Chelmer
Consultancy Services
'Groundbreaking Services'

Geo-Environmental Interpretative Report

Site	57 Cotleigh Road London NW6 2NN
Client	William McIntyre
Date	17th March 2015
Our Ref	GENV/5016

Chelmer Site Investigation Laboratories Ltd
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Chelmer Consultancy Services
'Groundbreaking Services'

William McIntyre
Ground Floor Flat
57 Cotleigh Road
London
NW6 2NN

17th March 2015

CCS Ref: GENV/5016

Dear Sirs,

GEO-ENVIRONMENTAL INVESTIGATION AT
57 COTLEIGH ROAD, LONDON NW6 2NN

1.0 INTRODUCTION & SCOPE OF WORKS

At the request of the Architectural Designer of the project, DVM Architects Ltd, a site investigation has been undertaken at 57 Cotleigh Road, London NW6 2NN.

The Client for the project was William McIntyre.

The current site investigation was commissioned to provide information on the sub-soil characteristics of the site at the location of the proposed new development, together with laboratory testing and report, in order to assist future foundations to be designed as well as a risk assessment of any possible contaminated soils at the site. A number of samples collected from these soils were chemically tested to assess the potential risk with regards to the human health of future site users and ground workers at the site.

A Phase I Desk Top Study was not requested by the client.

It is understood that the proposed development will comprise excavation of approximately 1.00m beneath the existing basement/undercroft and underpinning the party wall with No.55 Cotleigh Road. The proposed basement structure will extend beneath the main part of the house, with a lightwell to the rear of the property. *Existing* and *Proposed Development Plans* have been appended to this letter report.

2.0 GEOLOGY

According to information published by the British Geological Survey the underlying geology at this site is shown as being the London Clay Formation.

3.0 SITE WORKS

All fieldwork was generally executed in accordance with the recommendations given in British Standard BS 5930:1999+A2:2010, “Code of Practice for Site Investigations”; contamination sampling was undertaken in accordance with BS 10175: 2011, “Code of Practice for the Investigation of Potentially Contaminated Sites”.

The work at this site was undertaken on the 5th January 2015 and comprised the drilling of a single c.f.a. borehole and the excavation of two trial pits at the locations chosen by Chelmer Site Investigation Laboratories Ltd. The locations of the borehole and trial pits at this site are indicated on the appended *Sketch Fieldwork Location Plan*.

C.f.a. Borehole

A single c.f.a. borehole (BH1) was drilled at the position indicated on the appended *Sketch Fieldwork Location Plan*. Borehole BH1 was undertaken to the front of the existing property and advanced to a depth of 8.00m below existing ground level. Upon completion of borehole BH1 a standpipe was installed to a depth of 8.00m below existing ground level.

Disturbed samples were taken from the borehole at regular depth intervals within each stratum and when a change of strata was encountered.

Shear Vane Tests were also undertaken throughout the borehole in order to provide additional information on the consistency of the material encountered.

Full details of the borehole findings are given on the appended borehole record sheets.

Hand Excavated Trial Pits

Two trial pits (TP1 & TP2) were excavated at the positions indicated on the appended *Sketch Fieldwork Location Plan*. Trial pit TP1 was undertaken adjacent to the east side of the bay window at the front of the existing building and trial pit TP2 was undertaken adjacent to the rear wall of the main part of the house, at the location of the proposed lightwell.

Both trial pits TP1 & TP2 found the brick wall to be corbelled directly into MADE GROUND at a depths of 885mm and 895mm below existing ground level.

Disturbed samples were taken from the foundation underside within both trial pits (TP1 & TP2).

Mackintosh Probes were undertaken at foundation underside within each trial pit in order to provide additional information on the consistency of the material encountered.

Full details of the trial pit findings are given on the appended trial pit record sheets.

Landborne Gas Emissions Monitoring

Following the initial site work, two return gas/groundwater monitoring visits have been undertaken to the standpipe installed within borehole BH1 on 28th January 2015 and 4th February 2015.

The barometric pressure was recorded together with the level of Carbon Dioxide, Oxygen and Methane within the borehole. In addition, gas flow measurements were taken and depth to groundwater recorded.

Full details of the readings are included on the appended Gas/Groundwater Monitoring Record Sheet.

4.0 LABORATORY TESTING

The following geotechnical and contamination tests have been carried out on samples recovered from the borehole and trial pits undertaken at this site and full details are appended to this report.

The chemical testing was carried out in accordance with standard industry methods in a UKAS approved laboratory which is also currently accredited in accordance with MCERTS for the majority of its testing. Further information regarding this accreditation is available on request together with a full list of test methods if required.

Moisture Content Tests

A total of seven moisture contents have been determined for the Weathered London Clay encountered beneath the site.

The moisture content was found to range between 27% and 34%.

Atterberg Limits

The Atterberg Limits have been determined for four samples from the Weathered London Clay stratum.

For the samples tested, the liquid limit (LL) was found to range between 72% and 80%, the plastic limit (PL) was found to range between 21% and 25%, and the modified plasticity index (PI) was found to range between 46% and 55%.

These results indicate that the samples tested would be classified as Clay of 'very high' plasticity (CV) in accordance with the Casagrande Geotechnical classification system.

In addition, the samples would fall into the "high" volume change potential category of the National House Building Councils (NHBC) classification system given in Part 4 of their Standards.

pH and Sulphate Tests

The pH and sulphate content has been determined for three samples recovered at various depths from the borehole and trial pits drilled at this site.

The pH values were found to vary between 7.7 and 8.2 with the sulphate content, on a 2:1 water:soil extract found to vary between 0.05 and 0.24 g/l.

BRE Special Digest 1:2005 Concrete Classification Tests

Four samples taken from the site were selected and tested to assess the aggressive chemical environment for concrete (ACEC) within the site; two samples of MADE GROUND at depths of 0.90m and 1.00m below existing ground level from trial pit TP2 and borehole BH1 respectively and two samples of Weathered London Clay at depths of 2.00m and 8.00m below existing ground level respectively from borehole BH1.

The pH of these samples was found to range between 7.9 and 9.5.

Full details of the results are given on the appended result sheets.

Chemical Analysis

A total of three representative MADE GROUND samples were selected and tested for a range of commonly occurring contaminants and indicators of contamination including those given by the Contaminated Land Exposure Assessment (CLEA).

The contamination suite undertaken at this site included heavy metals, speciated **P**olycyclic**A**romatic **H**ydrocarbon (PAH), speciated **T**otal **P**etroleum **H**ydrocarbon (TPH), BTEX (benzene, toluene, ethylbenzene, xylene), MTBE (Methyl tertiary-butyl ether) and asbestos screening.

Waste Classification Test

A single sample was also selected and tested for Waste Acceptance Criteria (WAC) in accordance with BS EN 12457 Part 3.

Full details of the results are given on the appended results sheets.

Samples

All soil samples will be kept for a period of 28 days after the date of the invoice for this project unless otherwise notified to Chelmer Site Investigation Laboratories Ltd in writing. Should samples be required to be stored for longer than 28 days then a storage charge will be levied.

5.0 SUMMARY OF GROUND CONDITIONS

Full details of the ground conditions encountered at this site can be found on the accompanying borehole record sheet and can be summarised as follows:

Depth From (m bgl)	Depth To (m bgl)	Description
0.00	0.10	CONCRETE
0.10	1.60	MADE GROUND
1.60	8.00+	Weathered London Clay

It should be noted that the MADE GROUND depths recorded above are those encountered within the borehole undertaken during the current work. Owing to the variable nature and unknown deposition criteria of MADE GROUND it is possible that deeper or more extensive areas of MADE GROUND may exist at this site which have not been revealed by the current work.

No groundwater was encountered during the drilling process of the current investigation. However, during the return monitoring visits on 28th January 2015 and 4th February 2015 groundwater depths of 2.18m below existing ground level were recorded.

No roots were observed during the current investigation.

6.0 DISCUSSION

The current work was commissioned to provide information on the sub-soil characteristics of the site at the location of the proposed development together with laboratory testing and reporting, in order to assist future foundations to be designed.

At the time of the current investigation, as no detailed information regarding the precise loadings associated with possible new developments on site was available, the foundation design discussed below is, by necessity, general in nature.

Foundation Design - Introduction

During the current investigation MADE GROUND was encountered to a maximum depth of 1.60m below existing ground level. The MADE GROUND was found to be underlain by Weathered London Clay which was not penetrated at the maximum borehole termination depth of 8.00m below existing ground level.

The results of the Atterberg Limit tests, given above, indicate that the Weathered London Clay would fall into the "high" volume change potential category of the National House Building Councils (NHBC) classification system given in part 4 of their standards.

Foundation Design – Basement

It is understood that the proposed basement structure at this site will extend under part of the footprint of the existing property. It is expected that the founding depth will be approximately 3.00m below existing ground level. *Existing* and *Proposed Development Plans* have been appended to this letter report.

The Weathered London Clay Formation encountered at an expected basement founding depth of approximately 3.00m below existing ground level appears to have relatively good load-bearing characteristics, with the results of the in-situ strength tests indicate maximum allowable bearing pressure in the order of 175 kN/m^2. This value is considered appropriate for RC rafts and monolithic upstand RC walls at basement floor level.

London Clay is a particularly challenging material in which to dig and construct. London Clay is an over-consolidated material. Aeons ago it was thickly covered in deposits that compressed it, making it stiff and typically almost impermeable. The clay resists further compression under loading. Below a depth of about 50m this clay gives way to substantial amounts of water-bearing silt and sand. When the clay is unloaded by deep excavations compressive stress is relieved and it expands. After excavation the small immediate rebound is lost in the excavation process. However, this is not the end of the story, as the material then continues to swell, producing significant uplift at the surface within 50 years or so. If the total load of the building and basement matches or exceeds the weight of soil excavated, and the loads from the building are distributed uniformly (as far as that is possible) across the basement slab then this uplift can be minimized. Swelling clay would try to lift up any foundation piles and if a floor slab is laid directly onto the clay without being structurally connected to the basement walls then it would be lifted. Lateral stress relief will also affect the basement side walls, and will need to be allowed for during detailed design, owing to the high 'at rest' earth pressures in these over-consolidated clays.

It is expected that an amount of overburden pressure will be released, which will be partially off-set by the weight of the new structure. A heave analysis using the net reduction of effective bearing pressure is also undertaken and soil movement aspects of this project are further discussed in detail within the associated Ground Movement Assessment ref GMA/5016.

The construction would also be required to resist pressures arising from the assumed groundwater regime, which is likely to be more onerous than those indicated during the current investigation.

No groundwater was encountered during the drilling process of the current investigation. However, during the return monitoring visits on 28th January 2015 and 4th February 2015 groundwater depths of 2.18m below existing ground level were recorded.

A suitable dewatering system will therefore need to be employed during the construction of the basement. The method of dewatering used must ensure that fines are not removed because that would increase settlements and might remove support from beneath the

adjoining properties. Advice of a specialist dewatering contractor should be sought to confirm whether well-pointing will be adequate or whether other techniques will be required. It is very important that the base of foundation excavations is kept dry, the foundation base is kept square and that any soft spots are replaced and compacted prior to pouring foundation concrete.

Once the basement construction has been completed, there is always a possibility that this will act as a local "sump" for surface groundwater and run-off. Therefore, we would recommend that the basement construction is designed to minimise any ingress of groundwater. Detailed recommendations for the waterproofing system are beyond the scope of this report although it is noted that, as a minimum, it would be prudent for the system to be designed in compliance with the requirements of BS8102:2009.

At this stage, it is still unclear how the proposed basement will be built. The possible presence of groundwater above basement formation level, and the release of overburden pressure may prove conventional underpinning not suitable in this case. As an alternative, the installation of a combination of secant/contiguous piles could form the basement pile walls could be adopted.

