GROUND INVESTIGATION REPORT

Stephenson House
75 Hampstead Road
London
NW1 2PL

Client: Lazari Properties 2 Ltd

Engineer: The Morton Partnership

J17275

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GEA

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This report is intended as a Ground Investigation Report (GIR) as defined in BS EN1997-2, unless specifically noted otherwise. The report is not a Geotechnical Design Report (GDR) as defined in EN1997-2 and recommendations made within this report are for guidance only.

CONTENTS

EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

BRIEF

This report describes the findings of a site investigation carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of The Morton Partnership, on behalf of Lazari Properties 2 Ltd. The work has been carried out with respect to the redevelopment of the site through the partial demolition of the existing building and subsequent construction of a new five-storey to six-storey building retaining the existing basement level. The purpose of the investigation has been to determine the ground conditions and hydrogeology, to assess the extent of any contamination and to provide information to assist with the design of new foundations. The site has previously been the subject of a desk study by GEA (report reference J17139 Issue 2, dated 12 July 2017) and the findings of the desk study have been referred to where appropriate.

DESK STUDY FINDINGS

The site was first developed with terraced housing during the late 18th Century. Greenwood's map of London, dated 1830, shows that part of the site had been redeveloped with a brewery. By the time of the next map studied, dated 1870, the building on the corner of Charles Street (now Drummond Street) and Highgate Road had been converted into a Public House, whilst the brewery is still shown to be present in the central part of the site. By 1896, the site had been redeveloped with new commercial buildings. Goad insurance plans indicate uses to have included showrooms for furniture, carpets and bedding, varnishers ('Japanner'), warehouses and offices, while the site is no longer listed as a brewery. An insurance plan dated 1927 also shows a 'sunken petrol tank' to be present towards the rear of No 15 William Street, approximately 5 m to the north of the site, which is shown on plans dated 1930 and 1939, but not on plans after 1957. By the time of the 1953 map, the majority of the buildings on the site had been demolished and replaced, including the Public House and remaining residential buildings in the northeast of the site. Part of the site is also labelled as a ruin and this coupled with the extensive post-war redevelopment could indicate that the site was damaged during World War II. The adjacent and nearby sites to the west are labelled as a timber yard, a printing works and a furniture works. Stephenson House is first labelled on the site on the map dated 1969. Goad insurance plans show Stephenson House, including the basement car park, to have comprised office space for its entire history. In addition, plans dated during the 1960s show a number of vehicle repair garages present adjacent to the site to the west and north.

GROUND CONDITIONS

The investigation has generally confirmed the expected ground conditions in that, beneath a variable thickness of made ground, Lynch Hill Gravel was encountered overlying the London Clay Formation. The made ground generally comprised brown clayey sand with variable amounts of gravel, brick and concrete fragments and extended to depths of between 0.50 m and 1.60 m. The Lynch Hill Gravel was encountered in the southern parts of the site and generally comprised dense orange-brown fine to coarse sand and fine to coarse sub-angular to sub-rounded gravel, and extended to depths of between 1.90 m and 2.30 m, with the thickness of the gravel appearing to increase southwards. The London Clay comprised an initial horizon of medium becoming high strength soft becoming firm and stiff fissured brown clay, extending to depths of 8.00 m and 8.90 m, whereupon very stiff high and locally very high strength fissured grey clay was encountered. This extended to the full depth investigated, of 20.00 m. Groundwater was encountered in most of the boreholes and trial pits at depths of between 0.60 m and 0.80 m. However, where the London Clay was found to be present immediately below the floor slab, groundwater was not generally encountered. The results of the chemical analyses have not identified contamination within the samples tested. The results of the testing of a single sample of groundwater indicated the presence of elevated concentrations of arsenic, monohydric phenols, total PAH and TPH.

RECOMMENDATIONS

It is proposed to use the existing foundations to support the new building, which will lead to an increase in load of about 30%. This should generally be feasible although additional work will be required to confirm the configuration of the foundations and that the anticipated settlements will remain within tolerable limits. Where new foundations are required, and they are constructed within the London Clay, a net allowable bearing pressure of between 150 kN/m^2 and 180 kN/m^2 could be adopted. The ground beneath the site is not considered to be contaminated, but the contamination of the groundwater will require further investigation.

Part 1: INVESTIGATION REPORT

This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2.

1.0 INTRODUCTION

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by The Morton Partnership, on behalf of Lazari Properties 2 Ltd, to carry out a ground investigation at Stephenson House, 75 Hampstead Lane, London, NW1 2PL.

The site has previously been the subject of a desk study by GEA (report reference J17139 Issue 2, dated 12 July 2017) and the findings of the desk study have been referred to where appropriate.

1.1 Proposed Development

It is understood that the proposed development comprises demolition of the existing building down to ground floor level, and the subsequent construction of a new mixed use reinforced concrete framed building. The existing basement structure and ground floor slab are to be retained and the building will be six storeys in height along the elevation lining Hampstead Road and five storeys in height along the Drummond Street elevation.

This report is specific to the proposed development and the advice herein should be reviewed once the development proposals are finalised.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to determine the ground conditions and their engineering properties;
- to provide advice with respect to the design of suitable foundations and retaining walls;
- to determine the nature of the existing footings;
- to provide an indication of the degree of soil contamination present; and
- to assess the risk that any such contamination may pose to the proposed development, its users or the wider environment.

1.3 Scope of Work

In the light of the previous desk study an intrusive ground investigation was carried out which comprised, in summary, the following activities:

- two boreholes advanced to a depth of 20.00 m below existing basement level by a dismantlable cable percussion rig;
- a series of shallow boreholes advanced through a mixture of window sampling and opendrive sampling methods;

- five trial pits excavated to a maximum depth of 1.27 m using a mini excavator;
- four concrete core holes through the existing foundations, advanced to a maximum depth of 3.40 m;
- standard penetration tests (SPTs) carried out at regular intervals within a selection of the boreholes to provide quantitative data on the strength of the soils;
- the installation of three groundwater monitoring standpipes to a maximum depth of 5.00 m;
- testing of selected soil samples for contamination and geotechnical purposes; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

The report includes a contaminated land assessment which has been undertaken in accordance with the methodology presented in Contaminated Land Report (CLR) 11[1] and involves identifying, making decisions on, and taking appropriate action to deal with, land contamination in a way that is consistent with government policies and legislation within the United Kingdom. The risk assessment is thus divided into three stages comprising Preliminary Risk Assessment, Generic Quantitative Risk Assessment, and Site-Specific Risk Assessment.

The exploratory methods adopted in this investigation have been selected on the basis of the constraints of the site including but not limited to access and space limitations, together with any budgetary or timing constraints. Where it has not been possible to reasonably use an EC7 compliant investigation technique a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon engineering experience, local precedent where applicable and relevant published information.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted and the number of locations where the ground was sampled. No liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

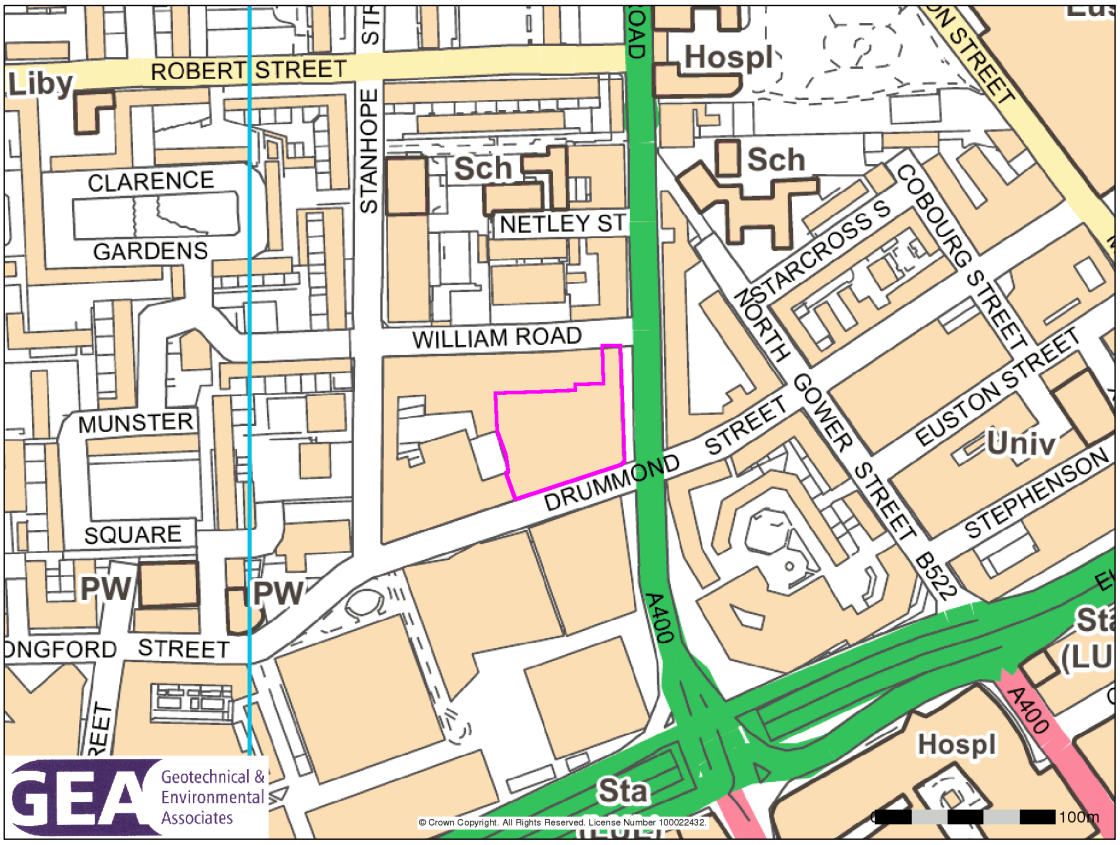
2.0 THE SITE

2.1 Site Description

The site is located within the London Borough of Camden, approximately 250 m north of Warren Street London Underground Station and 300 m west of London Euston Railway Station. It fronts onto Hampstead Road to the east and Drummond Street to the south and is bounded to the west by Nos 164 to 166 Drummond Street, a six-storey building with a rear courtyard area used for parking. To the north and northwest the site is bounded by parts of

1 *Model Procedures for the Management of Land Contamination* issued jointly by the Environment Agency and the Department for Environment, Food and Rural Affairs (DEFRA) Sept 2004

Nos 9, 11 to 15 and 17 to 33 William Road, which generally comprise five or six storey office buildings. The site extends to the boundary with William Road in the northeast.



The site may additionally be located by National Grid Reference 529191, 182517 and is shown on the map extract above. It forms an irregularly shaped area measuring 70 m east-west by 70 m north-south in maximum dimensions and is occupied by Stephenson House, a seven-storey office building with a single level basement currently used as parking for the offices above. The building occupies the entire site and the site is devoid of vegetation.

2.2 Summary of Desk Study Findings

The site history was researched by reference to internet sources and historical Ordnance Survey (OS) maps obtained from the Envirocheck database.

The site was first developed with terraced housing during the late 18th Century. Greenwood's map of London, dated 1830, shows that part of the site had been redeveloped with a brewery. By the time of the next map studied, dated 1870, the building on the corner of Charles Street (now Drummond Street) and Highgate Road had been converted into a Public House, whilst the brewery is still shown to be present in the central part of the site and all of the existing road network and many of the existing surrounding buildings had been constructed. By 1896, the site had been redeveloped with new commercial buildings. Goad insurance plans indicate uses to have included showrooms for furniture, carpets and bedding, varnishers ('Japanner'), warehouses and offices, while the site is no longer listed as a brewery. An insurance plan dated 1927 also shows a 'sunken petrol tank' to be present towards the rear of No 15 William Street, approximately 5 m to the north of the site, which is present on plans dated 1930 and 1939, but not on plans after 1957.

By the time of the 1953 map, the majority of the buildings on the site had been demolished and replaced, including the Public House and remaining residential buildings in the northeast of the site. Part of the site is also labelled as a Ruin and this coupled with the extensive post-war redevelopment could indicate that the site was damaged during World War II. The adjacent and nearby sites to the west are labelled as a timber yard, a printing works and a furniture Works.

Stephenson House is first labelled on the site on the map dated 1969. Goad insurance plans show Stephenson House, including the basement car park, to have comprised office space for its entire history, with tenants including Barclays Bank. In addition, plans dated during the 1960s show a number of vehicle repair garages present adjacent to the site to the west and north. The maps available show the site and surrounding area to have since remained essentially unchanged, although it is understood that the public house on the corner of Drummond Street and Hampstead Road was demolished and the area incorporated into Stephenson House in 2007.

Reference to archive building plans indicate the building to be supported by mass concrete spread foundations extending to a depth of about 3.00 m below basement level, where they bear within the London Clay. Archived calculations indicate the foundations to have been designed to support a load of 3 tonnes per square foot, which equates to about 285 kN/m^2.

The search has revealed that there are no landfills, waste management, transfer, treatment or disposal sites within 950 m of the site. Additionally, there have been no pollution incidents to controlled waters within 350 m of the site and there are no areas of potentially infilled lad within 300 m of the site.

The Geological Survey map of the area (Sheet 256) indicates that the site is underlain by the Lynch Hill Gravel over the London Clay Formation.

The Lynch Hill Gravel is classified as a Secondary ‘A’ Aquifer, which refers to strata that contain permeable layers capable of supporting water supply at a local level and in some cases may form an important source of base flow for local rivers, as defined by the Environment Agency (EA). The underlying London Clay is classified as a Non-Aquifer and Unproductive Stratum, which refers to a soil or rock with low permeability that has a negligible effect on local water supply or river base flow.

There are no EA designated Source Protection Zones (SPZs) on the site. The Envirocheck report indicates that the site is not located within 750 m of any surface water features. The site is not located in an area at risk of flooding from rivers or sea or surface water, as defined by the EA, although a section of both Drummond Street and Highgate Road, in close proximity to the site, are shown to be at low risk of surface water flooding.

2.3 Preliminary Risk Assessment

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a “suitable for use” approach, which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach.

2.3.1 Source

The desk study research has indicated the site to have been occupied by the existing office building since 1957, but it was previously occupied by a number of buildings with uses including a varnishers ('Japanner'), warehouses and a brewery prior to this date. In addition, the adjacent and nearby sites to the west and north are known to have previously been occupied by a timber yard, a printing works and a furniture works in the past. In addition, a number of garages were present on the adjacent sites to the north and west during the 1960s, and included a buried fuel tank close to the northern boundary of the site.

