Site Analytical Services Ltd.

Site Investigations, Analytical & Environmental Chemists, Laboratory Testing Services.

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Your Ref:

Our Ref:

Ref: 15/23902
September 2015

26 LYNDHURST ROAD,

LONDON, NW3 5PB

FACTUAL REPORT ON A GROUND INVESTIGATION

Prepared for

Mr John Fitzpatrick

CONTENTS

1.0 INTRODUCTION

1.1 Outline and Limitations of Report

At the request of Mr John Fitzpatrick, a ground investigation was carried out in connection with a proposed residential basement development at the above site. A Phase 1 Preliminary Risk Assessment (Desk Study) is presented under separate cover in Site Analytical Services Limited Report Reference 15/23902-1.

The information was required for the design and construction of foundations and infrastructure for the proposed development at the existing site.

The recommendations and comments given in this report are based on the ground conditions encountered in the exploratory holes made during the investigation and the results of the tests made in the field and the laboratory. It must be noted that there may be special conditions prevailing at the site remote from the exploratory hole locations which have not been disclosed by the investigation and which have not been taken into account in the report. No liability can be accepted for any such conditions.

2.0 SITE DETAILS

(National Grid Reference: TQ 271 792)

2.1 Site Location

The site is located to the south of Lyndhurst Road in Hampstead, North London, NW3 5PB and comprises a five storey residential property, including an existing basement level with front and rear garden areas.

The site covers an area of approximately 0.1 hectares and the general area is under the authority of the London Borough of Camden.

2.2 Geology

The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area is detailed in Figure 4 below and indicates the site to be underlain by the Claygate Member with the London Clay Formation at depth.

2.3 Previous Investigations

A Phase 1 Preliminary Risk Assessment (PRA) (SAS Report Ref: 15/23902-1 dated September 2015) has been undertaken across the site by Site Analytical Services Limited.

3.0 SCOPE OF WORK

3.1 Site Works

The proposed scope of works was agreed by the client prior to the commencement of the investigations. To achieve this, the following works were undertaken:-

- The drilling of one rotary percussive borehole to a depth of 15.00m below ground level (Borehole 1).
- The drilling of two continuous flight auger boreholes to 8.00m below ground level (Boreholes 2 and 3).
- The excavation of one trial pit to 1.50m maximum depth extended by hand auger to 3.00m depth to expose existing foundations at the site (Trial Pit 1).
- Sampling and in-situ testing as appropriate to the ground conditions encountered in the boreholes and trial pit.
- Laboratory testing to determine the engineering properties of the soils encountered in the exploratory holes.
- Factual reporting on the results of the investigation.

3.2 Ground Conditions

The locations of the exploratory holes are shown on the site sketch plan, Figure 1.

The boreholes revealed ground conditions that were consistent with the geological records and known history of the area and comprised Made Ground up to 4.10m in thickness resting on deposits of the Claygate Member with the London Clay Formation at depth.

These ground conditions are summarised in the following table. For detailed information on the ground conditions encountered in the boreholes, reference should be made to the exploratory hole records presented in Appendix A.

Strata	Depth to top of strata (mbgl)	Level to top of strata (mOD)	Depth to base of strata (mbgl)	Level to base of strata (mbgl)	Description
Made Ground	0.00	89.55 to 93.08	2.7 to 4.10 (base of TP1)	85.45 to 90.18	Grass surface over very loose silty clayey gravelly sand with brick fragments
Claygate Member	2.90 to 4.10	85.45 to 90.18	5.80 to 10.60	82.48 to 83.91	Soft becoming firm silty sandy locally gravelly clay with lenses of clayey silty fine sand
London Clay Formation	10.60	82.48	8.00 to 15.00 (base of BH's 1, 2 and 3)	81.55 to 78.08	Firm becoming stiff silty sandy clay with gypsum crystals

Table A: Summary of Ground Conditions in Exploratory Holes

3.3 Groundwater

Groundwater was not encountered in the trial pit and the soils remained essentially dry throughout. Groundwater was encountered in the boreholes as detailed in Table B below.

Exploratory Hole	Depth (m)	Level (mOD)	Notes	Stratum
BH1	6.50	86.58	Seepage rising to 6.30m (86.78mOD) after 20 minutes	Claygate Member
BH2	4.50	85.05	Seepage	Claygate Member
BH3	4.50	85.20	Seepage	Claygate Member

Table B: Groundwater Strike Summary

It must be noted that the speed of excavation is such that there may well be insufficient time for further light seepages of groundwater to enter the boreholes and trial pit and hence be detected, particularly within more cohesive soils.

Isolated pockets of groundwater may also be present perched within any less permeable material found at shallower depth on other parts of the site especially within any Made Ground.

Groundwater was encountered at respective depths of 6.55m (86.53mOD), 4.76m (84.79mOD) and 4.30m (85.41mOD) in the monitoring standpipes installed in Boreholes 1, 2 and 3 after a period of approximately eight weeks.

It should be noted that the comments on groundwater conditions are based on observations made at the time of the investigation (July, August and September 2015) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions.

4.0 IN-SITU TESTING AND LABORATORY TESTS

4.1 Standard Penetration Tests

The results of the Standard Penetration Tests carried out in the natural soils are shown on the exploratory hole records in Appendix A.