Piled Foundations

If due to the presence of groundwater, the magnitude of anticipated loads, or for any other economic reason that shallow foundations are not deemed acceptable at this site, as an alternative, loads from the proposed development could be supported on piled foundations. At this site the piles could be bored or driven to support foundation loads mainly in adhesion within the cohesive elements of the underlying London Clay Formation. Given the nature of the ground conditions encountered, and the neighbouring buildings, a bored pile solution would appear the most appropriate. However, we do not recommend c.f.a. solid auger piles at this site as these would leave pile sides unsupported prior to placing of concrete.

It is beyond our brief to provide a full and detailed pile design and the advice of a specialist piling contractor should be sought in this respect. All pile design is of course the responsibility of the selected piling contractor, and thus the soil parameters/assumptions listed below are given for guidance purposes only. These soil parameters/assumptions relate to "static design" for vertically loaded single bored/c.f.a. piles:-

Made Ground

Bulk unit weight, γ_b –	17 kN/m^3
Effective angle of internal friction, φ'	Zero
Undrained shear strength, Su/Cu	Zero

London Clay

Bulk unit weight, γ_b -	20 kN/m^3
Undrained shear strength, Su/Cu	Approximately 110-130 kN/m^2 (interpreted from Shear Vane results)
Adhesion Factor, α	Piling contractor's advice, but within the range 0.45 to 0.60
Effective angle of internal friction, φ' -	22°
Bearing Capacity Factor, Nc	9

In addition, we have assumed that the top 2-3 metres of each pile is 'sleeved' to reduce 'heave' forces developing on the shaft.

The following table gives typical working loads for isolated bored piles to 8.00m and 10.00m below existing ground level. It is assumed that the London Clay extended beyond the maximum borehole termination depth of 8.00m below existing ground level.

Pile Type	Depth below existing ground level (m)	Diameter (m)	Working Load (tonnes)
Bored	8.00	0.30	5-10
Bored	8.00	0.45	15-20
Bored	8.00	0.60	25-30
Bored	10.00	0.30	10-15
Bored	10.00	0.45	20-25
Bored	10.00	0.60	30-35

Again, it is recommended that the advice of competent piling contractors is sought as to the most suitable pile type at this site and for confirmation of the order of working load achievable given the ground conditions encountered and the proprietary pile type selected.

Settlements of such piles can be expected to be small, typically less than 5-10mm.

Depending on pile spacing, the ultimate capacity of a pile group may be less than the sum of the ultimate capacities for the individual piles.

It should be noted that should ground conditions differing significantly from those described in our report be encountered during foundation excavation, then Chelmer Site Investigation Laboratories Ltd should be contacted immediately and that the above noted allowable bearing pressure or recommended foundation type may need to be altered accordingly.

Retaining Structures

The full design of temporary and permanent retaining structures is beyond the scope of this report. The calculation of permanent lateral pressures against the sides should relate to long-term (effective) stress analysis using critical state soil parameters. However, the following primary guidelines are accordingly considered appropriate:-

Made Ground

Bulk unit weight, γ_b - 17 kN/m^3
Effective cohesion, c' - Zero
Effective angle of internal friction, φ' - 25^o

London Clay Formation

Bulk unit weight, γ_b - 20 kN/m^3
Effective cohesion, c' - Zero
Effective angle of internal friction, φ' - 22^o

For Surcharge loading it is necessary that the analyses take account of all lateral loadings arising from potential vehicle loading and any adjacent existing foundations.

Soil strengths and loads/actions should be factored in accordance with design code adopted.

Basement Construction

Potential uplift movements relating to the proposed overburden removal are expected considering the amount of material that will be excavated in order to form the proposed basement. The construction would also be required to resist pressures arising from the assumed groundwater regime, which is likely to be more onerous than those indicated during the current investigation.

No groundwater was encountered during the drilling process of the current investigation. However, during the return monitoring visits on 28th January 2015 and 4th February 2015 groundwater depths of 2.18m below existing ground level were recorded.

Current geotechnical design standards require use of a 'worst credible' approach to selection of groundwater pressures. On sites such as this where high plasticity clays (Made Ground and in-situ) are present close to surface, the groundwater may rise to ground level, at least in the wettest winters, unless mitigation measures such as land drainage can be installed. No acceptable disposal location exists for such water (because there is no accessible watercourse nearby and Thames Water generally will not allow disposal of groundwater to the mains drainage system). As a result, use of a provisional design groundwater level equal to ground level is recommended for short-term (total stress) design situations, and equal to 0.5m below ground level for long-term (effective stress) design situations. If the design is undertaken in accordance with Eurocode 7 (BS EN 1997-1), then groundwater should be taken at ground level in both short-term and long-term situations. Further recommendations on ground water can be found within the associated Basement Impact Assessment BIA/5016.

Buried Concrete

The results of the BRE Standard Digest 1:2005 test indicates that the samples collected and tested would fall into Class AC-3 of the Building Research Establishments (BRE) classification system Special Digest Part 1:2005 "Concrete in aggressive ground".

The results of the pH and Sulphate tests undertaken on samples collected and tested from the site indicate that the samples would fall into Class DS-1.

Preliminary Contamination Assessment

The National Planning Policy Framework contains the legislative framework for the regulation of Development on a site which "is affected by contamination or land stability issues". This legislation states that decisions should ensure that "the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation" and that "adequate site investigation information, prepared by a competent person, is presented." A Competent Person is defined as "a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation". Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the "developer and/or landowner." It also states that "all investigations of land potentially affected by contamination should be carried out in accordance with established procedures (such as BS10175 (2001)."

The Contaminated Land Exposure Assessment (CLEA) model was originally published in March 2002 as joint DEFRA/EA publications; Contaminated Land Research (CLR) Report CLR 11, with Report CLR7 as a supporting document, providing toxicity data and human tolerable daily intake (TDI) data to be used with this model. This model enabled the derivation

of more site-specific values for contaminants present on a site, rather than the use of 'generic' values, which were previously used.

It should be noted that the CLEA software has limited functionality and contains algorithms, which the EA has publicly expressed its intention to update. As a consequence of this, some of the screening values generated by the CLEA software may not adequately reflect specific site conditions and in some instances are unduly conservative. In addition, it should also be noted that the figures given in the appended table are based on a 6% soil organic matter (som) content.
The DEFRA/EA model has been developed on the basis of many critical assumptions about possible exposure to soil contamination and the development of conceptual exposure models to describe different land uses as follows:

Residential with plant uptake	Mainly refers to residential gardens in which vegetables are grown.
Residential without plant uptake	Refers to areas which have gardens (e.g. blocks of flats) but without vegetable uptake.
Open Spaces	Areas of open space only – not allocated for any specific usage.
Commercial /Industrial	Commercial/industrial usage where there are open areas which are not hard surfaced.

DEFRA/EA previously published a number of Soil Guideline Values (SGVs) for certain determinands, (common toxic metals), which were generic guideline criteria for assessing the risks to human health from chronic exposure to soil contamination for standard land-use functions. However, these were withdrawn in late 2008 and DEFRA/EA have now issued a new set of guidance documents. With regard to the Chelmer Site Investigations standard suite of tests, currently SGV figures have only been issued for Arsenic, Cadmium, Mercury, Nickel, Phenols and Selenium.

In the absence of currently published SGV values for the remaining contaminants, Messrs. W. S. Atkins have derived ATRISK^{soil} Soil Screening Values (SSVs) based on the new 2009 guidance (SC050021/SR3 (the CLEA Report) and SC050021/SR2 (the TOX report)) for commercial/industrial, residential without homegrown produce, residential with homegrown produce and allotment land uses. These have been based on the default assumptions provided in the CLEA report which it is understand will be used in the development of future Soil Guideline Values by DEFRA and the Environment Agency. Atkins SSVs have been derived in line with the new guidance using CLEA model v1.04. As the inhalation of vapour pathway contributes less than ten percent of total exposure, this is unlikely to significantly affect the combined assessment criterion and the SSV values used are the combined assessment criterion given by CLEA if free product is not observed.

The SGV and SSV levels represent "intervention" levels above which the levels of contamination may pose an unacceptable risk to the health of site-users such that further investigation and/or remediation is required.

Neither CLEA nor ATRISK currently publish values for Hexavalent Chromium. Therefore, both Total Chromium and Hexavalent Chromium values have been compared against the Land Quality Management/Chartered Institute of Environmental Health (LQM/CIEH) Generic Assessment Criteria published in 2009 and based on CLEA v1.04 with Total Chromium values based on Chromium III.

Total Petroleum Hydrocarbons are considered in accordance with the fractions proposed by The Environment Agency, drawing on the TPHCWG methodology. These are contained in Table 4.2 – Petroleum hydrocarbon fractions for use in UK human health risk assessment,

based on Equivalent Carbon (EC) number, contained in Science Report P5-080/TR3, *The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils.*

The results have been compared against the ***Residential with Plant Uptake*** criteria.

ASSESSMENT OF RESULTS

Soil Analysis

No samples exceeded the CLEA Soil Guideline Values (SGV), the CIEH/LQM Generic Assessment Criteria (GAC) or ATRISK Contaminated Land Screening Values (SSV) for a *Residential with Plant uptake* end usage.

The risk of significant harm to future site users is therefore considered to be '**low'** from the underlying soils.

Waste Acceptance Criteria (WAC) Tests

A EN 14473/02 Waste Acceptance Criteria (WAC) test has been undertaken during the current work and the certificate pertaining to this has been appended to this report.

The results of the WAC tests indicate that the sample of MADE GROUND from BH1 would probably be classified as 'Inert',

However, it should be noted that Chelmer Site Investigation Laboratories are not a licensed landfill operator and we therefore strongly recommend that the WAC data should be presented to potential Waste Management Companies in order for them to confirm the waste classification of surplus soils to be removed from this site and to determine its acceptability at appropriate landfill sites for disposal/treatment.

There is a requirement for waste to be treated before being disposed to landfill. Treatment must be a physical, thermal, chemical or biological process, but can include sorting, and it must change the characteristics of the waste to achieve one of the following:-

1. Reduce its volume
2. Reduce its hazardous nature
3. Facilitate its handling
4. Enhance recovery

Materials with a significant deleterious odour or with visual indicators of contamination, such as being brightly coloured or containing fibrous material should not be disposed at inert waste or exempt facilities. The waste should also not contain any significant quantities of deleterious materials such as paper, plastic, textiles, wood, gypsum and metal.

Particular care should be taken to ensure that the material contains no Hazardous waste such as asbestos or invasive weeds such as Japanese Knotweed. Materials destined for 'general fill' should also not contain significant quantities of organic matter, such as peat, topsoil or vegetation.

Landborne Gas Emissions

During the return gas/groundwater monitoring visits, the maximum concentration of methane was recorded at 0.4%v/v and the maximum carbon dioxide concentration was recorded at 0.6%v/v. A maximum flow rate of 0.1l/hr was recorded. The full landborne gas assessment details are appended.

The full land-borne gas assessment details are appended.

Due to the concentrations and associated low flow rates identified during the initial two monitoring visits, it was decided to assess whether further visits would be required. This was undertaken using guidance from BS 8576:2013 Annex F to assess the sufficiency of the data.

From the results obtained to date, the likely risk associated with ground gas is Characteristic Situation 1, taking worst case as:

0.6%v/v x 0.1 l/hr = 0.0006 l/hr (maximum limit is 0.07 l/hr)

- Keeping the flow rate at 0.1 l/hr, the gas concentration would have to increase to 70%v/v, 177 times as much as previously recorded, to move into CS 2.

- Keeping the same concentration, worst case recorded 0.6%v/v, the flow would have to increase to 11.7 l/hr, 117 times greater than the worst case identified.

The above required large increases in flow rates and gas concentrations that would be required to increase the risk from ground gases are not considered to be feasible. It should also be noted that the first monitoring visit was undertaken during a period of low pressure, and thus the results may represent 'worst case' scenario.

Furthermore, with the proposed basement development, the near surface soils will be excavated and removed from site. This will remove the source of any potential ground gas from the MADE GROUND, and thus further reduce the ground gas risk. The underlying geology encountered is also considered to be impermeable, and thus the migration of gases is considered to be a 'low' risk.

