

Appendix A

Field Work

Project Name: 77-79 Charlotte Street,

Project No.: 14653

Co-ords:

 Hole Type
 CP

Location: London W1T 4PW

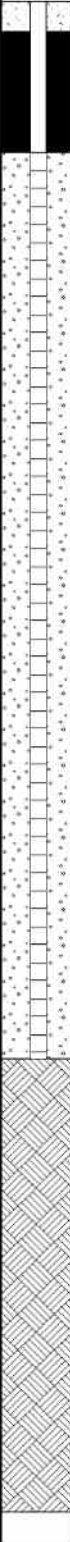
Level:

 Scale
 1:50

Client: MLM Consulting

Dates: 19/12/2014 - 23/12/2014

 Logged By
 RV

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			CONCRETE	
		0.50	D					Dark brown slightly sandy clayey GRAVEL with occasional brick fragments and concrete. Gravel is sub-rounded to sub-angular. MADE GROUND	
		1.00			1.00			CONCRETE	1
		1.10			1.10			Dark brown slightly sandy clayey GRAVEL with occasional brick fragments and concrete. Gravel is sub-rounded to sub-angular. MADE GROUND	
		1.50	SPT	N=6 (5,7/3,2,1,0)	1.50			Dark brown slightly sandy CLAY with lots of gravel and concrete fragments, brick fragments, some concrete fragments are cobble size. MADE GROUND	2
		1.50	D&B&C						
		2.50	D&B&C		2.50			Dark grey sandy silty CLAY with significant deposits of brick, concrete and sub-angular to sub-rounded gravel. MADE GROUND	3
		2.50	SPT	N=6 (1,0/1,2,1,2)					
		3.50	D&B&C		3.50			Dark grey gravelly silty SAND. Gravel is sub-rounded to sub-angular. MADE GROUND	4
		3.50	SPT	N=31 (3,4/5,7,7,12)					
		4.50	SPT	N=14 (1,2/2,3,4,5)	4.50			Brown very gravelly coarse SAND. Gravel is fine coarse and angular to rounded. LYNCH HILL GRAVEL MEMBER	5
		4.50	D&B&C						
		5.50	D						
		6.00	SPT	N=22 (2,3/4,6,6,6)					6
		6.00	C&D						
		6.50	D						
		6.90	D		6.90			Firm brown silty CLAY. LONDON CLAY FORMATION	7
		7.30			7.30			Stiff becoming very stiff slightly fissured to fissured dark grey silty CLAY. LONDON CLAY FORMATION	
		7.50	SPT	N=14 (1,2/2,3,4,5)					
		7.50 - 7.95	S						
		8.00	D						8
		9.00 - 9.45	U	Ublow=28					9
		9.50	D						
Continued on Next Sheet									

General Remarks:

Transport rig and equipment to site. 1 Hour waiting for access to site. 4 Hours moving rig and equipment down stairs into basement lightwell and rebuild rig. 30 Minutes unscrewing and cutting out screws, bolts and taking down overhead panels and run cables for electric. Set up on borehole 1. Install pipe at 7.00m bgl. 3 Hours move rig and equipment off of site.

Groundwater Remarks: Groundwater at 3.95m bgl in well on 07.01.15.

Borehole Type

CP: Cable Percussive
 WS: Windowless Sampler
 RC: Rotary Cored

Sample Types

D: Disturbed
 B: Bulk
 J: Jar
 W: Water
 U: Undisturbed

In-Situ Testing

SPT: Split spoon - Standard Penetration Test
 CPT: Cone - Standard Penetration Test

Project Name: 77-79 Charlotte Street,	Project No.: 14653	Co-ords:	Hole Type CP
Location: London W1T 4PW		Level:	Scale 1:50
Client: MLM Consulting		Dates: 19/12/2014 - 23/12/2014	Logged By RV

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50 10.50 - 10.95	SPT S	N=27 (2,4/6,6,7,8)					
		11.00	D						11
		12.00 - 12.45	U	Ublow=30					12
		12.50	D						13
		13.50 - 13.95 13.50	S SPT	N=30 (3,5/6,7,8,9)					14
		14.00	D						15
		15.00 - 15.45	U	Ublow=34					16
		15.50	D						17
		16.50 16.50 - 16.95	SPT S	N=34 (4,5/7,8,9,10)					18
		17.00	D						19
		18.00 - 18.45	U	Ublow=37					20
		18.50	D						
		19.50 19.50 - 19.95	SPT S	N=35 (4,6/7,9,9,10)					
		20.00	D						
Continued on Next Sheet									

General Remarks:

Transport rig and equipment to site. 1 Hour waiting for access to site. 4 Hours moving rig and equipment down stairs into basement lightwell and rebuild rig. 30 Minutes unscrewing and cutting out screws, bolts and taking down overhead panels and run cables for electric. Set up on borehole 1. Install pipe at 7.00m bgl. 3 Hours move rig and equipment off of site.

Groundwater Remarks: Groundwater at 3.95m bgl in well on 07.01.15.

Borehole Type

CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored

Sample Types

D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed

In-Situ Testing

SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

Project Name: 77-79 Charlotte Street,	Project No.: 14653	Co-ords:	Hole Type CP
Location: London W1T 4PW		Level:	Scale 1:50
Client: MLM Consulting		Dates: 19/12/2014 - 23/12/2014	Logged By RV

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		21.00 - 21.45	U	Ublow=36					21
		21.50	D						22
		22.50 - 22.95 22.50	S SPT	N=36 (5,6/7,8,10,11)					23
		23.00	D						24
		24.00 - 24.45	U	Ublow=40					25
		24.50	D						26
					25.00			End of Borehole at 25.00m	27
									28
									29
									30

General Remarks: Transport rig and equipment to site. 1 Hour waiting for access to site. 4 Hours moving rig and equipment down stairs into basement lightwell and rebuild rig. 30 Minutes unscrewing and cutting out screws, bolts and taking down overhead panels and run cables for electric. Set up on borehole 1. Install pipe at 7.00m bgl. 3 Hours move rig and equipment off of site.	Borehole Type CP: Cable Percussive WS: Windowless Sampler RC: Rotary Cored	Sample Types D: Disturbed B: Bulk J: Jar W: Water U: Undisturbed
	In-Situ Testing SPT: Split spoon - Standard Penetration Test CPT: Cone - Standard Penetration Test	

Groundwater Remarks: Groundwater at 3.95m bgl in well on 07.01.15.