4.2 Mackintosh Probe / Hand Vane Tests

Mackintosh Probe tests were made at regular depth increments in order to assess the relative density of the soils encountered in the trial pits. The results can be interpreted using the generally accepted correlation for Mackintosh Probe Tests which is as follows:

Mackintosh N75 X 0.38 = SPT 'N' Value

or

Mackintosh N300 X 0.1 = SPT 'N' Value

In the essentially cohesive natural soils encountered at the site, in-situ shear vane tests were made at regular depth increments in order to assess the undrained shear strength of the materials. The results indicate that the natural soils are of a generally high strength in accordance with BS 5930 (2015).

The results of the in-situ tests are shown on the appropriate exploratory hole records contained in Appendix A.

4.3 Undrained Triaxial Compression Test Results

A single Undrained Triaxial Compression test was carried out on an undisturbed 100mm diameter sample taken from 11.0m below ground level in Borehole 1.

The results of the tests are presented on Table 1, contained in Appendix B.

4.4 Classification Tests

Atterberg Limit tests were conducted on six samples taken at depth in Boreholes A and B and showed the samples tested to fall into Classes CL/CI and CI according to the British Soil Classification System.

The test results are given in Table 2, contained in Appendix B.

4.5 Sulphate and pH Analyses

The results of the sulphate and pH analyses made on seven soil samples are presented on Table 3, contained in Appendix B.

p.p. SITE ANALYTICAL SERVICES LIMITED

A P Smith BSc (Hons) FGS MCIWEM
Senior Geologist

5.0 REFERENCES

1. British Standards Institution, 1986. Code of practice for foundations, BS 8004, BSI, London.

2. British Standards Institution, 1990. Methods for test for soils for civil engineering purposes, BS1377, BSI, London

3. British Standards Institution, 1994. Code of practice for earth retaining structures, BS8002, BSI, London

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5. British Standards Institution, 2004. Geotechnical Design, BS EN 1997-1 BSI, London

6. Building Research Establishment Special Digest 1, 2005, "Concrete in Aggressive Ground – Third Edition."

7. Driscoll, R (1983) "The influence of vegetation on the shrinking and swelling of clay soils in Great Britain", Geo-technique 33, 93-107

8. Eurocode 1: Actions on structures – BS EN 1991-1-1:2002: General actions – Densities, self weight and imposed loads, BSI, London

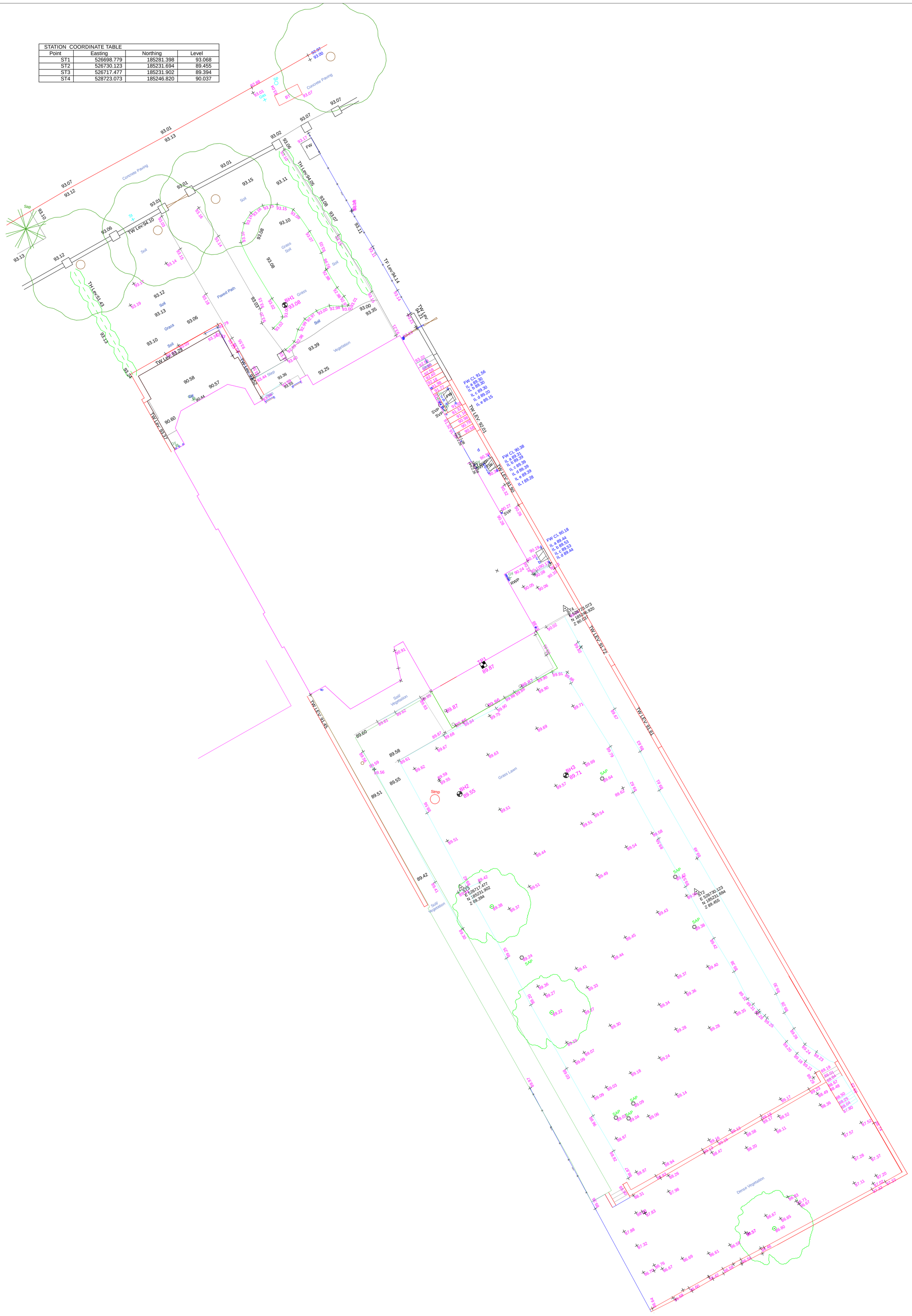
9. NHBC Standards, Chapter 4.1, "Land Quality - managing ground conditions", September 1999.

