GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site	Number
73 - 75 Avenue Road, London, NW8 6HP	BH14

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Deroda Investments Limited	J14383
	Location	**Dates** 14/01/2015	**Engineer** Heyne Tillett Steel	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	Topsoil.		
					0.40	Complete at 0.40m		

Remarks
Borehole refused at 0.40m.

Scale (approx)	Logged By
1:20	AB

Figure No. J14383.BH14

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site	Number
73 - 75 Avenue Road, London, NW8 6HP	BH15

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Window Sampler			Deroda Investments Limited	J14383
	Location	**Dates** 14/01/2015	**Engineer** Heyne Tillett Steel	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Topsoil		
					0.20	Made ground: Firm dark brown slightly sandy slightly gravelly silty clay. Gravel is fine to medium subangular to subrounded brick, carbonaceous material (possibly burnt material) and flint. Occasional cobble sized brick fragments. Frequent fine to medium roots.		
					(0.40)	At 0.55m becoming sandy		
					0.60	Made ground: Soft orange brown silty clay. Occasional fine to medium subangular brick and flint gravel.		
			At 0.70m PP: 0.75, 1.25, 1.0		(0.20)	Possible made ground: Firm dark brown mottled orange silty clay with occasional fine gravel and gravel sized soft black carbonaceous material . Rare medium gravel of coal. Occasional fine to medium roots.		
			At 0.90m PP: 2.0, 1.75, 2.5		0.80	Soft to firm orangish brown mottled grey silty CLAY. Occasional fine to medium subangular to subrounded gravel.		
					(0.20)			
					1.00			
					(1.30)			
					2.30	Soft to firm orangish brown very gravelly CLAY. Gravel is fine to medium subangular to subrounded gravel.		
					(0.10)			
					2.40	Firm orangish brown mottled grey silty CLAY. Occasional fine to medium subangular to subrounded gravel.		
					(0.20)			
					2.60	Stiff brown mottled grey CLAY with occasional fine to medium subangular to subrounded flint. Occasional partings of chalk sand.		
					(0.20)			
					2.80	Complete at 2.80m		

Remarks
PP refers to Pocket Penetrometer reading.
Borehole refused at 2.80m.

Scale (approx)	Logged By
1:20	AB

Figure No. J14383.BH15

Appendix D

GEA Ground Movement Analysis

Desk Study and Ground Investigation Report

Client Deroda Investments Limited

Engineer Price & Myers

J10229

December 2010

GEA Geotechnical & Environmental Associates

Document Control

Project title	75 Avenue Road, London, NW8 6JD	**Project ref**	J10229
Report prepared by	Mark Kentish BSc MSc FGS		
Report checked and approved for issue by	Steve Branch BSc MSc CGeol FGS FRGS MIEnvSc		

Issue No	Status	Date	Approved for Issue
1	Final	23 December 2010	

This report has been issued by the GEA office indicated below. Any enquiries regarding the report should be directed to the office indicated or to Steve Branch in our Herts office.

☑	Hertfordshire	tel 01727 824666	mail@gea-ltd.co.uk
☐	Nottinghamshire	tel 01509 674888	midlands@gea-ltd.co.uk

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 Price and Myers, on behalf of Deroda Investments Ltd, with respect to the redevelopment of the site through the construction of a three storey house with a two storey 8 m deep basement beneath the entire footprint of the house and extending into the rear garden. The purpose of the investigation has been to research the history of the site with respect to possible contaminative uses, to investigate the ground conditions, to assess the extent of any contamination and to provide information to assist with the design of suitable foundations and retaining walls..

DESK STUDY FINDINGS

The earliest map studied, dated 1872, shows the site to be developed with two houses with associated rear gardens, a detached house occupying the southern part of the site and the existing linked detached house occupying the northern part of the site. Queens Road, (later renamed Queens Grove Road) and Avenue Road were present at this time. The site remained in the same layout until some time between 1951 and 1953, by which time the house occupying the eastern part of the site had been removed and the site was occupied by the existing house in the north with the remainder of site forming a large L-shaped garden. At some point between 1953 and the present day the existing swimming pool was constructed in the south-eastern corner, although this is not shown on any of the historical maps. The site has remained in the same layout through to the present day.

GROUND CONDITIONS

Beneath a moderate thickness of made ground, comprising brown silty gravelly clay with brick fragments, which extended to depths of between 0.90 m and 1.40 m, London Clay was encountered and proved to the full depth investigated of 25.45 m. The London Clay initially comprised a naturally reworked layer of brown gravelly clay, extending to depths of 2.9 m and 4.30 m in Borehole Nos 1 and 2 respectively, whereupon firm becoming stiff mottled brown clay was encountered to depths of 7.40 m and 9.40 m respectively. Stiff becoming very stiff grey fissured clay was encountered below the brown clay and extended to the full depth investigated of 25.45 m. A claystone was encountered in Borehole No 1 at 7.40 m.

Groundwater was not encountered during the investigation and both standpipes were found to be dry on a subsequent groundwater monitoring visit. Elevated concentrations of arsenic and lead were encountered within the made ground samples tested.

RECOMMENDATIONS

The London Clay at basement level should provide a suitable bearing stratum for spread foundations and these may be designed to apply a net allowable bearing pressure of 250 kN/m^2 in the stiff fissured clay at a depth of about 8.0 m below existing ground level. Given the anticipated moderate loads and the need to form retaining walls, piled foundations may be a more suitable option. Alternatively consideration could be given to the use of a basement raft foundation, although this will be governed by the applied load from the new development and the amount of tolerable settlement / heave, and will need to be considered in more detail once loads are known.

The majority of the made ground at this site will be removed by the extent of the basement excavation with hard covered areas patio areas around the perimeter of the new building on completion. The existing mature garden that covers the south-western third of the site will remain and form the garden area. Upon completion of the development, direct contact with the soil will be restricted to areas where the existing mature garden is present. It is considered that the critical pathways for exposure to these contaminants will not be realised following the completion of the development and thus remedial action would not be required in this respect.

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 (GEA) has been commissioned by Price and Myers on behalf of Deroda Investments Ltd, to carry out a desk study and ground investigation at 75 Avenue Road, London, NW8 6JD.

1.1 Proposed Development

It is proposed to demolish the existing building and construct a three-storey house with a two-storey basement extending to a depth of about 8 m, which will extend beneath the entire footprint of the house and into the rear garden. It is understood the garden above the basement will be reinstated with a hard covered terrace and part of the existing mature garden and lawn area will remain in the south-western third of the site.

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

1.2 Purpose of Work

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

- to check the history of the site with respect to previous contaminative uses;
- to determine the ground conditions and their engineering properties;
- to provide advice with respect to the design of suitable foundations and retaining walls;
- 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 order to meet the above objectives, a desk study was carried out, followed by a ground investigation. The desk study comprised:

- a review of readily available geological maps;
- a review of historical Ordnance Survey (OS) maps and environmental searches sourced from the Landmark database; and
- a walkover survey of the site.

In the light of this desk study an intrusive ground investigation was carried out which

comprised, in summary, the following activities:

- two cable percussion boreholes, advanced to a maximum depth of 25.45 m below existing garden level;
- standard penetration tests (SPTs), carried out at regular intervals in the boreholes, to provide additional quantitative data on the strength of the soils;
- laboratory testing of selected soil samples for geotechnical purposes and for the presence of contamination; 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.

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, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; 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 approximately 250 m to the northeast of St John's Wood Barracks and fronts onto Avenue Road to the northeast. It is bounded to the northwest by a house, to the south by Queens Grove Road and to the west by detached houses and their associated gardens. Its location in respect to Avenue Road and Queens Grove Road can be seen on the map below. It may be additionally located by National Grid Reference 526920, 183820.

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

The site is rectangular in shape and measures approximately 40 m by 25 m. A two-storey house occupies the northern part of the site with a tarmac driveway in the northeast. To the south of the house is a swimming pool which has a textile arched roof structure which shows signs of disrepair.

The garden area occupying the eastern and western part of the site is sensibly level, but for a rectangular patio area directly to the rear of the house; the house itself and the front driveway are elevated relative to the garden by approximately 0.4 m.

Vegetation at the site includes a large number of semi-mature and mature deciduous trees of various species, located on all boundaries.

2.2 Site History

The site history has been researched by historical Ordnance Survey Maps (OS) provided by the Landmark database.

The earliest map studied, dated 1872, shows the site to be developed with two houses with associated rear gardens, a detached house occupying the southern part of the site and the existing linked detached house occupying the northern part of the site. Queens Road, (later renamed Queens Grove Road) and Avenue Road were present at this time. The site remained in the same layout until some time between 1951 and 1953 by which time the house occupying the eastern part of the site had been removed and the site occupied by the existing house in the north with the remainder of site forming a large L-shaped garden. At some point between 1953 and the present day the swimming pool was constructed in the south-eastern corner, although this is not shown on any of the historical maps. The site has remained in the same layout through to the present day.

2.3 Other Information

A search of public registers and databases has been made via the Envirocheck database and extracts from the results of the search are appended. More detailed information on the search can be provided if required.

The search has indicated that there are no landfills, waste transfer, treatment or disposal sites within 500 m of the site.

The search has indicated that the site is located in an area where less than 1% of homes are affected by radon emissions; which is the lowest classification given by the Health Protection Agency (HPA) and therefore no radon protective measures will be necessary.

The site is shown to be within a Source II Protection Zones as defined by the environment agency. The site is not at direct risk of flooding.

2.4 Geology and Hydrogeology

The Geological Survey map of the area (BGS Sheet 256) indicates that the site is underlain by London Clay.

The former National Rivers Authority (NRA) Ground Water Vulnerability map suggests that the site is underlain by a non aquifer with soils of negligible permeability. The nearest surface water feature is a pond located approximately 440 m to the north of the site. However, reference to The Lost Rivers of London[2] indicates that the site lies immediately to the west of a tributary of the former River Tyburn, which joined the River Tyburn approximately 100 m to the south of the site. It is understood the River Tyburn has been culverted into the sewage system which runs along Avenue Road.

A figure provided in the BGS memoir showing groundwater contours in 1965 indicates groundwater beneath the site to be at a level of -60 m OD (i.e. approximately 100 m below ground level). This reflects the level of groundwater within the chalk aquifer at depth; the London Clay effectively acts as a barrier to flow between the lower (chalk) aquifer and superficial groundwater. However a more recent contour map of groundwater levels provided by the Environment Agency[3] indicates that by 2009, groundwater in the London area had risen by approximately 30 m and is more likely to be at around -30 m OD, currently 70 m below ground level. Groundwater is unlikely to be present within the London Clay, although groundwater may be present within fissures.

Due to the cohesive nature of the soils, the groundwater flow rate is likely to be negligible. Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between 1 x 10^{-10} m/s and 1 x 10^{-8} m/s, with an even lower vertical permeability.

2.5 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.

2.5.1 Source

The historical usage of the site that has been established by the desk study and the site walkover indicates that the site does not have a potentially contaminative history by virtue of it having been developed with two semi detached houses from at least 1872 and with the existing house since some time between 1951 and 1953. However, as with any previously developed site localised areas of dumping or spillages could be present which could provide an isolated contaminant source.

2 Barton, N (1992). *The Lost Rivers of London*, Historical Publications Ltd
3 Environment Agency Status Report (2009) *Management of the London Basin Chalk Aquifer*

2.5.2 Receptor

The use of the site as a residential property with an area of soft landscaping in the west of the site would potentially result in exposure to the soil for residents and thus represents a relatively high sensitivity end-use. The site being underlain by a non-aquifer groundwater is unlikely to be considered as a sensitive target.

2.5.3 Pathway

The development will include the retention of an area of soft landscaping in the south-western part of the site so there is a potential for end users to come into direct contact with contaminated soil in this area. There will be a limited potential for contaminants to move onto or off the site, except horizontally within any made ground or topsoil layer, or upon the interface with the underlying London Clay, possibly in association with perched water movements. However, the area to remain soft landscaped has been soft landscaped for the sites entire developed history and as such any leachable contaminants are likely to have already been mobilised. There is thus considered to be limited potential for a significant contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

2.5.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a very low risk of there being a significant contaminant linkage at this site which would result in a requirement for major remediation work. Furthermore as there is no evidence of filled ground within the vicinity and as it is anticipated to be underlain by cohesive soils at shallow depth there is not considered to be a significant potential for hazardous soil gas to be present on or migrating towards the site: there should thus be no need to consider soil gas exclusion systems.

3.0 EXPLORATORY WORK

In order to meet the objectives described in Section 1.2, two cable percussion boreholes were advanced to a depth of 25.45 m below ground level by means of a dismantlable cable percussion drilling rig. Standard Penetration Tests (SPTs) were carried out at regular intervals in the boreholes and disturbed and undisturbed samples were recovered for subsequent laboratory examination and testing.

Groundwater monitoring standpipes were installed within Borehole Nos 1 and 2 to a depth of 8 m in each borehole and have been monitored on a single occasion, approximately four weeks after installation.

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

The borehole records and results of the laboratory analyses are appended together with a site plan indicating the exploratory positions.

3.1 Sampling Strategy

The locations of the boreholes and trial pits were specified by the consulting engineers and were confirmed on site by GEA to be away from underground services.

Two samples recovered from the made ground were subjected to analysis for a range of common industrial contaminants and contamination indicative parameters. 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.

The soil samples were selected to provide a general view of the chemical conditions of the soils that are likely to be involved in a human exposure or groundwater pathway and to provide advice in respect of re-use or for waste disposal classification. The samples are considered to represent the general fill material that may be encountered across the site. The contamination analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. Details of the MCERTs accreditation and test methods are included in the Appendix together with the analytical results.

4.0 GROUND CONDITIONS

The investigation has confirmed the expected ground conditions in that, below moderate thicknesses of made ground, London Clay was encountered and proved to the full depth of the investigation.

4.1 Made Ground

The made ground was encountered in both boreholes and extended to depths of 1.4 m and 0.9 m in Borehole Nos 1 and 2 respectively. It comprised brown silty gravelly clay with occasional brick, stone and ash fragments.

No evidence of significant contamination was observed within these soils. Samples of the made ground were analysed for a range of contaminants and the results are summarised in section 4.4.

4.2 London Clay

The London Clay initially comprised naturally reworked firm brown mottled silty sandy slightly gravelly clay which extended to depths of 2.9 m and 4.3 m in Borehole Nos 1 and 2 respectively.

The upper zone was underlain by a weathered zone, comprising firm becoming stiff brown mottled grey silty fissured clay with traces of selenite crystals which extended to depths of 8.2 m and 9.4 m. Typical unweathered London Clay was then encountered and comprised stiff becoming very stiff dark brownish grey and grey silty fissured clay with traces of pyrites which was proved to the full depth investigated of to 25.45 m in each borehole.

The results of laboratory undrained triaxial compression tests do not correlate well with the SPT N values for the London Clay. The triaxial results are probably reflective of sample disturbance and a similar lack of correlation has been found previously on a nearby site, although not to such a marked degree.

A claystone was encountered in Borehole No 1 at a depth of 7.4 m.

Laboratory plasticity index tests indicate the London Clay to be of high shrinkability.

4.3 Groundwater

Groundwater was not encountered within either of the boreholes during drilling.

Subsequent monitoring of the standpipes installed in Borehole Nos 1 and 2, approximately four weeks after installation, measured groundwater at a depth of 7.7 m in Borehole No 1 whilst the standpipe in Borehole No 2 was found to be dry. It is possible that the groundwater encountered in Borehole No 1 represents a pocket or seepage of perched water associated with the claystone that was encountered within the borehole at a similar depth. In any case it is not believed to represent a significant quantity of water, but monitoring of the standpipes should be continued to check this assumption.

