CONSULTANCY, SITE INVESTIGATION CONSTRUCTION MATERIALS TESTING, CONTAMINATED LAND SURVEYS, DESK STUDIES, RISK ASSESSMENT.

MRH GEOTECHNICAL

REPORT ON A GROUND INVESTIGATION AT

97 CAMDEN MEWS
LONDON
NW1 9BU

Report No: 171581

Date: October 2017

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Report No: 171581

Date: October 2017

REPORT ON A GROUND INVESTIGATION AT 97 CAMDEN MEWS, LONDON NW1 9BU

1 INTRODUCTION

1.1 This report has been prepared for Paul Simon Developments Ltd, Magic House, 5-11 Green Lanes, London N13 4TN.

1.2 Our brief for the investigation was to:
a) Construct six boreholes with associated sampling and in situ testing
b) Laboratory testing for soil classification
c) Undertake six suites of contamination analysis (see separate report)
d) Carry out Gas Monitoring (see separate report)
e) Produce a Desk Study of the site history (see separate report)

2 DETAILS OF FIELD WORK

2.1 The field work comprised the construction of six boreholes and contamination sampling at the positions indicated in appendix A.

2.2 Soil samples were recovered at regular intervals, sealed in airtight containers and transported to the laboratory for testing and detailed descriptions.

2.3 Water level observations were made and noted on the borehole logs.

2.4 The field work was carried out on the 21st and 22nd September 2017.

3 GENERAL GEOLOGY AND REVEALED STRATUM

3.1 The boreholes proved Concrete or Made Ground to depths of 0.18m - 0.40m, over soft to firm or firm to stiff Clay with stiff to very stiff Clay being penetrated at depths of 1.70m (BH 1), 2.10m (BH 2) and 1.70m (BH 4).

3.2 Details of the soil stratum, sample depths and in situ test results are given in appendix B.

3.3 The 1:50,000 scale geological map indicates the natural deposits of the area to be London Clay.

4 GROUNDWATER

4.1 The boreholes remained dry throughout the construction period and immediately upon completion. Piezometers and Gas Wells were installed in BH's 1 and 2 to allow long term monitoring.

5 LABORATORY TESTING

5.1 The recovered soil samples were tested for moisture levels together with six Atterberg Limit determinations.

5.2 The results are tabulated in appendix C, categorising the Clay elements to be of high plasticity (Plasticity Index 38% - 42%).

5.3 Although this is indicative of a high potential susceptibility to moisture related cyclic volume change, there were no indications of desiccation within the samples tested.

6 CONCLUSIONS

6.1 The findings of the boreholes indicate natural ground from depths of 0.18m - 0.40m in the form of London Clay.

6.2 The in situ testing indicates the following allowable bearing capacities within the natural ground (F.O.S. =3):

BH No.	Depth (m)	Allowable Bearing Capacity (KN/m^2)
1	1.00	120
1	1.50	190
1	2.00	260
1	2.50	310
1	3.00	290
2	1.00	90
2	1.50	150
2	2.00	190
2	2.50	210
2	3.00	290

(Continued)

BH No.	Depth (m)	Allowable Bearing Capacity (KN/m^2)
3	1.00	120
3	1.50	170
3	2.00	190
4	1.00	160
4	1.50	190
4	2.00	220
5	1.00	130
5	1.50	180
5	2.00	190
6	1.00	100
6	1.50	140
6	2.00	180

6.3 Alternatively, if greater loads are anticipated and a piled foundation scheme is adopted, plots of the Shear Strengths versus Depth relationships are given in appendix B (Page 7).

6.4 The SO_4 (2:1 Extract) results for BRE classification of concrete in contact with the ground will be noted in the Contamination Report.

7 REFERENCES

1) British Standard EN ISO 14688-1:2002
2) British Standard 5930:1999
3) British Standard 1377: Parts 1-9
4) British Geological Survey Sheet 256 (1:50,000 scale) North London
5) NHBC Standards Chapter 4.2
6) Foundation design and Construction (M.J. Tomlinson, Fifth Edition)
7) BRE Special Digest 1 (SD1: 2005)

[redacted]