Project Name: 77-79 Charlotte Street,	Project No.: 14653	Co-ords:	Hole Type WS
Location: London W1T 4PW		Level:	Scale 1:50
Client: MLM Consulting		Dates: 24/11/2014 - 26/11/2014	Logged By JO

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			CONCRETE.	
								Dark brown sandy gravelly clayey SILT. Sand is fine to coarse. Gravel is fine to coarse sub-angular to sub-rounded flint, brick and concrete. MADE GROUND	
		1.50	D						1
									2
		2.50	D						3
									4
		3.50	D						5
									6
		4.50	D						7
									8
		5.30	D						9
									10
					6.00			End of Borehole at 6.00m	

General Remarks:

No roots observed. Groundwater strike at 2.01m bgl. Hole collapsed back to 3.62m bgl.

Borehole Type

CP: Cable Percussive
WS: Windowless Sampler
RC: Rotary Cored

Sample Types

D: Disturbed
B: Bulk
J: Jar
W: Water
U: Undisturbed

In-Situ Testing

SPT: Split spoon - Standard Penetration Test
CPT: Cone - Standard Penetration Test

Groundwater Remarks:

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk			Trial Pit Log		Trial Pit No. TP1 Sheet 1 of 1	
Project Name: 77-79 Charlotte Street,				Project No.: 14653		Method:		Hole Type TP
Location: London W1T 4PW						Plant:		
Client: MLM Consulting				Trial Pit Length: m		Trial Pit Width: m		Scale 1:25
Dates: 24/11/2014 - 26/11/2014				Level:		Co-ords:		Logged By JO
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.15			CONCRETE.	
	0.30	D					Dark brown sandy gravelly clayey SILT. Sand is fine to coarse gravel is fine to coarse cobble sub-angular to sub-rounded made up of brick, concrete and flint. MADE GROUND	
	0.50	D		0.50			End of Pit at 0.50m	
								1
								2
								3
								4
								5
General Remarks: No roots observed. No groundwater encountered.								Sample Type D: Disturbed B: Bulk J: Jar W: Water
Groundwater Remarks:								

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk			Trial Pit Log		Trial Pit No. TP2 Sheet 1 of 1	
Project Name: 77-79 Charlotte Street,				Project No.: 14653		Method:		Hole Type TP
Location: London W1T 4PW						Plant:		
Client: MLM Consulting				Trial Pit Length: m		Trial Pit Width: m		Scale 1:25
Dates: 24/11/2014 - 26/11/2014				Level:		Co-ords:		Logged By JO
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			CONCRETE.	
	0.40	D					Dark brown sandy gravelly clayey SILT. Sand is fine to coarse. Gravel is fine to coarse cobble sub-angular to sub-rounded fine, brick and concrete. MADE GROUND	
	0.80	D						
				0.90			End of Pit at 0.90m	1
								2
								3
								4
								5
General Remarks:								Sample Type D: Disturbed B: Bulk J: Jar W: Water
No roots observed. No groundwater encountered.								
Groundwater Remarks:								

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk			Trial Pit Log		Trial Pit No. TP3 Sheet 1 of 1	
Project Name: 77-79 Charlotte Street,				Project No.: 14653		Method:		Hole Type TP
Location: London W1T 4PW						Plant:		
Client: MLM Consulting				Trial Pit Length: m		Trial Pit Width: m		Scale 1:25
Dates: 15/12/2014			Level:		Co-ords:		Logged By CF	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			CONCRETE.	
	0.30	D					Dark orange brown sandy gravelly CLAY. Sand id fine to coarse. Gravel is fine to coarse sub-angular to sub-rounded made up of flint, brick, concrete and metal. MADE GROUND	
	0.60	D						
	0.90	D						
	1.14	D						
				1.30			End of Pit at 1.30m	
General Remarks: No roots observed. No groundwater encountered.								
Groundwater Remarks:								
Sample Type D: Disturbed B: Bulk J: Jar W: Water								

Probe Log

Borehole No.

DP1

Sheet 1 of 1

Project Name: 77-79 Charlotte Street,

Project No.
14653

Co-ords: -

Hole Type
DP

Location: London W1T 4PW

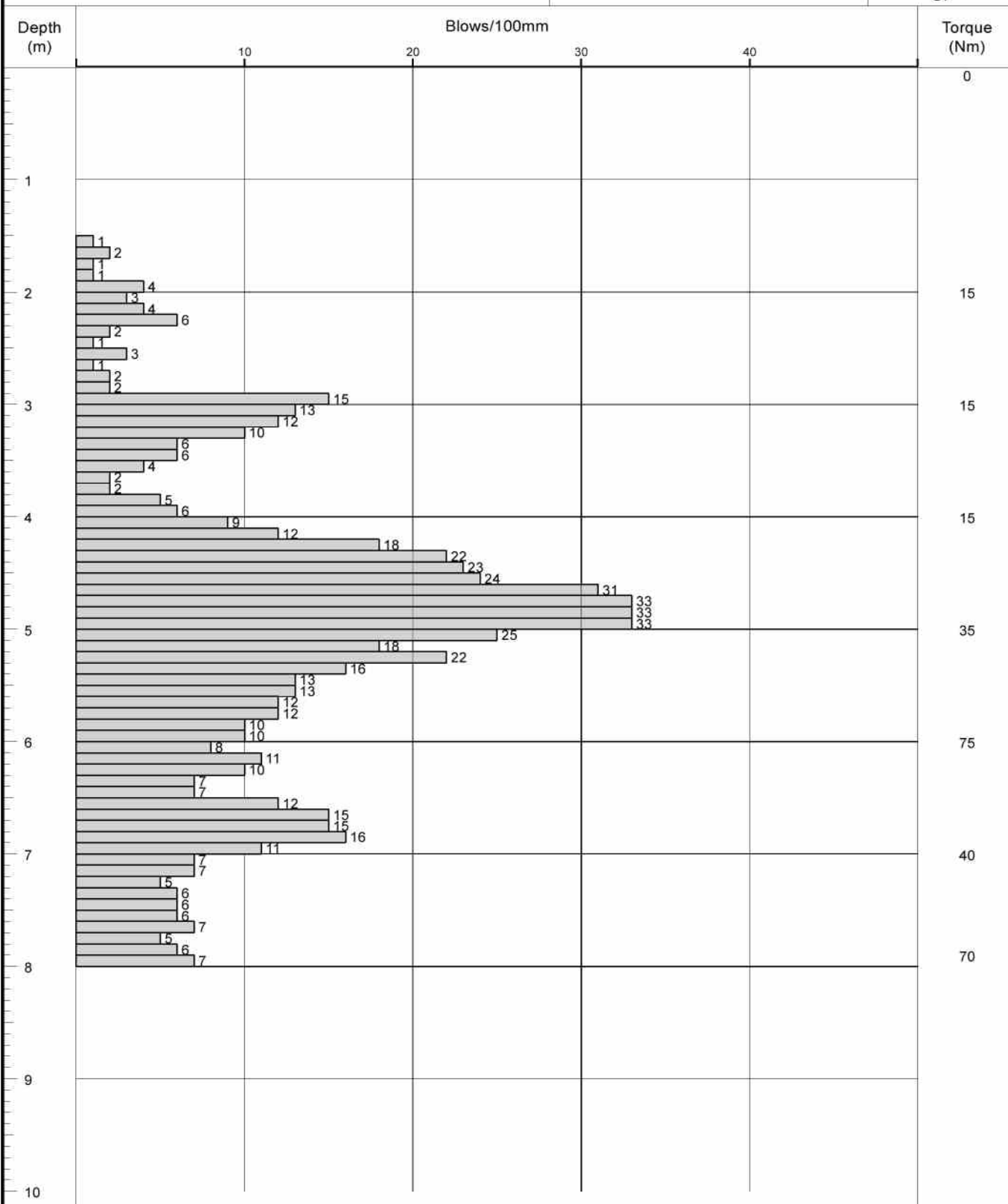
Level:

