

Report on a **GEOTECHNICAL GROUND INVESTIGATION**

Ref: 22/35445 | Date: August 2022

**43 Stanhope Gardens,
London,
N6 5TT**

Prepared for:
Michael Jones Architects

DOCUMENT CONTROL

<i>Project</i>	43 Stanhope Gardens, London, N6 5TT
<i>Document Type</i>	Report on a Ground Investigation
<i>Document Reference</i>	SAS 22/35455
<i>Document Status</i>	Final
<i>Revision</i>	0
<i>Changes</i>	-
<i>Date</i>	August 2022
<i>Document Version</i>	V1.1 – 1/21

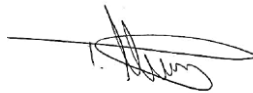
Checked

Author



Jim Warren
MRSC

Managing Director



Thomas Murray
BSc (Hons) MSc FGS

Senior Geotechnical Engineer

Reg. Office: Units 14 +15, River Road Business Park,
33 River Road, Barking, Essex IG11 0EA
Business Reg. No. 2255616

☎ 020 8594 8134

🌐 www.siteanalyticalgroup.co.uk



Ref: 22/35445
Date: August 2022

CONTENTS

1.0 EXECUTIVE SUMMARY	4
2.0 INTRODUCTION	5
2.1 OUTLINE AND LIMITATIONS OF REPORT	5
3.0 SITE DETAILS	5
3.1 SITE LOCATION	5
3.2 PUBLISHED GEOLOGY	5
4.0 SCOPE OF WORK	6
4.1 SITE WORKS	6
4.2 GROUND CONDITIONS	7
4.3 GROUNDWATER	8
4.4 EXISTING FOUNDATIONS	8
5.0 IN-SITU AND LABORATORY TESTS	9
5.1 IN-SITU TESTS	9
5.2 CLASSIFICATION TESTS	9
5.3 CHEMICAL ATTACK ON BURIED CONCRETE	9
6.0 FOUNDATION DESIGN	10
6.1 GENERAL	10
6.2 SITE PREPARATION WORKS	10
6.3 CONVENTIONAL SPREAD FOUNDATIONS	10
6.4 PILED FOUNDATIONS	11
6.5 RETAINING WALLS	11
6.6 FLOOR SLABS	12
6.7 EXCAVATIONS	12
7.0 LIST OF FIGURES / APPENDICES	12
8.0 REFERENCES	13

APPENDIX A

BOREHOLE / TRIAL PIT LOGS

APPENDIX B

LABORATORY TEST & GROUNDWATER MONITORING DATA

1.0 Executive Summary

Site Location	43 Stanhope Gardens, London, N6 5TT
Client	Michael Jones Architects
Proposed Development	It is proposed to slightly increase the size of the existing cellar as well as construct an extension to the existing property. Details of the structures, layouts etc. have been provided, although details of the loadings were not available at the time of preparation of this report.
Environmental Setting	The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area indicates the site to be underlain by deposits of London Clay Formation at depth. A surface cover of Made Ground should also be expected. The Bedrock geology underlying the site has been classified as a non-aquifer.

GEOTECHNICAL INVESTIGATION

Ground Conditions Encountered	The boreholes and trial pits revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground up to 0.70m in thickness resting on the London Clay Formation at depth within the boreholes. Made Ground was encountered to the base of TP2 at 1.50m depth.
Groundwater	Groundwater was encountered at respective depths of 1.64m and 2.04m below ground level in Boreholes 1 and 2 after a period of approximately eight weeks. Given the presence of a non-aquifer below the site it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large scale subterranean groundwater flow.
Engineering Observations & Recommendations	Based on the ground and groundwater conditions encountered in the boreholes, it could, in theory, be possible to support the proposed new development on conventional strip foundations taken down below the Made Ground and any weak superficial soils and placed in the natural stiff silty sandy clay deposits which occur at a depth of 0.70m across the site. Using theory from Terzaghi (1943), strip foundations placed within natural soils may be designed to allowable net bearing pressures of approximately 180kN/m² at 1.00m depth below ground level increasing to 260kN/m² at 3.00m depth below ground level in order to allow for a factor of safety of 2.5 against general shear failure. The actual allowable bearing pressure applicable will depend on the form of foundation, its geometry and depth in accordance with classical analytical methods, details of which can be obtained from "Foundation Design and Construction", Seventh Edition, 2001 by M J Tomlinson (see references) or similar texts.