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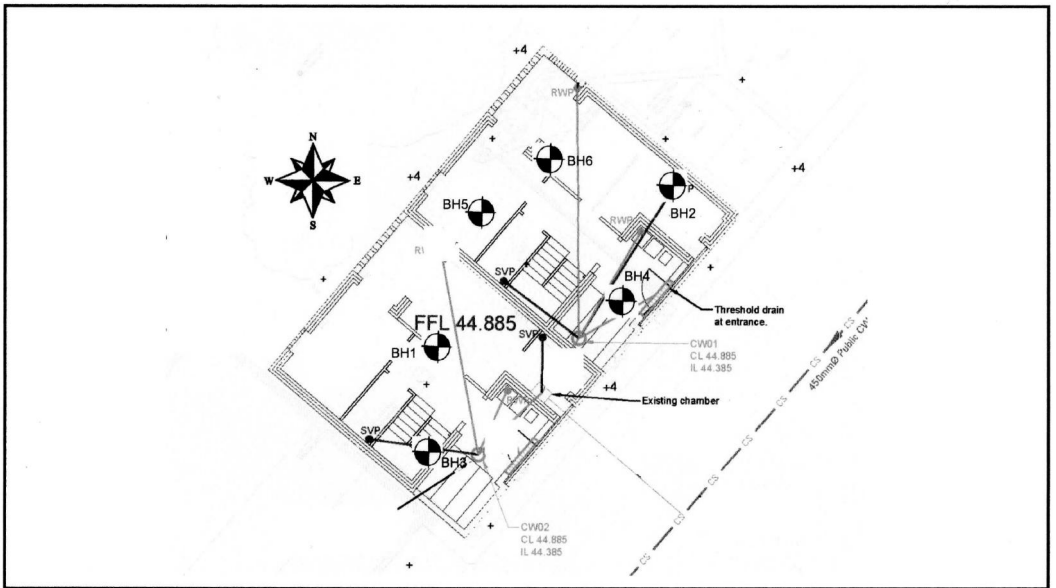
APPENDIX A

BOREHOLE LOCATION PLAN



MRH Geotechnical Limited	Borehole Location Plan	171581
Appendix A	97 Camden Mews, London, NW1 9BU.	October 2017

APPENDIX B

BOREHOLE LOGS

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 1
Sheet 1 of 1

CLIENT	SITE
Paul Simon Developments Ltd	97 Camden Mews, London NW1 9BU

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
22/09/17-22/09/17	1:50	GROUND / AS APPENDIX A	PA/SB	SH	171581

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete (0.18)	0.18	
0.25	D1			Soft to firm brown CLAY, occasional partings of orange silt (0.52)		
0.50	D2	(45)			0.70	
1.00	D3	(60)		Firm brown CLAY (0.60)		
1.50	D4	(95)		Firm to stiff brown CLAY (0.40)	1.30	
2.00	D5	(130)		Stiff brown CLAY (0.70)	1.70	
2.50	D6	(155)		Very stiff brown slightly fissured CLAY (0.40)	2.40	
3.00	D7	(145)		Stiff brown slightly fissured CLAY (1.10)	2.80	
3.50	D8	(145)				
4.00	D9	(160)		Very stiff brown slightly fissured CLAY (2.10)	3.90	
4.50	D10	(155)				
5.00	D11	(160)				
5.50	D12	(160)		Piezometer / Gas monitoring well installed		
6.00	D13	(165)		Borehole ends	6.00	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Dry on completion. Piezometer / Gas monitoring well installed

BORING METHOD AND REMARKS

Mechanical auger
Piezometer / Gas monitoring well installed

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 2
Sheet 1 of 1

CLIENT	SITE
Paul Simon Developments Ltd	97 Camden Mews, London NW1 9BU

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
22/09/17-22/09/17	1:50	GROUND / AS APPENDIX A	PA/SB	SH	171581

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete (0.15)		
0.25	D1				0.15	
0.50	D2	(40)		Soft to firm brown slightly sandy CLAY with traces of fine gravel (0.45)		
					0.60	
1.00	D3	(45)		Soft to firm brown CLAY (0.60)		
					1.20	
1.50	D4	(75)		Firm to stiff brown CLAY (0.90)		
2.00	D5	(95)				
					2.10	
2.50	D6	(105)		Stiff brown slightly fissured CLAY, occasional partings of orange silt (1.30)		
3.00	D7	(145)				
3.50	D8	(155)			3.40	
4.00	D9	(155)		Very stiff brown with traces of bluish grey slightly fissured CLAY (2.20)		
4.50	D10	(160)				
5.00	D11	(155)				
5.50	D12	(165)		Piezometer / Gas monitoring well installed	5.60	
6.00	D13	(175)		Very stiff dark brown slightly fissured CLAY, occasional partings of orange silt (0.40)		
				Borehole ends	6.00	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Dry on completion. Piezometer / Gas monitoring well installed

