DESK STUDY & GROUND INVESTIGATION REPORT

The Coach House
50A Belsize Square
London NW3

Client: Philip Welch

J17062

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GEA Geotechnical & Environmental Associates

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

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Part 3: GROUND MOVEMENT ASSESSMENT

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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 Philip Welch, with respect to the demolition of the existing house and subsequent construction of a new house with a new single level basement. The purpose of the investigation has been to research the history of the site with respect to possible contaminative uses, to determine 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. The report also includes information required to comply with London Borough of Camden (LBC) Planning Guidance CPG4, relating to the requirement for a Basement Impact Assessment (BIA) including a ground movement assessment.

SITE HISTORY

Greenwood's Map of London, dated 1827, shows Haverstock Hill in roughly the present-day orientation to the northeast of the site, while the site appears to have formed part of a larger area of land bounded by trees, with a cluster of houses annotated as Belsize House to the northwest. Two ponds, which appear to have been a notable distance from the location of the existing site, were present to the southeast within the Belsize Estate. The earliest OS map studied, dated 1850, shows the site and general area to be undeveloped, with the exception of Belsize Lane in the northwest and an unnamed road in the orientation of Haverstock Hill. By the time of the next map, dated 1871, Belsize Square and a number of semi-detached houses had been constructed in the vicinity of the site, with what appears to be No 50 Belsize Square and its associated private gardens shown to the southeast of the site. Also at that time, St Peters Church and a private garden area are shown to the south and the area had been developed with terraced and semi-detached townhouses, while a tunnel with a ventilation shaft is shown to the north of Belsize Lane, which is presumably the existing Thameslink tunnel. The 1895 map shows the garden area to the northwest of No 50 Belsize Square to have been developed, presumably with the existing house. The post-World War II aerial photograph, dated 1946, shows the buildings and surrounding houses to apparently still be present. The 1954 map annotates the house to the southeast as No 50, while the two semi-detached houses further to the southeast had apparently been cleared and were not rebuilt until the map dated 1967. A search of the Camden Planning Portal indicates that the building that occupied the site until 1982 was a lock-up garage to No 50 Belsize Square, as shown in an extract of a section drawing available on the planning portal. In June 1982, conditional planning was granted to convert the garage into a house, although it is not clear when the existing house was eventually built.

GROUND CONDITIONS

Below a significant thickness of made ground at the front of the house and a limited thickness at the rear, the London Clay was encountered and was proved to the full depth investigated, of 18.0 m. The London Clay initially comprised a weathered horizon of firm brown and grey mottled silty slightly sandy clay with occasional pockets of white silt, mica, occasional pockets of selenite crystals, occasional fine gravel, roots and rootlets to 3.75 m. At the front of the house only, soft blackish, dark grey and brown mottled silty clay with frequent carbonaceous material and fine rootlets extended to a depth of 4.00 m. Below this, firm becoming stiff medium to high strength fissured brown and pale grey silty clay extended to a depth of 8.00 m. Beneath the initially weathered horizon, the London Clay comprised stiff to very stiff high to very high strength fissured brownish grey silty clay, which was encountered to the full depth investigated, of 18.00 m.

Groundwater has been measured at a shallowest depth of 0.65 m at the rear of the house. Contamination testing has indicated no elevated concentrations of a range of contaminants within selected samples of shallow soils.

RECOMMENDATIONS

It is understood that, following demolition of the existing house, new reinforced concrete retaining walls and a raft foundation will be constructed to form the new basement, prior to the construction of the new house. Formation level for the proposed basement will be generally within the firm brown and grey mottled silty slightly sandy clay of the London Clay, although it may be prudent to extend the basement formation level through the soft blackish, dark grey and brown mottled silty clay that extends to a depth of 4.00 m at the front of the house. On the basis of the fieldwork, subsequent monitoring and rising head tests performed in the standpipes, groundwater is likely to be encountered within the basement excavation at the rear of the house and in the form of seepages at the front of the house. Inflows may also be encountered from within the made ground. It is understood that the basement raft foundation will apply a pressure of 55 kN/m^2. No elevated concentrations of contaminants tested were detected, such that remediation measures are not deemed necessary.

BASEMENT IMPACT ASSESSMENT

The BIA has not indicated any concerns with regard to the effects of the proposed basement construction on the site and surrounding area, although a flood risk assessment may be required to address the potential for surface water issues, in accordance with CPG4. It has been concluded that the impacts identified can be mitigated by appropriate design and standard construction practice.

GROUND MOVEMENT ASSESSMENT CONCLUSIONS

The analysis has concluded that the predicted damage to the neighbouring properties from the demolition of the existing house, installation of the retaining walls and basement excavation would generally be 'Negligible', with two wall predicted as 'Very Slight'. A monitoring strategy is recommended for the proposed construction and the horizontal movements outlined in this report to limit the predicted movement to Category 0 - Negligible, should be incorporated into the strategy. It is recommended that movement monitoring is carried out on all structures prior to and during the proposed basement construction.

Part 1: INVESTIGATION REPORT

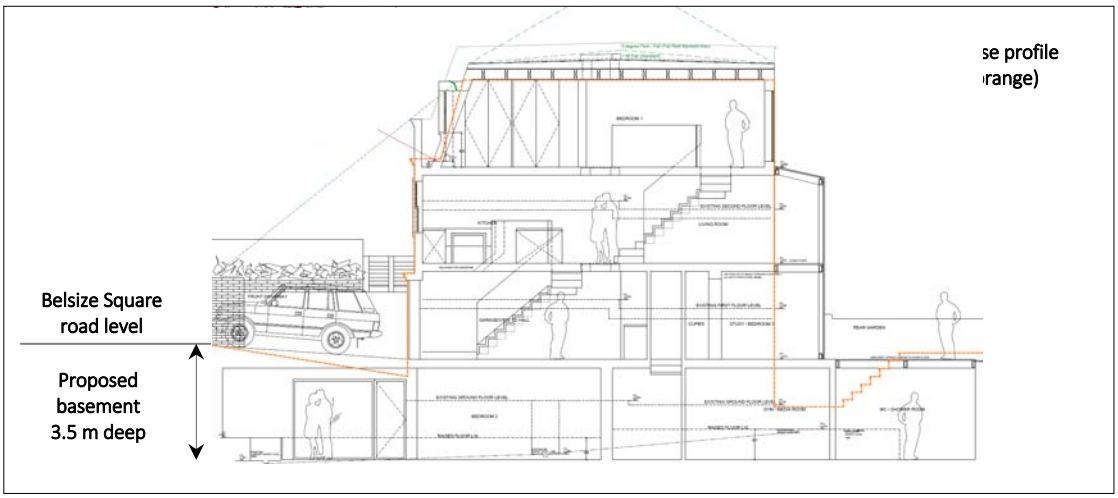
This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2, while the Ground Movement Assessment and Basement Impact Assessment are presented in Parts 3 and 4 respectively.

1.0 INTRODUCTION

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Philip Welch, to carry out a desk study and ground investigation at the Coach House, 50A Belsize Square London NW3 4HN. The ground investigation, including basement impact and ground movement assessments, will support a future planning application to the London Borough of Camden (LBC).

1.1 Proposed Development

It is understood that it is proposed to demolish the existing house and construct a new house which will be slightly higher than the existing building and will include a new single level basement. The new basement will be 3.5 m deep from existing pavement level and it will extend beneath the entire building footprint, beneath the front driveway and into the rear garden by roughly 5 m. It is proposed that the new house will be supported by means of a new raft foundation. A section through the proposed development is shown below.



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

1.2 Purpose of Work

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

- to check the history of the site and surrounding areas with respect to previous contaminative uses;
- to determine the ground conditions and their engineering properties;
- to assess the possible impact of the proposed development on the local hydrogeology and nearby sensitive structures;

- to provide information about the existing foundations;
- to provide advice with respect to design of suitable foundations and retaining walls;
- to carry out an assessment of the likely ground movements due to the proposed development;
- 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 historical Ordnance Survey (OS) maps, aerial photographs, and environmental searches sourced from the Envirocheck database;
- a review of readily available geology maps; and
- a walkover survey of the site carried out in conjunction with the fieldwork.

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

- a single borehole, advanced to a depth of 18.00 m by means of a dismantlable cable percussion rig;
- a single window sampler borehole advanced to a depth of 5.00 m;
- standard penetration tests (SPTs) carried out at regular intervals within a selection of the boreholes to provide quantitative data on the strength of the soils;
- installation of a standpipe within both boreholes to a depth of 5.00 m;
- three subsequent groundwater monitoring visits and a rising head test in each borehole;
- a single trial pit hand excavated to investigate the existing foundations of the Coach House and No 50 Belsize Square;
- testing of selected soil samples for contamination and geotechnical purposes; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

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

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

1.3.1 Basement Impact Assessment

The work carried out also includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment), all of which form part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG4[2] and their Guidance for Subterranean Development[3] prepared by Arup. The aim of the work is to provide information on surface water, land stability and groundwater and in particular to assess whether the development will affect neighbouring properties or groundwater movements and whether any identified impacts can be appropriately mitigated by the design of the development.

1.3.2 Qualifications

The land stability element of the Basement Impact Assessment (BIA) has been carried out by Martin Cooper, a BEng in Civil Engineering, a chartered engineer (CEng), member of the Institution of Civil Engineers (MICE), and Fellow of the Geological Society (FGS) who has over 25 years' specialist experience in ground engineering. The subterranean (groundwater) flow assessment has been carried out by John Evans, MSc in Hydrogeology, Chartered Geologist (CGeol) and Fellow of the Geological Society of London (FGS). The surface water and flooding assessment has been carried out by Rupert Evans, a hydrologist with more than ten years consultancy experience in flood risk assessment, surface water drainage schemes and hydrology / hydraulic modelling. Rupert Evans is a Chartered Environmentalist, Chartered Water and Environmental Manager and a Member of CIWEM.

The assessments have been made in conjunction with Steve Branch, a BSc in Engineering Geology and Geotechnics, MSc in Geotechnical Engineering, a chartered geologist (CGeol) and Fellow of the Geological Society (FGS) with some 30 years' experience in geotechnical engineering and engineering geology.

All assessors meet the qualification requirements of the Council guidance.

1.4 Limitations

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

2 London Borough of Camden Planning Guidance CPG4 *Basements and lightwells*
3 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

2.0 THE SITE

2.1 Site Description

The site is located in the London Borough of Camden, approximately 500 m to the southwest of Belsize Park London Underground station and about 600 m to the east of Finchley Road London Underground station. It fronts onto Belsize Square to the southwest and is bounded by the semidetached house and associated private rear garden of No 50 Belsize Square to the south and east, by vehicle storage garages to the west and by the private rear gardens of houses fronting onto Belsize Park Gardens and Belsize Park to the northeast and northwest respectively. The site may be additionally located by National Grid Reference 526958, 184813 and is shown on the map extract below.

A walkover of the site was carried out by a geotechnical engineer from GEA at the time of the fieldwork. The site is accessed from Belsize Square to the southwest via a private driveway and footpath that runs along the southeastern boundary of the site and leads to doorways in the side elevations of the Coach House and No 50 Belsize Square.

The site is irregular in shape and roughly half of the site is occupied in the south by a three-storey house, with a small courtyard area immediately to the rear of the house and a footpath that leads to a separate garden area in the northeast. The latter garden area did not form part of the walkover or of the ground investigation. The ground floor level of the house is roughly

1.1 m below pavement level and the driveway, at the front of the house, which is surfaced with concrete, slopes steeply down towards the house, while the adjacent footpath leads down a series of steps immediately adjacent to Belsize Square. Along the path there is access to a cupboard that is located beneath the entrance area to the adjacent No 50 Belsize Square, and the cupboard houses electricity utilities that apparently serve both buildings. The footpath is paved and steps up before reaching the doorways to both buildings.

At the rear of house is a courtyard area with decking and a series of steps lead up by around 1.5 m to a narrow footpath that provides access to the separate garden area in the northeast. Beneath the steps is a cupboard area for the storage of garden tools.

A private sewer that serves both the Coach House and No 50 Belsize Square flows between the Coach House from Belsize Square in a north-northeasterly direction, roughly 0.6 m and 2.4 m below the rear courtyard and pavement level respectively.

The western boundary of site is demarcated by a brick wall that varies in height as a result of the variation in the level of the site and adjacent to the front driveway and rear courtyard appears to act as a retaining wall. The northwestern elevation of the existing house also appears to be retaining the adjacent private rear gardens, which are roughly 1.5 m below the top of the brick wall in the rear courtyard. The adjacent private rear gardens appear to be generally vegetated with shrubs close to the boundary line. A tree stump is present in the garden adjacent to the rear of the Coach House; the homeowner advised that this tree was removed a number of years ago when damage was noted to the rear elevation of the Coach House, and extensive aesthetic repairs have been made to the building since that time.

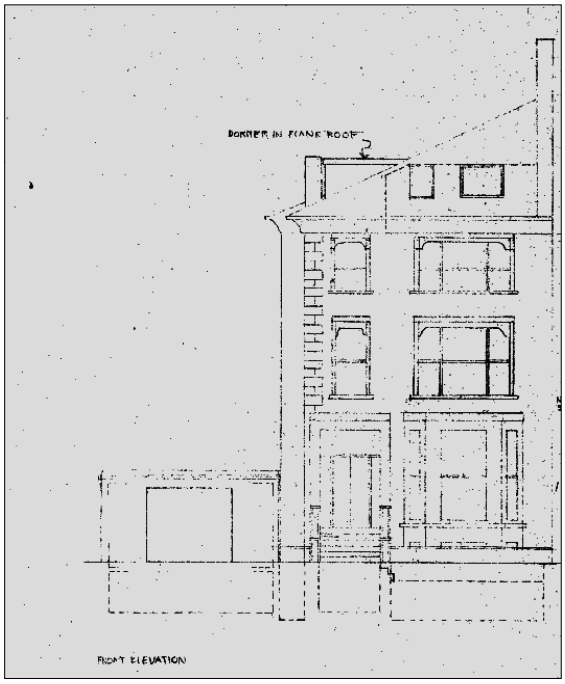
2.2 Site History

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

Greenwood's Map of London, dated 1827, shows Haverstock Hill in roughly the present-day orientation to the northeast of the site. The site appears to have formed part of a larger area of land bounded by trees, with a cluster of houses annotated as Belsize House to the northwest and two ponds, which appear to be a notable distance from the location of the existing site, to the southeast within the Belsize Estate. The earliest OS map studied, dated 1850, shows the site and general area to be undeveloped, with the exception of Belsize Lane in the northwest and an unnamed road in the orientation of Haverstock Hill.

By the time of the next map, dated 1871, Belsize Square and a number of semi-detached houses had been constructed in the vicinity of the site, with what appears to be No 50 Belsize Square and its associated private gardens shown to the southeast of the site. Also at that time, St Peters church and a private garden area are shown to the south, while College Road, later named Belsize Park, had been constructed to the west, Lancaster Grove, later Lancaster Road and Saint Margaret's Road, later Belsize Park Gardens are shown to the south and north respectively. Also at that time, the area had been developed with terraced and semi-detached townhouses, and areas of land to the northwest and southeast remained largely undeveloped, and occupied by fields and footpaths, while a tunnel with a ventilation shaft is shown to the north of Belsize Lane, which is presumably the existing Thameslink tunnel.

The 1895 map shows the garden area to the northwest of No 50 Belsize Square to have been developed, presumably with the existing house. A lecture room and vicarage are also shown to the south, while the area in general had been notably developed with housing. By 1919, the vicarage to the south had been redeveloped closer to St Peters Church and by 1935 a larger rectangular building had been constructed in its place.