10. NHBC Standards, Chapter 4.2, "Building near Trees", April 2010.

11. Stroud M.A. and Butler F.G. (1975) Symposium on the Engineering Behaviour of Glacial Materials; the Midland Soil Mechanics and Foundation Engineering Society; pgs 124 et seq.

12. Tomlinson, M J, 2001. “Foundation Design and Construction”, Seventh Edition, Prentice Hall (ISBN 0-13-031180-4).

STATION COORDINATE TABLE			
Point	Easting	Northing	Level
ST1	526698.779	185281.398	93.068
ST2	526730.123	185231.694	89.455
ST3	526717.477	185231.902	89.394
ST4	528723.073	185246.820	90.037



FEATURES

Fences shown thus
Walls
Hedges
Undefined Boundary
Gates

FENCE TYPES

B/W	Barbed wire
C/B	Close boarded
C/I	Corrugated iron
C/L	Chain link
C/P	Chestnut paling
I/R	Iron railing
P/R	Post and rail
P/W	Post and wire
W/F	Wooden fence

LEVEL DATA

Spot levels x43.62
Contours 43
Steep slopes

SERVICES

Foul sewers 225 FW
Storm sewers 375 SW

CONTROL DATA

Survey stations STN
Boundary posts BP

TREES

1,4,7 Girth, spread(radius), height

ABBREVIATIONS

AV Air valve
BB Belisha beacon
BC Basement cover
Bol Bollard
BS Bus stop
BT British Telecom cover
BTJB BT junction box
CATV Cable TV cover
CDP Cable draw pit
CL Cover level
CM Cable marker
CNL Could not lift
COL Column
CPL Coping level
DK Drop kerb
DP Down pipe
EJB Elec. junction box
EP Electricity pole
ER Earth rod
FB Flower bed
F/Esc Fire escape
FH Fire hydrant
FL Floodlight
FW Foul manhole
FP Flag pole
GL Gulley
GSC Gas stop cock
GV Gas valve
H Hydrant

All units are metric.

IC Inspection cover
IL Invert level
JB Junction box
KO Kerb outlet
LB Letter box
LP Lamp post
LW Light well
MH Manhole
Mkr Marker
NB Name board
OF Outfall
PM Parking meter
RC Rising cable
RE Rodding eye
Ret. Retaining
RS Road sign
RWP Rain water pipe
SC Stop cock
SL Sump level
SOP Soil pipe
SP Sign post
ST Stand pipe
STL Street light
SV Stop valve
SVP Soil vent pipe
SW Surface water manhole
TCB Telephone call box
TL Traffic light
TP Telegraph pole
VP Vent pipe
WL Weir level
WO Washout
WM Water meter
WSC Water stop cock
WV Water valve
WSV Water stop valve

NOTES

CLIENT

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LYNDHURST ROAD

SITE SURVEY

PROJECT NO.	SRS/15/1252
DWG. NO.	1252/001
SCALE	1:100 @ A1
DRAWN	MM-T
CHECKED	AS
DATE	AUGUST 2015
SHEET NO.	1 OF 1
REV	A
REV DATE	11/09/2015
REF.	

