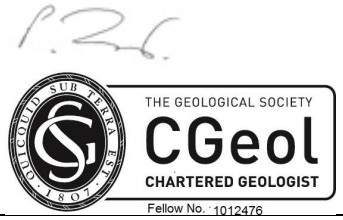
LMB GEOSOLUTIONS LTD

UPDATE OF BASEMENT IMPACT ASSESSMENT

52 DELANCEY STREET, LONDON NW1

June 2017

DOCUMENT RECORD

Document Title	Update of Basement Impact Assessment
Site	52 Delancey Street, London NW1 7RY
Document Date	9th June 2017
Document Version	Issue 1
Document Authorisation	Philip Lewis BSc (Hons), MSc, CGeol, FGS
	

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INTRODUCTION

Introduction

AUTHORISATION

LMB Geosolutions Ltd (LMB) was instructed by Oliver Gershfield and Natasha Gershfield (the Client) in May 2017 to complete an updated Basement Impact Assessment in relation to the proposed development at 52 Delancey Street, London NW1 7RY (the Site).

PROJECT AND SITE DETAILS

Site Address	52 Delancey Street, London NW1 7RY. A Site Location Plan is provided as **Figure 1**.
Proposed Development	The site comprises a three storey residential terrace property with a lower ground floor. It is proposed to redevelop the existing ground and lower ground floor of the three-storey terrace property into 2no. residential apartments. It is understood that they will achieve this by extending the existing lower ground floor of the property into the rear garden area. The Structural Engineers for the project (Davies Maguire) have indicated that it is proposed to '*use traditional underpinning locally on part of the existing garden wall, where foundations will be undermined by the new extension.*' No excavation beneath the existing lower ground floor will be undertaken. A development schematic is provided in **Appendix A**.
Background	It is understood that the following existing Basement Impact Assessment (BIA) has been issued to London Borough of Camden (LBC): • Ashton Bennett (December 2016, ref. MOG 3286). Screening & Scoping for Basement Impact Assessment at 52 Delancey Street, Camden, London. Following audit of the above report by Campbell Reith additional information was required to satisfy LBC planning. The following audit report produced by Campbell Reith on behalf of LBC has been referenced in completing the updated Basement Impact Assessment: • Campbell Reith (ref. 12466-43, February 2017). Basement Impact Assessment Audit for London Borough of Camden.
Previous Assessments	LMB has completed the following report in relation to the site and propose development:

INTRODUCTION

	• LMB Ground Investigation & Assessment. 52 Delancey Street, London NW1 (ref. LMB.17.06.07_REPPIL_GI_Delancey_v1.0, dated June 2017).

AIMS & OBJECTIVES

The information in this document aims to provide an updated Basement Impact Assessment that specifically addresses queries raised within the audit report (ref. Campbell Reith 12466-43, February 2017) and is suitable to support the planning application for the lower ground floor extension element of the proposed development.

SCOPE OF WORKS

The following scope of works has been completed:

- Review and appraisal of site specific ground and groundwater conditions based on the Ground Investigation & Assessment report (ref. LMB.17.06.07_REPPIL_GI_Delancey_v1.0, dated June 2017);
- Consultation with potential below ground asset holders (e.g. Transport for London, Crossrail etc) to ascertain if the proposed basement development is in proximity to any of their below ground assets;
- Completion of Ground Movement Assessment (GMA).
- Review of drainage proposals for the site.
- An appraisal of the potential impacts and provision of suitable mitigation measures.

CONTRIBUTORS

This report has been compiled by Philip Lewis, a hydrogeologist and chartered Geologist with over twenty years' experience as a geoscience professional, including over fifteen years' experience as a professional adviser (consultant) in hydrogeology, engineering geology and contaminated land.

Further specialist input has been provided in the form of a Ground Movement Assessment completed by Corrado Candian (CEng, MICE).

LIMITATIONS

LMB has prepared this report solely for the use of the named Client and those parties with whom a warranty agreement and/or assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from LMB and the Client.

LMB accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

b) issue of this document to any third party with whom an agreement has not been executed.

INTRODUCTION

The risk assessment and opinions provided, among other things, take in to consideration currently available guidance and best available techniques relating to acceptable contamination concentrations and interpretation of these values. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, if applied.

Baseline Data & Criteria

INTRODUCTION

As outlined the following existing Basement Impact Assessment (BIA) has been issued to London Borough of Camden (LBC):

- Ashton Bennett (December 2016, ref. MOG 3286). Screening & Scoping for Basement Impact Assessment at 52 Delancey Street, Camden, London.

The report contains baseline / desk study data in relation to the site. In addition, the Structural Engineers for the development (Davies Maguire) have produced the following report:

- Davies Maguire (June 2017, ref. DMAG-1717-CMS). Construction Method Statement for 52 Delancey Street, Camden, London.

This report also includes a desk study section which provides baseline data. As such this report does not present any desk study information but does make reference to information in the above reports.

Guidance and Frameworks

The proposed development is located in the London Borough of Camden (LBC) and the guidance and policies outlined in the following documents are considered to be relevant:

- Camden Planning Guidance: Basements and Lightwells (CPG 4); and
- LBC: Camden geological, hydrogeological and hydrological study Guidance for subterranean development (Issue 01, November 2010).

The above documents provide information and a framework for undertaking a BIA within LBC. In summary, the key aim of the documents is to ensure that basement and underground development is only permitted where it does not:

- cause harm to the built and natural environment and local amenity;
- result in flooding; or
- lead to ground instability.

LBC require that a submission for a proposed basement development should include information relating to the above within a BIA which is site and development specific to the site.

About this Assessment

In accordance with the referenced guidance and the audit review provided by LBC, this report includes the following elements:

- Site Investigation, monitoring, interpretation and ground movement assessment;

- Impact Assessment.

SIGNIFICANCE CRITERIA

The assessment of potential effects from the proposed development has taken into account both the construction and operational phases. The significance level attributed to each effect has been assessed based on the magnitude of change due to the development proposals and the sensitivity of the effected receptor/receiving environment to change, as well as a number of other factors.

Assessment criteria developed from the guidance and frameworks referenced have been used to determine the significance of the potential effects as a result of construction and operation of the proposed development.

The significance of potential effects has been determined by considering the magnitude of the effect, in terms of a change in existing baseline conditions.

Significance Measures

The following terms have been used to define the significance of the effects identified:

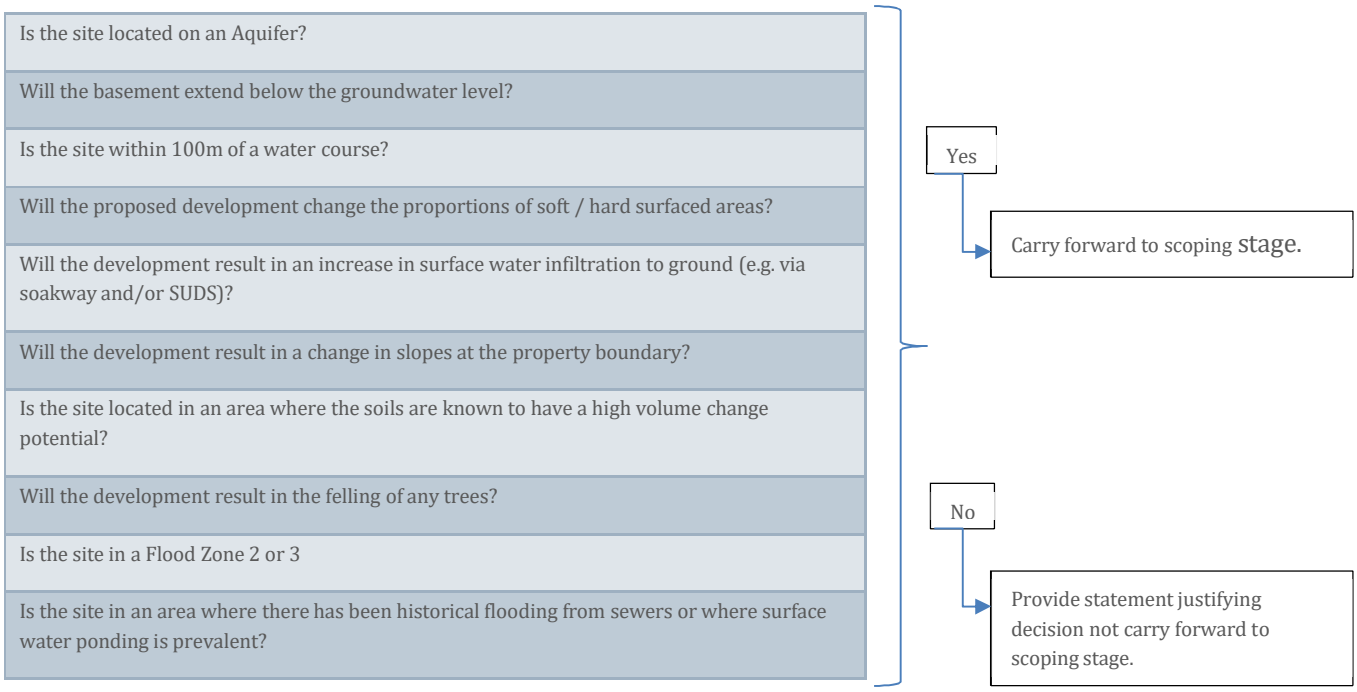
- **Major effect**: where the proposed development could be expected to have a very significant effect (either positive or negative) e.g. significant risk of flooding effect, an improvement in water quality class, allowing new uses to be made of the water resource (e.g. potable water supply) or impacts from contamination issued e.g. risk to groundwater or future site users;
- **Moderate effect**: where the proposed development could be expected to have a noticeable effect (either positive or negative) e.g. moderate flooding effect;
- **Minor effect**: where the proposed development could be expected to result in a small, barely noticeable effect (either positive or negative), but where current uses could still be maintained; and
- **Negligible**: where no discernible effect is expected as a result of the proposed development.