The post-World War II aerial photograph, dated 1946, shows the buildings and surrounding houses to apparently still be present and an internet search[4] indicates no bombs are recorded as having fallen on Belsize Square, although a moderate number of bombs were recorded in the surrounding Belsize Park area. The Bomb Damage Maps of London[5] do not indicate any significant damage to have occurred either within the site or in the immediate vicinity.

The 1954 map annotates the house to the southeast as No 50, while the two semi-detached houses further to the southeast had apparently been cleared and were not rebuilt until the map dated 1967. Also at that time, the vicarage had been expanded to the southeast and is annotated to have become a synagogue, while the lecture room to the southeast of the church is annotated as a hall and had been expanded to include a new vicarage. The 1974 map shows four lock-up garages had been constructed adjacent to the southwestern corner of the site.

A search of the Camden Planning Portal indicates that the building that occupied the site until 1982 was a lock-up garage to No 50 Belsize Square, as shown in an extract of a section drawing available on the planning portal. In June 1982, conditional planning was granted to convert the garage into a house, although it is not clear when the existing house was eventually built.

2.3 Other Information

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

The Envirocheck report has not indicated any historic landfill sites, waste management, waste transfer or Control of Major Accident Hazards (COMAH) sites are located within 250 m of the site. There are a number of areas of non-water potentially infilled land in the Belsize area to the northwest and northeast, although all of these sites are at least 267 m from the site and are not considered to pose a risk to the site from migrating soil gas. No pollution incidents to controlled waters have been recorded within 250 m of the site. The site is located within the Belsize Park Conservation area.

4 http://bombsight.org
5 Laurence Ward (2015) *The London County Council Bomb Damage Maps 1939-1945.* Thames & Hudson

Reference to records compiled by the Health Protection Agency (formerly the National Radiological Protection Board) indicates that the site falls within an area where less than 1% of homes are affected by radon emissions and therefore radon protective measures will not be necessary.

2.4 Geology

The British Geological Survey (BGS) map of the area (Sheet 256) indicates the site is directly underlain by the London Clay. According to the geological map, the site is located roughly 250 m from the boundary with the Claygate Member.

According to the BGS Sheet 256, the site is shown roughly 100 m south of an area of "Head Propensity", although the site itself is not indicated to be affected. Head propensity is shown on the BGS map as areas denoted as most likely to be covered by Quaternary Head Deposits as interpreted from digital slope analysis and confirmed by borehole data. These deposits are not mapped and have not been verified by fieldwork; they are noted as having properties similar to that of the London Clay and are shown to occur close to the boundary with the overlying Claygate Member.

According to the BGS memoir, the London Clay is homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine grained sand.

GEA has previously carried out a desk study that references a previous ground investigation carried out by others at Glenmore Road, located roughly 200 m to the east of the site. The investigation encountered the London Clay to the maximum depth investigated of 12.0 m, and comprised an initial horizon of weathered firm becoming very stiff brown mottled grey fissured silty clay, which extended to a depth of 11.0 m. Below this depth very stiff grey fissured silty clay was encountered. Groundwater was not encountered during drilling.

2.5 Hydrology and Hydrogeology

The London Clay is classified as an Unproductive Stratum, which refers to rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow, as defined by the Environment Agency (EA).

Any groundwater flow within the London Clay will be at a very slow rate, due to its negligible permeability. The permeability will be predominantly secondary, through fissures in the clay. Published data indicates the horizontal permeability of the London Clay to generally range between 1×10^{-11} m/s and 1×10^{-9} m/s.

Groundwater was not encountered during the aforementioned ground investigation on Glenmore Road.

The nearest surface water feature is located 516 m to the south, although the nature of the source is not clear.

Reference to the Lost Rivers of London[6] indicates that the site is located between two tributaries of the River Tyburn. The tributaries appear to be located roughly 180 m east and 200 m west of the site and flow in a southerly and southeasterly direction before they meet just to the northwest of Regents Park, and continue to flow south-southeast to join with the Thames.

[6] Nicholas Barton & Stephen Myers (2016) *The Lost Rivers of London.* Historical Publications Ltd

The site is not at risk of flooding from rivers or sea, as defined by the Environment Agency and is shown as being within an area at low to medium risk of surface water flooding. The site is not located in an area identified as having a potential for groundwater flooding to occur. The site is not located within a source protection zone, although it is located roughly 140 m north of an Outer Zone (Zone 2) source protection zone.

2.6 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.

2.6.1 Source

The desk study has revealed that the site does not have a contaminative history in that it has been developed with the existing house and private lock-up garage for its entire history. Spillages of fuels and oils may have occurred within the former garage area, although any such spillages are likely to have been localised and small in scale.

2.6.2 Receptor

The future occupants of the house will represent relatively high sensitivity receptors. Buried services are likely to come into contact with any contaminants present within the soils through which they pass and site workers are likely to come into contact with any contaminants present during construction works.

Perched water may be present in the made ground or in the vicinity of existing foundations, although such pockets of water are likely to be localised and unlikely to form part of a wider aquifer. The underlying chalk aquifer is considered to be a highly sensitive receptor.

2.6.3 Pathway

Within the site, end users will be isolated from direct contact with any contaminants present within the made ground by the proposed house and surrounding hard surfacing, thus no potential contaminant exposure pathways will exist with respect to end users. Only in areas of proposed soft landscaping will end users potentially come into contact with contaminants. There will be a potential for contaminants to move onto or off the site horizontally within the made ground, although these pathways are already in existence. A pathway for ground workers to come into contact with any contamination will exist during construction work and services will come into contact with any contamination within the soils in which they are laid.

2.6.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a LOW risk of there being a significant contaminant linkage at this site which would result in a requirement for major remediation work.

3.0 SCREENING

The London Borough of Camden guidance suggests that any development proposal that includes a subterranean basement should be screened to determine whether or not a full Basement Impact Assessment (BIA) is required.

3.1 Screening Assessment

A number of screening tools are included in the Arup document and for the purposes of this report reference has been made to Appendix E which includes a series of questions within a screening flowchart for three categories; groundwater flow; land stability; and surface water flow. Responses to the questions are tabulated on the following pages.

3.1.1 Subterranean (groundwater) Screening Assessment

Question	Response for the Coach House, 50A Belsize Square
1a. Is the site located directly above an aquifer?	No. The site is directly underlain by the London Clay, which is classified as an Unproductive stratum.
1b. Will the proposed basement extend beneath the water table surface?	Unlikely. The London Clay cannot support a water table and is classified as an unproductive stratum. However, if an upper weathered layer is present, this may have a higher permeability and could have the potential to collect groundwater if the stratum has a predominantly granular matrix, which is unlikely in this setting.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No. The nearest surface water feature is located 516 m to the south of the site.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. The proposed development will not extend beyond the existing footprint and surrounding areas of hardstanding as shown on proposed drawings provided by the consulting engineers.
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No, it is anticipated that the ground would not be sufficiently permeable to allow for a soakaway discharge design.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No. There are no local ponds or spring lines and the London Clay is not able to support groundwater flow to these features.

The above assessment has not identified any potential issues that need to be assessed.

3.1.2 Stability Screening Assessment

Question	Response for the Coach House, 50A Belsize Square
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No, as indicated on the Slope Angle Map Fig 16 of the Arup report.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No. The site is not to be significantly re-profiled as part of the development.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No. As indicated on the Slope Angle Map Fig 16 of the Arup report.
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	No. As indicated on the Slope Angle Map Fig 16 of the Arup report.
5. Is the London Clay the shallowest stratum at the site?	*Yes.*

Question	Response for the Coach House, 50A Belsize Square
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	No. There are no trees on the site.
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	*Yes. The area is prone to these effects as a result of the presence of shrinkable London Clay.*
8. Is the site within 100 m of a watercourse or potential spring line?	No. The nearest surface water feature is located 516 m to the south of the site.
9. Is the site within an area of previously worked ground?	No. According to the BGS geological map the site is not within an area of previously worked ground.
10a. Is the site within an aquifer?	No. The site is located above an unproductive stratum.
10b. Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No. The London Clay cannot support a water table and is classified as an unproductive stratum.
11. Is the site within 50 m of Hampstead Heath ponds?	No.
12. Is the site within 5 m of a highway or pedestrian right of way?	*Yes - the site is accessed from Belsize Square in the southwest.*
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	*Yes - The development will increase the foundation depths relative to the neighbouring properties to a relatively significant extent.*
14. Is the site over (or within the exclusion zone of) any tunnels, eg railway lines?	No.

The above assessment has identified the following potential issues that need to be assessed:

Q5 The London Clay is the shallow stratum on the site.
Q7 The site is possibly in an area likely to be affected by seasonal shrink-swell.
Q12 The site is within 5 m of Belsize Square.
Q13 The development will increase the foundation depths relative to the boundary wall foundations.

3.1.3 Surface Flow and Flooding Screening Assessment

Question	Response for the Coach House, 50A Belsize Square
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No. There will not be an increase in impermeable area across the ground surface above the basement, so the surface water flow regime will be unchanged. The basement will entirely be beneath the footprint of the building/hardstanding (ie both existing and proposed), therefore the 1m distance between the roof of the basement and ground surface as recommended by the Arup report and para 2.16 of the CPG4 does not apply.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. There will not be an increase in impermeable area across the ground surface above the basement.
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No. There will not be an increase in impermeable area across the ground surface above the basement, so the surface water flow regime will be unchanged. The basement will entirely be beneath the footprint of the building/hardstanding (i.e. both existing and proposed), therefore the 1m distance between the roof of the basement and ground surface as recommended by the Arup report and para 2.16 of the CPG4 does not apply.

Question	Response for the Coach House, 50A Belsize Square
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No.The proposed basement is very unlikely to result in any changes to the quality of surface water being received by adjacent properties or downstream watercourses as the surface water drainage regime will be unchanged and the land uses will remain the same.
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	*Yes. The findings of this BIA together with the Camden Flood Risk Management Strategy dated 2013, and Figures 3v, 4e, 5a and 5b of the SFRA dated 2014, and Environment Agency online flood maps show that the site has a low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses.* *The Environment Agency surface water flooding map indicates that the flood depth across the site during low risk events would mainly be below 0.3m, however, small parts of the site could be affected to between 0.3m and 0.9m.* *In accordance with paragraph 5.11 of the CPG a positive pumped device will be installed in the basement in order to further protect the site from sewer flooding.* *The site is located within the Critical Drainage Area number GROUP3-005, but is not in a Local Flood Risk Zone as identified in the Camden SWMP and Updated SFRA Figure 6/Rev 2.*

The following potential issues that need to be further assessed:

Q6. The site is in an area identified to have a surface water flood risk.

4.0 SCOPING AND SITE INVESTIGATION

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified potential impact factors.

4.1 Potential Impacts

The following potential impacts have been identified.

Potential Impact	Consequence
London Clay is the shallowest stratum at the site.	The London Clay is prone to seasonal shrink-swell (subsidence and heave).
Seasonal shrink-swell can result in foundation movements.	Multiple potential impacts depending on the specific setting of the basement development. For example, in terraced properties, the implications of a deepened basement/foundation system on neighbouring properties should be considered.
The site is located within 5 m of a highway or pedestrian right of way	Excavation of a basement may result in structural damage to the road or footway.
Founding depths relative to neighbours.	If not designed and constructed appropriately, the excavation of a basement may result in structural damage to neighbouring buildings and structures.
The site in an area identified to have surface water flood risk.	The proposed basement may be at risk of flooding.

These potential impacts have been investigated through the site investigation, as detailed in Section 9.0.

4.2 Exploratory Work

In order to meet the objectives described in Section 1.2, a single borehole was advanced on the front driveway to a depth of 18.00 m by means of a dismantlable cable percussion rig. In addition, a single window sampler borehole was advanced to a depth of 5.00 m and a single trial pit was hand excavated to a depth of 0.90 m.

SPTs were carried out at regular intervals within the cable percussion boreholes to provide quantitative information about the strength of the soils and both undisturbed and disturbed samples were recovered for subsequent laboratory examination and testing.

A groundwater monitoring standpipe was installed in each of the boreholes to a depth of 5.0 m to facilitate groundwater monitoring, which has been carried out on a three occasions approximately two, four and seven weeks after installation. A rising head test has been carried out in both standpipes and the results are appended.

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

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

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

4.3 Sampling Strategy

The scope of the investigation was specified by the consulting engineer and the borehole and trial pit locations were finalised on site by GEA, whilst avoiding areas of buried services.

Four samples of the made ground have been tested for the presence of contamination. The analytical suite of testing was selected to identify hydrocarbon contamination resulting from the former use of the site and a range of typical industrial contaminants for the purposes of general coverage. For this investigation the analytical suite for the soil included a range of metals, speciation of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. The samples were also submitted for asbestos identification.

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

5.0 GROUND CONDITIONS

The investigation encountered the expected ground conditions in that, below a relativell significant thickness of made ground at the front of the house and a limited thickness at the rear, the London Clay was encountered and was proved to the full depth investigated, of 18.0 m.

5.1 Made Ground

At the front of the house beneath a concrete slab surface, the made ground was found to comprise greyish brown silty sandy clayey gravel with brick, concrete, ceramic, coal, shell fragments, becoming clayey with ash from 1.2 m, and extended to a depth of 2.15 m. The significant depth of made ground may be associated with the former garage at the site or construction of the sewers that pass below the front of the house.

At the rear of the house, the made ground was generally absent, with only a notable thickness of concrete and crushed concrete to 0.45 m depth.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed during the fieldwork. Four samples of the made ground have however been analysed for a range of contaminants as a precautionary measure and the results are summarised in Section 5.4.

5.2 London Clay

The London Clay initially comprised a weathered horizon of firm brown and grey mottled silty slightly sandy clay with occasional pockets of white silt, mica, occasional pockets of selenite crystals, occasional fine gravel, roots and rootlets to 3.75 m.

Beneath this initial layer, at the front of the house only, soft blackish, dark grey and brown mottled silty clay with frequent carbonaceous material and fine rootlets extended to a depth of 4.00 m.

Below initial layers, firm becoming stiff medium to high strength fissured brown and pale grey silty clay with partings of pale grey silty clay, orange-brown silt and dark orange-brown sand, mica, occasional pockets of selenite crystals, occasional fine shell fragments, pyrite nodules, gypsum and traces of rootlets. Roots and rootlets were encountered to 2.00 m at the rear of the house. This initial weathered layer was found to extend to a depth of 8.00 m and to the maximum depth of the borehole at the rear of the house.

Beneath the initially weathered horizons, the London Clay comprised stiff to very stiff high to very high strength fissured brownish grey silty clay and was encountered to the full depth investigated, of 18.00 m. The clay was found to have pockets of pale grey and dark brown silt, occasional fine shell fragments, occasional nodules of pyrite and mica, with dark brown and pale brown silt pockets, partings of dark brownish grey silt and occasional fossils from 15.5 m depth.

Laboratory plasticity index tests indicate the initial clay layer to be of high volume change potential.

This stratum was observed to be free of evidence of contamination.

5.3 Groundwater

Groundwater was not encountered within Borehole No 1 during drilling, but was encountered at a depth of 1.0 m in Borehole No 2. Groundwater was not encountered during the excavation of the trial pit.

The following table shows the results of subsequent groundwater monitoring.