It is therefore considered that further gas monitoring is not required and the site would thus be classified as **GREEN**, or **Characteristic Situation 1.** However this should be agreed with the Local Authority, prior to development.

Conceptual Site Model

The Conceptual Site Model summarizes the potential On-Site sources/pathways/receptors at this site. No off-site sources were considered.

CIRIA Contaminated Land Risk Assessment Table

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Source	Potential Contaminants	Receptors	Pathways	Associated Hazard (Severity)	Likelihood of occurrence	Potential Risk	Notes
MADE GROUND	Heavy Metals TPHs PAHs Ground Gases	Sites Users (including young children) Neighbours Construction Workers	Direct contact, ingestion	Medium	Unlikely	Low	Low concentrations identified
			Inhalation of vapours (acute)	Severe	Unlikely	Low	Low gas concentrations recorded
			Inhalation of vapours (chronic)	Medium	Unlikely	Low	Low gas concentrations recorded
			Ingestion of contaminated water through water main pipework	Medium	Unlikely	Low	Low concentrations identified
		Surface Water	Leaching, lateral migration of shallow groundwater	Medium	Unlikely	Low	Low concentrations identified
		Groundwater	Leaching, migration through granular material	Medium	Unlikely	Low	Low concentrations identified
		Services	Direct contact	Medium	Unlikely	Low	Low concentrations identified

7.0 ENVIRONMENTAL RECOMMENDATIONS

No elevated concentrations were identified during this this investigation. It is therefore considered the site poses a 'low' risk to future site users and thus further works regarding contaminated land are not considered necessary.

We would recommend that standard Health and Safety precautions be taken with regard to ground workers at this site. These should include PPE equipment such as gloves, overalls etc. to prevent dermal contact with the soils. Washing facilities should be made available on-site to reduce extended contact with site soils. During the construction phase, dust suppression measures may be required to minimise potential inhalation of dust by neighbours or ground workers.

With regard to the installation of any future water supply pipe work, reference should be made to the Water Regulations Advisory Service (WRAS) information and guidance note, The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land. It is recommended that the results of the contamination testing undertaken on the site should be provided to the water supplier in order to ensure that any pipe provided complies with their requirements, to reduce the potential risk from damaged services.

As always, it must be noted that the above recommendations are based on a selected number of representative samples and further testing may be required if any other contamination is suspected or encountered during future groundworks.

We trust that you will find the enclosed information of value but should you have any queries please do not hesitate to contact the writer at the above noted address.

Yours sincerely,

Alexandra Ash MEng (Hons)
Graduate Geotechnical Engineer

Jack Hunter BSc (Hons)
Geo-Environmental Engineer

for CHELMER SITE INVESTIGATION LABORATORIES LIMITED

Chelmer Site Investigations 'Groundbreaking Services'

Client:	Eddie McIntyre	Scale:	N.T.S.	Sheet No:	1 of 1	Weather:	Overcast	Date:	05.01.15
Site:	57 Cotleigh Road, London, NW6 2NN	Job No:	5016	Borehole No:	1	Boring method:	CFA 100mmØ Secondman		

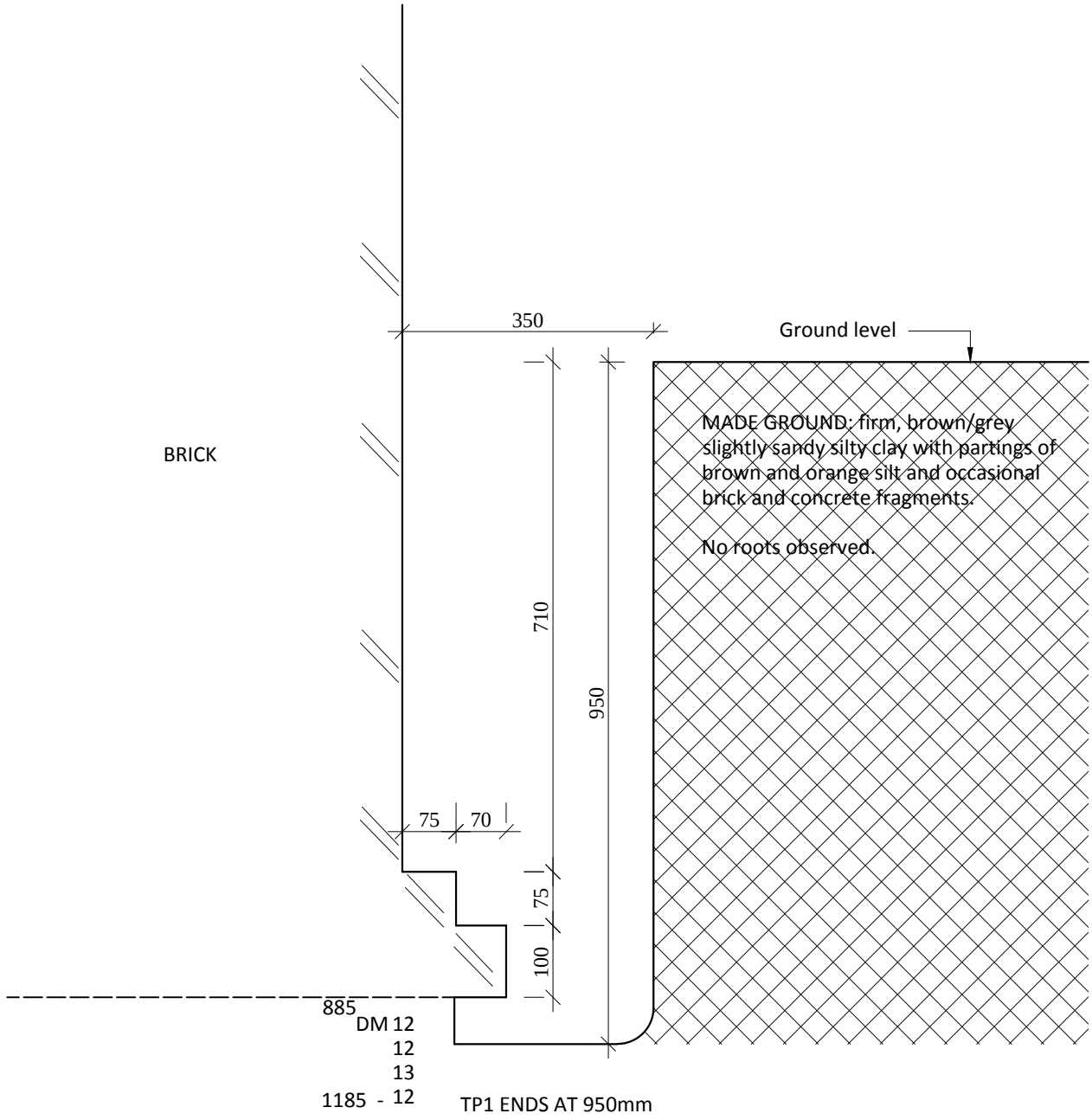
Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.1							
0.1	MADE GROUND: firm, brown/grey, slightly sandy silty clay with partings of brown and orange silt and fine sand and occasional brick and concrete fragments.	1.5		D			No roots observed.		0.25
				D					0.5
				D					0.75
				D	V	81 91			1.0
1.6				D					1.5
	Stiff, brown, slightly sandy silty CLAY with partings of brown and orange silt and fine sand.	1.8		D	V	110 120			2.0
				D					2.5
	Becoming very stiff from 3.0m.			D	V	130+ 130+			3.0
3.4				D					3.5
	Very stiff, dark brown, silty CLAY with partings of brown and orange silt and fine sand.	3.5		D	V	130+ 130+			4.0
				D					4.5
				D	V	130+ 130+			5.0
				D					5.5
				D	V	130+ 130+			6.0
6.9				D	V	130+ 130+			7.0
	Very stiff, dark brown, silty CLAY with fine crystals.	1.1							
8.0				D	V	130+ 130+			8.0
	Borehole ends at 8.0m								

Drawn by: PL **Approved by:** JH

Remarks: *Borehole dry and open on completion. Standpipe installed to 8.0m.*

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Client: Eddie McIntyre	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Date:** 05.01.15
Location: 57 Cotleigh Road, London, NW6 2NN	**Job No:** 5016	**Trial Pit No:** 1	**Weather:** Overcast
Excavation Method: Hand Tools		**Drawn by:** PL	**Checked by:** JH

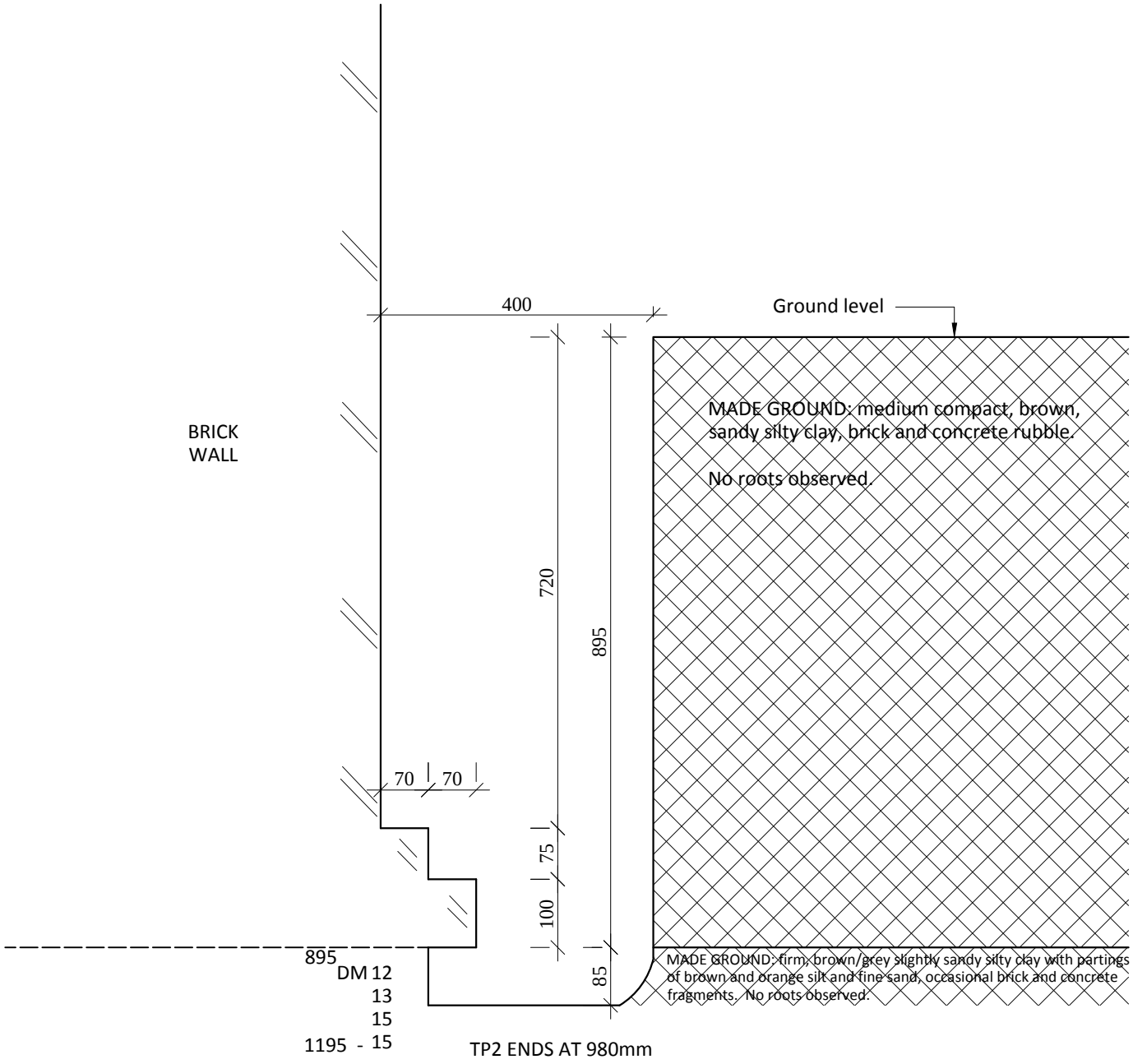


Remarks: Both foundations are similar.