Scale
1:50

Client: MLM Consulting

Dates: 26/11/2014 -

Logged By
CF



Remarks

Fall Height 500

Cone Base Diameter 45

Hammer Wt 50

Final Depth 7.90

Probe Type DPH

Log Scale 1:50



Project Name: 77-79 Charlotte Street.

Project No.	14653
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Co-ords: -

Hole Type
DP

Location: London W1T 4PW

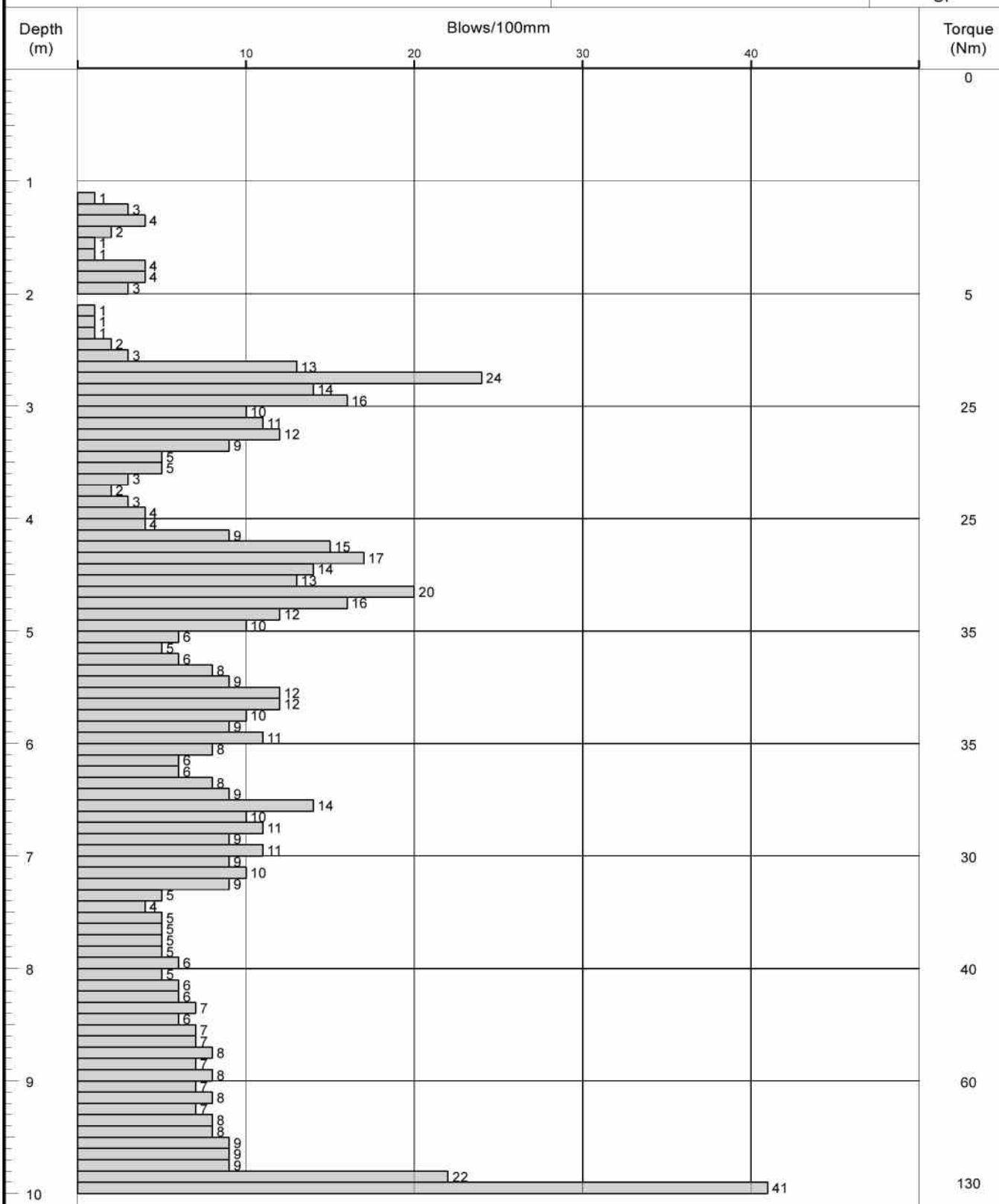
Level:

Scale
1:50

Client: MLM Consulting

Dates: 26/11/2014 -

Logged By
CF



Remarks

Fall Height	500
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Cone Base Diameter	45
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Hammer Wt	50
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Final Depth	9.90
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Probe Type	DPH
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Log Scale	1:50
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Appendix B
Geotechnical Laboratory Analysis

Client : Soils Ltd				18122		Our Job/report no:		07/01/2015		Testing Started:		22/01/2015	
Project name:				Charlotte Street, London		14653		Project Started:		Date reported:		23/01/2015	
BH / TP No	Sample no / ref	Sample depth (m)	Description	Moisture content (%)	Bulk Density (Mg/m3)	Dry density (Mg/m3)	Cell Pressure (kPa)	Strain at failure (%)	Max Deviator Stress (kPa)	Mode of failure	Shear Strength (kPa)	Phi (deg)	
BH1	U100	9.00 - 9.45	High strength slightly fissured dark grey silty CLAY	29	2.02	1.57	185	6.6	261	Brittle	131	NA	
BH1	U100	12.00 - 12.45	Very high strength fissured dark grey silty CLAY	26	2.01	1.59	245	6.1	350	Brittle	175	NA	
BH1	U100	18.00 - 18.45	High strength fissured dark grey silty CLAY - REMARKS - Sample was disturbed	25	1.96	1.56	365	4.0	210	Brittle	105	NA	
BH1	U100	24.00 - 24.45	Very high strength fissured dark grey silty CLAY	21	2.10	1.73	485	9.1	589	Compound	294	NA	

K4

SOILS

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Summary of Undrained Triaxial Compression Testing

BS 1377 : Part 7 : Clause 8 : 1990

Test Results relate only to the sample numbers shown above. All samples connected with this report, and any on 'hold' will be stored and disposed off according to company policy. A copy of this policy is available on request.

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Checked and approved

Initials kp

2519



Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Charlotte Street, London

Samples Received: 07/01/2015

Project Started: 09/01/2015

Client: Soils Ltd

Testing Started: 22/01/2015

Project no: 14653

Our job /report no: 18122

Date Reported: 23/01/2015

BH / TP no: BH1

Sample no: U100

Depth (m): 9.00

Soil Description: High strength slightly fissured dark grey silty CLAY

Sample Details

Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	29
Bulk Density	Mg/m ³	2.02
Dry Density	Mg/m ³	1.57

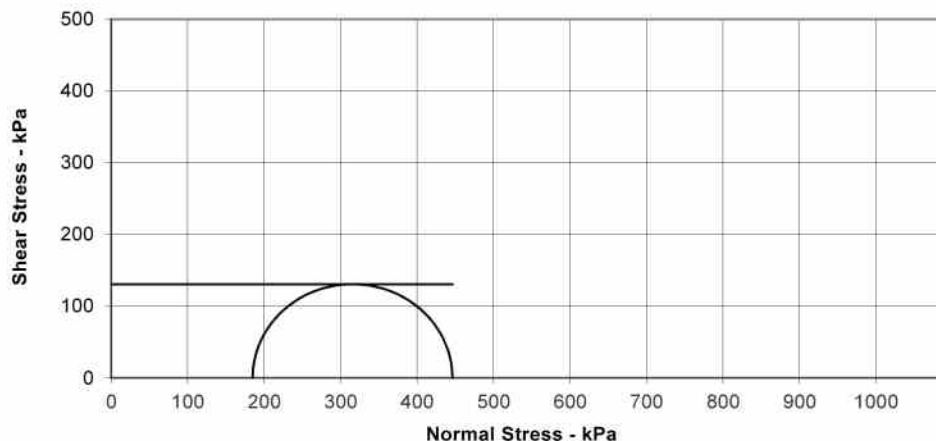
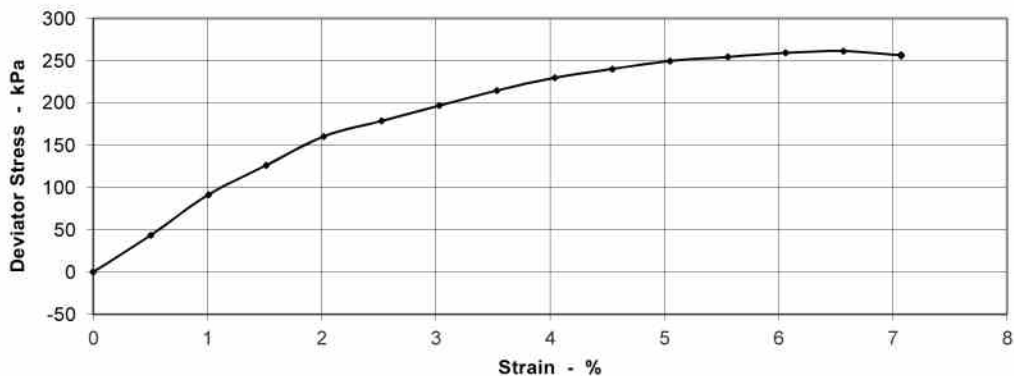
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.32
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	185
Strain at Failure	%	6.6
Maximum Deviator Stress	kPa	261
Shear Strength	kPa	131
Mode of Failure		Brittle

Position and orientation within
the original sampleShear Strength
Parameters

C 131 kPa
Phi 0.0 °

Specimen 1



K4 SOILS LABORATORY

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Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved

Initials: kp

Date: 23/01/2015



2519



Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Charlotte Street, London

Samples Received: 07/01/2015

Project Started: 09/01/2015

Client: Soils Ltd

Testing Started: 22/01/2015

Project no: 14653

Our job /report no: 18122

Date Reported: 23/01/2015

BH / TP no: BH1

Sample no: U100

Depth (m): 12.00

Soil Description: Very high strength fissured dark grey silty CLAY

Sample Details

Specimen 1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	26
Bulk Density	Mg/m ³	2.01
Dry Density	Mg/m ³	1.59