2.0 Introduction

2.1 Outline and Limitations of Report

At the request of Michael Jones Architects, a ground investigation was carried out in connection with a proposed development at the above site.

The information was required for the design and construction of foundations and infrastructure for the proposed development, which includes the extension of the existing cellar into a basement beneath the existing property on 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.

3.0 Site Details

National Grid Reference: TQ – 290 880

3.1 Site Location

The site is located on the north western side of Stanhope Gardens, North London at approximate postcode W4 5EF. The site consists of a semi-detached two storey residential property, with a small cellar.

The site is bound by residential properties to the north, south and west.

3.2 Published Geology

The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area indicates the site to be underlain by deposits of London Clay Formation at depth. A surface cover of Made Ground should also be expected.

4.0 Scope of Work

4.1 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 two continuous flight auger boreholes, one to a depth of 8.00m below ground level (Borehole 1) and one to a depth of 15.00m below ground level (Borehole 2). Due to access restrictions, the Archway rig could not enter site and the SPT testing was replaced with shear vane testing.
- The installation of groundwater monitoring standpipes to a depth of 6.00m depth in Boreholes 1 and 2, together with a single return monitoring visit.
- The excavation by hand of four trial pits, to 1.50m maximum depth to expose existing foundations on-site (Trial Pits 1 to 4 inclusive).
- Sampling and in-situ testing as appropriate to the ground conditions encountered in the boreholes and trial pits.
- Laboratory testing to determine the engineering properties of the soils encountered in the exploratory holes.
- Interpretative reporting on foundation options for the proposed building and infrastructure.

4.2 Ground Conditions

The approximate locations of the exploratory holes are illustrated on the site sketch plan, Figure 1 below.