With respect to the previous uses described above, possible contaminants include a range of metals, asbestos, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), creosotes and solvents. In view of the age of the potentially contaminative uses outlined in the previous paragraph, it is considered that the majority of any contamination occurring would have degraded or attenuated in the groundwater within the Lynch Hill Gravel and is unlikely to remain present. In addition, construction of the existing basement is likely to have removed much of the shallow potentially contaminated soils.

No landfills or areas of potentially infilled land have been identified within 300 m of the site and as a result, a risk from soil gas is not envisaged.

2.3.2 Receptor

The future end users of the commercial building will represent moderate sensitivity receptors. The site is underlain by a Secondary 'A' Aquifer and therefore groundwater is considered to be a relatively sensitive receptor. Buried services are likely to come into contact with any contaminants present within the soils through which they pass and site workers are likely to come into contact with any contaminants present during demolition and construction works.

2.3.3 Pathway

The existing building currently occupies the entire site and the site will be entirely covered by the new building. The building will, therefore, continue to effectively form a barrier between any contaminants within the near-surface soils and end-users and will prevent the infiltration of surface water. Furthermore, it is understood that areas of soft landscaping will not form part of the proposed development. Buried services will be exposed to any contaminants present within the soil through direct contact and site workers will come into contact with the soils during construction works.

There is thus considered to be very low potential for a contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

2.3.4 Preliminary Risk Appraisal

In accordance with the guidelines provided by CIRIA[2], the following table summarises possible pollution linkages for the site.

SOURCE	RECEPTOR	PATHWAY	PROBABILITY	CONSEQUENCE
Hydrocarbon and other contamination within near surface soils resulting from past activities on site and	End users	Ingestion of contaminated soil or dust, through skin contact or inhalation	Low likelihood	Minor
		Vapours	Low likelihood	Medium

2 Rudland, DJ, Lancefield, RM and Mayell, PN (2001) *Contaminated land risk assessment. A guide to good practice. CIRIA C552*

SOURCE	RECEPTOR	PATHWAY	PROBABILITY	CONSEQUENCE
on adjacent sites, including the buried fuel tank	Ground water	Percolation and leaching of surface run-off	Low likelihood	Minor
	Adjacent sites	Shallow perched water or drain runs	Unlikely	Minor
Nearby industrial works	End users	Ingestion of contaminated soil or dust, through skin contact or inhalation	Low likelihood	Minor
		Vapours	Low likelihood	Medium
	Ground water	Percolation and leaching of surface run-off	Low likelihood	Minor
		Well within gas works	Unlikely	Minor

This method of risk evaluation involves classification of the magnitude of the potential consequence (severity) and probability (likelihood) of the risk. The method by which these factors are classified is detailed in the Appendix. On the basis of the consequence and probability the site can be attributed a level of risk, ranging from very low to very high and the procedure for making this assessment is shown in the Appendix, together with a description of each level of assessed risk and the actions that may be required to mitigate the risk.

On this basis it is considered that there is a MODERATE RISK of there being a contaminant linkage at this site which would result in a requirement for any remediation work. It would be prudent to out chemical analyses on samples of the near surface soil and of the groundwater within the Lynch Hill Gravel to assess the presence of contamination.

3.0 EXPLORATORY WORK

In order to meet the objectives described in Section 1.2, two boreholes were advanced to a depth of 20.00 m using a dismantlable cable percussion rig. Additionally, four boreholes were advanced to depths of between 1.00 m and 4.50 m by means of an opendrive percussive sampler (Dart rig).

During boring, disturbed and undisturbed samples were obtained from the boreholes for subsequent laboratory examination and testing. Standard Penetration Tests (SPTs) were carried out at regular intervals in a selection of the boreholes to provide additional quantitative data on the strength of soils encountered.

Five trial pits were advanced to depths of between 0.85 m and 1.27 m through a combination of hand and machine excavation to determine the configuration of the existing foundations.

The trial pits were initially proposed to be advanced to a depth of 3.50 m to reach the underside of the foundations, but due to the presence of water-bearing sand and gravel at shallow depths, the scope of the investigation was revised, with the trial pits being used to determine the lateral extent of the foundations. Concrete coring was carried out through the exposed foundations to determine the depth of the foundations and a further four boreholes were advanced to depths of between 2.10 m and 4.00 m, either through the core holes or adjacent to the foundations, to determine the bearing stratum of each foundation.

Three groundwater monitoring standpipes were installed to depths of between 1.00 m and 5.00 m to facilitate groundwater monitoring, which has not been carried out to date.

A selection of the samples recovered from the boreholes was submitted to a soil mechanics laboratory for a programme of geotechnical testing and an analytical laboratory for a programme of contamination testing.

All of the above work was carried out under the supervision of a geotechnical engineer from GEA.

The borehole and trial pit records are appended, together with a site plan indicating the exploratory positions.

3.1 Sampling Strategy

The investigation locations were agreed with the consulting engineers, The Morton Partnership, in an initial site meeting with GEA and were positioned on site as close to the specified positions as possible, in accessible areas, whilst avoiding known buried services.

A total of eight sample of the made ground have been tested for the presence of contamination. The analytical suite of testing was selected to identify hydrocarbon contamination resulting from the former use of the site and a range of typical industrial contaminants for the purposes of general coverage. For this investigation the analytical suite for the soil included a range of metals, speciation of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. In addition, all eight of the samples were tested for the presence of asbestos and four of the samples were subjected to testing for a range of semi volatile and volatile organic compounds.

In addition, a single sample of groundwater was recovered from one of the trial pits where the presence of TPH contamination was evident within the groundwater. The sample was submitted for a suite of testing which included a range of common industrial contaminants including a range of metals and speciation testing of TPH.

The contamination analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. A summary of the MCERTs accreditation and test methods are included with the attached results and further details are available upon request.

4.0 GROUND CONDITIONS

The investigation has generally confirmed the expected ground conditions in that, beneath a variable thickness of made ground, the Lynch Hill Gravel was encountered and was underlain by the London Clay Formation.

4.1 Made Ground

The made ground generally comprised brown clayey sand with variable amounts of gravel, brick and concrete fragments and extended to depths of between 0.50 m and 1.60 m.

Within one of the trial pits a suspected relict foundation was encountered within the made ground, which could indicate the presence of obstructions within the made ground.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed within the soil during the fieldwork. Eight samples of the made ground have, however, been analysed for a range of contaminants as a precautionary measure and the results are detailed within Section 4.5.

4.2 Lynch Hill Gravel

The Lynch Hill Gravel was encountered in the southern parts of the site and generally comprised dense orange-brown fine to coarse sand and fine to coarse sub-angular to sub-rounded gravel, and extended to a depth of between 1.90 m and 2.30 m with the thickness of the gravel appearing to increase southwards.

No evidence of contamination was noted within this stratum.

4.3 London Clay

The London Clay comprised an initial horizon of soft becoming firm and stiff fissured brown clay which extended to depths of 8.00 m and 8.90 m, whereupon very stiff fissured grey clay was encountered and extended to the full depth investigated, of 20.00 m.

The results of plasticity index tests indicate the clay to be of high volume change potential, and the results of quick undrained triaxial compression tests indicate the clay to be of medium becoming high and locally very high strength.

4.4 Groundwater

Groundwater was encountered in most of the boreholes and trial pits at depths of between 0.60 m and 0.80 m. However, where the London Clay was found to be present immediately below the floor slab, groundwater was not encountered with the exception of Trial Pit No 6, where water was noted to be flowing through joins in the concrete foundation.

No evidence of contamination was generally observed within the groundwater, with the exception of the groundwater encountered within Trial Pit Nos 5 and 6, which had a strong hydrocarbon odour and clearly had a layer of free product on top of the water. A sample of the groundwater was recovered from this area and submitted for a suite of contamination testing, the results of which are summarised in Section 4.6.

4.5 Soil Contamination

The table below sets out the values measured within the eight samples analysed; all concentrations are in mg/kg unless otherwise stated.

Determinant	TP2 0.60 m	TP3 0.60 m	TP4 0.50 m	TP6 0.40 m	BH2 0.50 m	BH3 0.40 m	BH4 0.75 m	BH5 0.40 m
pH	10.8	11.7	9.2	10.4	10.7	12.0	11.5	9.1
Arsenic	7.1	14	13	12	8.6	7.2	6.4	10
Cadmium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	13	13	48	34	14	18	13	39
Lead	9.1	18	32	13	37	60	24	15
Mercury	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

Determinant	TP2 0.60 m	TP3 0.60 m	TP4 0.50 m	TP6 0.40 m	BH2 0.50 m	BH3 0.40 m	BH4 0.75 m	BH5 0.40 m
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Copper	10	18	17	45	26	21	24	37
Nickel	16	15	24	34	17	14	14	41
Zinc	20	36	46	63	47	49	28	83
Total Cyanide	<1	<1	<1	<1	<1	<1	<1	<1
Total Phenols	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total PAH	<0.80	<0.80	<0.80	<0.80	2.70	<0.80	2.69	<0.80
Sulphide	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	<0.05	<0.05	<0.05	<0.05	0.21	<0.05	<0.05	<0.05
Naphthalene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TPH	22	220	<10	600	110	66	<10	<10
Total Organic Carbon %	<0.1	<0.1	<0.1	0.4	0.1	<0.1	<0.1	0.2

Note: Figure in bold indicates concentration in excess of risk-based soil guideline values, as discussed in Part 2 of this report

The results of the chemical analyses have indicated the sample tested to be free from elevated concentrations of the contaminants tested for with respect to the relevant screening values.

4.5.1 Generic Quantitative Risk Assessment

The use of a risk-based approach has been adopted to provide an initial screening of the test results to assess the need for subsequent site-specific risk assessments. Contaminants of concern are those that have a value in excess of a generic human health risk based guideline value which is either the CLEA[3] Soil Guideline Value where available, a Generic Screening Value calculated using the CLEA UK Version 1.06[4] software assuming a commercial end use, or based on the DEFRA Category 4 Screening values[5]. The key generic assumptions for this end use are as follows:

- that groundwater is not a critical risk receptor;
- that the critical receptor for human health will be a working female aged 16 to 65 years old;
- that the exposure duration will be 49 years;
- that the critical exposure pathways will be direct soil and indoor dust ingestion, skin contact with soils and dust, and inhalation of dust and vapours; and
- that the building type equates to a three-storey office.

It is considered that these assumptions are acceptable for this generic assessment of this site as the ground floor and basement level will not be for residential use and the site is to be entirely occupied by the proposed building with no areas of soft landscaping proposed. The

[3] *Updated Technical Background to the CLEA Model (Science Report SC050021/SR3) Jan 2009* and Soil Guideline Value reports for specific contaminants; all DEFRA and Environment Agency.
[4] Contaminated Land Exposure Assessment (CLEA) Software Version 1.06 Environment Agency 2009
[5] CL:AIRE (2013) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Final Project Report SP1010 and DEFRA (2014) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Policy Companion Document SP1010

tables of generic screening values derived by GEA and an explanation of how each value has been derived are included in the Appendix.

Where contaminant concentrations are measured at concentrations below the generic screening value it is considered that they pose an acceptable level of risk and thus further consideration of these contaminant concentrations is not required. However, where concentrations are measured in excess of these generic screening values there is considered to be a potential that they could pose an unacceptable risk and thus further action will be required which could include;

- additional testing to zone the extent of the contaminated material and thus reduce the uncertainty with regard to its potential risk;
- site specific risk assessment to refine the assessment criteria and allow an assessment to be made as to whether the concentration present would pose an unacceptable risk at this site; or
- soil remediation or risk management to mitigate the risk posed by the contaminant to a degree that it poses an acceptable risk.

The results of the chemical analyses have indicated the sample tested to be free of elevated concentrations of the contaminants tested for with respect to the adopted screening values.

The significance of these results is considered further in Part 2 of the report.

4.6 Groundwater Contamination

The results of the testing showed the single sample of groundwater tested contained slightly elevated concentrations of arsenic and monohydric phenols. Elevated concentrations of a number of PAH compounds were also indicated. High concentrations of TPH were also measured and the below table indicates the elevated concentrations.

Determinant	TP6 0.80 m	Determinant	TP6 0.80 m
Arsenic	25	Total Phenols	38
Total PAH	255	Naphthalene	114
Acenaphthylene	8.10	Acenaphthene	14.9
Fluorine	32.4	Phenanthrene	76.2
Anthracene	8.83	TPH (C8-C35)	23710
Aliphatic > C5-C6	<1.0	Aromatic > C5-C6	<1.0
Aliphatic > C6-C8	<1.0	Aromatic > C6-C8	4.7
Aliphatic > C8-C10	<1.0	Aromatic > C8-C10	210
Aliphatic > C10-C12	600	Aromatic > C10-C12	850
Aliphatic > C12-C16	5500	Aromatic > C12-C16	3100
Aliphatic > C16-C21	9700	Aromatic > C16-C21	85
Aliphatic > C21-C35	3600	Aromatic > C21-C35	<10

These results are appended and discussed further in Part 2 of the report.

4.7 Existing Foundations

The findings of the trial pits and concrete cores are summarised in the table below. Sketches and photographs of each pit are included in the Appendix.

Trial Pit No	Structure	Foundation detail	Bearing Stratum
1	Internal column	Mass concrete pad Top 0.40 m Base 3.20 m Dimensions 2.70 m x 2.00 m	Stiff fissured dark brown slightly silty CLAY with bluish grey veins
2	Internal column	Mass concrete pad Top 0.30 m Base 3.30 m Dimensions 2.20 m x 3.80 m	Stiff fissured dark brown slightly silty CLAY with bluish grey veins
3	Internal column	Mass concrete strip Top 0.36 m Base 3.20 m Width 2.60 m	Stiff fissured dark brown slightly silty CLAY with bluish grey veins
4	Internal column	Mass concrete pad Top 0.39 m Base 2.00 m Dimensions 2.36 m x 2.34 m	Stiff fissured dark brown slightly silty CLAY with bluish grey veins
5	Suspected underpinned retaining wall	Mass concrete footing Top 0.30 m Base 2.80 m Lateral projection 0.80 m	Suspected London Clay (not proved) – Trial pit terminated to restrict spreading of groundwater contamination
6	Suspected retaining wall	Mass concrete footing Top 0.35 m Base Not Proved Lateral projection 1.75 m	Suspected London Clay (not proved) – Trial pit terminated to restrict spreading of groundwater contamination

Part 2: DESIGN BASIS REPORT

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the proposed development.