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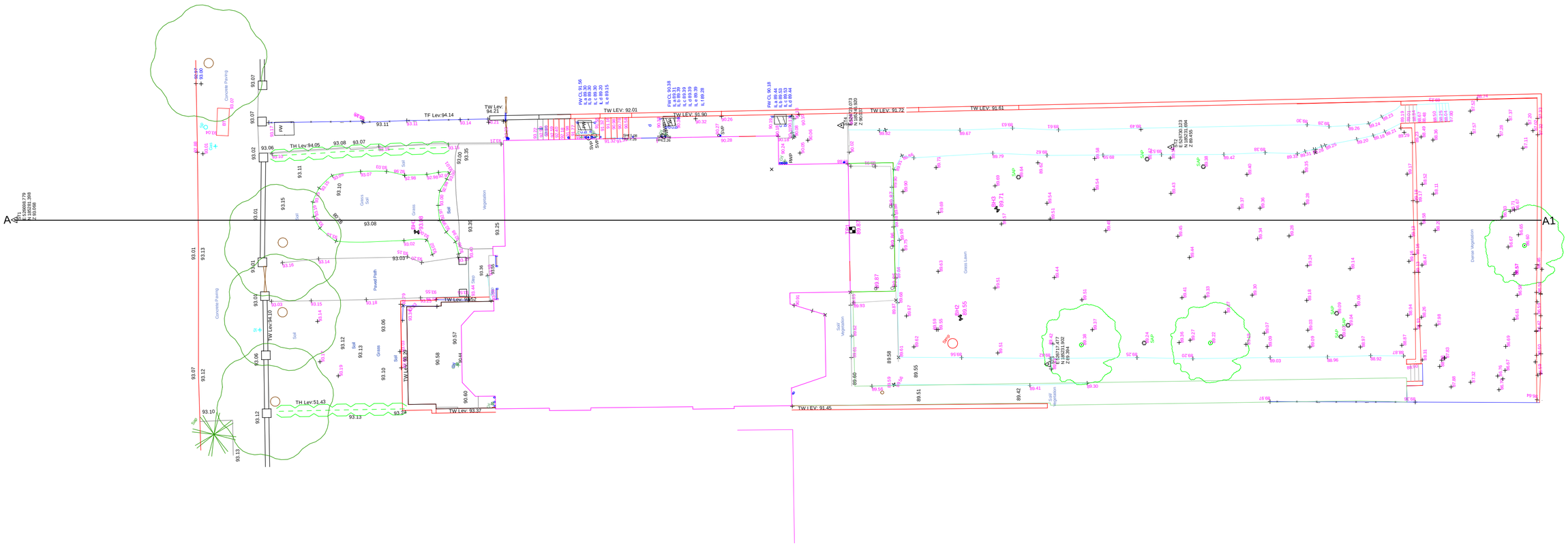

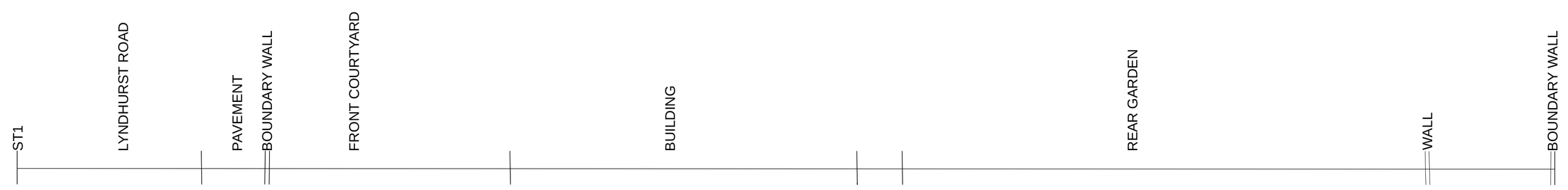

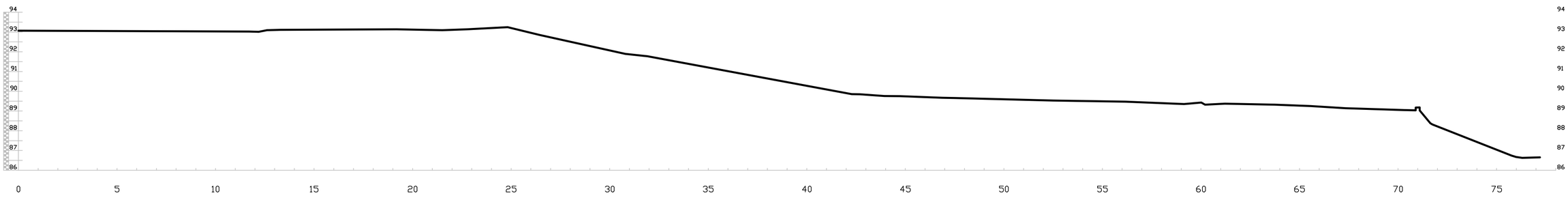

LONG SECTION A-A1

FEATURES

Fences shown thus
Walls
Hedges
Undefined Boundary
Gates

FENCE TYPES

B/W	Barbed wire
C/B	Close boarded
C/I	Corrugated iron
C/L	Chain link
C/P	Chestnut paling
I/R	Iron railing
P/R	Post and rail
P/W	Post and wire
W/F	Wooden fence