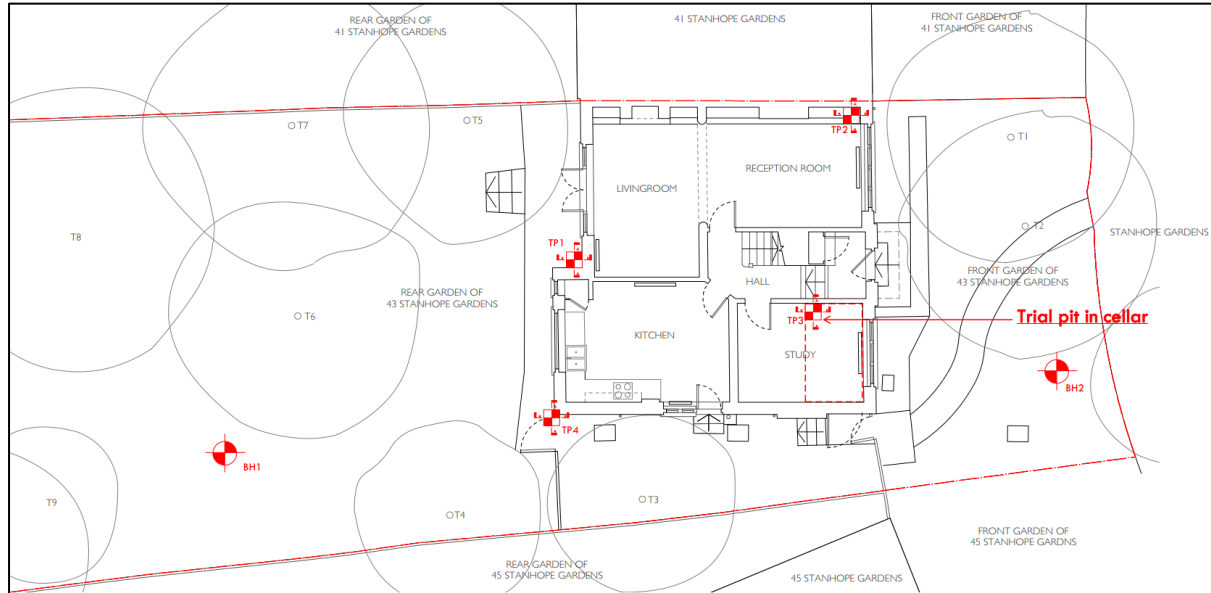


Figure 1. Site Sketch Plan

The boreholes and trial pits revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground up to 0.70m in thickness resting on the London Clay Formation at depth within the boreholes. Made Ground was encountered to the base of TP2 at 1.50m depth.

These ground conditions are summarised in the following table. For detailed information on the ground conditions encountered in the boreholes and trial pits, 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	0.20 to 1.50	Grass, hardcore or concrete over clayey, silty sand containing brick fragments.
London Clay Formation	0.20 to 0.70	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

4.3 Groundwater

Groundwater was not encountered in either of the boreholes or Trial Pits 1, 2 and 4 and the material remained essentially dry throughout. Groundwater was encountered in Trial Pit 3 as detailed in the table below.

Exploratory Hole	Depth (m)	Notes	Stratum
TP3	0.50	Slight seepage	London Clay Formation

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

Groundwater was encountered at respective depths of 1.64m and 2.04m below ground level in Boreholes 1 and 2 after a period of approximately eight weeks. Given the presence of a non-aquifer below the site it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large scale subterranean groundwater flow.

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 (June to August 2022) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions.

4.4 Existing Foundations

Sketches of the foundations exposed in Trial Pits 1 to 4 inclusive are presented on the appropriate exploratory hole records presented in Appendix A.

5.0 In-Situ and Laboratory Tests

5.1 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.

5.2 Classification Tests

Atterberg Limit tests were conducted on eight selected samples taken from the cohesive portion of the natural soils in Boreholes 1 and 2 and showed the samples tested to fall into Class CH according to the British Soil Classification System.

These are fine grained silty clay soils of high plasticity and as such generally have a low permeability and a medium to high susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2. The results indicated Modified Plasticity Index values of between 32% and 43%, with three samples being above the 40% boundary between soils assessed as being of medium swelling and shrinkage potential and those assessed as being of high swelling and shrinkage potential.

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

5.3 Chemical Attack on Buried Concrete

Using the results contained in Appendix B, the following table provides the highest values encountered for the BRE SD1 Suite D specification and the equivalent DS and ACEC classes, based on a static groundwater:

Strata	pH	2:1 Water Soluble SO ₄ (g/l)	2:1 Water Soluble Chloride (mg/l)	2:1 Water Soluble Nitrate (mg/l)	Total Sulphate (%)	Magnesium (mg/l)	DS Class	ACEC Class
London Clay Formation	7.3-8.2	3.00	82	<2.0	6.11	590	DS-3	AC-2s

Worst case DS and ACEC classes based on the BRE SD1 Suite D results

6.0 Foundation Design

6.1 General

It is proposed to slightly increase the size of the existing cellar as well as construct an extension to the existing property. Details of the structures, layouts etc. have been provided, although details of the loadings were not available at the time of preparation of this report.

6.2 Site Preparation Works

The main contractor should be informed of the site conditions and risk assessments should be undertaken to comply with the Construction Design Management (CDM) regulations. Site personnel are to be made aware of the site conditions. It is recommended that extensive searches of existing man-made services are undertaken over the site prior to final design works.

6.3 Conventional Spread Foundations

A result of the inherent variability of uncontrolled fill, (Made Ground) is that it is usually unpredictable in terms of bearing capacity and settlement characteristics. Foundations should, therefore, be taken through any Made Ground and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.

Based on the ground and groundwater conditions encountered in the boreholes, it could, in theory, be possible to support the proposed new development on conventional strip foundations taken down below the Made Ground and any weak superficial soils and placed in the natural stiff silty sandy clay deposits which occur at a depth of 0.70m across the site.