Screening Assessment

The information presented within the LBC guidance provides decision-making matrices to enable an initial screening assessment to be made in relation to potential impacts and issues related to proposed basement development.

The matrices specifically focus on Land Stability, Groundwater Movement and Surface flow and Flooding. An example of the type of matrix is presented below:

BASELINE DATA & CRITERIA



Baseline Conditions

BELOW GROUND ASSETS

As part of the assessment the following organisations were contacted to ascertain if they held any below ground assets below or in close proximity to the site:

- Network Rail;
- Crossrail;
- London Underground Ltd / Transport for London.

Responses have been received from London Underground and Crossrail confirm they do not hold any below ground assets in the vicinity of the site. A response from Network Rail has not been received to date.

Copies of correspondence are included in **Appendix B**.

SITE SPECIFIC GROUND & GROUNDWATER CONDITIONS

Ground Conditions

The ground investigation works were undertaken on 5th May 2017 and comprised the progression of 1no. borehole to a depth of 8.00m bgl using a modular dynamic (windowless) sampler rig and completion of 2no. hand excavated trial pit, with sampling of soil for laboratory testing.

The table below provides a summary of ground conditions encountered with full descriptions provided in the associated exploratory hole logs (ref. LMB.17.06.07_REPPIL_GI_Delancey_v1.0, dated June 2017):

Strata	Depth Range to Top (m bgl)	Depth Range to (Base (m bgl)	Summary Description
Made Ground	Ground Level	0.10 – 1.05	The ground surface at the level of the lower ground floor area (TP1 & TP2) was found to comprise concrete hardstanding. In rear garden area (BH1), the ground surface was found to comprise floor pavers and soft surfacing (soil). The Made Ground soils were generally found to comprise gravelly and locally sandy clay and gravelly sand with varying proportions of brick, brick cobbles and flint.
London Clay Formation	0.10 – 1.05	8.00(1)	In the borehole, the London Clay was found to comprise an frim becoming stiff closely and very closely fissured clay. A thin mudstone unit was encountered between approximately 5.60m and 5.70m bgl.

(1) Base of the London Clay was not determined.

BASELINE CONDITIONS

The ground conditions encountered during the investigation works are consistent with those predicted from the desk study information (Ashton Bennett, December 2016, ref. MOG 3286 & Davies Maguire, June 2017, ref. DMAG-1717-CMS).

Groundwater Conditions

Groundwater monitoring was undertaken following completion of site works on 6th June 2017.

No groundwater strikes were observed during drilling. During return monitoring groundwater was recorded at a depth of 4.89m bgl i.e. 0.11m of water at the base of the monitoring well.

Recording of groundwater in monitoring installations constructed within the London Clay is common. However, rather than being representative of a permanent and laterally continuous aquifer unit, the groundwater is present as discrete units within (for example) micro fissures and local mudstone horizons and the recorded groundwater level will most likely be reflective of the pore water pressure in these discrete features.

The ground conditions encountered during the investigation works are consistent with those predicted from the desk study information (Ashton Bennett, December 2016, ref. MOG 3286 & Davies Maguire, June 2017, ref. DMAG-1717-CMS).

Soil Infiltration

The London Clay Formation in this area comprises low permeability clay soils and reference to the CIRIA SUDS Manual and BGS data confirms that coefficients of infiltration through these soils are very low.

Summary

The information provided in the above sections has been used to compile a summary of the local conditions which are presented in the table below:

Strata	Proven Thickness Range (m bgl) (1)	Depth to Groundwater (m bgl) (1)	Aquifer Designation	Infiltration Coefficient Range (m/d) (2)
Made Ground	0.95	None encountered	Not Applicable	-
London Clay Formation	6.95	4.89	Unproductive Strata	2.60E-04 to 2.60E-06

(1) Site data.

(2) British Geological Survey (BGS), WN97/27. (Forster, 1997). The Engineering Geology of the London Area & SUDS Manual.

Updated Screening & Scoping Assessment

UPDATED SCREENING ASSESSMENT

The decision-making matrices presented in the Screening Assessment below have been completed based on the comments information presented in the previous sections.

Groundwater Flow

Is the site located on an Aquifer?	No The ground conditions comprise Made Ground overlying London Clay. The London Clay Formation is designated Unproductive Strata.
Will the basement extend below the groundwater level?	No Groundwater was encountered in the London Clay Formation but it is designated Unproductive Strata and the recorded level is below the formation level of the basement.

Land Stability

Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No There are existing lower ground floors in the neighbouring properties (50 & 54 Delancey St). However, the garden party garden walls will be underpinned to facilitate development so that foundations will be at the same level as the property and neighbouring properties.
Is the site over any tunnels e.g. railway lines?	No Enquiries with assets holders have been undertaken and responses have confirmed that they have no below ground assets in proximity to the site.

Surface Flow and Flooding

Will the proposed development change the proportions of soft / hard surfaced areas?	No The proposed lower ground floor extension will extend into the rear garden in areas that currently comprises hard surfacing. As such the proportion of soft / hard surface cover will not alter following development.
Will the proposed basement result in changes to the profile of the inflows (instantaneous and long term) of	No

surface water being received by adjacent properties or downstream watercourses?	There are no proposals to alter the site drainage and surface water flows following development and there is not anticipated to be any significant alteration to the profile of inflows being received downstream of the site.

Summary

Based on the Screening Assessment presented above, the following potential issues have been carried forward to the scoping stage of the assessment:

- Land stability: the development will include excavation and the party garden walls will be underpinned.
- Flooding & Drainage: although the development will not result in an increase in the proportions of hardstanding, the auditors specifically requested that drainage should be discussed in more detail.

SCOPING ASSESSMENT

The potential issues identified within the screening assessment are considered within the following scoping sub-sections:

Flooding & Drainage

The development will not result in a net increase in hard surfacing over the area of the site and given the relatively low permeability of the soils underlying the site, it is likely that infiltration to ground is minimal.

The development is not anticipated to alter the site drainage and surface water flows or the profile of inflows being received downstream of the site.

As outlined the site is underlain by low permeability London Clay and so an infiltration drainage solution is not considered feasible. In addition, the development is within an existing mid-terrace property and is constrained in terms of space and feasible options for the use of Sustainable Urban Drainage Systems (SuDS).