BORING METHOD AND REMARKS

Mechanical auger
Piezometer / Gas monitoring well installed

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 3
Sheet 1 of 1

CLIENT	SITE
Paul Simon Developments Ltd	97 Camden Mews, London NW1 9BU

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
21/09/17-21/09/17	1:50	GROUND / AS APPENDIX A	PA/SB	SH	171581

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete over compacted brick rubble (0.20)	0.20	
0.30	D1			Hard greyish brown sandy clay with traces of brick fragments and fine gravel. MADE GROUND (0.20)	0.40	
0.50	D2	(80)		Firm to stiff brown CLAY with occasional partings of fine sand (0.50)		
1.00	D3	(60)		Firm brown CLAY (0.40)	0.90	
1.50	D4	(85)		Firm to stiff brown CLAY (0.70)	1.30	
				Borehole ends		
2.00	D5	(95)			2.00	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Dry on completion

BORING METHOD AND REMARKS

Mechanical auger

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 4
Sheet 1 of 1

CLIENT	SITE
Paul Simon Developments Ltd	97 Camden Mews, London NW1 9BU

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
21/09/17-21/09/17	1:50	GROUND / AS APPENDIX A	PA/SB	SH	171581

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete over compacted brick rubble (0.19)	0.19	
0.25	D1			Firm brown CLAY, occasional partings of orange silt (0.51)	0.70	
0.50	D2	(55)				
1.00	D3	(80)		Firm to stiff brown CLAY, occasional partings of orange silt (1.00)		
1.50	D4	(95)				
				Stiff brown CLAY, occasional partings of orange silt (0.30)	1.70	
2.00	D5	(110)		Borehole ends	2.00	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Dry on completion

BORING METHOD AND REMARKS

Mechanical auger

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 5
Sheet 1 of 1

CLIENT	SITE
Paul Simon Developments Ltd	97 Camden Mews, London NW1 9BU

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
21/09/17-21/09/17	1:50	GROUND / AS APPENDIX A	PA/SB	SH	171581

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete over compacted brick rubble (0.30)	0.30	
0.50	D1	(65)		Firm brown with traces of bluish grey CLAY (1.00)		
1.00	D2	(65)				
1.50	D3	(90)		Firm to stiff brown CLAY (0.70)	1.30	
2.00	D4	(95)		Borehole ends	2.00	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Dry on completion

BORING METHOD AND REMARKS

Mechanical auger

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 6
Sheet 1 of 1

CLIENT	SITE
Paul Simon Developments Ltd	97 Camden Mews, London NW1 9BU

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
21/09/17-21/09/17	1:50	GROUND / AS APPENDIX A	PA/SB	SH	171581

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete (0.19)	0.19	
				Compacted brick rubble. MADE GROUND (0.21)	0.40	
0.50	D1	(45)		Soft to firm brown CLAY (0.80)		
1.00	D2	(50)			1.20	
1.50	D3	(70)		Firm to stiff brown CLAY (0.80)		
				Borehole ends	2.00	
2.00	D4	(90)				

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Dry on completion

BORING METHOD AND REMARKS

Mechanical auger

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

TEST REPORT.

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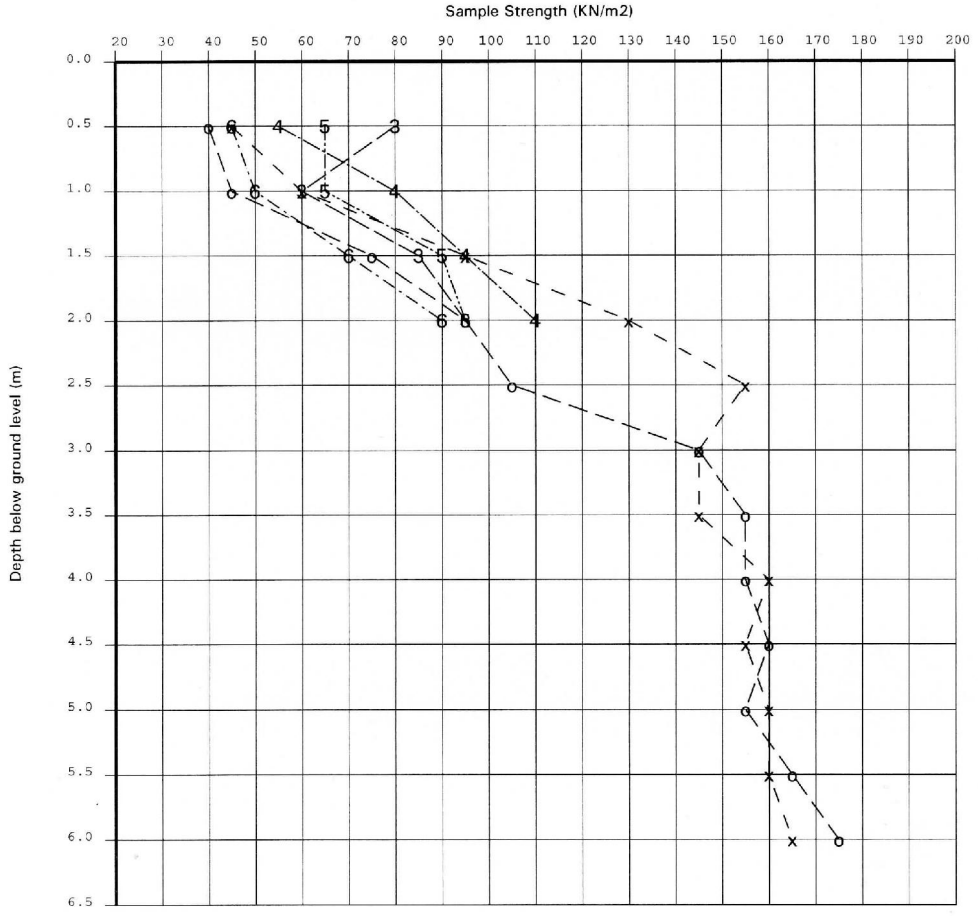
Sample Strength (KN/m2) vs Depth below ground level (m)