Using theory from Terzaghi (1943), strip foundations placed within natural soils may be designed to allowable net bearing pressures of approximately 180kN/m² at 1.00m depth below ground level increasing to 260kN/m² at 3.00m depth below ground level in order to allow for a factor of safety of 2.5 against general shear failure. The actual allowable bearing pressure applicable will depend on the form of foundation, its geometry and depth in accordance with classical analytical methods, details of which can be obtained from "Foundation Design and Construction", Seventh Edition, 2001 by M J Tomlinson (see references) or similar texts.

Any soft or loose pockets encountered within otherwise competent formations should be removed and replaced with well compacted granular fill.

In addition, foundations may need to be taken deeper should they be within the zones of influence of both existing or recently felled trees and any proposed tree planting. The depth of foundation required to avoid the zone likely to be affected by the root systems of trees is shown in the recommendations given in NHBC Standards, Chapter 4.2, April 2010, "Building near Trees" and it is considered that this document is relevant in this situation.

6.4 Piled Foundations

In the event that the use of conventional spread foundations proves either impracticable or uneconomical due to the size and depth of foundation required, then a piled foundation will be required. In these ground conditions, it is considered that some form of bored and in-situ cast concrete piled foundation with reinforced concrete ground beams should prove satisfactory.

The construction of a piled foundation is a specialist activity and the advice of a reputable contractor, familiar with the type of soil and groundwater conditions encountered at this site should be sought prior to finalising the foundation design. The actual pile working load will depend on the particular type of pile chosen and method of installation adopted.

To achieve the full bearing value a pile should penetrate the bearing stratum by at least five times the pile diameter.

Where piles are to be constructed in groups the bearing value of each individual pile should be reduced by a factor of about 0.8 and a calculation made to check the factor of safety against block failure.

Driven piles could also be used and would develop much higher working loads approximately 2.5 to 3 times higher than bored piles of a similar diameter at the same depth. However, the close proximity of adjacent buildings will in all probability preclude their use due to noise and vibration.

6.5 Retaining Walls

Several methods of retaining wall construction could be considered. These may include retaining structures cast in an underpinning sequence, or the use of temporary or sacrificial works to facilitate the retaining structure's construction. The excavation of the basement must not compromise the integrity of adjacent structures.

The full design of temporary and permanent retaining structures is beyond the scope of this report. However, the following design parameters for each element of soil recorded in the relevant exploratory holes are provided in the following table below to assist the design of these structures.

Stratum	Depth to top	Bulk Density (Mg/m ³) (γ)	Effective Angle of Internal Friction (Φ)
London Clay Formation	0.20 to 0.70	2.00	23

Retaining Wall Design Parameters

The designer should use these parameters to derive the active and passive earth pressure coefficients k_a and k_p . The determination of appropriate earth pressure coefficients, together with factors such as the pattern of the earth pressure distribution, will depend upon the type/geometry of the wall and overall design factors.

6.6 Floor Slabs

Due to the presence of soils assessed to be of high swelling and shrinkage potential below, it is recommended that ground slabs should be fully suspended.

Within the zone of influence of trees, either retained or removed, floor slabs should incorporate either underfloor voids or suitable depths of compressible material in accordance with NHBC requirements, for soils with high volume change potential.

6.7 Excavations

Given the presence of a non-aquifer below the site it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large scale subterranean groundwater flow. As a result, the impact on excavations carried out at the site from this perched water is expected to be minimal.

However, it may still be necessary to control this water during the construction period and consideration could be given to conventional internal pumping methods from open sumps.

It is recommended that the water levels in the monitoring borehole be periodically measured immediately prior to and during, the development. Should groundwater levels rise to within the excavation volume, or should significant groundwater inflow be observed during excavation, professional advice should be sought.

7.0 List of Figures / Appendices

Appendix A – Borehole / Trial Pit Logs

Appendix B – Laboratory Test & Groundwater Monitoring Data

8.0 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
4. British Standards Institution, 2007. Code of Practice for Site Investigations, BS EN 1997-2, BSI, London
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. Nathanail C.P., McCaffrey, C., Ashmore, M.H., Cheng, Y.Y., Gillet, A., Ogden, R. & Scott, D., 2009. The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition). Land Quality Press, Nottingham.
10. NHBC Standards, Chapter 4.1, "Land Quality - managing ground conditions", September 1999.
11. NHBC Standards, Chapter 4.2, "Building near Trees", April 2010.
12. 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.
13. Tomlinson, M J, 2001. "Foundation Design and Construction", Seventh Edition, Prentice Hall (ISBN 0-13-031180-4).