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Eddie McIntyre	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Date:** 05.01.15
Location: 57 Cotleigh Road, London, NW6 2NN	**Job No:** 5016	**Trial Pit No:** 2	**Weather:** Overcast
Excavation Method: Hand Tools		**Drawn by:** PL	**Checked by:** JH



Remarks:

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

UKAS TESTING
8284

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Content Summary

This report contains all test results as indicated on the test instruction/summary (Form Q17).

CGL Reference :	CGL04581
Client Reference :	CSI5016
For the attention of :	Eddie Mclntyre
This report comprises of the following :	2 Page(s) of Results
	1 Moisture/Shear Strength Chart
	1 Plasticity Chart
	4 Page(s) BRE SD1 Result(s)

Notes :

General

Please refer to report summary notes for details pertaining to methods undertaken and their subsequent accreditations

Samples were supplied by Chelmer Site Investigations

All tests performed in-house unless otherwise stated

Deviant Samples

Samples were received in suitable containers	Yes
A date and time of sampling was provided	Yes
Arrived damaged and/or denatured	No

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories "Groundbreaking Services"

Job Number : CGL04581
Client : Eddie McIntyre
Client Reference : CSI5016
Site Name : 57 Cotleigh Road, London, NW6 2NN

Date Received : 09/01/2015
Date Testing Started : 09/01/2015
Date Testing Completed : 16/01/2015
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
TP1	0.9	59403	D													8.2	0.04	0.05	DS-1

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D - Disturbed sample
B - Bulk sample
U - U100 (undisturbed sample)
W - Water sample
ENP - Essentially Non-Plastic
U/S - Underside Foundation

UKAS TESTING 8284

Comments :-

Technician :- LE/MT/HS
Checked By :- MC
Date Checked :- 16-Jan-15

Laboratory Testing Results

BS 1377 : 1990

Job Number : CGL04581
Client : Eddie McIntyre
Client Reference : CSI5016
Site Name : 57 Cotleigh Road, London, NW6 2NN

Date Received : 09/01/2015
Date Testing Started : 09/01/2015
Date Testing Completed : 16/01/2015
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH1	2.0	59406	D	33	<5	72	21	52	0.23	52	CV			115					
BH1	2.5	59407	D	32	<5														
BH1	3.0	59408	D	30	<5	75	22	53	0.14	53	CV			>130		7.7	0.13	0.16	DS-1
BH1	3.5	59409	D	28	<5														
BH1	4.0	59410	D	27	15	75	22	53	0.09	46	CV			>130		8.0	0.20	0.24	DS-1
BH1	4.5	59411	D	34	<5														
BH1	8.0	59412	D	31	<5	80	25	55	0.10	55	CV			>130					

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D - Disturbed sample
B - Bulk sample
U - U100 (undisturbed sample)
W - Water sample
ENP - Essentially Non-Plastic
U/S - Underside Foundation

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Comments :-

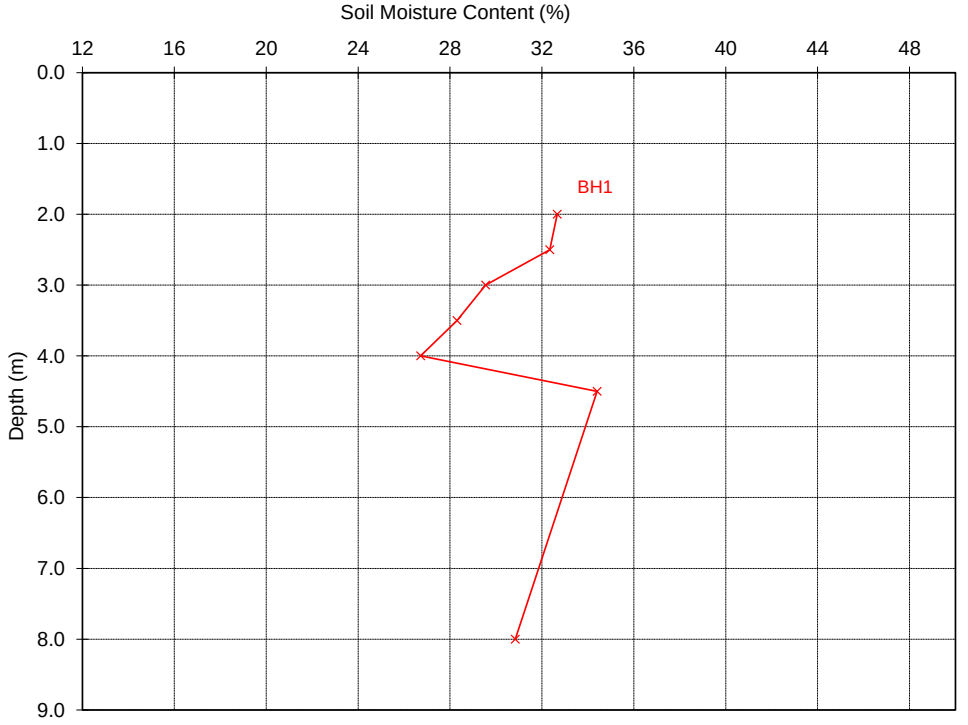
Technician :- LE/MT/HS
Checked By :- MC
Date Checked :- 16-Jan-15

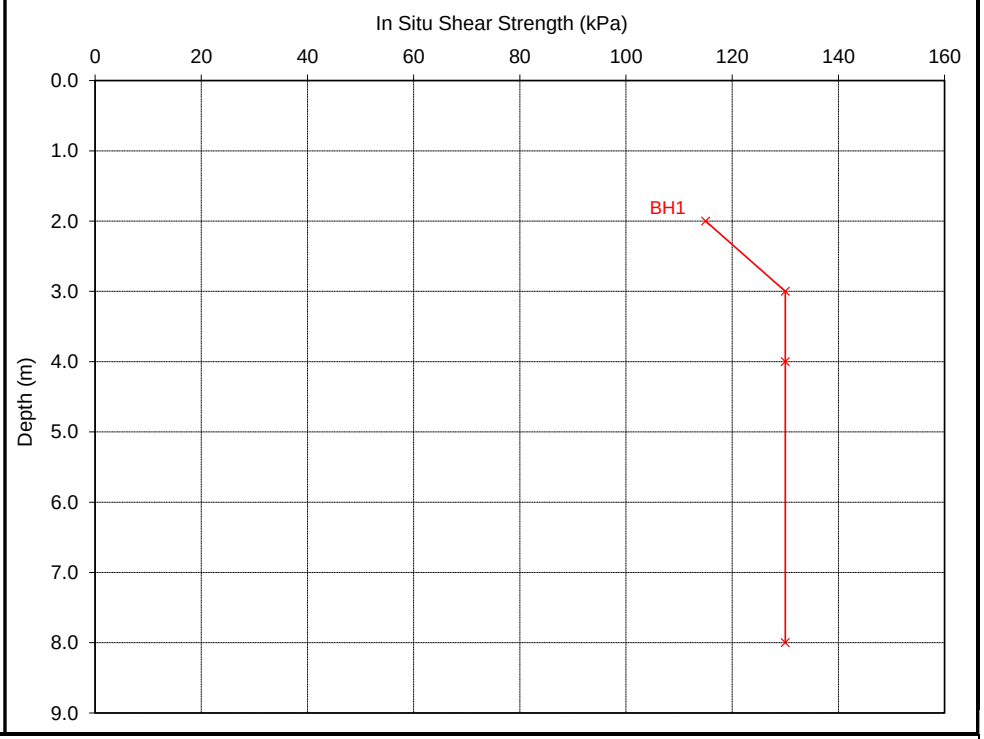
Laboratory Testing Results

Moisture Content/Shear Strength Profile

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number :	CGL04581	Date Received :	09/01/2015
Client :	Eddie McIntyre	Date Testing Started :	09/01/2015
Client Reference :	CSI5016	Date Testing Completed :	16/01/2015
Site Name :	57 Cotleigh Road, London, NW6 2NN	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB





Notes :-

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly over consolidated clays) at shallow depths.

Unless otherwise stated, values of Shear Strength were determined in situ by Chelmer Site Investigations using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 140 kPa. (Not UKAS accredited)

UKAS TESTING 8284

Comments :-

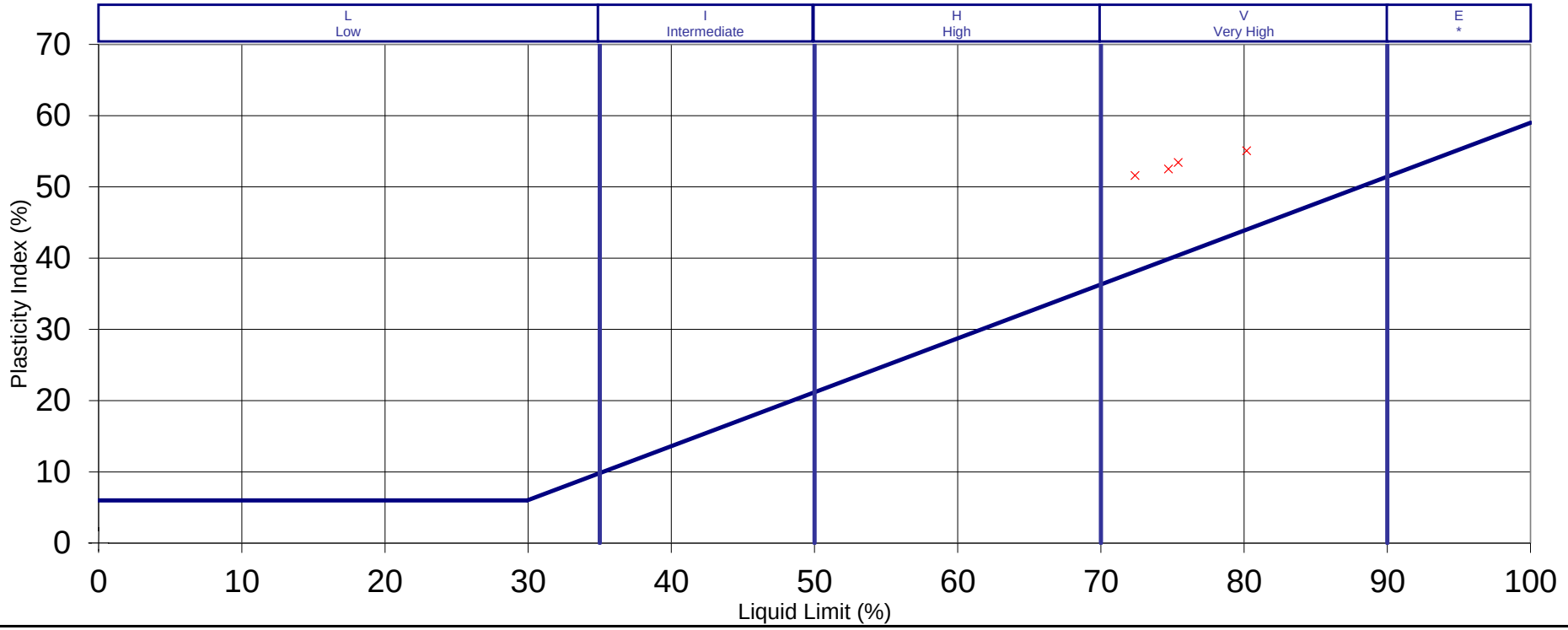
Checked By :- MC Date Checked :- 16-Jan-15

Laboratory Testing Results

Plasticity Chart for the classification of fine soils and the finer part of coarse soils
In Compliance with BS5930 : 1999

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Job Number :	CGL04581	Date Received :	09/01/2015
Client :	Eddie McIntyre	Date Testing Started :	09/01/2015
Client Reference :	CSI5016	Date Testing Completed :	16/01/2015
Site Name :	57 Cotleigh Road, London, NW6 2NN	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB



Notes :-

SILT (M-SOIL), M, plots below A-Line
CLAY, C, plots above A-Line }M and C may be combined as FINE SOIL, F.