Key to Data Points	x : BH 1	o : BH 2	3 : BH 3	4 : BH 4	5 : BH 5	6 : BH 6		

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APPENDIX C

MOISTURE CONTENT / ATTERBERG LIMIT RESULTS

TEST REPORT.

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97 Camden Mews, London NW1 9BU 171581

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 1	0.50	D2	35	-	-	-		Soft to firm brown CLAY, occasional partings of orange silt
BH 1	1.00	D3	31	-	-	-		Firm brown CLAY
BH 1	1.50	D4	27	61	23	38	0.11	Firm to stiff brown CLAY. CH: CLAY of high plasticity. (100% passing 425um)
BH 1	2.00	D5	26	-	-	-		Stiff brown CLAY
BH 1	2.50	D6	27	64	24	40	0.08	Very stiff brown slightly fissured CLAY. CH: CLAY of high plasticity. (100% passing 425um)
BH 1	3.00	D7	30	-	-	-		Stiff brown slightly fissured CLAY
BH 1	3.50	D8	29	-	-	-		Stiff brown slightly fissured CLAY
BH 1	4.00	D9	29	68	26	42	0.07	Very stiff brown slightly fissured CLAY. CH: CLAY of high plasticity. (100% passing 425um)
BH 1	4.50	D10	28	-	-	-		Very stiff brown slightly fissured CLAY
BH 1	5.00	D11	28	-	-	-		Very stiff brown slightly fissured CLAY
BH 1	5.50	D12	28	-	-	-		Very stiff brown slightly fissured CLAY
BH 1	6.00	D13	28	-	-	-		Very stiff brown slightly fissured CLAY
BH 2	0.50	D2	35	-	-	-		Soft to firm brown slightly sandy CLAY with traces of fine gravel
BH 2	1.00	D3	32	-	-	-		Soft to firm brown CLAY
BH 2	1.50	D4	29	-	-	-		Firm to stiff brown CLAY
BH 2	2.00	D5	28	66	24	42	0.10	Firm to stiff brown CLAY. CH: CLAY of high plasticity. (100% passing 425um)
BH 2	2.50	D6	30	-	-	-		Stiff brown slightly fissured CLAY, occasional partings of orange silt
BH 2	3.00	D7	30	-	-	-		Stiff brown slightly fissured CLAY, occasional partings of orange silt

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, **4.4, 5.3, 5.4**

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

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Contract Job No.
97 Camden Mews, London NW1 9BU 171581