APPENDIX A

Borehole / Trial Pit Logs

Site Analytical Services Ltd.							Site		Borehole Number	
CONTINUOUS FLIGHT AUGER							43 STANHOPE GARDENS, LONDON, N6 5TF		BH1	
Boring Method		Casing Diameter			Ground Level (mOD)		Client		Job Number	
		100mm cased to 0.00m					MICHAEL JONES ARCHITECTS		2235445	
		Location					Dates		Engineer	
		TQ289879			13/06/2022		STRUCTURAL DESIGN STUDIO		1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.25	D1					(0.70)	MADE GROUND: Grass over very loose dark brown silty clayey fine to coarse grained sand containing occasional brick fragments			
0.50-0.80	D2					0.70	Stiff, medium brown orange very sandy CLAY			
0.75	M1 41/300									
1.00	D3									
1.00	D4					(0.70)	Roots 1mm to 900mm			
1.00	V1 98									
						1.40	Stiff, medium brown orange grey veined sandy CLAY			
1.50	D5									
1.50	V2 120									
2.00	D6									
2.00	V3 140+									
2.50	D7									
2.50	V4 140+					(2.80)				
3.00	D8									
3.00	V5 140+									
3.50	D9									
3.50	V6 140+									
4.00	D10									
4.00	V7 140+					4.20	Stiff, medium brown silty sandy CLAY			
4.50	D11					(0.60)				
4.50	V8 140+									
						4.80	Stiff, dark grey silty sandy CLAY containing partings of silty fine grained sand and occasional gypsum crystals			
5.00	D12									
5.00	V9 140+									
6.00	D13									
6.00	V10 140+					(3.20)				
7.00	D14									
7.00	V11 140+									
8.00	D15					8.00	Complete at 8.00m			
8.00	V12 140+									
Remarks Unable to complete borehole due to a claystone obstruction Groundwater was not encountered during boring/excavation V= Vane Test - Results in kPa M= Makintosh Probe-Blows/Penetration (mm) D= Disturbed Sample								Scale (approx)		Logged By
								1:50		EW
								Figure No.		
2235445.BH1										

Site Analytical Services Ltd.						Site 43 STANHOPE GARDENS, LONDON, N6 5TF				Borehole Number BH1							
Installation Type Single Installation		Dimensions Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 100 mm				Client MICHAEL JONES ARCHITECTS				Job Number 2235445							
		Location TQ289879		Ground Level (mOD)		Engineer STRUCTURAL DESIGN STUDIO				Sheet 1/1							
Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description	Groundwater Strikes During Drilling											
				1.00	Bentonite Seal	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)								
				6.00	Bentonite Seal												
				7.00	Bentonite Seal												
				8.00	General Backfill												

Remarks
Lockable cover set in cement

Produced by the GEOTECHNICAL DATABASE SYSTEM (GEODASY) © all rights reserved

Site Analytical Services Ltd.							Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Borehole Number BH2	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445	
		Location TQ289879			Dates 13/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.25	D1					0.05 (0.35)	MADE GROUND: Hardcore			
0.50	D2					0.40 (0.30)	MADE GROUND: Dark brown silty clay containing brick and concrete fragments			
0.50-0.80	M1 53/300					0.70	MADE GROUND: Soft, brown orange sandy clay containing occasional brick fragments			
0.75	D3									
1.00	D4					(0.90)	Stiff, medium brown orange sandy CLAY Roots of alive appearance to 1mm to 900mm			
1.00	V1 111									
1.50	D5					1.60	Stiff, medium brown orange grey veined sandy CLAY			
1.50	V2 128									
2.00	D6									
2.00	V3 140+									
2.50	D7									
2.50	V4 140+									
3.00	D8									
3.00	V5 140+									
3.50	D9					(4.00)				
3.50	V6 140+									
4.00	D10									
4.00	V7 140+									
4.50	D11									
4.50	V8 140+									
5.00	D12									
5.00	V9 140+					5.60	Stiff, dark grey silty sandy CLAY containing partings of silty fine grained sand and occasional gypsum crystals			
6.00	D13									
6.00	V10 140+									
7.00	D14									
7.00	V11 140+									
8.00	D15					(4.40)				
8.00	V12 140+									
9.00	D16									
9.00	V13 140+									
Remarks Groundwater was not encountered during boring/excavation M= Makintosh Probe-Blows/Penetration (mm) V= Vane Test - Results in kPa D= Disturbed Sample								Scale (approx)	Logged By	
								1:50	EW	
								Figure No. 2235445.BH2		