Key :- BH1

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Comments :-

Checked By :- MC Date Checked :- 16-Jan-15

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QTS Environmental Report No: 15-27778

Site Reference:	57 Cotleigh Road London NW6 2NN
Project / Job Ref:	CSI5016 CGL04581
Order No:	PO/3620/5016/MC
Sample Receipt Date:	12/01/2015
Sample Scheduled Date:	12/01/2015
Report Issue Number:	1
Reporting Date:	16/01/2015

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
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Soil Analysis Certificate							
QTS Environmental Report No: 15-27778	**Date Sampled**	05/01/15	05/01/15	05/01/15	05/01/15	
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: 57 Cotleigh Road London NW6 2NN	**TP / BH No**	59404	59405	59406	59412	
Project / Job Ref: CSI5016 CGL04581	**Additional Refs**	TP2	BH1	BH1	BH1	
Order No: PO/3620/5016/MC	**Depth (m)**	0.90	1.00	2.00	8.00	
Reporting Date: 16/01/2015	**QTSE Sample No**	131381	131382	131383	131384	

Determinand	**Unit**	**RL**	**Accreditation**					
pH	pH Units	N/a	**MCERTS**	9.5	8.1	8.0	7.9	
Total Sulphate as SO_4	mg/kg	< 200	NONE	1745	935	707	7916	
W/S Sulphate as SO4 (2:1)	g/l	< 0.01	**MCERTS**	0.21	0.16	0.17	2.13	
Total Sulphur	mg/kg	< 200	NONE	589	329	240	2637	
Ammonium as NH_4	mg/kg	< 0.5	NONE	38.9	33.5	33.5	27.9	
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**	80	183	172	178	
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	**MCERTS**	17	35	33	13	
W/S Magnesium	g/l	< 0.0001	NONE	0.0039	0.0144	0.0294	0.3950	

Analytical results are expressed on a dry weight basis where samples are dried at less than $30^{O}C$

Analysis carried out on the dried sample is corrected for the stone content

Subcontracted analysis $^{(S)}$

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 15-27778	
Chelmer Site Investigation Laboratories Ltd	
Site Reference: 57 Cotleigh Road London NW6 2NN	
Project / Job Ref: CSI5016 CGL04581	
Order No: PO/3620/5016/MC	
Reporting Date: 16/01/2015	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
131381	59404	TP2	0.90	23.7	Brown gravelly clay with rubble
131382	59405	BH1	1.00	23	Brown clay
131383	59406	BH1	2.00	6.6	Brown clay with crystalline material
131384	59412	BH1	8.00	32.2	Brown clay with crystalline material

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

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Maidstone
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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 15-27778
Chelmer Site Investigation Laboratories Ltd
Site Reference: 57 Cotleigh Road London NW6 2NN
Project / Job Ref: CSI5016 CGL04581
Order No: PO/3620/5016/MC
Reporting Date: 16/01/2015

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001

D Dried
AR As Received

8284

This report is personal to the client, confidential and non assignable. It is issued with no admission of liability to any third party.

This report shall not be reproduced, except in full, without the written approval of Chelmer Site Investigations Laboratories Ltd.

Where our involvement consists exclusively of testing samples, the results and comments (if provided) relate only to the samples tested.

Any samples that are deemed to be subject to deviation will be recorded as such within the test summary.

Mark Collyer
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QTS Environmental Report No: 15-27801

Site Reference:	57 Cotleigh Road London NW6
Project / Job Ref:	CSI5016
Order No:	PO/3624/CSI/5016
Sample Receipt Date:	13/01/2015
Sample Scheduled Date:	13/01/2015
Report Issue Number:	1
Reporting Date:	19/01/2015

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

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Tel : 01622 850410

Soil Analysis Certificate							
QTS Environmental Report No: 15-27801	**Date Sampled**	12/01/15	12/01/15	12/01/15		
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: 57 Cotleigh Road London NW6	**TP / BH No**	59469	59471	59472		
Project / Job Ref: CSI5016	**Additional Refs**	BH1	TP1	TP2		
Order No: PO/3624/CSI/5016	**Depth (m)**	0.50	0.89	0.90		
Reporting Date: 19/01/2015	**QTSE Sample No**	131542	131544	131545		

Determinand	**Unit**	**RL**	**Accreditation**					
pH	pH Units	N/a	**MCERTS**	7.1	7.5	7.7		
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2		
Total Sulphate as SO_4	mg/kg	< 200	NONE	1148	747	1169		
W/S Sulphate as SO4 (2:1)	g/l	< 0.01	**MCERTS**	0.03	0.08	0.11		
Elemental Sulphur	mg/kg	< 10	NONE	< 10	< 10	< 10		
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5		
Arsenic (As)	mg/kg	< 2	**MCERTS**	14	12	11		
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	0.2	< 0.2	< 0.2		
Chromium (Cr)	mg/kg	< 2	**MCERTS**	38	48	29		
Copper (Cu)	mg/kg	< 4	**MCERTS**	42	31	30		
Lead (Pb)	mg/kg	< 3	**MCERTS**	206	298	211		
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	**MCERTS**	24	32	19		
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3		
Zinc (Zn)	mg/kg	< 3	**MCERTS**	101	84	259		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis $^{(S)}$

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
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Maidstone
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Tel : 01622 850410

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Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 15-27801	**Date Sampled**	12/01/15	12/01/15	12/01/15		
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: 57 Cotleigh Road London NW6	**TP / BH No**	59469	59471	59472		
Project / Job Ref: CSI5016	**Additional Refs**	BH1	TP1	TP2		
Order No: PO/3624/CSI/5016	**Depth (m)**	0.50	0.89	0.90		
Reporting Date: 19/01/2015	**QTSE Sample No**	131542	131544	131545		

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C

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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 15-27801	**Date Sampled**	12/01/15	12/01/15	12/01/15		
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: 57 Cotleigh Road London NW6	**TP / BH No**	59469	59471	59472		
Project / Job Ref: CSI5016	**Additional Refs**	BH1	TP1	TP2		
Order No: PO/3624/CSI/5016	**Depth (m)**	0.50	0.89	0.90		
Reporting Date: 19/01/2015	**QTSE Sample No**	131542	131544	131545		

Determinand	**Unit**	**RL**	**Accreditation**					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10		
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21		
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10		
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21		
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C

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Soil Analysis Certificate - BTEX / MTBE							
QTS Environmental Report No: 15-27801	**Date Sampled**	12/01/15	12/01/15	12/01/15		
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: 57 Cotleigh Road London NW6	**TP / BH No**	59469	59471	59472		
Project / Job Ref: CSI5016	**Additional Refs**	BH1	TP1	TP2		
Order No: PO/3624/CSI/5016	**Depth (m)**	0.50	0.89	0.90		
Reporting Date: 19/01/2015	**QTSE Sample No**	131542	131544	131545		

Determinand	**Unit**	**RL**	**Accreditation**					
Benzene	ug/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Toluene	ug/kg	< 5	**MCERTS**	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 2	**MCERTS**	< 2	< 2	< 2		
p & m-xylene	ug/kg	< 2	**MCERTS**	< 2	< 2	< 2		
o-xylene	ug/kg	< 2	**MCERTS**	< 2	< 2	< 2		
MTBE	ug/kg	< 5	**MCERTS**	< 5	< 5	< 5		

Analytical results are expressed on a dry weight basis where samples are dried at less than 30^{O}C

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UKAS TESTING 4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

QTS Environmental Report No: 15-27801	**Date Sampled**	12/01/15
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied
Site Reference: 57 Cotleigh Road London NW6	**TP / BH No**	59470
Project / Job Ref: CSI5016	**Additional Refs**	BH1
Order No: PO/3624/CSI/5016	**Depth (m)**	1.00
Reporting Date: 19/01/2015	**QTSE Sample No**	131543

Determinand	**Unit**	**MDL**		**Landfill Waste Acceptance Criteria Limits**		
				Inert Waste Landfill	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
TOC[MU]	%	< 0.1	0.9	3%	5%	6%
Loss on Ignition	%	< 0.01	5.70	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.7	< 0.7	1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10	500	--	--
Total PAH[MU]	mg/kg	< 1.7	< 1.7	100	--	--
pH[MU]	pH Units	N/a	7.1	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1	--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium[U]	0.04	0.02		0.3	20	100	300
Cadmium[U]	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium[U]	< 0.005	< 0.005		< 0.20	0.5	10	70
Copper[U]	0.01	< 0.01		< 0.5	2	50	100
Mercury[U]	< 0.005	< 0.005		< 0.01	0.01	0.2	2
Molybdenum[U]	0.011	0.007		< 0.1	0.5	10	30
Nickel[U]	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead[U]	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony[U]	< 0.005	< 0.005		< 0.06	0.06	0.7	5
Selenium[U]	< 0.005	< 0.005		< 0.1	0.1	0.5	7
Zinc[U]	< 0.005	< 0.005		< 0.2	4	50	200
Chloride[U]	8	2		22	800	15000	25000
Fluoride[U]	1.2	0.9		9.5	10	150	500
Sulphate[U]	44	9		104	1000	20000	50000
TDS	179	98		1023	4000	60000	100000
Phenol Index	< 0.01	< 0.01		< 0.5	1	-	-
DOC	37.8	29.2		297	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.23						
Dry Matter (%)	76.4						
Moisture (%)	31						
Stage 1							
Volume Eluate L2 (litres)	0.30						
Filtered Eluate VE1 (litres)	0.09						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 15-27801	
Chelmer Site Investigation Laboratories Ltd	
Site Reference: 57 Cotleigh Road London NW6	
Project / Job Ref: CSI5016	
Order No: PO/3624/CSI/5016	
Reporting Date: 19/01/2015	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
131542	59469	BH1	0.50	22.8	Light brown clayey gravel
131543	59470	BH1	1.00	23.6	Light brown clayey gravel
131544	59471	TP1	0.89	24.8	Light brown clayey gravel
131545	59472	TP2	0.90	15.8	Light brown clayey gravel

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 15-27801
Chelmer Site Investigation Laboratories Ltd
Site Reference: 57 Cotleigh Road London NW6
Project / Job Ref: CSI5016
Order No: PO/3624/CSI/5016
Reporting Date: 19/01/2015

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001

D Dried
AR As Received

Chelmer Consultancy Services
'Groundbreaking Services'

