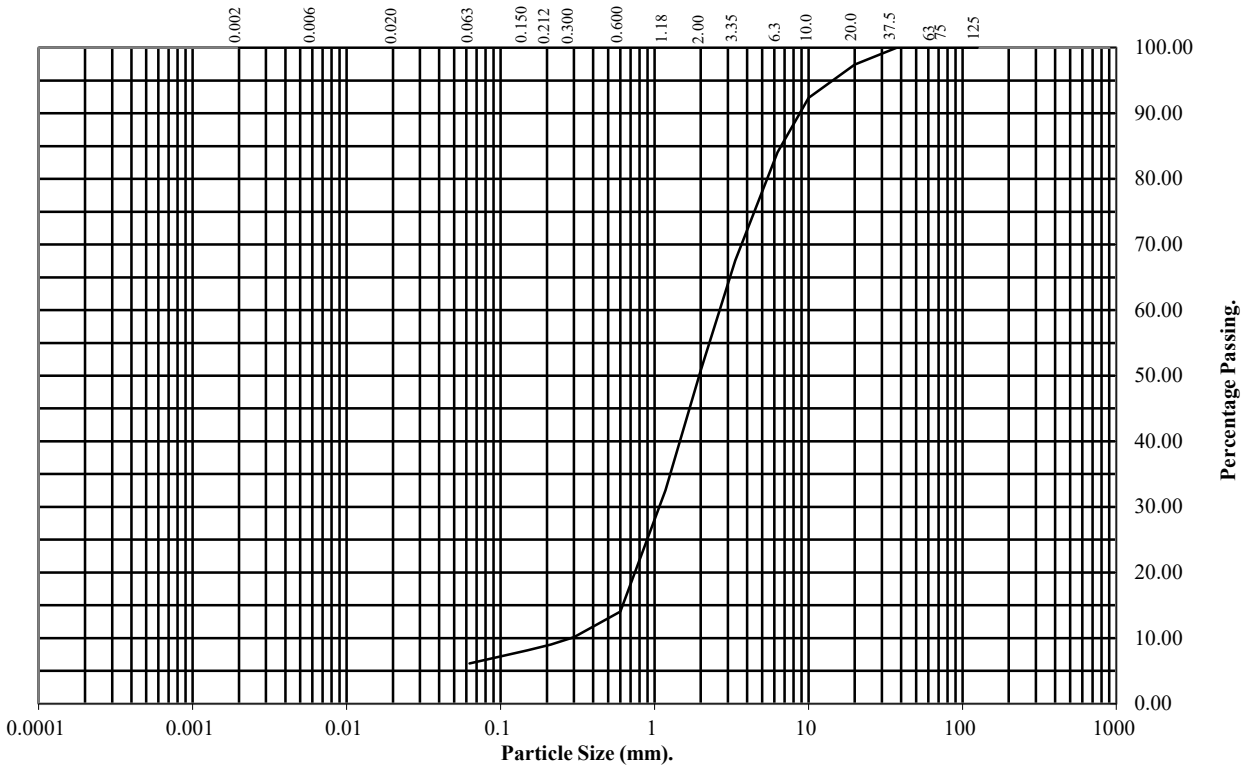
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1902N**	**Top Depth (m):**	**1.20**
Sample Number:	**12**	**Base Depth(m):**	**1.30**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	92
6.3	84
3.35	68
2	51
1.18	33
0.6	14
0.3	10
0.212	9
0.15	8
0.063	6

Soil Fraction	Total Percentage
Cobbles	0
Gravel	49
Sand	45
Silt/Clay	6

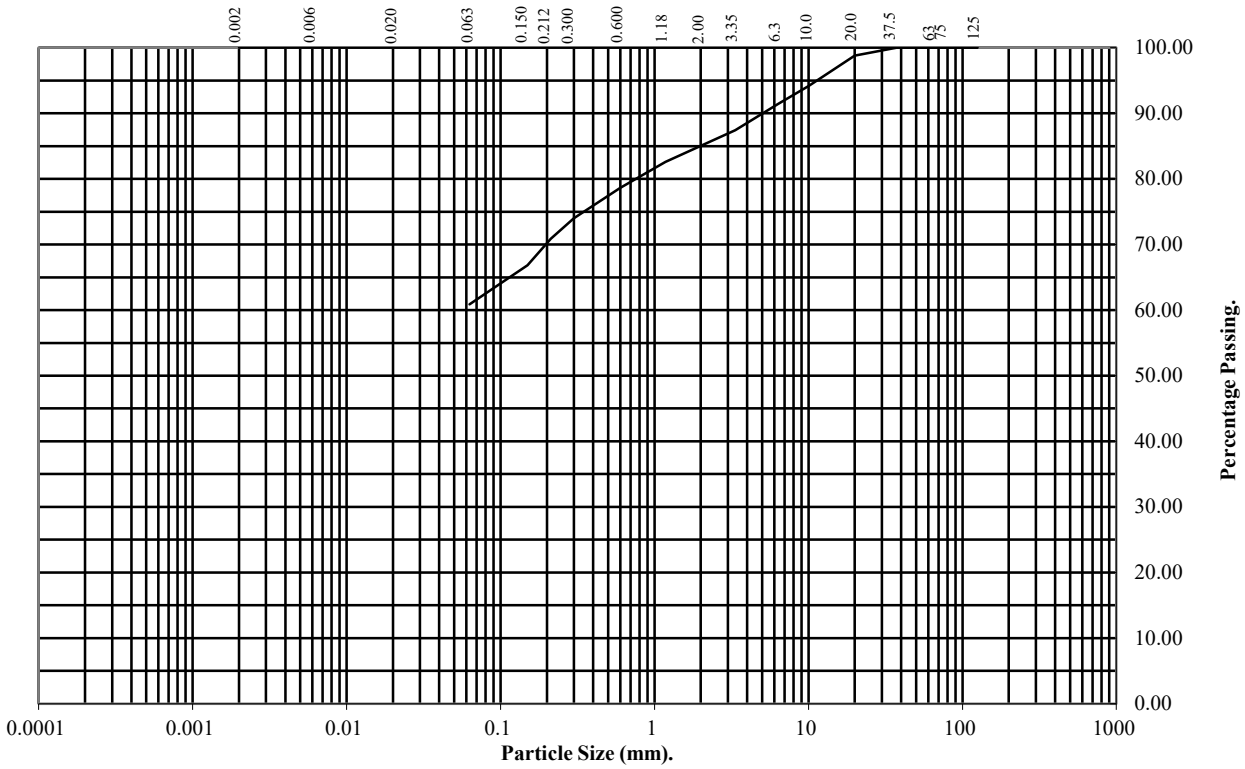
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1902N**	**Top Depth (m):**	**2.90**
Sample Number:	**16**	**Base Depth(m):**	**3.00**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	99
10	94
6.3	91
3.35	87
2	85
1.18	83
0.6	79
0.3	74
0.212	71
0.15	67
0.063	61

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	24
Silt/Clay	61

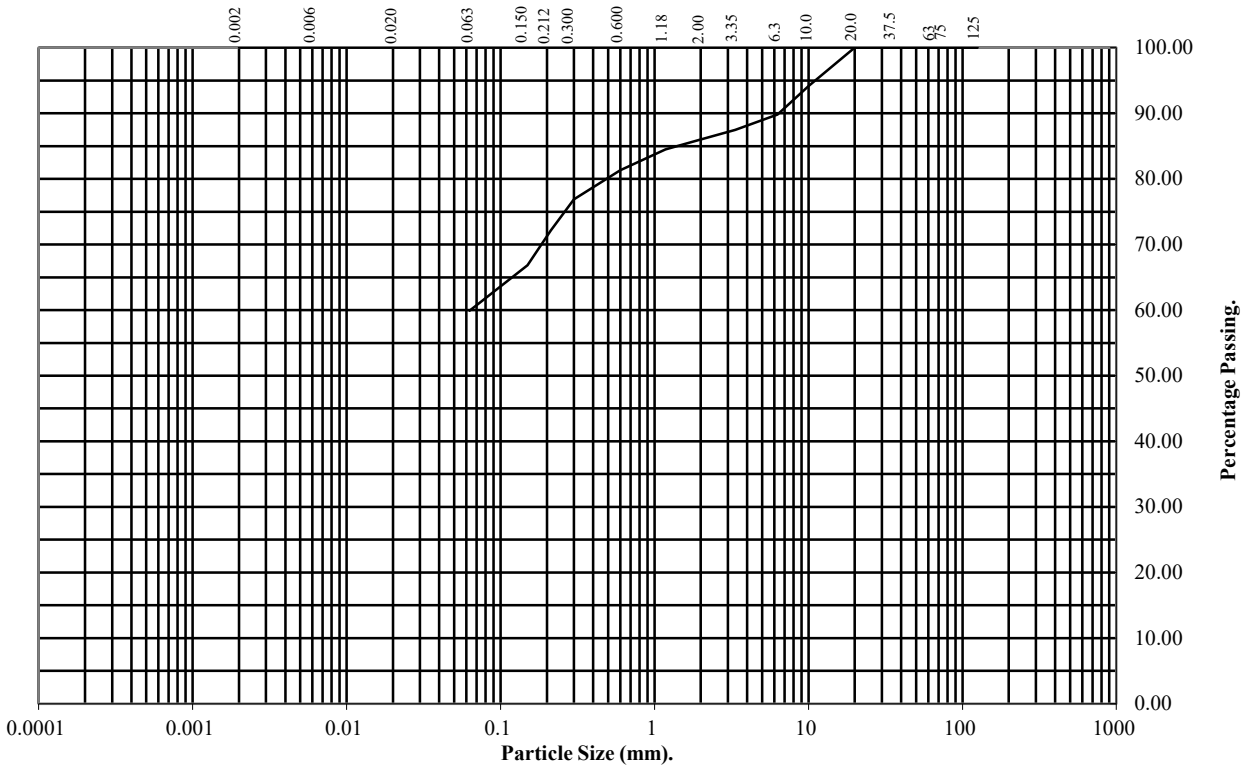
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1902N**	**Top Depth (m):**	**4.50**
Sample Number:	**18**	**Base Depth(m):**	**4.70**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	94
6.3	90
3.35	87
2	86
1.18	85
0.6	81
0.3	77
0.212	72
0.15	67
0.063	60

Soil Fraction	Total Percentage
Cobbles	0
Gravel	14
Sand	26
Silt/Clay	60

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

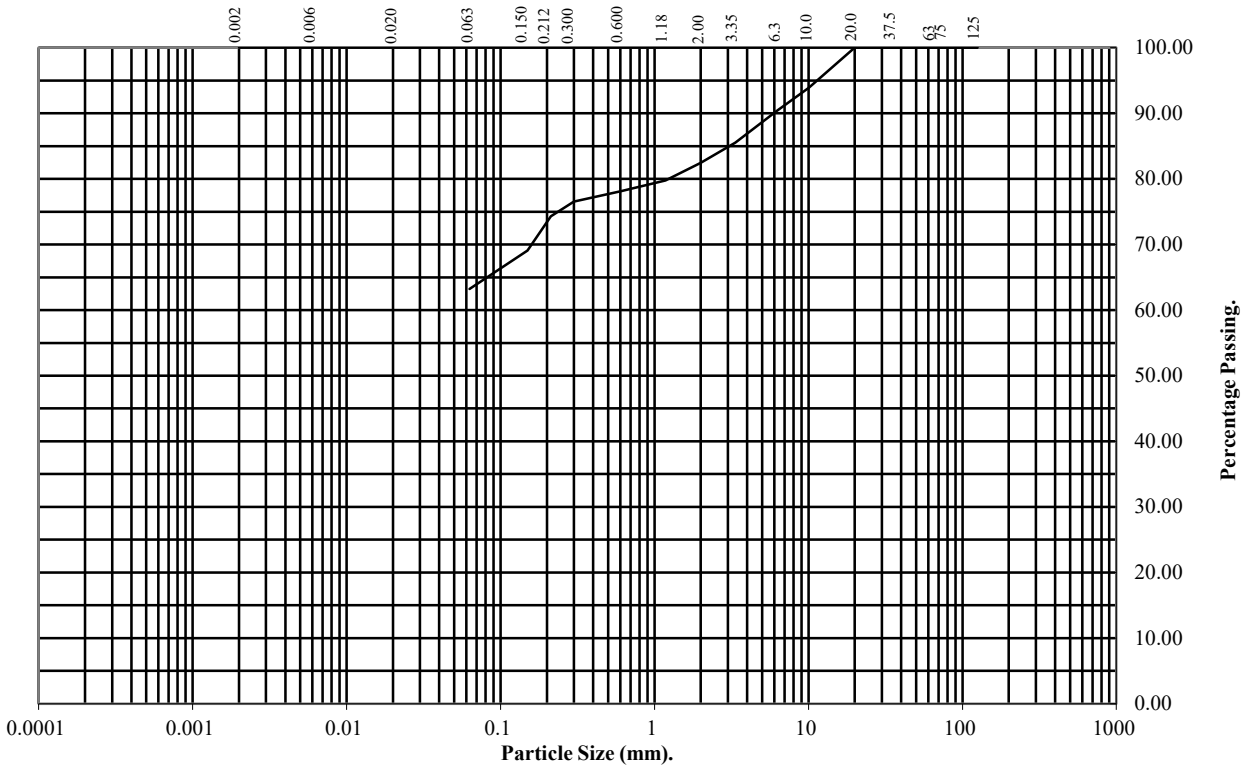
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1902N**	**Top Depth (m):**	**6.50**
Sample Number:	**19**	**Base Depth(m):**	**6.70**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	94
6.3	90
3.35	86
2	82
1.18	80
0.6	78
0.3	77
0.212	74
0.15	69
0.063	63

Soil Fraction	Total Percentage
Cobbles	0
Gravel	18
Sand	19
Silt/Clay	63

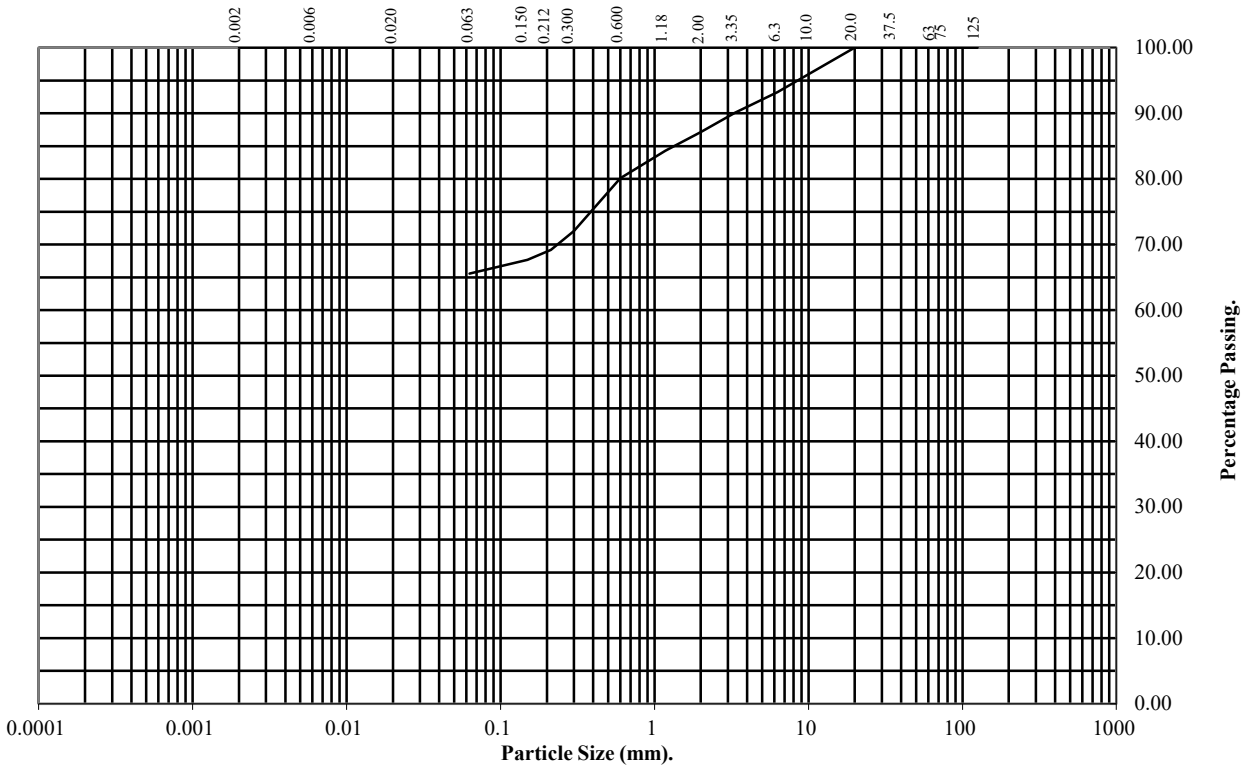
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1902N**	**Top Depth (m):**	**8.00**
Sample Number:	**9**	**Base Depth(m):**	**8.45**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	96
6.3	93
3.35	90
2	87
1.18	84
0.6	80
0.3	72
0.212	69
0.15	68
0.063	66

Soil Fraction	Total Percentage
Cobbles	0
Gravel	13
Sand	21
Silt/Clay	66

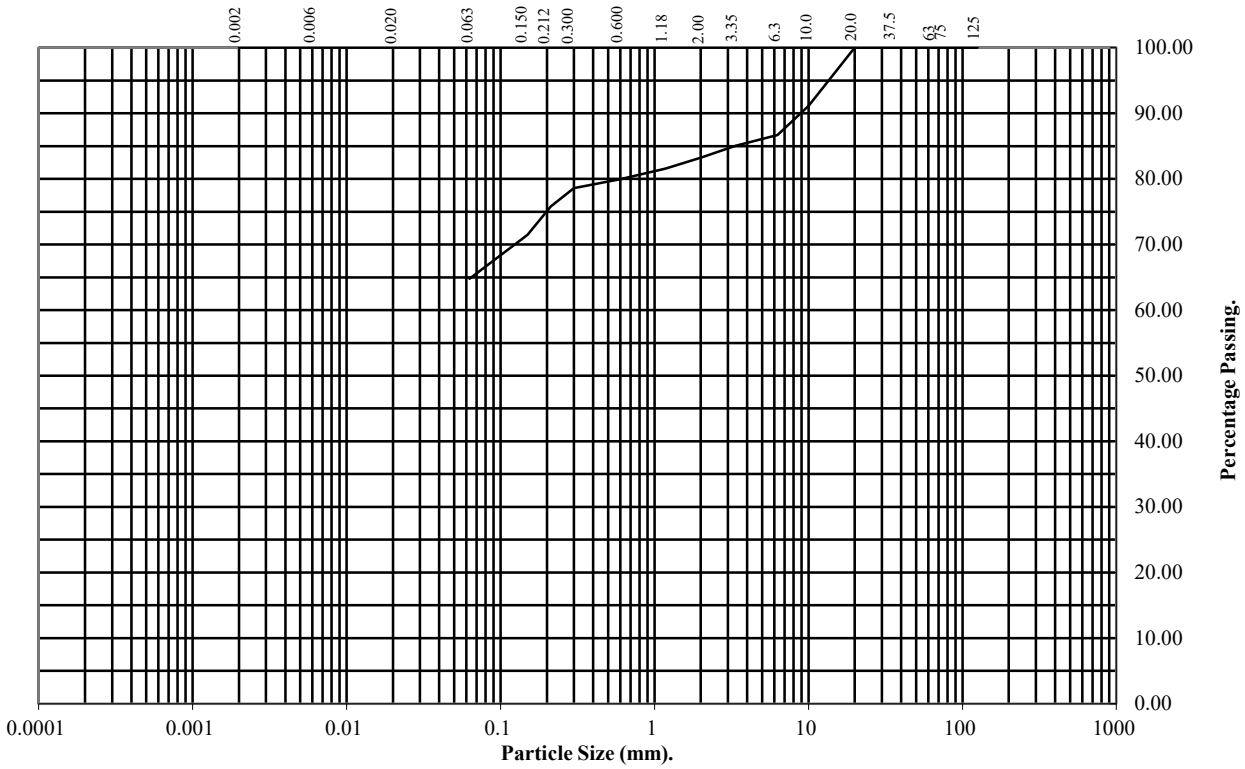
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1902N**	**Top Depth (m):**	**9.50**
Sample Number:	**22**	**Base Depth(m):**	**9.70**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	91
6.3	87
3.35	85
2	83
1.18	82
0.6	80
0.3	79
0.212	76
0.15	71
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	18
Silt/Clay	65