Site Analytical Services Ltd.							Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Borehole Number BH2	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445	
		Location TQ289879			Dates 13/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
10.00 10.00	D17 V14 140+					10.00	Stiff, dark grey silty sandy CLAY containing partings of silty fine grained sand and occasional gypsum crystals			
11.00 11.00	D18 V15 140+									
12.00 12.00	D19 V16 140+									
13.00 13.00	D20 V17 140+					(5.00)				
14.00 14.00	D21 V18 140+									
15.00 15.00	D22 V19 140+					15.00	Complete at 15.00m			
Remarks Groundwater was not encountered during boring/excavation M= Makintosh Probe-Blows/Penetration (mm) V= Vane Test - Results in kPa D= Disturbed Sample								Scale (approx)	Logged By	
								1:50	EW	
								Figure No. 2235445.BH2		

Site Analytical Services Ltd.			Site 43 STANHOPE GARDENS, LONDON, N6 5TF	Borehole Number BH2
Installation Type Single Installation	Dimensions Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 100 mm		Client MICHAEL JONES ARCHITECTS	Job Number 2235445
	Location TQ289879	Ground Level (mOD)	Engineer STRUCTURAL DESIGN STUDIO	Sheet 1/1

Remarks
Lockable cover set in cement

Site Analytical Services Ltd.						Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Trial Pit Number TP1	
Excavation Method HAND EXCAVATION		Dimensions 0.30m(W) x 0.30m(L) x 0.78m(D)		Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445	
		Location TQ289879		Dates 14/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.58 0.58	D1 V1 98				0.04	MADE GROUND: Concrete slab			
					0.14				
					(0.44)	MADE GROUND: Concrete			
					0.58 (0.20)	MADE GROUND: Dark brown silty clay containing brick and concrete fragments			
					0.78	Stiff, medium brown orange sandy CLAY			
						Complete at 0.78m			
Plan						Remarks			
.						Groundwater was not encountered during boring/excavation			
.						V= Vane Test - Results in Kpa			
.						D= Disturbed Sample			
.									
.									
.									
.									
.									
.						Scale (approx)		Logged By	
						1:50		EW	
								Figure No. 2235445.TP1	

Site Analytical Services Ltd.			Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Trial Pit Number TP1				
Method Trial Pit		Dimensions 0.30m(W) x 0.30m(L) x 0.78m(D)		Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445	
Orientation A D B C		Location TQ289879		Dates 14/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 1/1	
Depth 0.00 150mm Brick 50mm 75mm Brick 50mm 75mm Brick 50mm 75mm Brick 100mm 200mm Concrete Underside of foundation found at 0.58m depth. 0.78 Level 0.00									

Site Analytical Services Ltd.

Site

43 STANHOPE GARDENS, LONDON, N6 5TF

**Trial Pit
Number**
TP2

Excavation Method

HAND EXCAVATION

Dimensions
0.30m(W) x 0.30m(L) x 1.50m(D)

Ground Level (mOD)

Client
MICHAEL JONES ARCHITECTS

Job Number
2235445

Location

TQ289879

Dates	14/06/2022
--------------	------------

Engineer
STRUCTURAL DESIGN STUDIO

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
(Thickness)

Description

Legend

water

MADE GROUND: Screed

MADE GROUND: Concrete

MADE GROUND: Void

MADE GROUND: Medium brown silty fine to coarse grained sand containing brick, concrete and other man-made fragments

Complete at 1.50m

Plan

Remarks

Groundwater was not encountered during boring/excavation

Scale (approx)

1:50

Logged By

EW

Figure No.