Date	Borehole No	Depth to water (m) [Level m OD]
05/04/17	1	DRY
	2	0.65
19/04/17	1	4.75
	2	0.68
09/05/17	1	4.46
	2	0.69

Rising head tests were performed in both standpipes and the results are appended. In sumary, negligible inflow was noted within Borehole No 1, while a notable inflow was measured within Borehole No 2.

5.4 Soil Contamination

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

Determinant	BH1 (1.0 m)	BH2 (0.50 m)	TP1 (0.5 m)	BH1 (3.6 to 4.0 m)
pH	7.9	9.6	8.6	7.9
Arsenic	17	21	19	21
Cadmium	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	34	44	31	32
Copper	26	23	38	37
Mercury	< 0.3	< 0.3	0.8	< 0.3
Nickel	18	26	20	23
Lead	85	33	160	150
Selenium	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	45	100	83	85
Total Cyanide	< 1	< 1	< 1	< 1
Total Phenols	< 1.0	< 1.0	< 1.0	< 1.0
Sulphide	< 1.0	< 1.0	< 1.0	23
Total PAH	< 1.60	< 1.60	< 1.60	< 1.60
Benzo(a)pyrene	< 0.10	< 0.10	< 0.10	< 0.10
Naphthalene	< 0.05	< 0.05	< 0.05	< 0.05

Determinant	BH1 (1.0 m)	BH2 (0.50 m)	TP1 (0.5 m)	BH1 (3.6 to 4.0 m)
TPH (C8 – C10)	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 – C12)	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 – C16)	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 – C21)	< 1.0	< 1.0	2.8	2.6
TPH (C21 – C35)	1.3	< 1.0	3.2	18
Total Organic Carbon %	0.9	0.4	0.5	2.2

The results of the contamination testing have indicated no elevated concentrations of contaminants tested for in the selected samples.

5.4.1 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[7] Soil Guideline Value where available, or is a Generic Screening Value calculated using the CLEA UK Version 1.06[8] software assuming a residential without plant uptake end use, or is based on the DEFRA Category 4 Screening values[9]. 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 aged 0 to 6 years old;
- that young children will not have prolonged exposure to the site;
- that the exposure duration will be six 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 suitable for this generic first 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 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;

[7] *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.
[8] Contaminated Land Exposure Assessment (CL|EA) Software Version 1.06 Environment Agency 2009
[9] CL:AIRE (2013) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Final Project Report SP1010 and DEFRA (2014) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Policy Companion Document SP1010

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

The results of the chemical analyses have indicated typical concentrations of contaminants to be present within the made ground and underlying natural soils, all of which are below the generic screening values adopted for a residential end use without plant uptake.

5.5 Existing Foundations

A single trial pit was excavated in the passageway between the Coach House and No 50 Belsize Square, to expose the existing foundation of each building. The full trial pit record is appended to this report.

Trial Pit No	Foundation detail	Bearing stratum
1 (adjacent to the Coach House)	Concrete footing Depth to top of footing 680 mm Depth to underside of footing from GL 880 mm Lateral projection 730 mm from building elevation	Firm yellow brown and pale grey mottled silty CLAY with pockets of dark orange-brown silt
1 (adjacent to No 50 Belsize Square)	Shallow brick footing immediately beneath wall Depth to underside of brick footing from GL 170 mm Lateral projection 90 mm from building elevation	

Part 2: DESIGN BASIS REPORT

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the basement excavation and the potential impact on the hydrogeology, which is discussed in greater detail in the Basement Impact Assessment within Part 4.

6.0 INTRODUCTION

It is understood that it is proposed to demolish the existing house and subsequently construct a new house that will be slightly higher than the existing building height and will include a new single level basement. The new basement will be 3.5 m deep from existing pavement level and it will extend beneath the entire building footprint, beneath the front driveway and into the rear garden by roughly 5 m. It is understood that the new house will be supported by means of a raft foundation.

7.0 GROUND MODEL

The desk study has revealed that the site does not have a contaminative history in that it has been developed with the existing house for its entire history, and on the basis of the fieldwork and the findings of the previous ground investigation at the site, the ground conditions at this site can be characterised as follows.

- Below a significant thickness of made ground at the front of the house and a limited thickness at the rear, the London Clay was encountered and was proved to the full depth investigated, of 18.0 m;
- the London Clay initially comprises a weathered horizon of firm brown and grey mottled silty slightly sandy clay with occasional pockets of white silt, mica, occasional pockets of selenite crystals, occasional fine gravel, roots and rootlets to 3.75 m;
- at the front of the house only, soft blackish, dark grey and brown mottled silty clay with frequent carbonaceous material and fine rootlets extends to a depth of 4.00 m;
- below this, firm becoming stiff medium to high strength fissured brown and pale grey silty clay and extends to a depth of 8.00 m;
- beneath the initially weathered horizon, the London Clay comprises of stiff to very stiff high to very high strength fissured brownish grey silty clay and was encountered to the full depth investigated, of 18.00 m;
- groundwater has been measured at a shallowest depth of 0.65 m at the rear of the house; and
- the contamination testing has not measured any contamination within the shallow soils.

8.0 ADVICE AND RECOMMENDATIONS

It is understood that, following demolition of the existing house, the new reinforced concrete retaining walls and a raft foundation will be constructed to form the new basement, prior to the construction of the new house. Formation level for the proposed basement will be within the firm brown and grey mottled silty slightly sandy clay of the London Clay, although it would be prudent to extend the basement formation level through the soft blackish, dark grey and brown mottled silty clay that extends to a depth of 4.00 m at the front of the house.

On the basis of the fieldwork, subsequent monitoring and rising head tests performed in the standpipes, groundwater is likely to be encountered within the basement excavation at the rear of the house and in the form of seepages at the front of the house. Inflows may also be encountered from within the made ground.

The preferred foundation option it is understood to be a basement raft, which will apply a gross pressure of 55 kN/m^2.

8.1 Basement Construction

The basement will extend to a depth of 3.5 m and formation level is likely to be within the firm brown and grey mottled silty slightly sandy clay of the London Clay. It would be prudent to extend the basement formation level through the soft blackish, dark grey and brown mottled silty clay that extends to a depth of 4.00 m at the front of the house. Groundwater has subsequently been measured at a shallowest depth of 0.65 m at the rear of the house. Rising head tests performed in the standpipes indicated a “fast” inflow at the rear of the house, while slower seepages were encountered at the front of the house. On this basis, inflows of groundwater are anticipated to be encountered within the basement excavation, although monitoring of the standpipes should be continued to confirm water levels. Shallow inflows of localised perched water are likely to be encountered from within the made ground, which should be adequately controlled through sump pumping.

In view of the differing ground conditions encountered at the front and rear of the house it would be prudent to carry out additional investigation between these locations when the existing building has been demolished. Trial pits would be the most appropriate means of investigation, and should be extended to proposed formation level to provide an assessment of the ground conditions and groundwater conditions.

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 the requirement to prevent groundwater inflows and whether it is to be incorporated into the permanent works and have a load bearing function.

It is understood that the preferred method of retaining wall construction is by casting reinforced concrete retaining walls in the same sequence as underpinned walls.

At this stage, consideration may also be given to the use of a bored pile retaining wall, which would have the advantage of being incorporated into the permanent works and will be able to provide support for structural loads. The groundwater conditions at this site would dictate the adoption of a secant bored pile wall.

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 the movements. A ground movement assessment is included in Part 3 of this report.

8.1.1 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	1700	Zero	27
London Clay	1900	Zero	23

Monitoring of the standpipes should be continued to determine equilibrium levels and seasonal fluctuations. Perched groundwater is likely to be encountered within the excavation and, at this stage, it is recommended that the basement is designed with a water level assumed to be 1.0 m below ground level and the advice in BS8102:2009[10] should be followed in this respect.

8.2 Basement Raft Foundation

The use of a basement raft will depend to a large extent on whether or not the applied pressure can be relatively evenly distributed and may need to take account of the apparent variation in ground conditions across the site. Further analysis will need to be carried out in this respect in due course.

8.3 Spread Foundations

Spread foundations should extend through the made ground and bear on the firm brown and grey mottled silty slightly sandy clay of the London Clay which should provide a suitable bearing stratum for light loads. Foundations should however be extended through the soft blackish, dark grey and brown mottled silty clay that extends to a depth of 4.00 m below ground level at the front of the house. Moderate width pad or strip foundations bearing within the firm clay may be designed to apply a net allowable bearing pressure of 140 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.

8.4 Shallow Excavations

On the basis of the borehole findings it is considered that it will be generally unfeasible to form relatively shallow excavations terminating within the made ground without the requirement for lateral support, due to the likely inflows of groundwater.

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

8.5 Basement Floor Slab

If a raft foundation is not adopted, following the excavation of the basement it is likely that the floor slab for the proposed basement will need to be suspended over a void or layer of suitable compressible material to accommodate the anticipated heave unless the slab can be suitably reinforced to cope with these movements. In addition, consideration may also need to be given to designing the basement to cope with water pressure below the slab. Further consideration will need to be given to these issues once the levels and magnitude of any slab loading are known.

10 BS8102 (2009) *Code of practice for protection of below ground structures against water from the ground*

8.6 Effect of Sulphates

Chemical analyses carried out on selected samples for water soluble sulphate have been compared with of Table C2 of BRE Special Digest 1: SD1 Third Edition (2005) in order to determine the sulphate class and are summarised in the table below. The assessment has been based on mobile groundwater conditions and the guidelines contained in the above digest should be followed in the design of foundation concrete.

Stratum	pH	SO_4 (mg/l)	W/S Mg (mg/L)	Design Sulphate Class	ACEC Class
Made Ground	7.9 to 8.6	63 to 140	-	DS-1	AC-1
London Clay	7.5 to 9.6	140 to 3000	1000	DS-1 to DS-4	AC-1 to AC-4

8.7 Contamination Risk Assessment

The site has not had a historical contaminative use and the results of the contamination analysis do not indicate any elevated concentrations in excess of the generic risk-based screening values. On this basis, it is not considered that any remedial measures to protect sensitive receptors are necessary.

8.8 Waste Disposal

Under the European Waste Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a contaminated site. It should however be noted that the Environment Agency guidance WM3[11] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[12] guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the standard rate of £86.10 per tonne (about £155 per m^3) or at the lower rate of £2.70 per tonne (roughly £5 per m^3). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the 'standard' rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the 'lower rate' of landfill tax.

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

11 Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition
12 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Comments
Made ground	Non-hazardous (17 05 04)	No	-
Natural Soils	Inert (17 05 04)	Should not be required but confirm with receiving landfill	-

Under the requirements of the European Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper[13] 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 on site prior to excavation by sufficiently characterising the soils insitu prior to excavation.

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

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

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

Part 3: GROUND MOVEMENT ASSESSMENT

This section of the report comprises an analysis of the ground movements arising from the proposed basement and foundation scheme discussed in Part 2 and the information obtained from the investigation, presented in Part 1 of the report.

9.0 INTRODUCTION

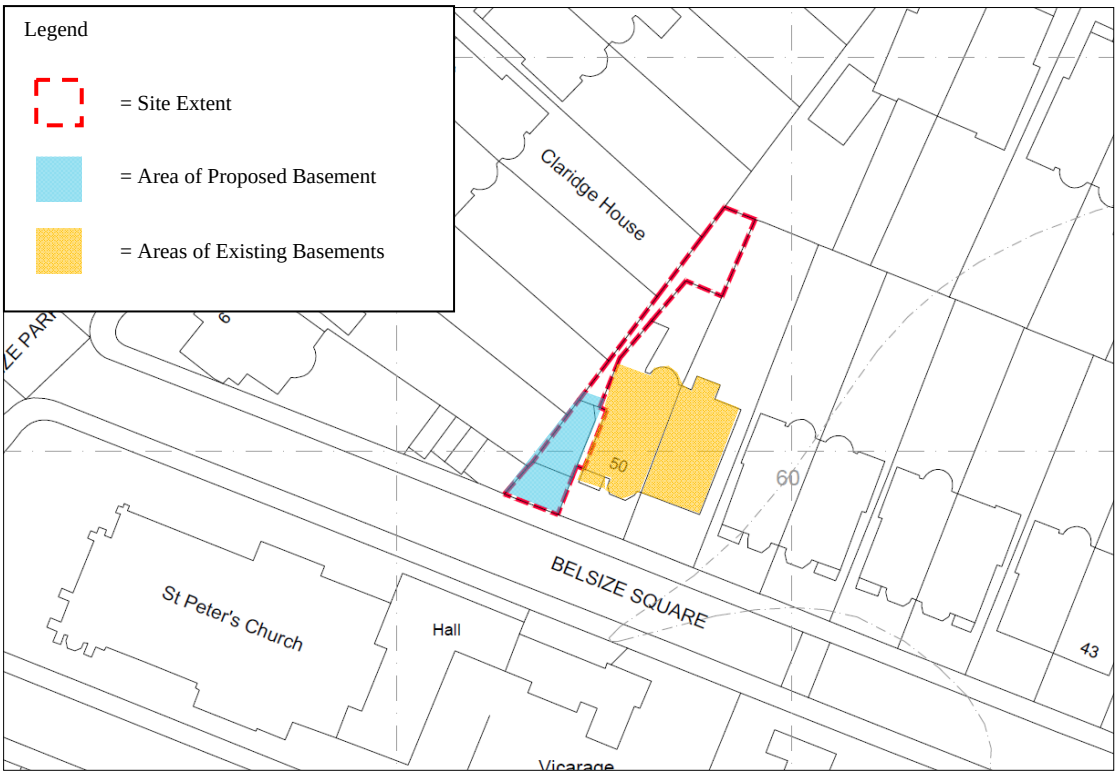
It is understood that it is proposed to demolish the existing house and reconstruct it to include a slight increase to the existing building height and a new single level basement. The new basement will be 3.5 m deep from existing pavement level and it will extend beneath the entire building footprint, beneath the front driveway and into the rear garden by roughly 5 m. It is understood that the new house will be supported by means of a new raft foundation.

The sides of an excavation will move to some extent regardless of how they are supported. The movement will typically be both horizontal and vertical and will be influenced by the engineering properties of the ground, groundwater level and flow, the efficiency of the various support systems employed during retaining wall construction and the efficiency or stiffness of any support structures used. An analysis has been carried out of the likely movements arising from the proposed basement construction and the results of this analysis have been used to predict the effect of these movements on surrounding structures.

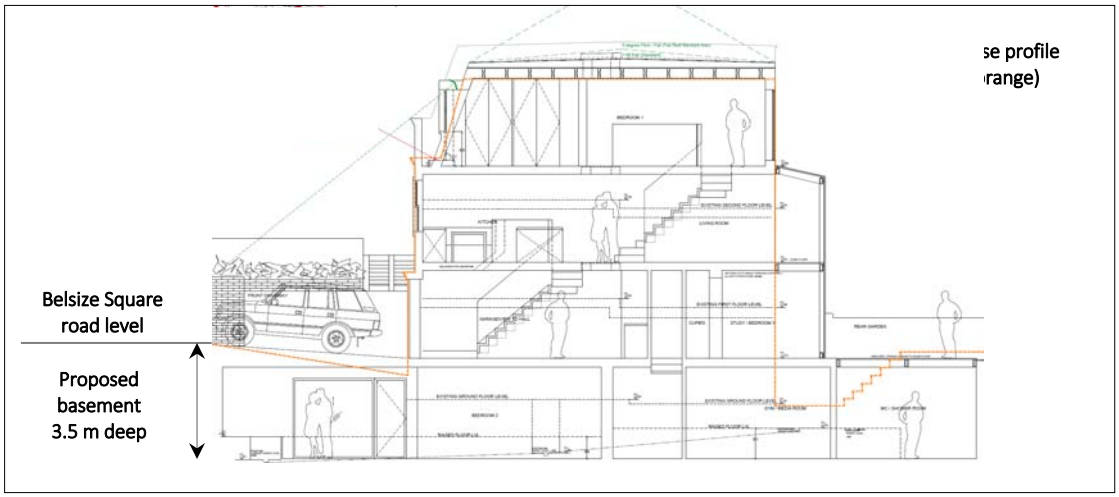
9.1 Basis of Ground Movement Assessment

9.1.1 Nearby Sensitive Structures

A plan showing the nearby sensitive structures is shown below.