Reference to CPG4 (2015) suggests that SuDS is only relevant where there will be increase in peak flows and thus an additional stress on the local drainage system. As outlined, there will be no net increase in hard surfacing or subsequent run-off rates through development and there is no proposed alteration to current on site drainage.

Land Stability

Existing lower ground floor levels are present in the neighbouring properties (no.50 & no.54) and as such it is not anticipate that there will be a differential depth in foundations.

However, the party garden walls will be underpinned to facilitate development and the removal of overburden could result in inward yielding and the properties of the London Clay mean there is potential for short and

long term heave. As such a Ground Movement Assessment (GMA) has been undertaken to appraise the potential impacts on neighbouring properties.

The GMA is provided in the following sections, with the calculation worksheets provided in **Appendix C.**

Details of the structural design and construction sequencing will be provided under separate cover within a Construction Method Statement (ref. Davies Maguire, June 2017, ref. DMAG-1717-CMS) and related documents.

Ground Movement Assessment

INTRODUCTION

There is the potential for ground movements due to the proposed development from the wall installation and from the excavation process.

The magnitude and extent of ground movements resulting from installation of a wall and excavation in front of such a wall are typically estimated based on the guidance given in the CIRIA publication C580 Embedded Retaining Walls – Guidance for Economic Design. The guidance in the CIRIA publication is based on the behaviour of embedded walls at numerous sites in London, which are predominantly walls embedded in London Clay, though typically with some near surface deposits consisting of for example River Terrace Deposits and Made Ground.

SUMMARY OF FOUNDATION PROPOSALS

The following information in relation to the proposed basement development and foundation solutions has been assumed:

- The development comprises an extension of the existing lower ground floor into the rear garden area, with a formation level of c. 2.80m below ground level.
- Traditional spread foundation underpins will be utilised beneath the garden party wall and formed on the firm to stiff London Clay deposits.
- The foundation design has considered an allowable bearing pressure of 125kN/m^2.
- There will be no excavation beneath the existing lower ground floor and the only adjoining structure to be underpinned will be the garden party wall.

In addition, it has been assumed that the excavation will be undertaken using the traditional method of underpinning formed in a 'hit and miss' sequence up to a depth of approximately 2.80m. An appropriate propping system will be utilised to provide high stiffness support.

To provide some basis of estimating likely movements and damage resulting from excavating the basement in front of the underpinning, and in the absence of underpinning specific guidance, the underpinned sections of the new basement have been treated as piles.

A Construction Method Statement has been produced under separate cover (ref. Davies Maguire, June 2017, ref. DMAG-1717-CMS).

BUILDING DAMAGE ASSESSMENT

C580 provides curves estimating horizontal and vertical ground surface movements due to piled wall installation and to excavation in front of wall. Total ground movements resulting from the excavation will be the combination of the installation movements and the excavation movements.

GROUND MOVEMENT ASSESSMENT

The method provided within Box 2.5 in CIRIA C580 has been used to inform the assessment. CIRIA 580 curves were used to make a prediction of ground movement considering a high support stiffness wall.

Ground Movements – Wall Installation

The movements resulting from excavation in front of the underpins incorporate the movements resulting from the construction (i.e. installation) of the underpins, since, unlike for the piles, the construction process requires an excavation prior to the pins being formed. However, the analysis has conservatively adopted the values for 'installation of a planar diaphragm wall' to represent the installation of the underpins (Fig. 2.9a and Fig. 2.9b in CIRIA C580).

Ground Movements – Excavation in Front of Wall

Ground movements arising from excavation in front of wall have been based on Fig. 2.11a and Fig. 2.11b of CIRIA C580 assuming a high support stiffness wall.

Summary of Results

Using these predicted movements, estimates of possible damage have been made for the surrounding structures, based on the Damage Classification Scheme proposed by Burland and Wroth (1974).

Copies of worksheets calculations and graphical representation of the results are presented in **Appendix C** and are summarised in the table below:

Nearby Building / Structure	Estimated Damage Category No.	Category of Damage	Comments
54 Delancey St	1	Very Slight	Fine cracks that can easily be treated during normal decoration.
50 Delancey St			
41 Delancey St	n/a	n/a	Outside zone of influence of ground movement.
56 Mornington Terrace			
99 Albert St			

The ground movement assessment undertaken indicates that damage to surrounding properties will be Burland Category 0 (Negligible) to 1 (Very Slight). It should be noted that the analysis of the two party walls will implicitly include the damage assessment of 52 Delancey Street itself, which is understood to be a listed building.

Anticipated vertical movements provide a maximum tilt of about 1 in 4500, which is well within generally tolerable differential movement.

GROUND MOVEMENT ASSESSMENT

ADDITIONAL CONSIDERATIONS

Heave

The excavation of c. 2.80m thickness of soil will generate a maximum unloading of around 50-60kN/m^2.

This will result in a measure of short term heave and long term swelling of the underlying London Clay, which theoretically takes a number of years to complete. The new basement slab will be designed to withstand the potential heave forces and movements. About 50% of total movement would normally be expected to occur prior to construction of the slab (for a normal construction programme).

The excavation depth and modest dimensions of the site are such that heave associated with unloading of the clay is unlikely to exceed a few millimetres or to have any significant impact on the surrounding structures. Any movement that does occur will be further mitigated by the necessarily slow rate of the excavation and construction.

Ground Movement & Construction

The predicted building damage during construction is based on a conservative approach and it is recommended that the contractor gives consideration to the Association of Specialist Underpinning Contractors (ASUC) guidelines which should provide some mitigate and reduce the potential movements.

Ground Movements Monitoring

As a minimum, it is recommended that movement monitoring should be undertaken with surveying points set up using a total station (or similar) prior to commencement of the works and it is recommended that monitoring be undertaken at weekly intervals. It is recommended that trigger values for monitoring are based on the predicted ground movements to ensure conservatism and that they are agreed under the Party Wall Act.

References

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Impact Assessment & Mitigation Measures

SUMMARY OF POTENTIAL IMPACTS & MITIGATION MEASURES

The table below provides a summary of the potential impacts and mitigation measures adopted to ensure that residual risks are minimised:

Description of Potential Impact		**Significance of Impact**	**Summary of Mitigation Measures**	**Residual & Cumulative Effects following Mitigation**
Land Stability	Impact on local properties/structures	Minor negative (the GMA has predicted potential for only very slight damage)	• Adoption of appropriate management procedures for basement excavation/ construction within the Construction Method Statement. • Surveying and monitoring of surrounding buildings / structures will be undertaken. • Repair and maintenance in accordance with C580.	Negligible
Surface water flooding & Drainage	Increase in run-off and peak flows	Moderate negative	• Review of the development proposals have shown that the area of hard standing will remain the same and there will be not net increase in surface water run-off that could increase stresses on the local drainage system.	Negligible

Conclusions and Recommendations

CONCLUSIONS

It is proposed to redevelop the existing ground and lower ground floor of the three-storey terrace property into 2no. residential apartments. It is understood that they will achieve this by extending the existing lower ground floor of the property into the rear garden area.

The assessment completed indicates that there is potential for the proposed basement development to result in minor impacts in relation to land stability and local drainage.

However, following adoption of appropriate mitigation measures to be included within the design, the residual and cumulative impacts of the proposed development are assessed to be negligible.

RECOMMENDATIONS

Based on the assessment completed and with regard to the proposed development in general it is recommended that the mitigation measures to minimise impacts associated with potential land stability are adopted within development design.

Further recommendations specific to the geotechnical appraisal, potential foundations options and in consideration of retaining wall design are provided in the LMB Ground Investigation and Assessment report (ref. LMB.17.06.07_REPPIL_GI_Delancey_v1.0, dated June 2017).

REFERENCES & GUIDANCE

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4. BS5930 (2007) Code of Practice for Site Investigations.
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11. CIRIA (2007). Assessing risks posed by hazardous ground gases to buildings
12. BS 8485:2007. Code of Practice for the Characterisation and Remediation from Ground Gas in affected Development.
13. NHBC (2007). Guidance on the Evaluation of Development proposals on sites where Methane and Carbon dioxide are present.
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20. Environment Agency (2009b), CLEA Software (Version 1.04) Handbook (and Software), Report SC050021/SR4, January 2009;
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[1] This document has been withdrawn but is considered to remain useful in proving technical background for designing ground investigation works.