5.0 INTRODUCTION

It is understood that the proposed development comprises the demolition of the existing building down to ground floor level, and the subsequent construction of a new mixed use reinforced concrete framed building. The existing basement structure and ground floor slab are to be retained and the building will be six storeys in height along the elevation lining Hampstead Road and five storeys in height along the elevation lining Drummond Street.

6.0 GROUND MODEL

The desk study has revealed that the site has had a potentially contaminative historical use as it has been developed with a brewery and bounded by garages and a timber yard prior to the construction of the existing building. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- below a variable thickness of made ground, the Lynch Hill Gravel is underlain by the London Clay, which extends to the maximum depth of the investigation, of 20.00 m;
- the made ground generally comprises brown clayey sand with variable amounts of gravel, brick and concrete fragments and extends to depths of between 0.50 m and 1.60 m;
- the Lynch Hill Gravel is present in the southern half of the site and generally comprises dense orange-brown fine to coarse sand and fine to coarse sub-angular to sub-rounded gravel extending to depths of between 1.90 m and 2.30 m;
- the London Clay initially comprises medium becoming high strength soft becoming firm and stiff fissured brown clay extending to depths of 8.00 m and 8.90 m, whereupon very stiff high and locally very high strength fissured grey clay is present and extends to the full depth of the investigation of 20.00 m;
- groundwater is present within the Lynch Hill Gravel at a depth of approximately 0.70 m; and
- the soil is free from elevated concentrations of contaminants, but the perched groundwater within the London Clay along the northern boundary of the site contains elevated concentrations of Arsenic, total Phenols, TPH and total PAH.

7.0 ADVICE AND RECOMMENDATIONS

It is understood that it is proposed to reuse the existing foundations to support the majority of the loads from the proposed building, and that a general increase in load of about 30% is anticipated. This should generally be feasible subject to a settlement check.

Two new lift cores will be constructed as part of the development and will extend to basement level. These will generally be supported by new foundations, but will partially be supported by the existing foundations in some areas.

7.1 Spread Foundations

7.1.1 New Foundations

Moderate width strip or pad foundations bearing on the stiff London Clay or the Lynch Hill Gravel may be designed to apply a net allowable bearing pressure of 150 kN/m^2. This value incorporates an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits. The recommended bearing pressure takes account of the variable nature of the soils and any foundations should be nominally reinforced where they span clay and granular material to protect against differential settlement.

If the foundations were extended to bear at a depth of about 3.00 m, a higher net allowable bearing pressure of 180 kN/m^2 could be adopted.

7.1.2 Re-Use of Existing Foundations

The existing building was constructed during the early 1950s and, as such, settlements associated with the existing loads should now be largely complete. It should therefore be possible to apply the same magnitude of load onto the foundations and expect the same magnitude of settlement, provided that the gross pressure applied by the foundations does not exceed the ultimate bearing capacity of the bearing stratum and that the footings are bearing on natural soil.

The trial pits have indicated the foundations of the internal columns to be bearing within the London Clay Formation at depths of between 2.20 m and 3.40 m. On the basis of these findings, supported by archive information about the existing building, it is considered a reasonable assumption that all of the foundations are bearing within the natural London Clay. However, the dimensions of the existing foundations have been found to vary somewhat from the archive plans and it is therefore recommended that additional work is carried out to further investigate the form and dimensions of the existing foundations.

The load increase on the majority of the foundations is estimated to be an additional 30% of the existing loads. Reference to archive information has indicated the foundations to have been designed using an allowable bearing pressure of 285 kN/m^2 with the foundations constructed at a depth of about 3.00 m. The ultimate bearing pressure of the London Clay at this depth has been calculated to be approximately 540 kN/m^2. The anticipated increase in stress of 30% would result in a pressure of 370 kN/m^2, which does not exceed the ultimate bearing capacity of the soil.

The demolition of the existing building will result in the temporary reduction of loading on the existing foundations which will give rise to short term heave movements of the underlying clay, which will be recovered as settlement when the new loads are applied. Consideration will need to be given to the magnitude of settlement as a result of the application of the additional load, and the effect of the anticipated heave movements due to demolition,

particularly with respect to differential movements where the loads vary between columns and the effect such movements would have on the basement structure that is to be retained. As a result, it is recommended that a full settlement analysis is carried out once the loads and existing foundation details have been finalised.

One of the new lift cores is to be supported partially by new foundations and partially by the existing foundations. Three of the four walls of the core will have new foundations, while the loads along one of the walls will be supported by the existing foundations. This is generally considered a feasible option, however, the size of the new foundations will need to be designed to produce a similar pressure on the ground beneath, as the additional loads on the existing foundation.

7.2 Existing Retaining Structures

It is understood that it is proposed to retain the existing basement. The suitability of the basement retaining walls will need to be assessed on the basis of the effect of any additional loads that may be imposed during the redevelopment and whether any part will be damaged and / or significantly weakened by the demolition of the existing building. A certain amount of propping or additional reinforcement may be required to ensure that the existing walls meet current safety and design requirements.

7.3 Piled Foundations

For the ground conditions at this site bored piles could be adopted. A conventional rotary augered pile could be utilised but consideration will need to be given to the possible instability and water ingress within the made ground and granular parts of the Lynch Hill Gravel. The use of bored piles installed using continuous flight auger (cfa) techniques may therefore be the most appropriate and the limited site access may be a factor in the selection of most appropriate pile type. As the gravel is only present across part of the site it has been ignored within this calculation.

The following table of ultimate coefficients may be used for the preliminary design of bored piles, based on the SPT and cohesion / depth graph in the appendix.

Stratum	Depths m	kN / m²
Ultimate Skin Friction		
Made Ground & Lynch Hill Gravel	GL to 2.00	Ignore
London Clay	2.00 to 20.00	Increasing linearly from 32.5 to 87.5
Ultimate End Bearing		
London Clay	10.00 to 20.00	Increasing linearly from 990 to 1575

In the absence of pile tests, guidance from the London District Surveyors Association (LDSA)[6] suggests that a factor of safety of 2.6 should be applied to the above coefficients in the computation of safe theoretical working loads. On the basis of the above coefficients, the following pile capacities have been estimated.

[6] LDSA (2009) *Foundations No 1 – Guidance notes for the design of straight shafted bored piles in London Clay*. LDSA

Pile diameter mm	Depth Below Ground Level m	Safe Working Load kN
450	10	250
	12	325
	15	440
	18	575

The above examples are not intended to constitute any form of recommendation with regard to pile size or type, but merely serve to illustrate the use of the above coefficients. Specialist piling contractors should be consulted with regard to the design of a suitable piling scheme and their attention should be drawn to potential groundwater inflows and instability within the Lynch Hill Gravel and the potential presence of obstructions within the made ground in the form of relict concrete foundations.

7.4 Shallow Excavations

On the basis of the borehole findings it is considered that it will be generally feasible to form relatively shallow excavations terminating within the made ground or Lynch Hill Gravel without the requirement for lateral support, although localised instabilities may occur where groundwater is encountered.

Significant inflows of groundwater into shallow excavations are likely where excavation extend beyond 0.60 m and consideration will need to be given to sufficient dewatering techniques where work is to be carried out in such excavations.

If deeper excavations are considered or if excavations are to remain open for prolonged periods it is recommended that provision be made for battered side slopes or lateral support. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides and dewatering considered in order to comply with normal safety requirements.

7.5 Effect of Sulphates

Chemical analyses has generally revealed relatively low concentrations of soluble sulphate and near-neutral pH in accordance with Class DS-1 conditions of Table C2 of BRE Special Digest 1:SD Third Edition (2005). The measured pH values of the samples show that an ACEC class of AC-1 would be appropriate for the site. This assumes a mobile water condition at the site.

However, a single sample of the London Clay from Borehole No 5 was found to contain a high concentration of soluble sulphate in accordance with DS-3 conditions of Table C2 of BRE Special Digest 1:SD Third Edition (2005). The measured pH values of the samples show that an ACEC class of AC-3 would be appropriate in this area. It may therefore be appropriate to adopt this higher concrete classification for the entire site or carry out additional testing to zone the site.

The guidelines contained in the digest should be followed in the design of foundation concrete.

7.6 Contamination Risk Assessment

The desk study has revealed that the site has had a potentially contaminative historical use as it has been developed with a brewery and bounded by garages and a timber yard prior to the construction of the existing building. However, contamination testing on eight samples of the made ground has not indicated elevated concentrations of a range of common contaminants. As a result a requirement for remedial measures is not generally envisaged.

Contaminated groundwater was encountered during two trial pit excavations in the north of the site. The contaminated groundwater was noted to be flowing through a joint in the concrete retaining wall. Analysis of a sample of this water indicated elevated TPH, total PAH, including naphthalene, arsenic and monohydric phenols. Speciation testing of TPH compounds has indicated the contamination to probably be diesel or light heating oil and reference to archive Goad insurance plans indicates the presence of a buried tank on the adjacent site at basement level in this area, which is the most likely source of the contamination.

In view of the presence of the London Clay from basement level in this area it is considered likely that the contamination has generally been prevented from migrating beneath the rest of the site, which is corroborated by the absence of contamination elsewhere on site. Further investigation will however be required to determine the lateral extent of the affected groundwater and measures will need to be taken to further limit the spread of the contamination.

The groundwater contamination will pose a risk to site workers in this area during the ground works. These risks are further assessed below.

7.6.1 Site Workers

Site workers should be made aware of the contamination and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE and CIRIA[7] and the requirements of the Local Authority Environmental Health Officer.

7.6.2 Buried Services

Consideration may need to be given to the protection of buried plastic services laid within the made ground. Details of the proposed protection measures for buried plastic services will in any case need to be approved by the EHO and the relevant service authority prior to the adoption of any scheme. It is possible that barrier pipe will be required or additional testing will need to be carried out.

7.7 Waste Disposal

Under the European Waste Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a contaminated site. It should

7 CIRIA (1996) *A guide for safe working on contaminated sites* - Report 132, Construction Industry Research and Information Association

however be noted that the Environment Agency guidance WM3[8] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[9] guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the standard rate of £86.10 per tonne (about £155 per m^3) or at the lower rate of £2.70 per tonne (roughly £5 per m^3). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the 'standard' rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the 'lower rate' of landfill tax.

Based upon on the technical guidance provided by the Environment Agency it is considered likely that the soils encountered during this ground investigation, as represented by the nine chemical analyses carried out, would be generally classified as follows;

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Comments
Made ground	Non-hazardous (17 05 04)	No	
Lynch Hill Gravel and London Clay	Inert (17 05 04)	Should not be required but confirm with receiving landfill	
London Clay affected by groundwater contamination	Non-hazardous (17 05 04)	Possibly	Further testing required in this area

Under the requirements of the European Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper[10] which states that in certain circumstances, segregation at source may be considered as pre-treatment and thus excavated material may not have to be treated prior to landfilling if the soils can be segregated onsite prior to excavation by sufficiently characterising the soils insitu prior to excavation.

The above opinion with regard to the classification of the excavated soils is provided for guidance only and should be confirmed by the receiving landfill once the soils to be discarded have been identified.

The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material but may require further testing.

8 Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition
9 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2
10 Environment Agency 23 Oct 2007 *Regulatory Position Statement Treating non-hazardous waste for landfill - Enforcing the new requirement*

8.0 OUTSTANDING RISKS AND ISSUES

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive, but covers the main areas where additional work may be required.

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the ground conditions based on the discrete points at which the ground was sampled, but the ground conditions should be subject to review as the work proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

Monitoring of the standpipes should be carried out to determine equilibrium groundwater levels and to establish any seasonal fluctuations. Additional groundwater samples should be taken and analysed to confirm that the identified groundwater contamination is not migrating freely beneath the site. Furthermore, additional investigation should be carried out in the area of the groundwater contamination to identify its full extent. Localised remedial works are likely to be required in this area.

In view of the proposed reuse of the existing foundations it would be prudent to carry out additional investigation to determine the configuration and lateral extent of the foundations.

These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk

APPENDIX

Borehole Records

Trial Pit Records

Geotechnical Laboratory Test Results

SPT & Cohesion/Depth Graph

Soil Contamination Test Results

Generic Risk-Based Screening Values

Water Contamination Test Results

Groundwater Screening Values

Site Plan

GEA

Geotechnical & Environmental Associates
Widbury Barn | Widbury Hill | Ware | SG12 7QE

Site
Stephenson House, 75 Hampstead Road, London NW1 2PL

Borehole Number
BH1

Boring Method
Cable Percussion

Casing Diameter
150 mm to 2.50 m

Ground Level (mOD)

Client
Lazari Properties 2 Limited

Job Number
J17275

Location

Dates
28/11/2017-
29/11/2017

Engineer
The Morton Partnership

Sheet
1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1						Made Ground (brown sand with brick and concrete fragments)		
0.50	B1					(1.00)			
						1.00	Dense orange-brown fine to coarse SAND and fine to coarse sub-agular to sub-rounded GRAVEL		
1.20-1.65	SPT(C) N60=40	1.20	DRY	5,6/8,10,10,8					
1.20-1.65	B2					(1.30)			
1.75	D2								
2.00-2.45	SPT(C) N60=12	2.00	1.00	4,3/2,2,3,4					
2.00-2.45	D3								
						2.30	Firm fissured brown CLAY		
						(0.30)			
						2.60	Very stiff high strength fissured grey CLAY with fine shell fragments		
2.75	D4								
3.00-3.45	SPT N60=18	2.50	DRY	2,3/3,4,4,5					
3.00-3.45	D5								
3.75	D6								
4.00-4.45	U1								
4.75	D7					(4.40)			
5.00-5.45	SPT N60=19	2.50	DRY	2,3/3,4,5,5					
5.00-5.45	D8								
6.00	D9								
6.50-6.95	U2								
						7.00	Very stiff fissured brownish grey slightly silty CLAY with partings of pale grey sand, pale grey veins and fine selenite crystals		
7.50	D10								
8.00-8.45	SPT N60=21	2.50	DRY	3,4/5,5,4,5		(2.00)			
8.00-8.45	D11								
9.00	D12					9.00	Very stiff high strength fissured grey CLAY		
9.50-9.95	U3								

Remarks
Groundwater not encountered.
Water added to aid drilling at depths of between 1.00 m and 2,50 m.
Groundwater monitoring standpipe installed to a depth of 5.00 m.

