Factual Report on a

GEOTECHNICAL GROUND INVESTIGATION

Ref: 20/32020-2 | Date: February 2021

67 Gascony Avenue
London
NW6 4ND

Prepared for:
Mr G Sandullo

DOCUMENT CONTROL

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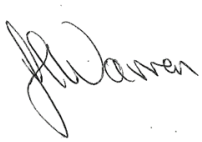	
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1.0 Introduction

1.1 Outline and Limitations of Report

At the request of Mr G Sandullo, a ground investigation was carried out in connection with a proposed residential basement development at the above site. A Desk Top Study and Scoping and Screening Report are presented under separate cover in Site Analytical Services Limited Report References 20/32020 and 20/32020-1 from July 2020.

The information was required for the design and construction of foundations and infrastructure for the proposed development at the existing site which includes the extension of the existing single storey basement to 3.00m maximum depth towards the rear of the property with a small lightwell in the rear garden area.

The recommendations and comments given in this report are based on the ground conditions encountered in the exploratory hole 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 location 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: 525303, 184194)

2.1 Site Location

The site is located on the northern and upper side of Gascony Avenue, in the south of West Hampstead, London, at approximate postcode NW6 4ND. It is immediately bound by residential properties to the north, east and west. The site is in use as a residential property and comprises a 3-storey terraced house. The nearby surrounding areas to the site are mainly residential in all directions.

The site is bound by Gascony Avenue to the immediate south, with residential properties to the north, east and west.

2.2 Published Geology

The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area is detailed in Figure 3 below and indicates the site to be underlain by the London Clay Formation. Deposits of the overlying Claygate Member are indicated to be over 1.6 kilometre to the north of the site.

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 continuous flight auger borehole to a depth of 10.00m below ground level (Borehole 1).
- The installation of a groundwater monitoring standpipe to a depth of 5.00m depth in Borehole 1, together with two return monitoring visits.
- Sampling and in-situ testing as appropriate to the ground conditions encountered in the borehole.
- Laboratory testing to determine the engineering properties of the soils encountered in the exploratory hole.

3.2 Ground Conditions

The approximate location of the exploratory hole is illustrated on the site sketch plan, Figure 1 below.