[2] This document has been withdrawn but is considered to remain useful in proving technical background for designing ground investigation works.

REFERENCES & GUIDANCE

23. Nathanial et. al., (2009), The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd edition), Land Quality Press, Nottingham, ISBN 0-9547474-7-X
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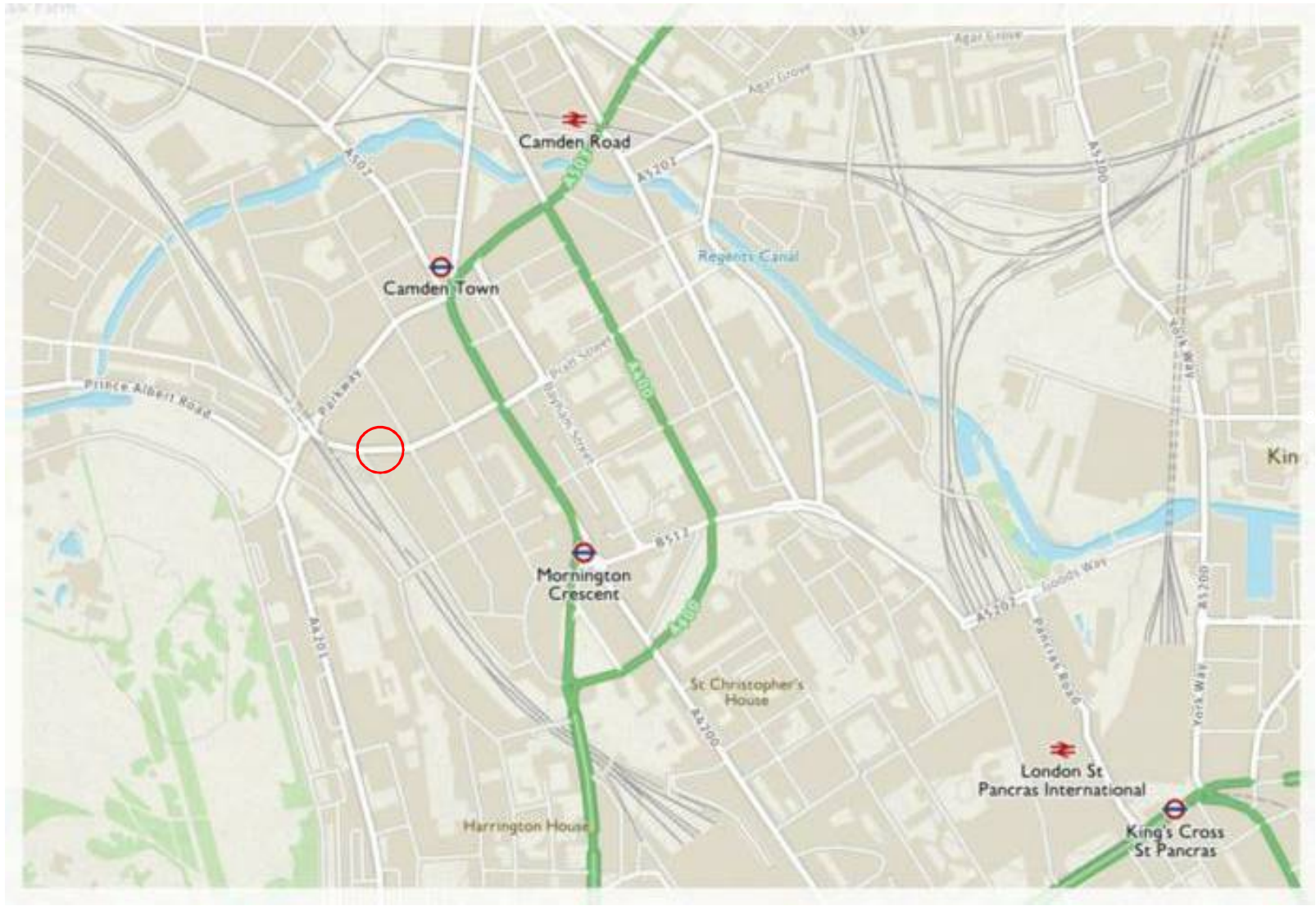
FIGURES



Key:

Approximate site location

IMPORTANT – Please Read

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LMB

Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

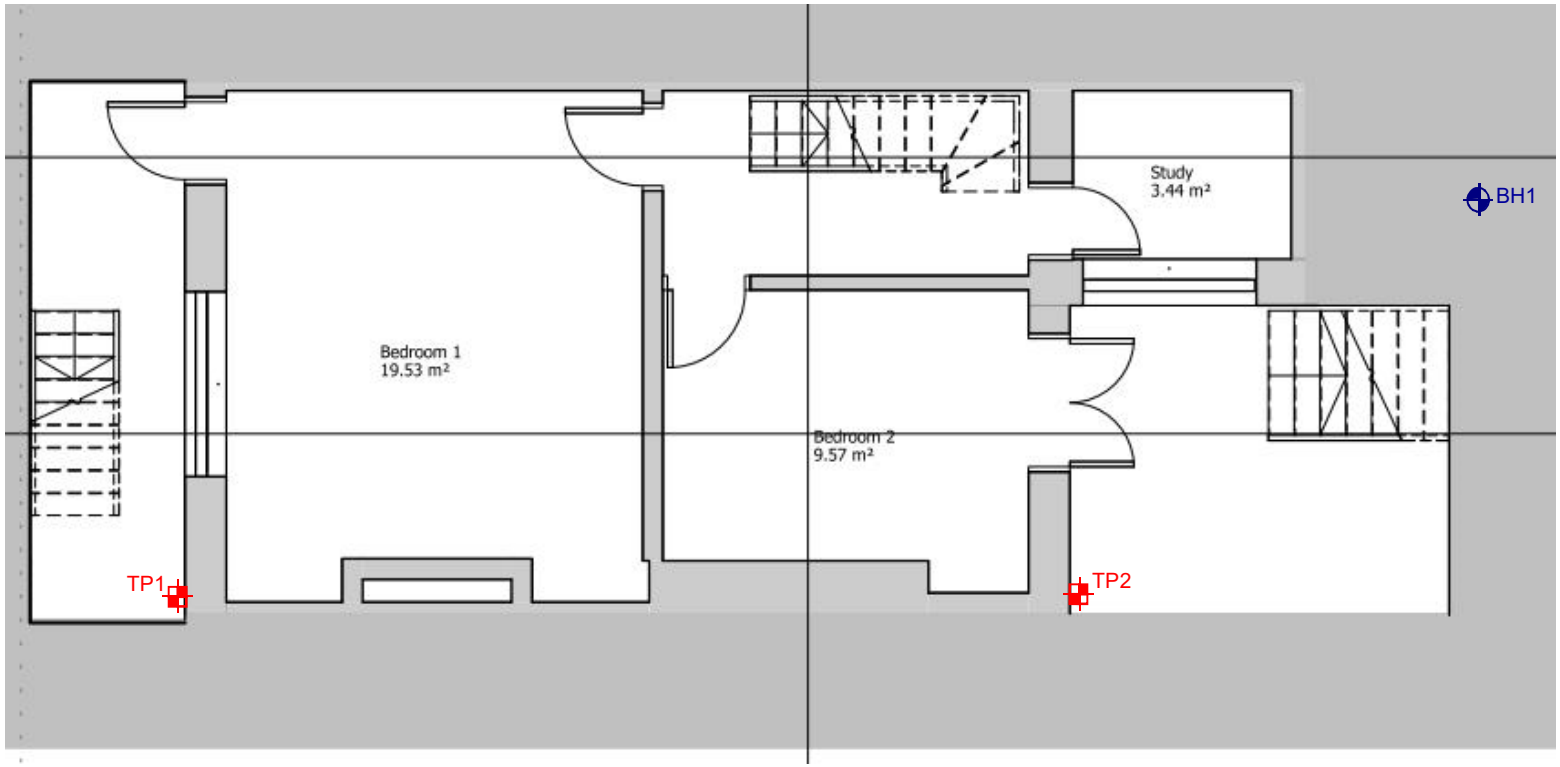
Site: 52 Delancey Street, London NW1

Figure Number: Figure 1

Title: Site Location Plan

Project No:	Created By:	Date:
	PIL	May 2017

Client: Natasha & Oliver Gershfield



Key:

BH — Dynamic Sampler Borehole location

TP — Hand excavated trial pit location

IMPORTANT – Please Read

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LMB

Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Site: 52 Delancey Street, London NW1

Figure Number: Figure 2

Title: Exploratory Hole Location Plan

Project No:	Created By:	Date:
	PIL	May 2017

Client: Natasha & Oliver Gershfield

APPENDICES

Appendices

APPENDIX A DEVELOPMENT SCHEMATIC

NOTES:

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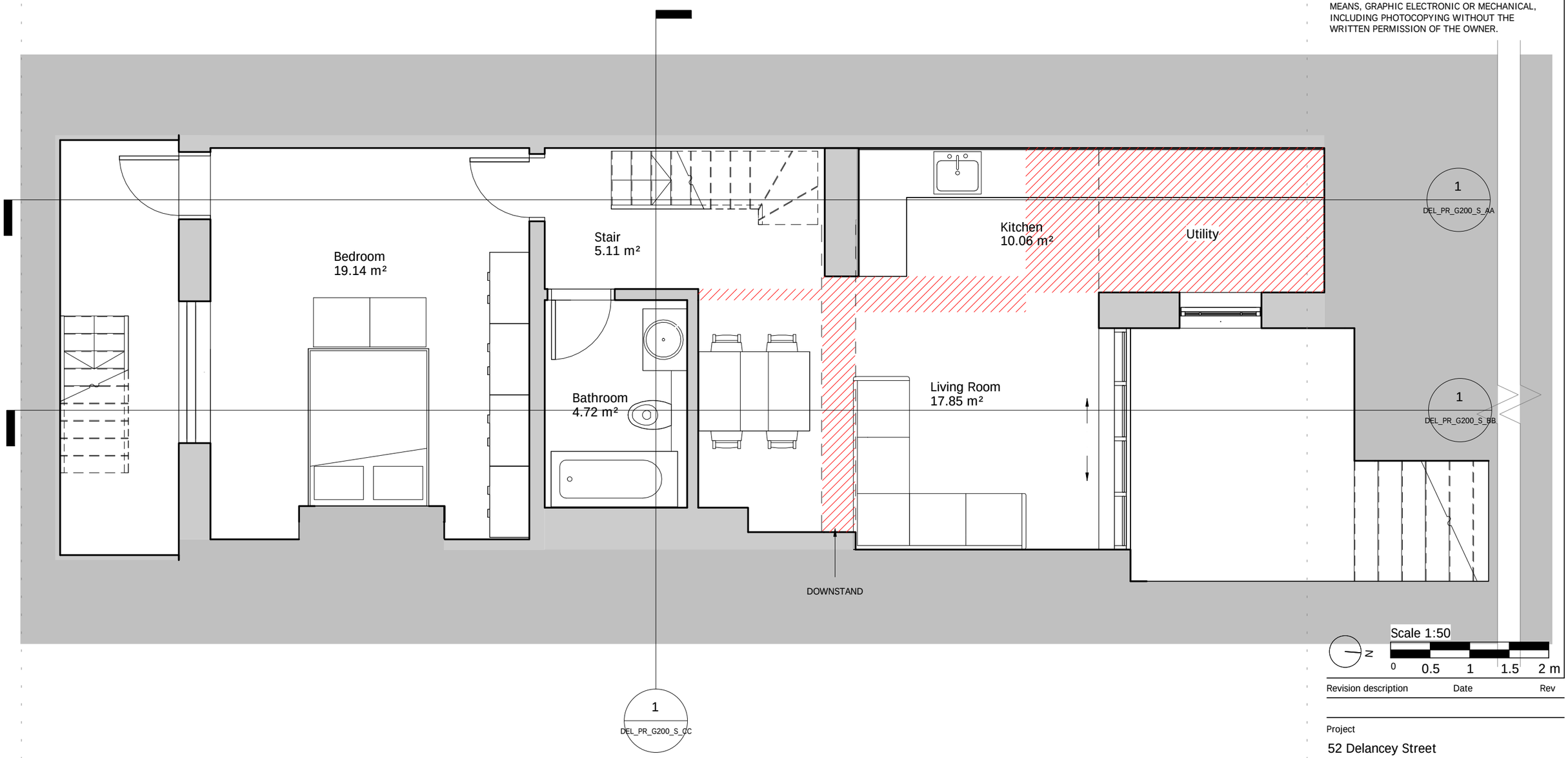

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Revision description	Date	Rev

Project

52 Delancey Street

Drawing

Proposed Lower Ground Floor Plan

Drawn	Date	Scale @ A3
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Job Number	Drawing number	Revision
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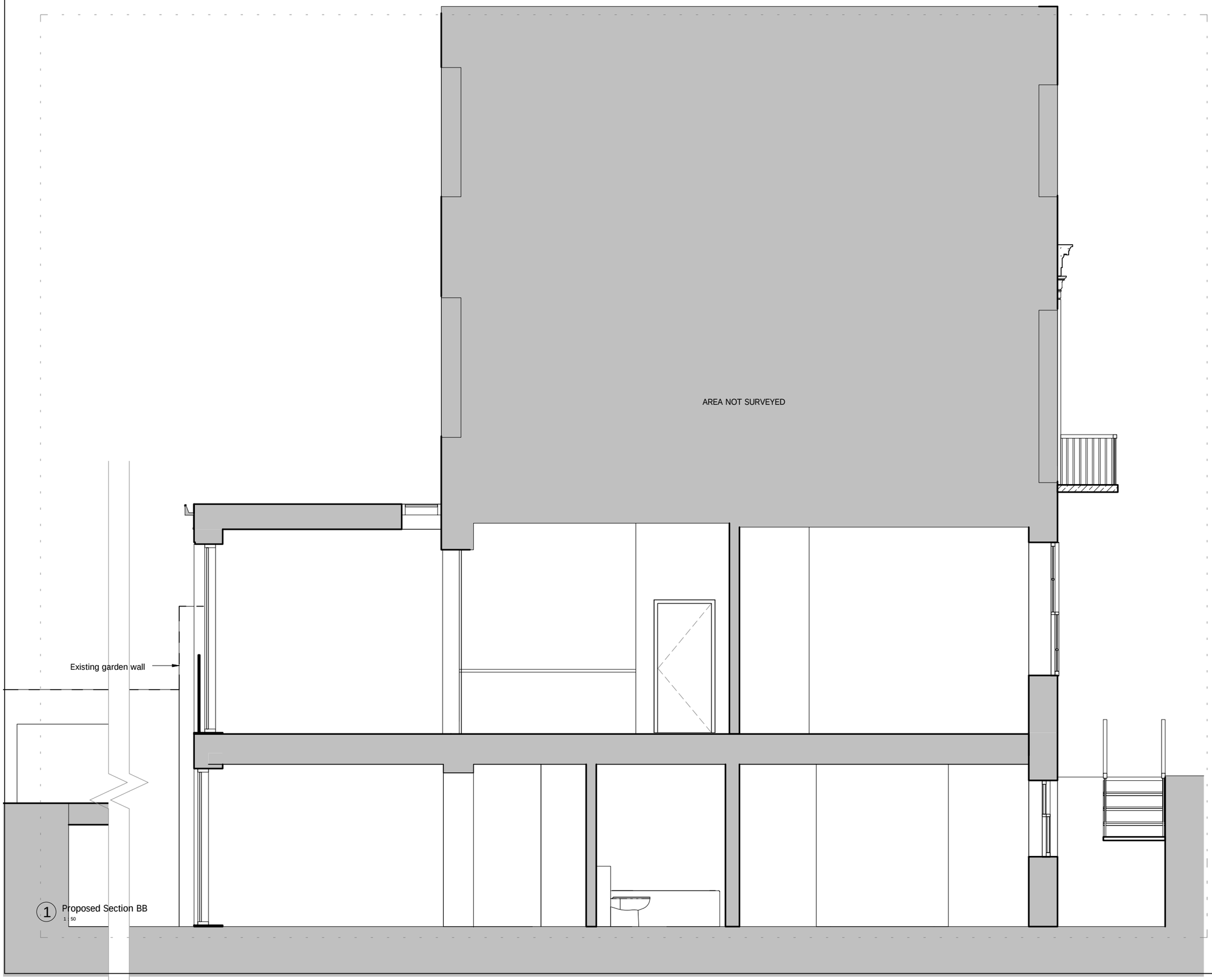