Scale (approx)
1:50

Logged By
AT

Figure No.
J17275.BH1

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Borehole Number BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150 mm to 2.50 m		Lazari Properties 2 Limited	J17275
	Location	**Dates**	**Engineer**	**Sheet**
		28/11/2017- 29/11/2017	The Morton Partnership	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D13					(3.00)			
11.00-11.45	SPT N60=29	2.50	DRY	4,5/6,6,7,7					
11.00-11.45	D14								
12.00	D15					12.00	Very stiff high strength fissured grey slightly sandy CLAY with partings of grey sand		
12.50-12.95	U4					(1.50)			
13.50	D16					13.50	Very stiff high and locally very high strength fissured grey slightly silty CLAY with occasional pale grey veins		
14.00-14.45	SPT N60=28	2.50	DRY	3,4/5,6,7,7					
14.00-14.45	D17								
15.00	D18								
15.50-15.95	U5								
16.50	D19					(6.50)			
17.00-17.45	SPT N60=29	2.50	DRY	4,5/5,6,7,8					
17.00-17.45	D20								
18.00	D21								
18.50-18.95	U6								
19.25	D22								
19.55-20.00	SPT N60=30	2.50	DRY	4,5/6,6,7,8					
19.55-20.00	D23					20.00			

Remarks	Scale (approx)	Logged By
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	Figure No.	
	J17275.BH1	

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Borehole Number **BH2**
Boring Method Cable Percussion **Casing Diameter** 150 mm to 3.00 m	**Ground Level (mOD)**	**Client** Lazari Properties 2 Limited **Job Number** J17275
Location	**Dates** 23/11/2017-24/11/2017	**Engineer** The Morton Partnership **Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.40)	Concrete Floor Slab		
						0.40	Made Ground (pale orange-brown sandy clay with occasional gravel and fine brick and concrete fregments)		
						(1.00)			
1.20-1.65	SPT(C) N60=9	1.20	DRY	2,2/2,2,2,2		1.40			
1.20-1.65	D1					(0.30)	Soft brown CLAY		
1.75	D2					1.70	Stiff medium strength fissured grey CLAY with occasional pale grey veins and fine selenite crystals		▽1
2.00-2.45	U1			Seepage(1) at 2.00m, sealed at 3.00m.					
2.75	D3								
3.00-3.45	SPT N60=19	3.00	DRY	2,3/3,4,5,5		(2.80)			
3.00-3.45	D4								
3.75	D5								
4.00-4.45	U2								
						4.50	Stiff fissured grey slightly sandy slightly silty CLAY with occasional partings of pale grey sand and fine selenite crystals		
4.75	D6								
5.00-5.45	SPT N60=22	3.00	DRY	3,3/4,5,6,5					
5.00-5.45	D7					(2.00)			
6.00	D8								
6.50-6.95	U3					6.50	Very stiff high and locally very high strength fissured grey CLAY		
7.50	D9								
8.00-8.45	SPT N60=22	3.00	DRY	3,4/5,5,5,5					
8.00-8.45	D10								
9.00	D11					(5.00)			
9.50-9.95	U4								

Remarks
Groundwater monitoring standpipe installed to a depth of 5.00 m

Scale (approx)	Logged By
1:50	AT

Figure No.
J17275.BH2

GEA

Geotechnical & Environmental Associates

Widbury Barn | Widbury Hill | Ware | SG12 7QE

Site
Stephenson House, 75 Hampstead Road, London NW1 2PL

Borehole Number
BH2

Boring Method
Cable Percussion

Casing Diameter
150 mm to 3.00 m

Ground Level (mOD)

Client
Lazari Properties 2 Limited

Job Number
J17275

Location

Dates
23/11/2017-
24/11/2017

Engineer
The Morton Partnership

Sheet
2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D12								
11.00-11.45 11.00-11.45	SPT N60=41 D13	3.00	DRY	3,6/8,10,10,9			Claystone encoutered at 11.00 m		
						11.50			
12.00	D14						Very stiff high and locally very high strength fissured grey silty CLAY with fine shell fragments, pale grey veins and fine selenite crystals		
12.50-12.95	U5								
13.50	D15								
14.00-14.45 14.00-14.45	SPT N60=23 D16	3.00	DRY	4,5/4,5,6,6					
15.00	D17								
15.50-15.95	U6					(8.50)			
16.50	D18								
17.00-17.45 17.00-17.45	SPT N60=31 D19	3.00	DRY	4,5/6,7,7,8					
18.00	D20								
18.50-18.95	U7								
19.25	D21								
19.55-20.00 19.55-20.00	SPT N60=34 D22	3.00	DRY	4,5/6,7,8,9					
						20.00			

Remarks

Scale (approx)
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AT

Figure No.
J17275.BH2

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Number **BH3**
Excavation Method Opendrive Percussive Sampler (dart rig)	**Dimensions**	**Ground Level (mOD)**
Client Lazari Properties 2 Limited	**Job Number** J17275
Location	**Dates** 20/11/2017	**Engineer** The Morton Partnership	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Concrete Floor Slab		
					0.30			
0.40	D1				(0.25)	Made Ground (brown clayey sand with gravel, brick and concrete fragments)		
					0.55			▽1
0.80	D2		Fast Inflow(1) at 0.60m.			Orange-brown fine to coarse SAND and fine to coarse subangular to subrounded GRAVEL		
					(1.25)			
					1.80			
					(0.40)	Orange-brown fine to coarse SAND with occasional fine to medium subrounded gravel		
					2.20			
2.30	D3				(0.30)	Stiff fissured brown CLAY		
					2.50			
2.60	D4				(0.30)	Stiff fissured dark brown slightly silty CLAY		
					2.80			
						Terminated at 2.80m		

Remarks
Borehole terminated at a depth of 2.80 m due to side collapse of borehole.

Scale (approx)	Logged By
1:50	AT

Figure No.
J17275.BH3

GEA
Geotechnical & Environmental Associates
Widbury Barn | Widbury Hill | Ware | SG12 7QE

Site	Number
Stephenson House, 75 Hampstead Road, London NW1 2PL	BH4

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Opendrive Percussive Sampler (dart rig)			Lazari Properties 2 Limited	J17275
	Location	**Dates** 20/11/2017	**Engineer** The Morton Partnership	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.70)	Concrete Floor Slab		
					0.70			
0.75	D1		Fast Inflow(1) at 0.80m.		0.80	Made Ground (dark brown sand with gravel and concrete fragments)		▽1
1.00-1.45	SPT(C) N60=15	0.80	2,3/3,3,3,4		(0.30) 1.10	Orange-brown fine to coarse SAND with fine to coarse subangular to subrounded gravel		
1.50	D2				(0.90)	Orange-brown sandy fine to coarse subangular to subrounded GRAVEL		
2.00-2.45	SPT N60=12	0.80	1,1/2,3,3,3		2.00	Stiff fissured brown CLAY		
2.10	D3				(0.40) 2.40			
					(0.50) 2.90	Stiff fissured dark brown slightly silty CLAY		
3.00-3.45	SPT N60=17	0.80	4,3/3,3,4,5			Stiff fissured brown CLAY with fine selenite crystals Claystone encountered at 3.10 m		
3.50	D4				(1.55)			
4.00-4.45	SPT N60=24	0.80	4,4/4,5,6,6		4.45	Complete at 4.45m		

Remarks

Scale (approx)	Logged By
1:50	AT

Figure No. J17275.BH3

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	**Site** Stephenson House, 75 Hampstead Road, London NW1 2PL	**Number** **BH5**
Excavation Method Opendrive Percussive Sampler (dart rig)	**Client** Lazari Properties 2 Limited	**Job Number** J17275
Dimensions **Location**	**Ground Level (mOD)** **Dates** 20/11/2017	**Engineer** The Morton Partnership **Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.35)	Concrete Floor Slab		
0.40	D1				0.35	Stiff fissured brown silty CLAY with fine slelnite crystals, bluish grey veins and pockets of orange-brown fine sand		
1.00-1.45 1.00	SPT N60=17 D2	DRY	3,3/3,4,4,4		(1.95)			
2.00-2.45 2.00	SPT N60=17 D3	DRY	2,2/3,4,4,4		2.30	Stiff fissured dark brown CLAY with fine slenite crystals and bluish grey veins		
3.00-3.45 3.00	SPT N60=19 D4	DRY	3,3/3,4,5,5		(2.15)			
4.00-4.45 4.00	SPT N60=23 D5	DRY	3,3/4,5,5,6		4.45	Complete at 4.45m		

Remarks
Borehole terminated at a depth of 2.80 m due to side collapse of borehole.

Scale (approx)	**Logged By**
1:50	AT

Figure No.
J17275.BH3

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Number **BH6**
Excavation Method Opendrive Percussive Sampler (dart rig)	**Client** Lazari Properties 2 Limited	**Job Number** J17275
Dimensions **Location**	**Ground Level (mOD)** **Dates** 20/11/2017	**Engineer** The Morton Partnership **Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.35) 0.35	Concrete Floor Slab		
0.40	D1				(0.65) 1.00	Firm fissured brown slightly silty CLAY with bluish grey veins and selenite crystals and a hydrocarbon odour		
						Complete at 1.00m		

Remarks

Scale (approx)	Logged By
1:50	AT

Figure No. J17275.BH6

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Number **BH7**
Excavation Method Drive-in Window Sampler **Dimensions** **Location**	**Ground Level (mOD)** **Dates** 27/11/2017	**Client** Lazari Properties 2 Limited **Engineer** The Morton Partnership	**Job Number** J17275 **Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(2.20)	Concrete Foundation		
					2.20	Stiff fissured dark brown slightly silty fissured CLAY with bluish grey veins		
					(1.80)			
					4.00	Complete at 4.00m		

Remarks
Borehole advanced through concrete core through existing foundation

Scale (approx)	Logged By
1:50	AT

Figure No.
J17275.BH7

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Number **BH8**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Lazari Properties 2 Limited	J17275
	Location	**Dates** 27/11/2017	**Engineer** The Morton Partnership	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			Fast Inflow(1) at 0.70m.		(0.36) 0.36 (0.24) 0.60 (1.00) 1.60 (0.70) 2.30 (0.30) 2.60 (0.50) 3.10	Concrete floor slab Made Ground (brown slightly clayey sand with gravel, brick and concrete fragments) Made Ground (brown sand and gravel with brick and concrete fragments and occasional pockets of sandy clay) Orange-brown fine to coarse SAND with fine to coarse subangular to subrounded gravel Stiff slightly fissured brown sandy CLAY Stiff fissured brown slightly silty CLAY with rare claystone nodules Terminated at 3.10m		∇_1

Remarks
Borehole terminated at 3.10 m due to stiffness of the clay.

Scale (approx)	Logged By
1:50	AT

Figure No.
J17275.BH8

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Number **BH9**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Lazari Properties 2 Limited	J17275
	Location	**Dates** 27/11/2017	**Engineer** The Morton Partnership	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			Fast Inflow(1) at 0.70m.		(0.30) 0.30 (0.30) 0.60 (0.80) 1.40 (0.50) 1.90 (0.20) 2.10	Concrete floor slab Made Ground (brown slightly clayey sand with gravel, brick and concrete fragments) Made Ground (brown sand and gravel with brick and concrete fragments and occasional pockets of sandy clay) Orange-brown fine to coarse SAND with fine to coarse subangular to subrounded gravel Stiff fissured brown sandy CLAY Terminated at 2.10m		∇_1

Remarks
Borehole terminated at 2.10 m due to side collapse

Scale (approx)	Logged By
1:50	AT

Figure No.
J17275.BH8

GEA Geotechnical & Environmental Associates Widbury Barn | Widbury Hill | Ware | SG12 7QE	Site Stephenson House, 75 Hampstead Road, London NW1 2PL	Number **BH10**

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Lazari Properties 2 Limited	J17275
	Location	**Dates** 27/11/2017	**Engineer** The Morton Partnership	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			Fast Inflow(1) at 0.65m.		(0.40) 0.40	Concrete floor slab		
					(0.30) 0.50	Made Ground (brown slightly clayey sand with gravel, brick and concrete fragments)		▽1
					(0.80) 0.80	Made Ground (brown sand and gravel with brick and concrete fragments and occasional pockets of sandy clay)		
					(0.30) 1.60	Orange-brown fine to coarse SAND and fine to coarse subangular to subrounded GRAVEL		
					(0.30) 1.90	Orange-brown fine to coarse SAND with fine to coarse subangular to subrounded gravel		
					(0.40) 2.20	Stiff fissured brown slightly sandy CLAY		
					2.60	Stiff fissured dark brown CLAY Terminated at 2.60m		

Remarks
Borehole terminated at 2.60 m due to stiffness of the clay.