4.4 Soil Contamination

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

Determinant	BH No 1 @ 0.5 m	BH No 2 @ 0.5 m
pH	8.2	8.1
Arsenic	21	**35**
Cadmium	0.12	0.31
Chromium	68	86
Copper	49	86
Mercury	0.82	2.9
Nickel	43	58
Lead	400	**1300**
Selenium	<0.2	<0.2
Zinc	96	220
Total Cyanide	<0.5	<0.5
Total Phenols	<0.3	<0.3
Total Sulphate	1100	700
Sulphide	3.6	10
Extractable Chloride (g/l)	0.018	<0.01
TPH C5–C35	<10	16
Benzo(a)Pyrene	0.27	0.8
Total PAH	2.4	**7.1**
Total Organic Carbon %	1.3	2.6

Note: Figure in bold indicates concentration in excess of risk-based soil guideline values, as discussed below

4.4.1 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. To this end the table below indicates those contaminants of concern that have values in excess of a generic human health risk based guideline values which are either that of the CLEA[4] Soil Guideline Value where available, or is a Generic Guideline Value calculated using the CLEA UK Version 1.06 software assuming a residential end use. The key generic assumptions for this end use are as follows:

- that groundwater will not be a critical risk receptor;
- that the critical receptor for human health will be a young female child (zero to six years old);
- that the exposure duration will be 6 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 two storey small terraced house.

It is considered that these assumptions are acceptable for this generic assessment of this site. The 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 concentration ranges of the contaminants of concern highlighted by a comparison of the measured concentrations against the generic screening values are tabulated below. This assessment is based upon the potential for risk to human health, which as this site is underlain by a non-aquifer is considered to be the critical risk receptor.

4 *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.

Contaminant of Concern	Maximum concentration recorded (mg/kg)	Location(s) where elevated concentration recorded	Generic Risk-Based Screening Value
Lead	1300	BH 2	450
Arsenic	35	BH 2	32
Total PAH	7.1	BH 1	6.3

**Threshold values marked thus are for compounds with a limited human toxicity hence the threshold values adopted are not derived on a risk based methodology. Justification for all of the values quoted is provided in the appended table of Generic Risk Based Threshold Soil Guideline Values*

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

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 foundation options and contamination issues.

5.0 INTRODUCTION

It is proposed to demolish the existing building and construct a three-storey house with a two storey basement extending to a depth of 8 m, which will extend beneath the entire footprint of the house and into the rear garden. It is understood the garden above the basement will be reinstated with a hard covered terrace and part of the existing mature garden and lawn area will remain in the south-western third of the site. Proposed loads have not been provided but are expected to moderate and thus typical of this type of development.

6.0 GROUND MODEL

The desk study has indicated the site was originally developed with two semi detached houses prior to being redeveloped with the existing house in the early 1950s. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows.

- A moderate thickness of made ground overlies London Clay which was proved to the full depth of the investigation of 25.45 m;
- the made ground generally comprises dark brown silty gravelly silt/clay with fragments of ash, brick and stone and extended to depths of 1.4 m and 0.9 m in Borehole Nos 1 and 2 respectively;
- the London Clay generally initially comprises a naturally reworked layer of brown silty sandy gravelly clay to depths of 2.9 m and 42 m respectively;
- whereupon a weathered zone was encountered, comprising firm becoming stiff brown mottled grey silty fissured clay with traces of selenite crystals which extended to depths of 8.2 m and 9.4 m in each borehole respectively;
- this weathered zone is underlain by typical unweathered London Clay which comprises stiff becoming very stiff dark brownish grey and grey silty fissured clay with traces of pyrites and was proved to the full depth investigated of to 25.45 m in each borehole;
- groundwater was not encountered within either of the boreholes during drilling;
- subsequent monitoring of the standpipes installed in the boreholes, approximately four weeks after installation, measured the groundwater at a depth of 7.7 m within Borehole No 1 and found Borehole No 2 to be dry;
- the contamination analyses have indicated that there are elevated concentrations of arsenic, lead and Total PAH within the sample of made ground tested from Borehole No 2 which could pose a risk to human health. No elevated concentrations were recorded in Borehole No 1.

7.0 ADVICE AND RECOMMENDATIONS

It is proposed to demolish the existing buildings and construct a three storey house with a two storey basement extending to a depth of 8 m, which will extend beneath the entire footprint of the house and into the rear garden

The basement is anticipated to extend to a depth of about 8.0 m below existing ground level and loads are expected to be moderate and thus typical of this type of development. The London Clay at basement level should provide a suitable bearing stratum for spread foundations. In view of the anticipated columns loads there are a number of suitable foundation options. With the reduction in load at basement formation level as a result of the removal of overburden, the use of a basement raft foundation bearing on the clay may be a suitable foundation solution. The viability of a raft will be governed by the net load from the new structure and the amount of ground movement that arises; this will need to be the subject of additional analysis once proposals have been finalised if this option is preferred. A bored pile retaining wall may be a suitable means of temporary support for the basement excavation and it may therefore be appropriate to also consider the use of piles to support structural loads.

7.1 Basement Construction

7.1.1 Basement Excavation

Groundwater was not encountered during the investigation; however, subsequent monitoring of the standpipes found groundwater to be present at a depth of 7.7 m in one of the boreholes which may represent a relatively minor seepage associated with the claystone at the similar depth. Monitoring should be continued, but it is not possible to draw wholly meaningful conclusions from the measurements made in the standpipe, as the level of the water table is not as significant as the volume of water that may flow into the excavation. For example, a high level of water measured in a standpipe may not be significant if this represents only a small volume of water. It would therefore be prudent to carry out a number of trial excavations, to depths as close to the full basement depth as possible, to provide an indication of the likely ground water conditions. Monitoring of the standpipe should be continued in any case.

There are a number of methods by which the sides of the basement excavation could be supported in the temporary and permanent conditions. The choice of wall may be governed to a large extent by whether it is to be incorporated into the permanent works and have a load bearing function.

Consideration will need to be given to a retention system that maintains the stability at all times of the neighbouring properties to the northwest and southwest, and of surrounding roads and services. Due to the extent of the proposed basement there is insufficient space on the northern, eastern and southern sides of the site to excavate the basement in an open cut but sheet piling would probably be a cost effective alternative. Sheet piling would also prevent any limited groundwater inflows, although the noise and vibrations associated with some techniques may be undesirable, given the close proximity of the adjacent buildings to the east. Consideration could be given to using pressing techniques, although pressing techniques that use water jetting should be treated with caution in view of the risk of causing heave or settlement of the surrounding structures.

For the south-western extent of the basement it may be possible to construct insitu retaining walls within an open cut excavation with the sides battered to a safe angle. Slopes within the made ground should be excavated at 1 in 2, and slopes within the London Clay could

theoretically be cut at 1 in ½, although this would not eliminate the risk of minor slips, which is unlikely to be acceptable in view of the proximity of existing structures. It would therefore be prudent to cut the London Clay at an angle 1 in 2, although in any case any cut slopes should be subject to daily inspections and it is assumed that surface loads, for example from heavy plant, will not be applied to the top of the cut slopes.

Alternatively it may be preferable to adopt a contiguous bored pile wall and deal with inflows through the wall by means of sump pumping, as this would have the benefit of providing support for structural loads.

The ground movements associated with the basement excavation will depend on the method of excavation and support, and the overall stiffness of the basement structure in the temporary condition. Thus, a suitable amount of propping will be required to provide the necessary rigidity. In this respect the timing of the provision of support to the wall will have an important effect on movements. The stability of the foundations of the neighbouring building to the northwest and southwest and the roads to the northeast and south will need to be ensured at all times.

7.1.2 Basement Retaining Walls

The following parameters are suggested for the design of the permanent basement retaining walls.

Stratum	Bulk Density (kg/m^3)	Effective Cohesion (c' – kN/m^2)	Effective Friction Angle (Φ' – degrees)
Made ground	1800	Zero	25
London Clay	2000	Zero	25

The investigation has indicated that ground water is likely to be present within the 8 m deep basement excavation. Reference to Clause 3.4 of BS BS8102:1990 "Protection of Structures Against Water from the Ground" indicates that, for basements which extend below a depth of 4 m, the water table should be taken as being 1 m below ground level.

In addition reference should be made to BS 8002:1994 “Code of Practice for Earth Retaining Structures” which states that an obligatory minimum surcharge of 10 kN/m^2 should be applied to the surface of retained soils in the design of all retaining walls. Additional surcharge loading should be used in the design to take account of incidental loading arising from construction plant, stacking of materials and movement of traffic both during construction and subsequently unless the nature of the layout of the site precludes the need for such additional surcharge.

7.1.3 Basement Heave

It has been estimated that the excavation of an 8.0 m depth of soil will lead to an unloading of approximately 160 kN/m^2 over the new basement area. This will result in short term elastic heave and long term swelling of the London Clay, although long term movements will be mitigated to some extent by the loads applied by the new development. A heave analysis should be carried out once final loads and levels are known.

7.2 Basement Raft Foundation

Consideration could also be given to the use of a basement raft foundation for the entire building. The weight of the soil removed is unlikely to be balanced by the applied loads from the proposed three storey house so there is likely to be a net unloading, resulting in potential uplift. Therefore, the use of a raft foundation will be governed by the applied load from the new development, the amount of settlement and / or heave and the extent to which the movement can be tolerated or resisted by the structure. A detailed ground movement analysis should therefore be carried out once final dimensions and loadings are known.

7.3 Spread Foundations

It should be possible to use spread foundations bearing within the stiff London Clay below basement level. Moderate width pad or strip foundations bearing on the firm or stiff clay at this depth may be designed to apply a net allowable bearing pressure of 250 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.

Given the need to form retaining walls piled foundations may need to be considered.

7.4 Piled Foundations

For the ground conditions at this site consideration could be given to the use of a driven or bored pile, although the noise and vibrations associated with the use of driven piles may render them unsuitable due to the close proximity of the neighbouring buildings and roads on all sides of the site. Conventional rotary augered piles may be considered as only nominal amounts of casing will be required through the made ground; alternatively, piles installed by continuous flight auger (cfa) techniques may be considered.

The following table of ultimate coefficients may be used for the preliminary design of cfa piles, based on the SPT / cohesion depth graph in the appendix. Greater reliance should be placed on the results of the insitu SPTs as the laboratory test results are not considered to accurately represent the strength of the clay. All depths are shown relative to existing ground floor level.

Ultimate Skin Friction		*kN/m^2*
Basement Excavation	GL to 8.0 m	Ignore
London Clay (α = 0.5)	8.0 m to 25.0 m	Increasing linearly from 45 to 110
Ultimate End Bearing		*kN/m^2*
London Clay	20.0 m to 25.0 m	Increasing linearly from 1665 to 1980

In the absence of pile tests, guidance from the London District Surveyors Association[5] (LDSA) suggests that a factor of safety of 2.6 should be applied to the above coefficients in the computation of safe theoretical working loads and that the average ultimate skin friction within the clay should be limted to 110 kN/m^2.

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

On the basis of the above coefficients and a factor of safety of 2.6 it has been estimated that a 450 mm diameter pile founding at a depth of 25 m below existing ground level should provide a safe working load of about 850 kN and a 450 mm diameter pile founding at a depth of 20 m should provide a safe working load of about 550 kN. A 600 mm diameter pile founding at depths of 25 m and 20 m should provide a safe working load of about 1175 kN and 775 kN respectively.

These 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 an appropriate piling scheme. Consideration will need to be given to the possible effects of heave on the piles and this should be considered further once the layout has been finalised.

7.5 Excavations

On the basis of the borehole findings it is considered likely that it will be feasible to form relatively shallow excavations within the made ground and London Clay without the requirement for lateral support, however small scale instabilities may occur within the made ground. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

Inflows of groundwater are unlikely to be encountered; however perched water may be encountered within the vicinity of existing foundations and other buried structures, although any such inflows should be suitably dealt with by sump pumping.

7.6 Basement Floor Slab

Following the excavation of the basement it should be possible to adopt a ground bearing floor slab on the London Clay. The formation level should be proof rolled in any case and any soft spots should be replaced with compacted granular fill. Further consideration will however need to be given to the need to design the slab to take account of heave due to unloading and to the possible requirement to design with respect to a ground water table at a theoretical depth of 1 m below ground level. A void or layer of compressible material is likely to be required below the slab to accommodate the heave.

7.7 Hydrogeological Assessment

The current development proposal includes the construction of a two storey basement beneath the entire footprint of the new house, which will extend into the rear garden and to a depth of approximately 8.0 m below present garden ground level.

The desk study research has indicated that significant movement of groundwater is unlikely to be occurring within the soils of the London Clay beneath the site, except for relatively minor movements associated with fissures or claystones within the clay. This has been confirmed by the investigation, in which groundwater was not encountered during drilling and subsequent monitoring of the standpipes found one standpipe to be dry and the other to have a water level at 7.7 m within an 8 m standpipe. This level is relatively consistent with the presence of a claystone and is likely to represent a seepage of perched water associated with the claystone.

The basement construction and underlying foundations are unlikely to encounter groundwater and in any case the basement will not provide a barrier to any shallow water moving through the London Clay. The construction of the basement should therefore have no affect on the local groundwater regime.

7.8 Effect of Sulphates

Chemical analyses of selected soil samples have indicated low to moderate concentrations of soluble sulphate, corresponding to Class DS-1, ACEC class AC1s and Class DS-3, ACEC class AC2s of Table C2 of BRE Special Digest 1: Part C (2005). The guidelines contained in the above digest should be followed in the design of any new foundation concrete.

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

7.9 Site Specific Risk Assessment

The chemical analyses have highlighted the presence of arsenic, lead and total PAH concentrations within the made ground sample tested from Borehole No 2 at 0.5 m. These concentrations could thus pose a potentially unacceptable risk to human health through direct contact, accidental ingestion or inhalation of soil or soil derived dust.

The majority of the made ground at this site will be removed by the extent of the basement excavation with hard covered patio areas around the perimeter of the new building on completion.

The existing mature garden that covers the south-western third of the site will remain and form the garden area. Upon completion of the development, direct contact with the soil will be restricted to areas where the existing mature garden is present. It is considered that the critical pathways for exposure to these contaminants will not be realised following the completion of the development and thus remedial action would not be required in this respect.

However, these contaminants could pose a potential risk to ground workers in the short term. In addition where the made ground is not removed, ie in the far eastern part of the site, which is likely to be the entry point of buried services for the proposed house, there is the potential for the presence of pockets of contamination to be present. If ashy material is found within the proposed service trenches during the site works it could affect the integrity of plastic services and it would be prudent to carry out further testing of the soils within the service trenches in order to eliminate the need for protective measures for buried plastic services.

7.9.1 Site Workers

Concentrations of potentially toxic lead and carcinogenic PAH have been measured in the made ground soils. 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[6] and CIRIA[7] and the requirements of the Local Authority Environmental Health Officer.

6 HSE (1992) HS(G)66 *Protection of workers and the general public during the development of contaminated land* HMSO

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

7.10 Waste Disposal

Any spoil arising from excavations or landscaping works will need to be disposed of to a licensed tip. Under the European Waste Directive landfills are classified as accepting inert, non-hazardous or hazardous wastes in accordance with the EU waste Directive.

Based upon the results of the analyses carried out and the technical guidance provided by the Environment Agency[8] it is considered likely that the made ground will be classified as a Non-Hazardous waste and the natural soils may be classified as an Inert waste. However, this classification should be confirmed by the receiving landfill once the soils to be discarded have been identified. In order to finalise this classification it will probably be necessary to carry out further analyses including WAC CEN method bulk leaching tests if a classification of Inert waste is to be considered for the made ground. Such tests should be carried out upon representative samples from the waste stream once the extent of the materials to be discarded has been established.

Under the European Waste Directive all waste going to landfill requires pre-treatment. 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 only exceptions to this requirement are for inert waste where it is technically not feasible to do so, or for any other waste where the quantity or hazardous nature of the waste cannot be reduced. 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[9] 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 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 and may require testing to be carried out.

8.0 FURTHER WORK

It would be prudent to carry out a ground movement analysis for the basement excavation and basement raft foundation once final loads and levels have been determined.