Contamination Test Results on Soil Samples

Location: 57 Cotleigh Road		Date : March 2015			Job No. : 5016		Sheet 1 of 1	
Borehole No.	Units	BH1	TP1	TP2	*ATRISK Contaminated Land Screening Values (SSV) derived using CLEA v1.04 for 6% SOM*			
Sample No.		131542	131544	131545				
Depth (m)		0.50	0.89	0.90	*Residential with plant uptake*	*Residential without plant uptake*	*Allotments*	*Commercial/ Industrial*
Material Type		MADE GROUND	MADE GROUND	MADE GROUND				
Aromatic Hydrocarbons (mg/kg)	>C5-C7	< 0.01	< 0.01	< 0.01	*0.06*	*0.07*	*0.07*	*7.37*
	>C7-C8	< 0.05	< 0.05	< 0.05	*14.9*	*15.2*	*106*	*1780*
	>C8-C10	< 2	< 2	< 2	*23.7*	*24.1*	*53.2*	*2700*
	>C10-C12	< 2	< 2	< 2	*132*	*147*	*71.3*	*36800*
	>C12-C16	< 2	< 2	< 2	*452*	*700*	*132*	*38000*
	>C16-C21	< 3	< 3	< 3	*804*	*1330*	*288*	*28400*
	>C21-C35	< 10	< 10	< 10	*1220*	*1330*	*1550*	*28400*
Aliphatic Hydrocarbons (mg/kg)	>C5-C6	< 0.01	< 0.01	< 0.01	*26.1*	*26.1*	*4250*	*>1000000*
	>C6-C8	< 0.05	< 0.05	< 0.05	*87.8*	*87.9*	*13900*	*>100000*
	>C8-C10	< 2	< 2	< 2	*14.5*	*14.5*	*1780*	*86700*
	>C10-C12	< 2	< 2	< 2	*87.7*	*87.8*	*7460*	*94600*
	>C12-C16	< 3	< 3	< 3	*4010*	*4050*	*13300*	*95300*
	>C16-C21	< 3	< 3	< 3	*88200*	*88900*	*281000*	*>1000000*
	>C21-C35	< 10	< 10	< 10	*88200*	*88900*	*281000*	*>1000000*
Naphthalene	mg/kg	< 0.1	< 0.1	< 0.1	*8.71*	*9.22*	*23.4*	*22700*
Acenaphthylene	mg/kg	< 0.1	< 0.1	< 0.1	*-*	*-*	*-*	*-*
Acenaphthene	mg/kg	< 0.1	< 0.1	< 0.1	*2130*	*4770*	*612*	*106000*
Fluorene	mg/kg	< 0.1	< 0.1	< 0.1	*1930*	*3100*	*725*	*72100*
Phenanthrene	mg/kg	< 0.1	< 0.1	< 0.1	*-*	*-*	*-*	*-*
Anthracene	mg/kg	< 0.1	< 0.1	< 0.1	*18300*	*24000*	*10400*	*545000*
Fluoranthene	mg/kg	< 0.1	< 0.1	< 0.1	*2160*	*3210*	*924*	*72700*
Pyrene	mg/kg	< 0.1	< 0.1	< 0.1	*1550*	*2400*	*620*	*54500*
Benzo(a)anthracene	mg/kg	< 0.1	< 0.1	< 0.1	*18*	*18.2*	*76.8*	*218*
Chrysene	mg/kg	< 0.1	< 0.1	< 0.1	*2280*	*2330*	*6350*	*22000*
Benzo(b)fluoranthene	mg/kg	< 0.1	< 0.1	< 0.1	*24.1*	*24.4*	*93*	*223*
Benzo(k)fluoranthene	mg/kg	< 0.1	< 0.1	< 0.1	*244*	*246*	*1100*	*2240*
Benzo(a)pyrene	mg/kg	< 0.1	< 0.1	< 0.1	*2.43*	*2.46*	*10.3*	*22.3*
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	< 0.1	< 0.1	*23.9*	*24.3*	*84.9*	*222*
Dibenz(a,h)anthracene	mg/kg	< 0.1	< 0.1	< 0.1	*2.4*	*2.42*	*12.3*	*22.4*
Benzo(ghi)perylene	mg/kg	< 0.1	< 0.1	< 0.1	*248*	*249*	*1630*	*2250*
TOTAL PAH	mg/kg	< 1.6	< 1.6	< 1.6				
Cyanide (Free)	mg/kg	< 2	< 2	< 2	*34*	*34*	*34*	*34*
pH	unit	7.1	7.5	7.7	*-*	*-*	*-*	*-*
Copper (Total)	mg/kg	42	31	30	*4020*	*8370*	*1110*	*109000*
Lead (Total)	mg/kg	206	298	211	*322*	*444*	*160*	*6830*
Zinc (Total)	mg/kg	101	84	259	*17200*	*46800*	*3990*	*917000*
					LQM/CIEH Generic Assessment Criteria			
Chromium (Total)	mg/kg	38	48	29	*3000*	*3000*	*34600*	*30400*
					CLEA Soil Guideline Values (SGV)			
Arsenic (Total)	mg/kg	14	12	11	*32*	*32*	*43*	*640*
Cadmium (Total)	mg/kg	0.2	< 0.2	< 0.2	*10*	*10*	*1.8*	*230*
Mercury (Total)	mg/kg	< 1	< 1	< 1	*170*	*170*	*80*	*3600*
Nickel (Total)	mg/kg	24	32	19	*130*	*130*	*230*	*1800*
Phenols (Total)	mg/kg	< 2	< 2	< 2	*420*	*420*	*280*	*3200*
Selenium (Total)	mg/kg	< 3	< 3	< 3	*350*	*350*	*120*	*13000*
Total Sulphate as SO4	mg/kg	1148	747	1169	*-*	*-*	*-*	*-*
W/S Sulphate as SO4 (2:1)	g/l	0.03	0.08	0.11				
Elemental Sulphur	mg/kg	< 10	< 10	< 10	*-*	*-*	*-*	*-*
Sulphide	mg/kg	< 5	< 5	< 5	*-*	*-*	*-*	*-*

Key

PAH - Polyaromatic Hydrocarbons
TPH - Total Petroleum Hydrocarbons
- Not determined

Result exceeds ATRISK screening value
Result exceeds EQS/CIEH generic assessment criteria
Result exceeds CLEA Soil Guideline Value (SGV)

Landborne Gas Assessment

Site Ref: 5016
Site Name: 57 Cotleigh Road, NW6 2NN

Well	Date	Methane Peak	Methane Steady	Methane GSV	Carbon Dioxide Peak	Carbon Dioxide Steady	Carbon Dioxide GSV	Oxygen	Atmos.	Flow	Response Zone	Depth to Water	CO	H2S
		%v/v	%v/v	l/hr	%v/v	%v/v	l/hr	%v/v	mbar	l/hr	m bgl	m bgl	ppm	ppm
BH1	28.01.15	0.4	0.4	0.0004	0.6	0.6	0.0006	20.9	994	0.1	1.00-8.00	2.18	0	0
	04.02.15	0.4	0.4	0.0000	0.3	0.3	0.0000	20.9	1007	0.0		2.18	0	0

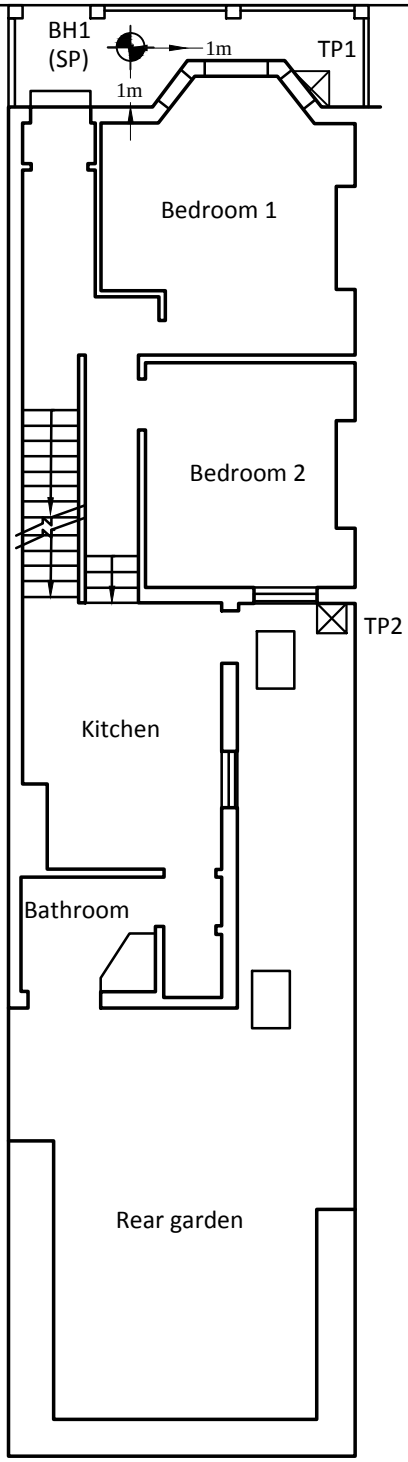
Notes

NR = Not recorded
Values in Bold exceed the CO_2 Building Regulations threshold (>1.5%)
Values in Red exceed the Buildings Regulations Action Level (CO_2 >5.0% and CH_4 >1.5%)

Client: Eddie McIntyre		**Scale:** N.T.S.	**Sheet:** 1 of 1	**Date:** 05.01.15	
Location: 57 Cotleigh Road, London, NW6 2NN		**Job No:** 5016	**Weather:** Overcast	**Drawn by: PL**	**Checked by: JH**

Cotleigh Road

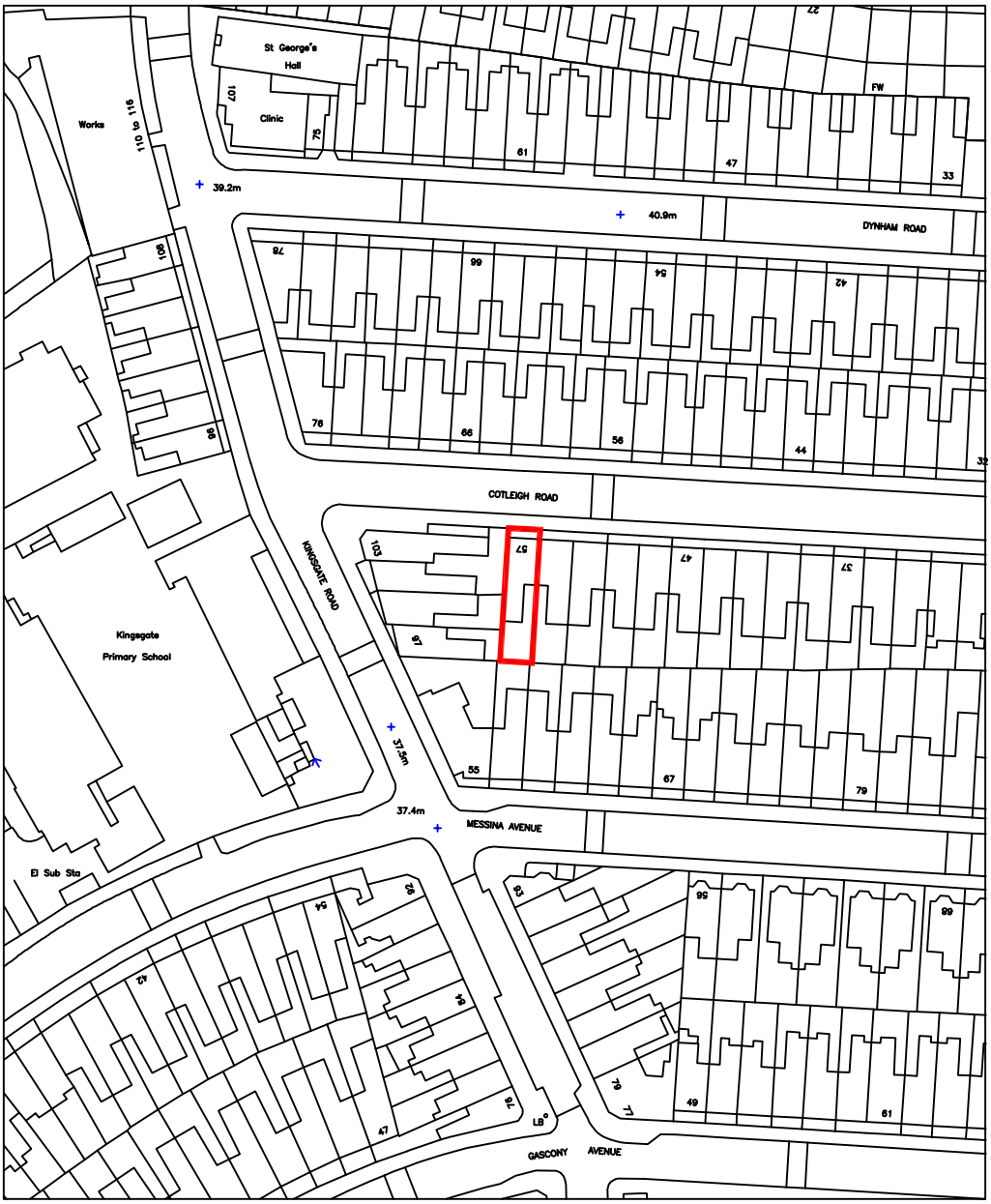
Path



Notes: *On site tree identification for guidance only. Not authenticated.*

Key:

Tree/Shrub | Borehole | Trial Pit | Gully | Tree Stump | Rain Water/ Soil Pipe | Manhole



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57 Cotleigh Road London NW6 2NN