Sensitive structures relevant to this assessment include Nos 49 and 50 Belsize Square, the garages to the southwest of the site and the vicarage and church hall on the opposite side of Belsize Square. Garden and boundary walls have not been included in this assessment. A search of the Camden Planning Portal indicates that there is a basement beneath the entire footprint of the main house of No 50 Belsize Square, which is consistent with the known site levels and trial pit findings.



Section: Proposed Basement

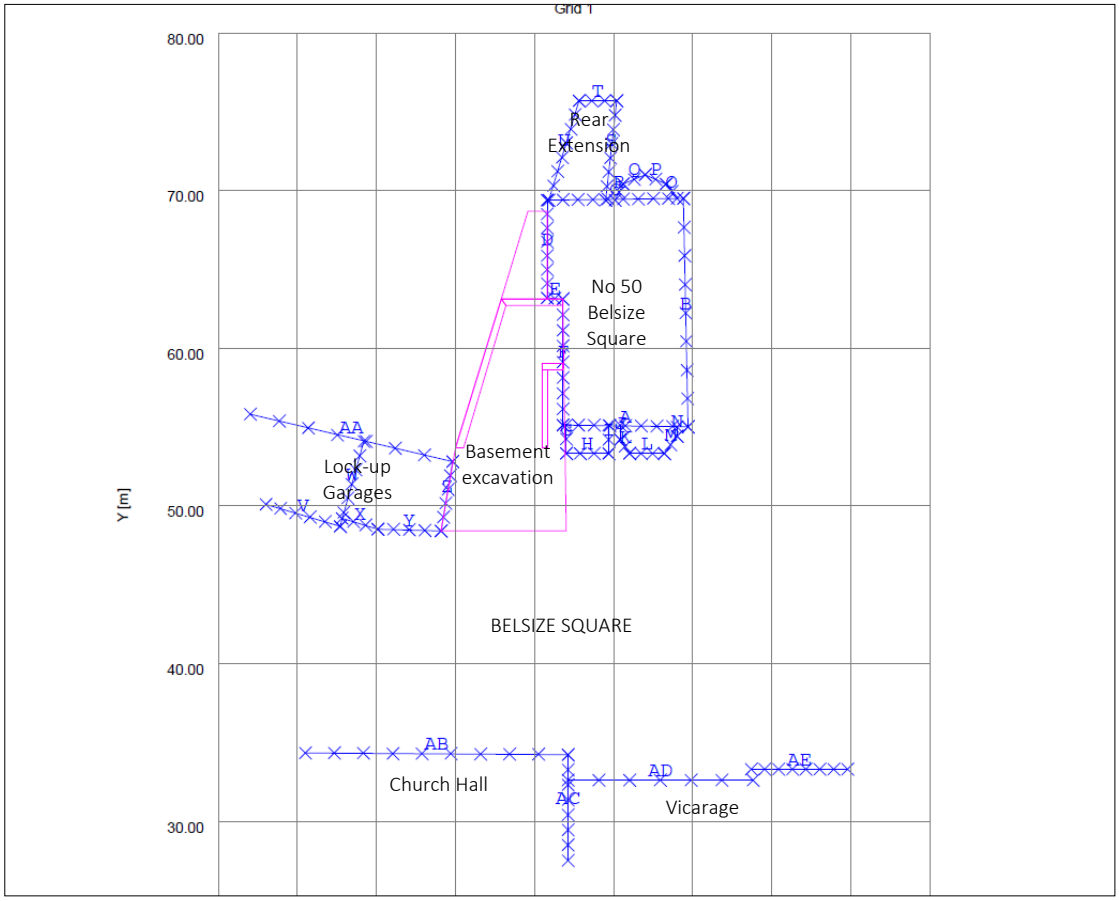
A single trial pit was excavated as part of the ground investigation in order to determine the depth of the existing foundations and this information has been used within the ground movement assessment.

The heights of neighbouring houses have been estimated from observation and from drawings provided by the consulting engineers. Where the depths of foundations or the heights of buildings are not known due to restricted access, these dimensions have been assumed.

The heights and basement depths of each of the nearby sensitive structures are summarised in the table below. All building foundation depths that have not been proved by means of trial pitting are assumed to be approximately 1.0 m deep.

Sensitive Structure	Structure Reference	Depth below existing ground level of foundations (m)	Height of building above ground level (m)
No 50 Belsize Square (main house)	A to C	1.0	10.50
No 50 Belsize Square (main house underpinned party walls)	D to F	3.5	10.50
No 50 Belsize Square (bay window, underpinned party wall)	G	3.5	4.86
No 50 Belsize Square (bay windows)	H to R	1.0	4.86
No 50 Belsize Square (rear extension)	S to U	1.0	3.00
Not Used	V, X and Y	-	-
Lock-up garages	W, Z, AA	1.0	2.67
Church Hall	AB and AC	1.0	4.00
Vicarage	AD and AE	1.0	4.00

The diagram below details the sensitive structures in relation to the proposed excavation.



The following drawings have been referred to, where relevant, to model the sensitive structures and proposed excavation.

Drawing Reference	Drawing Title
170013-X-00-DR-S-1100 P1, dated April 2017	Proposed Ground Floor Plan
170013-X-XX-DR-S-2-1099 P1, dated April 2017	Proposed Lower Ground Floor Plan
1507_PL_001, dated April 2017	Proposed Site Plan
1507_PL_008, dated April 2017	Proposed Section A-A
1507_EX_001, dated April 2017	Existing Site Plan
1507_EX_008, dated April 2017	Existing Section A-A

9.1.2 Construction Sequence

It is assumed that the proposed reinforced concrete basement walls will be constructed by the same methodology as traditional underpinning, although the building will have been demolished prior to the retaining wall construction.

The following sequence of operations has been assumed to enable analysis of the ground movements around the proposed basement both during and after construction.

In general, the sequence of works for basement construction will comprise the following stages.

1. Demolition of the existing structure, including removal of the existing spread foundations;

2. Construct reinforced concrete retaining walls to perimeter of proposed basement. It is assumed the retaining walls will be formed in a 'hit and miss' sequence using a trench box excavation, commonly sheet lined, shored and strutted; all temporary shoring and propping to be inspected by a suitably qualified person; and

3. construct new reinforced concrete slabs and excavate the new basement in a sequence that provides full restraint to the head and base of the wall, casting floor and basement slabs to provide propping as the excavation proceeds. Temporarily retain and strengthen the new retaining walls with sufficient propping and walling beams. Construct new raft foundation. Construct new house.

The retaining walls will be adequately laterally propped and sufficiently dowelled together, and the concrete will be cast and adequately cured prior to excavation of the basement and removal of the formwork and supports. It is assumed that the corners of the excavation will be locally stiffened by cross-bracing or similar and that the new retaining walls will not be cantilevered at any stage during the construction process. It is assumed that adequate temporary propping of the new retaining walls, particularly at the top level, will occur at all times prior to the construction of permanent concrete floor slabs.

The detail of the support provided to adjacent walls is beyond the scope of this report at this stage and the structural engineer will be best placed to agree a methodology with the retaining wall contractor once appointed.

When the final excavation depths have been reached the permanent works will be formed, which are likely to comprise reinforced concrete walls with a drained cavity lining the inside of the retaining walls. Reinforced concrete will be used for the proposed floor slabs. Following this, the proposed raft slab will be constructed at basement depth and the temporary props will be removed.

9.2 Ground Movements

An assessment of ground movements within and surrounding the excavation has been undertaken using the P-Disp Version 19.3 – Build 12 package licensed from the OASYS suite of geotechnical modelling software from Arup. This program is commonly used within the ground engineering industry and is considered to be an appropriate tool for the analysis of a reinforced concrete retained wall.

Published data for ground movements associated with underpinned retaining walls and the subsequent excavation of a new basement is limited compared to other types of retaining wall. It is possible to use the well-documented predictions and movement curves for embedded retaining walls contained within CIRIA C760[14], although this approach is considered to be unnecessarily conservative. A manual approach has therefore been adopted in conjunction

14 Gaba, A, Hardy, S, Powrie, W, Doughty, L and Selemetas, D (2017) *Embedded retaining walls – guidance for economic design* CIRIA Report C760

with the results of a P-Disp analysis to assess the effects of construction of the proposed reinforced concrete retaining walls and the subsequent excavation of the new basement in cohesive soils.

9.2.1 P-Disp Model

At this site, unloading of the underlying London Clay will take place as a result of the demolition of the existing house, installation of the new retaining walls and excavation of the new basement, such that the reduction in vertical stress in the short term will cause heave to take place. Undrained soil parameters have been used to estimate the potential short term movements, which include the "immediate" or elastic movements as a result of the basement excavation. The model is based on the assumption that the soils behave elastically, which provides a reasonable approximation to soil behaviour at small strains. Drained parameters have been used to provide an estimate of the total movement, which includes long term swelling that will continue for a number of years.

The elastic analysis requires values of soil stiffness at various levels to calculate displacements. Values of stiffness for the soils at this site are readily available from published data and we have used a well-established method to provide our estimates. This relates values of E_u and E', the drained and undrained stiffness respectively, to values of undrained cohesion, as described by Padfield and Sharrock[15] and Butler[16] and more recently by O'Brien and Sharp[17]. Relationships of $E_u = 500\ C_u$ and $E' = 300\ C_u$ for the cohesive soils have been used to obtain values of Young's modulus. More recent published data[18] indicates stiffness values of 750 x Cu for the London Clay and a ratio of E' to Eu of 0.75, and it is considered that the use of the more conservative values provides a sensible approach for this stage in the design. The profile of the underlying London Clay has been interpolated from a GEA investigation on the site and a design line of 8.0z + 50 has been adopted for this analysis.

For the purpose of this analysis, the corners have been defined by x and y coordinates, with the x-direction parallel with the orientation northwest-southeast, whilst the y-direction is parallel with the orientation of northeast-southwest. Vertical movement is in the z-direction. Wall lengths of less than 10 m have been modelled as 1 m long structural elements, while walls greater than 10 m in length have been modelled as 2 m elements to reflect their greater stiffness. The full outputs of all the analyses and P-Disp movement contour plots are included within the appendix.

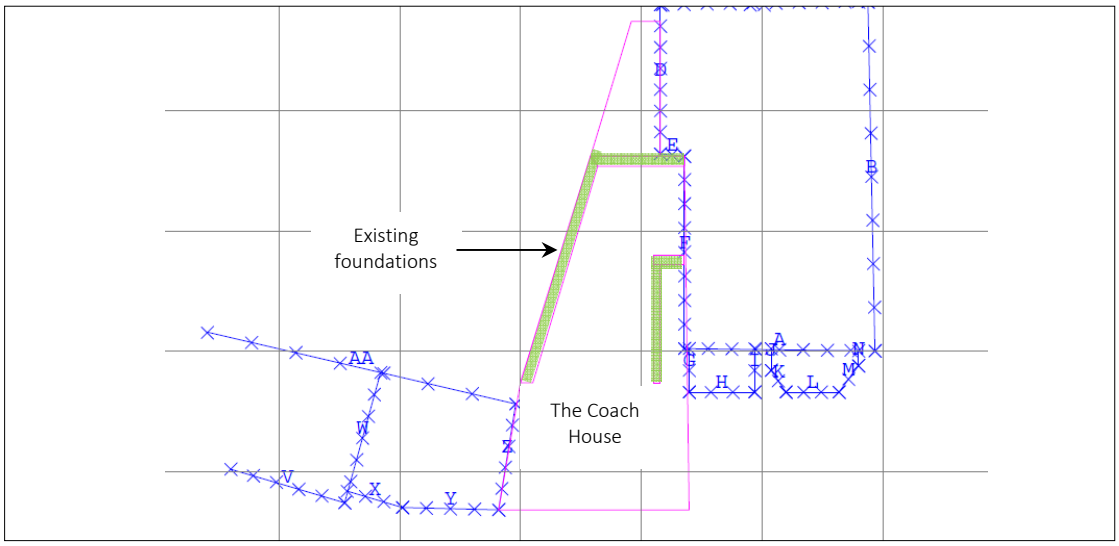
It is understood from information provided by the consulting engineer that the existing foundations are approximately 340 mm wide and applying a pressure of 100 kN/m^2; demolition of the house will result in heave of the soil below the foundations at 1.68 m depth. The proposed basement excavation will result in a short term unloading of around 65 kN/m^2 and is assumed to act at a maximum excavation depth of 3.5 m below existing pavement level. In the long term, the new house will be supported by means of a concrete raft foundation, with an applied uniformly distributed pressure of 55 kN/m^2 at basement level.

[15] Padfield CJ and Sharrock MJ (1983) *Settlement of structures on clay soils*. CIRIA Special Publication 27

[16] Butler FG (1974) *Heavily overconsolidated clays: a state of the art review*. Proc Conf Settlement of Structures, Cambridge, 531-578, Pentech Press, Lond

[17] O'Brien AS and Sharp P (2001) *Settlement and heave of overconsolidated clays - a simplified non-linear method.* Part Two, Ground Engineering, Nov 2001, 48-53

[18] Burland JB, Standing, JR, and Jardine, FM (2001) *Building response to tunnelling, case studies from construction of the Jubilee Line Extension* CIRIA Special Publication 200



The soil parameters used in this assessment are tabulated below.

Stratum	Depth range (m)	Eu (MPa)	E' (MPa)
Made Ground	GL to 2.2	8.0	20.0
London Clay	2.2 to 30.0	25.0 to 140.0	15.0 to 84.0

A rigid boundary for the analysis has been set at the base of the London Clay at roughly 84 m below ground level, where a nearby BGS record indicates that the base of this formation is likely to be present.

9.2.2 Ground Movements – Surrounding the Basement

Wall Installation

As noted previously, due to the lack of publicly available information, predictions of the vertical and horizontal ground movements behind the wall, as a result of wall installation, is based on case study information from CIRIA for a planar diaphragm wall installed into stiff clay.

Reinforced concrete walls are unlikely to move horizontally to any significant degree as they are subject to a continued vertical loading from the structure above. The horizontal movements due to the diaphragm wall installation in the CIRIA guidance are associated with the rotation of the top of the wall which is not considered to be an issue in the installation of an underpinned type wall in limited widths.

Following Excavation

Experience with respect to the construction of underpinned retaining walls suggests that horizontal ground movements of underpinned walls should remain typically within the range of 2 mm to 5 mm following completion of the works, provided that they are installed by a reputable and experienced contractor in accordance with the guidelines published by the Association of Specialist Underpinning Contractors[19]. While the new retaining walls are not underpins, the sequence of construction is assumed to be the same as underpins without the building above, and the parameters above are deemed reasonable for this assessment.