LEVEL DATA

Spot levels x43.62
Contours 43
Steep slopes

SERVICES

Foul sewers 225 FW
Storm sewers 375 SW

CONTROL DATA

Survey stations STN
Boundary posts BP

TREES

1,4,7 Girth, spread(radius), height

ABBREVIATIONS

AV Air valve
BB Belisha beacon
BC Basement cover
Bol Bollard
BS Bus stop
BT British Telecom cover
BTJB BT junction box
CATV Cable TV cover
CDP Cable draw pit
CL Cover level
CM Cable marker
CNL Could not lift
COL Column
CPL Coping level
DK Drop kerb
DP Down pipe
EJB Elec. junction box
EP Electricity pole
ER Earth rod
FB Flower bed
F/Esc Fire escape
FH Fire hydrant
FL Floodlight
FW Foul manhole
FP Flag pole
GL Gulley
GSC Gas stop cock
GV Gas valve
H Hydrant
IC Inspection cover
IL Invert level
JB Junction box
KO Kerb outlet
LB Letter box
LP Lamp post
LW Light well
MH Manhole
Mkr Marker
NB Name board
OF Outfall
PM Parking meter
RC Rising cable
RE Rodding eye
Ret. Retaining
RS Road sign
RWP Rain water pipe
SC Stop cock
SL Sump level
SOP Soil pipe
SP Sign post
ST Stand pipe
STL Street light
SV Stop valve
SVP Soil vent pipe
SW Surface water manhole
TCB Telephone call box
TL Traffic light
TP Telegraph pole
VP Vent pipe
WL Weir level
WO Washout
WM Water meter
WSC Water stop cock
WV Water valve
WSV Water stop valve

All units are metric.

NOTES

CLIENT

SITE ANALYTICAL LIMITED

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LYNDHURST ROAD

LONG SECTION

PROJECT NO.	SRS/15/1252
DWG. NO.	1252/0/02
SCALE	1:150 @ A1
DRAWN	MM-T
CHECKED	AS
DATE	SEPTEMBER 2015
SHEET NO.	1 OF 1
REV	-
REV DATE	-
REF.	

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A P P E N D I X `A'

Borehole / Trial Pit Logs

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
ROTARY PERCUSSION	128mm cased to 0.00m	93.08	MR JOHN FITZPATRICK	1523902
	Location TQ 266 852	**Dates** 08/07/2015	**Engineer**	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					92.93	(0.15) 0.15	MADE GROUND : Grass surface over topsoil		
0.25	D1						MADE GROUND : Very loose brown silty clayey gravelly fine to coarse sand with brick fragments. Gravel is fine to coarse of sub angular to sub rounded flint		
0.50	D2								
0.75	D3								
1.00-1.45 1.00	SPT(C) N=2 D4		DRY	1/1,,1					
						(2.75)			
1.75	D5								
2.00-2.45 2.00	SPT(C) N=9 D6		DRY	1,1/1,2,3,3					
2.75	D7				90.18	2.90			
3.00-3.45 3.00	SPT N=8 D8		DRY	2,3/1,2,3,2			Soft becoming firm orange brown silty sandy slightly gravelly CLAY with occasional lenses of clayey silty fine sand. Gravel is fine to medium of subrounded flint		
3.75	D9								
4.00-4.45 4.00	SPT N=14 D10		DRY	2,3/3,3,4,4					
						(3.60)			
4.75	D11								
5.00-5.45 5.00	SPT N=10 D12		DRY	3,2/1,2,3,4					
6.00	D13								▼1
6.50	D14			SEEPAGE(1) at 6.50m, rose to 6.30m in 20 mins.	86.58	6.50	Firm orange brown silty very sandy CLAY with frequent lenses of clayey silty fine sand.		▽1
6.50-6.95	SPT N=10		6.30	2,3/3,2,3,2					
7.50	D15								
8.00-8.45 8.00	SPT N=17 D16		6.30	2,3/4,4,5,4					
						(3.50)			
9.00	D17								
9.50-9.95 9.50	SPT N=14 D18		6.30	3,4/3,2,4,5					

Remarks
U = Undisturbed 100mm Diameter Sample
D = Disturbed Sample
SPT (C) = Standard Penetration Test (Cone)
SPT = Standard Penetration Test
Excavating from 0.00m to 1.00m for 1 hour.

Scale (approx)	Logged By
1:50	APS

Figure No. 1523902.BH1

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
ROTARY PERCUSSION	128mm cased to 0.00m	93.08	MR JOHN FITZPATRICK	1523902
	Location TQ 266 852	**Dates** 08/07/2015	**Engineer**	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					83.08	10.00	Firm mottled grey brown silty sandy CLAY with frequent lenses of clayey silty fine sand		
						(0.60)			
10.50	D19				82.48	10.60	Firm becoming stiff dark grey brown fissured silty CLAY with occasional partings of light brown silty fine sand and scattered small gypsum crystals		
11.00-11.45	U1			80 blows					
12.00	D20								
12.50-12.95	SPT N=26		6.30	5,5/6,6,7,7					
12.50	D21					(4.40)			
13.25	D22								
14.55-15.00	SPT N=31		6.30	5,6/7,8,8,8					
14.55	D23								
				08/07/2015:6.30m	78.08	15.00	Complete at 15.00m		

Remarks
U = Undisturbed 100mm Diameter Sample
D = Disturbed Sample
SPT (C) = Standard Penetration Test (Cone)
SPT = Standard Penetration Test