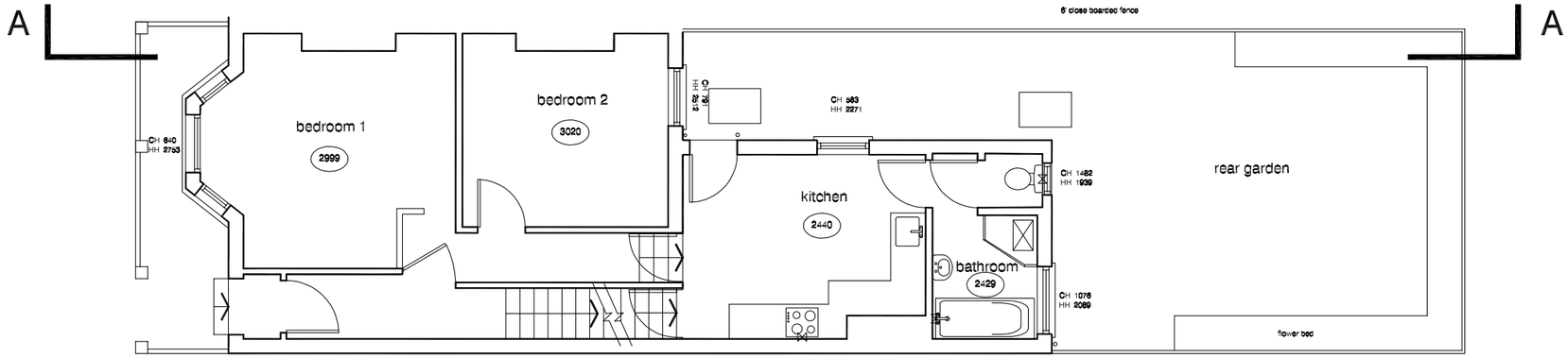
site location plan

Drg no 1859-01

N

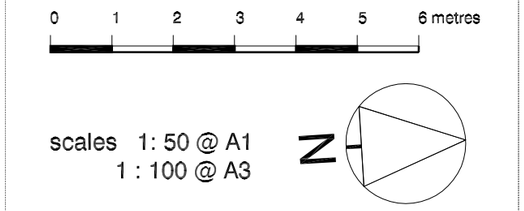
0 5 10 15 20 30 40 50

scale 1:1250 @ A4



ground floor as existing

basement as existing



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Project
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Title
Ground Floor Plan
AS EXISTING

Scale	Date	Job No.
1:100	27.06.14	1859–02

Drawing No.	Rev.
1859–02	

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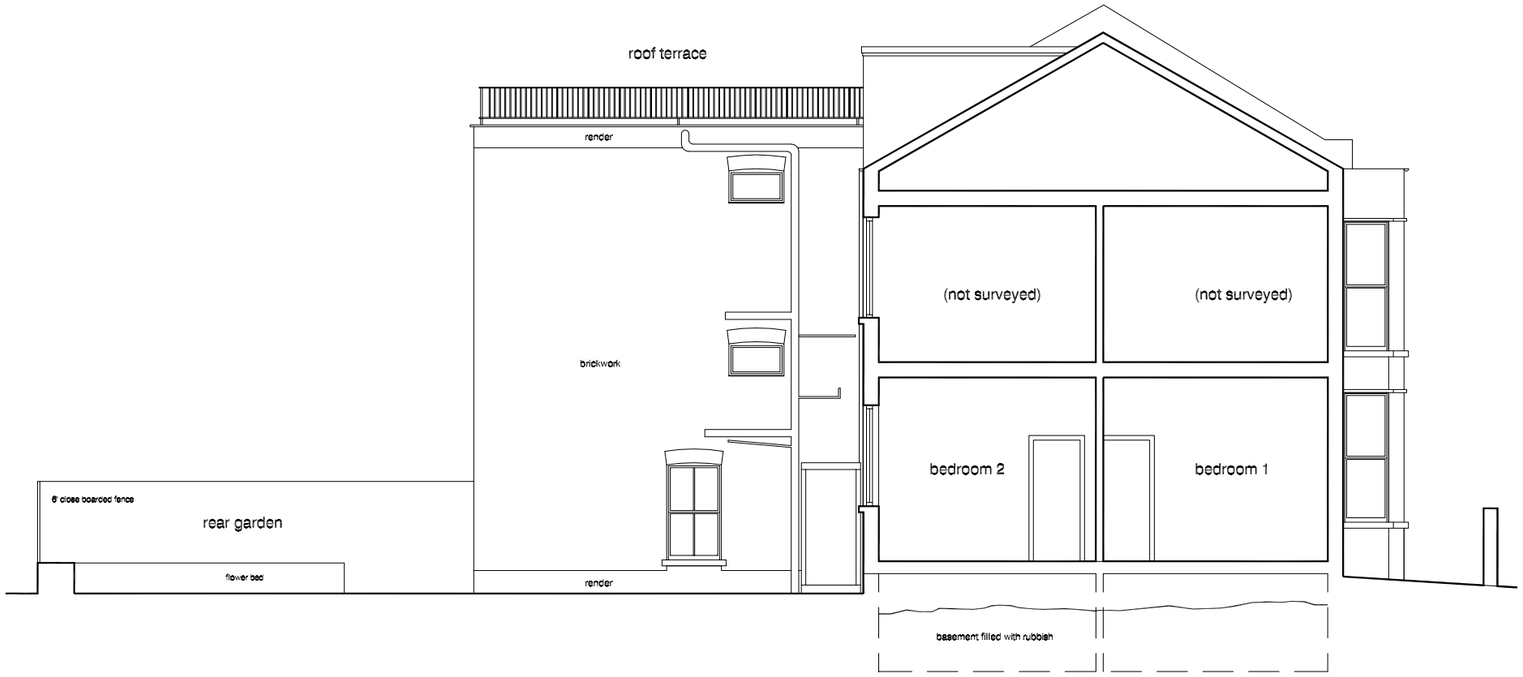
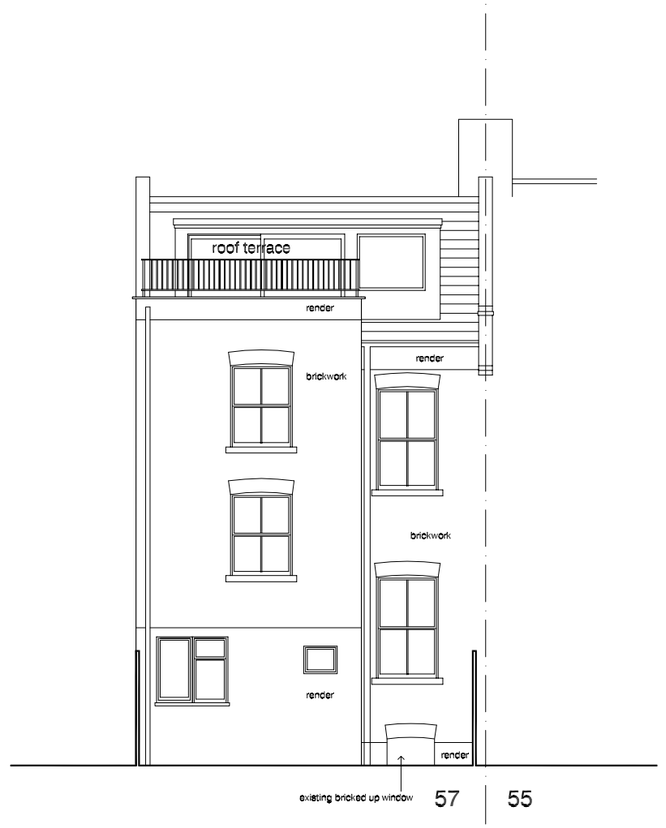


sectional elevation AA as existing



rear elevation as existing

0 1 2 3 4 5 6 metres

scales 1: 50 @ A1
1 : 100 @ A3

N

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Title
Elevations
AS EXISTING

Scale	Date	Job No.
1:100	06.10.14	1859

Drawing No.	Rev.
1859–03	A

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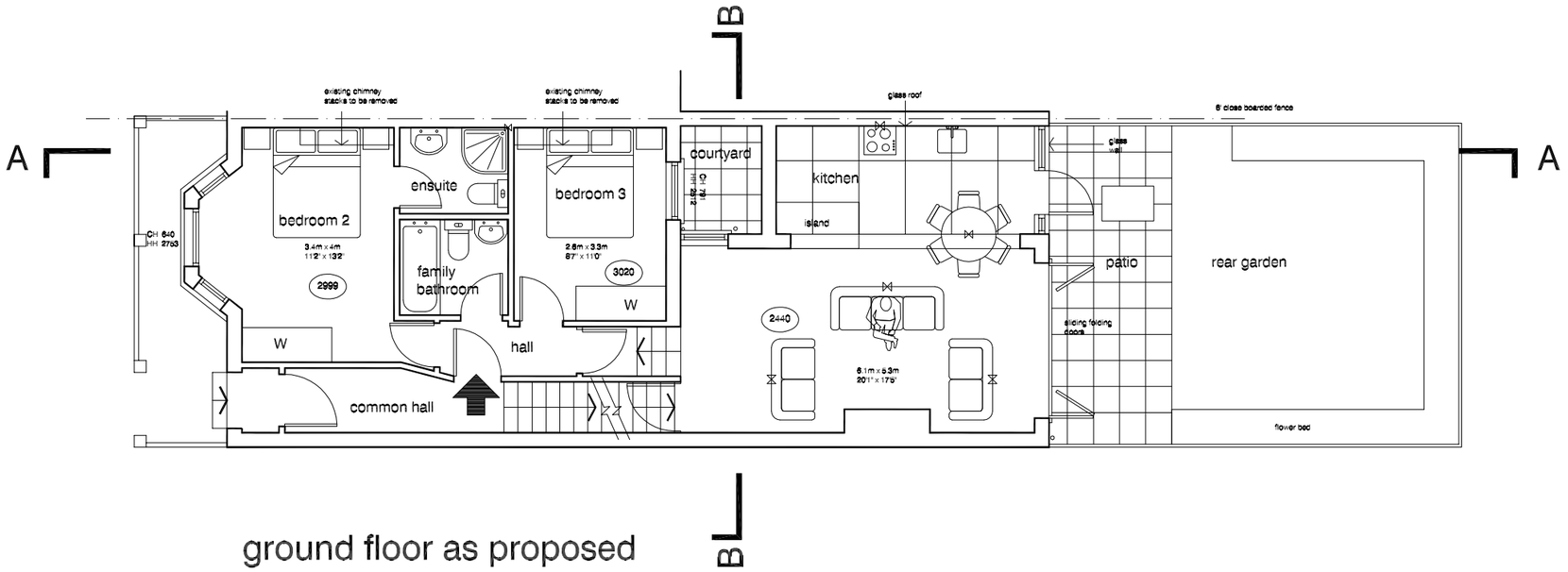
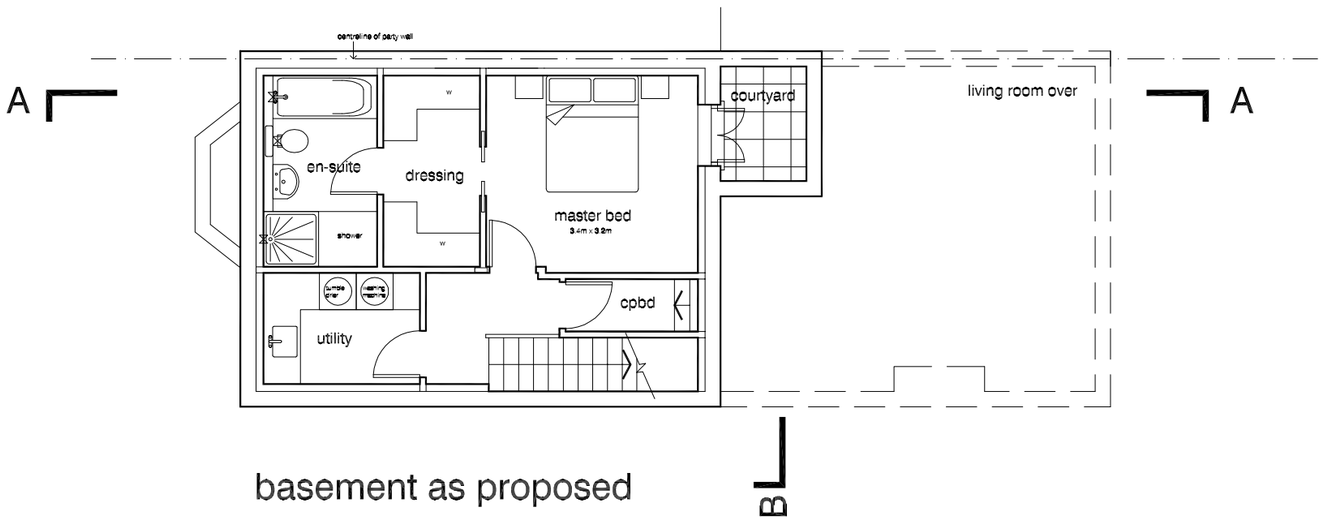
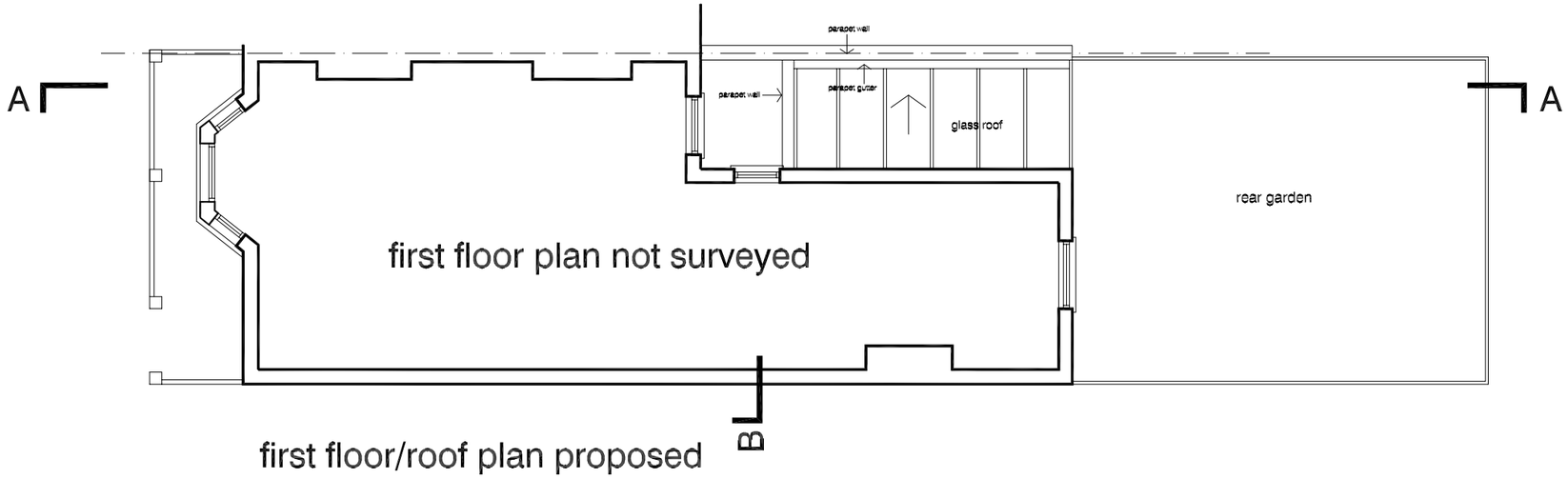