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 2	3.50	D8	30	68	27	41	0.07	Very stiff brown with traces of bluish grey slightly fissured CLAY. CH: CLAY of high plasticity. (100% passing 425um)
BH 2	4.00	D9	30	-	-	-		Very stiff brown with traces of bluish grey slightly fissured CLAY
BH 2	4.50	D10	29	-	-	-		Very stiff brown slightly fissured CLAY
BH 2	5.00	D11	29	-	-	-		Very stiff brown with traces of bluish grey slightly fissured CLAY
BH 2	5.50	D12	28	67	25	42	0.07	Very stiff brown slightly fissured CLAY. CH: CLAY of high plasticity. (100% passing 425um)
BH 2	6.00	D13	28	-	-	-		Very stiff dark brown slightly fissured CLAY, occasional partings of orange silt
BH 3	0.50	D2	31	-	-	-		Firm to stiff brown CLAY with occasional partings of fine sand
BH 3	1.00	D3	31	-	-	-		Firm brown CLAY
BH 3	1.50	D4	29	-	-	-		Firm to stiff brown CLAY
BH 3	2.00	D5	29	-	-	-		Firm to stiff brown CLAY
BH 4	0.50	D2	33	-	-	-		Firm brown CLAY, occasional partings of orange silt
BH 4	1.00	D3	30	-	-	-		Firm to stiff brown CLAY
BH 4	1.50	D4	27	-	-	-		Firm to stiff brown CLAY
BH 4	2.00	D5	30	-	-	-		Stiff brown CLAY, occasional partings of orange silt
BH 5	1.00	D2	30	-	-	-		Firm brown with traces of bluish grey CLAY
BH 5	1.50	D3	29	-	-	-		Firm to stiff brown CLAY
BH 5	2.00	D4	28	-	-	-		Firm to stiff brown CLAY
BH 6	1.00	D2	32	-	-	-		Firm brown CLAY

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

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Contract Job No.
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SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 6	1.50	D3	28	-	-	-		Firm to stiff brown CLAY
BH 6	2.00	D4	29	-	-	-		Firm to stiff brown CLAY

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

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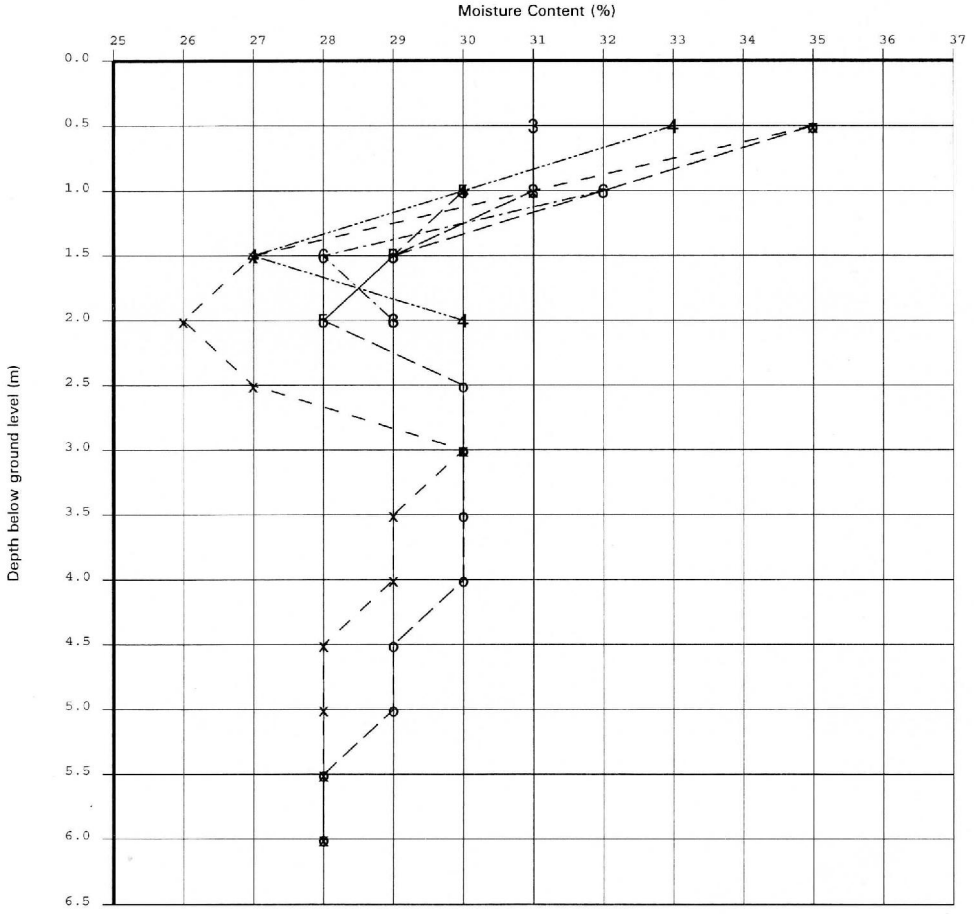
97 Camden Mews, London NW1 9BU 171581

Moisture Content (%) vs Depth below ground level (m)



Key to Data Points	x : BH 1	o : BH 2	3 : BH 3	4 : BH 4	5 : BH 5	6 : BH 6		

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