Scale (approx)	Logged By
1:50	APS

Figure No. 1523902.BH1

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
CONTINUOUS FLIGHT AUGER	128mm cased to 0.00m	89.55	MR JOHN FITZPATRICK	1523902
	Location TQ 266 852	**Dates** 08/07/2015	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					89.45	0.10	MADE GROUND : Grass surface over topsoil		
0.25	D1					(0.50)	MADE GROUND : Brown silty clayey gravelly fine to coarse sand with brick and clinker fragments. Gravel is fine to coarse of sub angular to sub rounded flint		
0.50	D2				88.95	0.60			
0.75	D3						MADE GROUND : Firm mottled brown silty sandy gravelly clay with brick fragments. Gravel is fine to medium of sub angular flint		
1.00 1.00-1.30	D4 M1 85/300					(0.80)			
					88.15	1.40	MADE GROUND : Medium dense silty slightly clayey fine to coarse sand with brick fragments		
1.50 1.50-1.80	D5 M2 101/300								
2.00 2.00-2.30	D6 M3 120/300								
2.50 2.50-2.80	D7 M4 120/300					(2.70)			
3.00 3.00-3.30	D8 M5 122/300								
3.50 3.50-3.80	D9 M6 144/300								
4.00 4.00-4.30	D10 M7 153/300				85.45	4.10	Firm becoming stiff orange brown silty very sandy CLAY with lenses of clayey very silty fine sand.		
4.50 4.50	D11 V1 108			SEEPAGE(1) at 4.50m.					▽1
5.00 5.00	D12 V2 121					(1.90)			
6.00 6.00	D13 V3 140+				83.55	6.00	Firm becoming stiff dark grey brown fissured silty CLAY with occasional partings of light brown silty fine sand and scattered small gypsum crystals		
7.00 7.00	D14 V4 140+					(2.00)			
8.00 8.00	D15 V5 140+			09/07/2015:4.50m	81.55	8.00	Complete at 8.00m		

Remarks
D = Disturbed Sample
M = Mackintosh Probe - Blows/Penetration (mm)
V = In Situ Vane Test - Result in kPa
Excavating from 0.00m to 1.00m for 1 hour.

Scale (approx)	Logged By
1:50	APS

Figure No. 1523902.BH2

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
CONTINUOUS FLIGHT AUGER	128mm cased to 0.00m	89.71	MR JOHN FITZPATRICK	1523902
	Location TQ 266 852	**Dates** 08/07/2015	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					89.61	0.10	MADE GROUND : Grass surface over topsoil		
0.25	D1					(0.50)	MADE GROUND : Brown silty clayey gravelly fine to coarse sand with brick fragments. Gravel is fine to coarse of sub angular to sub rounded flint		
0.50	D2				89.11	0.60			
0.75	D3					(0.60)	MADE GROUND : Firm mottled brown silty sandy gravelly clay with brick fragments. Gravel is fine to medium of sub angular flint		
1.00 1.00-1.30	D4 M1 69/300				88.51	1.20	MADE GROUND : Medium dense silty slightly clayey fine to coarse sand with brick fragments		
1.50 1.50-1.80	D5 M2 90/300					(1.50)			
2.00 2.00-2.30	D6 M3 126/300								
2.50 2.50-2.80	D7 M4 148/300				87.01	2.70	Firm becoming stiff orange brown silty very sandy CLAY with lenses of clayey very silty fine sand.		
3.00 3.00	D8 V1 104								
3.50 3.50	D9 V2 118								
4.00 4.00	D10 V3 140+					(3.10)			
4.50 4.50-4.60	D11 M5 100/100			SEEPAGE(1) at 4.50m.					▽1
5.00 5.00-5.10	D12 M6 100/100								
					83.91	5.80	Firm becoming stiff dark grey brown fissured silty CLAY with occasional partings of light brown silty fine sand and scattered small gypsum crystals		
6.00 6.00	D13 V4 140+								
						(2.20)			
7.00 7.00	D14 V5 140+								
8.00 8.00	D15 V6 140+			09/07/2015:4.50m	81.71	8.00	Complete at 8.00m		

Remarks
D = Disturbed Sample
M = Mackintosh Probe - Blows/Penetration (mm)
V = In Situ Vane Test - Result in kPa
Excavating from 0.00m to 1.00m for 1 hour.

Scale (approx)	Logged By
1:50	APS

Figure No. 1523902.BH3

Site Analytical Services Ltd.

Standard Penetration Test Results

Site : 26 LYNDHURST ROAD, LONDON, NW35PB

Client : MR JOHN FITZPATRICK

Engineer :

Job Number 1523902

Sheet 1 / 1

Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
BH1	1.00	1.15	1.45	CPT	1		1		1		N=2	
BH1	2.00	2.15	2.45	CPT	1	1	1	2	3	3	N=9	
BH1	3.00	3.15	3.45	SPT	2	3	1	2	3	2	N=8	
BH1	4.00	4.15	4.45	SPT	2	3	3	3	4	4	N=14	
BH1	5.00	5.15	5.45	SPT	3	2	1	2	3	4	N=10	
BH1	6.50	6.65	6.95	SPT	2	3	3	2	3	2	N=10	
BH1	8.00	8.15	8.45	SPT	2	3	4	4	5	4	N=17	
BH1	9.50	9.65	9.95	SPT	3	4	3	2	4	5	N=14	
BH1	12.50	12.65	12.95	SPT	5	5	6	6	7	7	N=26	
BH1	14.55	14.70	15.00	SPT	5	6	7	8	8	8	N=31	

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH1

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 19 mm
Diameter of Filter Zone = 128 mm