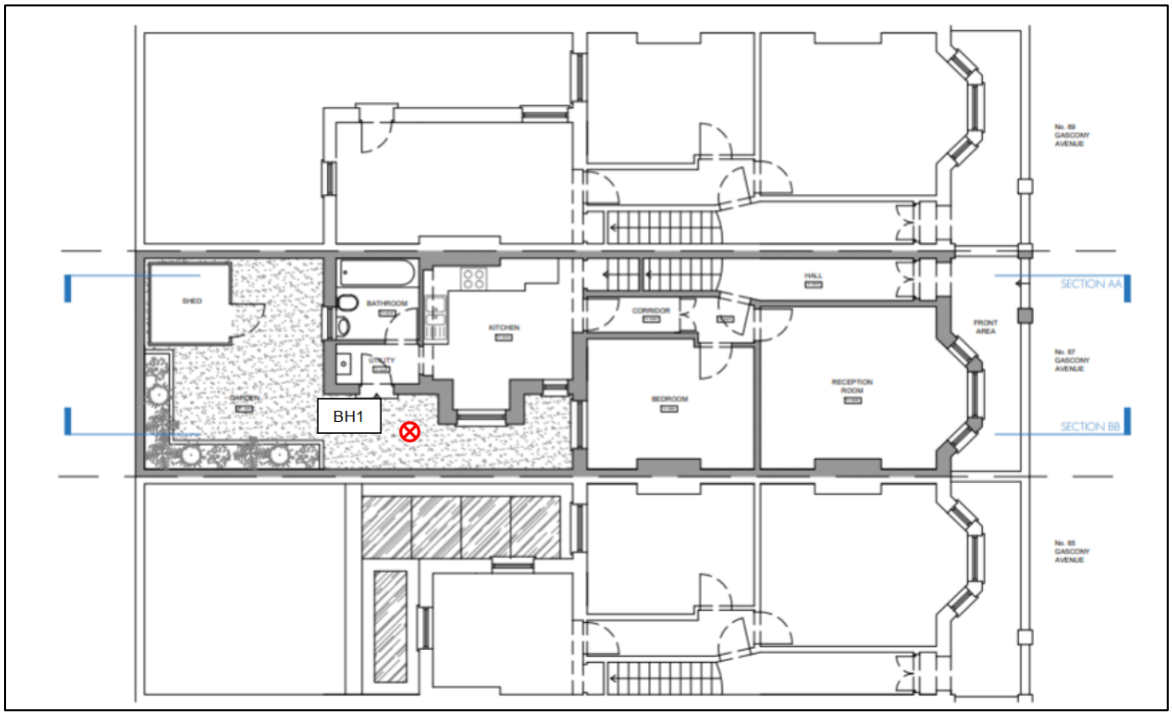

Figure 1. Site Sketch Plan

The borehole revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground up to 1.10m in thickness resting on 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 borehole, reference should be made to the exploratory hole records presented in Appendix A.

Strata	Depth to top of strata (mbgl)	Depth to base of strata (mbgl)	Description
Made Ground	0.00	1.10	Concrete over clayey sand containing brick rubble and concrete fragments.
London Clay Formation	1.10	15.00 (maximum depth of drilling)	Stiff silty sandy clay containing partings of silty fine sand and gypsum crystals.

Summary of Ground Conditions in Exploratory Holes

3.3 Groundwater

Groundwater was not encountered in the borehole and the material remained essentially dry throughout.

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 borehole and hence be detected, particularly within more cohesive soils.

Groundwater was encountered at a depth of 4.14m below ground level in Borehole 1 after a period of approximately three to four weeks.

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.

It should be noted that the comments on groundwater conditions are based on observations made at the time of the investigation (January and February 2021) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions.

4.0 In-Situ and Laboratory Tests

4.1 In-Situ Tests

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.

Mackintosh Probe tests were made in order to assess the relative density of the Made Ground encountered in the borehole. 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

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

4.2 Classification Tests

Atterberg Limit tests were conducted on four selected samples taken from the cohesive portion of the natural soils in Borehole 1 and showed the samples tested to fall into Classes CH and CV according to the British Soil Classification System.

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

4.3 Sulphate and pH Analyses

The results of the sulphate and pH analyses made on three soil samples are presented within the i2 Analytical Limited Report No: 21-53817, contained in Appendix B.

5.0 List of Appendices

Appendix A – Borehole Logs

Appendix B – Laboratory Test & Groundwater Monitoring Data

6.0 References

1. British Standards Institution, 2015. 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

4. British Standards Institution, Code of Practice for Site Investigations, BS5930: 2015, BSI, London

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

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

APPENDIX A

Borehole Logs

Site Analytical Services Ltd.

Site	Borehole Number
67 GASCONY AVENUE, WEST HAMPSTEAD, LONDON, NW6 4ND	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
CONTINUOUS FLIGHT AUGER	100mm cased to 0.00m		MR G SANDULLO	2032020
	Location TQ253841	**Dates** 22/01/2021	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.15) 0.15	MADE GROUND: Concrete		
0.25	D1						MADE GROUND: Very loose, brown clayey fine to coarse grained sand containing brick rubble and concrete fragments		
0.50	D2					(0.95)			
0.75	D3								
1.00 1.00-1.30	D4 M1 41/300					1.10	Stiff, mottled brown silty sandy CLAY		
1.50 1.50	D5 V1 84								
2.00 2.00	D6 V2 103								
2.50 2.50	D7 V3 118								
3.00 3.00	D8 V4 130+								
3.50 3.50	D9 V5 130+								
4.00 4.00	D10 V6 130+								
4.50 4.50	D11 V7 130+								
5.00 5.00	D12 V8 130+								
						(8.90)			
6.00 6.00	D13 V9 130+								
7.00 7.00	D14 V10 130+								
8.00 8.00	D15 V11 130+								
9.00 9.00	D16 V12 130+								
10.00 10.00	D17 V13 130+					10.00			

Remarks
D= Disturbed Sample
M= Makintosh Probe-Blows/Penetration (mm)
V= Vane Test - Results in kPa
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

Scale (approx)	Logged By
1:50	EW

Figure No. 2032020.BH1

Site Analytical Services Ltd.