8 Environment Agency 2008. *Hazardous Waste: Interpretation of the definition and classification of hazardous waste.* Technical Guidance WM2 Version 2.2

9 Regulatory Position Statement *‘Treating non-hazardous waste for landfill - Enforcing the new requirement’* Environment Agency 23 Oct 2007

APPENDIX

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Boring Method: Cable Percussion	**Casing Diameter**: 150mm cased to 1.00m	**Ground Level (mOD)**	**Site**: 75 Avenue Road, London, NW8 6JD
	Location	**Dates**: 04/11/2010-05/11/2010	**Client**: Deroda Investments Ltd
			Engineer: Price and Myers

Borehole Number: BH1
Job Number: J10229
Sheet: 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1					(1.40)	Made Ground (brown silty gravelly clay with occasional brick, stone and ash fragments)		
1.20-1.65	CPT N=11	1.00	DRY	1,3/2,3,3,3		1.40			
1.50	D2						Firm becoming stiff brown silty sandy gravelly CLAY		
2.00-2.45	U3					(1.50)			
2.45-2.50	D4					2.90			
3.00-3.45	U5						Stiff dark brown mottled grey silty fissured CLAY with traces of selenite crystals. Claystone encountered 7.4 m		
3.45-3.50	D6								
4.00-4.45 4.00	SPT N=16 D7	1.00	DRY	2,3/3,4,4,5					
4.50	D8								
5.00-5.45	U9								
5.45-5.50	D10					(5.30)			
6.00-6.45 6.00	SPT N=19 D11	1.00	DRY	3,3/4,4,5,6					
7.00-7.45 7.00	SPT N=40 D12	1.00	DRY	5,7/9,9,11,11					
8.00	D13					8.20			
9.00-9.45	U14						Stiff becoming very stiff from 10 m dark brown and grey silty fissured CLAY with traces of pyrites		
9.45-9.50	D15								

Remarks
Groundwater not encountered
Service inspection pit excavated to 1.2 m - 1hr
19 mm groundwater monitoring standpipe installed to 8.0 m - Groundwater subsequently monitored at a depth of 7.7 m below ground level on 16/12/10

Scale (approx): 1:50
Logged By: MK
Figure No.: J10229.BH1

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site: 75 Avenue Road, London, NW8 6JD

Borehole Number: BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 1.00m		Deroda Investments Ltd	J10229

Location	Dates	Engineer	Sheet
	04/11/2010-05/11/2010	Price and Myers	2/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50-10.95 10.50	SPT N=32 D16	1.00	DRY	6,7/7,8,8,9					
11.50	D17								
12.00-12.45	U18								
12.45-12.50	D19								
13.50-13.95 13.50	SPT N=40 D20	1.00	DRY	6,8/9,9,10,12					
14.00	D21								
15.00-15.45	U22								
15.45-15.50	D23								
16.50-16.94 16.50	SPT 50/290 D24	1.00	DRY	8,11/12,13,13,12					
17.50	D25								
18.00-18.45	U26					(17.25)			
18.45-18.50	D27								
19.50-19.91 19.50	SPT 50/255 D28	1.00	DRY	9,13/14,14,15,7					

Remarks

Scale (approx)	Logged By
1:50	MK

Figure No. J10229.BH1

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site: 75 Avenue Road, London, NW8 6JD

Borehole Number: BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 1.00m		Deroda Investments Ltd	J10229

Location	Dates	Engineer	Sheet
	04/11/2010-05/11/2010	Price and Myers	3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
20.50	D29								
21.00-21.45	U30								
21.45-21.50	D31								
22.50-22.89 22.50	SPT 50/240 D32	1.00	DRY	11,13/15,15,16,4					
23.00	D33					(17.25)			
24.00	D34								
24.45-24.77 24.50	SPT 25*/90 50/227 D35	1.00	DRY	12,13/15,16,18,1					
25.00-25.33 25.00	SPT 25*/125 50/200 D36	1.00	DRY	13,12/17,19,14					
						25.45	Complete at 25.45m		

Remarks

Scale (approx)	Logged By
1:50	MK

Figure No. J10229.BH1

D8
D9

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site
75 Avenue Road, London, NW8 6JD

Borehole Number
BH2

Boring Method
Cable Percussion

Casing Diameter
200mm cased to 1.50m

Ground Level (mOD)

Client
Deroda Investments Ltd

Job Number
J10229

Location

Dates
03/11/2010-
04/11/2010

Engineer
Price and Myers

Sheet
1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.90)	Made Ground (brown silty gravelly clay with occasional brick and ash fragments and rootlets)		
0.50	D1					0.90	Firm becoming stiff brown silty sandy gravelly CLAY		
1.20-1.65	CPT N=13	1.00	DRY	2,3/3,3,3,4					
1.50	D2								
2.00-2.45	CPT N=17	1.50	DRY	2,3/4,4,4,5					
2.50	D3					(3.40)			
3.00-3.45	CPT N=17	1.50	DRY	2,4/4,4,4,5					
3.50	D4								
4.00-4.45	CPT N=19	1.50	DRY	3,4/4,5,5,5					
4.50	D5					4.30	Stiff brown mottled grey silty fissured CLAY with traces of selenite crystals		
5.00-5.45	U6								
5.50	D7								
6.00-6.45	SPT N=20	1.50	DRY	3,4/5,5,5,5					
						(5.10)			
7.50-7.95	U10								
7.95-8.00	D11								
9.00-9.45	SPT N=26	1.50	DRY	4,5/6,6,7,7					
9.00	D12					9.40	Stiff becoming very stiff from about 12 m dark brown and grey silty fissured CLAY with traces of pyrites and occasional silt partings at depth		

Remarks
Service inspection pit excavated to 1.2 m - 1hr
18 mm diameter standpipe installed to a depth of 8 m
Groundwater not encountered - Standpipe dry on subsequent monitoring visit on 16/12/10

Scale (approx) 1:50

Logged By MK

Figure No. J10229.BH2

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site
75 Avenue Road, London, NW8 6JD

Borehole Number
BH2

Boring Method
Cable Percussion

Casing Diameter
200mm cased to 1.50m

Ground Level (mOD)

Client
Deroda Investments Ltd

Job Number
J10229

Location

Dates
03/11/2010-
04/11/2010

Engineer
Price and Myers

Sheet
2/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00	D13								
10.50-10.95	U14								
10.95-11.00	D15								
12.00-12.45	SPT N=37	1.50	DRY	7,8/9,9,9,10					
12.00	D16								
12.50	D17								
13.00	D18								
13.50-13.95	U19								
13.95-14.00	D20								
15.00-15.45	SPT N=45	1.50	DRY	7,9/10,11,12,12					
15.00	D21								
16.00	D22								
16.50-16.95	U23								
16.95-17.00	D24								
						(16.05)			
18.00-18.44	SPT 50/285	1.50	DRY	9,11/12,14,14,10					
18.00	D25								
19.00	D26								
19.50-19.95	U27								

Remarks

Scale (approx) 1:50

Logged By MK

Figure No. J10229.BH2

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Site 75 Avenue Road, London, NW8 6JD

Borehole Number BH2

Boring Method Cable Percussion

Casing Diameter 200mm cased to 1.50m

Ground Level (mOD)

Client Deroda Investments Ltd

Job Number J10229

Location

Dates 03/11/2010-04/11/2010

Engineer Price and Myers

Sheet 3/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
19.95-20.00	D28								
21.00-21.41 21.00	SPT 50/255 D29	1.50	DRY	9,12/12,13,14,11					
22.00	D30								
22.50-22.95	U31								
						(16.05)			
22.95-23.00	D32								
24.00-24.41 24.00	SPT 50/255 D33	1.50	DRY	11,12/14,14,15,7					
24.50	D34								
25.00-25.40 25.00	SPT 50/250 D35	1.50	DRY	12,13/14,15,15,6					
						25.45	Complete at 25.45m		

Remarks

Scale (approx) 1:50

Logged By MK

Figure No. J10229.BH2

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Standard Penetration Test Results

Site : 75 Avenue Road, London, NW8 6JD

Client : Deroda Investments Ltd

Engineer: Price and Myers

Job Number J10229

Sheet 1 / 1

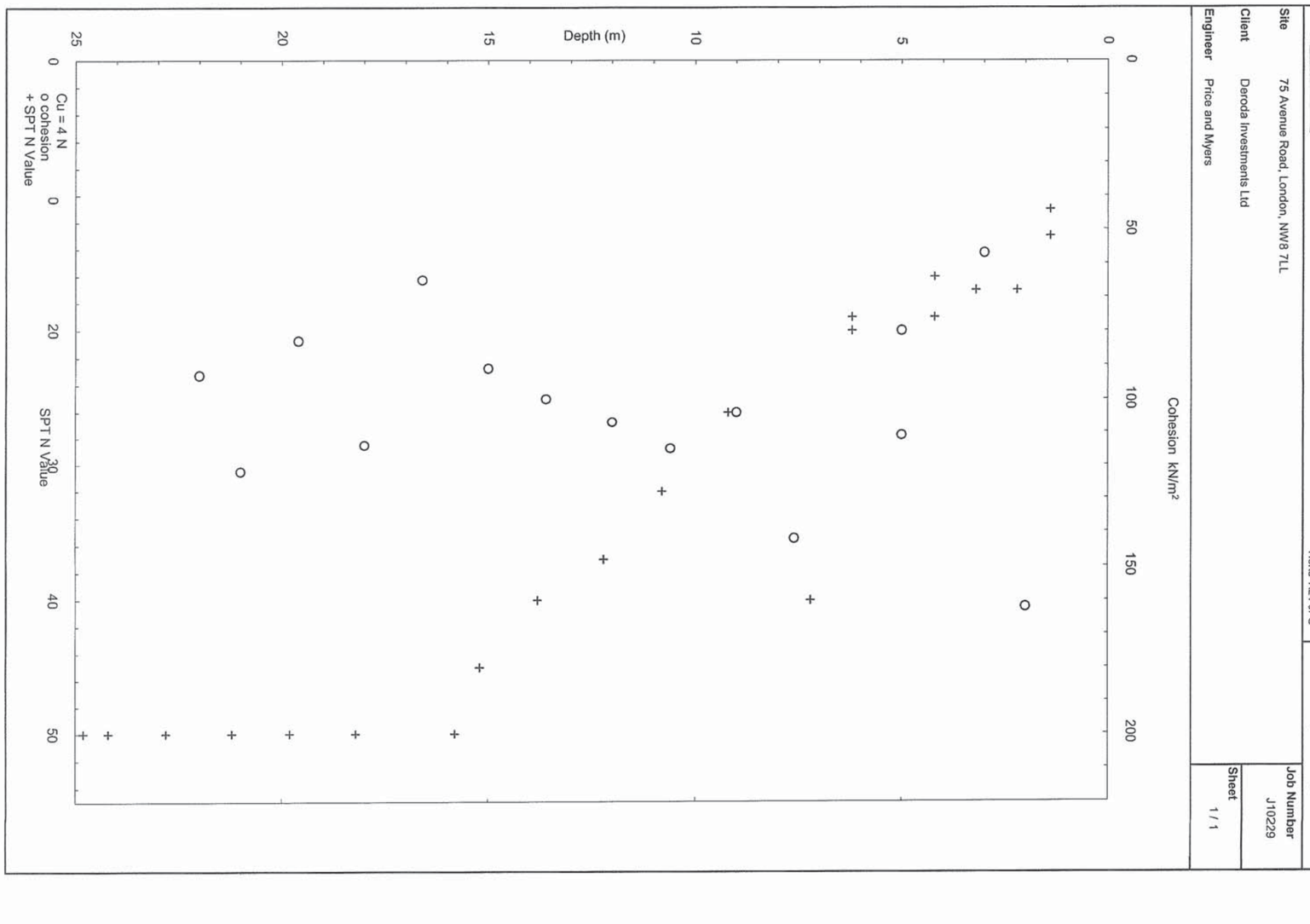
Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
BH1	1.20	1.35	1.65	CPT	1	3	2	3	3	3	N=11	
BH1	4.00	4.15	4.45	SPT	2	3	3	4	4	5	N=16	
BH1	6.00	6.15	6.45	SPT	3	3	4	4	5	6	N=19	
BH1	7.00	7.15	7.45	SPT	5	7	9	9	11	11	N=40	
BH1	10.50	10.65	10.95	SPT	6	7	7	8	8	9	N=32	
BH1	13.50	13.65	13.95	SPT	6	8	9	9	10	12	N=40	
BH1	16.50	16.65	16.94	SPT	8	11	12	13	13	12	50/290mm	
BH1	19.50	19.65	19.91	SPT	9	13	14	14	15	7	50/255mm	
BH1	22.50	22.65	22.89	SPT	11	13	15	15	16	4	50/240mm	
BH1	24.45	24.54	24.77	SPT	12	13	15	16	18	1	25*/90mm 50/227mm	
BH1	25.00	25.13	25.33	SPT	13	12	17	19	14		25*/125mm 50/200mm	
BH2	1.20	1.35	1.65	CPT	2	3	3	3	3	4	N=13	
BH2	2.00	2.15	2.45	CPT	2	3	4	4	4	5	N=17	
BH2	3.00	3.15	3.45	CPT	2	4	4	4	4	5	N=17	
BH2	4.00	4.15	4.45	CPT	3	4	4	5	5	5	N=19	
BH2	6.00	6.15	6.45	SPT	3	4	5	5	5	5	N=20	
BH2	9.00	9.15	9.45	SPT	4	5	6	6	7	7	N=26	
BH2	12.00	12.15	12.45	SPT	7	8	9	9	9	10	N=37	
BH2	15.00	15.15	15.45	SPT	7	9	10	11	12	12	N=45	
BH2	18.00	18.15	18.44	SPT	9	11	12	14	14	10	50/285mm	
BH2	21.00	21.15	21.41	SPT	9	12	12	13	14	11	50/255mm	
BH2	24.00	24.15	24.41	SPT	11	12	14	14	15	7	50/255mm	
BH2	25.00	25.15	25.40	SPT	12	13	14	15	15	6	50/250mm	

Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
Herts AL4 0PG

SPT & Cohesion / Depth Graph

Site	75 Avenue Road, London, NW8 7LL	**Job Number**	J10229
Client	Deroda Investments Ltd	**Sheet**	1 / 1
Engineer	Price and Myers		



PROJECT NAME	75 AVENUE ROAD, LODON, NW8 6JD
	Job Number: J10229
PROJECT NO:	GEO / 16342

Date	30/11/2010
Approved	Simon Burke
Page	1 of 3

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression Tests			Chemical Tests			
Borehole No.	Depth (m)	No.	Type	Description	MC (%)	LL (%)	PL (%)	PI	<425 mic (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Shear Stress (kPa)	pH	2:1 W/S SO4 (g/l)	Ground Water SO4 (g/l)	Other tests and comments
BH1	1.50	D2	D	MADE GROUND: (Brown and orange slightly sandy clay with rare gravel, brick and chalk)	35	60	27	33	96									
BH1	2.00	U3	U	Very stiff mottled grey and brown slightly sandy CLAY with occasional fine to medium gravel	15					2.01	1.75	40	324	162				
BH1	2.45	D4	D	Brown and orange sandy gravelly CLAY	9.1													
BH1	3.00	U5	U	Firm brown CLAY with rare light grey staining	31					2.01	1.53	60	114	57				
BH1	4.00	D7	D	Brown CLAY with rare selenite crystals	29													
BH1	4.50	D8	D	Brown CLAY with rare selenite crystals	33													
BH1	5.00	U9	U	Stiff brown CLAY with rare selenite crystals	31					1.98	1.51	100	160	80				
BH1	9.00	U14	U	Stiff dark grey CLAY	29					2.02	1.57	180	208	104				
BH1	10.50	D16	D	Dark grey-brown CLAY	31	83	30	53	100									
BH1	12.00	U18	U	Stiff fissured dark brown CLAY	31					2.02	1.54	240	214	107				
BH1	15.00	U22	U	Stiff fissured grey silty CLAY	31					1.97	1.51	300	183	91				
BH1	18.00	U26	U	Stiff fissured dark brown CLAY	29					2.00	1.56	360	228	114				

SUMMARY OF GEOTECHNICAL TESTING

GEOLABS®

PROJECT NAME	75 AVENUE ROAD, LODON, NW8 6JD	Date	30/11/2010
	Job Number: J10229	Approved	Simon Burke
PROJECT NO:	GEO / 16342	Page	2 of 3