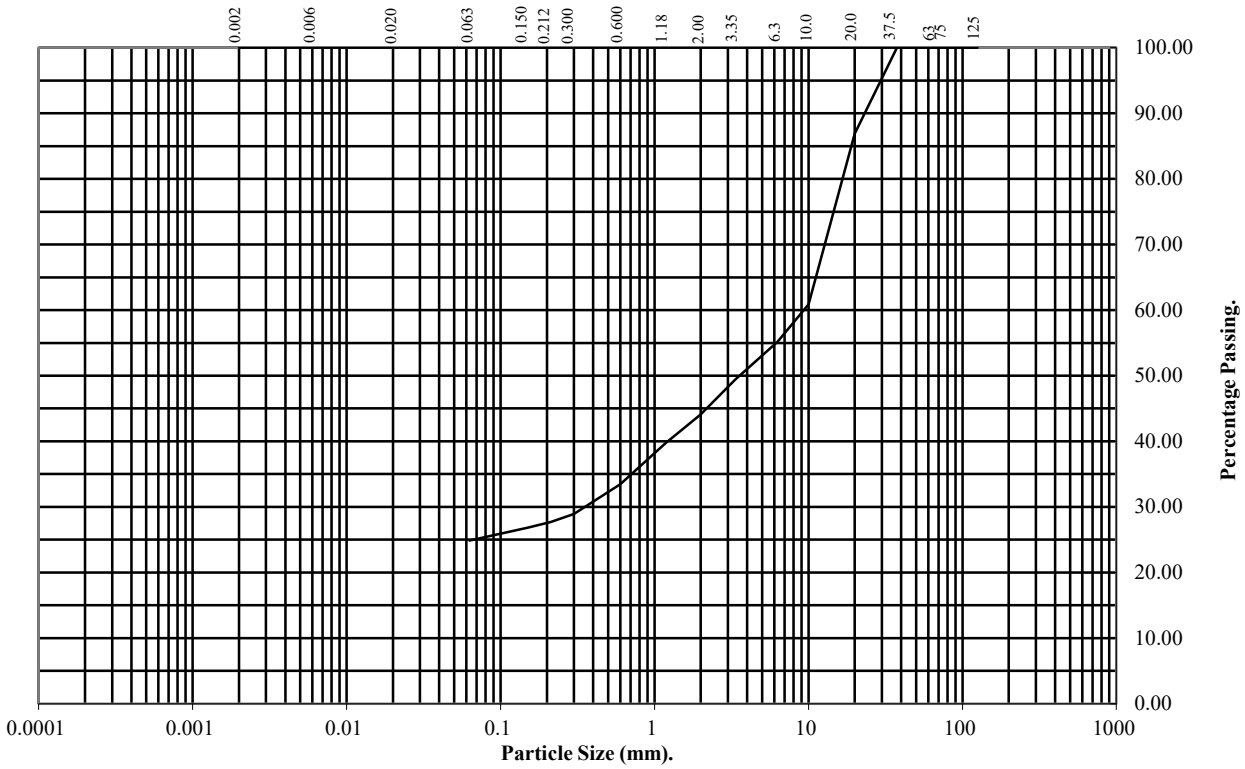
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**1.20**
Sample Number:	**12**	**Base Depth(m):**	**1.30**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	87
10	61
6.3	55
3.35	49
2	44
1.18	40
0.6	33
0.3	29
0.212	28
0.15	27
0.063	25

Soil Fraction	Total Percentage
Cobbles	0
Gravel	56
Sand	19
Silt/Clay	25

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

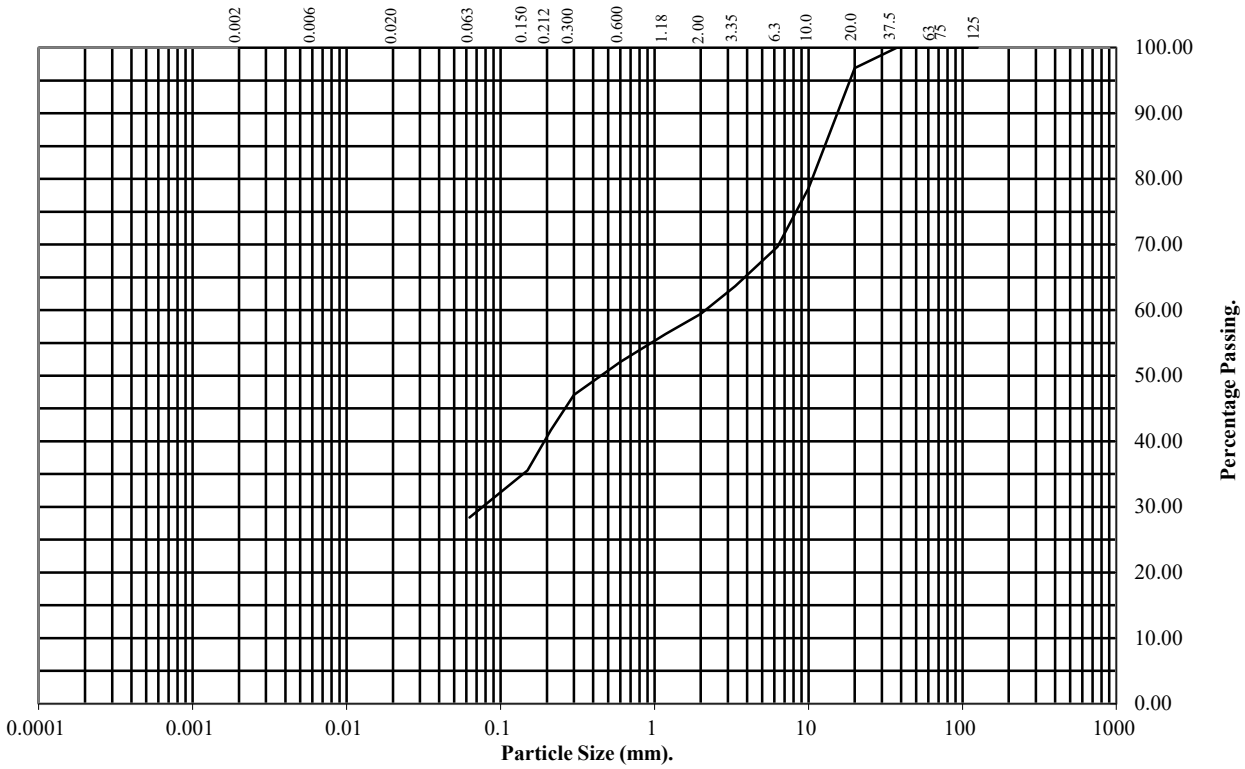
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**1.20**
Sample Number:	**15**	**Base Depth(m):**	**1.30**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	79
6.3	70
3.35	64
2	59
1.18	56
0.6	52
0.3	47
0.212	42
0.15	36
0.063	28

Soil Fraction	Total Percentage
Cobbles	0
Gravel	41
Sand	31
Silt/Clay	28

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

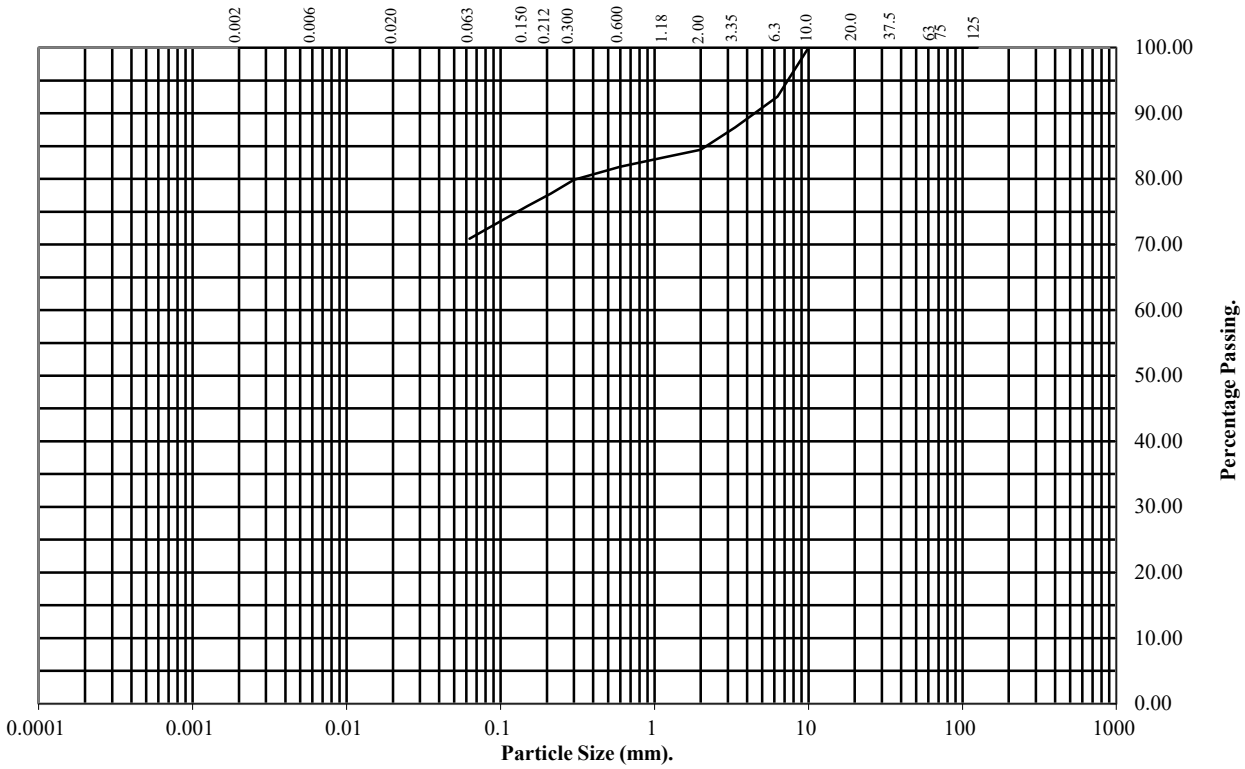
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**2.80**
Sample Number:	**18**	**Base Depth(m):**	**2.90**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	93
3.35	88
2	84
1.18	83
0.6	82
0.3	80
0.212	78
0.15	76
0.063	71

Soil Fraction	Total Percentage
Cobbles	0
Gravel	16
Sand	13
Silt/Clay	71

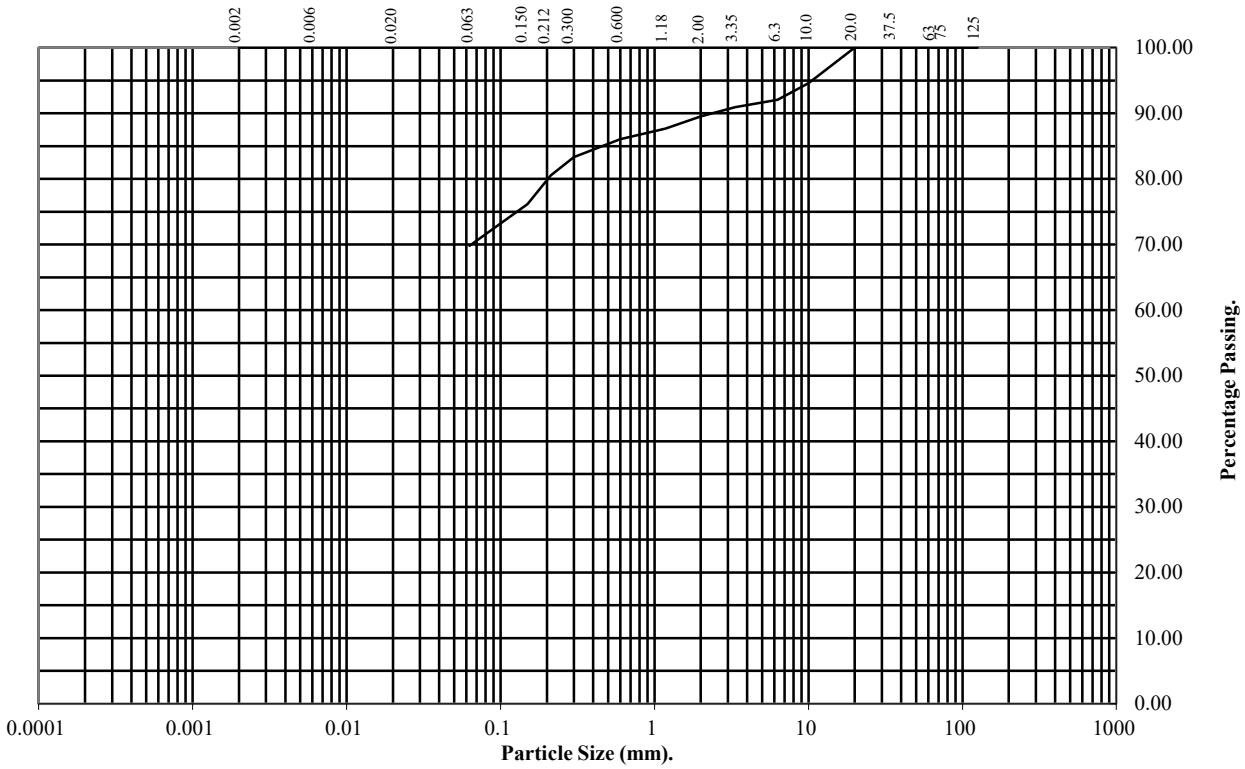
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**4.10**
Sample Number:	**21**	**Base Depth(m):**	**4.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	95
6.3	92
3.35	91
2	90
1.18	88
0.6	86
0.3	83
0.212	81
0.15	76
0.063	70

Soil Fraction	Total Percentage
Cobbles	0
Gravel	10
Sand	20
Silt/Clay	70

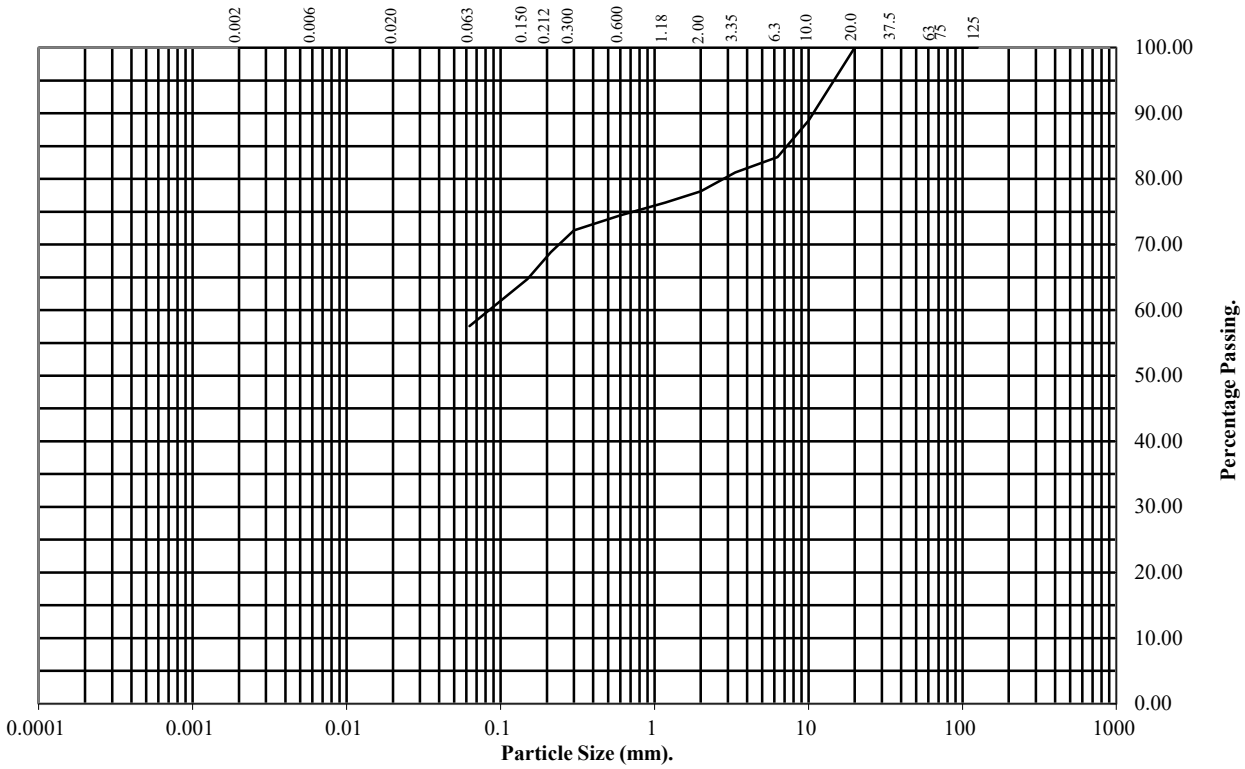
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**5.10**
Sample Number:	**23**	**Base Depth(m):**	**5.20**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	89
6.3	83
3.35	81
2	78
1.18	76
0.6	74
0.3	72
0.212	69
0.15	65
0.063	58

Soil Fraction	Total Percentage
Cobbles	0
Gravel	22
Sand	20
Silt/Clay	58

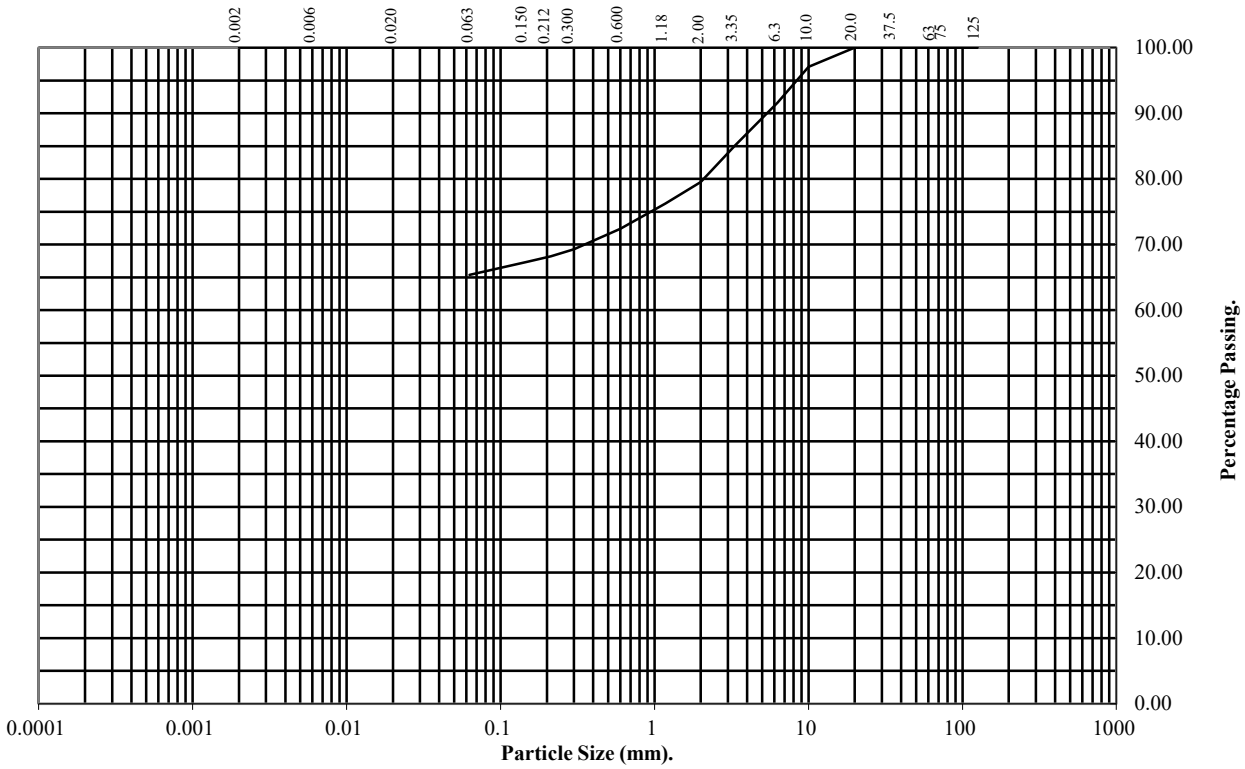
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**6.20**
Sample Number:	**7**	**Base Depth(m):**	**6.65**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	92
3.35	85
2	80
1.18	76
0.6	72
0.3	69
0.212	68
0.15	67
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	15
Silt/Clay	65