2235445.TP2

Site 43 STANHOPE GARDENS, LONDON, N6 5TF	Trial Pit Number TP2
Client MICHAEL JONES ARCHITECTS	Job Number 2235445
Engineer STRUCTURAL DESIGN STUDIO	Sheet 1/1



Strata			Samples and Tests		
Depth (m)	No.	Description	Depth (m)	Type	Field Records
0.00-0.05	1	MADE GROUND: Screed			
0.05-0.20	2	MADE GROUND: Concrete			
0.20-0.28	3	MADE GROUND: Void			
0.28-1.50	4	MADE GROUND: Medium brown silty fine to coarse grained sand containing brick, concrete and other man-made fragments			

Excavation Method:

HAND EXCAVATION

Shoring / Support:

Stability:

Backfill:

Remarks
Groundwater was not encountered during boring/excavation

Logged By : EW
Checked By :
Figure No. : 2235445.TP2

Site Analytical Services Ltd.						Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Trial Pit Number TP3		
Excavation Method HAND EXCAVATION		Dimensions 0.30m(W) x 0.30m(L) x 1.50m(D)		Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445		
		Location TQ289879		Dates 14/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
			Water Strike (1) at 0.50m.		0.12	MADE GROUND: Screed			▽1	
					0.20	MADE GROUND: Hardcore and brick rubble				
					(1.30)	Medium brown orange sandy CLAY				
					1.50	Complete at 1.50m				
Plan					Remarks					
.										
.										
.										
.										
.										
.										
.					Scale (approx)		Logged By		Figure No.	
					1:50		EW		2235445.TP3	

Site Analytical Services Ltd.				Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Trial Pit Number TP3			
Method Trial Pit		Dimensions 0.30m(W) x 0.30m(L) x 1.50m(D)		Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445	
Orientation A D B C		Location TQ289879		Dates 14/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 1/1	
Depth 0.00 1.50 Unseen Concrete Concrete 1500mm Underside of foundation was not found. Level 0.00 1.50 Σ1									
Strata						Samples and Tests			
Depth (m)		No.	Description			Depth (m)		Type	Field Records
0.00-0.12		1	MADE GROUND: Screed						
0.12-0.20		2	MADE GROUND: Hardcore and brick rubble						
0.20-1.50		3	Medium brown orange sandy CLAY						
Groundwater						Excavation Method:			
Date		Struck (m)	Rate	5 min	10 min	15 min	20 min	Remarks	
14/06/22		0.50	Water Strike						
						HAND EXCAVATION			
						Shoring / Support:			
						Stability:			
						Backfill:			
Remarks									
Logged By : EW Checked By : Figure No. : 2235445.TP3									

Site Analytical Services Ltd.						Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Trial Pit Number TP4	
Excavation Method HAND EXCAVATION		Dimensions 0.30m(W) x 0.30m(L) x 0.57m(D)		Ground Level (mOD)		Client MICHAEL JONES ARCHITECTS		Job Number 2235445	
		Location TQ289879		Dates 14/06/2022		Engineer STRUCTURAL DESIGN STUDIO		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
					0.05 0.15 (0.42) 0.57	MADE GROUND: Concrete slab MADE GROUND: Concrete MADE GROUND: Medium to dark brown sandy clay containing brick and concrete fragments Complete at 0.57m			
Plan						Remarks			
.						Groundwater was not encountered during boring/excavation			
.									
.									
.									
.									
.									
						Scale (approx)		Logged By	
						1:50		EW	
								Figure No.	
								2235445.TP4	