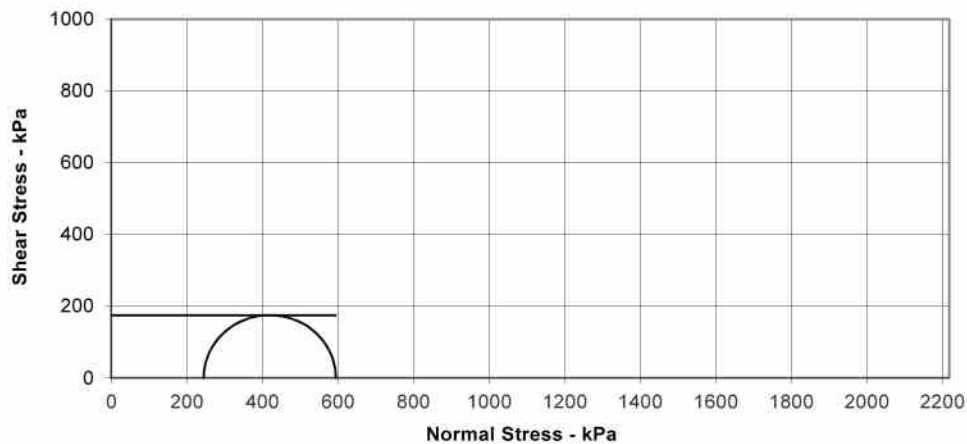
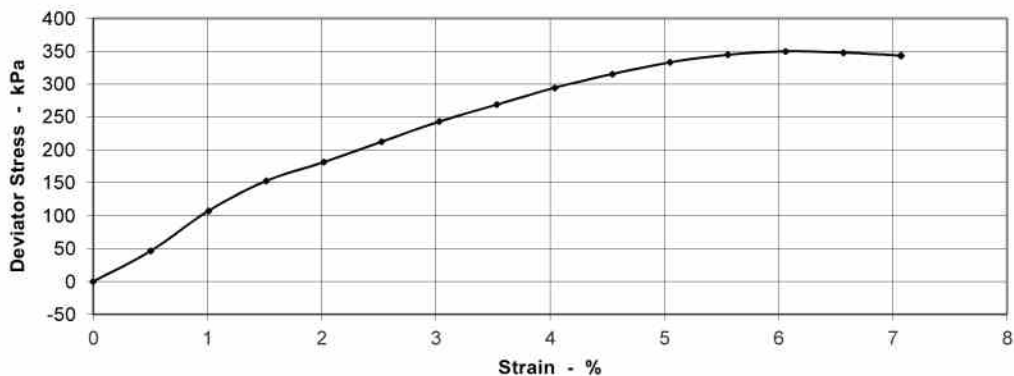
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.30
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	245
Strain at Failure	%	6.1
Maximum Deviator Stress	kPa	350
Shear Strength	kPa	175
Mode of Failure		Brittle

Position and orientation within
the original sampleShear Strength
Parameters

C 175 kPa
Phi 0.0 °

Specimen 1



K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.

Tel: 01923 711288 Fax: 01923 711311

E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved

Initials: kp

Date: 23/01/2015



2519



Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Charlotte Street, London

Samples Received: 07/01/2015

Project Started: 09/01/2015

Client: Soils Ltd

Testing Started: 22/01/2015

Project no: 14653

Our job /report no: 18122

Date Reported: 23/01/2015

BH / TP no: BH1

Sample no: U100

Depth (m): 18.00

Soil Description: High strength fissured dark grey silty CLAY - REMARKS - Sample was disturbed

Sample Details

Specimen 1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	25
Bulk Density	Mg/m ³	1.96
Dry Density	Mg/m ³	1.56

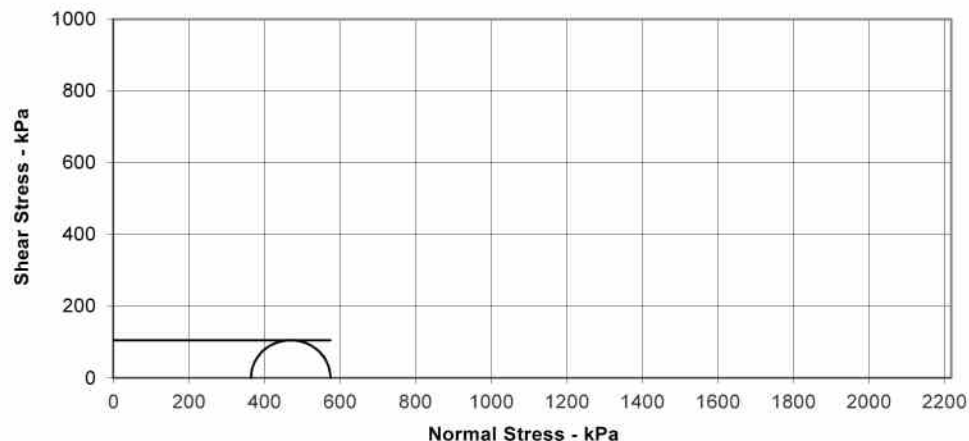
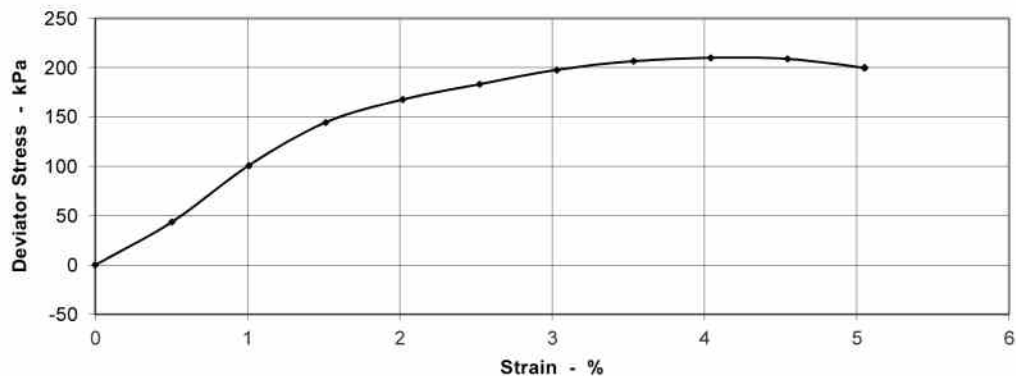
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.21
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	365
Strain at Failure	%	4.0
Maximum Deviator Stress	kPa	210
Shear Strength	kPa	105
Mode of Failure		Brittle

Position and orientation within
the original sampleShear Strength
Parameters

C 105 kPa
Phi 0.0 °

Specimen 1



K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.