Scale (approx)	Logged By
1:50	AT

Figure No.
J17275.BH8

GEA

www.gea-ltd.co.uk

Herts | 01727 824666 Notts | 01509 674888

Trial Pit No

1

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL
Client	Lazari Properties 2 Limited
Engineer	The Morton Partnership

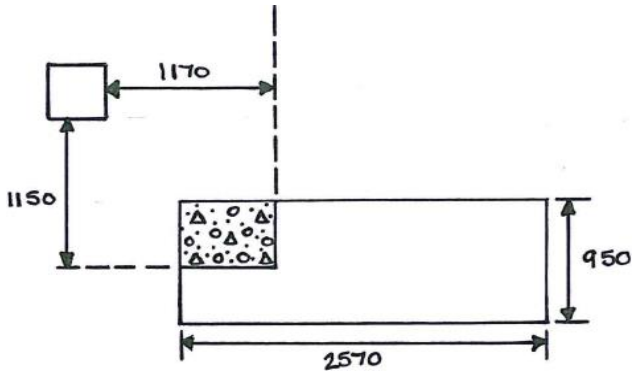
Job Number J17275

Sheet 1/1

Dates 16/11/2017

Excavation Method	Dimensions	Ground Level (mOD)	Location
Mini Excavator	950 x 2570 x 950		Internal Column

Plan:



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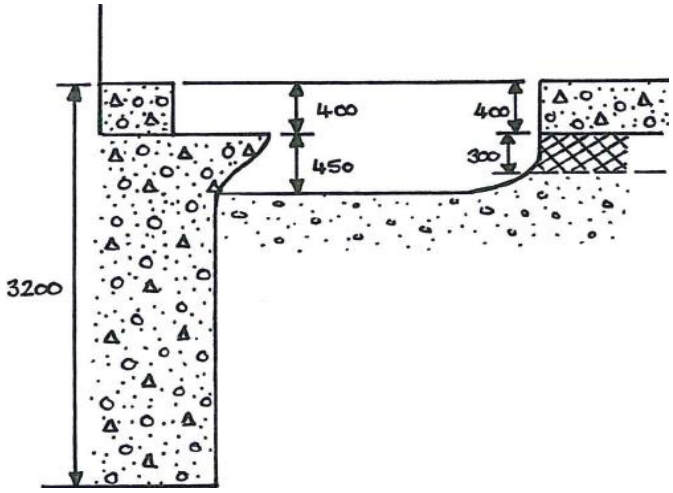


Concrete Foor Slab

Made Ground (orange-brown sand and gravel with concrete and brick fragments)

Orange-brown fine to coarse SAND and fine to coarse angular to subrounded

Remarks:

All dimensions in millimetres

Sides of trial pit collapsing towards the base

Scale: 1:20

Logged by: AT

GEA

www.gea-ltd.co.uk

Herts | 01727 824666 Notts | 01509 674888

Trial Pit No 2

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL
Client	Lazari Properties 2 Limited
Engineer	The Morton Partnership

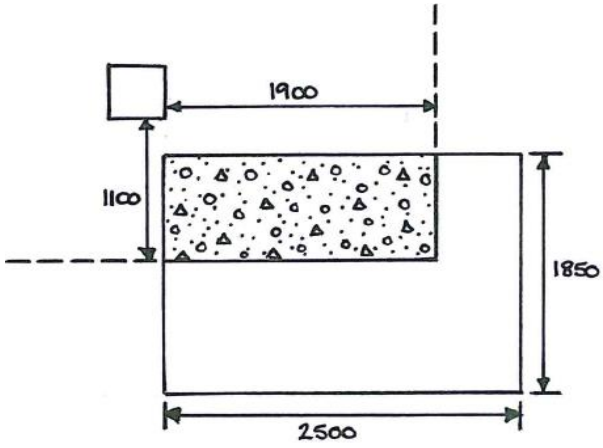
Job Number J17275

Sheet 1/1

Dates 16/11/2017

Excavation Method	Dimensions	Ground Level (mOD)	Location
Mini Excavator	1850 x 2500 x 1250		Internal Column

Plan:



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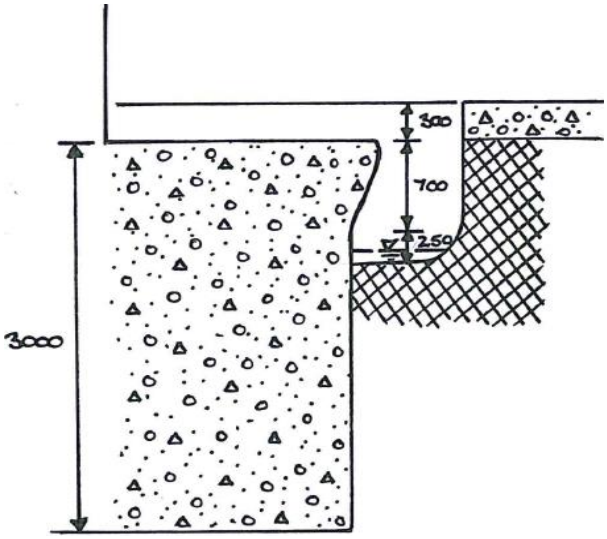


Concrete Floor Slab

Made Ground (orange-brown sand and gravel with concrete and brick fragments with brick and concrete obstructions)

Remarks:

All dimensions in millimetres

Sides of trial pit collapsing towards the base

Scale: 1:20

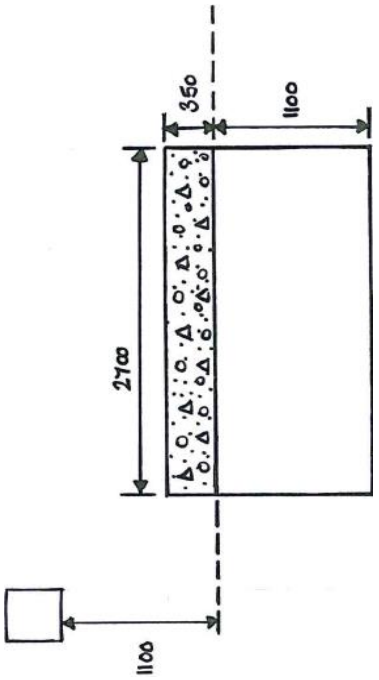
Logged by: AT

GEA	www.gea-ltd.co.uk Herts | 01727 824666 Notts | 01509 674888	**Trial Pit No** 3

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL	**Job Number** J17275
Client	Lazari Properties 2 Limited	Sheet 1/1
Engineer	The Morton Partnership	**Dates** 16/11/2017

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Location**
Mini Excavator	2750 x 1450 x 1230		Internal Column

Plan:



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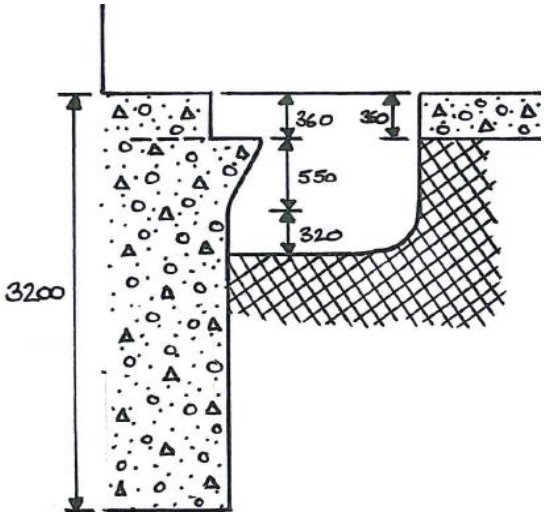


Concrete Floor Slab

Made Ground (orange-brown sand and gravel with concrete and brick fragments with brick and concrete obstructions)

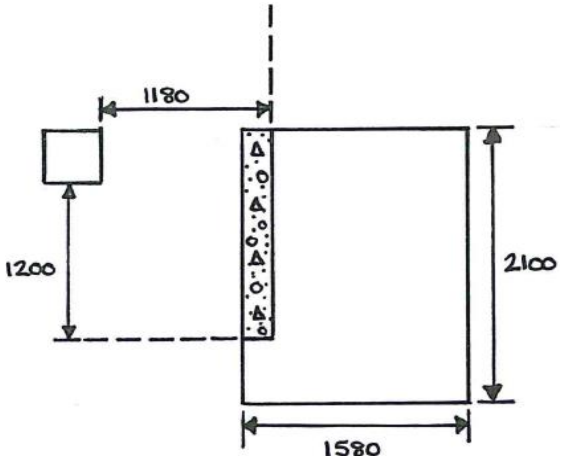
Remarks:	Scale:
All dimensions in millimetres	1:20
Sides of trial pit collapsing towards the base	Logged by: AT

GEA	www.gea-ltd.co.uk Herts | 01727 824666 Notts | 01509 674888	**Trial Pit No** 4

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL	**Job Number** J17275
Client	Lazari Properties 2 Limited	Sheet 1/1
Engineer	The Morton Partnership	**Dates** 16/11/2017

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Location**
Mini Excavator	1580 x 2100 x 1040		Internal Column

Plan:



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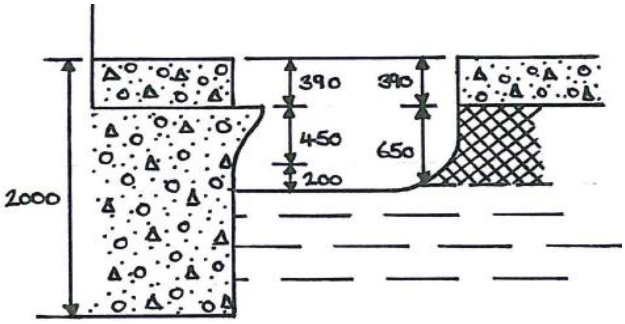


Concrete Floor Slab

Made Ground (brown and dark brown sandy clay with gravel and concrete fragments and a concrete obstruction)

Stiff fissured dark brown CLAY

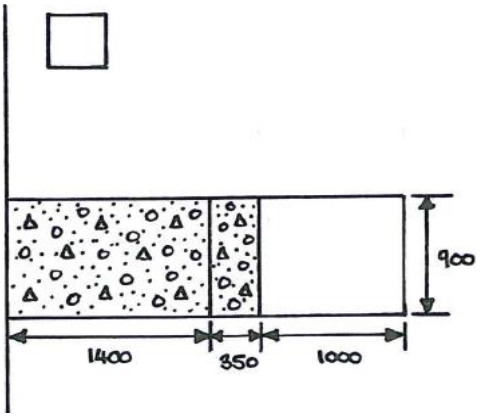
Remarks:	Scale:
All dimensions in millimetres	1:20
Side of the trial pit remained stable during excavation	Logged by: AT

GEA	www.gea-ltd.co.uk Herts | 01727 824666 Notts | 01509 674888	**Trial Pit No** 6

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL	**Job Number** J17275
Client	Lazari Properties 2 Limited	Sheet 1/1
Engineer	The Morton Partnership	**Dates** 16/11/2017

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Location**
Mini Excavator	900 x 2750 x 950		Northern boundary wall

Plan:



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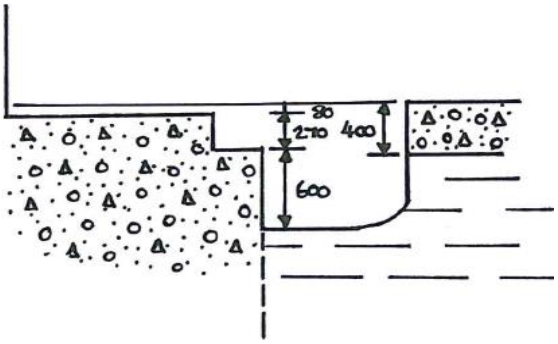

Concrete Floor Slab

Stiff fissured brown CLAY with bluish grey veins and fine selenite

Remarks:	Scale:
All dimensions in millimetres	1:20
Side of the trial pit remained stable during excavation	Logged by:
Trial pit abandoned due to contaminated groundwater seeping through concrete foundation	AT

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
BH1		2.00-2.45	D	Brown slightly sandy silty CLAY with rare fine to medium gravel														Particle Size Distribution
BH1		2.75	D	Dark brown silty CLAY	26.1	73	25	48	100									
BH1		3.00	D												7.8	0.23		
BH1		4.00-4.45	U	Stiff fissured dark brown CLAY	27.8					1.88	1.47	80	262	131				
BH1		6.50-6.95	U	Very stiff fissured dark brown silty CLAY.	27.5					1.98	1.56	130	201	101				
BH1		9.50-9.95	U	Very stiff fissured dark brown silty CLAY.	25.0					2.05	1.64	190	206	103				
BH1		12.50-12.95	U	Very stiff fissured dark brown silty CLAY.	24.7					2.03	1.63	250	253	126				
BH1		15.00	D	Dark brown silty CLAY	27.0	70	23	47	100									
BH1		15.50-15.94	U	Very stiff fissured dark brown silty CLAY.	27.2					2.02	1.59	310	313	157				
BH1		18.50-18.95	U	Very stiff fissured dark brown silty CLAY.	26.3					1.95	1.55	370	241	121				

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

GEOLABS®

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
BH2		2.00-2.45	U	Stiff fissured dark brown silty CLAY.	30.6					1.98	1.51	40	133	67				
BH2		2.75	D												8.3	0.19		
BH2		3.75	D	Dark brown silty CLAY	27.7	75	25	50	100									
BH2		4.00-4.45	U	Stiff fissured dark brown silty CLAY.	28.3					1.98	1.54	80	181	90				
BH2		6.50-6.95	U	Very stiff fissured dark brown silty CLAY.	27.3					2.00	1.57	130	324	162				
BH2		9.50-9.95	U	Very stiff fissured dark brown silty CLAY.	24.8					2.03	1.62	190	211	105				
BH2		12.50-12.95	U	Very stiff fissured dark brown silty CLAY	28.8					1.94	1.51	250	249	124				
BH2		15.50-15.95	U	Very stiff fissured dark brown silty CLAY	26.4					2.01	1.59	310	323	162				
BH2		18.50-18.95	U	Very stiff fissured dark brown silty CLAY	22.7					2.02	1.64	370	294	147				
BH3		0.80	D	Yellow brown very sandy GRAVEL														Particle Size Distribution

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

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SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
BH4		1.50	D	Yellow brown gravelly SAND														Particle Size Distribution
BH5		1.00	D	Dark brown mottled grey silty CLAY	30.2	74	25	49	100									
BH5		2.00	D												7.9	1.80		

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

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BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