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

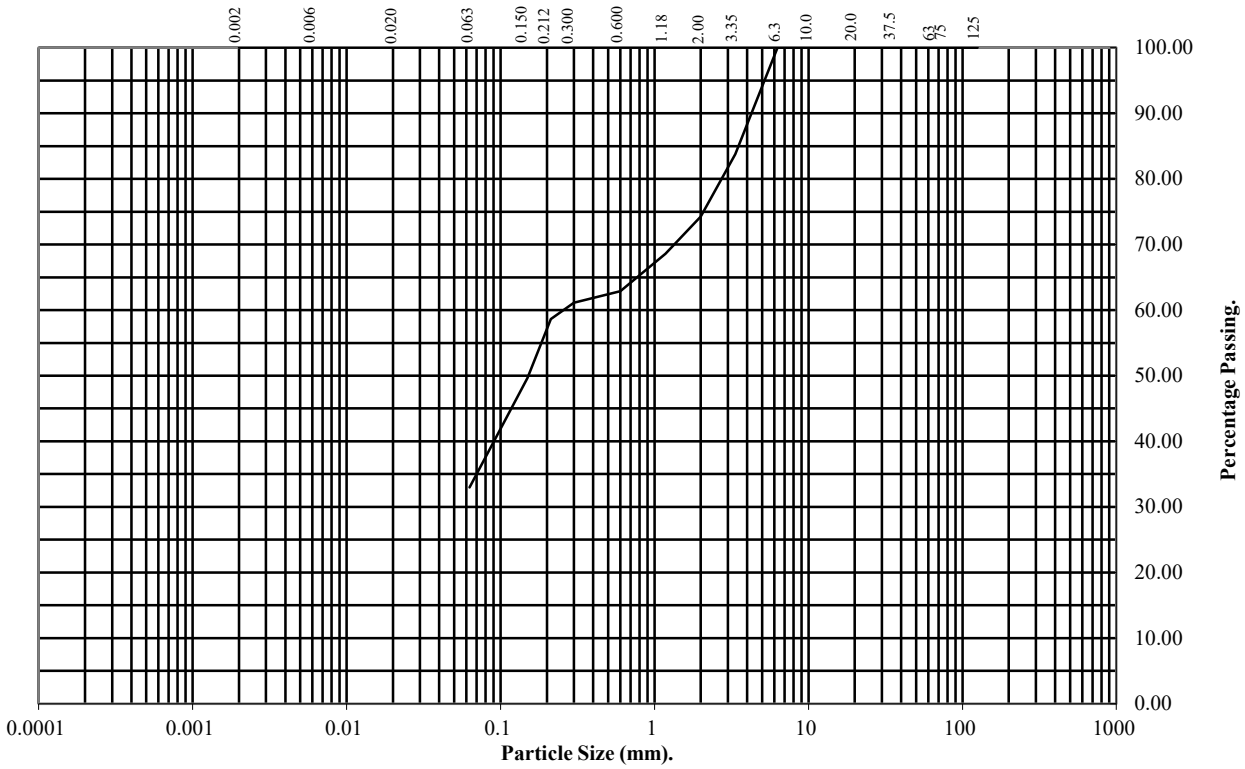
Contract No:
PSL23/6016
Client Ref:
G230600

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**8.20**
Sample Number:	**9**	**Base Depth(m):**	**8.65**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	84
2	74
1.18	69
0.6	63
0.3	61
0.212	59
0.15	50
0.063	33

Soil Fraction	Total Percentage
Cobbles	0
Gravel	26
Sand	41
Silt/Clay	33

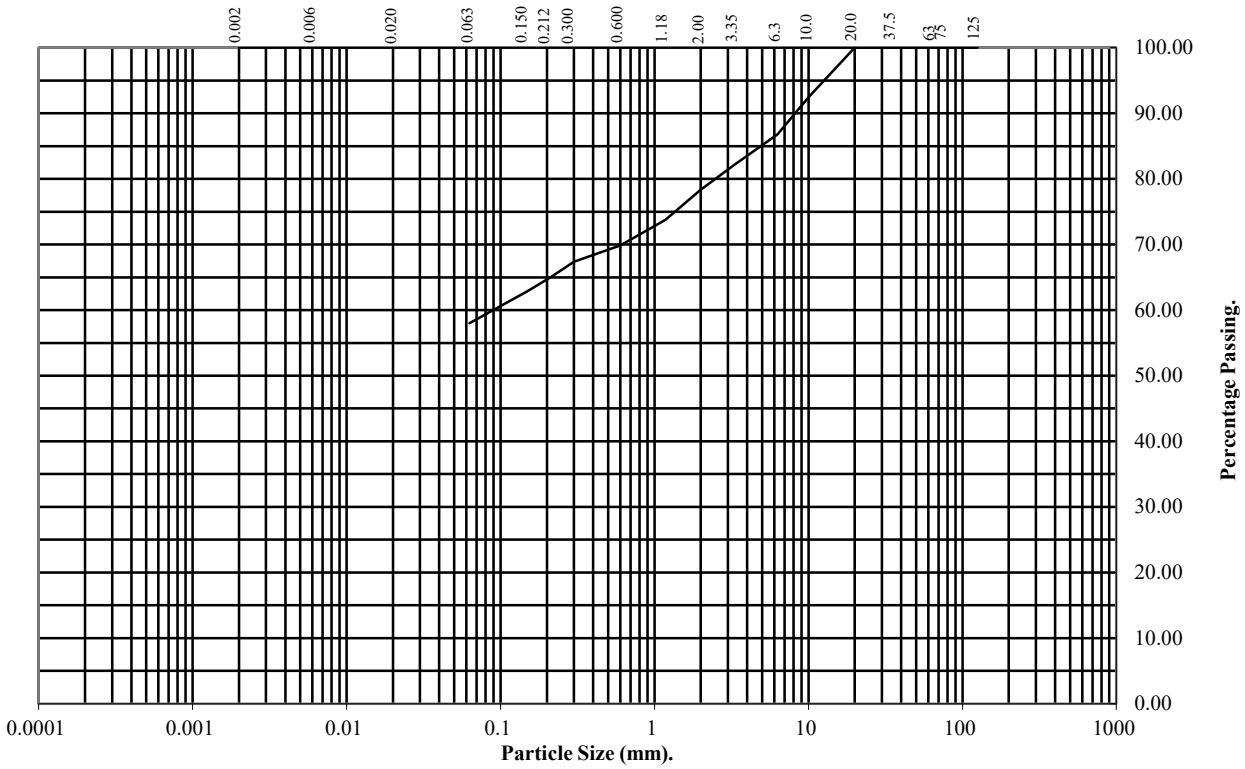
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH1933S**	**Top Depth (m):**	**9.20**
Sample Number:	**10**	**Base Depth(m):**	**9.65**
Sample Type:	**D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	92
6.3	87
3.35	82
2	78
1.18	74
0.6	70
0.3	67
0.212	65
0.15	63
0.063	58

Soil Fraction	Total Percentage
Cobbles	0
Gravel	22
Sand	20
Silt/Clay	58

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

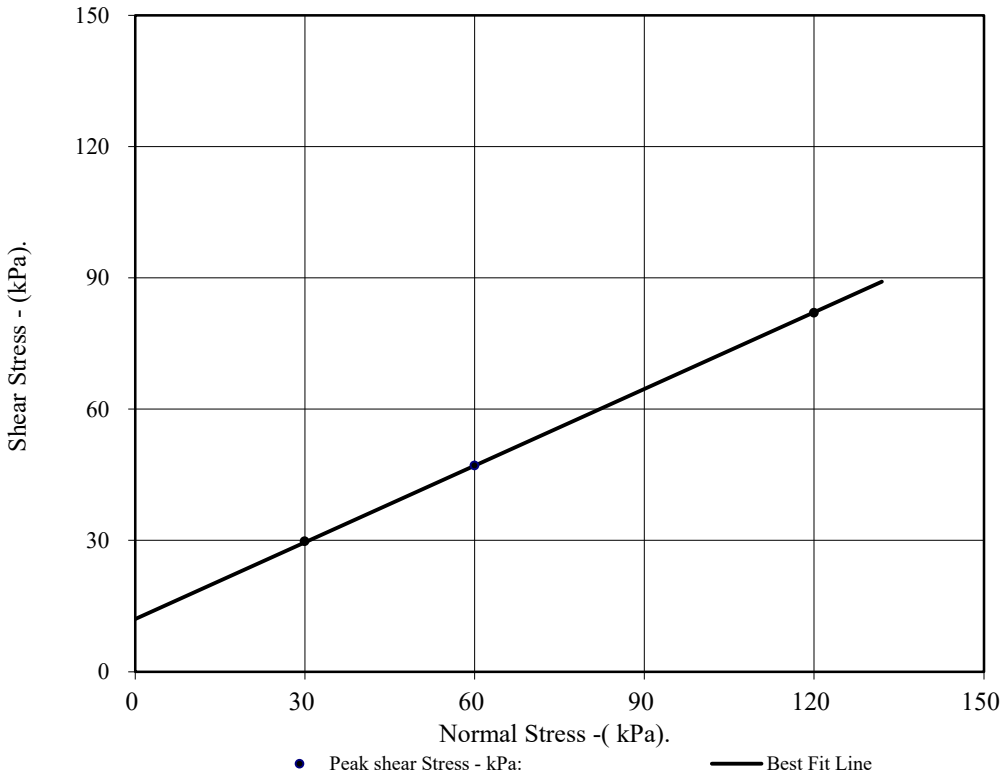
Contract No:
PSL23/6016
Client Ref:
G230600

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1902N**		Top Depth:	**2.90**
Sample Number:	**16**		Base Depth:	**3.00**
Sample Conditions:	Submerged		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	13	13	13
Bulk Density - Mg/m3:	2.15	2.15	2.15
Dry Density - Mg/m3:	1.90	1.90	1.90
Voids Ratio:	0.395	0.395	0.395
Normal Pressure- kPa	30	60	120
Consolidation Stage			
Consolidated Height - mm:	19.62	19.30	18.94
Shearing Stage			
Rate of Strain - mm/min	0.061	0.061	0.061
Displacement at peak shear stress - mm	2.11	2.40	10.19
Peak shear Stress - kPa:	30	47	82
Final Consolidated Conditions			
Moisture Content - %:	22	21	20
Bulk Density - Mg/m3:	2.19	2.23	2.27
Dry Density - Mg/m3:	1.80	1.84	1.89
Peak			
Angle of Shearing Resistance:(~~θ~~)	**30**		
Effective Cohesion - kPa:	**12**		



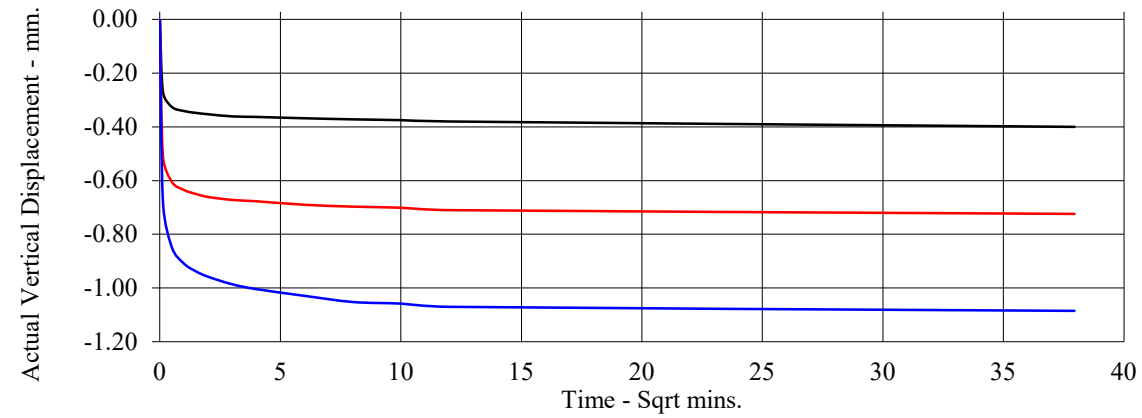
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

CONSOLIDATED DRAINED SHEARBOX TEST

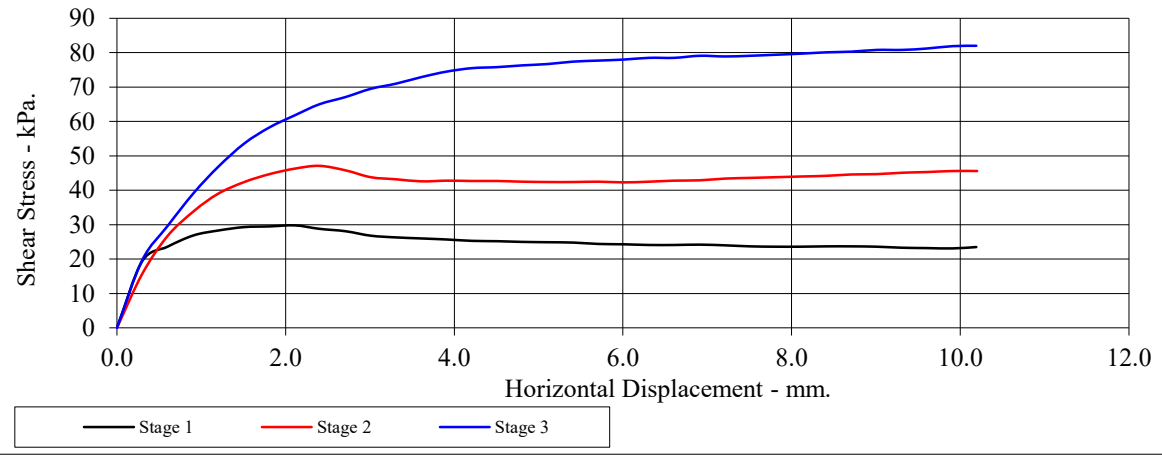
BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1902N**	Top Depth:	**2.90**
Sample Number:	**16**	Base Depth:	**3.00**

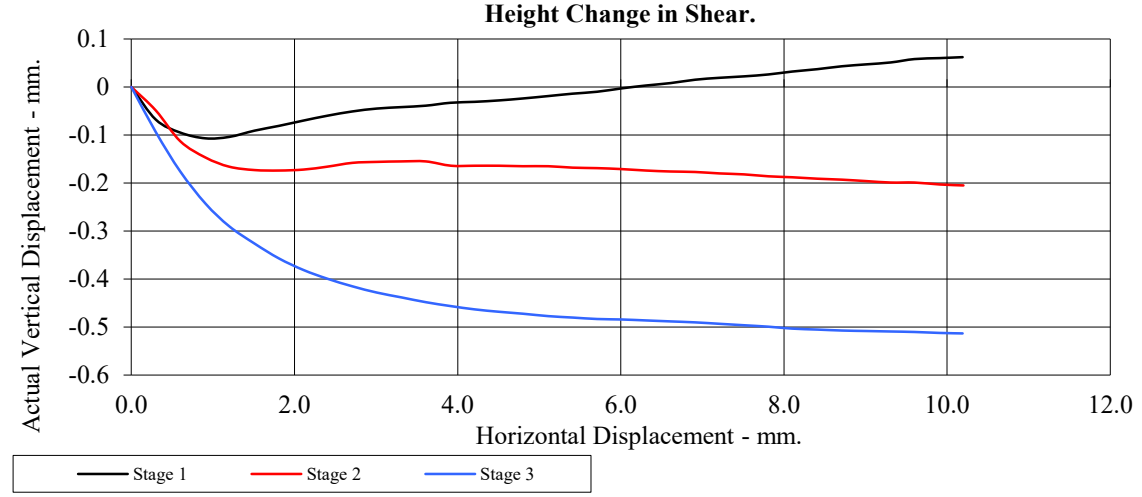
Consolidation Stage.



Shearing Stage.



Height Change in Shear.



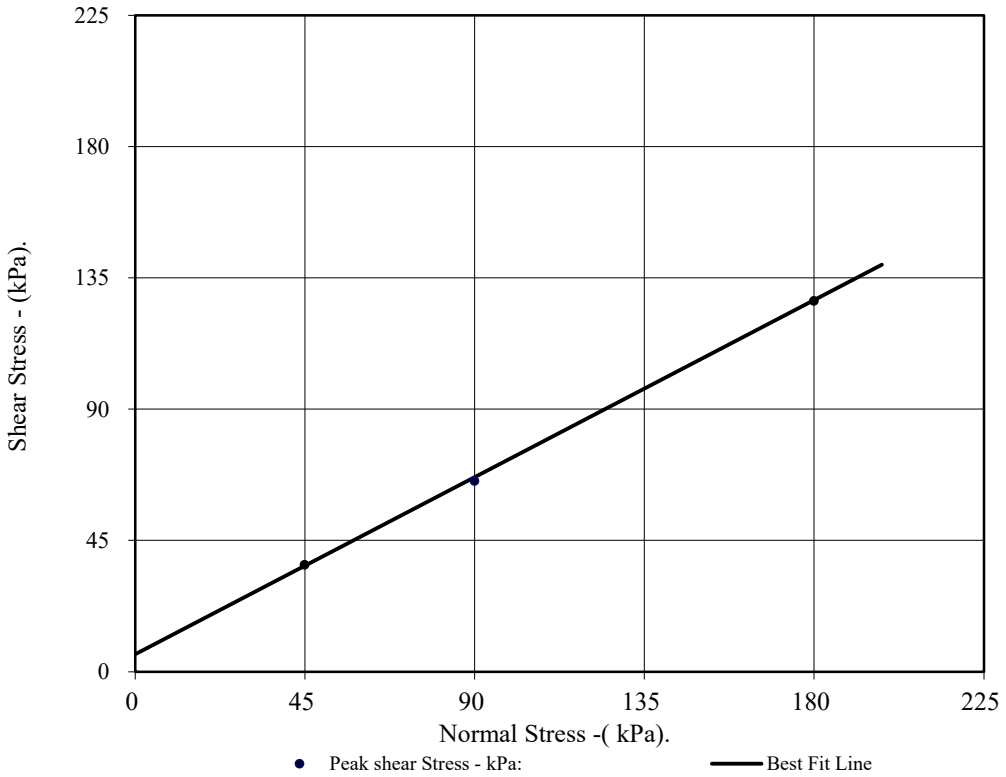
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 / **Client Ref:** G230600

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1902N**		Top Depth:	**4.50**
Sample Number:	**18**		Base Depth:	**4.70**
Sample Conditions:	Submerged		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	18	18	18
Bulk Density - Mg/m3:	2.08	2.08	2.08
Dry Density - Mg/m3:	1.76	1.76	1.76
Voids Ratio:	0.506	0.506	0.506
Normal Pressure- kPa	45	90	180
Consolidation Stage			
Consolidated Height - mm:	19.31	19.08	18.01
Shearing Stage			
Rate of Strain - mm/min	0.054	0.054	0.054
Displacement at peak shear stress - mm	3.01	5.11	4.21
Peak shear Stress - kPa:	37	65	127
Final Consolidated Conditions			
Moisture Content - %:	21	19	19
Bulk Density - Mg/m3:	2.15	2.18	2.31
Dry Density - Mg/m3:	1.77	1.82	1.95
Peak			
Angle of Shearing Resistance:(~~θ~~)	**34**		
Effective Cohesion - kPa:	**6**		

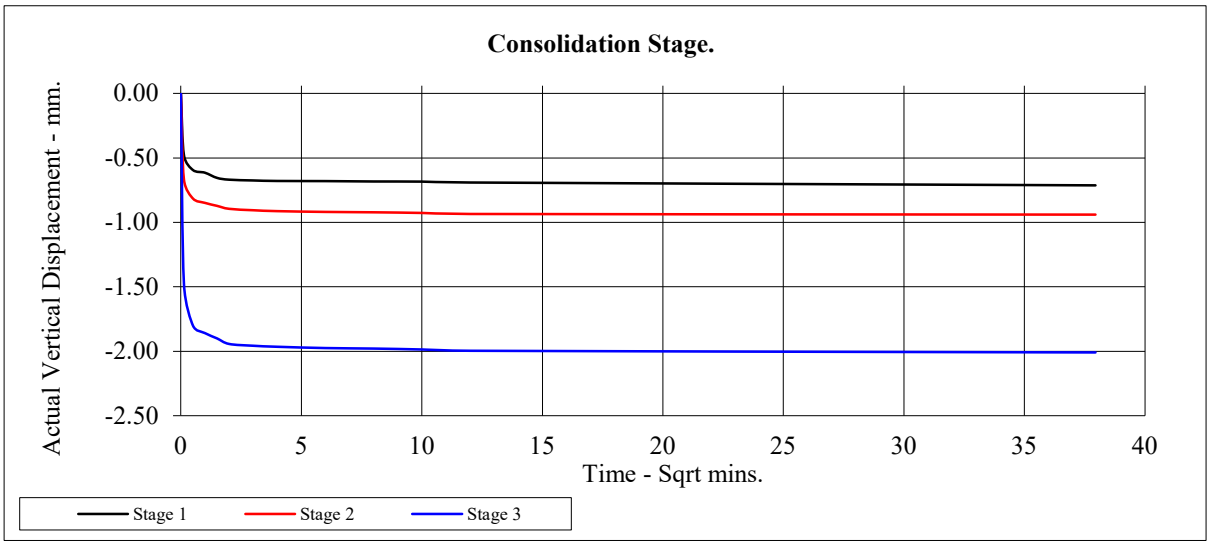


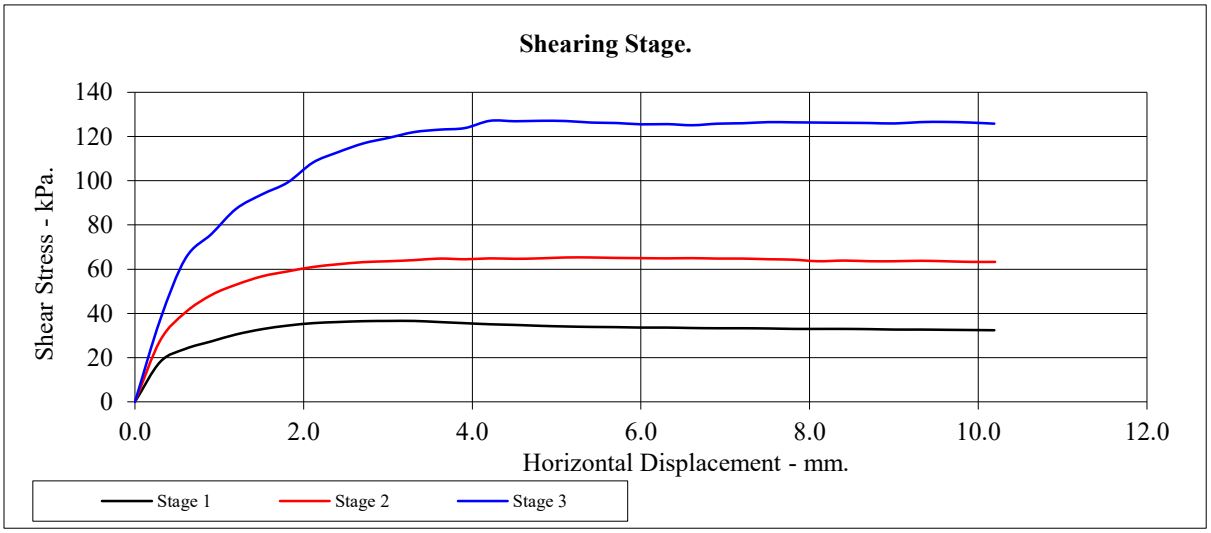
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