[19] Haslam S, O'Connor L (2013) *Guidelines on safe and efficient basement construction directly below or near to existing structures* ASUC

P-Disp has been used to predict the heave movements as a result of the unloading of the underlying soils, following the proposed basement excavation and reloading of the ground due to the proposed house construction. The heave movements have been used to estimate the deflection ratio of the nearby sensitive structures, the values of which are shown in the table below.

The results of the P-Disp analysis are tabulated below and have been presented to the degree of accuracy required to allow predicted variations in ground movements around the structure(s) to be illustrated, but may not reflect the anticipated accuracy of the predictions.

Sensitive Structure Reference	Maximum Deflection Ratio, Δ (mm)
A	2.0
B	0.11
C	0.2
D	0.6
E	< 0.1
F	0.71
G	< 0.1
H	0.8
I	< 0.1
J	< 0.1
K	< 0.1
L	< 0.1
M	< 0.1
N	< 0.1
O	< 0.1
P	< 0.1
Q	< 0.1
R	< 0.1
S	< 0.1
T	< 0.1
U	0.32
W	< 0.1
Z	0.25
AA	2.6
AB	< 0.1
AC	< 0.1
AD	< 0.1
AE	< 0.1

9.2.3 Movements within the Excavation (Heave)

Results

Using the same P-Disp model, the analysis indicates that, by the time the basement construction is complete, around 8 mm of heave is likely to have taken place at the centre of the proposed excavation, reducing to around 5 mm to 6 mm at the edges. In the long term, following the application of loads from the proposed raft foundation, around 3 mm of settlement is likely to occur within the centre of the excavation, with up to around 3 mm of heave at the edges of the excavation, where a greater degree of unloading has occurred due to the removal of the previous foundations in these areas.

9.3 Building Damage Assessment

In addition to the above assessment of the likely movements that will result from the proposed development, the neighbouring buildings are considered to be sensitive structures, requiring Building Damage Assessments, on the basis of the classification given in Table 2.5 of C760.

The results above have been used to manually predict the building damage category for each sensitive structure and these are shown in Section 6.1 overleaf. A summary page showing the individual results for each sensitive structure is appended.

All structures are shown on the plan in Section 9.2.1.

9.3.1 Damage to Neighbouring Structures

P-Disp has been used to estimate the differential movement along the length of each sensitive structure and the results have been used in a manual assessment to predict the building damage category for each sensitive structure. The results of the building damage assessment are shown in the table below.

The plot for horizontal wall movements as a result of the excavation in front of a wall in stiff clay in CIRIA C760 (Fig 6.15a) has been adapted to reflect a trend line that assumes a movement of 5 mm immediately behind the wall. The trend line is set such that the predicted movement diminishes with both depth and distance from the top of the wall according to the trend line set by a high stiffness wall within high stiffness clay. The results of the preliminary conservative assessment are shown in the table below.

Sensitive Structure Reference	Category of Damage*
A	Category 1 – Very Slight
B	Category 0 - Negligible
C	Category 0 - Negligible
D	Category 0 - Negligible
E	Category 0 - Negligible
F	Category 0 - Negligible
G	Category 0 - Negligible
H	Category 0 - Negligible

Sensitive Structure Reference	Category of Damage*
I	Category 0 - Negligible
J	Category 0 - Negligible
K	Category 0 - Negligible
L	Category 0 - Negligible
M	Category 0 - Negligible
N	Category 0 - Negligible
O	Category 0 - Negligible
P	Category 0 - Negligible
Q	Category 0 - Negligible
R	Category 0 - Negligible
S	Category 0 - Negligible
T	Category 0 - Negligible
U	Category 0 - Negligible
W	Category 0 - Negligible
Z	Category 0 - Negligible
AA	Category 1 – Very Slight
AB	Category 0 - Negligible
AC	Category 0 - Negligible
AD	Category 0 - Negligible
AE	Category 0 - Negligible

**From Table 6.4 of C760[1]: Classification of visible damage to walls.*

The first preliminary analysis has predicted that the proposed demolition of the existing house, installation of the retaining walls and excavation of the proposed basement may result in the building damage for sensitive structures of generally Category 0 (negligible), with two walls classified as Category 1 (Very Slight).

The Camden Planning Guidance notes that '*The Council…..will expect BIAs to provide mitigation measures where any risk of damage is identified of Burland category 1 'very slight' or higher. Following inclusion of mitigation measures into the proposed scheme the changes in attributes are to be re-evaluated and new net consequences determined.'* Additional consideration has therefore been given to the walls with damage categories of Very Slight and Slight, as discussed below.

The table below shows the maximum allowable horizontal and vertical movement for each sensitive structure in order to achieve a building damage category[20] of Category 0 – Negligible.

Sensitive Structure	Reference	Maximum Allowable Horizontal Movement at Foundation Depth to Achieve Category 0 – Negligible (mm)	Maximum Allowable Horizontal Movement at Ground Level to Achieve Category 0 – Negligible (mm)
No 50 Belsize Square	A	2.3	3.3
Adjacent lock-up garages	AA	2.0	2.8

The limiting values of movements listed in the table above are considered to be feasible maximum limits with respect to basement construction.

9.3.2 Monitoring of Ground Movements

The predictions of ground movement based on the ground movement analysis should be checked by monitoring of adjacent properties and structures. The structures to be monitored during the construction stages should include the existing house and neighbouring structures. Condition surveys of the existing structures should be carried out before and after the proposed works.

The precise monitoring strategy will be developed at a later stage and it will be subject to discussions and agreements with the owners of the adjacent properties and structures. Contingency measures will be implemented if movements of the adjacent structures exceed predefined trigger levels. Both contingency measures and trigger levels will need to be developed within a future monitoring specification for the works.

9.4 Ground Movement Assessment Conclusions

The analysis has concluded that the effect arising at the neighbouring properties from the installation of the proposed house demolition, retaining wall construction, basement excavation and reloading of the ground can be restricted to 'Negligible' by limiting horizontal movements to within what would normally be considered achievable limits. On this basis the predicted movements are considered to be acceptable. A monitoring strategy is recommended for the proposed construction and it is recommended that movement monitoring is carried out on all structures prior to and during the proposed basement construction.

The separate phases of work, including excavation of the proposed basement, will in practice be separated by a number of weeks, during which time construction of permanent supports, basement slab and retaining wall curing will take place. This will provide an opportunity for the ground movements during and immediately after retaining wall construction to be measured and the data acquired can be fed back into the design and compared with the predicted values. Such a comparison will allow the ground model to be reviewed and the predicted wall movements to be reassessed prior to the main excavation taking place so that propping arrangements can be adjusted if required.

Part 4: BASEMENT IMPACT ASSESSMENT

This section of the report evaluates the direct and indirect implications of the proposed project, based on the findings of the previous screening and scoping, site investigation and ground movement assessment.

10.0 INTRODUCTION

The screening identified a number of potential impacts. The desk study and ground investigation information has been used below to review the potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

10.1 Potential Impacts

The table below summarises the previously identified potential impacts and the additional information that is now available from the ground investigation in consideration of each impact.

Potential Impact	Site Investigation Conclusions
London Clay is the shallowest stratum at the site.	The London Clay is prone to seasonal shrink-swell (subsidence and heave).
Seasonal shrink-swell can result in foundation movements.	The London Clay is prone to seasonal shrink-swell and can cause structural damage. Desiccation was not noted during the fieldwork.
The site is located within 5 m of a highway or pedestrian right of way	The proposed basement will not extend to within 5 m of Belsize Square to the south.
Founding depths relative to neighbours.	The retention system will ensure the stability of the excavation and neighbouring properties at all times.
The site is in an area identified to have surface water flood risk.	The proposed basement will be on a level below the existing pavement level and may be prone to flooding from surface water.

The results of the site investigation have been used below to review the remaining potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

Seasonal Shrink-Swell
The proposed basement is not located close to any existing trees and proposed planting of new trees does not form part of the proposals, such that the effect of shrink-swell of the London Clay is not envisaged.

The proposed basement will significantly increase differential depth of foundations to neighbouring properties
As part of the investigation, the depth of a number of neighbouring foundations has been determined and has been included in the ground movement assessment. The proposed basement will extend to a significant depth relative to the existing foundations of the neighbouring properties and will need to be designed to ensure the stability of the site and any potentially sensitive structures that are in close proximity to the site.

Appropriate propping and temporary works installed during basement construction will limit the effect of ground movements on the surrounding properties.

The results of a ground movement assessment by GEA to predict the likely movements as a result of the proposed development is shown in Part 3 of this report.

The Site is in an area identified to have surface water flood risk
The findings of the BIA have identified that the site has a low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses.

It is possible that granular fill around the basement may become saturated as the London Clay would effectively prevent it from draining and the recommendations outlined in the BIA with regards to water-proofing and tanking of the basement will reduce the risk to acceptable levels. In accordance with paragraph 5.11 of the CPG a positive pumped device will be installed in the basement in order to further protect the site from sewer flooding.

In addition and according to the requirements of CPG4, a flood risk assessment may be required for the site.

10.2 Non-Technical Summary of Evidence

This section provides a short summary of the evidence acquired and used to form the conclusions made within the BIA.

10.2.1 Screening

The following table provides the evidence used to answer the subterranean groundwater screening questions.

Question	Evidence
1a. Is the site located directly above an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
1b. Will the proposed basement extend beneath the water table surface?	The proposals provided by the consulting engineers assessed against the standpipe monitoring levels.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	Figures 11 and 12 of the Arup report.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	Figures 12 and 14 of the Arup report.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	Site walkover and the proposals provided by the consulting engineers.
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	The proposals provided by the consulting engineers.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	The proposals provided by the consulting engineers assessed against the standpipe monitoring levels.

The following table provides the evidence used to answer the surface water flow and flooding screening questions.

Question	Evidence
1. Is the site within the catchment of the pond chains on Hampstead Heath?	Figures 12 and 14 of the Arup report.
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	A site walkover confirmed the proportions of hardstanding, which has been compared to the proposals to work out any proposed changes in hardstanding.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	

Question	Evidence
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	
5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?	
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	Flood risk maps acquired from the Environment Agency as part of the desk study, Figure 15 of the Arup report, the Camden Flood Risk Management Strategy dated 2013 together with Figures 3iv, 4e, 5a and 5b of the Strategic Flood Risk Assessment dated 2014.

The following table provides the evidence used to answer the slope stability screening questions.

Question	Evidence
1. Does the existing site include slopes, natural or manmade, greater than 7°?	Figures 16 and 17 of the Arup report and confirmed during a site walkover.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	The details of the proposed development provided do not include the re-profiling of the site to create new slopes.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	Figures 16 and 17 of the Arup report and confirmed during a site walkover.
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	
5. Is the London Clay the shallowest strata at the site?	Geological maps and Figures 3, 5 and 8 of the Arup report.
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	The proposals provided by the consulting engineers.
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	Knowledge on the ground conditions of the area were used to make an assessment of this, in addition to a visual inspection of the buildings carried out during the site walkover.
8. Is the site within 100 m of a watercourse or potential spring line?	Figures 11 and 12 of the Arup report.
9. Is the site within an area of previously worked ground?	Geological maps and Figures 3, 5 and 8 of the Arup report.
10. Is the site within an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
11. Is the site within 50 m of Hampstead Heath ponds?	Figures 12 and 14 of the Arup report.
12. Is the site within 5 m of a highway or pedestrian right of way?	Aerial photography, site plans and the site walkover.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Records held on the Camden Planning Portal.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	Maps and plans of infrastructure tunnels were reviewed, in addition to online infrastructure maps, showing exclusion zones, made available by Transport for London.

10.2.2 Scoping and Site Investigation

The questions in the screening stage that there were answered 'yes', were taken forward to a scoping stage and the potential impacts discussed in Section 4.0 of this report, with reference to the possible impacts outlined in the Arup report.

A ground investigation has been carried out, which has allowed an assessment of the potential impacts of the basement development on the various receptors identified from the screening and scoping stages. Principally the investigation aimed to establish the ground conditions, including the groundwater level, the engineering properties of the underlying soils to enable suitable design of the basement development and the configuration of the existing wall foundations. The findings of the investigation are discussed in Section 5.0 of this report and summarised in both Section 7.0 and the Executive Summary.

10.2.3 Impact Assessment

Section 9.0 of this report summarises whether or not, on the basis of the findings of the investigation, the potential impacts still need to be given consideration and identifies ongoing risks that will require suitable engineering mitigation. Section 8.0 of this report also provides recommendations for the design of the proposed development, whilst Section 9.0 makes reference to the outcomes of a ground movement analysis and building damage assessment included as an appendix to this report, which has also been used to provide a conclusion on any potential impacts from the proposed basement development.

10.3 BIA Conclusion

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden. Information from a Site Investigation and Ground Movement Assessment has been used to assess potential impacts identified by the screening process.

It is concluded that the proposed development is unlikely to result in any specific land or slope stability issues or groundwater issues, although a flood risk assessment may be required to address the potential for surface water issues, in accordance with CPG4.

11.0 OUTSTANDING RISKS AND ISSUES

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

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

A flood risk assessment may be required to address the potential for surface water issues, in accordance with CPG4.

Monitoring of the standpipes should be continued to determine equilibrium groundwater levels and to establish any seasonal fluctuations. Ideally, trial excavations extending to as close to the full depth of the proposed basement as possible should be carried out to determine likely groundwater inflows into the basement excavation.

APPENDIX

Borehole Records

Trial Pit Record

Rising Head Test Results

Laboratory Geotechnical Test Results

Chemical Analyses (soil)

Risk-based Generic Guideline Values

Envirocheck Extracts

Historical Maps

P-Disp Analysis Short Term Movement Contour Plots

P-Disp Analysis Total Movement Contour Plots

P-Disp Analysis Vertical Displacement Plots

Damage Category Manual Calculations

Site Plan

GEA Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** The Coach House, 50A Belsize Square, London NW3 4HN	**Borehole Number** **BH1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 2.00m		Philip Welch	J17062
	Location	**Dates**	**Engineer**	**Sheet**
	Front driveway	16/03/2017- 17/03/2017	Conisbee	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.25)	CONCRETE (unreinforced)		
0.30	D					0.25	MADE GROUND (greyish brown silty sandy clayey gravel with brick, concrete, ceramic, coal, shell fragments, with becoming clayey with ash from 1.2 m)		
0.50	B								
						(1.90)			
1.20-1.65 1.20	SPT(C) N=8 B			1,2/3,1,2,2					
1.75	D								
2.00-2.45 2.00	SPT(C) N=8 B	2.00	DRY	1,1/2,2,2,2		2.15	Firm brown and grey mottled silty slightly sandy CLAY with occasional pockets of white silt, mica, occasional pockets of selenite crystals, occasional fine gravel, roots and rootlets		
2.75	D								
						(1.60)			
3.00-3.45 3.00	SPT N=10 D	2.00	DRY	1,1/2,2,3,3					
3.50	D								
3.75	D					3.75 (0.25)	Soft blackish, dark grey and brown mottled silty CLAY with frequent lignite and fine rootlets		
4.00-4.45	U					4.00	Firm becoming stiff medium to high strength fissured brown and pale grey silty CLAY with partings of pale grey silty clay, partings of orange-brown silt and dark orange-brown sand, mica, occasional pockets of selenite crystals, occasional fine shell fragments, pyrite nodules and traces of rootlets		
4.50	D								
4.75	D								
5.00-5.45 5.00	SPT N=16 D	2.00	DRY	2,3/3,4,4,5					
						(4.00)			
6.00	D								
6.50-6.95	U								
8.00-8.45 8.00	SPT N=19 D	2.00	DRY	2,4/5,4,4,6		8.00	Stiff to very stiff high to very high strength fissured brownish grey silty CLAY with pockets of pale grey and dark brown silt, occasional fine shell fragments, occasional nodules of pyrite and mica, with dark brown and pale brown silt pockets, partings of dark brownish grey silt and occasional fossils from 15.5 m depth		
9.00	D								
9.50-9.95	U			16/03/2017:DRY 17/03/2017:DRY					

Remarks
3 hrs 30 mins man handling rig into position on slope and making safe at end of day
3 hrs to demobilise rig and wash down area and neighbouring walls
Groundwater monitoring standpipe installed to 5.0 m to enable future monitoring
Borehole dry on completion and following removal of casing
Groundwater monitoring result (05/04/17): DRY
Groundwater monitoring result (19/04/17): 4.75 m
Groundwater monitoring result (09/05/17): 4.46 m. Rising head test carried out on this date and reported separately.