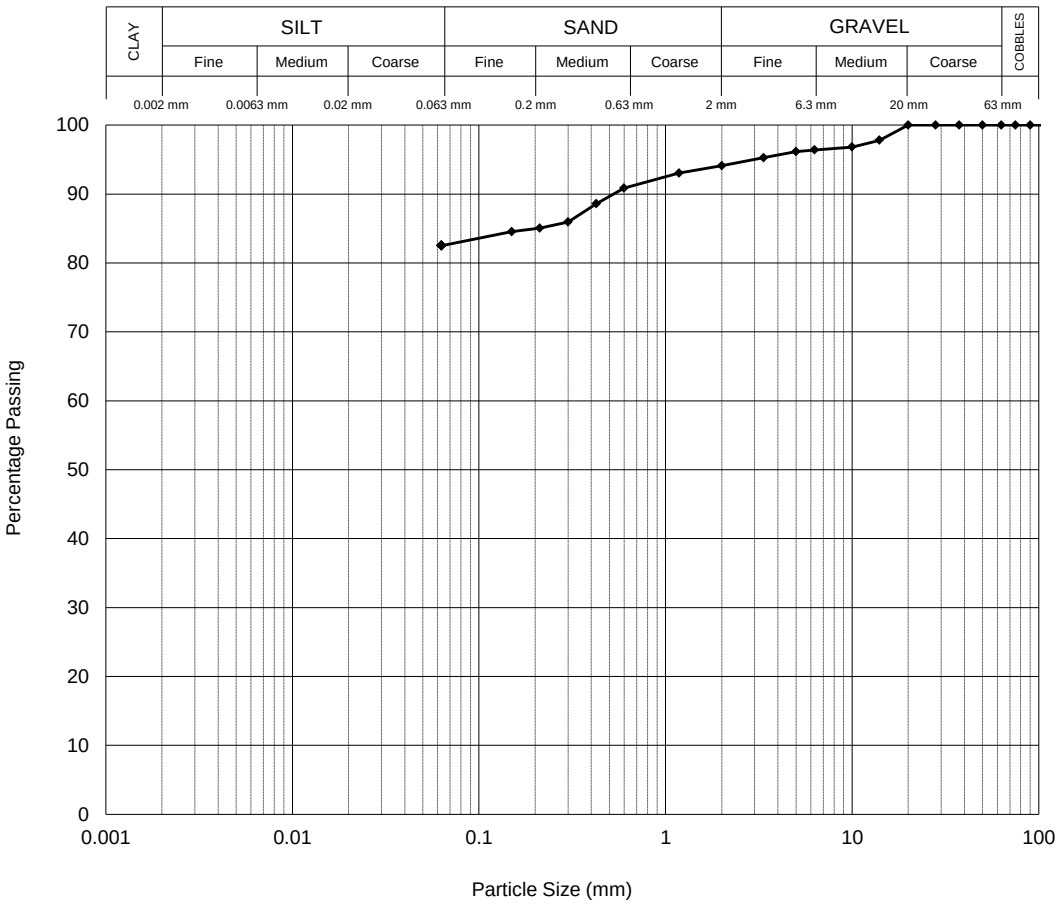
BH / TP No.	BH1
Depth (m)	2.00-2.45
Sample Type	D

Description

Brown slightly sandy silty CLAY with rare fine to medium gravel

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	100
14.0 mm	98
10.0 mm	97
6.30 mm	96
5.00 mm	96
3.35 mm	95
2.00 mm	94
1.18 mm	93
600 µm	91
425 µm	89
300 µm	86
212 µm	85
150 µm	85
63 µm	83



Particle Proportions	
Cobbles	0
Gravel	6
Sand	12
Silt & Clay	82

Checked and Approved by

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

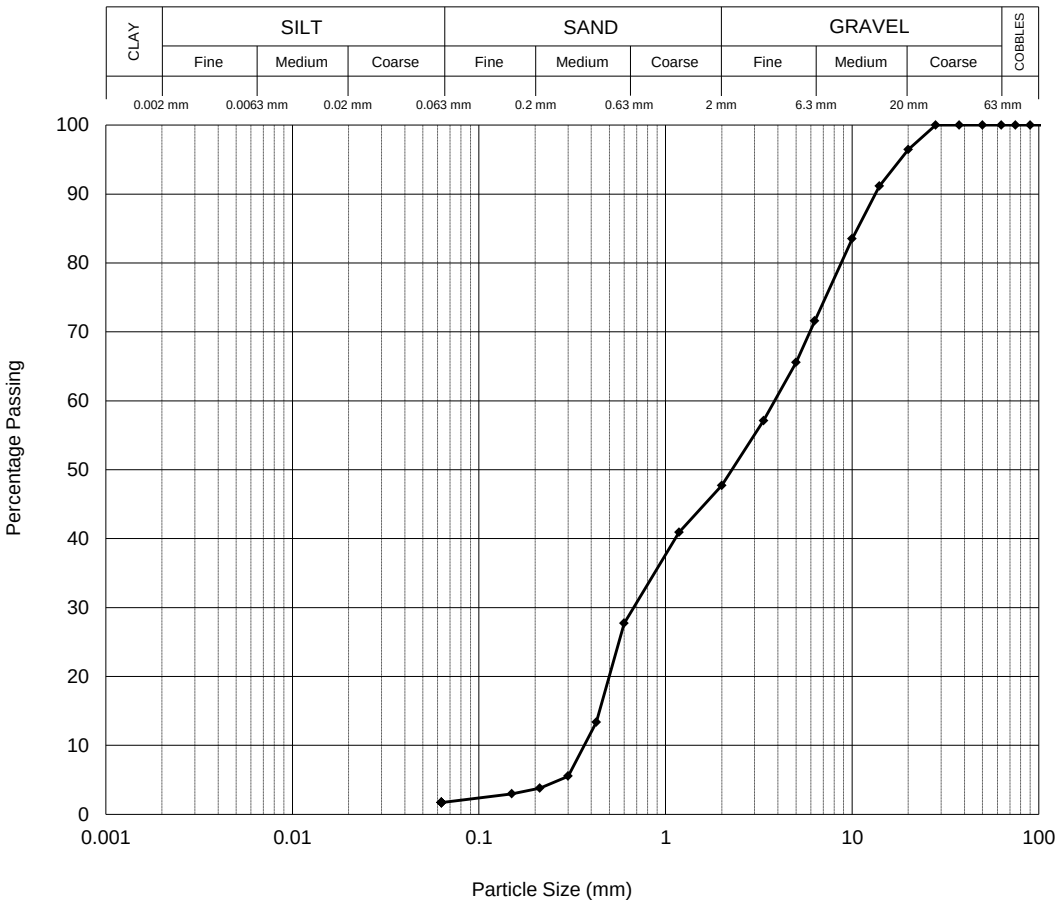
BH / TP No.	BH3
Depth (m)	0.80
Sample Type	D

Description

Yellow brown very sandy GRAVEL

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Dry Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	96
14.0 mm	91
10.0 mm	83
6.30 mm	72
5.00 mm	66
3.35 mm	57
2.00 mm	48
1.18 mm	41
600 µm	28
425 µm	13
300 µm	6
212 µm	4
150 µm	3
63 µm	2



Particle Proportions	
Cobbles	0
Gravel	52
Sand	46
Silt & Clay	2

Checked and Approved by

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

GEOLABS

UKAS TESTING 1982

BS EN ISO 17892-4 : 2016

PARTICLE SIZE DISTRIBUTION

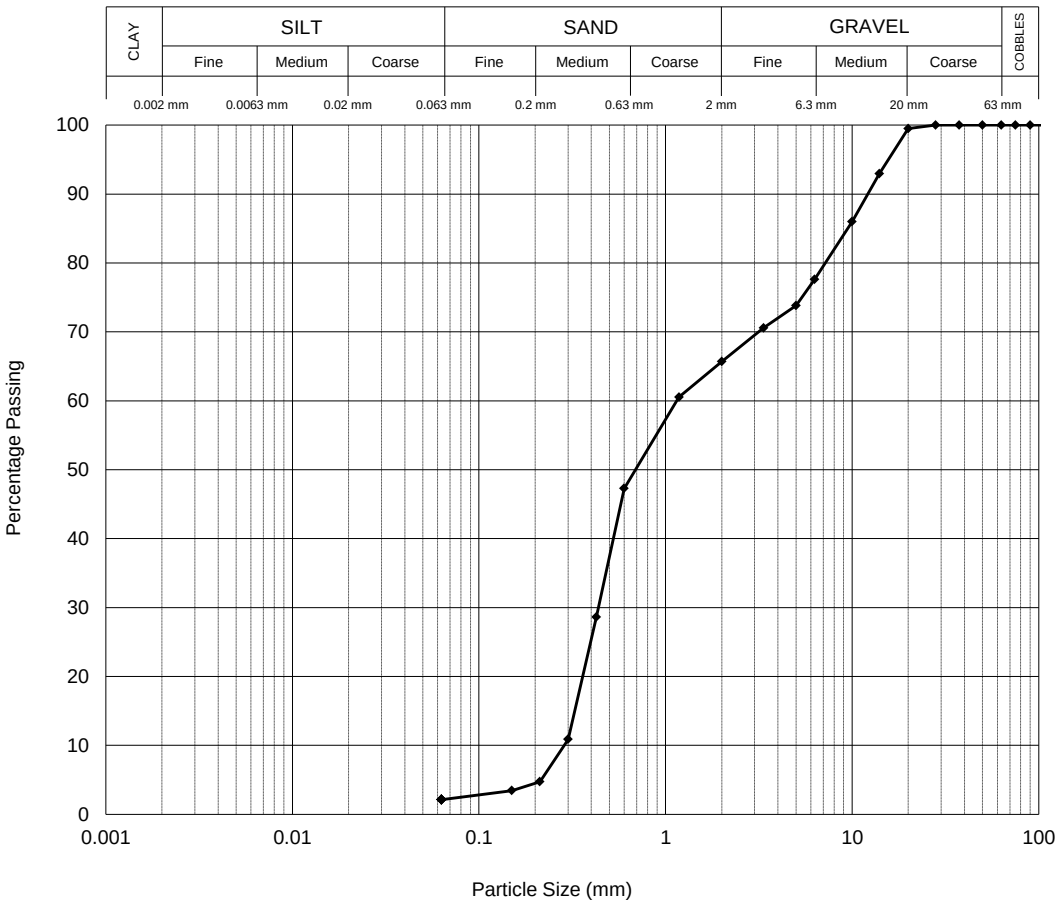
BH / TP No.	BH4
Depth (m)	1.50
Sample Type	D

Description

Yellow brown gravelly SAND

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Dry Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	99
14.0 mm	93
10.0 mm	86
6.30 mm	78
5.00 mm	74
3.35 mm	71
2.00 mm	66
1.18 mm	61
600 µm	47
425 µm	29
300 µm	11
212 µm	5
150 µm	3
63 µm	2



Particle Proportions	
Cobbles	0
Gravel	34
Sand	64
Silt & Clay	2

Checked and Approved by

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

GEOLABS

UKAS TESTING 1982

BS 1377 : Part 7 : 1990 Clause 8

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	4.00-4.45
Sample Type	U

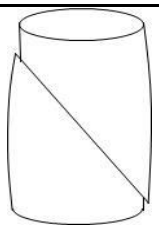
Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	75.2
Diameter	(mm)	38.6
Moisture Content	(%)	27.8
Bulk Density	(Mg/m³)	1.88
Dry Density	(Mg/m³)	1.47
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.7
Cell pressure	(kPa)	80
Strain at failure	(%)	5.3
Maximum Deviator Stress	(kPa)	262
Shear Stress Cu	(kPa)	131

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	250

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

GEOLABS®

UKAS TESTING 1982

BS 1377 : Part 7 : 1990 Clause 8

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	6.50-6.95
Sample Type	U

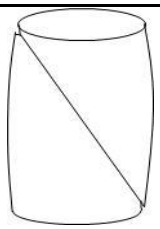
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	102.9
Moisture Content	(%)	27.5
Bulk Density	(Mg/m³)	1.98
Dry Density	(Mg/m³)	1.56
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	130
Strain at failure	(%)	4.2
Maximum Deviator Stress	(kPa)	201
Shear Stress Cu	(kPa)	101

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	45

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

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BS 1377 : Part 7 : 1990 Clause 8

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	9.50-9.95
Sample Type	U

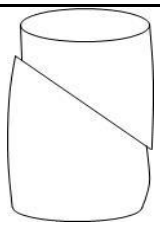
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	102.8
Moisture Content	(%)	25.0
Bulk Density	(Mg/m³)	2.05
Dry Density	(Mg/m³)	1.64
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	190
Strain at failure	(%)	3.5
Maximum Deviator Stress	(kPa)	206
Shear Stress Cu	(kPa)	103

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	120

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	12.50-12.95
Sample Type	U

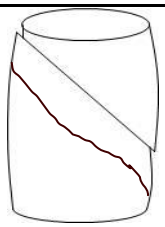
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	192.8
Diameter	(mm)	103.0
Moisture Content	(%)	24.7
Bulk Density	(Mg/m³)	2.03
Dry Density	(Mg/m³)	1.63
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	2.1
Cell pressure	(kPa)	250
Strain at failure	(%)	9.3
Maximum Deviator Stress	(kPa)	253
Shear Stress Cu	(kPa)	126

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	80

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	15.50-15.94
Sample Type	U

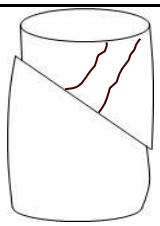
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	102.7
Moisture Content	(%)	27.2
Bulk Density	(Mg/m³)	2.02
Dry Density	(Mg/m³)	1.59
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	310
Strain at failure	(%)	7.9
Maximum Deviator Stress	(kPa)	313
Shear Stress Cu	(kPa)	157

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	110

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	18.50-18.95
Sample Type	U

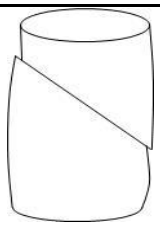
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	192.4
Diameter	(mm)	101.8
Moisture Content	(%)	26.3
Bulk Density	(Mg/m³)	1.95
Dry Density	(Mg/m³)	1.55
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	2.1
Cell pressure	(kPa)	370
Strain at failure	(%)	3.4
Maximum Deviator Stress	(kPa)	241
Shear Stress Cu	(kPa)	121

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	130

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	2.00-2.45
Sample Type	U

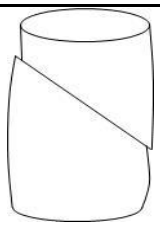
Description:

Stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	102.3
Moisture Content	(%)	30.6
Bulk Density	(Mg/m³)	1.98
Dry Density	(Mg/m³)	1.51
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.4
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	40
Strain at failure	(%)	5.4
Maximum Deviator Stress	(kPa)	133
Shear Stress Cu	(kPa)	67

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	40

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	4.00-4.45
Sample Type	U

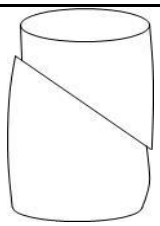
Description:

Stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.5
Diameter	(mm)	103.0
Moisture Content	(%)	28.3
Bulk Density	(Mg/m³)	1.98
Dry Density	(Mg/m³)	1.54
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.2
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	80
Strain at failure	(%)	3.0
Maximum Deviator Stress	(kPa)	181
Shear Stress Cu	(kPa)	90