Client
MR JOHN FITZPATRICK

Job Number
1523902

Location
TQ 266 852

Ground Level (mOD)
93.08

Engineer

Sheet
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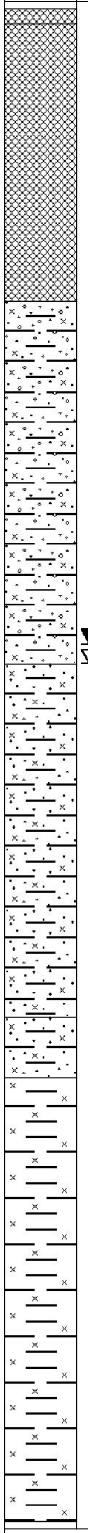

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
			92.08	1.00	Bentonite Seal
					Cement/Bentonite Grout
			86.08	7.00	Sand Filter
			85.28	7.80	
			85.08	8.00	Piezometer Tip
					General Backfill
			78.08	15.00	

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
08/07/15		6.50	0.00	SEEPAGE				6.30	

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)
08/07/15				DRY			15.00		6.30	86.78

Instrument Groundwater Observations

Inst. [A] Type : Standpipe Piezometer

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks
Lockable cover set in concrete

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH2

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 19 mm
Diameter of Filter Zone = 100 mm

Client
MR JOHN FITZPATRICK

Job Number
1523902

Location
TQ 266 852

Ground Level (mOD)
89.55

Engineer

Sheet
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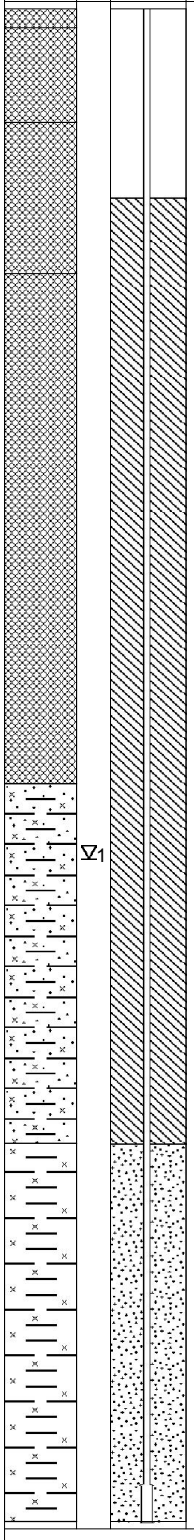

Instr (A)	Level (mOD)	Depth (m)	Description
	88.55	1.00	Bentonite Seal
	83.55	6.00	Cement/Bentonite Grout
	81.75	7.80	Sand Filter
	81.55	8.00	Piezometer Tip

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
08/07/15		4.50	0.00	SEEPAGE					

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)
09/07/15				DRY			8.00		4.50	85.05

Instrument Groundwater Observations

Inst. [A] Type : Standpipe Piezometer

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks
Lockable cover set in concrete

Site Analytical Services Ltd.

Site	Borehole Number
26 LYNDHURST ROAD, LONDON, NW35PB	BH3

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 19 mm
Diameter of Filter Zone = 100 mm

Client
MR JOHN FITZPATRICK

Job Number
1523902

Location
TQ 266 852

Ground Level (mOD)
89.71

Engineer

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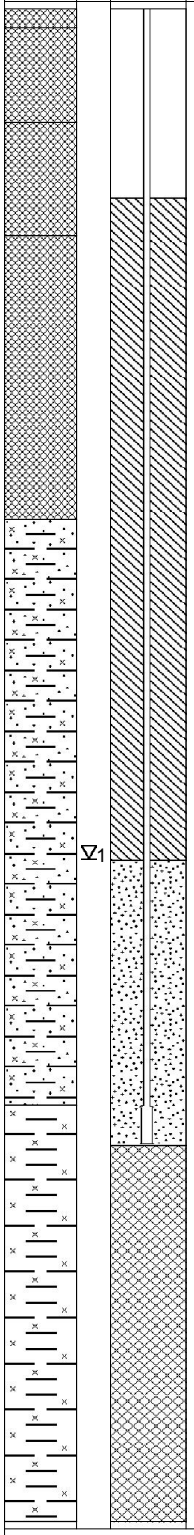

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
08/07/15		4.50	0.00	SEEPAGE					

Groundwater Observations During Drilling

Date	Start of Shift: Time	Start of Shift: Depth Hole (m)	Start of Shift: Casing Depth (m)	Start of Shift: Water Depth (m)	Start of Shift: Water Level (mOD)	End of Shift: Time	End of Shift: Depth Hole (m)	End of Shift: Casing Depth (m)	End of Shift: Water Depth (m)	End of Shift: Water Level (mOD)
09/07/15				DRY			8.00		4.50	85.21

Instrument Groundwater Observations

Inst. [A] Type : Standpipe Piezometer

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks
Lockable cover set in concrete

Site Analytical Services Ltd.