Site Analytical Services Ltd.			Site 43 STANHOPE GARDENS, LONDON, N6 5TF		Trial Pit Number TP4
Method Trial Pit		Dimensions 0.30m(W) x 0.30m(L) x 0.57m(D)	Ground Level (mOD)	Client MICHAEL JONES ARCHITECTS	Job Number 2235445
Orientation A B C D		Location TQ289879	Dates 14/06/2022	Engineer STRUCTURAL DESIGN STUDIO	Sheet 1/1
Depth 0.00 250mm 75mm 75mm 75mm 90mm 0.57 Brick Brick Brick Brick Concrete 50mm 50mm 50mm 50mm Underside of foundation was not found due to a possible drain run. Level 0.00 0.57					
Strata			Samples and Tests		
Depth (m)	No.	Description	Depth (m)	Type	Field Records
0.00-0.05	1	MADE GROUND: Concrete slab			
0.05-0.15	2	MADE GROUND: Concrete			
0.15-0.57	3	MADE GROUND: Medium to dark brown sandy clay containing brick and concrete fragments			
			Excavation Method: HAND EXCAVATION		
			Shoring / Support:		
			Stability:		
			Backfill:		
Remarks Groundwater was not encountered during boring/excavation					
Logged By : EW Checked By : Figure No. : 2235445.TP4					

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 μ m (%)	Modified Plasticity Index (%)	Class
BH1	1.00	22	54	17	37	95	35	CH
	2.00	27	57	24	33	100	33	CH
	3.00	29	67	24	43	100	43	CH
	4.00	27	58	26	32	100	32	CH
BH2	0.75	27	59	22	37	100	37	CH
	1.50	30	66	25	41	100	41	CH
	2.50	31	65	26	39	100	39	CH
	3.50	30	64	23	41	100	41	CH

Table 1

GROUNDWATER MONITORING

GROUNDWATER MONITORING RECORD			
Date	Weather Conditions	Ground Conditions	Temperature (°C)
09/08/2022	Sunny with clear skies	Dry	19.0
Monitoring Point Location	Depth to water (mBGL)		Depth to Base of well (mBGL)
BH1	1.64		6.00
BH2	2.04		6.10

Table 2

Steve Barrett
Site Analytical Services Ltd
Units 14 -15
River Road Business Park
33 River Road
Barking
Essex
IG11 0EA
t: 0208 5948134
f: 0208 5948072
e: SAS -

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS
t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 22-66565

Project / Site name:	43 Stanhope Gardens, London N6 5TF	Samples received on:	22/06/2022
Your job number:	22 35445	Samples instructed on/ Analysis started on:	22/06/2022
Your order number:	10511	Analysis completed by:	29/06/2022
Report Issue Number:	1	Report issued on:	29/06/2022
Samples Analysed:	4 soil samples		


Signed:

Martyna Langer
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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: 22-66565

Project / Site name: 43 Stanhope Gardens, London N6 5TF

Your Order No: 10511

Lab Sample Number				2323281	2323282	2323283	2323284
Sample Reference				BH1	BH1	BH2	BH2
Sample Number				D7	D11	D6	D14
Depth (m)				2.50	4.50	2.00	7.00
Date Sampled				14/06/2022	14/06/2022	14/06/2022	14/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	20	20	22	20
Total mass of sample received	kg	0.001	NONE	2	2	2	2

Whole Sample Crushed		N/A	NONE	Crushed	Crushed	Crushed	Crushed
----------------------	--	-----	------	---------	---------	---------	---------

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	7.7	7.3	8.2
Total Sulphate as SO ₄	%	0.005	MCERTS	0.094	2.47	6.11	0.171
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivale	g/l	0.00125	MCERTS	0.38	3	3	0.91
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	13	23	38	82
Total Sulphur	%	0.005	MCERTS	0.04	1.56	2.44	1.03
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	75	590	550	160
---------------------------	-------	---	------	----	-----	-----	-----

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-66565

Project / Site name: 43 Stanhope Gardens, London N6 5TF

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2323281	BH1	D7	2.5	Brown clay.
2323282	BH1	D11	4.5	Brown clay.
2323283	BH2	D6	2	Brown clay.
2323284	BH2	D14	7	Brown clay.

Analytical Report Number : 22-66565

Project / Site name: 43 Stanhope Gardens, London N6 5TF

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-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
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
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
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
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.