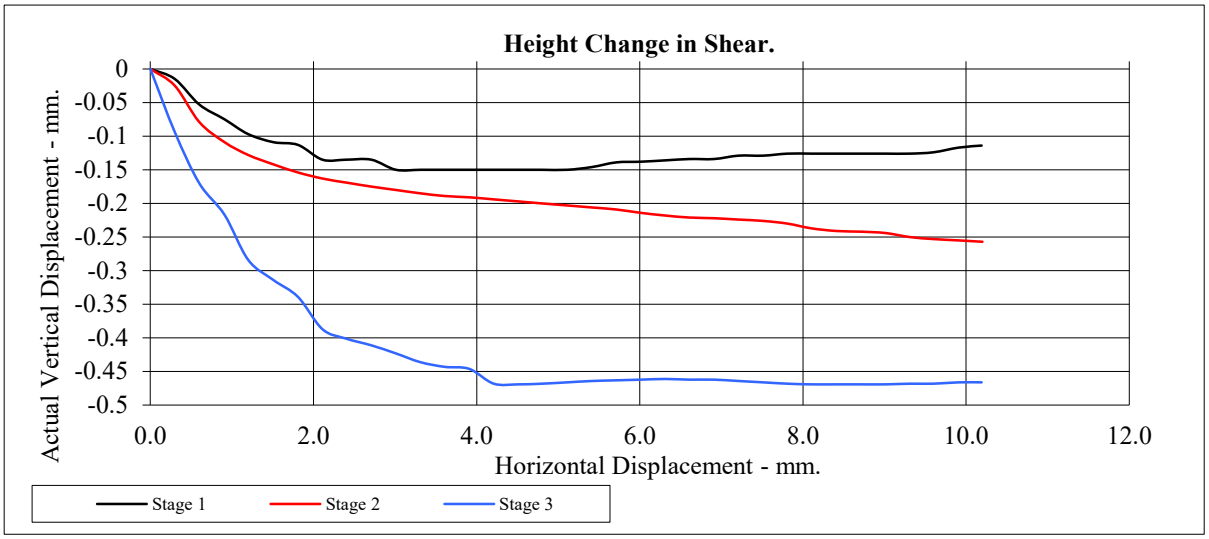
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1902N**	Top Depth:	**4.50**
Sample Number:	**18**	Base Depth:	**4.70**







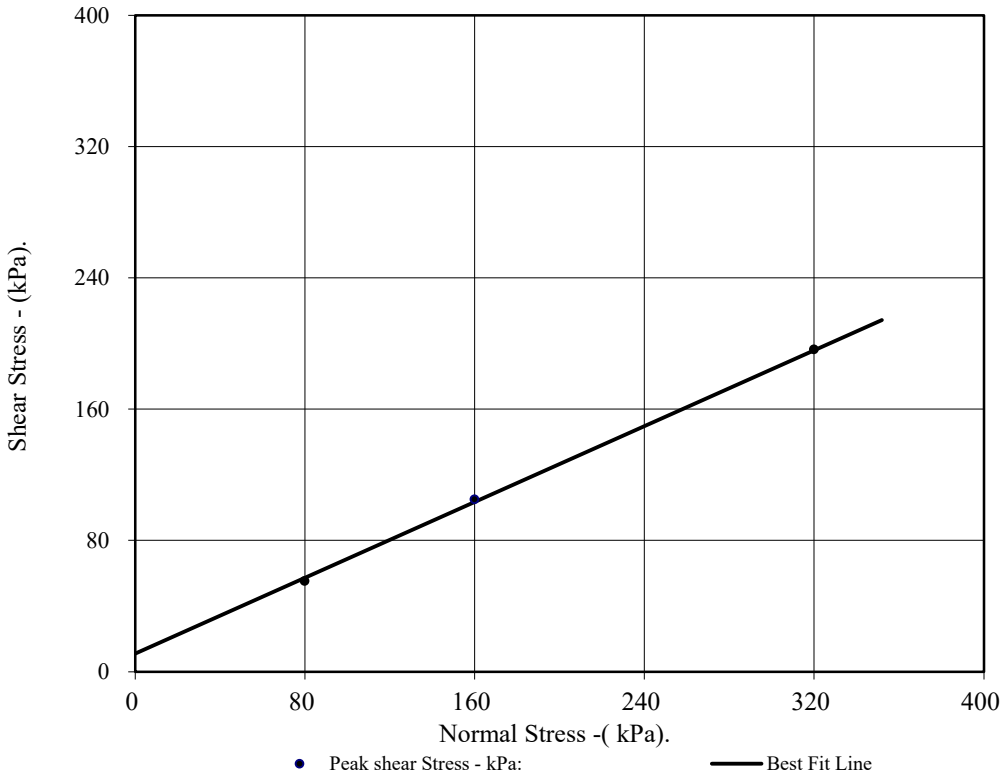
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1902N**		Top Depth:	**8.00**
Sample Number:	**9**		Base Depth:	**8.45**
Sample Conditions:	Submerged		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	19	19	19
Bulk Density - Mg/m3:	2.07	2.07	2.07
Dry Density - Mg/m3:	1.74	1.74	1.74
Voids Ratio:	0.522	0.522	0.522
Normal Pressure- kPa	80	160	320
Consolidation Stage			
Consolidated Height - mm:	18.35	18.06	17.41
Shearing Stage			
Rate of Strain - mm/min	0.047	0.047	0.047
Displacement at peak shear stress - mm	8.71	8.10	6.91
Peak shear Stress - kPa:	55	105	196
Final Consolidated Conditions			
Moisture Content - %:	23	22	22
Bulk Density - Mg/m3:	2.26	2.30	2.38
Dry Density - Mg/m3:	1.84	1.88	1.95
Peak			
Angle of Shearing Resistance:(~~θ~~)	**30**		
Effective Cohesion - kPa:	**11**		

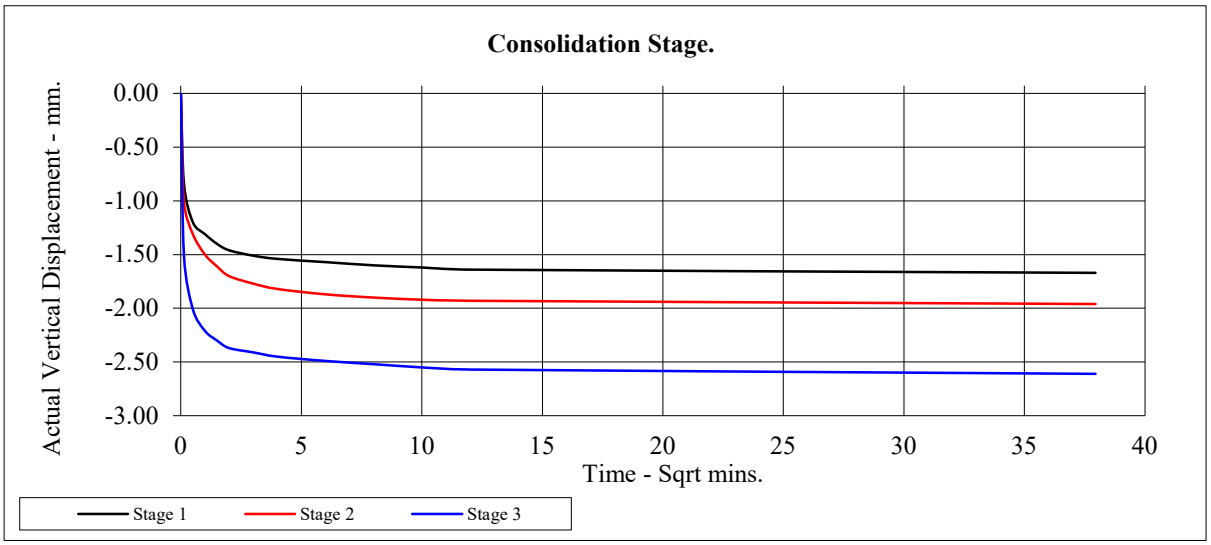


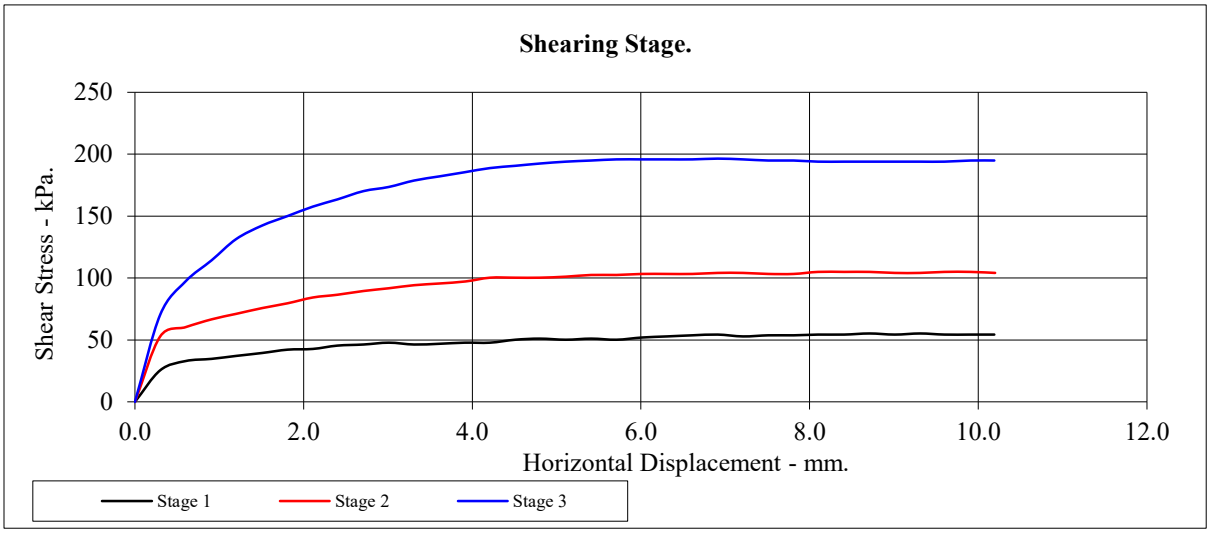
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

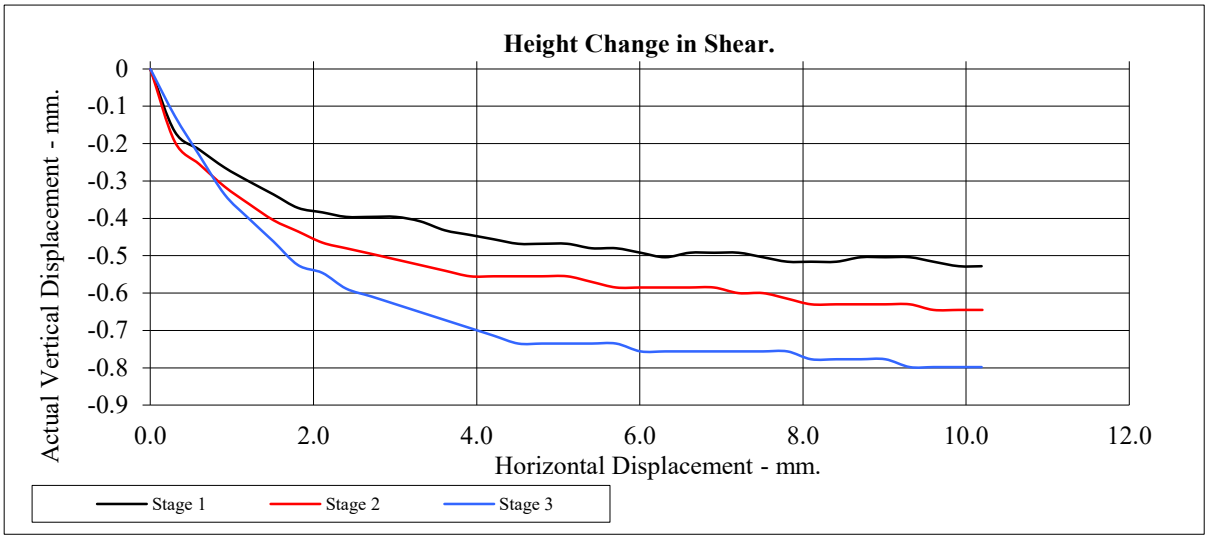
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1902N**	Top Depth:	**8.00**
Sample Number:	**9**	Base Depth:	**8.45**







UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

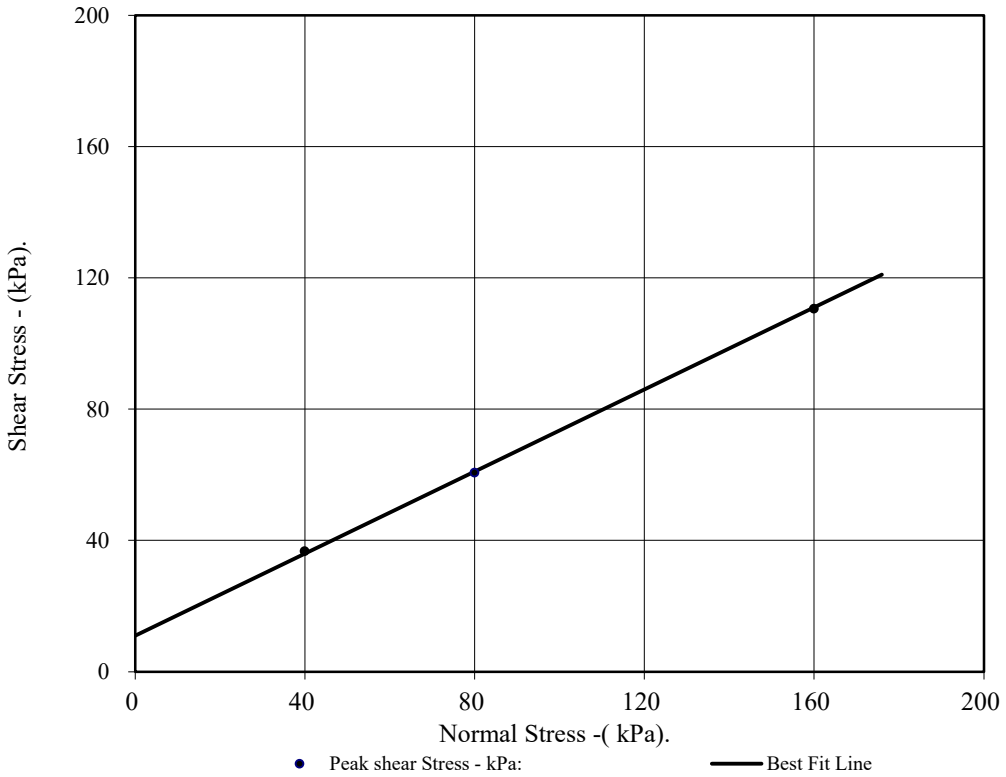
Contract No:	
PSL23/6016	
Client Ref:	
G230600	

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**		Top Depth:	**4.10**	
Sample Number:	**21**		Base Depth:	**4.20**	
Sample Conditions:	Submerged		Sample Type	**D**	
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**		
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.				
Sample Description:	**See summary of soil descriptions.**				

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	12	12	12
Bulk Density - Mg/m3:	2.11	2.11	2.11
Dry Density - Mg/m3:	1.88	1.88	1.88
Voids Ratio:	0.408	0.408	0.408
Normal Pressure- kPa	40	80	160
Consolidation Stage			
Consolidated Height - mm:	18.51	17.02	16.48
Shearing Stage			
Rate of Strain - mm/min	0.056	0.056	0.056
Displacement at peak shear stress - mm	7.81	9.01	5.71
Peak shear Stress - kPa:	37	61	111
Final Consolidated Conditions			
Moisture Content - %:	21	19	18
Bulk Density - Mg/m3:	2.29	2.49	2.57
Dry Density - Mg/m3:	1.89	2.08	2.17
Peak			
Angle of Shearing Resistance:(~~θ~~)	**32**		
Effective Cohesion - kPa:	**11**		

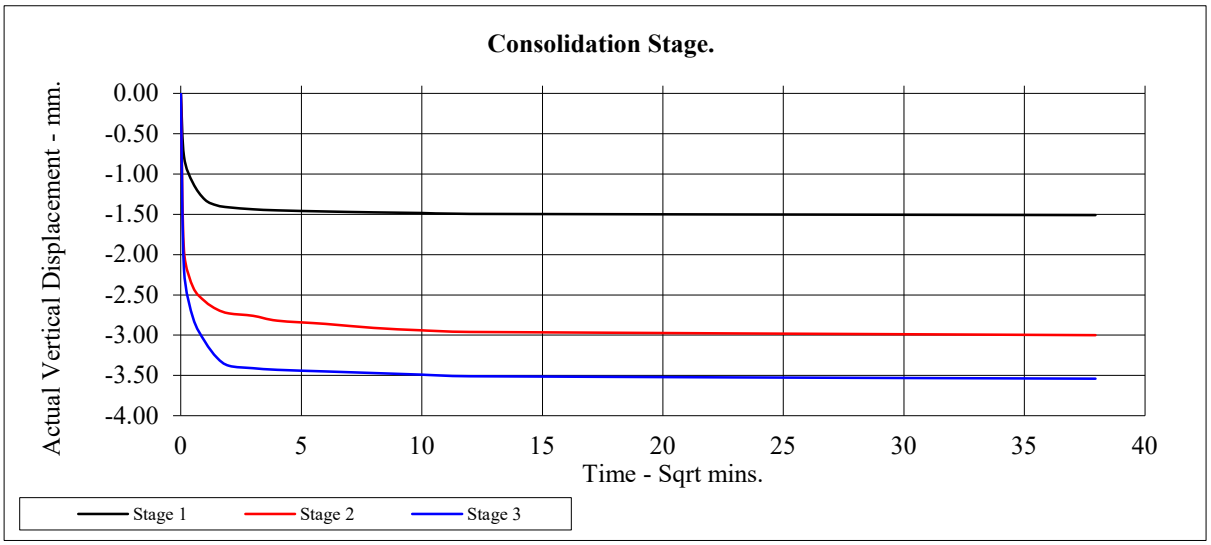


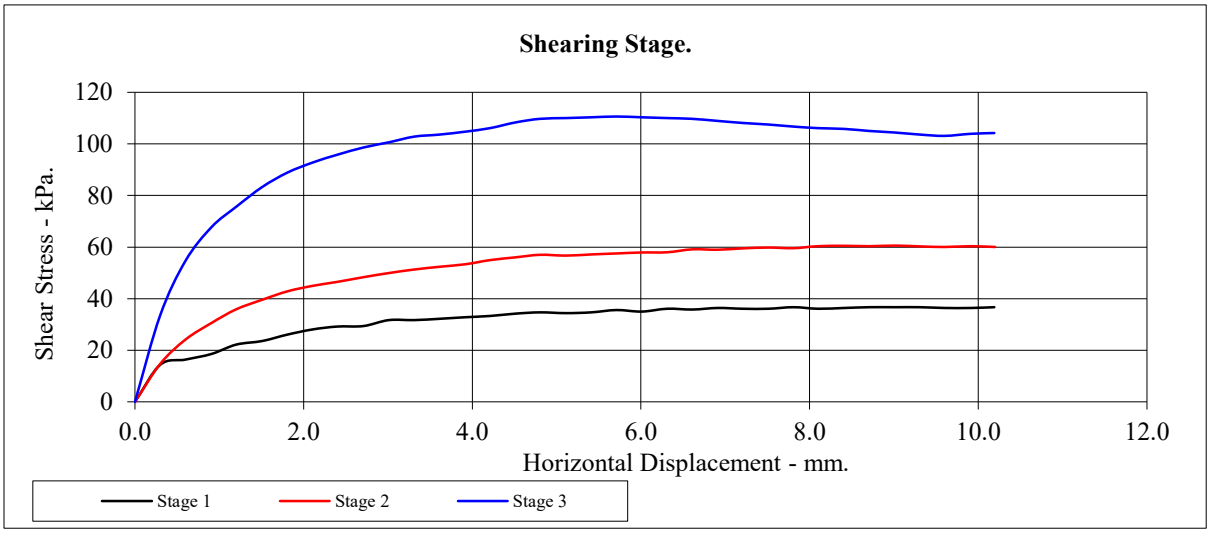
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