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

Figure No.
J17062.BH1

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** The Coach House, 50A Belsize Square, London NW3 4HN	**Borehole Number** **BH1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150mm cased to 2.00m		Philip Welch	J17062
	Location	**Dates**	**Engineer**	**Sheet**
	Front driveway	16/03/2017- 17/03/2017	Conisbee	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D								
11.00-11.45 11.00	SPT N=22 D	2.00	DRY	3,4/5,5,6,6					
12.00	D								
12.50-12.95	U					(10.00)			
13.50	D								
14.00-14.45 14.00	SPT N=24 D	2.00	DRY	2,3/5,5,6,8					
15.00	D								
15.50-15.95	U								
17.00	D								
17.55-18.00 17.55	SPT N=27 D	2.00	DRY	3,5/5,6,7,9					
				17/03/2017:DRY		18.00	Complete at 18.00m		

Remarks
3 hrs 30 mins man handling rig into position on slope and making safe at end of day
3 hrs to demobilise rig and wash down area and neighbouring walls
Groundwater monitoring standpipe installed to 5.0 m to enable future monitoring
Borehole dry on completion and following removal of casing
Groundwater monitoring result (05/04/17): DRY
Groundwater monitoring result (19/04/17): 4.75 m
Groundwater monitoring result (09/05/17): 4.46 m. Rising head test carried out on this date and reported separately.

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

Figure No.
J17062.BH1

GEA Geotechnical & Environmental Associates Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** The Coach House, 50A Belsize Square, London NW3 4HN	**Number** **BH2**	
Excavation Method Window Sampler	**Dimensions**	**Ground Level (mOD)**	**Client** Philip Welch	**Job Number** J17062
	Location Rear Garden	**Dates** 17/03/2017	**Engineer** Conisbee	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15) 0.15	CONCRETE		
					(0.25) 0.40	CONCRETE crushed		
					0.45	CONCRETE		
0.60	D1					Firm greyish brown and dark orange-brown mottled silty slightly sandy CLAY with occasional gravel, claystones, pyrite nodules, pockets of coarse gypsum, pockets of dark orange-brown silt, occasional mica, occasional blackish pockets of silt and roots to 0.7 m depth with rootlets to 2.0 m depth at 0.7 m soft region noted at 1.0 m becoming brown and pale grey with pockets of orange-brown fine sand		
1.00	D2							
1.50	D3							
2.00	D4							
2.50	D5					at 2.5 m becoming bluish and greyish brown clay		
3.00	D6				(4.55)			
3.50	D7					at 3.0 m becoming brown with coarse selenite crystals at 3.5 m depth		
4.00	D8					at 4.0 m becoming stiff		
4.50	D9							
5.00	D10				5.00	Terminated at 5.00m		

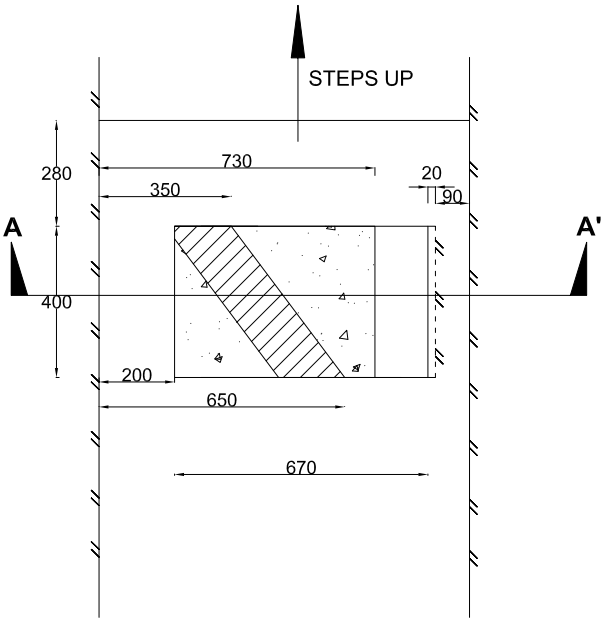
Remarks
PP = Pocket Penetrometer
Borehole terminated at 5.0 m due to strength of clay
Groundwater monitoring standpipe installed to 5.0 m depth
Groundwater monitoring result (05/04/17): 0.65 m
Groundwater monitoring result (19/04/17): 0.68 m
Groundwater monitoring result (09/05/17): 0.69 m. Rising head test carried out on this date and reported separately.

Scale (approx)	Logged By
1:50	CA

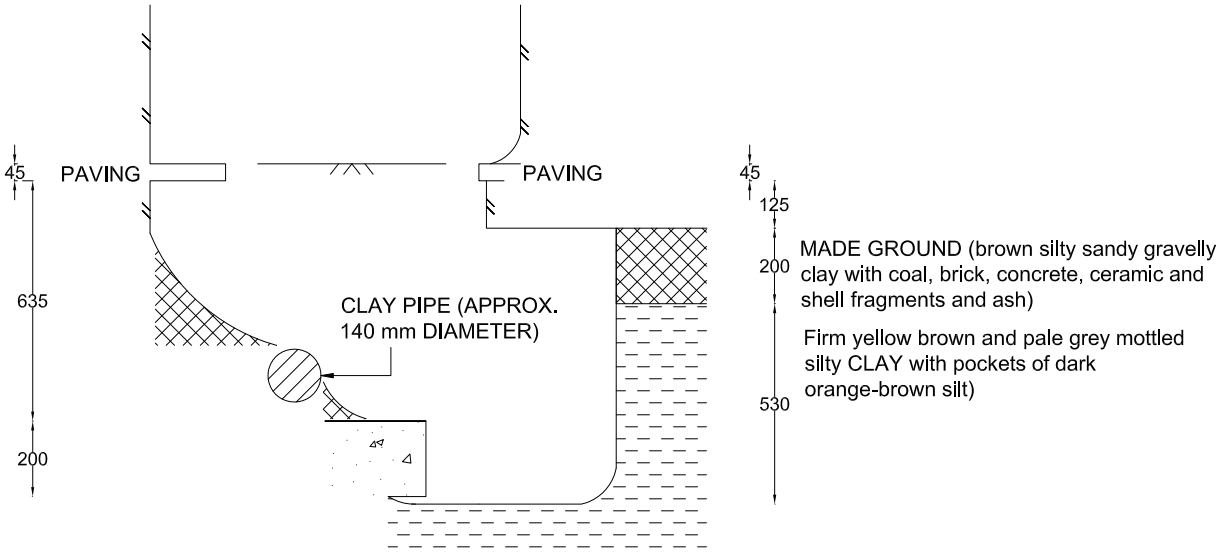
Figure No.
J17062.BH2

GEA Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware Herts SG12 7QE	**Site** The Coach House, 50A Belsize Square London NW3 4HN		**Trial Pit Number** TP1
Excavation Method Manual	**Dimensions** 620 x 400 x 900 mm	**Ground Level (m OD)**	**Client** Philip Welch	**Job Number** J17062
	Location Side entrance to house		**Engineer** Conisbee	**Sheet Number** 1 of 1

Plan



Section A - A'



1 : 20

1000 mm 0 250 mm 500 mm 1000 mm 1500 mm 2000 mm 2500 mm

Notes:
Groundwater not encountered
Trial pit obscured by presence of clay pipe

Scale 1 : 20

Logged By CA

Geotechnical & Environmental Associates

Widbury Barn
Widbury Hill
Ware,Herts
SG12 7QE

Standard Penetration Test Results

Site : The Coach House, 50A Belsize Square, London NW3 4HN

Client : Philip Welch

Engineer : Conisbee

Job Number J17062

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	2	3	1	2	2	N60=11	
BH1	2.00	2.15	2.45	CPT	1	1	2	2	2	2	N60=11	
BH1	3.00	3.15	3.45	SPT	1	1	2	2	3	3	N60=14	
BH1	5.00	5.15	5.45	SPT	2	3	3	4	4	5	N60=22	
BH1	8.00	8.15	8.45	SPT	2	4	5	4	4	6	N60=26	
BH1	11.00	11.15	11.45	SPT	3	4	5	5	6	6	N60=30	
BH1	14.00	14.15	14.45	SPT	2	3	5	5	6	8	N60=33	
BH1	17.55	17.70	18.00	SPT	3	5	5	6	7	9	N60=37	

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

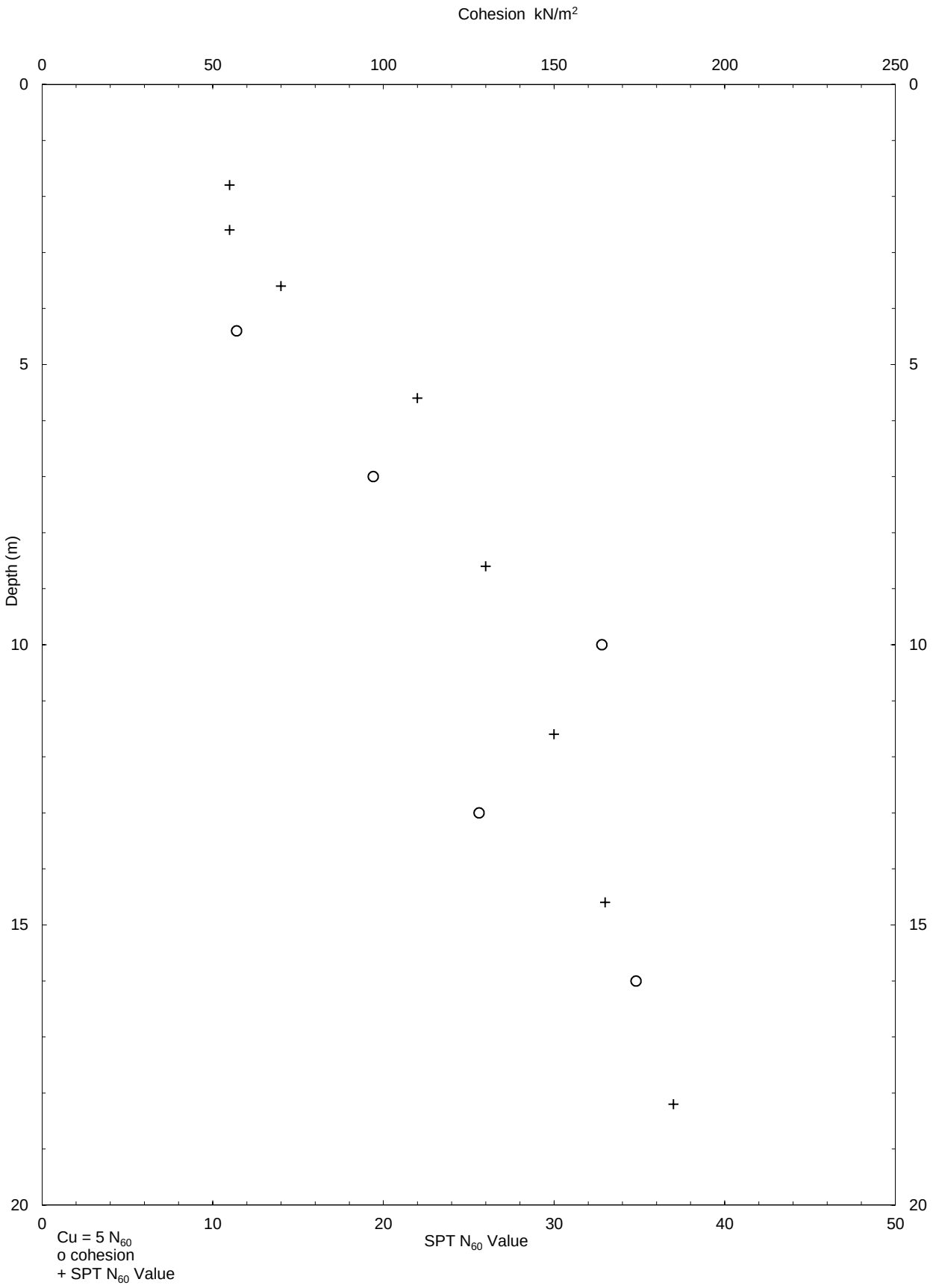
SPT & Cohesion / Depth Graph

Site The Coach House, 50A Belsize Square London NW3 4HN

Client Philip Welch

Job Number J17062

Sheet 1 / 1



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

Borehole Permeability Test

Site The Coach House, 50A Belsize Square London NW3 4HN

Client Philip Welch

Job Number J17062

Sheet 1/2

BOREHOLE No	BH1
TEST NO	1
DATE	09/05/2017

AT START OF TEST	
Standpipe Diameter (mm)	50
Standpipe Depth (m)	5.00
Depth to water on arrival (m)	4.46
Depth to water at start of test (m)	4.92

TIME (mins)	*WATER LEVEL (m)*
0	4.92
1	4.92
6	4.91
11	4.91
14	4.91
18	4.91
23	4.91
28	4.91
37	4.9
46	4.9
56	4.9
66	4.9
76	4.9

REMARKS

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

Borehole Permeability Test

Site The Coach House, 50A Belsize Square London NW3 4HN

Client Philip Welch

Job Number J17062

Sheet 2/2

BOREHOLE No	BH2
TEST NO	1
DATE	09/05/2017

AT START OF TEST	
Standpipe Diameter (mm)	50
Standpipe Depth (m)	5.00
Depth to water on arrival (m)	0.69
Depth to water at start of test (m)	3.66

TIME (mins)	*WATER LEVEL (m)*
0	3.66
0.5	3.39
1	3.30
1.5	3.20
2	3.14
2.5	3.07
3	3.00
4	2.90
4.5	2.85
5	2.82
6	2.75
7	2.63
8	2.56
9	2.47
10	2.34
12	2.28
14	2.25
16	2.25
18	2.23
20	2.22
25	2.19
30	2.14
35	1.92
40	1.71
45	1.52
50	1.25
55	0.90
60	0.88
70	0.82
80	0.77
90	0.76
100	0.75
110	0.74
120	0.73
130	0.73
140	0.73
150	0.73
160	0.73

REMARKS

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
BH1		3.75	D	Grey brown mottled grey and black CLAY	47.4	88	28	60	100									
BH1		4.00-4.45	U	Stiff fissured yellow brown mottled grey CLAY	33.4					1.92	1.44	80	114	57				
BH1		4.75	D	Grey brown mottled grey CLAY	37.1	85	27	58	100						7.7	3.00	1000	
BH1		6.50-6.95	U	Stiff fissured brown CLAY with rare gypsum	31.2					1.90	1.45	130	194	97				
BH1		9.50-9.95	U	Stiff fissured dark brown CLAY	26.5					2.01	1.59	190	329	164				
BH1		12.50-12.95	U	Stiff fissured dark brown CLAY	29.2					1.93	1.50	250	256	128				
BH1		15.50-15.95	U	Stiff fissured dark brown CLAY	25.0					2.03	1.62	310	348	174				
BH2		2.00	D	Grey brown CLAY with rare gravel	31.7	80	25	55	99						7.5	2.90		
BH2		4.50	D	Yellow brown CLAY with rare fine gravel	30.6	79	27	52	99						7.8	2.80		
TP1			D	Yellow brown CLAY with rare fine gravel	33.2	82	27	55	99						7.9	0.14		