Site	Borehole Number
67 GASCONY AVENUE, WEST HAMPSTEAD, LONDON, NW6 4ND	BH1

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm
Diameter of Filter Zone = 100 mm

Client
MR G SANDULLO

Job Number
2032020

Location
TQ253841

Ground Level (mOD)

Engineer

Sheet
1/1

Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
				1.00	Bentonite Seal
				5.00	Slotted Standpipe
				6.00	Bentonite Seal
				10.00	General Backfill

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings				Depth Sealed (m)
					5 min	10 min	15 min	20 min	

Groundwater Observations During Drilling

Date	Start of Shift					End of Shift				
	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)

Instrument Groundwater Observations

Inst. [A] Type : Slotted Standpipe

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

Remarks
Lockable cover set in cement

APPENDIX B

Laboratory Test & Groundwater Monitoring Data

PLASTICITY INDEX & MOISTURE CONTENT DETERMINATIONS

BH/TP No.	Depth (m)	Natural Moisture (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 μm (%)	Modified Plasticity Index (%)	Class
BH1	1.50	29	65	20	45	100	45	CH
	2.00	32	74	25	49	100	49	CV
	3.00	32	71	30	41	100	41	CV
	4.00	32	68	30	38	100	38	CH

Table 1

GROUNDWATER MONITORING

GROUNDWATER MONITORING RECORD			
Date	**Weather Conditions**	**Ground Conditions**	**Temperature (°C)**
09/02/2021	Cloudy	Wet	5.0
Monitoring Point Location	**Depth to water (mBGL)**		**Depth to Base of well (mBGL)**
BH1	4.53		5.06

Table 2

GROUNDWATER MONITORING RECORD			
Date	**Weather Conditions**	**Ground Conditions**	**Temperature (°C)**
16/02/2021	Overcast	Damp	11.0
Monitoring Point Location	**Depth to water (mBGL)**		**Depth to Base of well (mBGL)**
BH1	4.14		5.06

Table 2a

Aubrey Davidson
Site Analytical Services Ltd
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33 River Road
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Herts,
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t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 21-53817

Project / Site name:	67 Gascony Avene, Hampsted, London NW6 4ND	**Samples received on:**	28/01/2021
Your job number:	20-32020	**Sample instructed/ Analysis started on:**	29/01/2021
Your order number:	8189	**Analysis completed by:**	04/02/2021
Report Issue Number:	1	**Report issued on:**	04/02/2021
Samples Analysed:	3 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)

For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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: 21-53817

Project / Site name: 67 Gascony Avene, Hampsted, London NW6 4ND
Your Order No: 8189

Lab Sample Number				1752339	1752340	1752341		
Sample Reference				BH1	BH1	BH1		
Sample Number				7	9	13		
Depth (m)				2.50	3.50	6.00		
Date Sampled				22/01/2021	22/01/2021	22/01/2021		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Moisture Content	%	0.01	NONE	22	23	20		
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.0		
Whole Sample Crushed		N/A	NONE	Crushed	Crushed	Crushed		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.9	8.1		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	3.2	2.7	4.0		

Analytical Report Number : 21-53817

Project / Site name: 67 Gascony Avene, Hampsted, London NW6 4ND

* 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 topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1752339	BH1	7	2.50	Brown clay.
1752340	BH1	9	3.50	Brown clay.
1752341	BH1	13	6.00	Brown clay.

Analytical Report Number : 21-53817

Project / Site name: 67 Gascony Avene, Hampsted, London NW6 4ND

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Crush Whole Sample	Either: Client specific preparation instructions - sample(s) crushed whole prior to analysis; OR Sample unsuitable for standard preparation and therefore crushed whole prior to analysis.	In house method, applicable to dry samples only.	L019-PL	D	NONE
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
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

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' 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.