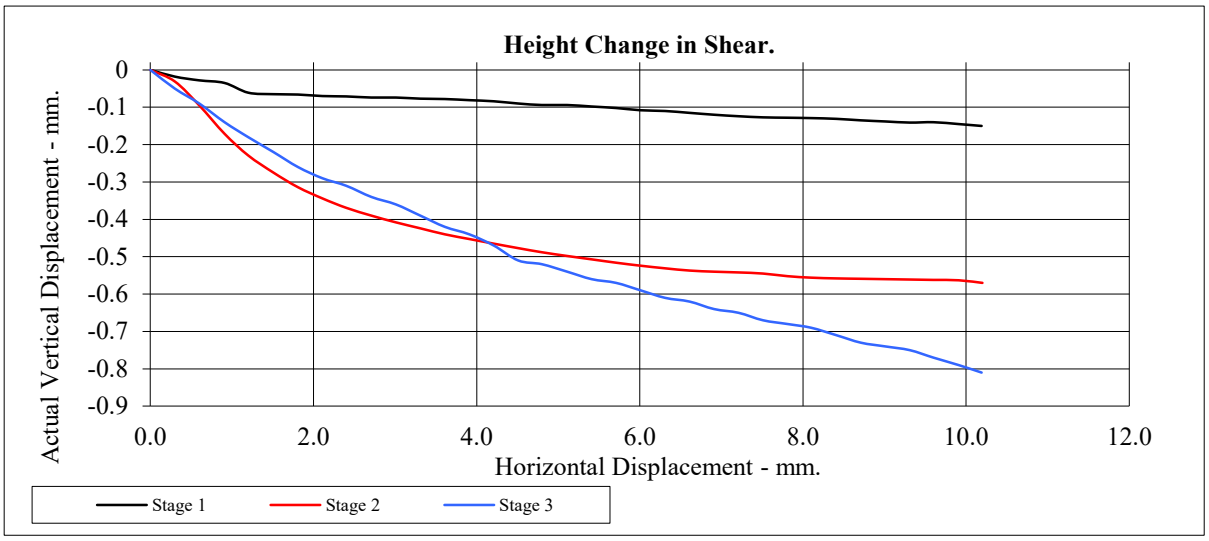
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**	Top Depth:	**4.10**
Sample Number:	**21**	Base Depth:	**4.20**







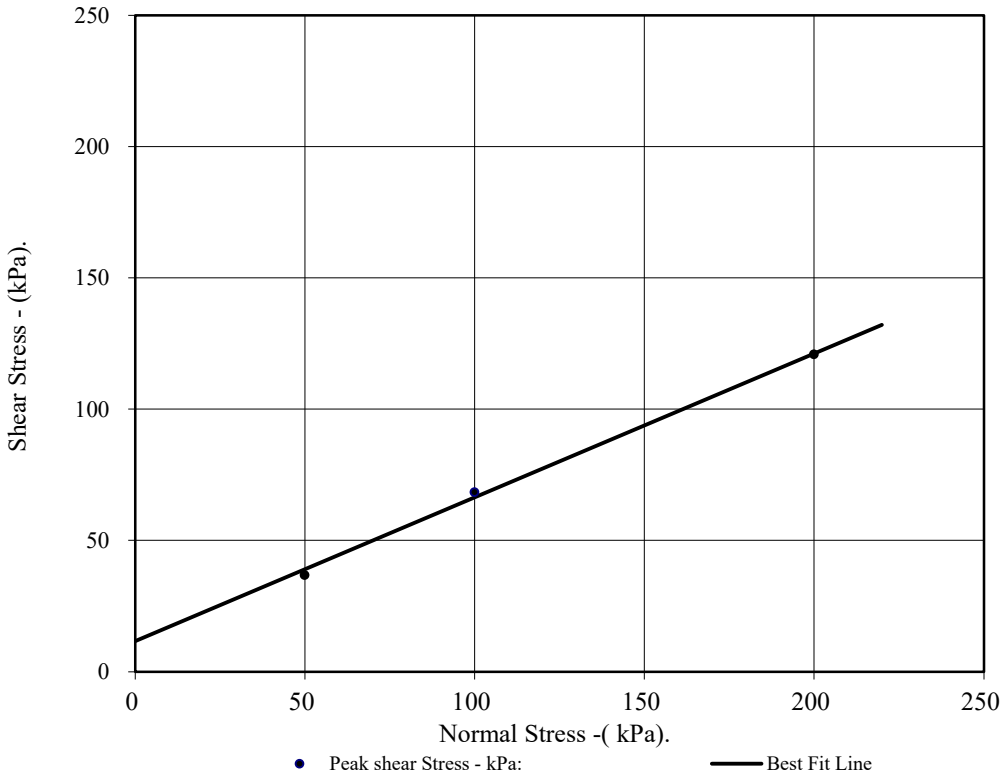
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** **PSL23/6016** **Client Ref:** **G230600**

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**		Top Depth:	**5.10**	
Sample Number:	**23**		Base Depth:	**5.20**	
Sample Conditions:	Submerged		Sample Type	**D**	
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**		
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.				
Sample Description:	**See summary of soil descriptions.**				

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	14	14	14
Bulk Density - Mg/m3:	2.06	2.06	2.06
Dry Density - Mg/m3:	1.81	1.81	1.81
Voids Ratio:	0.465	0.465	0.465
Normal Pressure- kPa	50	100	200
Consolidation Stage			
Consolidated Height - mm:	18.98	18.65	18.15
Shearing Stage			
Rate of Strain - mm/min	0.056	0.056	0.056
Displacement at peak shear stress - mm	7.81	6.61	5.71
Peak shear Stress - kPa:	37	68	121
Final Consolidated Conditions			
Moisture Content - %:	19	19	18
Bulk Density - Mg/m3:	2.18	2.21	2.28
Dry Density - Mg/m3:	1.83	1.86	1.93
Peak			
Angle of Shearing Resistance:(~~θ~~)	**29**		
Effective Cohesion - kPa:	**12**		



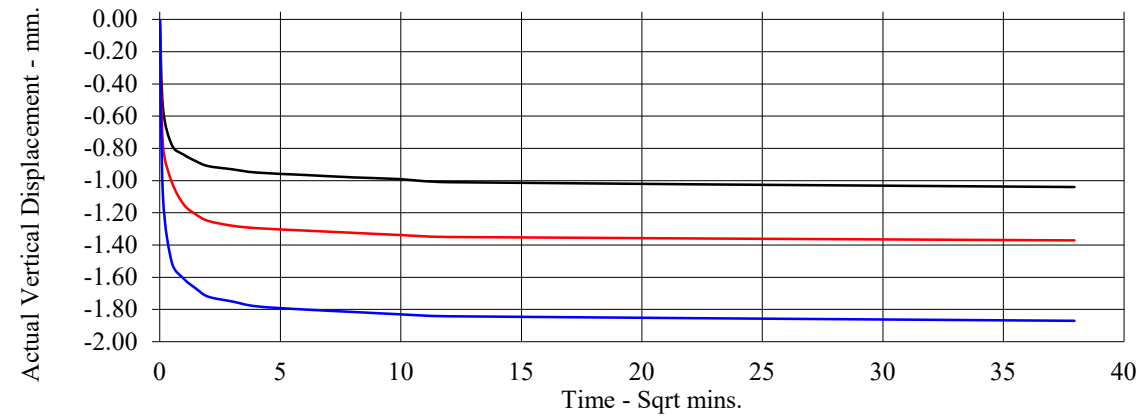
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

CONSOLIDATED DRAINED SHEARBOX TEST

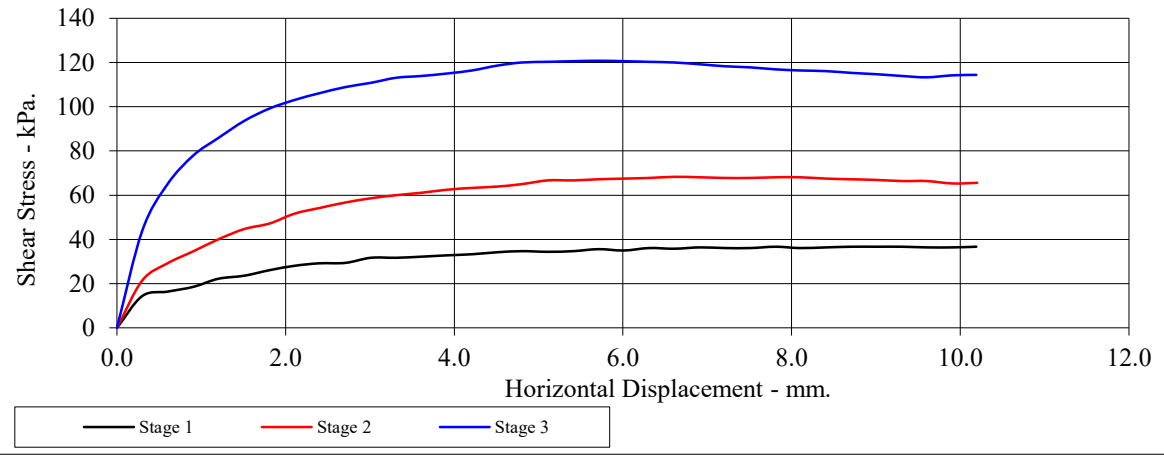
BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**	Top Depth:	**5.10**
Sample Number:	**23**	Base Depth:	**5.20**

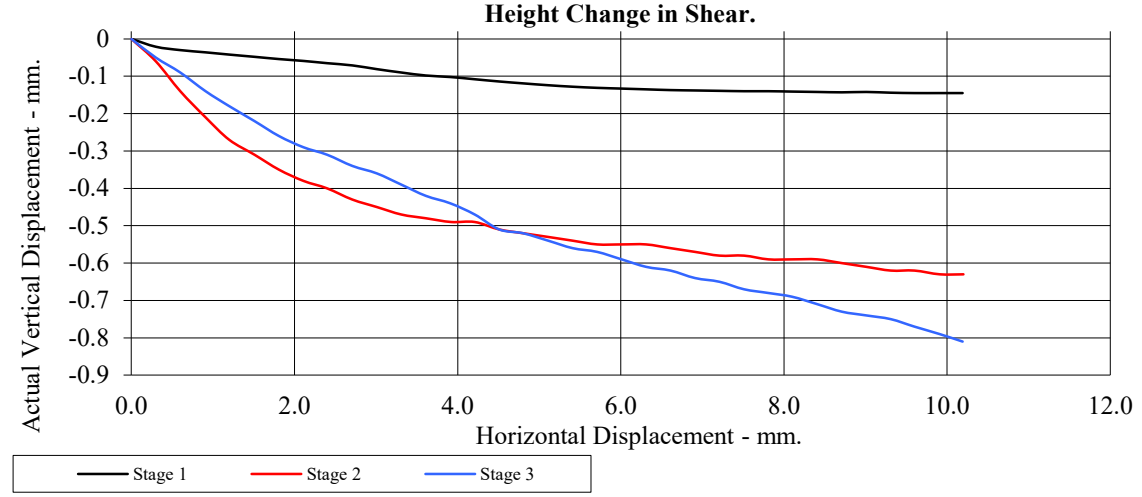
Consolidation Stage.



Shearing Stage.



Height Change in Shear.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

M1 J23a-J25

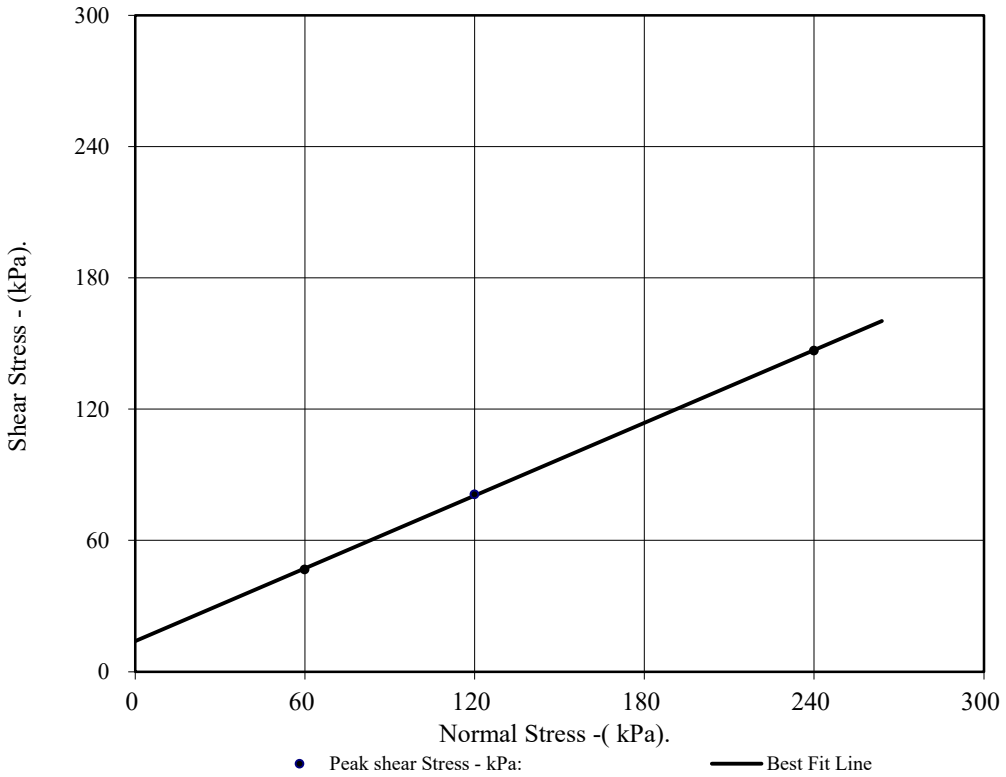
Contract No:
PSL23/6016
Client Ref:
G230600

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**		Top Depth:	**6.20**	
Sample Number:	**7**		Base Depth:	**6.65**	
Sample Conditions:	Submerged		Sample Type	**D**	
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**		
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.				
Sample Description:	**See summary of soil descriptions.**				

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	12	12	12
Bulk Density - Mg/m3:	2.16	2.16	2.16
Dry Density - Mg/m3:	1.93	1.93	1.93
Voids Ratio:	0.375	0.375	0.375
Normal Pressure- kPa	60	120	240
Consolidation Stage			
Consolidated Height - mm:	19.18	19.08	18.63
Shearing Stage			
Rate of Strain - mm/min	0.058	0.058	0.058
Displacement at peak shear stress - mm	2.71	3.61	4.51
Peak shear Stress - kPa:	47	81	147
Final Consolidated Conditions			
Moisture Content - %:	19	18	18
Bulk Density - Mg/m3:	2.25	2.27	2.32
Dry Density - Mg/m3:	1.90	1.91	1.97
Peak			
Angle of Shearing Resistance:(~~θ~~)	**29**		
Effective Cohesion - kPa:	**14**		

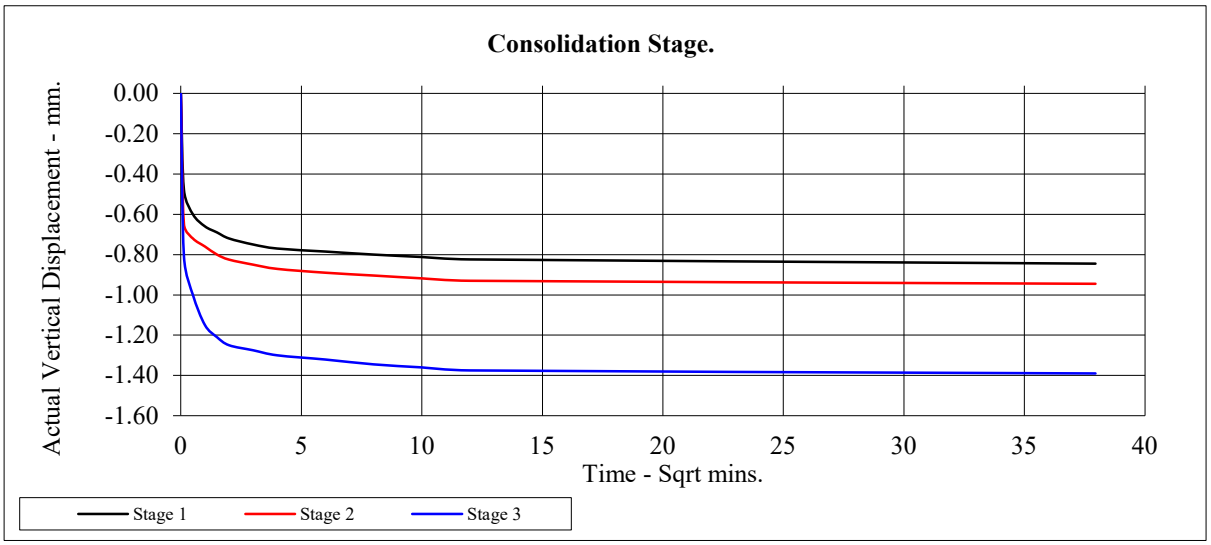


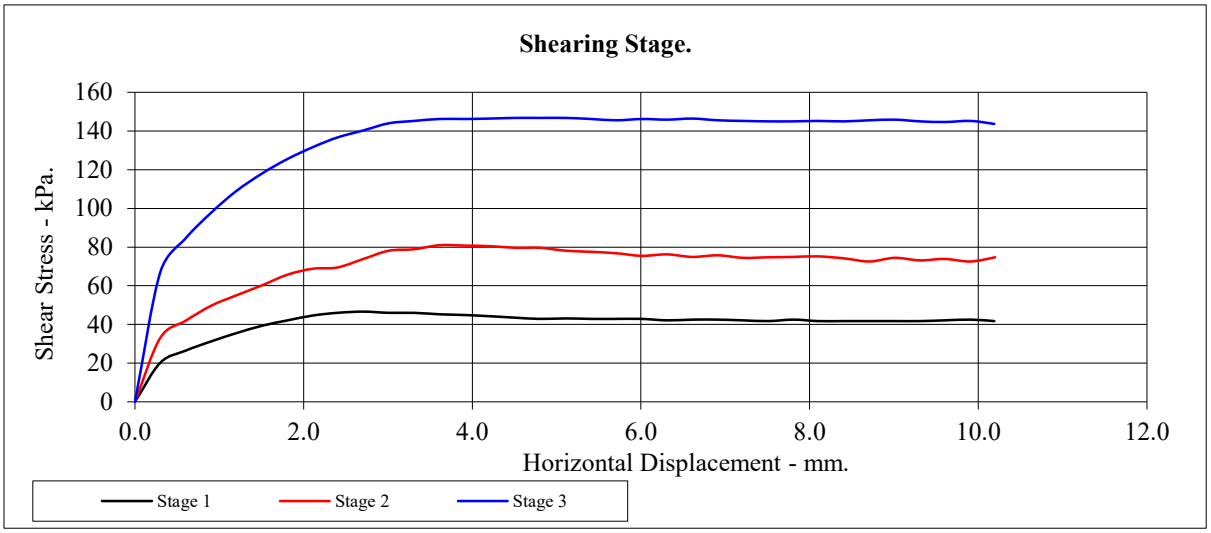
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