Sample details				Description	Classification Tests					Density Tests		Undrained Triaxial Compression Tests			Chemical Tests			Other tests and comments
Borehole No.	Depth (m)	No.	Type		MC (%)	LL (%)	PL (%)	PI	<425 mic (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Shear Stress (kPa)	pH	2:1 W/S SO4 (g/l)	Ground Water SO4 (g/l)	
BH1	21.00	U30	U	Stiff grey silty CLAY	29					1.96	1.52	420	245	122				
BH2	1.50	D2	D	Mottled brown and orange slightly sandy gravelly CLAY, Gravel is fine to medium with rare rootlets	33													
BH2	2.50	D3	D	Mottled brown and orange sandy gravelly CLAY with rare rootlets	28										8.4	0.033		
BH2	3.50	D4	D	Mottled brown and orange sandy gravelly CLAY with rare rootlets	27													
BH2	4.50	D5	D	Brown and grey fine sandy CLAY	33													
BH2	5.00	U6	D	Stiff brown CLAY with rare selenite crystals	30					2.00	1.54	100	223	111				
BH2	5.50	D7	D	Brown and grey CLAY with rare selenite crystals	27													
BH2	7.50	U10	U	Stiff fissured brown silty CLAY	31					1.96	1.50	150	283	142				
BH2	10.50	U14	U	Stiff fissured grey CLAY	30					2.00	1.53	210	230	115				
BH2	12.50	D17	D												8.3	1.3		
BH2	13.50	U19	U	Stiff grey silty CLAY	30					2.00	1.53	270	199	100				
BH2	15.00	D21	D	Dark grey-brown CLAY	30	79	26	53	100									

SUMMARY OF GEOTECHNICAL TESTING

GEOLABS®

PROJECT NAME	75 AVENUE ROAD, LODON, NW8 6JD	Date	30/11/2010
	Job Number: J10229	Approved	Simon Burke
PROJECT NO:	GEO / 16342	Page	3 of 3

Sample details				Description	Classification Tests					Density Tests		Undrained Triaxial Compression Tests			Chemical Tests			Other tests and comments
Borehole No.	Depth (m)	No.	Type		MC (%)	LL (%)	PL (%)	PI	<425 mic (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Cell Pressure (kPa)	Deviator Stress (kPa)	Shear Stress (kPa)	pH	2:1 W/S SO4 (g/l)	Ground Water SO4 (g/l)	
BH2	16.50	U23	U	Firm dark grey CLAY	31					1.95	1.49	330	131	65				
BH2	19.50	U27	U	Stiff grey silty CLAY	32					1.95	1.48	390	166	83				
BH2	22.00	D30	D												8.4	1.6		
BH2	22.50	U31	U	Stiff fissured dark grey brown CLAY	30					2.00	1.54	450	186	93				
BH2	24.50	D34	D	Dark grey-brown CLAY	33	79	27	52	100									

SUMMARY OF GEOTECHNICAL TESTING

GEOLABS®

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number: BH2	Description:
Sample Number: U31	Stiff fissured dark grey brown CLAY
Depth (m): 22.50	

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.5
Diameter (mm):	101.6
Moisture Content (%):	30
Bulk Density (Mg/m³):	2.00
Dry Density (Mg/m³):	1.54
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.6
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	450
Strain at failure (%):	8.4
Maximum Deviator Stress (kPa):	186
Shear Stress Cu (kPa):	93

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number: BH2	Description:
Sample Number: U27	Stiff grey silty CLAY
Depth (m): 19.50	

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.9
Diameter (mm):	102.5
Moisture Content (%):	32
Bulk Density (Mg/m³):	1.95
Dry Density (Mg/m³):	1.48
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.6
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	390
Strain at failure (%):	8.9
Maximum Deviator Stress (kPa):	166
Shear Stress Cu (kPa):	83

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

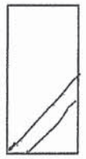
Borehole Number: BH2	Description:
Sample Number: U23	Firm dark grey CLAY
Depth (m): 16.50	

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	202.0
Diameter (mm):	101.2
Moisture Content (%):	31
Bulk Density (Mg/m³):	1.95
Dry Density (Mg/m³):	1.49
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.5
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	330
Strain at failure (%):	6.9
Maximum Deviator Stress (kPa):	131
Shear Stress Cu (kPa):	65

Orientation and position of sample

Mode of failure:



Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number: BH2	Description:
Sample Number: U19	Stiff grey silty CLAY
Depth (m): 13.50	

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	202.0
Diameter (mm):	101.7
Moisture Content (%):	30
Bulk Density (Mg/m³):	2.00
Dry Density (Mg/m³):	1.53
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.2
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	270
Strain at failure (%):	3.0
Maximum Deviator Stress (kPa):	199
Shear Stress Cu (kPa):	100

Orientation and position of sample

Mode of failure:

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BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number: BH2 Sample Number: U14 Depth (m): 10.50	Description: Stiff fissured grey CLAY

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.9
Diameter (mm):	101.5
Moisture Content (%):	30
Bulk Density (Mg/m³):	2.00
Dry Density (Mg/m³):	1.53
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.4
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	210
Strain at failure (%):	5.0
Maximum Deviator Stress (kPa):	230
Shear Stress Cu (kPa):	115

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

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Quick Undrained Triaxial Test

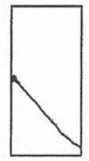
Borehole Number: BH2 Sample Number: U10 Depth (m): 7.50	Description: Stiff fissured brown silty CLAY

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.8
Diameter (mm):	102.3
Moisture Content (%):	31
Bulk Density (Mg/m³):	1.96
Dry Density (Mg/m³):	1.50
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.4
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	150
Strain at failure (%):	5.9
Maximum Deviator Stress (kPa):	283
Shear Stress Cu (kPa):	142

Orientation and position of sample

Mode of failure:



Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number:	BH2
Sample Number:	U6
Depth (m):	5.00

Description:
Stiff brown CLAY with rare selenite crystals

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.7
Diameter (mm):	101.6
Moisture Content (%):	30
Bulk Density (Mg/m³):	2.00
Dry Density (Mg/m³):	1.54
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.6
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	100
Strain at failure (%):	9.4
Maximum Deviator Stress (kPa):	223
Shear Stress Cu (kPa):	111

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

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Quick Undrained Triaxial Test

Borehole Number:	BH1
Sample Number:	U30
Depth (m):	21.00

Description:
Stiff grey silty CLAY

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.7
Diameter (mm):	102.0
Moisture Content (%):	29
Bulk Density (Mg/m³):	1.96
Dry Density (Mg/m³):	1.52
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.5
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	420
Strain at failure (%):	6.9
Maximum Deviator Stress (kPa):	245
Shear Stress Cu (kPa):	122

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number: BH1	Description:
Sample Number: U26	Stiff fissured dark brown CLAY
Depth (m): 18.00	

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.7
Diameter (mm):	101.7
Moisture Content (%):	29
Bulk Density (Mg/m³):	2.00
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):	360
Strain at failure (%):	4.2
Maximum Deviator Stress (kPa):	228
Shear Stress Cu (kPa):	114

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: Project Name: GEO / 16342 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

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Quick Undrained Triaxial Test

Borehole Number: BH1	Description:
Sample Number: U22	Stiff fissured grey silty CLAY
Depth (m): 15.00	

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	176.5
Diameter (mm):	102.1
Moisture Content (%):	31
Bulk Density (Mg/m³):	1.97
Dry Density (Mg/m³):	1.51
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.6
Axial displacement rate (%/min):	2.3
Cell pressure (kPa):	300
Strain at failure (%):	7.9
Maximum Deviator Stress (kPa):	183
Shear Stress Cu (kPa):	91

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: Project Name: GEO / 16342 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number:	BH1
Sample Number:	U18
Depth (m):	12.00

Description: Stiff fissured dark brown CLAY

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.5
Diameter (mm):	101.2
Moisture Content (%):	31
Bulk Density (Mg/m³):	2.02
Dry Density (Mg/m³):	1.54
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.4
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	240
Strain at failure (%):	6.0
Maximum Deviator Stress (kPa):	214
Shear Stress Cu (kPa):	107

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number:	BH1
Sample Number:	U14
Depth (m):	9.00

Description: Stiff dark grey CLAY

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	201.7
Diameter (mm):	101.4
Moisture Content (%):	29
Bulk Density (Mg/m³):	2.02
Dry Density (Mg/m³):	1.57
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.7
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	180
Strain at failure (%):	11.4
Maximum Deviator Stress (kPa):	208
Shear Stress Cu (kPa):	104

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number:	BH1
Sample Number:	U9
Depth (m):	5.00

Description: Stiff brown CLAY with rare selenite crystals

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	202.0
Diameter (mm):	101.8
Moisture Content (%):	31
Bulk Density (Mg/m³):	1.98
Dry Density (Mg/m³):	1.51
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.6
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	100
Strain at failure (%):	9.4
Maximum Deviator Stress (kPa):	160
Shear Stress Cu (kPa):	80

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

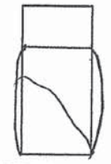
Borehole Number:	BH1
Sample Number:	U5
Depth (m):	3.00

Description: Firm brown CLAY with rare light grey staining

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	202.0
Diameter (mm):	100.5
Moisture Content (%):	31
Bulk Density (Mg/m³):	2.01
Dry Density (Mg/m³):	1.53
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	1.1
Axial displacement rate (%/min):	2.0
Cell pressure (kPa):	60
Strain at failure (%):	19.8
Maximum Deviator Stress (kPa):	114
Shear Stress Cu (kPa):	57

Orientation and position of sample



Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

BS1377 : Part 7 : Clause 8 : 1990

Quick Undrained Triaxial Test

Borehole Number: BH1 Sample Number: U3 Depth (m): 2.00	Description: Very stiff mottled grey and brown slightly sandy CLAY with occasional fine to medium gravel

Single Stage Specimen

Specimen details	Single Specimen
Specimen condition:	Undisturbed
Length (mm):	171.8
Diameter (mm):	102.0
Moisture Content (%):	15
Bulk Density (Mg/m³):	2.01
Dry Density (Mg/m³):	1.75
Test details	
Latex membrane thickness (mm):	0.3
Membrane correction (kPa):	0.7
Axial displacement rate (%/min):	2.3
Cell pressure (kPa):	40
Strain at failure (%):	9.9
Maximum Deviator Stress (kPa):	324
Shear Stress Cu (kPa):	162

Orientation and position of sample

Mode of failure:

Checked and Approved Initials: SB Date: 30/11/2010	Project Number: GEO / 16342 Project Name: 75 AVENUE ROAD, LODON, NW8 6JD Job Number: J10229	GEOLABS

Chemtest
The right chemistry to deliver results

Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

GEA
Tyttenhanger House
Coursers Road
St Albans Herts
AL4 0PG

FAO Mark Kentish
24 November 2010

Dear Mark Kentish

Test Report Number **121450**
Your Project Reference **J10229 - 75 Avenue Rd**

Please find enclosed the results of analysis for the samples received 16 November 2010.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely

Authorised Signatory

- ☐ Darrell Hall — Director
- ☑ Phil Hellier — Director
- ☐ Keith Jones — Technical Manager
- ☐ John Crawford — Quality Manager
- ☐ Malcolm Avis — Director

UKAS TESTING 2183

MCERTS

ISO 14001 sira UKAS ENVIRONMENTAL MANAGEMENT

Notes to accompany report:

- *The sign < means 'less than'*
- *Tests marked 'U' hold UKAS accreditation*
- *Tests marked 'M' hold MCertS (and UKAS) accreditation*
- *Tests marked 'N' do not currently hold UKAS accreditation*
- *Tests marked 'S' were subcontracted to an approved laboratory*
- *n/e means 'not evaluated'*
- *i/s means 'insufficient sample'*
- *u/s means 'unsuitable sample'*
- *Comments or interpretations are outside of the scope of UKAS accreditation*
- *The results relate only to the items tested*
- *Stones represent the quantity of material removed prior to analysis*
- *All results are expressed on a dry weight basis*
- *The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs. SVOCs, PCBs, phenols*
- *For all other tests the samples were dried at < 37°C prior to analysis*
- *Uncertainties of measurement for the determinands tested are available upon request*
- *Soil descriptions, including colour and texture, are beyond the scope of MCertS accreditation*
- *None of the test results included in this report have been recovery corrected*

Test Report 121450 Cover Sheet

GEA
Tyttenhanger House
Coursers Road
St Albans Herts
AL4 0PG

FAO Mark Kentish

LABORATORY TEST REPORT

Results of analysis of 2 samples received 16 November 2010

J10229 - 75 Avenue Rd

Chemtest

Report Date 24 November 2010

Login Batch No					**121450**	
Chemtest LIMS ID					AF48480	AF48481
Sample ID					BH1	BH2
Sample No						
Sampling Date					11/11/2010	11/11/2010
Depth					0.5m	0.5m
Matrix					*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*		
2300	Cyanide (total)	57125	mg kg-¹	M	<0.50	<0.50
2325	Sulfide	18496258	mg kg-¹	M	3.6	10
2625	Total Organic Carbon		%	M	1.3	2.6
2220	Chloride (extractable)	16887006	g l-¹	M	0.018	<0.010
2430	Sulfate (total)	14808798	mg kg-¹	M	1000	700
2450	Arsenic	7440382	mg kg-¹	M	21	35
	Cadmium	7440439	mg kg-¹	M	0.12	0.31
	Chromium	7440473	mg kg-¹	M	68	86
	Copper	7440508	mg kg-¹	M	49	86
	Mercury	7439976	mg kg-¹	M	0.82	2.9
	Nickel	7440020	mg kg-¹	M	43	58
	Lead	7439921	mg kg-¹	M	400	1300
	Selenium	7782492	mg kg-¹	M	<0.20	<0.20
	Zinc	7440666	mg kg-¹	M	96	220
2676	TPH >C5-C6		mg kg-¹	U	< 0.1	< 0.1
	TPH >C6-C7		mg kg-¹	U	< 0.1	< 0.1
	TPH >C7-C8		mg kg-¹	M	< 0.1	< 0.1
	TPH >C8-C10		mg kg-¹	M	< 0.1	< 0.1
	TPH >C10-C12		mg kg-¹	M	< 0.1	< 0.1
	TPH >C12-C16		mg kg-¹	M	< 0.1	1.1
	TPH >C16-C21		mg kg-¹	M	< 0.1	2.8
	TPH >C21-C35		mg kg-¹	M	< 0.1	12
	Total Petroleum Hydrocarbons		mg kg-¹	U	< 10	16
2700	Naphthalene	91203	mg kg-¹	M	< 0.1	0.12
	Acenaphthylene	208968	mg kg-¹	M	< 0.1	< 0.1
	Acenaphthene	83329	mg kg-¹	M	0.12	0.1
	Fluorene	86737	mg kg-¹	M	< 0.1	0.12
	Phenanthrene	85018	mg kg-¹	M	0.31	0.4
	Anthracene	120127	mg kg-¹	M	< 0.1	< 0.1

All tests undertaken between 16-Nov-2010 and 22-Nov-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

GEA
Tyttenhanger House
Coursers Road
St Albans Herts
AL4 0PG

FAO Mark Kentish

LABORATORY TEST REPORT

Results of analysis of 2 samples received 16 November 2010

J10229 - 75 Avenue Rd

Chemtest

Report Date 24 November 2010

					121450	
					AF48480	AF48481
					BH1	BH2
					11/11/2010	11/11/2010
					0.5m	0.5m
					SOIL	*SOIL*
2700	Fluoranthene	206440	mg kg-¹	M	0.23	1
	Pyrene	129000	mg kg-¹	M	0.27	1.2
	Benzo[a]anthracene	56553	mg kg-¹	M	0.18	0.51
	Chrysene	218019	mg kg-¹	M	0.23	0.56
	Benzo[b]fluoranthene	205992	mg kg-¹	M	0.21	0.78
	Benzo[k]fluoranthene	207089	mg kg-¹	M	0.15	0.46
	Benzo[a]pyrene	50328	mg kg-¹	M	0.27	0.8
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M	< 0.1	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M	0.12	0.43
	Benzo[g,h,i]perylene	191242	mg kg-¹	M	0.18	0.43
	Total (of 16) PAHs		mg kg-¹	M	2.4	7.1
2920	Phenols (total)		mg kg-¹	N	<0.3	<0.3
2010	pH		-	M	8.2	8.1
2030	Moisture		%	n/a	17.9	20.7
	Stones content (>50mm)		%	n/a	<0.02	<0.02
2140	Soil colour			n/a	brown	brown
	Soil texture			n/a	clay	clay
	Other material			n/a	stones	stones