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

Checked and Approved by

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

GEO / 25758

Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN
J17062

GEOLABS®

BS 1377 : Part 7 : 1990 Clause 8

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

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

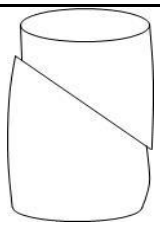
Description:

Stiff fissured yellow brown mottled grey CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	203.2
Diameter	(mm)	102.4
Moisture Content	(%)	33.4
Bulk Density	(Mg/m³)	1.92
Dry Density	(Mg/m³)	1.44
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.4
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	80
Strain at failure	(%)	5.4
Maximum Deviator Stress	(kPa)	114
Shear Stress Cu	(kPa)	57

Mode of failure



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

Checked and Approved by:

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

GEO / 25758

Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN
J17062

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BS 1377 : Part 7 : 1990 Clause 8

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

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

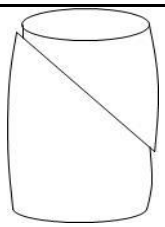
Description:

Stiff fissured brown CLAY with rare gypsum

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	203.5
Diameter	(mm)	103.2
Moisture Content	(%)	31.2
Bulk Density	(Mg/m³)	1.90
Dry Density	(Mg/m³)	1.45
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	130
Strain at failure	(%)	11.8
Maximum Deviator Stress	(kPa)	194
Shear Stress Cu	(kPa)	97

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	30

Checked and Approved by:

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

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Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN
J17062

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

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

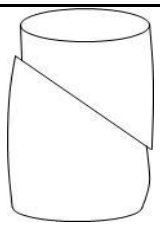
Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	192.5
Diameter	(mm)	103.2
Moisture Content	(%)	26.5
Bulk Density	(Mg/m³)	2.01
Dry Density	(Mg/m³)	1.59
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	2.1
Cell pressure	(kPa)	190
Strain at failure	(%)	8.3
Maximum Deviator Stress	(kPa)	329
Shear Stress Cu	(kPa)	164

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	90

Checked and Approved by:

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

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Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

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

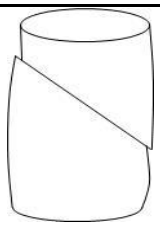
Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	203.2
Diameter	(mm)	103.4
Moisture Content	(%)	29.2
Bulk Density	(Mg/m³)	1.93
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)	250
Strain at failure	(%)	5.4
Maximum Deviator Stress	(kPa)	256
Shear Stress Cu	(kPa)	128

Mode of failure



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

Checked and Approved by:

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

GEO / 25758

Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN
J17062

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UKAS TESTING 1982

BS 1377 : Part 7 : 1990 Clause 8

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No	BH1
Depth (m)	15.50-15.95
Sample Type	U

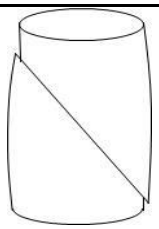
Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	203.3
Diameter	(mm)	102.8
Moisture Content	(%)	25.0
Bulk Density	(Mg/m³)	2.03
Dry Density	(Mg/m³)	1.62
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	310
Strain at failure	(%)	7.9
Maximum Deviator Stress	(kPa)	348
Shear Stress Cu	(kPa)	174

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	30

Checked and Approved by:

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

GEO / 25758

Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN
J17062

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UKAS TESTING 1982

1131 - BS1377 Chemical Suite - 25758.XLSM

SUMMARY OF CHEMICAL TESTS ON SOIL

Borehole / Trial Pit	Depth m	Sample Ref	Sample Type	pH Value	Total Acid Soluble Sulphate as SO4 %	Water Soluble Sulphate as SO4 2:1 Water:Soil Extract g/L	Total Sulphur %	Water Soluble Chloride mg/L	Water Soluble Nitrate mg/L	Magnesium mg/L	Organic Content %	Mass Loss on Ignition %	Carbonate Content %
BH1	3.75		D								2.7		
BH1	4.75		D	7.7		3.00				1000			
BH2	2.00		D	7.5		2.90							
BH2	4.50		D	7.8		2.80							
TP1			D	7.9		0.14							

Tested by i2 Analytical Limited : UKAS No 4041

Checked and Approved by:

S Burke

S Burke - Senior Technician
19/04/2017

Project Number:

GEO / 25758

Project Name:

THE COACH HOUSE, 50A BELSIZE SQUARE, LONDON NW3 4HN

J17062

GEOLABS®

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Croxley Green
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Watford,
Herts,
WD18 8YS

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

Analytical Report Number : 17-43264

Project / Site name:	50A Belsize Square, London, NW3 4HN	**Samples received on:**	20/03/2017
Your job number:	J17062	**Samples instructed on:**	20/03/2017
Your order number:	J17062	**Analysis completed by:**	27/03/2017
Report Issue Number:	1	**Report issued on:**	27/03/2017
Samples Analysed:	4 soil samples		

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 17-43264

Project / Site name: 50A Belsize Square, London, NW3 4HN
Your Order No: J17062

Lab Sample Number				721308	721309	721310	721311	
Sample Reference				BH1	BH2	TP1	BH1	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.00	0.50	0.50	3.60-4.00	
Date Sampled				16/03/2017	17/03/2017	17/03/2017	16/03/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	16	19	16	30	
Total mass of sample received	kg	0.001	NONE	1.9	1.1	0.90	0.38	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	9.6	8.6	7.9	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	570	1400	830	4600	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.14	0.36	0.063	1.7	
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	23	
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	8.7	10	98	760	
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.9	0.4	0.5	2.2	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	21	19	21	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	44	31	32	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	23	38	37	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	85	33	160	150	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.8	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	26	20	23	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	45	100	83	85	
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10	26	
TPH (C8 - C10)	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	2.8	2.6	
TPH (C21 - C35)	mg/kg	1	MCERTS	1.3	< 1.0	3.2	18	

Analytical Report Number : 17-43264

Project / Site name: 50A Belsize Square, London, NW3 4HN

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
721308	BH1	None Supplied	1.00	Light brown clay and sand with gravel and brick.
721309	BH2	None Supplied	0.50	Light brown clay and sand.
721310	TP1	None Supplied	0.50	Brown clay and sand with gravel.
721311	BH1	None Supplied	3.60-4.00	Brown clay and sand.

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

Analytical Report Number : 17-43264

Project / Site name: 50A Belsize Square, London, NW3 4HN

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

GEA Geotechnical & Environmental Associates

Widbury Barn
Widbury Hill
Ware
Herts SG12 7QE

Generic Risk-Based Soil Screening Values

Site The Coach House, 50A Belsize Square London NW3 4HN

Client Philip Welch

Job Number J17062

Sheet 1 / 2

Proposed End Use Residential without plant uptake

Soil pH 7

Soil Organic Matter content % 1.0

Contaminant	Screening Value mg/kg	Data Source
Metals		
Arsenic	40	C4SL
Cadmium	149	C4SL
Chromium (III)	3000	LQM/CIEH
Chromium (VI)	21	C4SL
Copper	2,330	LQM/CIEH
Lead	310	C4SL
Elemental Mercury	1.02	SGV
Inorganic Mercury	235	SGV
Nickel	99	LQM/CIEH
Selenium	595	SGV
Zinc	3,750	LQM/CIEH
Hydrocarbons		
Benzene	0.89	C4SL
Toluene	120	SGV
Ethyl Benzene	65	SGV
Xylene	42	SGV
Aliphatic C5-C6	30	LQM/CIEH
Aliphatic C6-C8	73	LQM/CIEH
Aliphatic C8-C10	19	LQM/CIEH
Aliphatic C10-C12	93	LQM/CIEH
Aliphatic C12-C16	740	LQM/CIEH
Aliphatic C16-C35	45,000	LQM/CIEH
Aromatic C6-C7	See Benzene	LQM/CIEH
Aromatic C7-C8	See Toluene	LQM/CIEH
Aromatic C8-C10	27	LQM/CIEH
Aromatic C10-C12	69	LQM/CIEH
Aromatic C12-C16	140	LQM/CIEH
Aromatic C16-C21	250	LQM/CIEH
Aromatic C21-C35	890	LQM/CIEH
PRO (C_5 –C_{10})	270	Calc
DRO (C_{12} –C_{28})	46,130	Calc
Lube Oil (C_{28} –C_{44})	45,890	Calc
TPH	**1000**	Trigger for speciated testing

Contaminant	Screening Value mg/kg	Data Source
Anions		
Soluble Sulphate	500 mg/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon (%)	6	Methanogenic potential
Total Cyanide	140	WRAS
Total Mono Phenols	310	SGV
PAH		
Naphthalene	2.33	C4SL exp & LQM/CIEH
Acenaphthylene	1,950	LQM/CIEH
Acenaphthene	2,020	LQM/CIEH
Fluorene	1,850	LQM/CIEH
Phenanthrene	837	LQM/CIEH
Anthracene	19,800	LQM/CIEH
Fluoranthene	972	LQM/CIEH
Pyrene	2,330	LQM/CIEH
Benzo(a) Anthracene	5.5	C4SL exp & LQM/CIEH
Chrysene	13	C4SL exp & LQM/CIEH
Benzo(b) Fluoranthene	10.6	C4SL exp & LQM/CIEH
Benzo(k) Fluoranthene	15.2	C4SL exp & LQM/CIEH
Benzo(a) pyrene	4.65	C4SL
Indeno(1 2 3 cd) Pyrene	6.3	C4SL exp & LQM/CIEH
Dibenzo(a h) Anthracene	1.31	C4SL exp & LQM/CIEH
Benzo (g h i) Perylene	71	C4SL exp & LQM/CIEH
Screening value for PAH	**66.4**	B(a)P / 0.15
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	12.9	LQM/CIEH
tetrachloroethane (PCA)	3.6	LQM/CIEH
tetrachloroethene (PCE)	1.46	LQM/CIEH
trichloroethene (TCE)	0.15	LQM/CIEH
1,2-dichloroethane (DCA)	0.00646	LQM/CIEH
vinyl chloride (Chloroethene)	0.00129	LQM/CIEH
tetrachloromethane (Carbon tetra	0.0362	LQM/CIEH
trichloromethane (Chloroform)	1.72	LQM/CIEH

Notes

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

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

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

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

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

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

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

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
117160731_1_1

Customer Reference:
J17062

National Grid Reference:
526930, 184810

Slice:
A

Site Area (Ha):
0.05

Search Buffer (m):
1000

Site Details:

The Coach House
50A Belsize Square
LONDON
NW3 4HN

Client Details:

Mr S Branch
GEA Ltd
Widbury Barn
Widbury Hill
Ware
Herts
SG12 7QE

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/Natural Resources Wales 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 v50.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1			Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents					
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
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		1	4	13
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3				Yes
Pollution Incidents to Controlled Waters					
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances	pg 3				37
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 10				4 (*14)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 14	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 14	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones	pg 14		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
Detailed River Network Lines	pg 15			Yes	n/a
Detailed River Network Offline Drainage					n/a

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 16				1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 16			2	4
Potentially Infilled Land (Water)	pg 16				1
Registered Landfill Sites					
Registered Waste Transfer Sites	pg 17				2
Registered Waste Treatment or Disposal Sites					
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					

GEA Geotechnical & Environmental Associates

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 18	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry					
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry	pg 18		Yes	Yes	Yes
BGS Urban Soil Chemistry Averages	pg 21	Yes			
CBSCB Compensation District			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	pg 21	Yes	Yes	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 22	Yes	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 22	Yes	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 23		9	47	177
Fuel Station Entries	pg 42			1	2
Points of Interest - Commercial Services	pg 42		8	28	27
Points of Interest - Education and Health	pg 48		1		5
Points of Interest - Manufacturing and Production	pg 48		2		2
Points of Interest - Public Infrastructure	pg 48			5	13
Points of Interest - Recreational and Environmental	pg 50				19
Gas Pipelines					
Underground Electrical Cables	pg 52		6	4	26

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
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					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (NW)	261	2	526800 185050
1	**Local Authority Pollution Prevention and Controls** Name: Pyramid Cleaners Location: 52 Besize Lane, London, Nw3 5ar Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC8 Dated: 1st 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	A13NW (N)	170	3	526872 184985
2	**Local Authority Pollution Prevention and Controls** Name: Perkins Dry Cleaners Location: 171 Haverstock Hill, London, Nw3 4qs Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC7 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	A14NW (NE)	460	3	527342 185055
2	**Local Authority Pollution Prevention and Controls** Name: Swan Dry Cleaners Location: 163 Haverstock Hill, London, Nw3 4qt Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC42 Dated: 24th 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	A14NW (NE)	475	3	527371 185032
3	**Local Authority Pollution Prevention and Controls** Name: Belsize Park Service Station Location: 215 Haverstock Hill, LONDON, NW3 4RE Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC21 Dated: 2nd January 1999 Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status:** **Permitted** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	468	3	527187 185227
4	**Local Authority Pollution Prevention and Controls** Name: Kings Dry Cleaners Location: 25 Winchester Road, London, E4 Authority: London Borough of Waltham Forest, Environmental Health Department Permit Reference: DC05 Dated: 6th July 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)	491	4	526812 184310
5	**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	A12SE (SW)	501	3	526471 184554
5	**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	A12SE (SW)	501	3	526471 184554

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	**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	A7SE (SW)	936	3	526262 184119
12	**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	A7NW (SW)	943	3	526237 184134
13	**Local Authority Pollution Prevention and Controls** Name: The Dry Cleaners Of Hampstead Location: 80 Haverstock Hill, London, Nw3 2be Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC41 Dated: 25th June 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A14SE (E)	944	3	527875 184684
14	**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	A7SE (SW)	967	3	526352 184004
	Nearest Surface Water Feature	A8NW (S)	516	-	526768 184296
15	**Registered Radioactive Substances** Name: Royal Free Hampstead NHS Trust Location: Royal Free Hospital, Pond Street, Hampstead, LONDON, Greater London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: AV8011 Dated: 25th October 1996 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variationSuperseded** Positional Accuracy: Automatically positioned to the address	A19SW (NE)	671	5	527292 185400
15	**Registered Radioactive Substances** Name: Royal Free And University College Medical School Of University College London Location: Royal Free Hospital, Pond Street, London, NW3 2QG Authority: Environment Agency, Thames Region Permit Reference: Bz9758 Dated: 5th January 2006 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: Manually positioned to the address or location	A19SW (NE)	673	5	527299 185399

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	**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	A8NW (S)	523	5	526800 184280
18	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/087 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 April Authorised End: 31 March Permit Start Date: 5th December 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (S)	555	5	526750 184261
18	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/087 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: General Washing/Process Washing 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 April Authorised End: 31 March Permit Start Date: 5th December 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (S)	555	5	526750 184261
18	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/087 Permit Version: 1 Location: Swiss Cottage Open Space- Borehole Authority: Environment Agency, Thames Region Abstraction: Municipal Grounds: Lake And Pond Throughflow 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 April Authorised End: 31 March Permit Start Date: 5th December 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8NW (S)	555	5	526750 184261