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	120

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	6.50-6.95
Sample Type	U

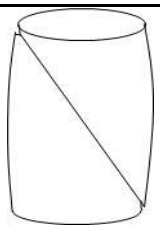
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	102.6
Moisture Content	(%)	27.3
Bulk Density	(Mg/m³)	2.00
Dry Density	(Mg/m³)	1.57
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	130
Strain at failure	(%)	3.2
Maximum Deviator Stress	(kPa)	324
Shear Stress Cu	(kPa)	162

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	160

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	9.50-9.95
Sample Type	U

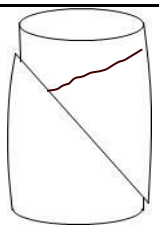
Description:

Very stiff fissured dark brown silty CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	102.5
Moisture Content	(%)	24.8
Bulk Density	(Mg/m³)	2.03
Dry Density	(Mg/m³)	1.62
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	190
Strain at failure	(%)	10.4
Maximum Deviator Stress	(kPa)	211
Shear Stress Cu	(kPa)	105

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	75

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	12.50-12.95
Sample Type	U

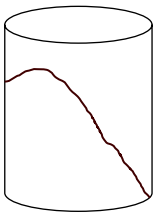
Description:

Very stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	192.7
Diameter	(mm)	102.9
Moisture Content	(%)	28.8
Bulk Density	(Mg/m³)	1.94
Dry Density	(Mg/m³)	1.51
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	2.1
Cell pressure	(kPa)	250
Strain at failure	(%)	7.3
Maximum Deviator Stress	(kPa)	249
Shear Stress Cu	(kPa)	124

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	140

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

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Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	15.50-15.95
Sample Type	U

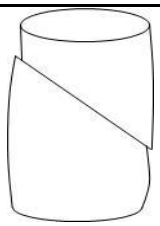
Description:

Very stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.6
Diameter	(mm)	103.4
Moisture Content	(%)	26.4
Bulk Density	(Mg/m³)	2.01
Dry Density	(Mg/m³)	1.59
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.2
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	310
Strain at failure	(%)	2.5
Maximum Deviator Stress	(kPa)	323
Shear Stress Cu	(kPa)	162

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	180

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH2
Depth (m)	18.50-18.95
Sample Type	U

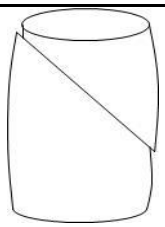
Description:

Very stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	103.3
Moisture Content	(%)	22.7
Bulk Density	(Mg/m³)	2.02
Dry Density	(Mg/m³)	1.64
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	370
Strain at failure	(%)	7.9
Maximum Deviator Stress	(kPa)	294
Shear Stress Cu	(kPa)	147

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	40

Checked and Approved by:

S Burke

S Burke - Senior Technician
16/01/2018

Project Number:

GEO / 26866

Project Name:

STEPHENSON HOUSE
J17275

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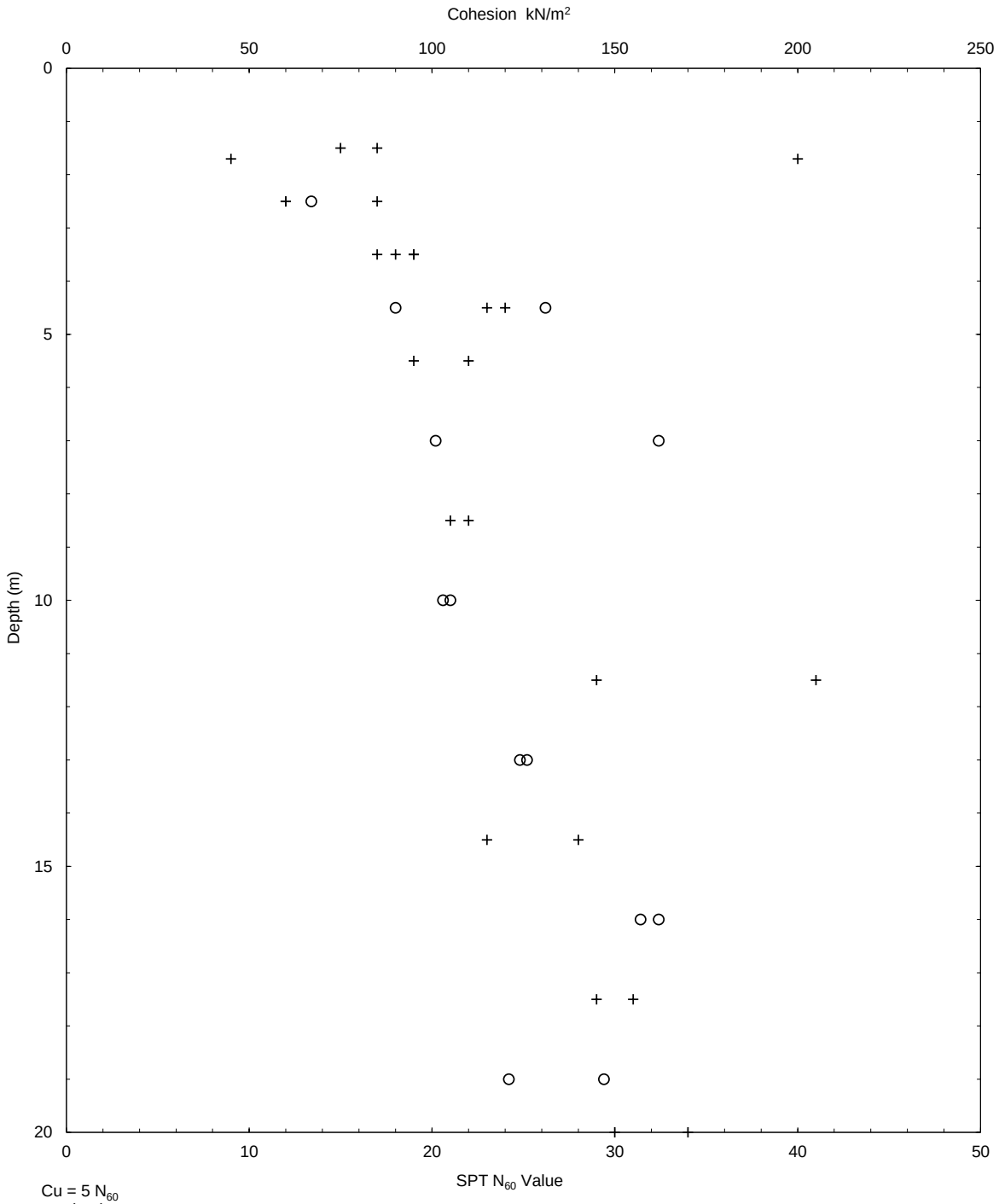
SPT & Cohesion / Depth Graph

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL
Client	Lazari Properties 2 Limited
Engineer	The Morton Partnership

Job Number J17275

Sheet 1 / 1



Cu = 5 N_{60}
o cohesion
+ SPT N_{60} Value

Alex Taylor
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WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 17-69033

Project / Site name:	Stephenson House, Hampstead Road, London	**Samples received on:**	22/11/2017
Your job number:	J17275	**Samples instructed on:**	28/11/2017
Your order number:	J17275	**Analysis completed by:**	05/12/2017
Report Issue Number:	1	**Report issued on:**	05/12/2017
Samples Analysed:	8 soil samples		

Signed:

Jordan Hill
Reporting Manager
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.

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865865	865866	865867	865868	865869
Sample Reference				TP2	TP3	TP4	TP6	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	0.50	0.40	0.50
Date Sampled				16/11/2017	16/11/2017	16/11/2017	16/11/2017	16/11/2017
Time Taken				None Supplied	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	18
Moisture Content	%	N/A	NONE	7.4	8.9	19	21	8.5
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	1.5
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.8	11.7	9.2	10.4	10.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	440	2500	28000	2700	3200
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.070	0.075	0.12	0.54	0.28
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	15	19	12	79	13
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.4	0.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.30
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.56
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.53
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.38
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.30
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.28
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.14
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	2.70
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.1	14	13	12	8.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	13	48	34	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10	18	17	45	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.1	18	32	13	37
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	15	24	34	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	20	36	46	63	47

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865865	865866	865867	865868	865869
Sample Reference				TP2	TP3	TP4	TP6	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	0.50	0.40	0.50
Date Sampled				16/11/2017	16/11/2017	16/11/2017	16/11/2017	16/11/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	22	220	< 10	600	110
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	7.2	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	62	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	100	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	60	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	230	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	6.4	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	77	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	170	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	80	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	330	-
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	4.9	< 2.0	14	3.3
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	29	< 4.0	140	8.8
TPH (C16 - C21)	mg/kg	1	MCERTS	5.0	70	< 1.0	270	30
TPH (C21 - C35)	mg/kg	1	MCERTS	14	100	< 1.0	140	64

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865865	865866	865867	865868	865869
Sample Reference				TP2	TP3	TP4	TP6	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	0.50	0.40	0.50
Date Sampled				16/11/2017	16/11/2017	16/11/2017	16/11/2017	16/11/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865865	865866	865867	865868	865869
Sample Reference				TP2	TP3	TP4	TP6	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	0.50	0.40	0.50
Date Sampled				16/11/2017	16/11/2017	16/11/2017	16/11/2017	16/11/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.30
Anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.56
Pyrene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.53
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.38
Chrysene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.30
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.28
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.14
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865870	865871	865872		
Sample Reference				BH3	BH4	BH5		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.75	0.40		
Date Sampled				16/11/2017	16/11/2017	16/11/2017		
Time Taken				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		
Moisture Content	%	N/A	NONE	6.4	12	26		
Total mass of sample received	kg	0.001	NONE	2.0	1.5	2.0		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	12.0	11.5	9.1		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	2300	2100	770		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.081	0.30		
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	6.5	27	21		
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	< 0.1	0.2		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.18	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.98	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.86	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.30	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.37	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	2.69	< 0.80		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	6.4	10		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	13	39		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	24	37		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	60	24	15		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	14	41		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	28	83		

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865870	865871	865872		
Sample Reference				BH3	BH4	BH5		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.75	0.40		
Date Sampled				16/11/2017	16/11/2017	16/11/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-		
Toluene	µg/kg	1	MCERTS	-	-	-		
Ethylbenzene	µg/kg	1	MCERTS	-	-	-		
p & m-xylene	µg/kg	1	MCERTS	-	-	-		
o-xylene	µg/kg	1	MCERTS	-	-	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-		
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	66	< 10	< 10		
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	4.9	< 1.0	< 1.0		
TPH (C21 - C35)	mg/kg	1	MCERTS	53	2.7	3.2		

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865870	865871	865872		
Sample Reference				BH3	BH4	BH5		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.75	0.40		
Date Sampled				16/11/2017	16/11/2017	16/11/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Chloroethane	µg/kg	1	NONE	-	< 1.0	< 1.0		
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	< 1.0		
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	< 1.0		
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0		
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0		
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Styrene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Tribromomethane	µg/kg	1	NONE	-	< 1.0	< 1.0		
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		

Analytical Report Number: 17-69033

Project / Site name: Stephenson House, Hampstead Road, London
Your Order No: J17275

Lab Sample Number				865870	865871	865872		
Sample Reference				BH3	BH4	BH5		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.40	0.75	0.40		
Date Sampled				16/11/2017	16/11/2017	16/11/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2		
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2		
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3		
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Phenanthrene	mg/kg	0.05	MCERTS	-	0.18	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Fluoranthene	mg/kg	0.05	MCERTS	-	0.98	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	-	0.86	< 0.05		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.30	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	-	0.37	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		

Analytical Report Number : 17-69033

Project / Site name: Stephenson House, Hampstead Road, London

* 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 *
865865	TP2	None Supplied	0.60	Light brown gravelly sand.
865866	TP3	None Supplied	0.60	Light brown gravelly sand.
865867	TP4	None Supplied	0.50	Brown clay and sand.
865868	TP6	None Supplied	0.40	Brown clay.
865869	BH2	None Supplied	0.50	Light brown gravelly sand with stones.
865870	BH3	None Supplied	0.40	Light brown gravelly sand.
865871	BH4	None Supplied	0.75	Brown gravelly sand.
865872	BH5	None Supplied	0.40	Brown clay.

The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 17-69033

Project / Site name: Stephenson House, Hampstead Road, London

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
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-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 based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

Analytical Report Number : 17-69033

Project / Site name: Stephenson House, Hampstead Road, London

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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	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.

The results included within the report are representative of the samples submitted for analysis.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH2		S	17-69033	865869	c	Sulphide in soil	L010-PL	c
BH3		S	17-69033	865870	c	Sulphide in soil	L010-PL	c
BH4		S	17-69033	865871	c	Sulphide in soil	L010-PL	c
BH5		S	17-69033	865872	c	Sulphide in soil	L010-PL	c
TP2		S	17-69033	865865	c	Sulphide in soil	L010-PL	c
TP3		S	17-69033	865866	c	Sulphide in soil	L010-PL	c
TP4		S	17-69033	865867	c	Sulphide in soil	L010-PL	c
TP6		S	17-69033	865868	c	Sulphide in soil	L010-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

GEA
Widbury Barn
Widbury Hill
Ware
Herts SG12 7QE

Generic Risk-Based Soil Screening Values

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL	**Job Number** J17275
Client	Lazari Properties 2 Limited	**Sheet** 1 / 1
Engineer	The Morton Partnership	

Proposed End Use Commercial

Soil pH 8

Soil Organic Matter content % 1.0

Contaminant	Screening Value mg/kg	Data Source
Metals		
Arsenic	640	C4SL
Cadmium	410	C4SL
Chromium (III)	30400	LQM/CIEH
Chromium (VI)	49	C4SL
Copper	71,700	LQM/CIEH
Lead	2330	C4SL
Elemental Mercury	170	SGV
Inorganic Mercury	3600	SGV
Nickel	1350	LQM/CIEH
Selenium	13000	SGV
Zinc	665,000	LQM/CIEH
Hydrocarbons		
Benzene	27	C4SL
Toluene	870	SGV
Ethyl Benzene	48000	SGV
Xylene	475	SGV
Aliphatic C5-C6	3400	LQM/CIEH
Aliphatic C6-C8	8300	LQM/CIEH
Aliphatic C8-C10	2100	LQM/CIEH
Aliphatic C10-C12	10000	LQM/CIEH
Aliphatic C12-C16	61000	LQM/CIEH
Aliphatic C16-C35	1,600,000	LQM/CIEH
Aromatic C6-C7	See Benzene	LQM/CIEH
Aromatic C7-C8	See Toluene	LQM/CIEH
Aromatic C8-C10	3700	LQM/CIEH
Aromatic C10-C12	17000	LQM/CIEH
Aromatic C12-C16	36000	LQM/CIEH
Aromatic C16-C21	28000	LQM/CIEH
Aromatic C21-C35	28000	LQM/CIEH
PRO (C_5 –C_{10})	18397	Calc
DRO (C_{12} –C_{28})	1,725,000	Calc
Lube Oil (C_{28} –C_{44})	1,628,000	Calc
TPH	**1000**	Trigger for speciated testing