1 Proposed Section BB
1 : 50

NOTES:

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Scale 1:50

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Revision description	Date	Rev

Project

52 Delancey Street

Drawing

Proposed Section BB

Drawn	Date	Scale @ A3
NG	29/12/15	1 : 50

Job Number	Drawing number	Revision
DEL52	DEL_PR_G200_S_BB	

APPENDICES

APPENDIX B CONSULTATION WITH BELOW GROUND ASSET HOLDERS

philip lewis

From: Safeguarding <Safeguarding@crossrail.co.uk>
Sent: 08 May 2017 11:31
To: 'Philip Lewis'
Subject: RE: 52 Delancey St, London NW1 7RY Crossrail Ref: CRL-00-167945

Dear Mr. Lewis

Crossrail Ref: CRL-00-167945

RE: 52 Delancey St, London NW1 7RY

Thank you for your enquiry of 5 May 2017 regarding the effect of Crossrail on the above property.

Crossrail is a new railway currently being constructed that will link Reading and Heathrow in the west to Shenfield and Abbey Wood in the east using existing Network Rail tracks and new tunnels under Central London.

The Crossrail Bill which was introduced into Parliament by the Secretary of State for Transport in February 2005 was enacted as the Crossrail Act on the 22nd July 2008. The first stage of Crossrail preparatory construction works began in early 2009. Main construction works have started with works to the central tunnel section to finish in 2018, to be followed by a phased opening of services.

Crossrail Limited (CRL) administers a Direction issued by the Department for Transport on 24 January 2008 for the safeguarding of the proposed alignment of Crossrail.

The above property is outside the safeguarded limits of land as defined by the Safeguarding Direction (the maximum extent of land that may be required for the construction and operation of Crossrail).

You may inspect copies of Plans, Sections, Environmental Statements, Explanatory Notes and Non-Technical Summaries pertaining to the Crossrail proposals on the Crossrail website

http://www.crossrail.co.uk/construction/crossrail-act-2008-and-crossrail-bill-supporting-documents.

In addition, the latest project developments can be found on the Crossrail website www.crossrail.co.uk/safeguarding, which is updated on a regular basis.

I hope this information is helpful, but if you require any further assistance then please feel free to contact a member of the Safeguarding Team on 0345 602 3813, or by email to safeguarding@crossrail.co.uk.

Yours sincerely

Helen McCarthy
Community Relations Assistant
CROSSRAIL HELPDESK
Tel (24 hour): 0345 602 3813
Helpdesk@crossrail.co.uk

MOVING LONDON FORWARD

Transport for London
London Underground

London Underground
Infrastructure Protection

3rd Floor
Albany House
55 Broadway
London SW1H 0BD

www.tfl.gov.uk/tube

Your ref:
Our ref: 20403-SI-10-080517

Philip Lewis
LMB Geosolutions
philip@lmbgeosolutions.com

08 May 2017

Dear Philip,

52 Delancey Street London NW1 7RY

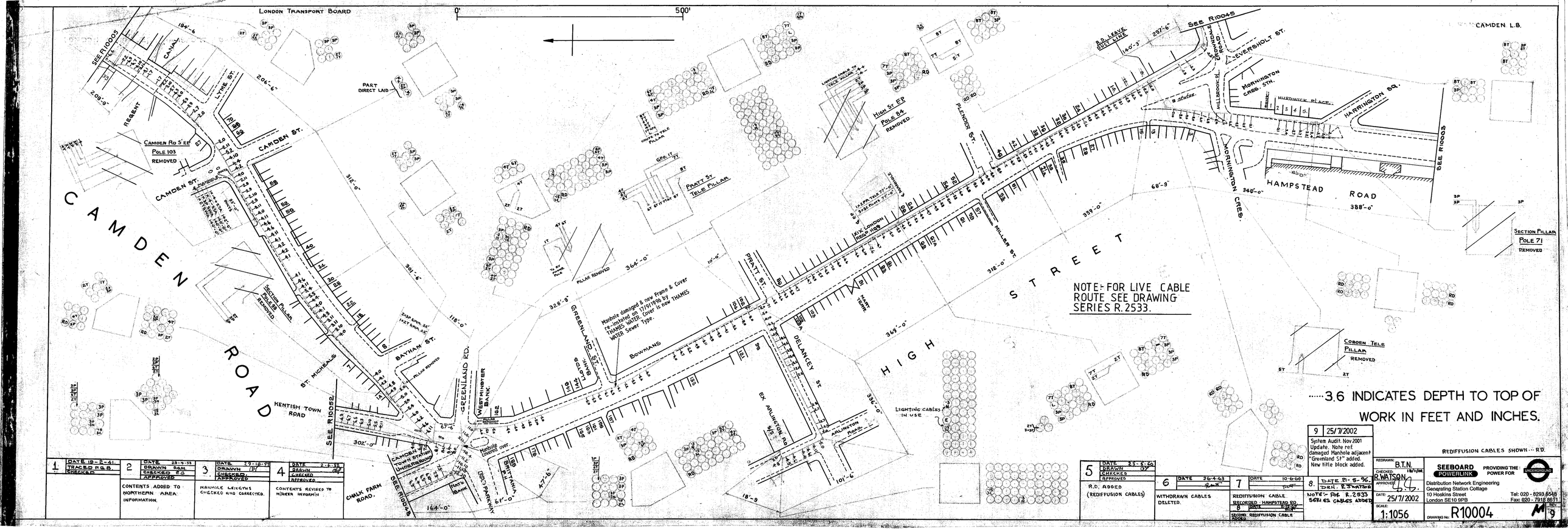
Thank you for your communication of 5th May 2017.

I can confirm that London Underground has no assets within 50 metres of your site as shown on the plan you provided.

If I can be of further assistance, please contact me.

Yours sincerely

Shahina Inayathusein
Information Manager
Email: locationenquiries@tube.tfl.gov.uk
Direct line: 020 3054 1365



1 DATE 18-2-41. TRACED P.G.S. CHECKED	2 DATE 23-4-53 DRAWN R.D.R. CHECKED E.G. APPROVED — CONTENTS ADDED TO NORTHERN AREA INFORMATION.	3 DATE 29-10-57 DRAWN CW CHECKED APPROVED — MANHOLE LENGTHS CHECKED AND CORRECTED.	4 DATE 2-6-58 DRAWN A.P. CHECKED APPROVED — CONTENTS REVISED TO MINKER INFORMTN

5 DATE 23-5-60 DRAWN CHECKED APPROVED — R.D. ADDED (REDIFFUSION CABLES)	6 DATE 26-4-63 — WITHDRAWN CABLES DELETED.	7 DATE 10-6-00 — REDIFFUSION CABLE RECORDED HAMPSTEAD RD	8 DATE 21-5-96. DRN. R.S.WATSON — NOTE:- FOR R.2533 SERIES CABLES ADDED	9 25/7/2002 — System Audit. Nov 2001 Update. Note ref damaged Manhole adjacent "Greenland St" added. New title block added.

REDRAWN: B.T.N. 18/11/02
CHECKED: R.WATSON
APPROVED:
DATE: 25/7/2002
SCALE: 1:1056
DRAWING No. R10004
REV. M 9

SEEBOARD POWERLINK PROVIDING THE POWER FOR LONDON ELECTRICITY
Distribution Network Engineering
Generating Station Cottage
10 Hoskins Street
London SE10 9PB
Tel: 020 - 8293 6548
Fax: 020 - 7918 8611

philip lewis

From: Purser Richard <Richard.Purser@networkrail.co.uk> on behalf of OP Buried Services Enquiries <OPBuriedSE@networkrail.co.uk>
Sent: 05 May 2017 12:59
To: philip lewis
Subject: RE: 52 Delancey St, London NW1 7RY

Dear Sir/Madam,

With regards to your enquiry, Network Rail does not believe there is any Network Rail owned apparatus or underground services within the area you have defined. As there is always the possibility that new works could be planned and undertaken in this area by Network Rail this information is valid as at today's date and is supplied for general guidance only.