All tests undertaken between 16-Nov-2010 and 22-Nov-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

GEA Geotechnical & Environmental Associates

Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Generic Risk-Based Soil Guideline Values

Site	75 Avenue Road, London, NW8 7LL	**Job Number** J10229
Client	Deroda Investments Ltd	**Sheet** 1 / 1
Engineer	Price and Myers	

Proposed End Use Residential with plant uptake

Soil pH 8

Soil Organic Matter content % 2.5

Contaminant	Guideline Value mg/kg	Data Source
Metals		
Arsenic	32	SGV
Cadmium	10	SGV
Chromium (III)	3000	LQM/CIEH
Chromium (VI)	4.3	LQM/CIEH
Copper	2,330	LQM/CIEH
Lead	450	withdrawn SGV
Elemental Mercury	1	SGV
Inorganic Mercury	170	SGV
Nickel	130	LQM/CIEH
Selenium	350	SGV
Zinc	3,750	LQM/CIEH
Hydrocarbons		
Benzene	0.18	SGV
Toluene	320	SGV
Ethyl Benzene	180	SGV
Xylene	120	SGV
Aliphatic C5-C6	55	LQM/CIEH
Aliphatic C6-C8	160	LQM/CIEH
Aliphatic C8-C10	46	LQM/CIEH
Aliphatic C10-C12	230	LQM/CIEH
Aliphatic C12-C16	1700	LQM/CIEH
Aliphatic C16-C35	64,000	LQM/CIEH
Aromatic C6-C7	See Benzene	LQM/CIEH
Aromatic C7-C8	See Toluene	LQM/CIEH
Aromatic C8-C10	65	LQM/CIEH
Aromatic C10-C12	160	LQM/CIEH
Aromatic C12-C16	310	LQM/CIEH
Aromatic C16-C21	480	LQM/CIEH
Aromatic C21-C35	1100	LQM/CIEH
PRO (C_5 –C_{10})	646	Calc
DRO (C_{12} –C_{28})	66,490	Calc
Lube Oil (C_{28} –C_{44})	65,100	Calc
TPH	**500**	Trigger for speciated testing

Contaminant	Guideline Value mg/kg	Data Source
Anions		
Soluble Sulphate	0.5 g/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon	6	Methanogenic potential
Total Cyanide	140	WRAS
Total Mono Phenols	290	SGV
PAH		
Naphthalene	3.70	LQM/CIEH
Acenaphthylene	400	LQM/CIEH
Acenaphthene	480	LQM/CIEH
Fluorene	380	LQM/CIEH
Phenanthrene	200	LQM/CIEH
Anthracene	4,900	LQM/CIEH
Fluoranthene	460	LQM/CIEH
Pyrene	1,000	LQM/CIEH
Benzo(a) Anthracene	4.7	LQM/CIEH
Chrysene	8	LQM/CIEH
Benzo(b) Fluoranthene	6.5	LQM/CIEH
Benzo(k) Fluoranthene	9.6	LQM/CIEH
Benzo(a) pyrene	0.94	LQM/CIEH
Indeno(1 2 3 cd) Pyrene	3.9	LQM/CIEH
Dibenzo(a h) Anthracene	0.86	LQM/CIEH
Benzo (g h i) Perylene	46	LQM/CIEH
Total PAH	**6.3**	B(a)P / 0.15
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	12.9	LQM/CIEH
tetrachloroethane (PCA)	2.1	LQM/CIEH
tetrachloroethene (PCE)	2.1	LQM/CIEH
trichloroethene (TCE)	0.22	LQM/CIEH
1,2-dichloroethane (DCA)	0.008	LQM/CIEH
vinyl chloride (Chloroethene)	0.00064	LQM/CIEH
tetrachloromethane (Carbon tetra	0.039	LQM/CIEH
trichloromethane (Chloroform)	1.3	LQM/CIEH

Notes

Concentrations measured below the above values may be considered to represent 'uncontaminated conditions' which do not pose a risk to human health. Concentrations measured in excess of these valuesindicate a potential risk, and thus require further, site specific risk assessment.

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

withdrawn SGV - Former SGV, derived from the CLEA 2000 model and published by DEFRA pending confirmation of new approach to modeling lead

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

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

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

GEA Geotechnical & Environmental Associates

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
32983683_1_1

Customer Reference:
J10229

National Grid Reference:
526920, 183820

Slice:
A

Site Area (Ha):
0.25

Search Buffer (m):
1000

Site Details:

75 Avenue Road
LONDON
NW8 6JD

Client Details:

Mr S Branch
GEA Ltd
Tyttenhanger House
Corsers Road
St Albans
Herts
AL4 0PG

Landmark® Information Group

Contents

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Natural England Copyright Notice

Ove Arup Copyright Notice

Peter Brett Associates Copyright Notice

Radon Potential dataset Copyright Notice

Report Version v47.0

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				1
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 1			2	15
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3			Yes	
Pollution Incidents to Controlled Waters	pg 3				2
Prosecutions Relating to Authorised Processes					
Prosecutions Relating to Controlled Waters					
Registered Radioactive Substances	pg 4				6
River Quality	pg 5				1
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 5			1	2 (*14)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 9	Yes	n/a	n/a	n/a
Source Protection Zones	pg 9	1		1	
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Recorded Landfill Sites					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS Recorded Mineral Sites					
BGS 1:625,000 Solid Geology	pg 11	Yes	n/a	n/a	n/a
Brine Compensation Area			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards				n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 11	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards				n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 11	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 12			12	129
Fuel Station Entries	pg 23			1	3

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
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Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves	pg 25				1
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					

Order Number: 32983683_1_1 Date: 02-Nov-2010 rpr_ec_datasheet v47.0 A Landmark Information Group Service

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Reservoir/Borehole Site Location: Barrow Hill Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.0018 Permit Version: 1 Effective Date: 15th September 1989 Issued Date: 15th September 1989 Revocation Date: 5th October 2000 Discharge Type: Trade Effluent Discharge Environment: Freshwater Stream/River Receiving Water: River Thames **Status: Authorisation revokedRevoked** Positional Accuracy: Located by supplier to within 100m	A14SE (E)	680	1	527600 183600
2	**Local Authority Pollution Prevention and Controls** Name: Ivy Dry Cleaner Location: 4 Queens Terrace, London, Nw8 6dx Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/40583/EE1EP Dated: 14th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A13SW (SW)	347	2	526672 183539
3	**Local Authority Pollution Prevention and Controls** Name: Kings Location: 25 Winchester Road, London, E4 Authority: London Borough of Waltham Forest, Environmental Health Department Permit Reference: DC05 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A18SW (N)	470	3	526812 184310
4	**Local Authority Pollution Prevention and Controls** Name: Swiss Cottage Dry Cleaners Location: 121 Finchley Road, London, Nw3 6hy Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC10 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	515	4	526626 184270
5	**Local Authority Pollution Prevention and Controls** Name: Johnsons Cleaners Location: 69 St Johns Wood High Street, London, Nw8 7nl Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/40583/EE1EP Dated: 7th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	559	2	526938 183230
5	**Local Authority Pollution Prevention and Controls** Name: Madame George Location: 9 Circus Road, London, Nw8 6nx Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/39117/EE1EP Dated: 7th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NW (S)	562	2	526902 183227
6	**Local Authority Pollution Prevention and Controls** Name: Masterclean Dry Cleaners Location: 6 Langtry Walk, London, Nw8 0du Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC38 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NE (W)	565	4	526352 184004

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Agency & Hydrological

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Local Authority Pollution Prevention and Controls** Name: Tempo Dry Cleaners Location: 98 St Johns Wood High Street, London, Nw8 7sh Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/38279/EE1EP Dated: 7th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	614	2	527019 183184
8	**Local Authority Pollution Prevention and Controls** Name: Connoisseur Dry Cleaners Location: 3-5 Fairhazel Gardens, London, Nw6 3qe Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC11 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NE (NW)	692	4	526262 184119
8	**Local Authority Pollution Prevention and Controls** Name: Sqweaky Clean Professional Dry Cleaners Location: 13 Fairhazel Gardens, London, Nw6 3qe Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC37 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A12NW (NW)	721	4	526237 184134
9	**Local Authority Pollution Prevention and Controls** Name: Elias Dry Cleaners Location: 68 St Johns Wood High Street, London, Nw8 7sh Authority: Westminster City Council, Environmental Health Department Permit Reference: 08/15232/EE1EP Dated: 6th March 2008 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8SE (S)	698	2	527077 183110
10	**Local Authority Pollution Prevention and Controls** Name: Bp Filling Station Location: 21-41 Wellington Road, St John's Wood, LONDON, NW8 9SP Authority: Westminster City Council, Environmental Health Department Permit Reference: VR8 Dated: 7th May 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Manually positioned to the address or location	A8SW (S)	710	2	526864 183080
11	**Local Authority Pollution Prevention and Controls** Name: Abbey Dry Cleaners Location: 11 Blenheim Terrace, London, Nw8 0eh Authority: Westminster City Council, Environmental Health Department Permit Reference: 07/71922/EE1EP Dated: 25th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	745	2	526303 183355
12	**Local Authority Pollution Prevention and Controls** Name: Siciliana Location: 6 Blenheim Terrace, London, Nw8 0eb Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/48997/EE1EP Dated: 25th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	808	2	526198 183395

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	**Local Authority Pollution Prevention and Controls** Name: B P Harmony Location: 104a Finchley Road, London, NW3 5EY Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 1st July 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	837	4	526471 184554
13	**Local Authority Pollution Prevention and Controls** Name: Bp Harmony Location: 104a Finchley Road, LONDON, NW3 5EY Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC18 Dated: 1st July 1999 Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status: Permitted** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	837	4	526471 184554
14	**Local Authority Pollution Prevention and Controls** Name: Chequers Textile Care Ltd Location: 48 Englands Lane, London, Nw3 4ue Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC47 Dated: 5th December 2006 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	920	4	527498 184580
15	**Local Authority Pollution Prevention and Controls** Name: Bromptons Of Windsor Street Location: 91 Boundary Road, London, Nw8 0rg Authority: Westminster City Council, Environmental Health Department Permit Reference: 06/38226/EE1EP Dated: 14th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	925	2	525983 183617
	Nearest Surface Water Feature	A18SW (N)	443	-	526776 184270
16	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: LONDON, NW8 Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 2nd February 1996 Incident Reference: SE960054 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A8NW (S)	599	1	526800 183200
17	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: LONDON, NW8 Authority: Environment Agency, Thames Region Pollutant: Miscellaneous - Natural Note: Not Supplied Incident Date: 10th September 1996 Incident Reference: SE960481 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A9NW (SE)	705	1	527300 183200

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Agency & Hydrological

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Registered Radioactive Substances** Name: Humana Hospital Wellington Location: 27 Circus Road, LONDON, Greater London, NW8 9JG Authority: Environment Agency, Thames Region Permit Reference: AB8520 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA in respect of a registration under S7 when Technetium 99M is used being =< 10 gigabecquerels **Status: Authorisation either revoked or cancelledCancelled** Positional Accuracy: Unknown	A8SW (S)	666	1	526794 183133
18	**Registered Radioactive Substances** Name: Wellington Hospital Location: 8a Wellington Place, LONDON, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: Bw7716 Dated: 1st December 2003 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Application has been authorised and any conditions apply to the operatorAuthorised** Positional Accuracy: Automatically positioned to the address	A8SW (S)	669	1	526814 183127
18	**Registered Radioactive Substances** Name: Wellington Hospital Location: 8a Wellington Place, LONDON, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: Br5558 Dated: 28th March 2002 Process Type: Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1) Description: Registration under the Act of an open source which is also the subject of an authorisation **Status: Application has been authorised and any conditions apply to the operatorAuthorised** Positional Accuracy: Automatically positioned to the address	A8SW (S)	669	1	526814 183127
18	**Registered Radioactive Substances** Name: Wellington Hospital Location: 8a Wellington Place, LONDON, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: Br5531 Dated: 28th March 2002 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variationSuperseded** Positional Accuracy: Automatically positioned to the address	A8SW (S)	669	1	526814 183127
19	**Registered Radioactive Substances** Name: Wynn Institute For Metabolic Research Location: Flat 21, Cavendish House, 21 Wellington Road, LONDON, Greater London, NW8 9SQ Authority: Environment Agency, Thames Region Permit Reference: AC0591 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation either revoked or cancelledCancelled** Positional Accuracy: Automatically positioned to the address	A8SW (S)	764	1	526898 183025
20	**Registered Radioactive Substances** Name: Humana Hospital Wellington Location: 8A Wellington Place, LONDON, Greater London, NW8 9LE Authority: Environment Agency, Thames Region Permit Reference: AB8511 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation either revoked or cancelledCancelled** Positional Accuracy: Unknown	A8SW (S)	828	1	526918 182961

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	River Quality Name: Guc (Paddington Arm) GQA Grade: River Quality E Reach: Canal Feeder - Camden Road Estimated Distance (km): 10.5 Flow Rate: Flow greater than 80 cumecs Flow Type: Canal Year: 2000	A9NW (SE)	716	1	527377 183244
21	**Water Abstractions** Operator: London Borough Of Camden Licence Number: 28/39/39/0219 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Swiss Cottage Open Space, Winchester Road, London. Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (N)	445	1	526800 184280
22	**Water Abstractions** Operator: Thames Water Utilities Ltd Licence Number: 28/39/39/0231 Permit Version: 1 Location: Barrow Hill Pumping Station - Borehole Authority: Environment Agency, Thames Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Barrow Hill Pumping Station Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2007 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SE (E)	694	1	527640 183690
22	**Water Abstractions** Operator: Thames Water Utilities Ltd Licence Number: 28/39/39/0202 Permit Version: 1 Location: Barrow Hill Pumping Station - Borehole Authority: Environment Agency, Thames Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Barrow Hill Pumping Station Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th September 2002 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A14SE (E)	694	1	527640 183690
	Water Abstractions Operator: Zoological Society Of London Licence Number: 28/39/39/0035 Permit Version: 100 Location: Borehole At Regent'S Park, London Nw1 Authority: Environment Agency, Thames Region Abstraction: Zoos/Kennels/Stables: Animal Watering & General Use (Non Agricultural) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 59 Yearly Rate (m3): 681 Details: Regent'S Park, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 4th April 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A10NW (E)	1125	1	528000 183400

Geotechnical & Environmental Associates

Agency & Hydrological

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Bellnorth Limited Licence Number: 28/39/39/0021 Permit Version: 101 Location: Two Boreholes At Dorset House, Gloucester Place, London. W1 Authority: Environment Agency, Thames Region Abstraction: Household Water Supply: Drinking; Cooking; Sanitary; Washing; (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 318 Yearly Rate (m3): 56370 Details: Dorset House, Gloucester Place, London W1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th January 1994 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(SE)	1997	1	527800 182000
	Groundwater Vulnerability Geological Classification: Non Aquifer (Negligibly permeable) - Formations which are generally regarded as containing insignificant quantities of groundwater. However, groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants Soil Classification: Not classified Map Sheet: Sheet 39 West London Scale: 1:100,000	A13NW (SE)	0	1	526922 183822
	Drift Deposits None				
23	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A13NW (SE)	0	1	526922 183822
24	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.	A14SW (E)	402	1	527357 183771
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				

Waste

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		0	7	526922 183822
	Local Authority Landfill Coverage Name: Westminster City Council - Has supplied landfill data		52	2	526878 183750