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: London Borough Of Camden Licence Number: 28/39/39/0091 Permit Version: 100 Location: Two Bores At Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Industrial; Commercial And Public Services: Laundry Use Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: St. Pancras Public Baths, Prince Of Wales Road, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 13th June 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1862	5	528800 184700
	Water Abstractions Operator: London Borough Of Camden Licence Number: 28/39/39/0091 Permit Version: 100 Location: Two Bores At Kentish Town Sports Centre, Prince Of Wales St Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: St. Pancras Public Baths, Prince Of Wales Road, London Nw1 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 13th June 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1862	5	528800 184700
	Groundwater Vulnerability Soil Classification: Not classified Map Sheet: Sheet 39 West London Scale: 1:100,000	A13SE (SE)	0	5	526929 184808
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13SE (SE)	0	2	526929 184808
	Superficial Aquifer Designations No Data Available				
19	**Source Protection Zones** Name: Barrow Hill Source: Environment Agency, Head Office Reference: Th405 Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A13SE (S)	144	5	526953 184646
	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				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: B06 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13SE (E)	255	5	527197 184798
	Detailed River Network Offline Drainage None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**Historical Landfill Sites** Licence Holder: Not Supplied Location: London NW6 Name: Canfield Place Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD12043 First Input Date: Not Supplied Last Input Date: Not Supplied Specified Waste Type: Not Supplied EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: Not Supplied Other Ref: DON009	A12SW (W)	838	5	526074 184790
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		0	6	526929 184808
	Local Authority Landfill Coverage Name: Westminster City Council - Has supplied landfill data		941	7	526738 183866
22	**Potentially Infilled Land (Non-Water)** Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A13NW (NW)	267	9	526763 185029
23	**Potentially Infilled Land (Non-Water)** Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1991	A12NE (NW)	490	9	526467 184999
24	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A19SW (NE)	526	9	527284 185228
25	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A19SW (NE)	542	9	527347 185189
26	**Potentially Infilled Land (Non-Water)** Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A18SW (NW)	568	9	526616 185296
27	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A19SW (NE)	685	9	527473 185261
28	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1873	A18NE (N)	882	9	527250 185654

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
29	**Registered Waste Transfer Sites** Licence Holder: P B Donoghue Licence Reference: DL140 Site Location: BR Goods Yard at 269 Finchley Road, CAMDEN, London, NW3 Operator Location: As Site Address Authority: Environment Agency - Thames Region, North East Area Site Category: Transfer Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st February 1992 Preceded By Licence: DL140 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Lwra Cat. A = Inert Wastes Lwra Cat. Bi Gen.Non-Putresc Max.Waste Permitted By Licence-Stated Prohibited Waste: Clinical - As In Coll/Disp.Regs Of '88 Liquid/Slurry/Sludge Wastes Poisonous, Noxious, Polluting Wastes Special Wastes Waste N.O.S.	A12SW (W)	712	5	526200 184780
29	**Registered Waste Transfer Sites** Licence Holder: P B Donoghue Licence Reference: DL140 Site Location: BR Goods Yard, 269 Finchley Road, CAMDEN, London, NW3 Operator Location: As Site Address Authority: Environment Agency - Thames Region, North East Area Site Category: Transfer Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 1st August 1983 Preceded By Licence: Not Given Superseded By Licence: DL140 Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Commercial Waste Construction Ind. Wastes Max.Waste Permitted By Licence(Stated) Prohibited Waste: Clinical Waste -Clause 2 & 4 Hsc 1982 Notifiable Wastes Putrescible Waste Special Wastes	A12SW (W)	712	5	526200 184780

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thames Group	A13SE (SE)	0	2	526929 184808
	BGS Estimated Soil Chemistry No data available				
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527169, 184808 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 20.70 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 83.40 mg/kg Lead Measured Concentration: 2153.80 mg/kg Nickel Measured Concentration: 34.90 mg/kg	A13SE (E)	227	2	527169 184808
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526703, 184701 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 32.80 mg/kg Cadmium Measured Concentration: 0.70 mg/kg Chromium Measured Concentration: 79.00 mg/kg Lead Measured Concentration: 770.10 mg/kg Nickel Measured Concentration: 44.30 mg/kg	A13SW (SW)	228	2	526703 184701
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 526763, 185153 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 17.60 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 55.10 mg/kg Lead Measured Concentration: 617.70 mg/kg Nickel Measured Concentration: 22.30 mg/kg	A18SW (NW)	369	2	526763 185153
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527207, 184291 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 13.10 mg/kg Cadmium Measured Concentration: 0.70 mg/kg Chromium Measured Concentration: 81.00 mg/kg Lead Measured Concentration: 714.00 mg/kg Nickel Measured Concentration: 26.50 mg/kg	A8NE (SE)	571	2	527207 184291

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 527717, 184227 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 21.20 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 77.40 mg/kg Lead Measured Concentration: 2046.50 mg/kg Nickel Measured Concentration: 33.50 mg/kg	A9NE (SE)	970	2	527717 184227
	BGS Urban Soil Chemistry Averages Source: British Geological Survey, National Geoscience Information Service Sample Area: London Count Id: 7209 Arsenic Minimum Concentration: 1.00 mg/kg Arsenic Average Concentration: 17.00 mg/kg Arsenic Maximum Concentration: 161.00 mg/kg Cadmium Minimum Concentration: 0.10 mg/kg Cadmium Average Concentration: 0.90 mg/kg Cadmium Maximum Concentration: 165.20 mg/kg Chromium Minimum Concentration: 13.00 mg/kg Chromium Average Concentration: 79.00 mg/kg Chromium Maximum Concentration: 2094.00 mg/kg Lead Minimum Concentration: 11.00 mg/kg Lead Average Concentration: 280.00 mg/kg Lead Maximum Concentration: 10000.00 mg/kg Nickel Minimum Concentration: 2.00 mg/kg Nickel Average Concentration: 28.00 mg/kg Nickel Maximum Concentration: 506.00 mg/kg	A13SE (SE)	0	2	526929 184808
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	171	2	526929 185000
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	171	2	526929 185000
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	171	2	526929 185000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	171	2	526929 185000
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	171	2	526929 185000
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	171	2	526929 185000
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	2	526929 184808
	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	A13SE (SE)	0	2	526929 184808

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	**Contemporary Trade Directory Entries** Name: Daily Carpet Cleaning Location: 90 Belsize Lane, London, NW3 5BE Classification: Carpet, Curtain & Upholstery Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	149	-	526784 184870
30	**Contemporary Trade Directory Entries** Name: Gems Dry Cleaning Co Ltd Location: 90, Belsize Lane, London, NW3 5BE Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	150	-	526784 184870
30	**Contemporary Trade Directory Entries** Name: Mr Lewis Cohens Fry Cleaning Co Location: 90, Belsize Lane, London, NW3 5BE Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	150	-	526784 184870
30	**Contemporary Trade Directory Entries** Name: Smoother You Ltd Location: 1, McCrone Mews, Belsize Lane, London, NW3 5BG Classification: Electrolysis **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	162	-	526777 184884
30	**Contemporary Trade Directory Entries** Name: Auto Reliant Suspension Co Location: 25, Daleham Mews, London, NW3 5DB Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	170	-	526768 184884
30	**Contemporary Trade Directory Entries** Name: Comac Motors Location: 19, Daleham Mews, London, NW3 5DB Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	184	-	526770 184911
30	**Contemporary Trade Directory Entries** Name: Daleham Garage Location: 14, Daleham Mews, London, NW3 5DB Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	192	-	526749 184894
30	**Contemporary Trade Directory Entries** Name: Continental Autos Location: 10, Daleham Mews, London, NW3 5DB Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	205	-	526749 184917
31	**Contemporary Trade Directory Entries** Name: Pyramid Cleaners Location: 52, Belsize Lane, London, NW3 5AR Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (N)	168	-	526874 184984
32	**Contemporary Trade Directory Entries** Name: Chalcot House Services Location: 47, Belsize Park Gardens, London, NW3 4JL Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (E)	253	-	527182 184746
32	**Contemporary Trade Directory Entries** Name: Chalcot House Services Location: Flat 1, 51, Belsize Park Gardens, London, NW3 4JL Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (E)	275	-	527202 184737
33	**Contemporary Trade Directory Entries** Name: 47 Jours Design Location: 19, Glenloch Road, London, NW3 4DJ Classification: Soft Furnishings - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NE (NE)	274	-	527191 184943

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
123	**Contemporary Trade Directory Entries** Name: K C Gray Ltd Location: 341-347, Finchley Road, London, NW3 6ET Classification: Engineers - General **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	990	-	525978 185122
123	**Contemporary Trade Directory Entries** Name: Alan Day Location: Finchley Rd, London, NW3 6LT Classification: Commercial Vehicle Dealers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12NW (W)	990	-	525978 185122
124	**Contemporary Trade Directory Entries** Name: Kronus (Uk) Ltd Location: 6, Park End, London, NW3 2SE Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NE (N)	979	-	527263 185752
125	**Contemporary Trade Directory Entries** Name: Oven Cleaning (Hampstead) Location: 32, Downshire Hill, London, NW3 1NT Classification: Oven cleaning **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NE (N)	988	-	527034 185812
126	**Contemporary Trade Directory Entries** Name: Destination Skin Location: 12, Heath Street, London, NW3 6TE Classification: Electrolysis **Status: Active** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	989	-	526396 185655
127	**Contemporary Trade Directory Entries** Name: Cincimanio Location: 60, Dunboyne Road, London, NW3 2YY Classification: Architectural Woodwork **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19SE (NE)	993	-	527784 185355
128	**Fuel Station Entries** Name: Belsize Park Service Station Location: Belzier Park Service Station, 215, Haverstock Hill, London, NW3 4QE Brand: BP Premises Type: Petrol Station **Status: Open** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	468	-	527187 185227
129	**Fuel Station Entries** Name: Hampstead Service Station Location: 104a, Finchley Road, London, NW3 5EY Brand: BP Premises Type: Petrol Station **Status: Open** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	501	-	526471 184554
130	**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	A7SE (SW)	965	-	526423 183961
131	**Points of Interest - Commercial Services** Name: Auto Reliant Suspension Co Location: 25 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	170	8	526768 184884
131	**Points of Interest - Commercial Services** Name: J R J Motors Location: 25 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	170	8	526768 184884

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
131	**Points of Interest - Commercial Services** Name: Comac Motors Location: 19 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	184	8	526770 184911
131	**Points of Interest - Commercial Services** Name: Daleham Garage Location: 14 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	192	8	526749 184894
131	**Points of Interest - Commercial Services** Name: Daleham Garage Location: 14 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	192	8	526749 184894
131	**Points of Interest - Commercial Services** Name: Comac Motors Location: 13 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	197	8	526773 184937
131	**Points of Interest - Commercial Services** Name: Continental Autos Location: 10 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	205	8	526749 184917
131	**Points of Interest - Commercial Services** Name: Continental Autos Location: 10 Daleham Mews, London, NW3 5DB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13NW (NW)	205	8	526749 184917
132	**Points of Interest - Commercial Services** Name: Hampstead Motor Services Ltd Location: 4 Lambolle Place, London, NW3 4PD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14SW (SE)	418	8	527295 184591
132	**Points of Interest - Commercial Services** Name: Porsheworx Location: 2 Lambolle Place, London, NW3 4PD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14SW (SE)	418	8	527303 184607
132	**Points of Interest - Commercial Services** Name: Autotech London Ltd Location: 3 Lambolle Place, London, NW3 4PD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14SW (SE)	418	8	527299 184600
132	**Points of Interest - Commercial Services** Name: Porsheworx Engineering Location: 2 Lambolle Place, London, NW3 4PD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14SW (SE)	418	8	527302 184606
132	**Points of Interest - Commercial Services** Name: Hampstead Motor Services UK Ltd Location: 4 Lambolle Place, London, NW3 4PD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14SW (SE)	418	8	527295 184591
132	**Points of Interest - Commercial Services** Name: Autotech Hamstead Location: 3 Lambolle Place, London, NW3 4PD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14SW (SE)	418	8	527299 184599

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
149	**Points of Interest - Commercial Services** Name: Thorne Henderson Location: 79 Loudoun Road, London, NW8 0DQ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7SE (SW)	977	8	526346 183997
150	**Points of Interest - Education and Health** Name: Daleham House Location: 5 Daleham Gardens, London, NW3 5BY Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A13SW (W)	237	8	526684 184727
151	**Points of Interest - Education and Health** Name: Eating Disorders Intensive Service Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A19SW (NE)	682	8	527297 185410
151	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A19SW (NE)	682	8	527297 185410
151	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Hospitals Positional Accuracy: Positioned to address or location	A19SW (NE)	682	8	527297 185410
151	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Accident & Emergency Department Positional Accuracy: Positioned to address or location	A19SW (NE)	682	8	527297 185410
151	**Points of Interest - Education and Health** Name: Royal Free Hospital Location: Royal Free Hospital, Pond Street, London, NW3 2QG Category: Health Practitioners and Establishments Class Code: Accident & Emergency Department Positional Accuracy: Positioned to address or location	A18SE (NE)	693	8	527240 185454
152	**Points of Interest - Manufacturing and Production** Name: Zarka Marble Ltd Location: 43 Belsize Lane, London, NW3 5AU Category: Extractive Industries Class Code: Stone Quarrying and Preparation Positional Accuracy: Positioned to address or location	A13NW (NW)	118	8	526861 184917
152	**Points of Interest - Manufacturing and Production** Name: Zarka Marble Ltd Location: 43 Belsize Lane, London, NW3 5AU Category: Extractive Industries Class Code: Stone Quarrying and Preparation Positional Accuracy: Positioned to address or location	A13NW (NW)	118	8	526861 184917
153	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	967	8	527251 185744
153	**Points of Interest - Manufacturing and Production** Name: Works Location: NW3 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	967	8	527252 185744
154	**Points of Interest - Public Infrastructure** Name: Belsize Fire Station Location: Belsize Fire Station 36, Lancaster Grove, London, NW3 4PB Category: Central and Local Government Class Code: Fire Brigade Stations Positional Accuracy: Positioned to address or location	A13SE (SE)	401	8	527241 184539

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
169	**Underground Electrical Cables** Unique Feature Identifier: 265403 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A13NW (NW)	56	9	526883 184851
170	**Underground Electrical Cables** Unique Feature Identifier: 265525 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A13NW (NW)	57	9	526882 184852
171	**Underground Electrical Cables** Unique Feature Identifier: 264253 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A13NW (N)	111	9	526894 184930
172	**Underground Electrical Cables** Unique Feature Identifier: 265545 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A13NW (N)	117	9	526888 184934
173	**Underground Electrical Cables** Unique Feature Identifier: 265402 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A13SW (S)	149	9	526869 184650
174	**Underground Electrical Cables** Unique Feature Identifier: 265524 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A13SW (S)	150	9	526869 184649
175	**Underground Electrical Cables** Unique Feature Identifier: 264471 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A8NW (S)	405	9	526775 184412
176	**Underground Electrical Cables** Unique Feature Identifier: 265401 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A8NW (S)	409	9	526779 184406
177	**Underground Electrical Cables** Unique Feature Identifier: 265523 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A8NW (S)	438	9	526799 184368
178	**Underground Electrical Cables** Unique Feature Identifier: 265400 Cable Status: Commissioned Cable Type: Pilot (Communication) Record Last Updated: 4th June 2013	A8NW (S)	441	9	526803 184365

Useful Contacts

Contact	Name and Address	Contact Details
2	**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
3	**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
4	**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
5	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
6	**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
7	**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
8	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
9	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9966 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk
10	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
11	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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