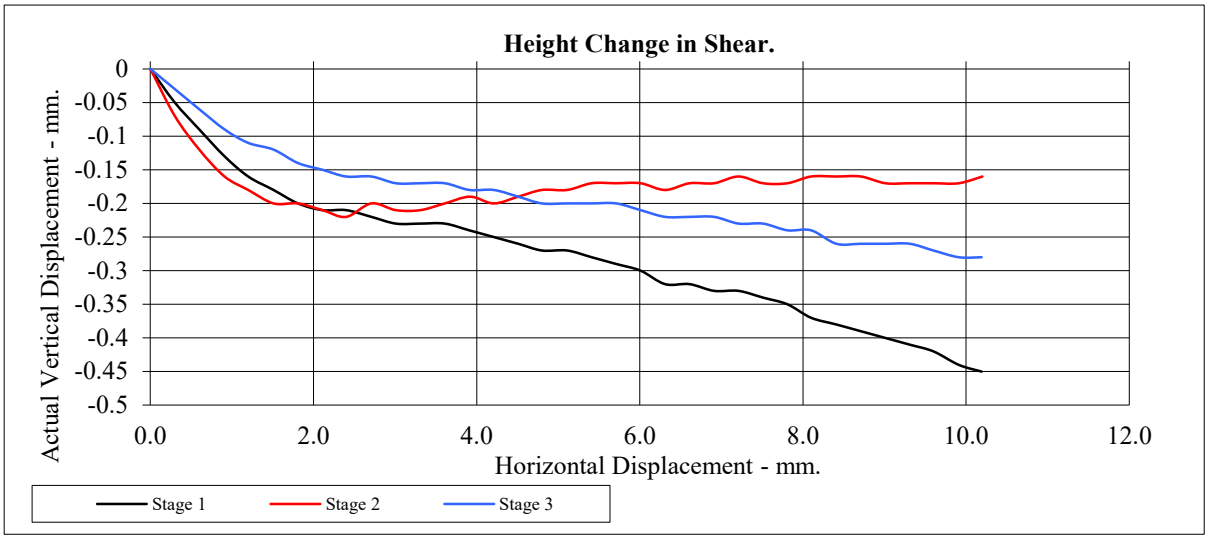
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**	Top Depth:	**6.20**
Sample Number:	**7**	Base Depth:	**6.65**







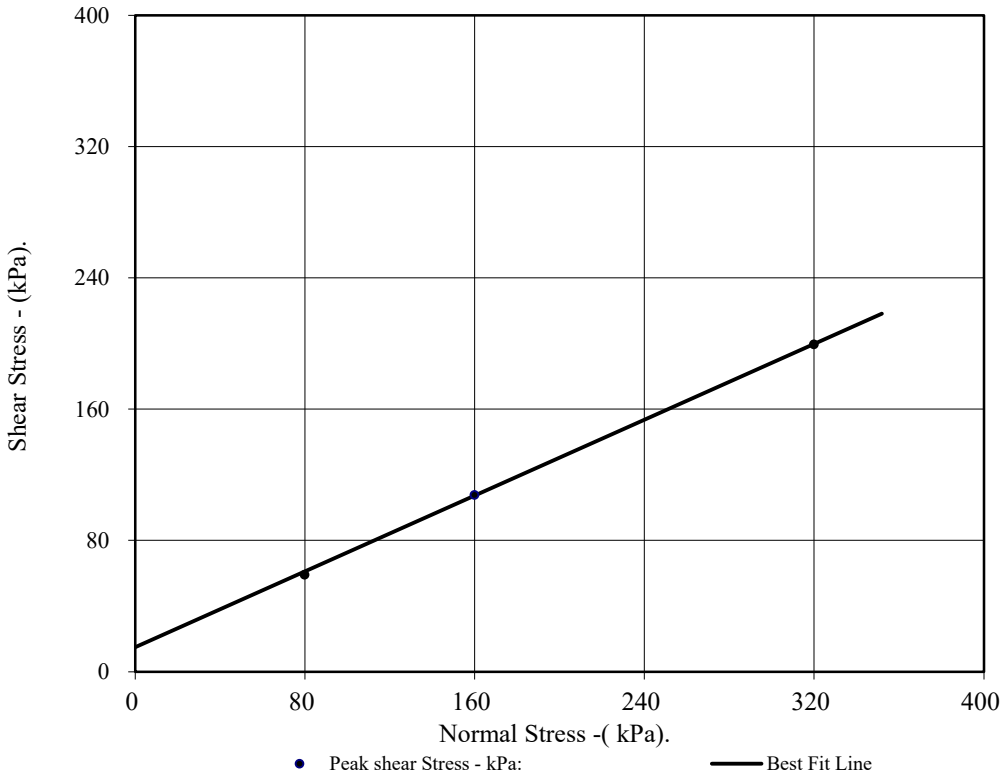
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** **PSL23/6016** **Client Ref:** **G230600**

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**		Top Depth:	**8.20**
Sample Number:	**9**		Base Depth:	**8.65**
Sample Conditions:	Submerged		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	16	16	16
Bulk Density - Mg/m3:	2.10	2.10	2.10
Dry Density - Mg/m3:	1.81	1.81	1.81
Voids Ratio:	0.462	0.462	0.462
Normal Pressure- kPa	80	160	320
Consolidation Stage			
Consolidated Height - mm:	18.91	18.81	18.09
Shearing Stage			
Rate of Strain - mm/min	0.051	0.051	0.051
Displacement at peak shear stress - mm	5.71	9.91	8.41
Peak shear Stress - kPa:	59	108	199
Final Consolidated Conditions			
Moisture Content - %:	20	20	19
Bulk Density - Mg/m3:	2.23	2.24	2.33
Dry Density - Mg/m3:	1.85	1.87	1.95
Peak			
Angle of Shearing Resistance:(~~θ~~)	**30**		
Effective Cohesion - kPa:	**15**		

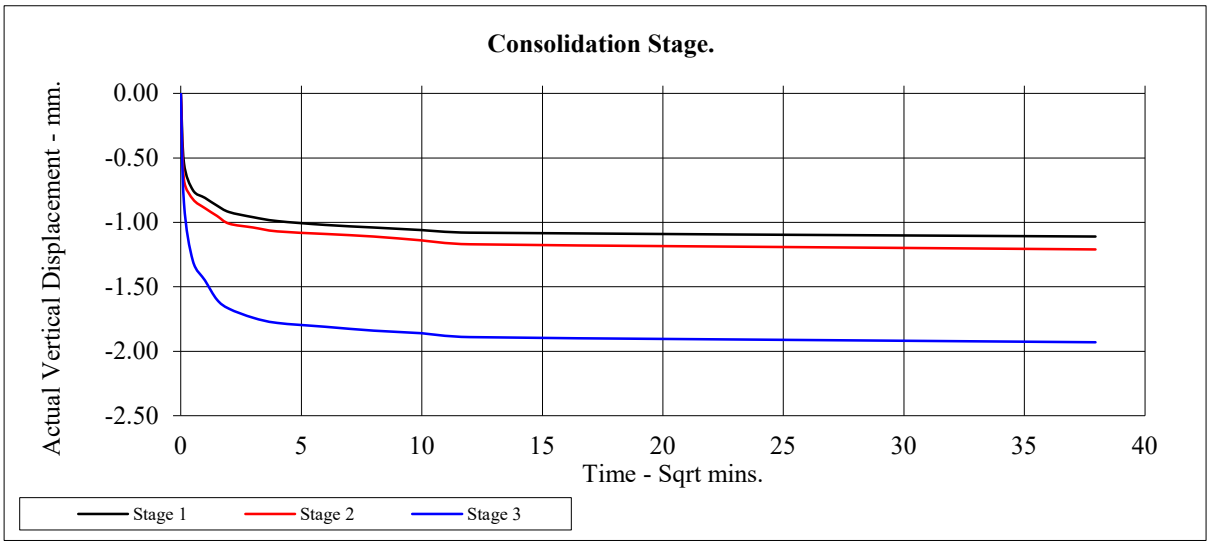


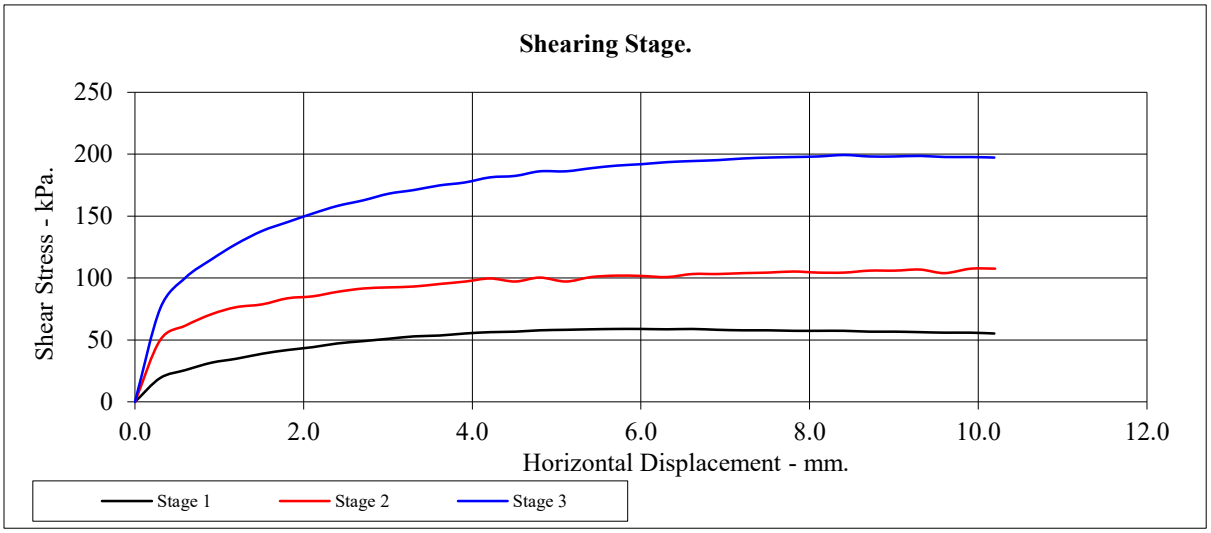
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

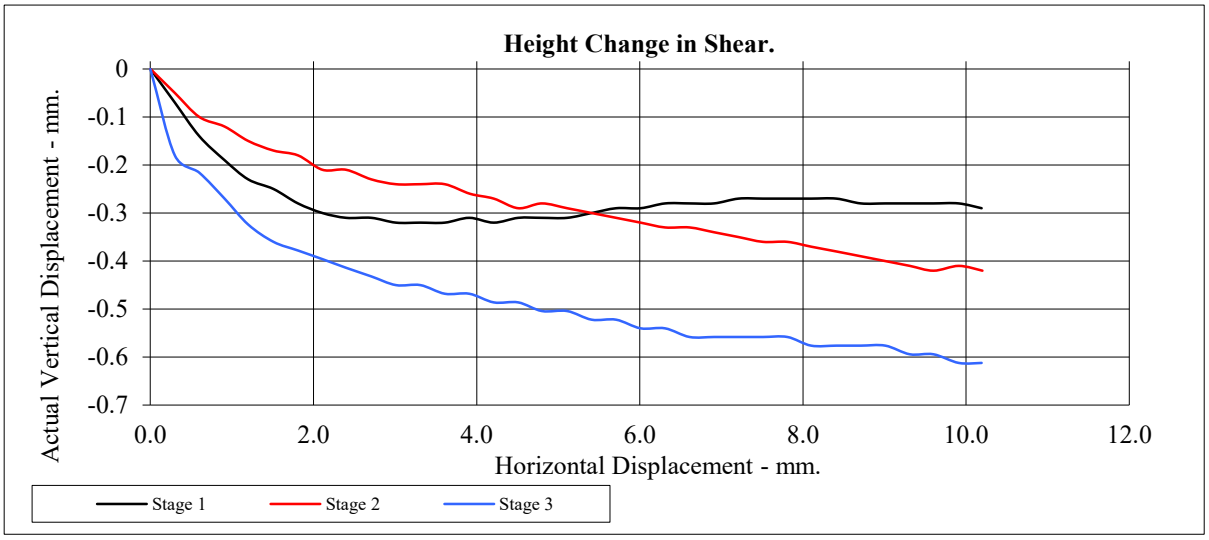
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**	Top Depth:	**8.20**
Sample Number:	**9**	Base Depth:	**8.65**







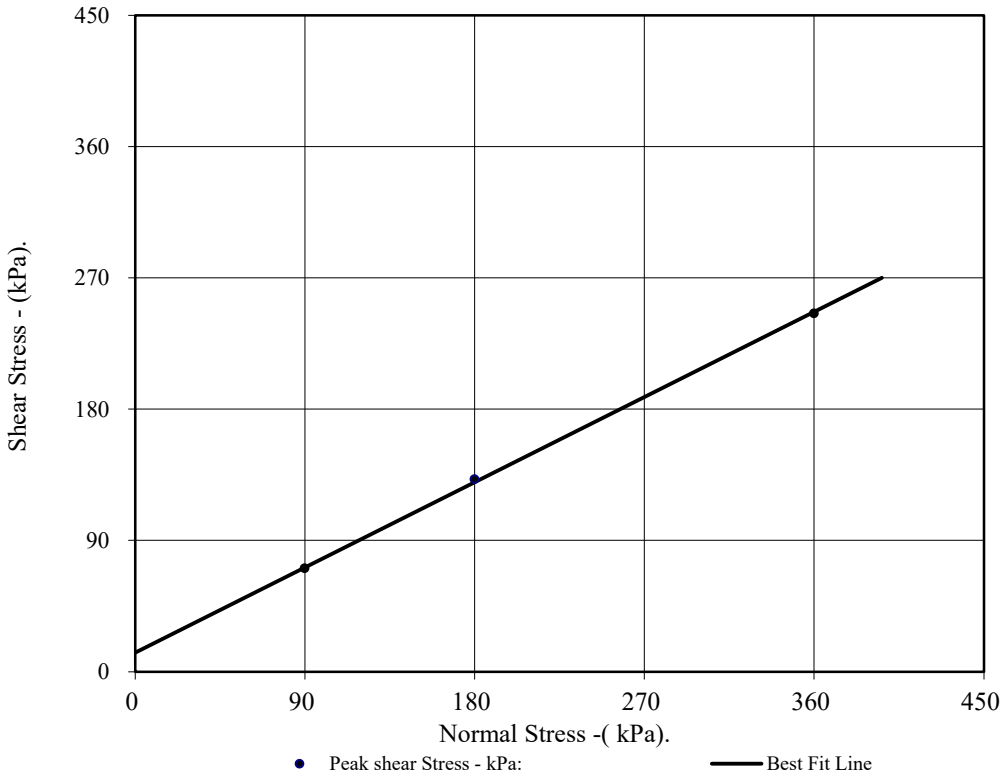
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**		Top Depth:	**9.20**
Sample Number:	**10**		Base Depth:	**9.65**
Sample Conditions:	Submerged		Sample Type	**D**
Particle Density - Mg/m3:	2.65	Assumed	**Remarks:**	
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.			
Sample Description:	**See summary of soil descriptions.**			

STAGE	**1**	**2**	**3**
Initial Conditions			
Height - mm:	20.02	20.02	20.02
Length - mm:	59.97	59.97	59.97
Moisture Content - %:	12	12	12
Bulk Density - Mg/m3:	2.14	2.14	2.14
Dry Density - Mg/m3:	1.91	1.91	1.91
Voids Ratio:	0.389	0.389	0.389
Normal Pressure- kPa	90	180	360
Consolidation Stage			
Consolidated Height - mm:	19.23	18.98	18.78
Shearing Stage			
Rate of Strain - mm/min	0.063	0.063	0.063
Displacement at peak shear stress - mm	4.21	4.21	5.41
Peak shear Stress - kPa:	71	132	246
Final Consolidated Conditions			
Moisture Content - %:	19	18	17
Bulk Density - Mg/m3:	2.22	2.25	2.28
Dry Density - Mg/m3:	1.87	1.91	1.94
Peak			
Angle of Shearing Resistance:(~~θ~~)	**33**		
Effective Cohesion - kPa:	**13**		

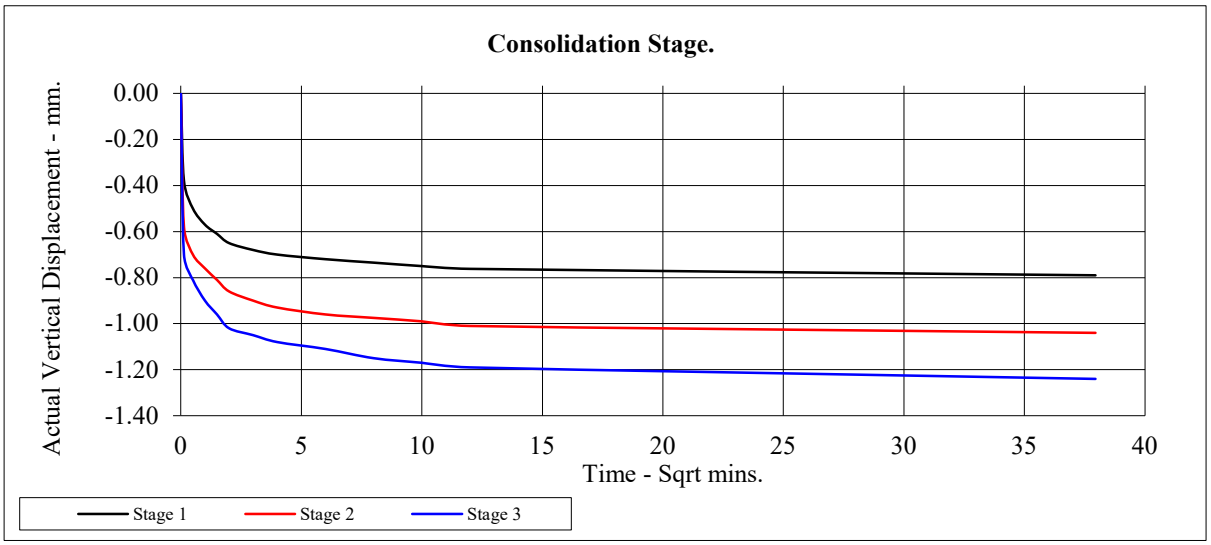


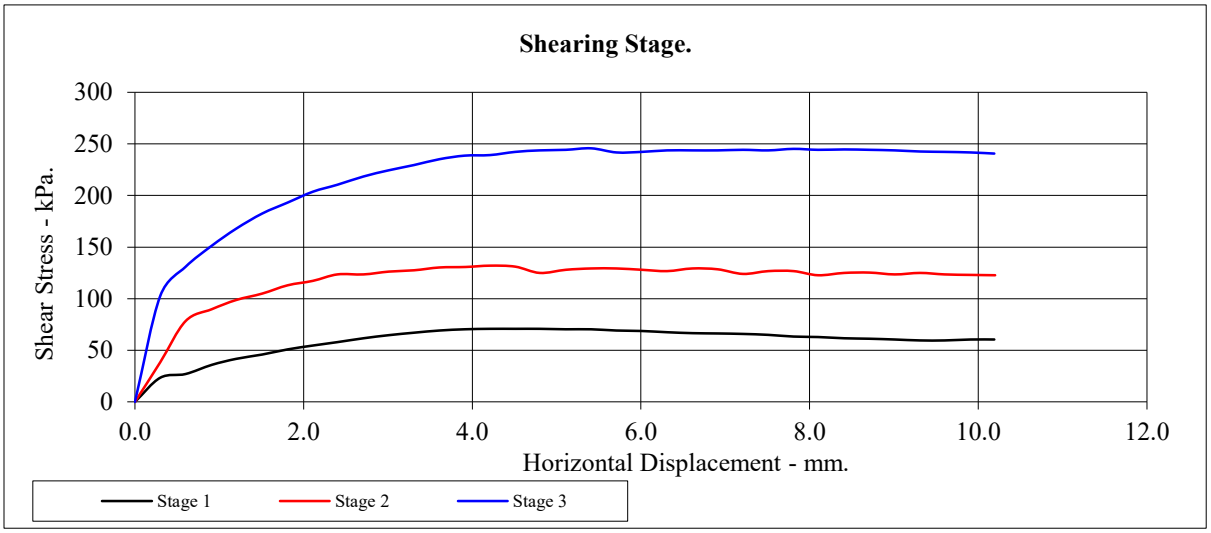
UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** PSL23/6016 **Client Ref:** G230600