Tel: 01923711288 Fax: 01923711311

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Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved

Initials: kp

Date: 23/01/2015



2519



Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Charlotte Street, London

Samples Received: 07/01/2015

Project Started: 09/01/2015

Client: Soils Ltd

Testing Started: 22/01/2015

Project no: 14653

Our job /report no: 18122

Date Reported: 23/01/2015

BH / TP no: BH1

Sample no: U100

Depth (m): 24.00

Soil Description: Very high strength fissured dark grey silty CLAY

Sample Details

Specimen 1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	102.0
Moisture Content	%	21
Bulk Density	Mg/m ³	2.10
Dry Density	Mg/m ³	1.73

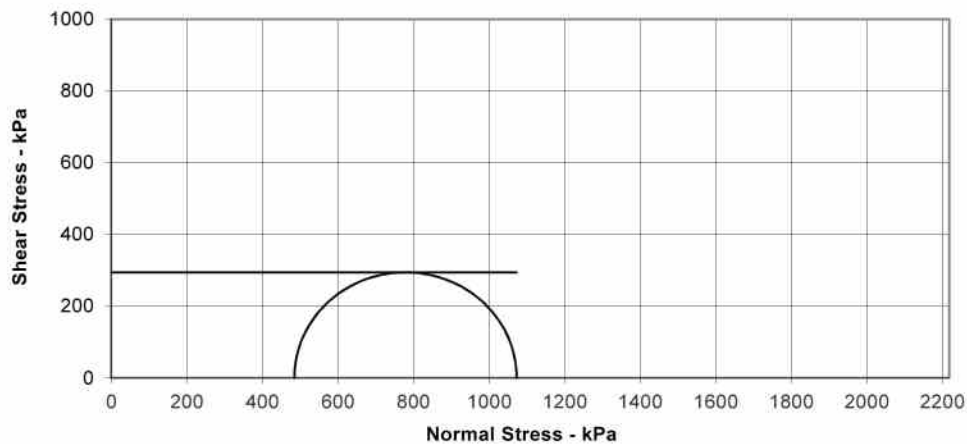
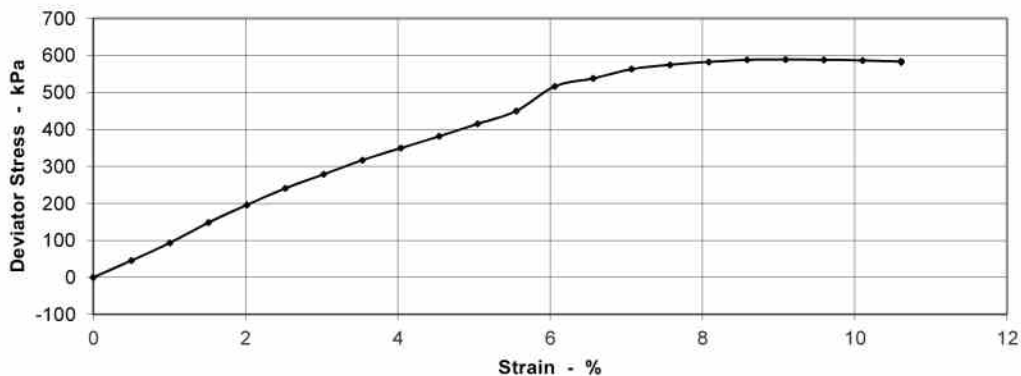
Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.41
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	485
Strain at Failure	%	9.1
Maximum Deviator Stress	kPa	589
Shear Strength	kPa	294
Mode of Failure		Compound

Position and orientation within
the original sampleShear Strength
Parameters

C 294 kPa
Phi 0.0 °

Specimen 1



K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.

Tel: 01923711288 Fax: 01923711311

E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved

Initials: kp

Date: 23/01/2015



2519

Project Name: Charlotte Street, London					Samples Received: 07/01/2015		K4 SOILS 		
Client: Soils Ltd					Project Started: 09/01/2015				
Project No: 14653					Testing Started: 22/01/2015				
Our job/report no: 18122					Date Reported: 23/01/2015				

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks (Modified PI and Class)
BH1	D	6.90	Orangey brown slightly mottled blue grey slightly sandy silty CLAY	29	71	27	44	100	44 (CV)
BH1	U100	9.00 - 9.45	High strength slightly fissured dark grey silty CLAY	29	83	28	55	100	55 (CV)

	Summary of Test Results								Checked and Approved Initials: K.P Date: 23/01/2015
	BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.								
	BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.								
	BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.								

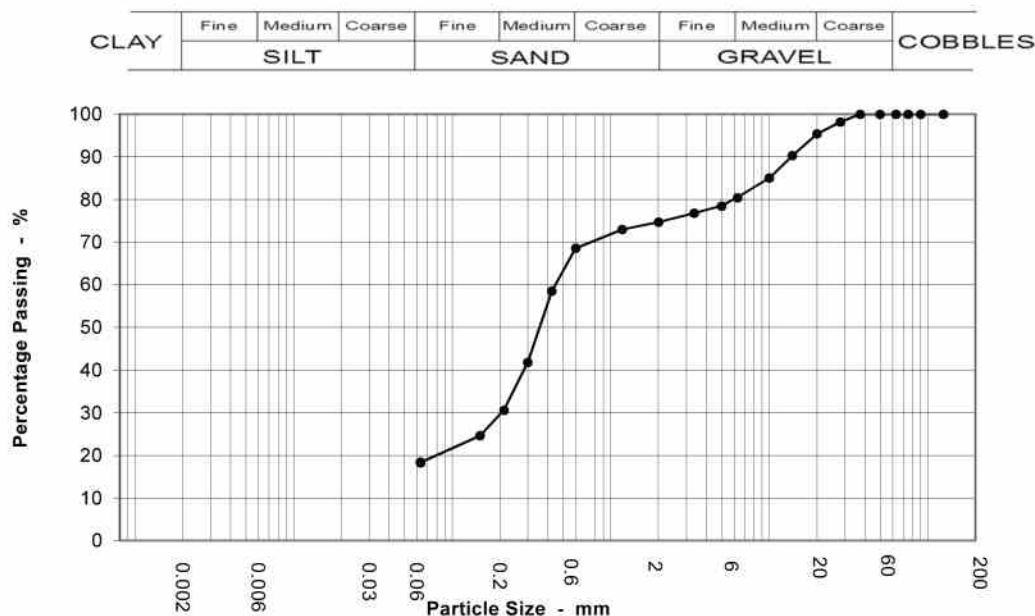
Test Report by: K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report, incl any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.