Site	Trial Pit Number
26 LYNDHURST ROAD, LONDON, NW35PB	TP1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
HAND EXCAVATION EXTENDED BY HAND AUGER	0.50m x 0.50m	89.86	MR JOHN FITZPATRICK	1523902
	Location TQ 266 852	**Dates** 08/07/2015	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				89.80	0.06	MADE GROUND : Stone slab		
					(0.34)			
0.25	D1			89.46	0.40	MADE GROUND : Brick and concrete rubble		
0.50	D2					MADE GROUND : Soft silty sandy gravelly clay with brick fragments. Gravel is fine to medium of sub rounded flint		
0.75	D3				(0.60)			
1.00	D4			88.86	1.00	MADE GROUND : Loose brown silty fine to coarse sand with brick fragments		
					(0.40)			
1.37	D5			88.46	1.40	MADE GROUND : Loose silty clayey gravelly fine to coarse sand with brick fragments. Gravel is fine to coarse of sub rounded to sub angular flint		
1.37-1.67	M1 88/300							
1.50	D6							
2.00	D7				(1.60)			
2.50	D8							
3.00	D9		08/07/2015:DRY	86.86	3.00	Complete at 3.00m		

Remarks

D = Disturbed Sample
M = Mackintosh Probe
Groundwater was not encountered during the excavation

Scale (approx)	Logged By	Figure No.
1:50	APS	1523902.TP1

Site Analytical Services Ltd.

Summary of Surveying

Site : 26 LYNDHURST ROAD, LONDON, NW35PB

Client : MR JOHN FITZPATRICK

Engineer :

Job Number 1523902

Sheet 1 / 1

Location	Easting	Northing	Level	Level Type
BH1			93.08	mOD
BH2			89.55	mOD
BH3			89.71	mOD
TP1			89.86	mOD

A P P E N D I X `B'

Laboratory Test Data

Site Analytical Services Ltd.

Ref: 15/23902

UNDRAINED TRIAXIAL COMPRESSION TEST

LOCATION 26 Lyndhurst Road, London, NW3 5PB

BH/TP No.	MOISTURE CONTENT	BULK DENSITY	LATERAL PRESSURE	COMPRESSIVE STRENGTH	COHESION	ANGLE OF SHEARING RESISTANCE	DEPTH
	%	Mg/m^3	kN/m^2	kN/m^2	kN/m^2	degrees	m
BH1	28	1.88	220	113	57		11.25

Table 1

Site Analytical Services Ltd.

Ref: 15/23902

PLASTICITY INDEX & MOISTURE CONTENT DETERMINATIONS

LOCATION 26 Lyndhurst Road, London, NW3 5PB

BH/TP No.	Depth m	Natural Moisture %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 425 μm %	Class
BH1	4.75	18	35	17	18	100	CL/CI
	6.00	24	41	18	23	100	CI
BH2	4.50	31	38	24	14	98	CI
BH3	3.00	25	47	23	24	100	CI
	4.00	26	36	23	13	100	CI
	4.50	32	41	24	17	100	CI

Table 2

Ref: 15/23902

SULPHATE & pH DETERMINATIONS

LOCATION 26 Lyndhurst Road, London, NW3 5PB

BH/TP No.	DEPTH BELOW GL m	SOIL SULPHATES AS SO_4 TOTAL %	SOIL SULPHATES AS SO_4 WATER SOL g/l	WATER SULPHATES AS SO_4 g/l	pH	CLASS	SOIL - 2mm %
BH1	5.00		0.06		5.8	DS-1	100
	9.50		0.06		5.5	DS-1	100
	13.75		0.20		4.4	DS-1	100
BH2	6.00		0.07		4.6	DS-1	100
BH3	3.50		0.06		5.7	DS-1	100
	5.00		0.05		5.9	DS-1	100
	7.00		0.21		4.6	DS-1	100

Classification – Tables C1 and C2 : BRE Special Digest 1 : 2005

Table 3

Site Analytical Services Ltd.

Ref: 15/23902

GROUNDWATER MONITORING

LOCATION 26 Lyndhurst Road, London, NW3 5PB

MONITORING DATE 14th July 2015

BOREHOLE REF:		**BH1**	**BH2**	**BH3**
Water Level	(m.bgl)	6.54	4.76	4.31
	(m.OD)	86.54	84.79	85.40
Depth to base of well	(m.bgl)	8.31	5.98	6.05
	(m.OD)	84.77	83.57	83.66

Table 4

Ref: 15/23902

GROUNDWATER MONITORING

LOCATION 26 Lyndhurst Road, London, NW3 5PB

MONITORING DATE 30th July 2015

BOREHOLE REF:		**BH1**	**BH2**	**BH3**
Water Level	(m.bgl)	6.56	4.77	4.30
	(m.OD)	86.52	84.78	85.41
Depth to base of well	(m.bgl)	8.31	5.98	6.05
	(m.OD)	84.77	83.57	83.66

Table 4a

Ref: 15/23902

GROUNDWATER MONITORING

LOCATION 26 Lyndhurst Road, London, NW3 5PB

MONITORING DATE 2nd September 2015

BOREHOLE REF:		**BH1**	**BH2**	**BH3**
Water Level	(m.bgl)	6.55	4.76	4.30
	(m.OD)	86.53	84.79	85.41
Depth to base of well	(m.bgl)	8.31	5.98	6.05
	(m.OD)	84.77	83.57	83.66

Table 4b