ground floor as proposed



basement as proposed



first floor plan not surveyed

first floor/roof plan proposed

0 1 2 3 4 5 6 metres

scales 1: 50 @ A1
1 : 100 @ A3

N

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Title
FLOOR PLANS
AS PROPOSED

Scale	Date	Job No.
1:100	06.10.14	1859

Drawing No.	Rev.
1859–04	B

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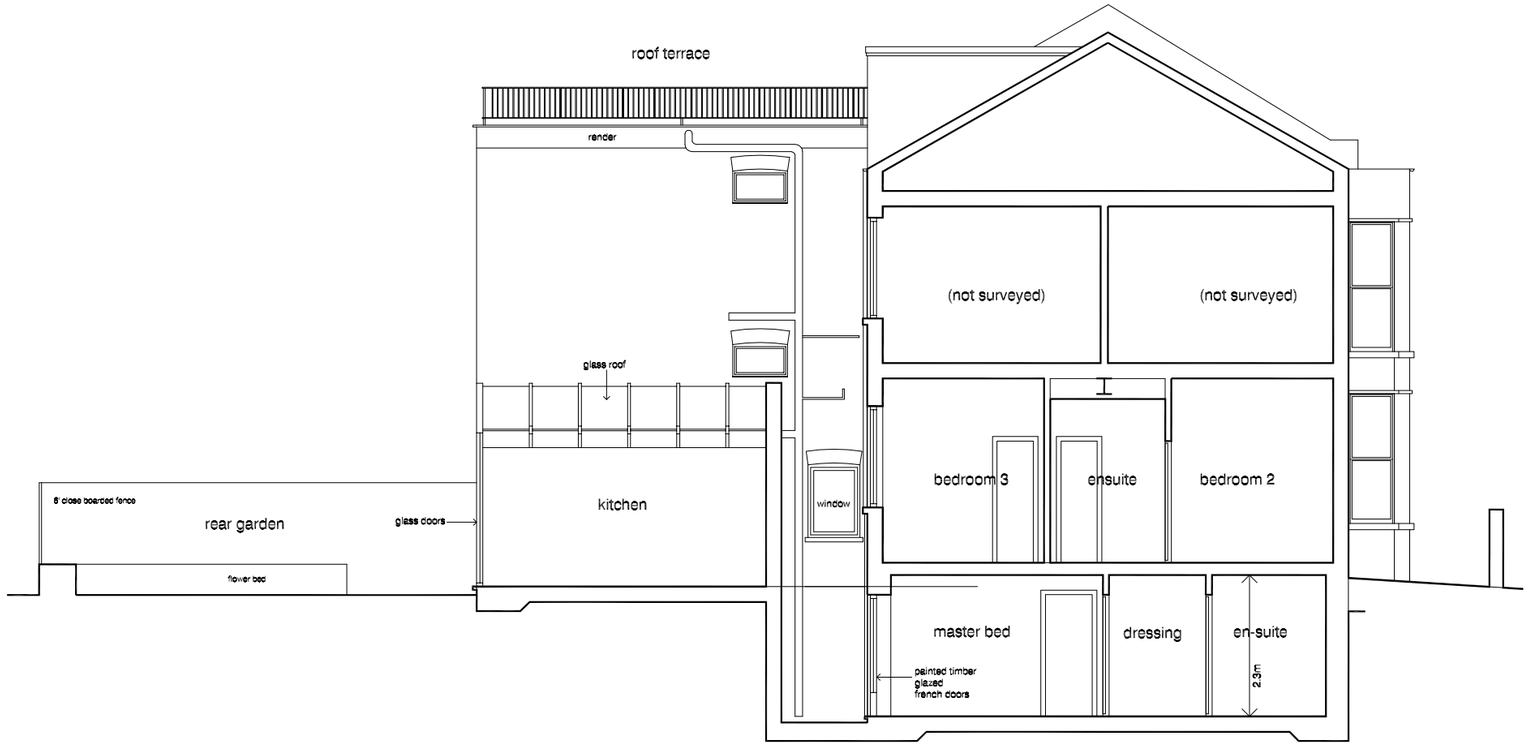
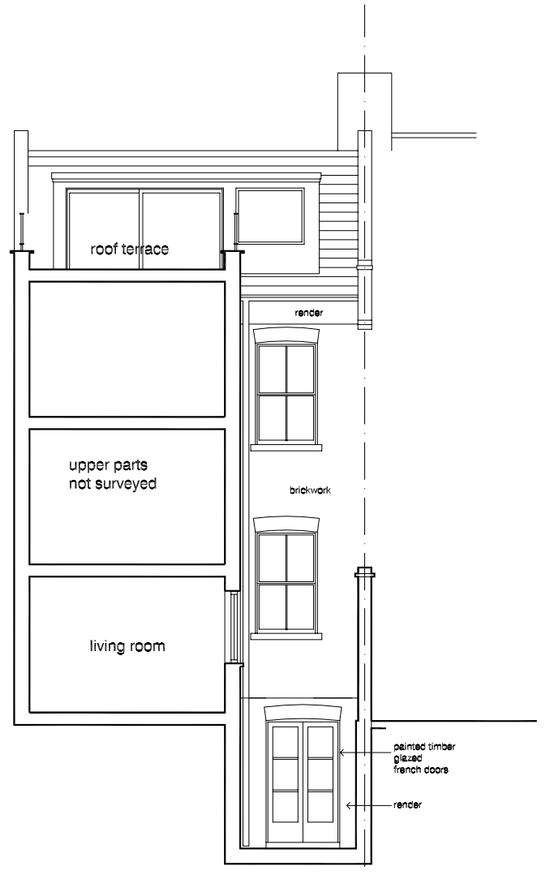
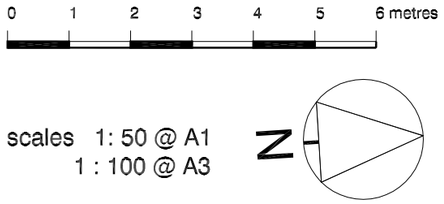


sectional elevation AA as proposed



sectional elevation
BB as proposed



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Title
Sectional Elevations
AS PROPOSED

Scale	Date	Job No.
1:100	10.06.14	1859

Drawing No.	Rev.
1859–05	A

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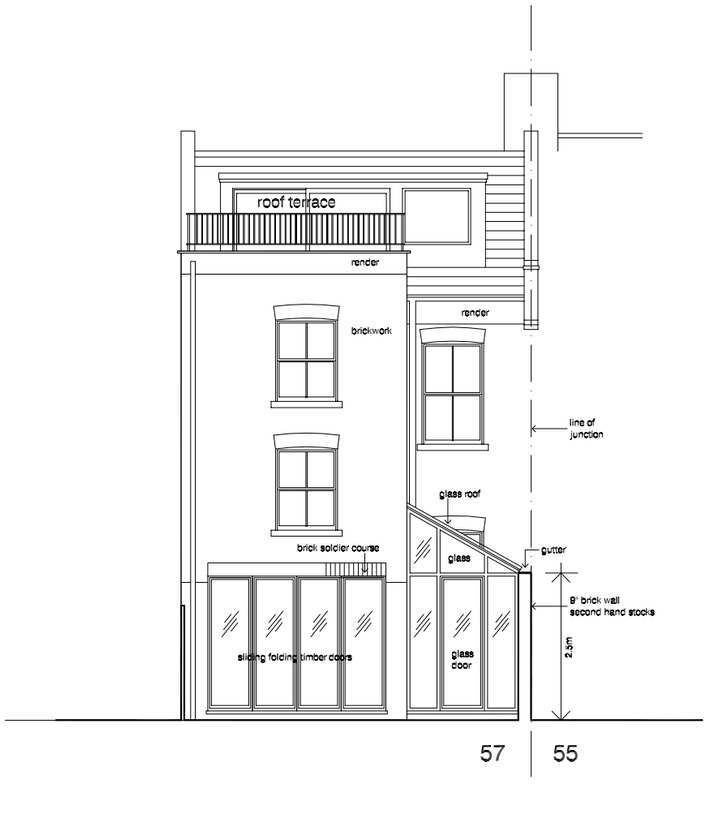

rear elevation as proposed

0 1 2 3 4 5 6 metres

scales 1: 50 @ A1
1 : 100 @ A3

N

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Title
Sectional Elevations
AS PROPOSED

Scale	Date	Job No.
1:100	10.06.14	1859

Drawing No.	Rev.
1859-06	

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