Geological

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: London Clay	A13NW (SE)	0	5	526922 183822
	Coal Mining Affected Areas In an area which may not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards No Hazard				
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	5	526922 183822
	Potential for Ground Dissolution Stability Hazards No Hazard				
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	5	526922 183822
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	5	526922 183822
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	5	526922 183822
	Radon Potential - Radon Affected Areas Affected Area: The property is not in a radon affected area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	5	526922 183822
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (SE)	0	5	526922 183822

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
25	**Contemporary Trade Directory Entries** Name: Ivy Dry Cleaner Location: 4, Queens Terrace, London, NW8 6DX Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	346	-	526673 183539
26	**Contemporary Trade Directory Entries** Name: Fairfax Engineering Location: 1, Regency Parade, Finchley Road, London, NW3 5EQ Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	391	-	526694 184166
26	**Contemporary Trade Directory Entries** Name: Medoroux Medical Ltd Location: 11, Regency Parade, Finchley Road, London, NW3 5EG Classification: Medical Equipment Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	391	-	526694 184166
26	**Contemporary Trade Directory Entries** Name: Balco Ltd Location: 8, Regency Parade, Finchley Road, London, NW3 5EG Classification: Ventilators & Ventilation Systems **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	391	-	526694 184166
26	**Contemporary Trade Directory Entries** Name: Oxyvita Ltd Location: 11, Regency Parade, Finchley Road, London, NW3 5EG Classification: Medical Instruments - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	391	-	526694 184166
26	**Contemporary Trade Directory Entries** Name: Golf Doktor Location: Regency Pde,Finchley Rd, London, NW3 5EG Classification: Garage Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A18SW (NW)	414	-	526652 184162
27	**Contemporary Trade Directory Entries** Name: Endoscan Ltd Location: 58, Acacia Road, London, NW8 6AG Classification: Industrial Instrument & Apparatus Manufacturers **Status: Active** Positional Accuracy: Manually positioned to the address or location	A8NW (S)	407	-	526819 183393
28	**Contemporary Trade Directory Entries** Name: Soap Opera The Location: 8, Winchester Road, London, NW3 3NT Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	408	-	526882 184260
29	**Contemporary Trade Directory Entries** Name: Buzy Cleaning Location: 18-22, Finchley Road, London, NW8 6EB Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (SW)	426	-	526615 183484
30	**Contemporary Trade Directory Entries** Name: 24 Hr Waste Disposal Location: St. Johns Wood Ter, London, NW8 6LP Classification: Waste Disposal Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A8NE (SE)	431	-	527122 183412
31	**Contemporary Trade Directory Entries** Name: Arrow Enterprises (Uk) Ltd Location: 13, Lower Merton Rise, London, NW3 3RA Classification: Chemicals & Allied Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	484	-	527235 184231
31	**Contemporary Trade Directory Entries** Name: Swan Dry Cleaners Location: 19, Lower Merton Rise, London, NW3 3RA Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	500	-	527226 184259

Geotechnical & Environmental Associates

Industrial Land Use

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
32	**Contemporary Trade Directory Entries** Name: Swiss Cottage Dry Cleaners Location: 121, Finchley Road, London, NW3 6HY Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	516	-	526623 184270
32	**Contemporary Trade Directory Entries** Name: Fuji Photo Film (Uk) Ltd Location: 125, Finchley Road, London, NW3 6HY Classification: Photographic Equipment & Supplies - Wholesale **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	533	-	526612 184282
32	**Contemporary Trade Directory Entries** Name: Primary Industries Location: Station House, 9-13, Swiss Terrace, London, NW6 4RR Classification: Metal Industries - Primary **Status: Active** Positional Accuracy: Manually positioned to the address or location	A18SW (NW)	579	-	526599 184329
33	**Contemporary Trade Directory Entries** Name: Urgent Detergent Location: 16-18 Circus Rd, London, NW8 6PG Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Manually positioned to the address or location	A8NW (S)	530	-	526893 183259
34	**Contemporary Trade Directory Entries** Name: Parks Location: 76-78, Allitsen Road, London, NW8 7BG Classification: Candle Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	531	-	527121 183301
35	**Contemporary Trade Directory Entries** Name: Snappy Snaps Location: 140, St. Johns Wood High Street, London, NW8 7SE Classification: Photographic Processors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	537	-	526958 183254
35	**Contemporary Trade Directory Entries** Name: Johnson Cleaners (Uk) Ltd Location: 69-71, St. Johns Wood High Street, London, NW8 7NL Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NE (S)	564	-	526935 183226
35	**Contemporary Trade Directory Entries** Name: Supasnaps Location: 69-71, St. Johns Wood High Street, London, NW8 7NL Classification: Photographic Processors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	564	-	526935 183226
35	**Contemporary Trade Directory Entries** Name: Shirt Makers England Ltd Location: Cochrane Mews, London, NW8 6NY Classification: Shirt Makers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A8NE (S)	571	-	526925 183218
36	**Contemporary Trade Directory Entries** Name: Drown & Co Ltd Location: 73, Loudoun Road, London, NW8 0DQ Classification: Art Restoration & Picture Cleaning **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	568	-	526346 183997
36	**Contemporary Trade Directory Entries** Name: Francis Butlin Location: 73, Loudoun Road, London, NW8 0DQ Classification: Art Restoration & Picture Cleaning **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	568	-	526346 183997
36	**Contemporary Trade Directory Entries** Name: Thorne Henderson Location: 79, Loudoun Road, London, NW8 0DQ Classification: Distribution Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (W)	568	-	526346 183997

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
86	**Contemporary Trade Directory Entries** Name: Red Grey Ltd Location: 32, Englands Lane, London, NW3 4UE Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	971	-	527522 184625
86	**Contemporary Trade Directory Entries** Name: Allchin Pharmacy Location: 28, Englands Lane, London, NW3 4UE Classification: Pharmaceutical Manufacturers & Distributors **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	981	-	527536 184627
87	**Contemporary Trade Directory Entries** Name: Technomarine Location: A, 8, Hamilton Gardens, London, NW8 9PU Classification: Jewellery Manufacturers & Repairers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	979	-	526449 182927
88	**Contemporary Trade Directory Entries** Name: Gayle Mcvay Location: 52, Belsize Park Gardens, London, NW3 4ND Classification: Hats & Caps - Manufacturers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	981	-	527379 184728
89	**Contemporary Trade Directory Entries** Name: John Chambers Location: 4, Nugent Terrace, London, NW8 9QB Classification: Antiques - Repairing & Restoring **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	984	-	526304 183015
89	**Contemporary Trade Directory Entries** Name: My Fair Laundry Services Location: 8, Nugent Terrace, London, NW8 9QB Classification: Laundries & Launderettes **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	988	-	526310 183006
90	**Contemporary Trade Directory Entries** Name: Spellbound Entertainment Ltd Location: 6, Primrose Mews, Sharpleshall Street, London, NW1 8YW Classification: Television & Video Manufacturers & Wholesalers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A14NE (E)	986	-	527925 184028
91	**Contemporary Trade Directory Entries** Name: Map Print Ltd Location: 96a, Clifton Hill, London, NW8 0JT Classification: Printers Textile **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (W)	990	-	525966 183453
92	**Contemporary Trade Directory Entries** Name: Perfect Clean Location: Flat 12, Lavington, 24, Greville Place, London, NW6 5JU Classification: Carpet, Curtain & Upholstery Cleaners **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	996	-	525935 183522
93	**Fuel Station Entries** Name: Boundary Road Service Station Location: 150 Loudon Road, St Johns Wood, LONDON, NW8 0DH Brand: Total Premises Type: Not Applicable **Status:** **Obsolete** Positional Accuracy: Automatically positioned to the address	A12NE (W)	484	-	526423 183961
94	**Fuel Station Entries** Name: Loudon Road Service Station Location: 21a, Loudon Road, St Johns Wood, London, Greater London, NW8 0NB Brand: Unbranded Premises Type: Not Applicable **Status:** **Obsolete** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	534	-	526375 183661

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
95	**Fuel Station Entries** Name: Wellington Service Station Location: 21-41, WELLINGTON ROAD, ST JOHNS WOOD, LONDON, GREATER LONDON, NW8 9SQ Brand: BP Premises Type: Petrol Station **Status:** **Open** Positional Accuracy: Manually positioned to the address or location	A8SW (S)	710	-	526864 183080
96	**Fuel Station Entries** Name: Hampstead Service Station Location: 104a Finchley Road, Hampstead, LONDON, Greater London, NW3 5EY Brand: BP Premises Type: Petrol Station **Status:** **Open** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	837	-	526471 184554

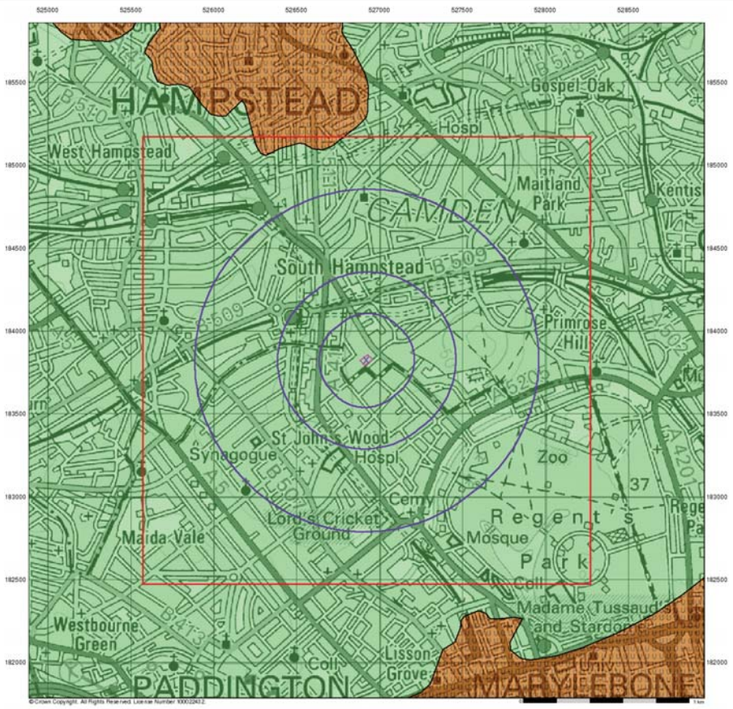
Sensitive Land Use

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
97	**Local Nature Reserves** Name: St John'S Wood Church Grounds Multiple Area: N Area (m2): 19887.75 Source: Natural England Designation Date: 1st January 1998	A8SE (S)	753	6	527088 183057

Useful Contacts

Contact	Name and Address	Contact Details
1	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 08708 506 506 Email: enquiries@environment-agency.gov.uk
2	**Westminster City Council - Environmental Health Department** Council House, Marylebone Road, London, NW1 5PT	Telephone: 020 7641 1317 Fax: 020 7641 1142 Website: www.westminster.gov.uk
3	**London Borough of Waltham Forest - Environmental Health Department** 154 Blackhorse Road, Walthamstow, London, E17 6NW	Telephone: 020 8496 3000 Fax: 0181 524 8960 Website: www.lbwf.gov.uk
4	**London Borough of Camden - Pollution Projects Team** Seventh Floor, Town Hall Extension, Argyle Street, London, WC1H 8EQ	Telephone: 020 7278 4444 Fax: 020 7860 5713 Website: www.camden.gov.uk
5	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
6	**Natural England** Northminster House, Northminster Road, Peterborough, Cambridgeshire, PE1 1UA	Telephone: 0845 600 3078 Fax: 01733 455103 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
7	**London Borough of Camden** Town Hall, Judd Street, London, WC1H 9JE	Telephone: 020 7974 4444 Fax: 020 7974 6866 Email: info@camden.gov.uk Website: www.camden.gov.uk
-	**Health Protection Agency - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@hpa.org.uk Website: www.hpa.org.uk
-	**Landmark Information Group Limited** The Smith Centre, Henley On Thames, Oxfordshire, RG9 6AB	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / SEPA have a charging policy in place for enquiries.



GEA Geotechnical & Environmental Associates

Groundwater Vulnerability

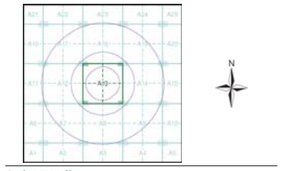
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



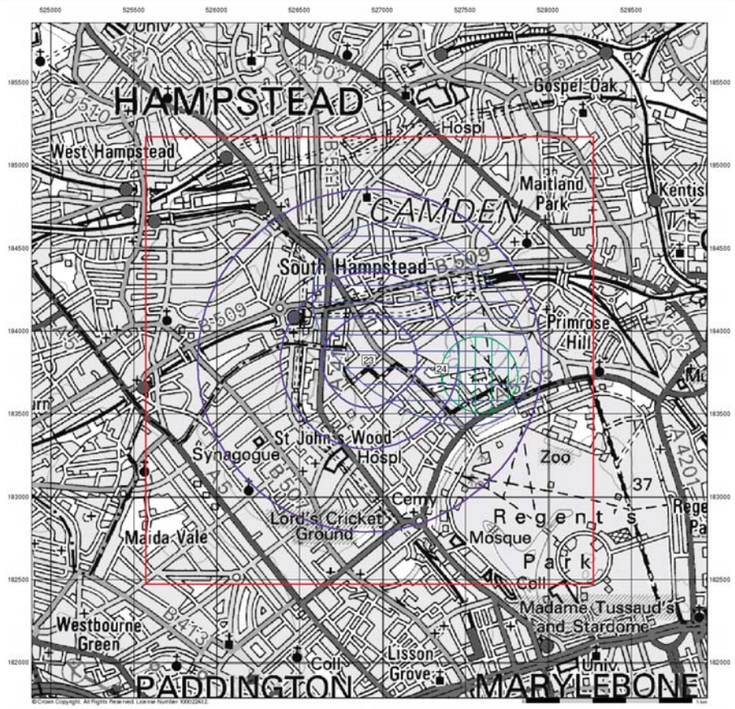
Order Details

Order Number:	32983683_1_1
Customer Ref:	J10229
National Grid Reference:	526920, 183820
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	1000

Site Details

75 Avenue Road, LONDON, NW8 6JD

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



GEA Geotechnical & Environmental Associates

Source Protection Zones

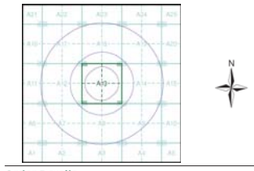
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III
- Zone of Special Interest
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



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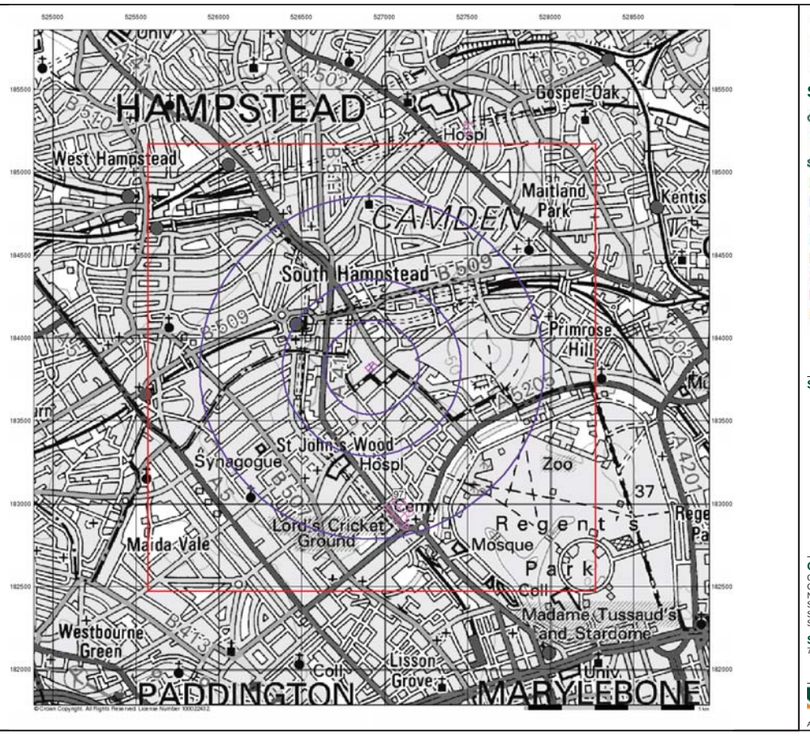