Contaminant	Screening Value mg/kg	Data Source
Anions		
Soluble Sulphate	500 mg/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon (%)	10	Methanogenic potential
Total Cyanide	12000	WRAS
Total Mono Phenols	3200	SGV
PAH		
Naphthalene	200.00	C4SL exp & LQM/CIEH
Acenaphthylene	84,000	LQM/CIEH
Acenaphthene	85,000	LQM/CIEH
Fluorene	64,000	LQM/CIEH
Phenanthrene	22,000	LQM/CIEH
Anthracene	530,000	LQM/CIEH
Fluoranthene	23,000	LQM/CIEH
Pyrene	54,000	LQM/CIEH
Benzo(a) Anthracene	90.0	C4SL exp & LQM/CIEH
Chrysene	140	C4SL exp & LQM/CIEH
Benzo(b) Fluoranthene	100.0	C4SL exp & LQM/CIEH
Benzo(k) Fluoranthene	140.0	C4SL exp & LQM/CIEH
Benzo(a) pyrene	42.00	C4SL
Indeno(1 2 3 cd) Pyrene	60.0	C4SL exp & LQM/CIEH
Dibenzo(a h) Anthracene	13.00	C4SL exp & LQM/CIEH
Benzo (g h i) Perylene	650	C4SL exp & LQM/CIEH
Screening value for PAH	**600.0**	B(a)P / 0.15
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	552	LQM/CIEH
tetrachloroethane (PCA)	150	LQM/CIEH
tetrachloroethene (PCE)	63.1	LQM/CIEH
trichloroethene (TCE)	6.42	LQM/CIEH
1,2-dichloroethane (DCA)	0.71	LQM/CIEH
vinyl chloride (Chloroethene)	0.0587	LQM/CIEH
tetrachloromethane (Carbon tetra	3	LQM/CIEH
trichloromethane (Chloroform)	79.4	LQM/CIEH

Notes

Concentrations measured below the above values may be considered to represent 'uncontaminated conditions' which pose 'LOW' risk to human health. Concentrations measured in excess of these values indicate a potential risk which require further, site specific risk assessment.

SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009

LQM/CIEH - Generic Assessment Criteria for Human Health Risk Assessment 2nd edition (2009)derived using CLEA 1.04 model 2009

C4SL - Defra Category 4 Screening value based on Low Level of Toxicological Risk

C4SL exp & LQM/CIEH calculated using C4SL revisions to exposure assessment but LQM/CIEH health criteria values

Calc - sum of nearest available carbon range specified including BTEX for PRO fraction

B(a)P / 0.15 - GEA experience indicates that Benzo(a) pyrene (one of the most common and most carcinogenic of the PAHs) rarely exceeds 15% of the total PAH concentration, hence this Total PAH threshold is regarded as being conservative

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Analytical Report Number : 17-69127

Project / Site name:	Stephenson House, Hampstead Road, London	**Samples received on:**	29/11/2007
Your job number:	J17275	**Samples instructed on:**	29/11/2017
Your order number:	J17275	**Analysis completed by:**	06/12/2017
Report Issue Number:	1	**Report issued on:**	06/12/2017
Samples Analysed:	1 water sample		

Signed:

Jordan Hill
Reporting Manager
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

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Analytical Report Number: 17-69127

Project / Site name: Stephenson House, Hampstead Road, London

Your Order No: J17275

Lab Sample Number				866442				
Sample Reference				TP6				
Sample Number				None Supplied				
Depth (m)				0.80				
Date Sampled				27/11/2017				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	10.8				
Electrical Conductivity at 20 °C	µS/cm	10	NONE	1600				
Sulphate as SO_4	µg/l	45	ISO 17025	771000				
Sulphate as SO_4	mg/l	0.045	ISO 17025	771				
Sulphide	µg/l	5	NONE	650				
Chloride	mg/l	0.15	ISO 17025	99				
Ammonia as NH_3	µg/l	15	ISO 17025	4400				
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	63.7				
Nitrate as N	mg/l	0.01	ISO 17025	0.20				
Nitrate as NO_3	mg/l	0.05	ISO 17025	0.86				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	38				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	114				
Acenaphthylene	µg/l	0.01	ISO 17025	8.10				
Acenaphthene	µg/l	0.01	ISO 17025	14.9				
Fluorene	µg/l	0.01	ISO 17025	32.4				
Phenanthrene	µg/l	0.01	ISO 17025	76.2				
Anthracene	µg/l	0.01	ISO 17025	8.83				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	NONE	255				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1	ISO 17025	25				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.1				
Lead (dissolved)	µg/l	1	ISO 17025	3.3				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.6				

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Project / Site name: Stephenson House, Hampstead Road, London

Your Order No: J17275

Lab Sample Number				866442				
Sample Reference				TP6				
Sample Number				None Supplied				
Depth (m)				0.80				
Date Sampled				27/11/2017				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	4.7				
Ethylbenzene	µg/l	1	ISO 17025	7.3				
p & m-xylene	µg/l	1	ISO 17025	16.5				
o-xylene	µg/l	1	ISO 17025	16.9				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	600				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	5500				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	9700				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	3600				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	19000				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	4.7				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	210				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	850				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	3100				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	85				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	4300				
TPH (C8 - C10)	µg/l	10	ISO 17025	210				
TPH (C10 - C12)	µg/l	10	NONE	1500				
TPH (C12 - C16)	µg/l	10	NONE	8600				
TPH (C16 - C21)	µg/l	10	NONE	9800				
TPH (C21 - C35)	µg/l	10	NONE	3600				

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

Analytical Report Number : 17-69127

Project / Site name: Stephenson House, Hampstead Road, London

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
Ammonia as NH3 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method	L031-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

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.

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Groundwater Screening Values

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL
Client	Lazari Properties 2 Limited
Engineer	The Morton Partnership

Job Number J17275

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Contaminant	Guideline Value	Data Source
Metals	***µg/l***	
Arsenic	7.5	EQS (groundwater)
Boron	750	EQS (groundwater)
Cadmium	3.75	EQS (groundwater)
Chromium	37.5	EQS (groundwater)
Copper	1,500	EQS (groundwater)
Iron	200	UK DWS
Lead	7.5	EQS (groundwater)
Mercury	0.75	EQS (groundwater)
Nickel	15	EQS (groundwater)
Zinc	23.1	EQS (groundwater)
Anions	***mg/l***	
Ammonia	0.29	EQS (groundwater)
Bromate (BrO_3)	0.0075	EQS (groundwater)
Chloride	188	EQS (groundwater)
Fluoride	1	EQS (groundwater)
Nitrate	37.5	EQS (groundwater)
Sulphate	188	EQS (groundwater)
Hydrocarbons	***µg/l***	
Benzene	0.75	EQS (groundwater)
Toluene	157	EQS (groundwater)
Ethyl Benzene	300	WHO
Xylene	63.6	EQS (groundwater)
Aliphatic C5-C6	20	No published threshold
Aliphatic C6-C8	20	No published threshold
Aliphatic C8-C10	300	WHO
Aliphatic C10-C12		
Aliphatic C12-C16	0.8	Solubility Limit
Aliphatic C16-C21	0.0013	Solubility Limit
Aliphatic C21-C35		
Aromatic C6-C7	0.75	See Benzene
Aromatic C7-C8	120	WHO
Aromatic C8-C10	120	WHO
Aromatic C10-C12		
Aromatic C12-C16		
Aromatic C16-C21	90	WHO
Aromatic C21-C35		

Contaminant	Guideline Value	Data Source
Others	***µg/l***	
Cyanide	50	UK DWS
Total Mono Phenols	14.9	EQS (groundwater)
Pentachlorophenol	1	EQS (surface water)
Organochlorine pesticides	0.03	per species UK DWS
Other Pesticides	0.1	per species UK DWS
Total pesticides	0.5	UK DWS
Tributyltin	0.0015	EQS (surface water)
pH	<6.5, >9.5	UK DWS
Electrical conductivity (µS/cm)	1,880	EQS (groundwater)
PAH	***µg/l***	
Naphthalene	0.075	EQS (groundwater)
Anthracene	0.193	EQS (groundwater)
Fluoranthene	0.075	EQS (groundwater)
Benzo(b)fluoranthene	0.075	EQS (groundwater)
Benzo(k)fluoranthene	0.017	EQS (surface water)
Benzo(g,h,i)perylene	0.0082	EQS (surface water)
Benzo(a) pyrene	0.0075	EQS (groundwater)
Total PAH	0.1	UK DWS
Chlorinated Solvents	***µg/l***	
Dichloromethane	20	EQS (surface water)
Trichloromethane (chloroform)	7.5	EQS (groundwater)
Tetrachloromethane (CCl_4)	75	EQS (groundwater)
vinyl chloride (Chloroethene)	0.375	EQS (groundwater)
1,2-dichloroethane (DCA)	21,2	EQS (groundwater)
1,1,1 trichloroethane (TCA)	212	EQS (groundwater)
1,1,2 trichloroethane (TCA)	848	EQS (groundwater)
tetrachloroethane (PCA)	7.5	EQS (groundwater)
trichloroethene (TCE)	7.5	EQS (groundwater)
tetrachloroethene (PCE)	7.5	EQS (groundwater)

Notes

Concentrations measured below the above values may be considered to represent 'uncontaminated conditions' which do not pose a risk

Concentrations measured in excess of these values indicate a potential risk to groundwater quality , and thus require further, site specific risk assessment.

UK DWS - United Kingdom Drinking Water Standard - Drinking Water Inspectorate & Health Protection Agency, 2009

EQS - Environmental Quality Standards -The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015

WHO - World Health Organisation, Guidelines for Drinking-water Quality, 2010

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Site Plan

Site	Stephenson House, 75 Hampstead Road, London NW1 2PL
Client	Lazari Properties 2 Limited
Engineer	The Morton Partnership

Job Number J17275

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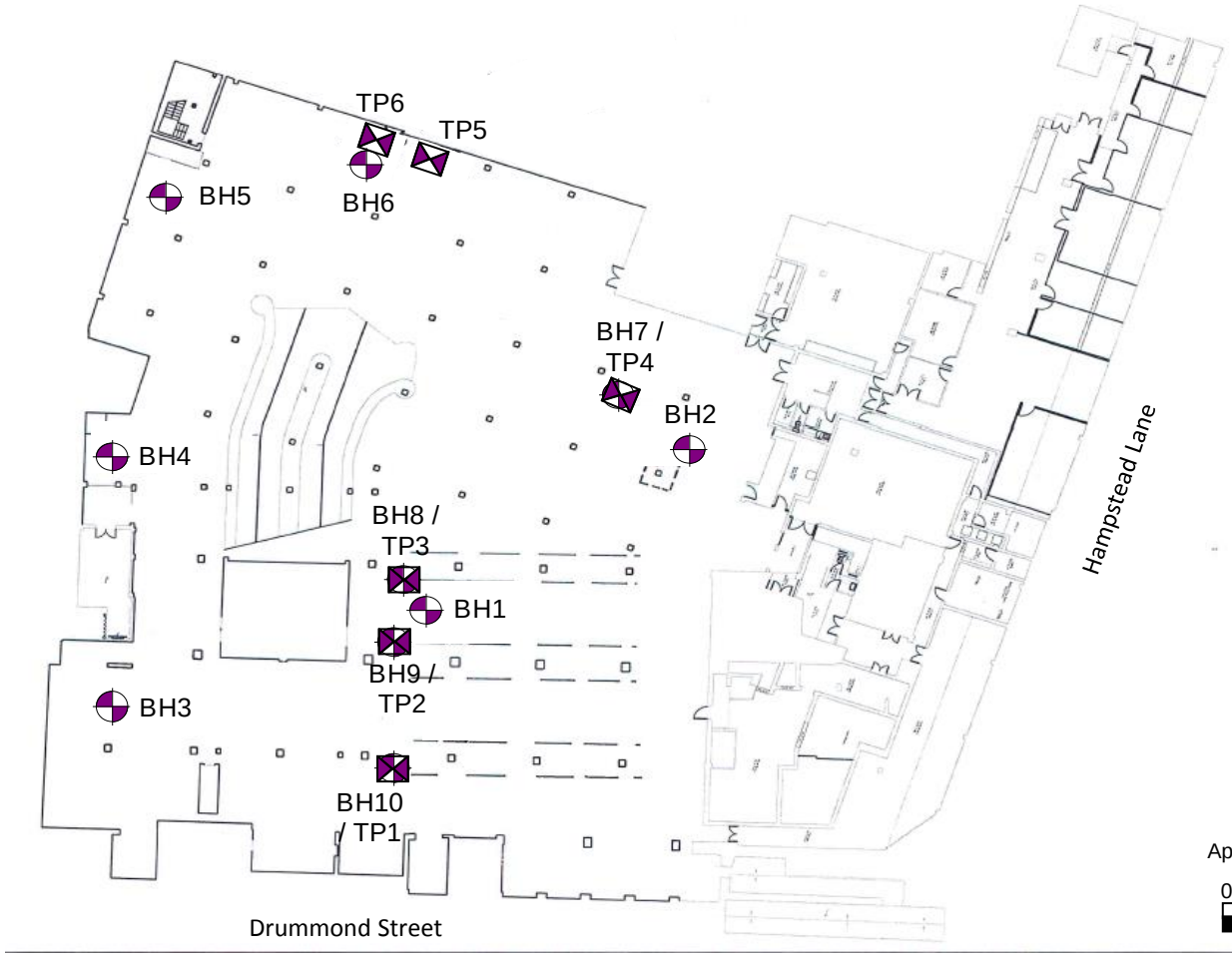

Approximate Scale in metres

0 5 10 15

Geotechnical & Environmental Associates (GEA)
is an engineer-led and client-focused independent specialist providing a complete range of geotechnical and contaminated land investigation, analytical and consultancy services to the property and construction industries.

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where information can be found on all of the services that we offer.

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