MSF-11/R2

K4 SOILS 	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	18122
		Project No:	14653
Location	Charlotte Street, London	Borehole / Trial Pit No:	BH1
Visual Soil Description	Greenish grey clayey very gravelly SAND (gravel is fmc and sub-angular to rounded)	Depth	2.50 - 3.00 m
		Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	95		
14	90		
10	85		
6.3	80		
5	78		
3.35	77		
2	75		
1.18	73		
0.6	69		
0.425	59		
0.3	42		
0.212	31		
0.15	25		
0.063	18		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	25.3
Sand	56.4
Silt & Clay	18.3

Grading Analysis	
D100	125.0
D60	0.5
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY

Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories:

K.Phaure(Tech.Mgr) J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

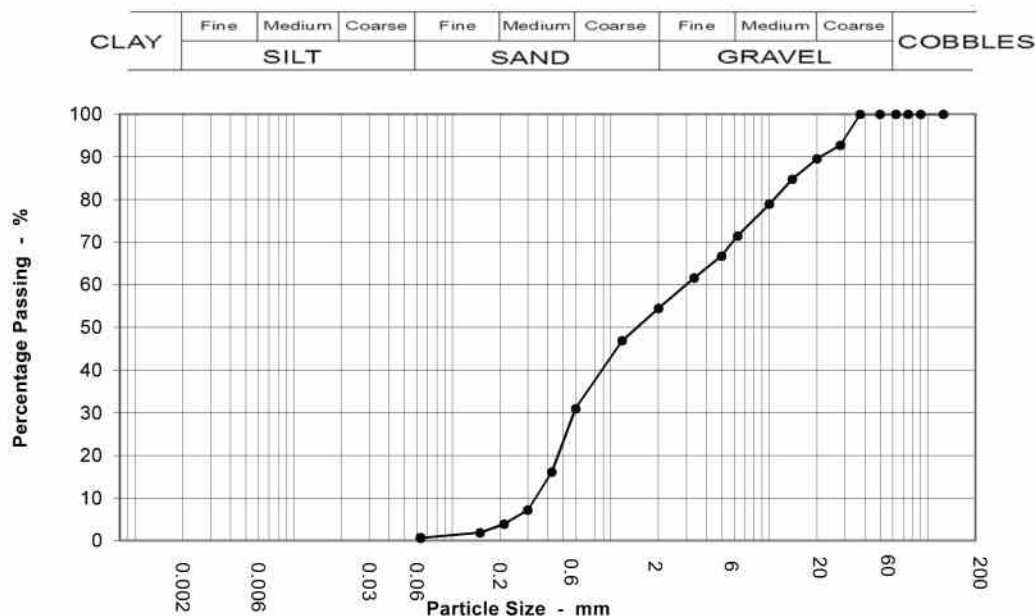
Checked and Approved

Initials: kp

Date: 23/01/2015



K4 SOILS 	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	18122
		Project No:	14653
Location	Charlotte Street, London	Borehole / Trial Pit No:	BH1
		Depth	4.50 - 5.00 m
Visual Soil Description	Pale brown very gravelly SAND (gravel is fmc and angular to rounded)	Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	90		
14	85		
10	79		
6.3	71		
5	67		
3.35	62		
2	54		
1.18	47		
0.6	31		
0.425	16		
0.3	7		
0.212	4		
0.15	2		
0.063	1		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	45.5
Sand	53.8
Silt & Clay	0.6

Grading Analysis	
D100	125.0
D60	3.0
D10	0.3
Uniformity Coefficient	9

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Approved Signatories:

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Test results relate only to the sample numbers shown above

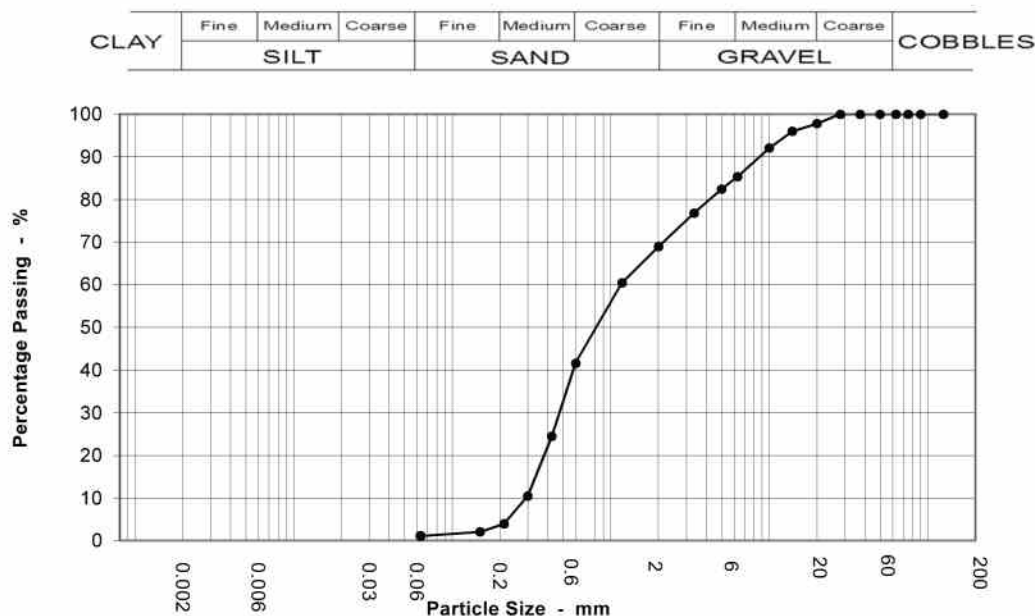
Checked and Approved

Initials: kp

Date: 23/01/2015



K4 SOILS 	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	18122
		Project No:	14653
Location	Charlotte Street, London	Borehole / Trial Pit No:	BH1
		Depth	6.00 - 6.50 m
Visual Soil Description	Pale brown very gravelly SAND (gravel is fmc and angular to rounded)	Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	96		
10	92		
6.3	85		
5	82		
3.35	77		
2	69		
1.18	60		
0.6	42		
0.425	24		
0.3	10		
0.212	4		
0.15	2		
0.063	1		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	31.1
Sand	67.8
Silt & Clay	1.1