GEA Geotechnical & Environmental Associates

Sensitive Land Uses

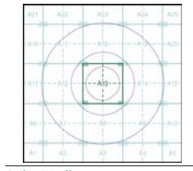
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Sensitive Land Uses

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

Site Sensitivity Context Map - Slice A



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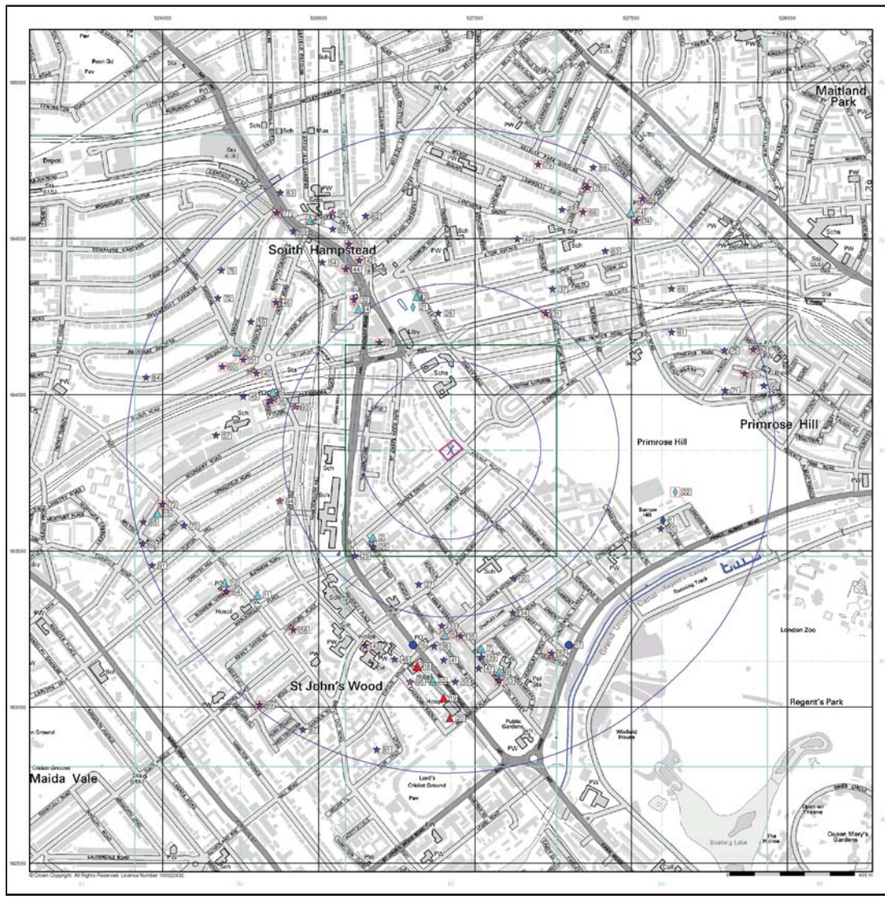


GEA Geotechnical & Environmental Associates

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID | Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

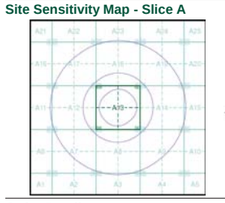
Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Surface Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Slice A



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Slice:	A
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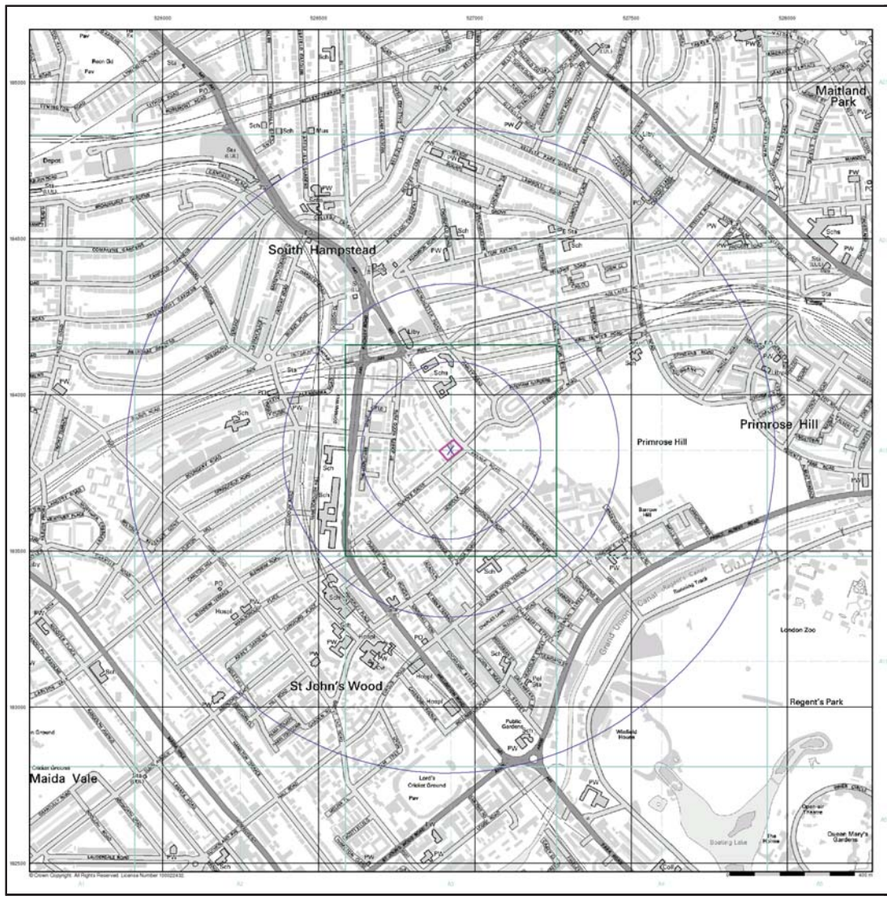


Geotechnical & Environmental Associates

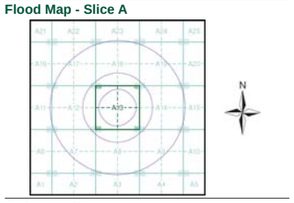
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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Slice:	A
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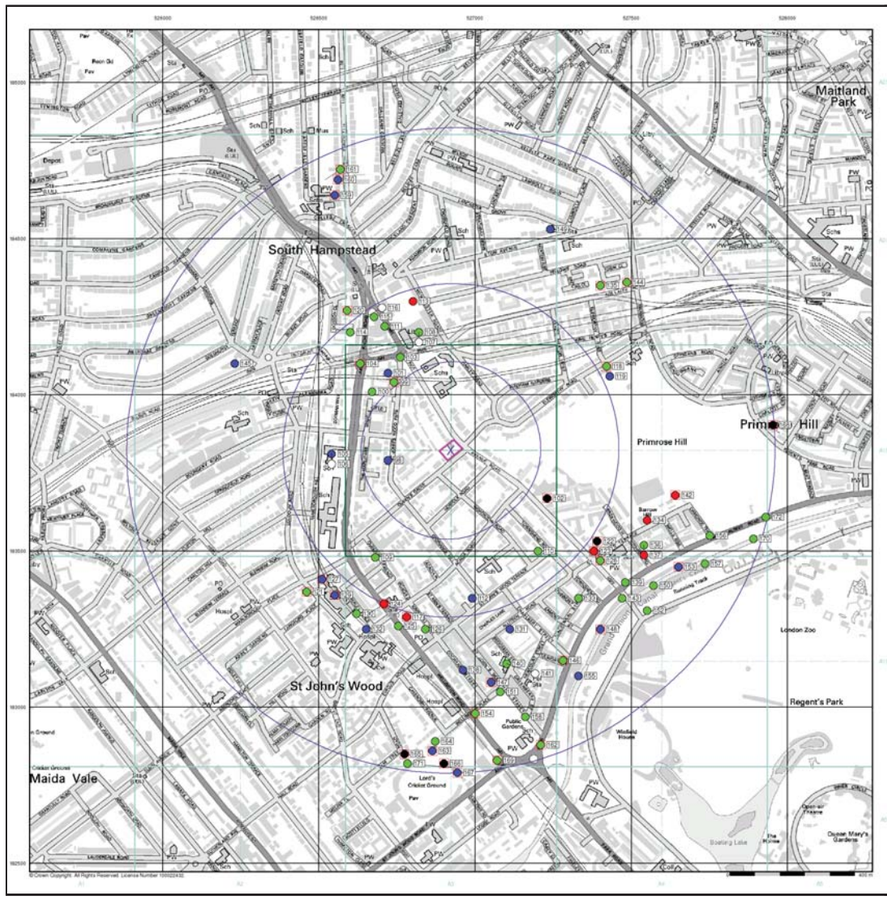


Geotechnical & Environmental Associates

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

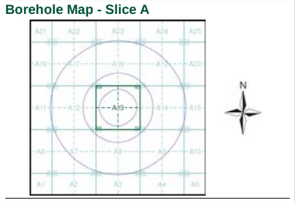
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

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Customer Ref:	J10229
National Grid Reference:	526920, 183820
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	1000

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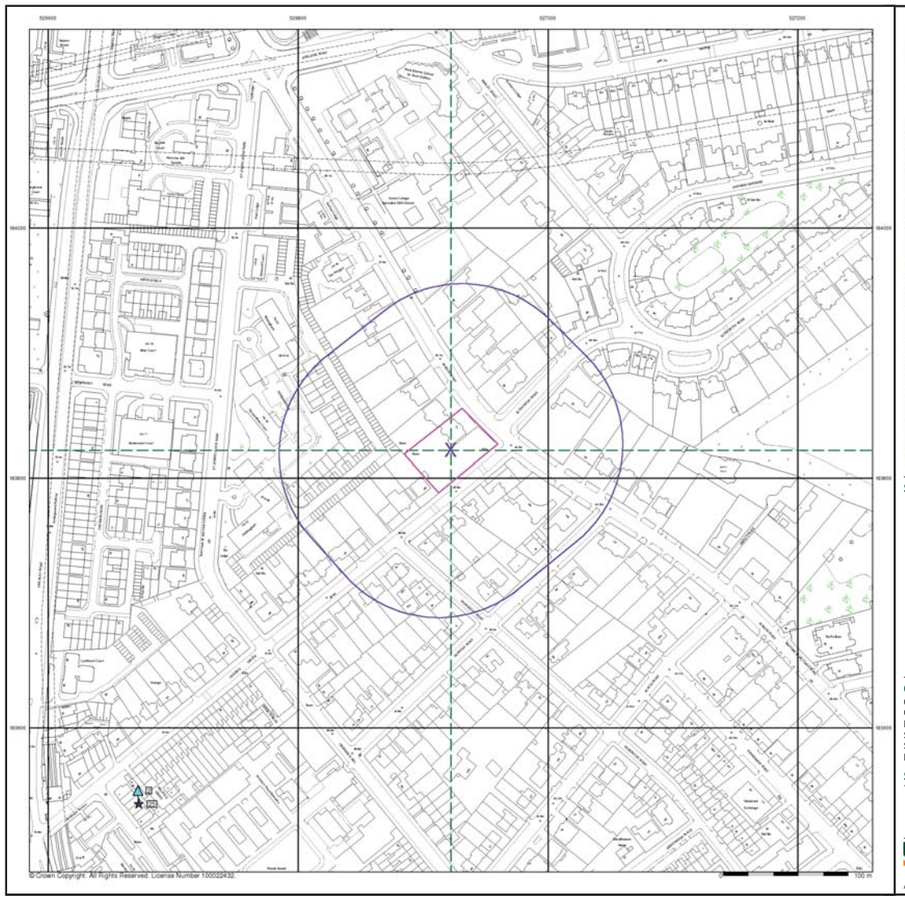


GEA Geotechnical & Environmental Associates

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID
Several of Type at Location | Pylon | Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Surfaced Area)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Geological

- BGS Recorded Mineral Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Site Sensitivity Map - Segment A13

Order Details

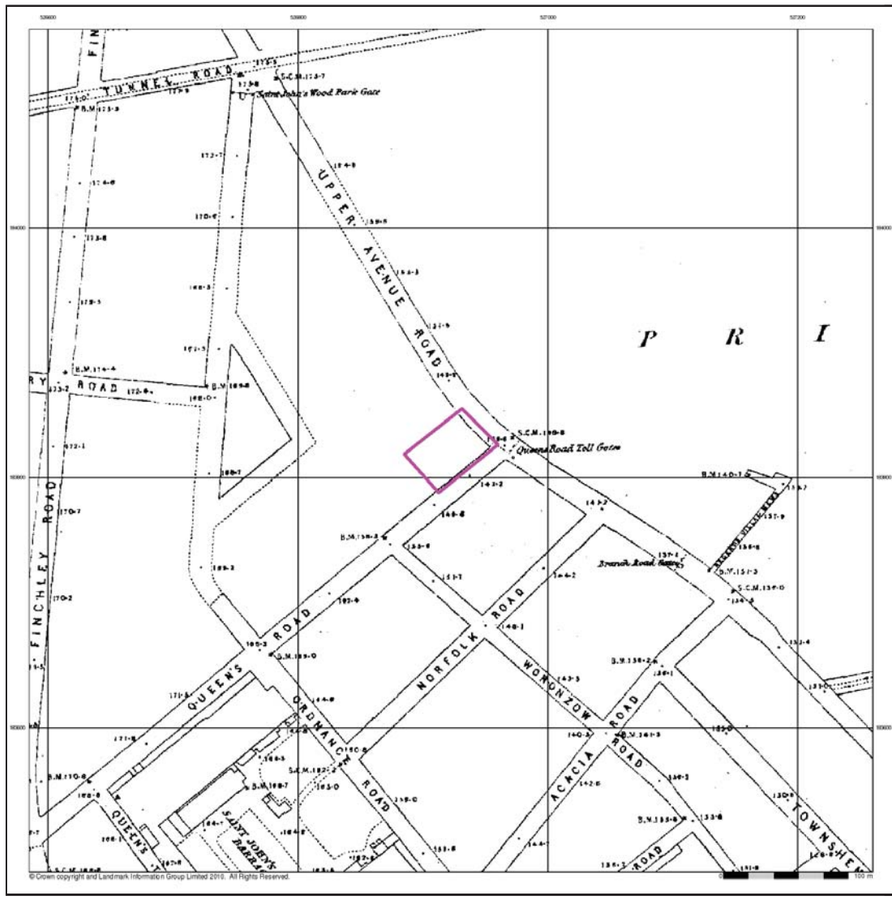
Order Number:	32983683_1_1
Customer Ref:	J10229
National Grid Reference:	526920, 183820
Slice:	A
Site Area (Ha):	0.25
Plot Buffer (m):	100

Site Details

75 Avenue Road, LONDON, NW8 6JD

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



GEA Geotechnical & Environmental Associates

London

Published 1850

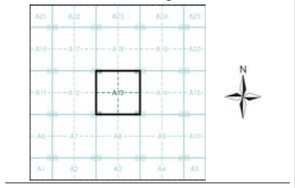
Source map scale - 1:5,280

The historical town plans shown derive from Ordnance Survey mapping from the early to mid 1850s. The 1:2640 scale was introduced in the early 1850s, to survey districts covered by the Local Boards of Health and for a map of the Osborne Estate of Queen Victoria. The general style is similar to that of the early 1:2500s published shortly afterwards.
1:5280 scale was surveyed shortly afterwards in the mid 1850s as general purpose mapping with a standard of content similar to the more contemporary 1:10,560 mapping. The scale was also used for a reduction of the 1:1056 'skeleton survey' of London that was undertaken between 1848 and 1850.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)

Historical Town Plan - Segment A13



Order Details

Order Number:	32983683_1_1
Customer Ref:	J10229
National Grid Reference:	526920, 183820
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	0