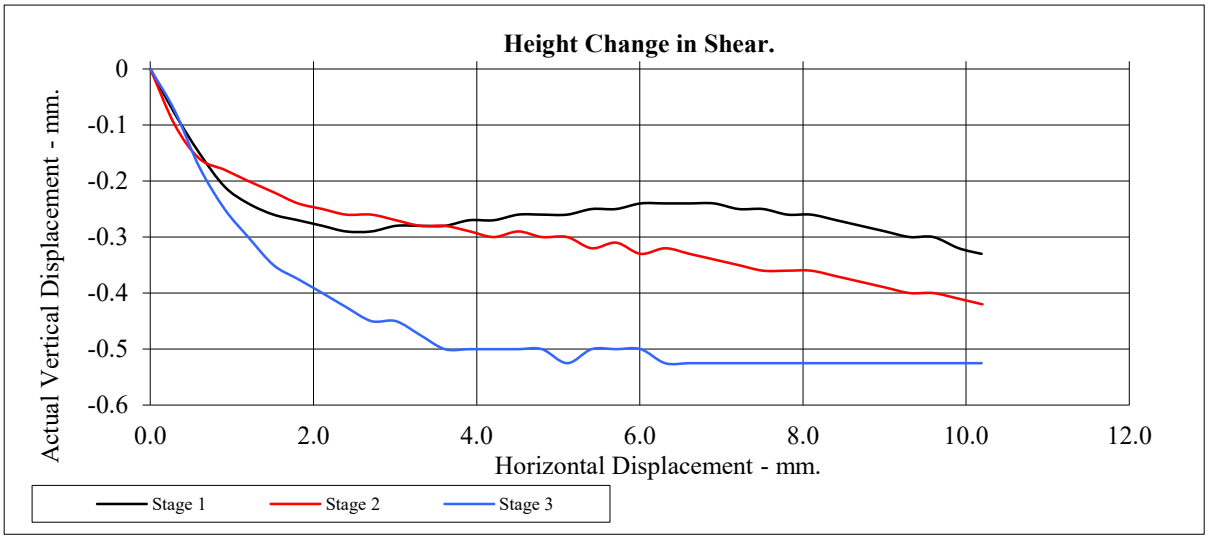
CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	**BH1933S**	Top Depth:	**9.20**
Sample Number:	**10**	Base Depth:	**9.65**







UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**M1 J23a-J25**	**Contract No:** **PSL23/6016** **Client Ref:** **G230600**

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L23/03926/PSL - 23-35886

Your Project Reference:	**PSL23/6016 M1 J23a-J25**		
Your Order Number:	PSL	Samples Received / Instructed:	28/07/2023 / 28/07/2023
Report Issue Number:	1	Sample Tested:	28/07 to 03/08/2023
Samples Analysed:	6 soil samples	Report issued:	03/08/2023

[redacted]
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 26.07.23

Issued by: J. Gane

Issue No: 4

Rev No: 2

4161

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03926/PSL - 23-35886

Project Reference - PSL23/6016 M1 J23a-J25

Analytical Test Results - Chemical Analysis

Lab Reference			307141	307142	307143	307144	307145	307146
Client Sample ID			-	-	-	-	-	-
Client Sample Location			BH1877N	BH1877N	BH1902N	BH1902N	BH1933N	BH1933N
Client Sample Type			D	D	B	D	B	D
Client Sample Number			13	2	12	13	`1	17
Depth - Top (m)			0.50	1.20	1.20	1.40	1.20	1.90
Depth - Bottom (m)			0.50	1.65	1.30	1.50	1.30	2.00
Date of Sampling			-	-	-	-	-	-
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Other	Clay	Sand	Other	Clay	Clay
Determinant	**Units**	**Accreditation**						
Water soluble sulphate (as SO_4)	(mg/l)	u	54	61	57	35	81	37
Acid Soluble Sulphate	(%)	u	0.05	0.04	0.05	0.05	0.06	0.05
Total Sulphur	(%)	UKAS	0.04	0.03	0.08	0.02	0.02	0.02
pH Value	pH Units	MCERTS	9.7	9.4	9.4	9.0	9.5	9.6
Water Soluble Chloride	(mg/l)	u	23	210	30	51	93	120
Water Soluble Nitrate (As NO_3)	(mg/l)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Magnesium	(mg/l)	u	2.5	2.5	7.5	8.6	7.9	6.0
Water Soluble Ammonium Ion	(mg/l)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03926/PSL - 23-35886

Project Reference - PSL23/6016 M1 J23a-J25

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
307141	-	BH1877N	D	13	Grey crushed rock	9.6	< 0.1	45
307142	-	BH1877N	D	2	Brown slightly gravelly silty clay	8.7	< 0.1	93
307143	-	BH1902N	B	12	Brown very gravelly silty sand	11	< 0.1	37
307144	-	BH1902N	D	13	Greyish brown slightly clayey silt	10	< 0.1	49
307145	-	BH1933N	B	`1	Brown slightly gravelly silty clay	9.7	< 0.1	29
307146	-	BH1933N	D	17	Brown gravelly silty clay	11	< 0.1	37

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CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03926/PSL - 23-35886

Project Reference - PSL23/6016 M1 J23a-J25

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
307141	-	BH1877N	D	13	
307142	-	BH1877N	D	2	
307143	-	BH1902N	B	12	
307144	-	BH1902N	D	13	
307145	-	BH1933N	B	`1	
307146	-	BH1933N	D	17	

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CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/03926/PSL - 23-35886

Project Reference - PSL23/6016 M1 J23a-J25

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

4161

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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

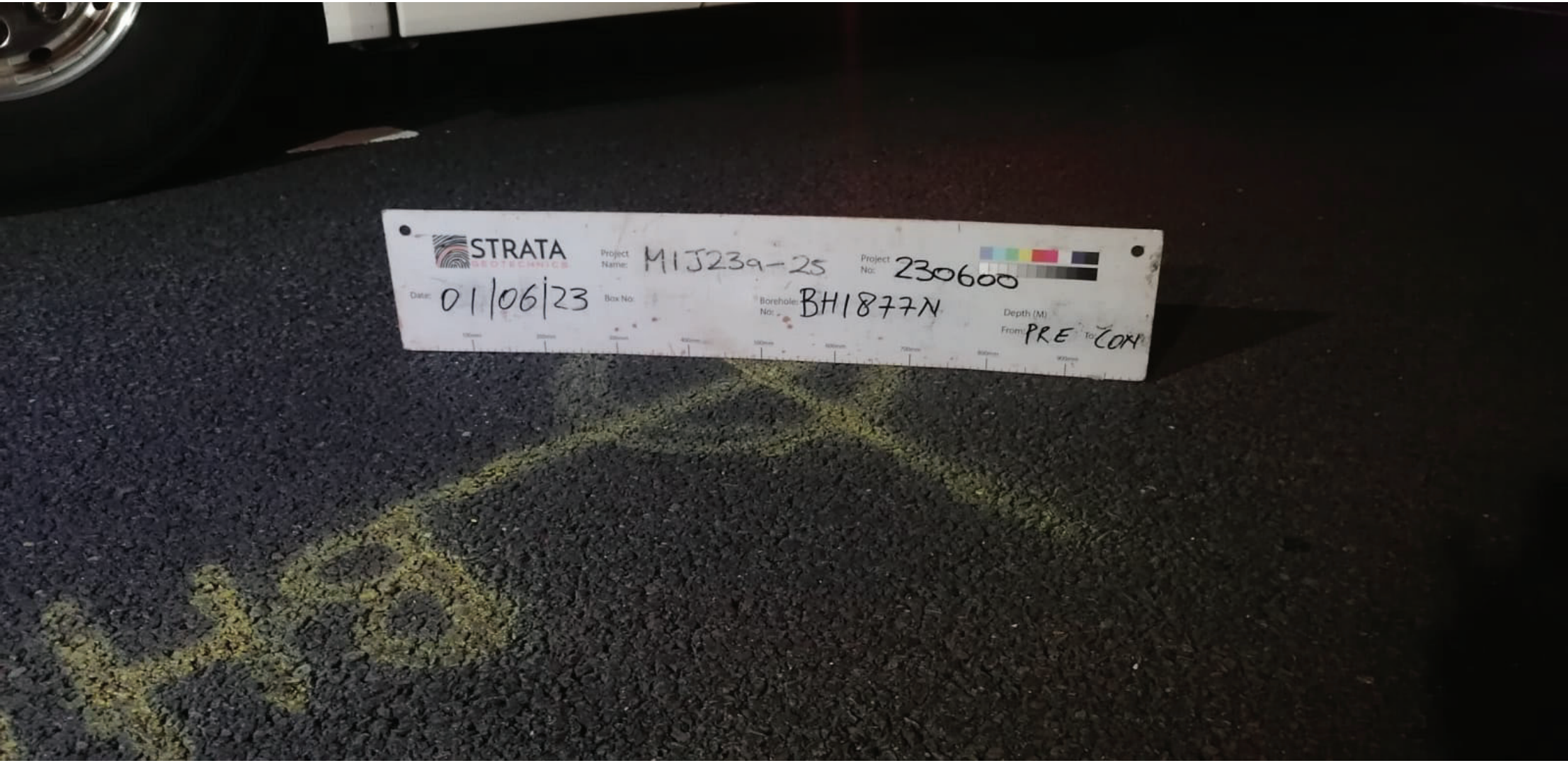
A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

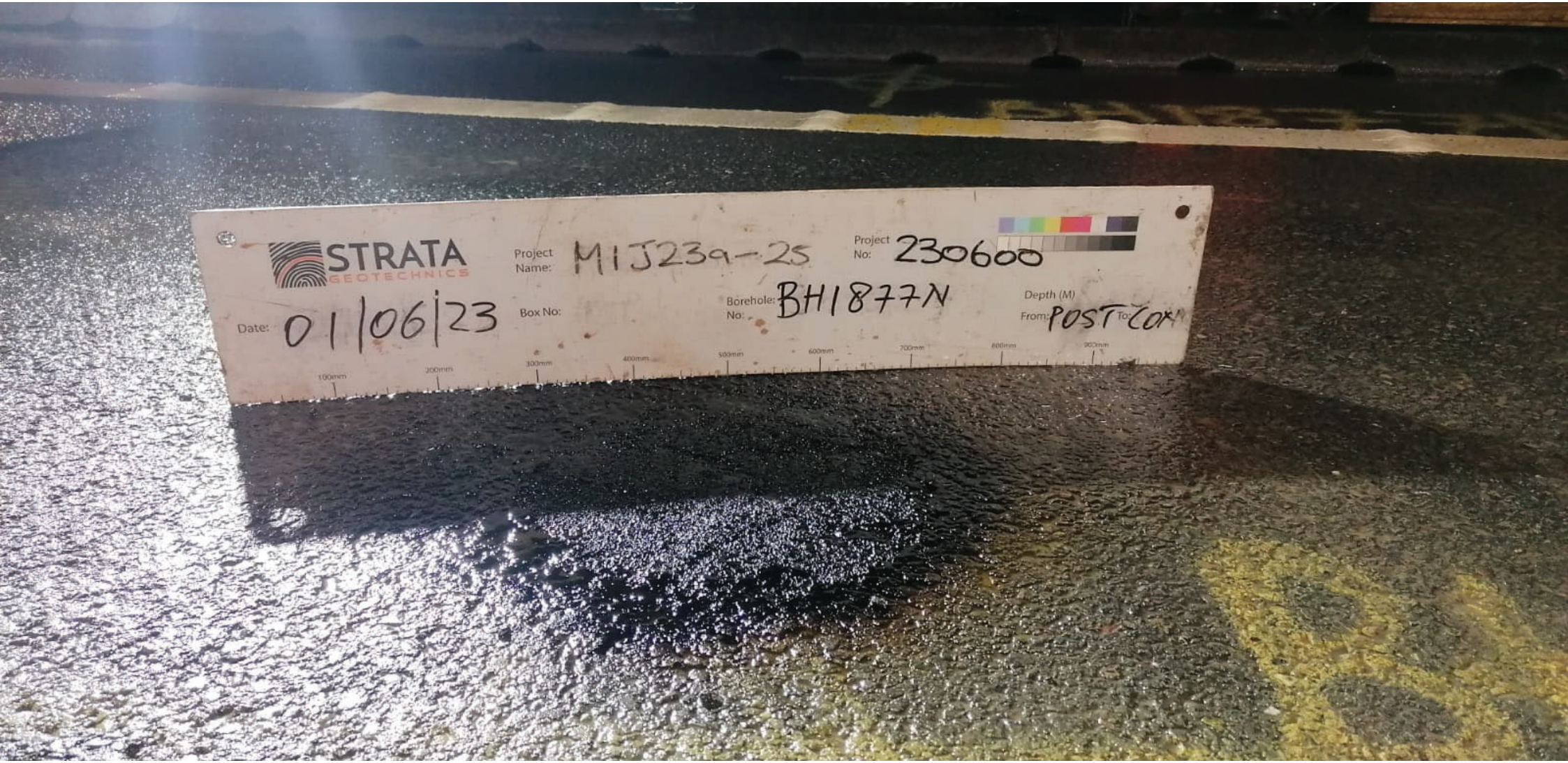
Observations whist in laboratory

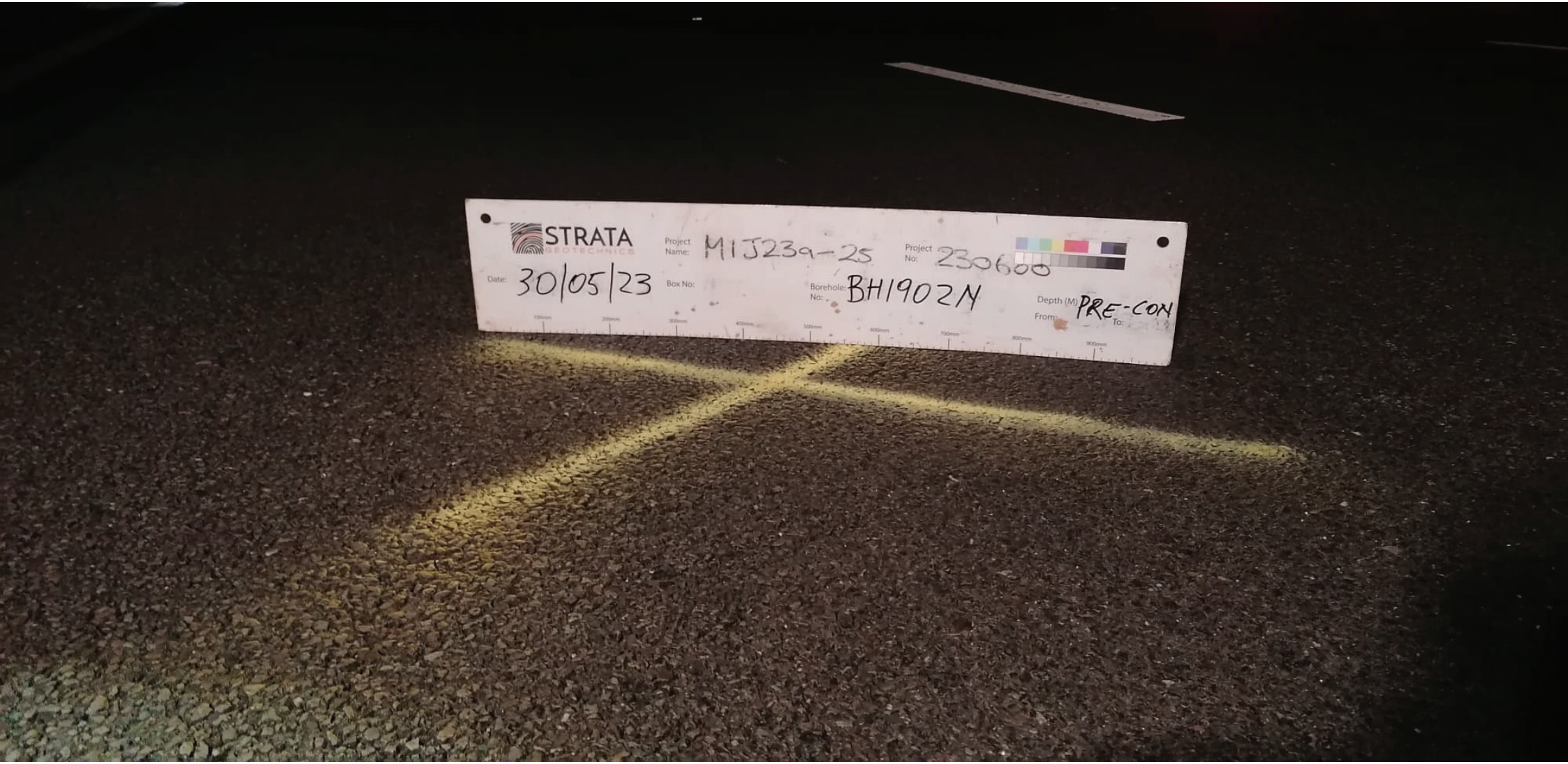
X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
307141	-	BH1877N	D	13		A
307142	-	BH1877N	D	2		A
307143	-	BH1902N	B	12		A
307144	-	BH1902N	D	13		A
307145	-	BH1933N	B	`1		A
307146	-	BH1933N	D	17		A

Appendix D: Core & Dynamic Sample Photographs


STRATA
GEOTECHNICS
Project Name: M1J23a-25
Project No: 230600
Date: 01/06/23
Box No:
Borehole No: BH1877N
Depth (M) From: PRE To: CON


STRATA
GEOTECHNICS
Project Name: M1J23a-25
Project No: 230600
Date: 01/06/23
Box No:
Borehole No: BH1877N
Depth (M)
From: POST To: COX
100mm
200mm
300mm
400mm
500mm
600mm
700mm
800mm
900mm


STRATA
GEOTECHNICS
Project Name: M1J23a-25
Project No: 230600
Date: 30/05/23
Box No:
Borehole No: BH1902N
Depth (M) From: PRE-CON To:


STRATA
GEOTECHNICS
Project Name: M1J23a-25
Project No: 230600
Date: 31/05/23
Box No:
Borehole No: BH1902N
Depth (M)
From: POST
To: CON


STRATA
GEOTECHNICS
Project Name:
MI J239-25
Project No:
230600
Borehole No:
BH1902N
Depth (M)
From:
1.20
To:
Date:
31/05/23
Box No:
100mm
200mm
300mm
400mm
500mm
600mm
700mm
800mm
900mm


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1902N
Depth (M) From: 1.20 To: 2.20


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1902N
Depth (M) From: 2.20 To: 3.00


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1902N
Depth (M) From: 3.0 To: 4.0


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Box No:
Borehole No: BH1902N
Depth (M) From: 4.0 To: 5.0
Date: 02/6/23


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Box No:
Borehole No: BH1902N
Depth (M) From: 6.0 To: 7.0
Date: 02/6/23


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1902N
Depth (M) From: 7.0 To: 8.0


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1902N
Depth (M) From 8.0 To: 9.0


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1902N
Depth (M) From: 9.0 To: 10.0


STRATA
GEOTECHNICS
Project Name: M1_J23A-25
Project No: 230600
Box No:
Borehole No: BH1877N
Depth (M) From: 1.20 To: 2.20
Date: 02/6/23


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Daté: 02/6/23
Box No:
Borehole No: BH1877N
Depth (M) From: 3.0 To: 4.03


STRATA
GEOTECHNICS
Project Name: M1_J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH1877N
Depth (M)
From: 40
To: 50


STRATA
GEOTECHNICS
Project Name: M1_J23A-25
Project No: 230600
Date: 02/6/23
Box No:
Borehole No: BH187N
Depth (M) From: 7.0 To: 8.0

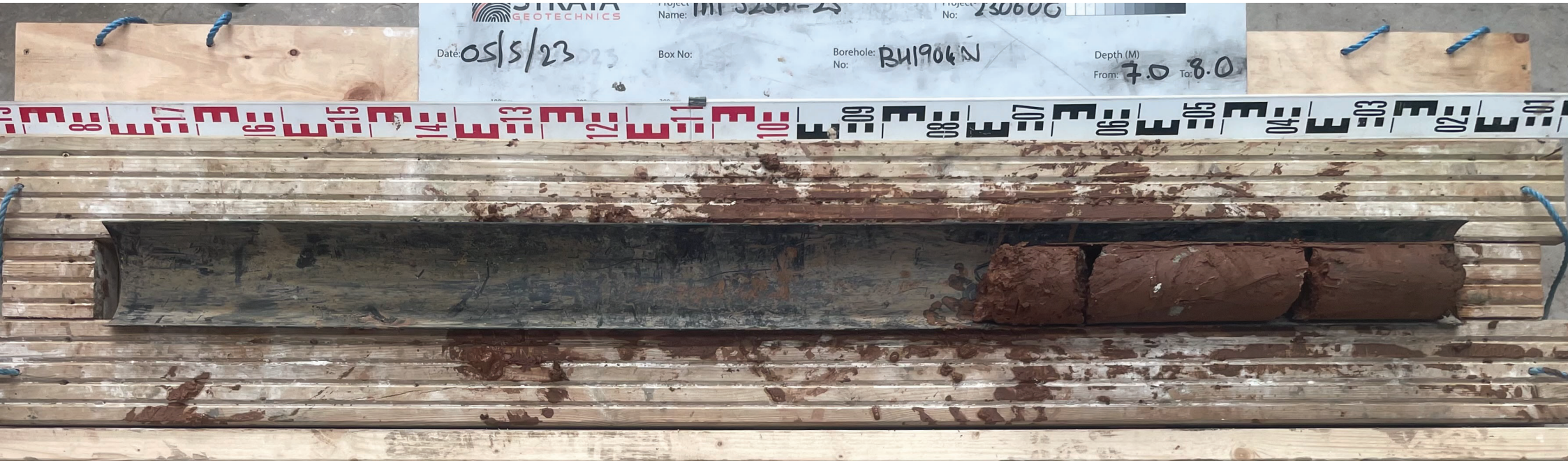

STRATA
GEOTECHNICS
Project Name: M1-J23a-2S
Project No: 230600
Date: 04/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 1.20 To: 2.0