Grading Analysis	
D100	125.0
D60	1.2
D10	0.3
Uniformity Coefficient	4

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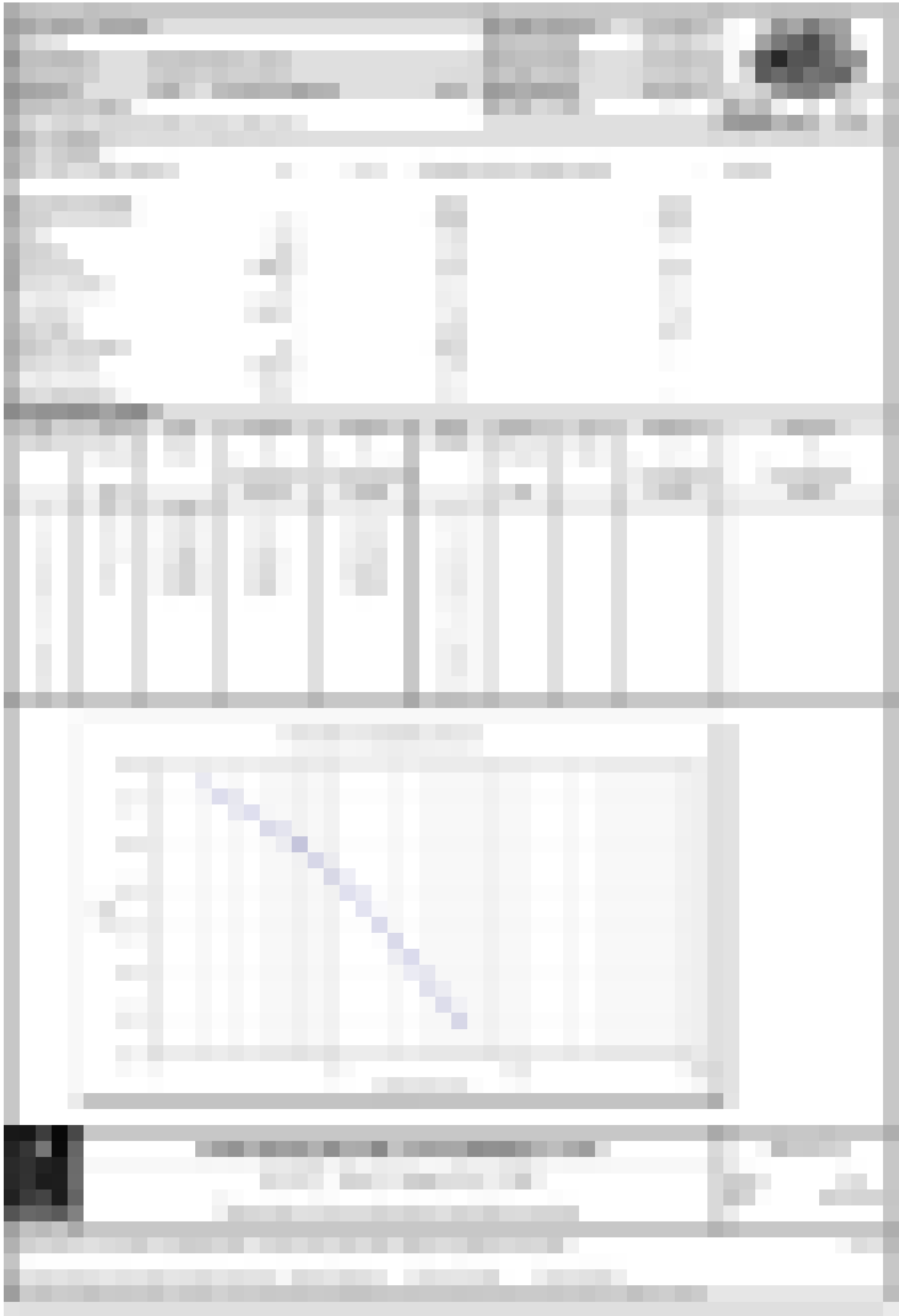
Test results relate only to the sample numbers shown above

Checked and Approved

Initials: kp

Date: 23/01/2015







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QTS Environmental Ltd
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Rose Lane Industrial Estate
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Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 15-27637

Site Reference: Charlotte Street

Project / Job Ref: 14653

Order No: None Supplied

Sample Receipt Date: 06/01/2015

Sample Scheduled Date: 06/01/2015

Report Issue Number: 1

Reporting Date: 09/01/2015

Authorised by:

Russell Jarvis
Director

On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director

On behalf of QTS Environmental Ltd



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
QTS Environmental Report No: 15-27637	Date Sampled	23/12/14	23/12/14	23/12/14		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Charlotte Street	TP / BH No	BH1	BH1	BH1		
Project / Job Ref: 14653	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	4.50	7.50 - 7.90	18.50		
Reporting Date: 09/01/2015	QTSE Sample No	130823	130824	130825		

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	MCERTS	7.6	7.5	8.2	
Total Sulphate as SO ₄	mg/kg	< 200	NONE	< 200	901	1876	
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.03	0.19	0.18	
Total Sulphur	mg/kg	< 200	NONE	< 200	1738	2577	
Ammonium as NH ₄	mg/kg	< 0.5	NONE	3.5	71.2	19.8	
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	8	98	40	
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS	7	20	11	
W/S Magnesium	g/l	< 0.0001	NONE	0.0024	0.0118	0.0079	

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

Subcontracted analysis ⁽⁵⁾



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Soil Analysis Certificate - Sample Descriptions

QTS Environmental Report No: 15-27637

Soils Ltd

Site Reference: Charlotte Street

Project / Job Ref: 14653

Order No: None Supplied

Reporting Date: 09/01/2015

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 130823	BH1	None Supplied	4.50	7.9	Light brown sand with stones
\$ 130824	BH1	None Supplied	7.50 - 7.90	18.8	Brown clay
\$ 130825	BH1	None Supplied	18.50	17	Brown clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{W/S}

\$ samples exceeded recommended holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

QTS Environmental Report No: 15-27637

Soils Ltd

Site Reference: Charlotte Street

Project / Job Ref: 14653

Order No: None Supplied

Reporting Date: 09/01/2015

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001

D Dried
AR As Received