Site Details

75 Avenue Road, LONDON, NW8 6JD

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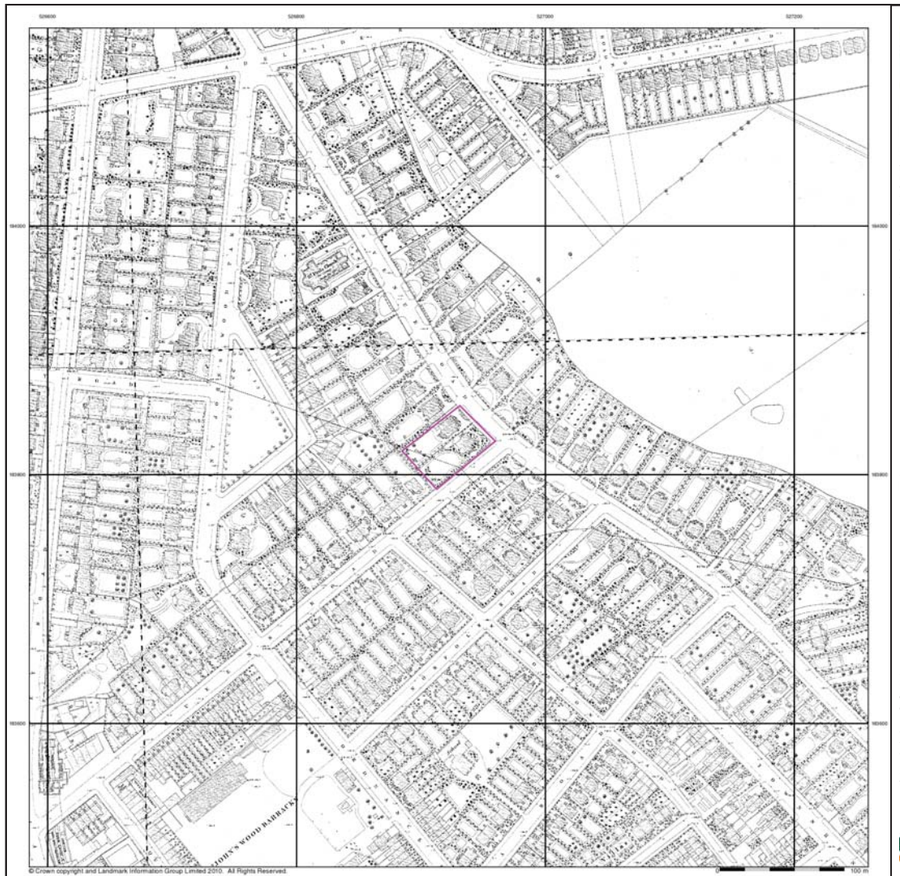


GEA Geotechnical & Environmental Associates

London

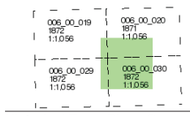
Published 1871 - 1872

Source map scale - 1:1,056

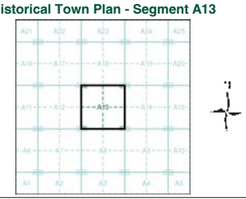
The 1:1056 scale of Ordnance Survey mapping was adopted from Ireland in 1848 and was used to survey towns with a population of over 4000, plus county towns of lesser population, in those counties mapped at the six-inch scale in 1841-55. The scale was the largest scale at which London was mapped by the Ordnance Survey and a 'skeleton' survey of the capital, showing little more than streets, street names, frontages and altitudes, was undertaken between 1848 and 1850. The majority of the 1:1056 surveys were later replaced by 1:500 surveys; although almost all the remainder were revised at this scale, sometimes more than once before 1895. The type of detail shown on the 1:1056 scale is broadly similar to that on 1:500; the apparent omission of minor details such as sewer access points and street lights may be as much a reflection of the generally earlier date of these plans, as of the specification of the map.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number:	32983683_1_1
Customer Ref:	J10229
National Grid Reference:	526920, 183820
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	0

Site Details

75 Avenue Road, LONDON, NW8 6JD

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
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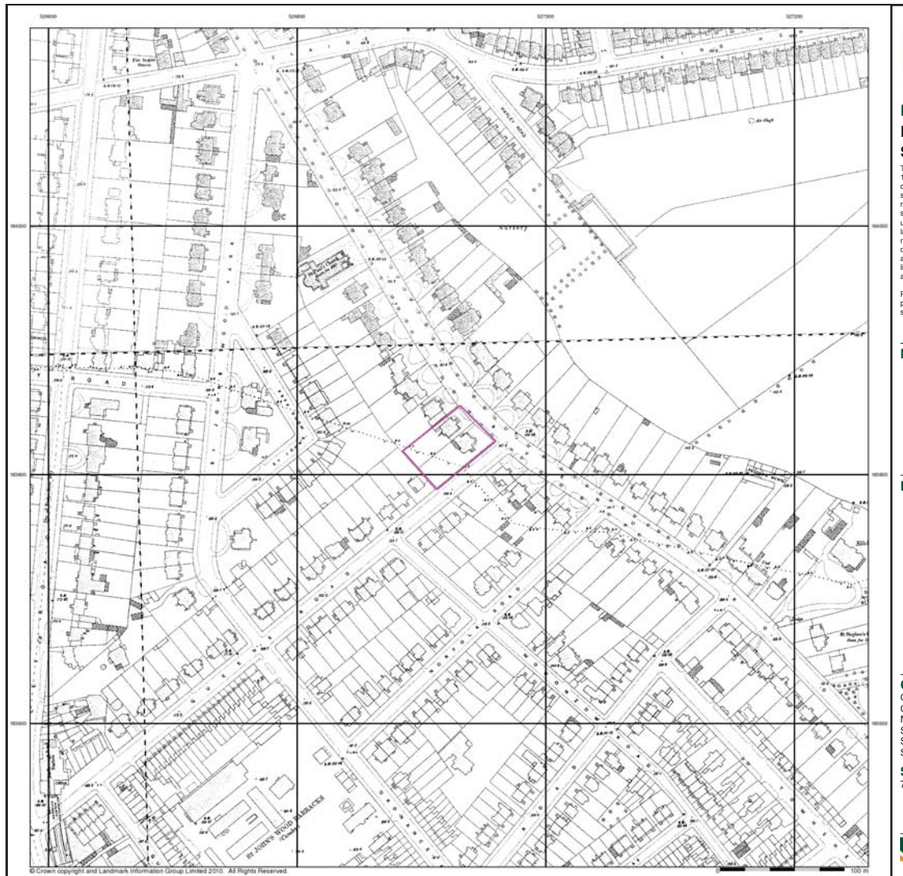


GEA Geotechnical & Environmental Associates

London

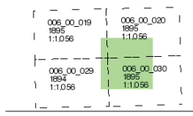
Published 1894 - 1895

Source map scale - 1:1,056

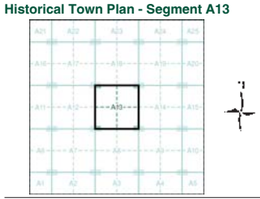
The 1:1056 scale of Ordnance Survey mapping was adopted from Ireland in 1848 and was used to survey towns with a population of over 4000, plus county towns of lesser population, in those counties mapped at the six-inch scale in 1841-55. The scale was the largest scale at which London was mapped by the Ordnance Survey and a 'skeleton' survey of the capital, showing little more than streets, street names, frontages and altitudes, was undertaken between 1848 and 1850. The majority of the 1:1056 surveys were later replaced by 1:500 surveys; although almost all the remainder were revised at this scale, sometimes more than once before 1895. The type of detail shown on the 1:1056 scale is broadly similar to that on 1:500; the apparent omission of minor details such as sewer access points and street lights may be as much a reflection of the generally earlier date of these plans, as of the specification of the map.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number:	32983683_1_1
Customer Ref:	J10229
National Grid Reference:	526920, 183820
Slice:	A
Site Area (Ha):	0.25
Search Buffer (m):	0

Site Details

75 Avenue Road, LONDON, NW8 6JD

Landmark Information Group

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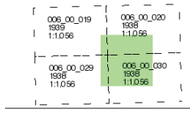
GEA Geotechnical & Environmental Associates

London
Published 1938 - 1939
Source map scale - 1:1,056

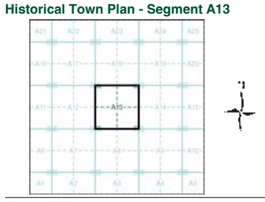
The 1:1056 scale of Ordnance Survey mapping was adopted from Ireland in 1848 and was used to survey towns with a population of over 4000, plus county towns of lesser population, in those counties mapped at the six-inch scale in 1841-55. The scale was the largest scale at which London was mapped by the Ordnance Survey and a 'skeleton' survey of the capital, showing little more than streets, street names, frontages and altitudes, was undertaken between 1848 and 1850. The majority of the 1:1056 surveys were later replaced by 1:500 surveys; although almost all the remainder were revised at this scale, sometimes more than once before 1895. The type of detail shown on the 1:1056 scale is broadly similar to that on 1:500; the apparent omission of minor details such as sewer access points and street lights may be as much a reflection of the generally earlier date of these plans, as of the specification of the map.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number: 32983683_1_1
Customer Ref: J10229
National Grid Reference: 526920, 183820
Slice: A
Site Area (Ha): 0.25
Search Buffer (m): 0

Site Details

75 Avenue Road, LONDON, NW8 6JD

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Tel: 0844 844 9952
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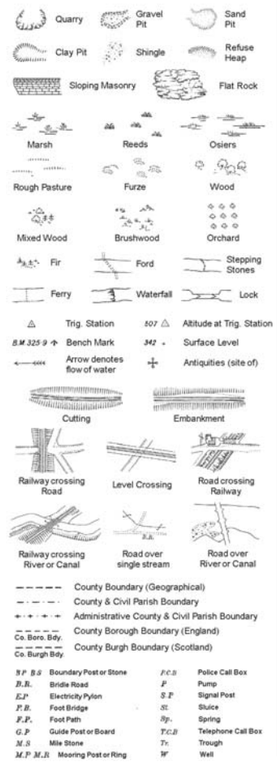
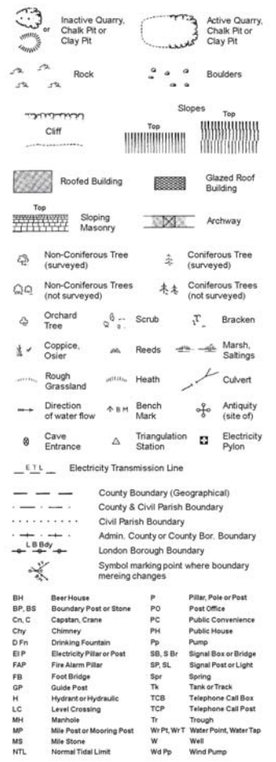
Web: www.envirocheck.co.uk

Historical Mapping Legends

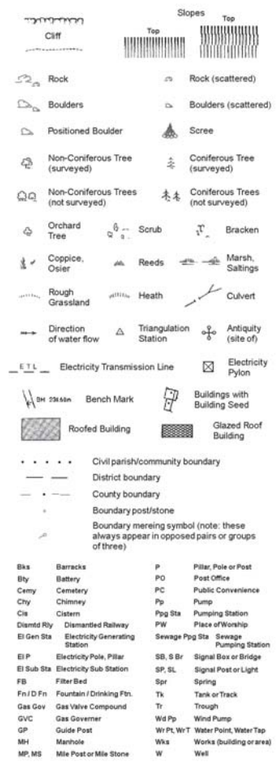
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



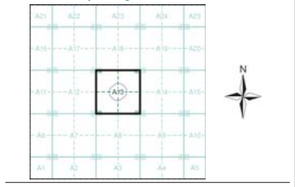
Large-Scale National Grid Data 1:2,500 and 1:1,250



GEA Geotechnical & Environmental Associates

Historical Mapping & Photography included:

Historical Map - Segment A13



Order Details

Order Number: 32983683_1_1
Customer Ref: J10229
National Grid Reference: 526920, 183820
Slice: A
Site Area (Ha): 0.25
Search Buffer (m): 100

Site Details

75 Avenue Road, LONDON, NW8 6JD

Landmark Information Group
Tel: 0844 844 9952
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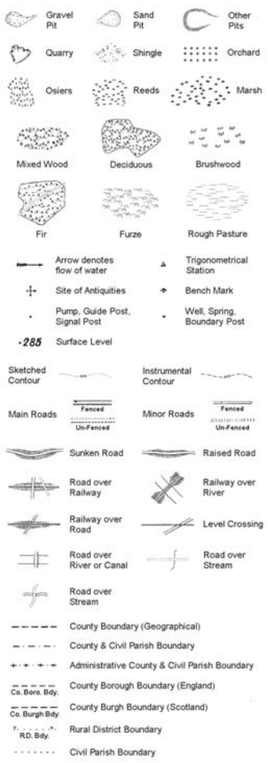
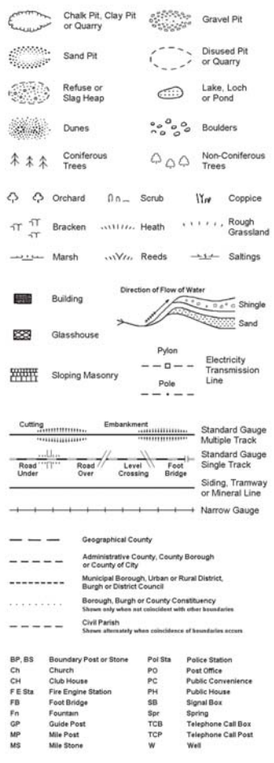
Web: www.envirocheck.co.uk

Historical Mapping Legends

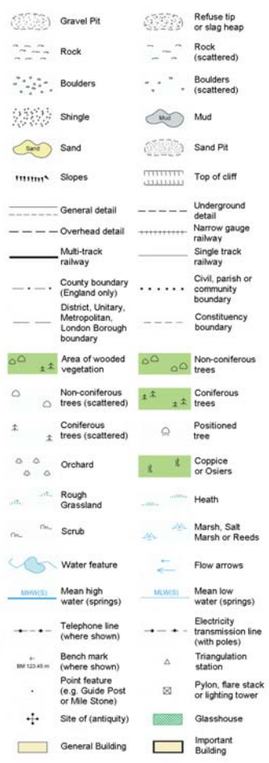
Ordnance Survey County Series 1:10,560



Ordnance Survey Plan 1:10,000



1:10,000 Raster Mapping

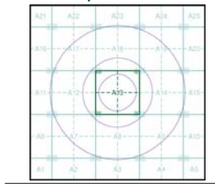


GEA Geotechnical & Environmental Associates

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1873 - 1882	3
London	1:10,560	1896	4
London	1:10,560	1920	5
London	1:10,560	1938	6
Historical Aerial Photography	1:10,560	1950	7
Ordnance Survey Plan	1:10,000	1951	8
Ordnance Survey Plan	1:10,000	1957 - 1958	9
Ordnance Survey Plan	1:10,000	1968	10
Ordnance Survey Plan	1:10,000	1974 - 1976	11
London	1:25,000	1985	12
Ordnance Survey Plan	1:10,000	1991 - 1996	13
10K Raster Mapping	1:10,000	1999	14
10K Raster Mapping	1:10,000	2006	15
10K Raster Mapping	1:10,000	2010	16

Historical Map - Slice A



Order Details

Order Number: 32983683_1_1
Customer Ref: J10229
National Grid Reference: 526920, 183820
Slice: A
Site Area (Ha): 0.25
Search Buffer (m): 1000

Site Details

75 Avenue Road, LONDON, NW8 6JD

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

GEA Geotechnical & Environmental Associates

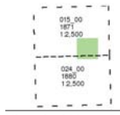
London

Published 1871 - 1880

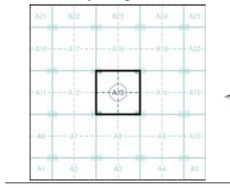
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 32983683_1_1
Customer Ref: J10229
National Grid Reference: 526920, 183820
Slice: A
Site Area (Ha): 0.25
Search Buffer (m): 100

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