STRATA
GEOTECHNICS
Project Name: M1-J23a-2S
Project No: 230600
Date: 04/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 2.0 To: 3.0


STRATA
GEOTECHNICS
Project Name: M1-J23a-2S
Project No: 230600
Date: 04/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 3.0 To: 4.0


STRATA
GEOTECHNICS
Project Name: M1-J23a-2S
Project No: 230600
Date: 04/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 4.0 To: 5.0


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 05/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 6.0 To: 7.0


STRATA
GEOTECHNICS
Name:
No:
Date: 05/5/23
Box No:
Borehole: No: BH1904N
Depth (M)
From: 7.0 To: 8.0

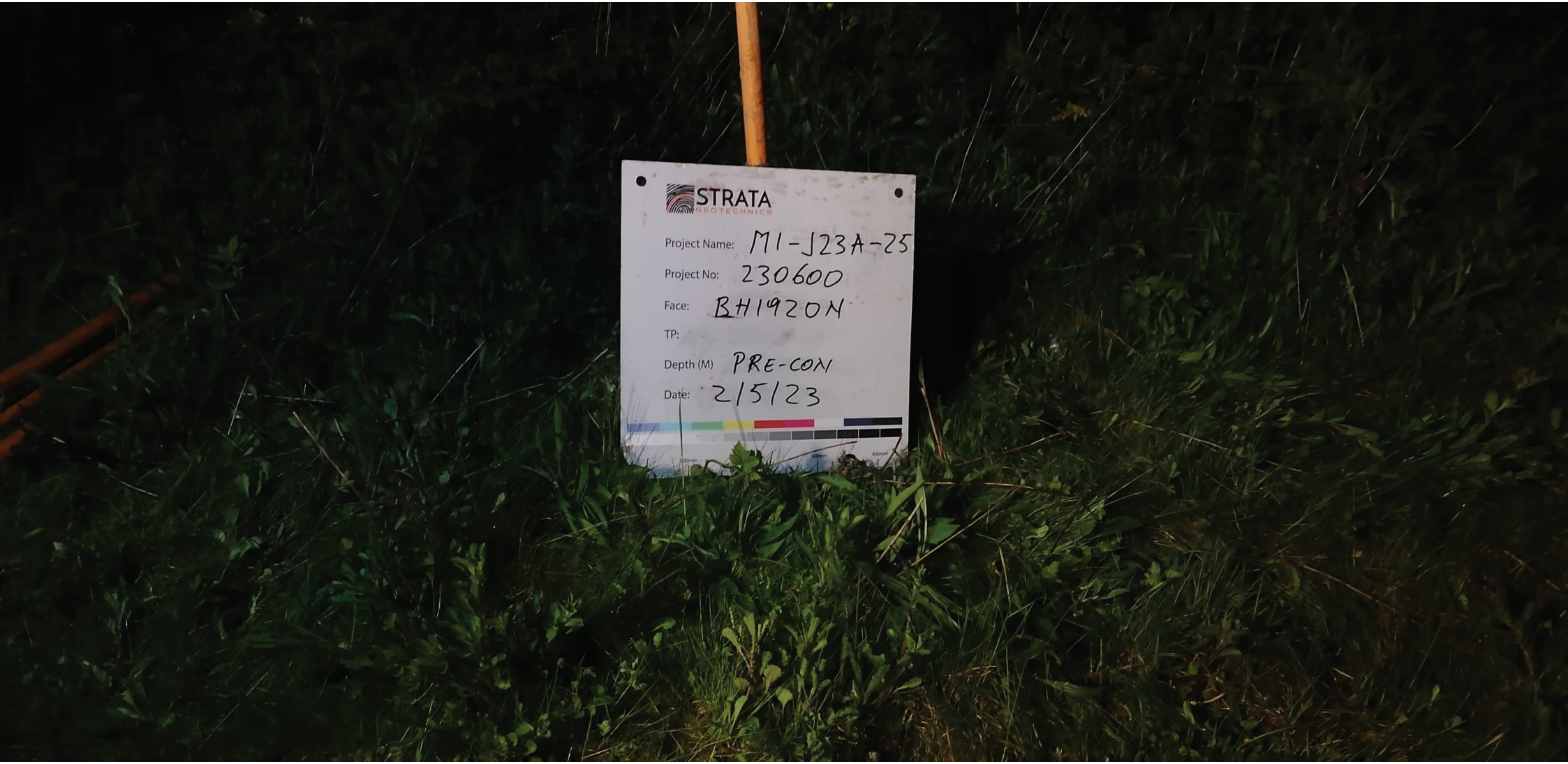

STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 09/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 8.0 To: 9.50


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230606
Date: 11/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 11.00 To: 12.00


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 11/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 13.50 To: 15.0


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 11/5/23
Box No:
Borehole No: BH904N
Depth (M) From: 16.00 To: 17.0


STRATA
GEOTECHNICS
Project Name: M1-23A-25
Project No: 230609
Date: 15/23
Box No:
Borehole No: BHS1904N
Depth (M) From: 19.50 To: 20.0


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Face: BH19ON
TP:
Depth (M) PRE-CON
Date: 2/5/23


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Face: BH1920N
TP:
Depth (M) 1.20
Date: 21/5/23
200mm
300mm
400mm


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 05/5/23
Box No:
Borehole No: BH1920N
Depth (M) From: 1.20 To: 2.20


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230606
Date: 05/5/23
Box No:
Borehole No: BH192DN
Depth (M) From: 2.80 To: 3.80

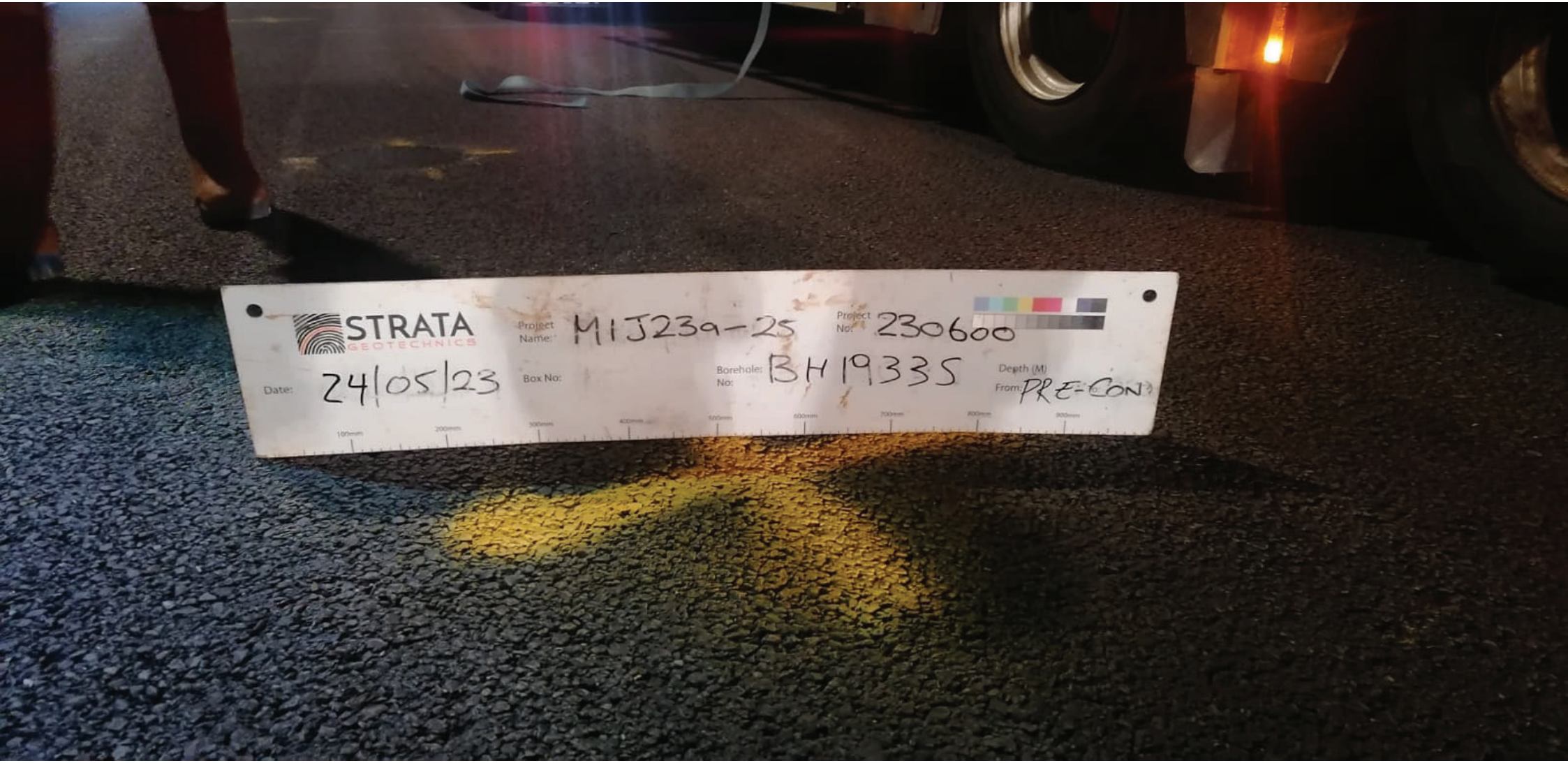

STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 05/5/23
Box No:
Borehole No: BH1920N
Depth (M)
From: 3.80
To: 4.80

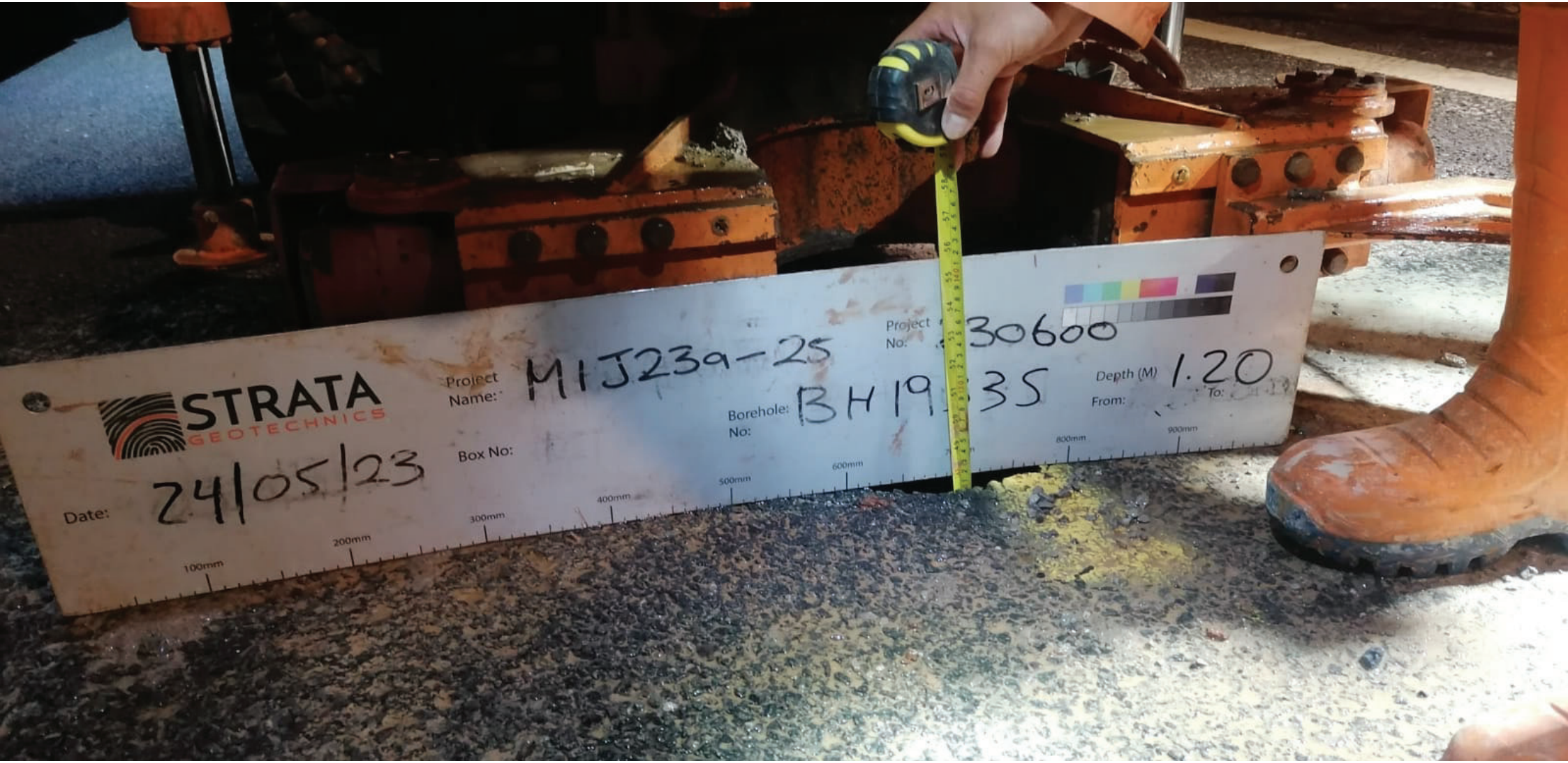

STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 09/5/23
Box No:
Borehole No: BH12cN
Depth (M) From: 5.0 To: 6.0


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 09/5/23
Box No:
Borehole No: B41920N
Depth (M) From 60 To: 70


STRATA
GEOTECHNICS
Project Name: M1 J23A-25
Project No: 230600
Date: 09/5/23
Box No:
Borehole No: B41920N
Depth (M) From: 7.0 To: 8.0

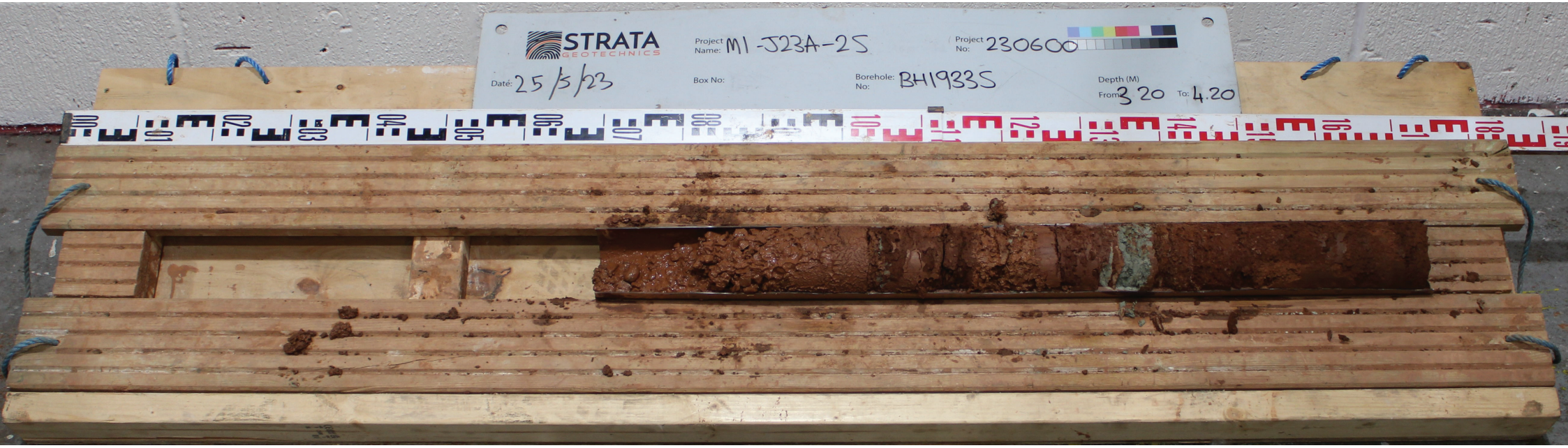

STRATA
GEOTECHNICS
Project Name: MIJ23A-2S
Project No: 230600
Date: 09/5/23
Box No:
Borehole No: BH1904N
Depth (M) From: 8.0 To: 9.50


STRATA
GEOTECHNICS
Project Name: M1J23a-25
Project No: 230600
Date: 24/05/23
Box No:
Borehole No: BH19335
Depth (M) From: PRE-CON


STRATA
GEOTECHNICS
Project Name: MIJ239-25
Project No: 30600
Borehole No: BH19 35
Depth (M) From: 1.20 To:
Box No:
Date: 24/05/23
100mm
200mm
300mm
400mm
500mm
600mm
800mm
900mm

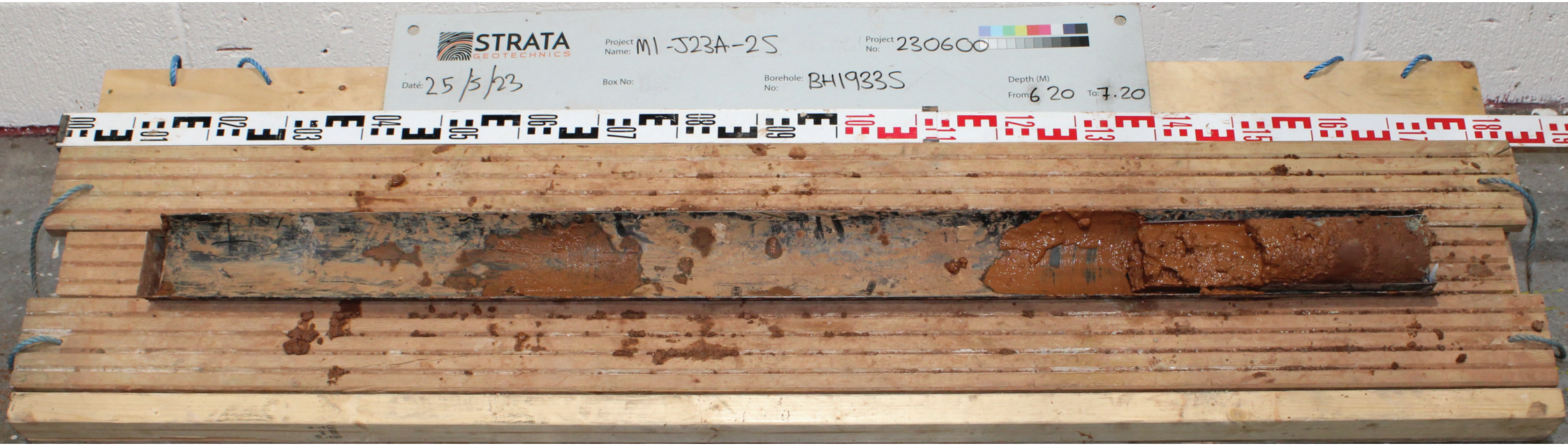

STRATA
GEOTECHNICS
Project Name: M1-J23A-2S
Project No: 230600
Date: 25/5/23
Box No:
Borehole No: BH1933S
Depth (M) From: 1.20 To: 2.20


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 25/5/23
Box No:
Borehole No: BH1933S
Depth (M) From: 2.20 To: 3.20


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 25/5/23
Box No:
Borehole No: BH1933S
Depth (M) From 3.20 To: 4.20


STRATA
GEOTECHNICS
Project Name: M1-J23A-2S
Project No: 230600
Date: 25/5/23
Box No:
Borehole No: BH1933S
Depth (M) From 4.20 To: 5.20


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 25/5/23
Box No:
Borehole No: BH1933S
Depth (M) From 5.20 To: 6.20


STRATA
GEOTECHNICS
Project Name: M1-J23A-25
Project No: 230600
Date: 25/5/23
Box No:
Borehole No: BH1933S
Depth (M) From 6.20 To: 7.20


STRATA
GEOTECHNICS
Project Name: M1 J23a-25
Project No: 230600
Date: 28/6/23
Box No: 1
Borehole No: BH18515
Depth (M)
From: 1.20 To: 2.00
100mm
200mm
300mm
400mm
500mm
600mm
700mm
800mm
900mm


STRATA
GEOTECHNICS
Project Name: M1 J23a-25
Project No: 230600
Date: 28/6/23
Box No: 1
Borehole No: BH18515
Depth (M)
From: 2.00 To: 3.00
100mm
200mm
300mm
400mm
500mm
600mm
700mm
800mm
900mm


STRATA
GEOTECHNICS
Project Name: M1 J23a-25
Project No: 230600
Date: 28/6/23
Box No: 2
Borehole No: BH18515
Depth (M)
From: 3.00 To: 4.00
100mm
200mm
300mm
400mm
500mm
600mm
700mm
800mm
900mm


STRATA
GEOTECHNICS
Project Name: M1 J23a-25
Project No: 230600
Date: 28/6/23
Box No: 3
Borehole No: BH18515
Depth (M)
From: 4.00 To: 5.00
100mm
200mm
300mm
400mm
500mm
600mm
700mm
800mm
900mm