Please be aware that this response is based on Network Rail's records and knowledge and no guarantee can be given regarding accuracy or completeness. CAT scans, safe digging practices (as contained in HSE publications) and other appropriate investigative techniques should always be carried out.

There may be other apparatus or underground services owned or operated by Utility Companies and accordingly you should contact individual utilities for information.

If, in connection with your investigations and/or work, you become aware of Network Rail apparatus or underground services within your area of work, please ensure these are notified to our Asset Protection team via the following link as a matter of urgency so that appropriate measures for avoidance of risk and damage can be put in place.

http://www.networkrail.co.uk/aspx/1758.aspx?cd=1

If you require any further clarification on any of the information please contact opburiedservicesenquiries@networkrail.co.uk.

Regards,

Richard Purser
Distribution Administrator (Underground Services), Asset Information Services

Asset Information Services: to inspire & enable through the power of data
National Records Group, Audax Road, Clifton Moor York YO30 4US

T: 01904 386 388
E: richard.purser@networkrail.co.uk

From: philip lewis [mailto:philip@lmbgeosolutions.com]
Sent: 05 May 2017 11:52
To: OP Buried Services Enquiries
Subject: RE: 52 Delancey St, London NW1 7RY
Importance: High

Dear Sir/Madame
We are currently undertaking some works at the above property in support of a basement development. We would be interested in finding out if you have any below ground assets in the nearby vicinity.

I have attached site location plans for your information.

Best regards,

Philip Lewis
Bsc (Hons), Msc, FGS, CGeol
Director
LMB Geosolutions Ltd
Tel. +44 7739735097

Home - LMB Geosolutions Ltd
Connect with me on
LinkedIn

APPENDICES

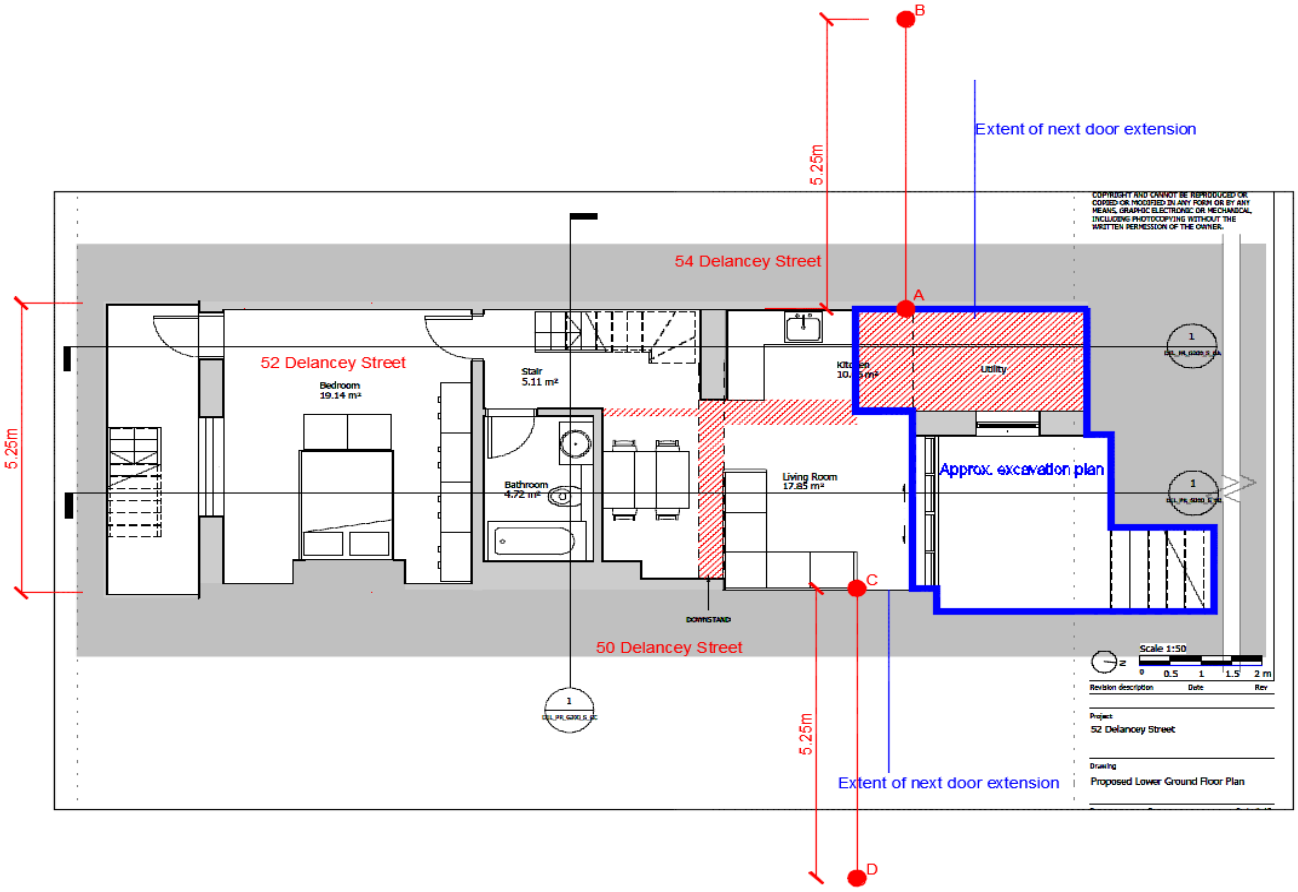
APPENDIX C GMA CALCULATION WORKSHEET

Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	1	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	52 Delancey Street - London	Date	07.06.17

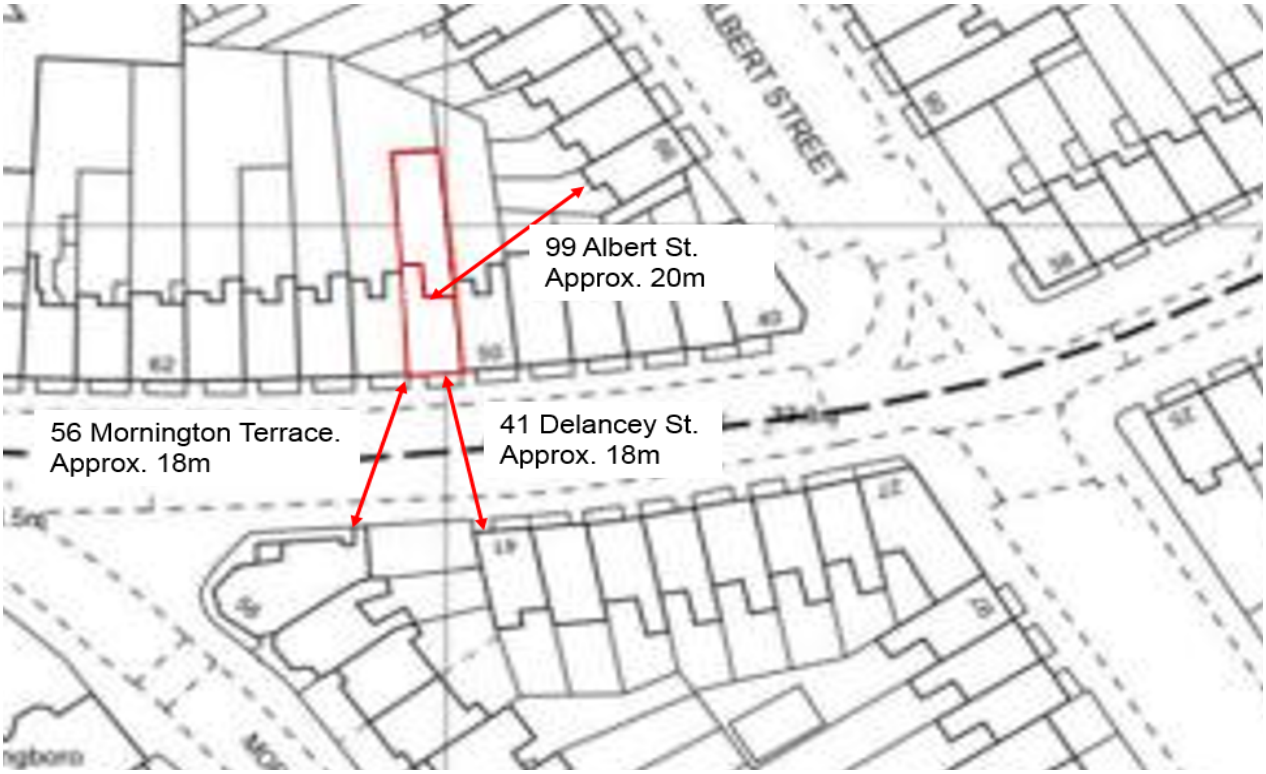


Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	2	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	52 Delancey Street - London	Date	07.06.17



Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	3	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	52 Delancey Street - London	Date	07.06.17

Assumptions

Mass Concrete Underpinning
Propping System will be utilised

Max Excavation Depth 2.80 m
Wall Depth 3.00 m

Nearby Structure	Note	Point	Distance from wall (m)	Ground movements arising from wall installation					Ground movements arising from excavation in front of wall				
				Distance from wall / wall depth	Horizontal movement / wall depth (%) Fig. 2.9a	Horizontal movement (mm)	Settlement / wall depth (%) Fig. 2.9b	Vertical movement (mm)	Distance from wall / max excavation depth	Horizontal movement / max excavation depth (%) Fig. 2.11a	Horizontal movement (mm)	Settlement / max excavation depth (%) Fig. 2.11b	Vertical movement (mm)
54 Delancey Street	Underpinning	A	0.0	0.0	0.05	1.5	0.05	1.5	0.0	0.12	3.4	0.04	1.1
		B	5.25	1.8	0	0.0	0	0.0	1.9	0.08	2.2	0.04	1.1
50 Delancey Street	Underpinning	C	0.0	0.0	0.05	1.5	0.05	1.5	0.0	0.12	3.4	0.04	1.1
		D	5.25	1.8	0	0	0	0	1.9	0.08	2.2	0.04	1.1

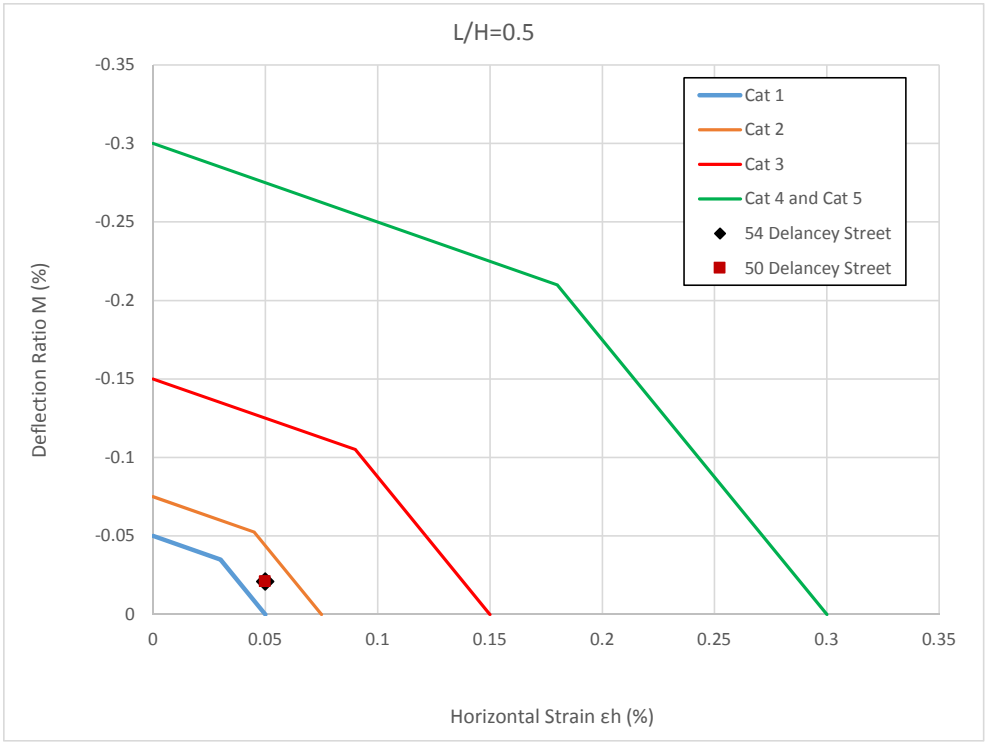
Nearby Structure	Total Movements										
	Corner Effect	Total horizontal movement (mm)	Total vertical movement (mm)	L (m)	H (m)	L/H	Δ (mm)	Tilt (1/x)	M=Δ/L (%)	δh (mm)	εh=δh/L (%)
54 Delancey Street	N	4.9	2.6	5.25	10.0	0.5	1.1	4773	0.021	2.6	0.050
		2.2	1.1								
50 Delancey Street	N	4.9	2.6	5.25	10.0	0.5	1.1	4773	0.021	2.6	0.050
		2.2	1.1								

Ground Investigation
Land Contamination
Hydrogeology
Engineering Geology

Calc No.	Sheet No.	Rev
	4	A

Calculation Sheet

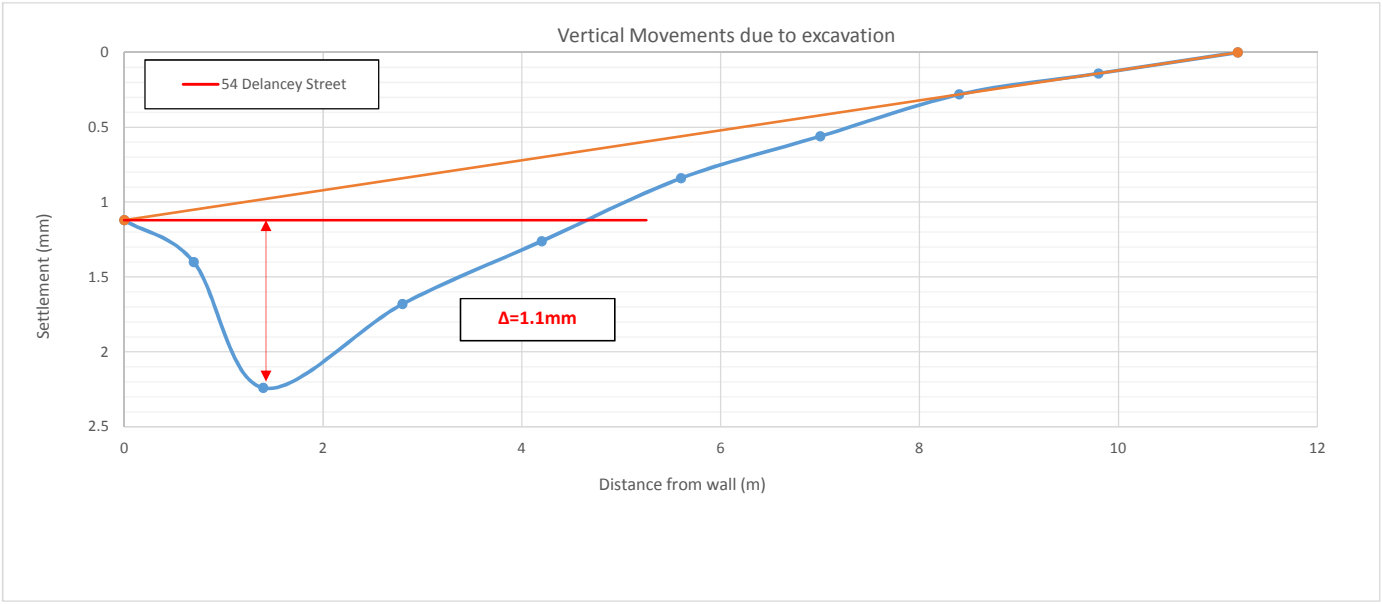
Project	Ground Movement Assessment	Made by	CC
Location	52 Delancey Street - London	Date	07.06.17

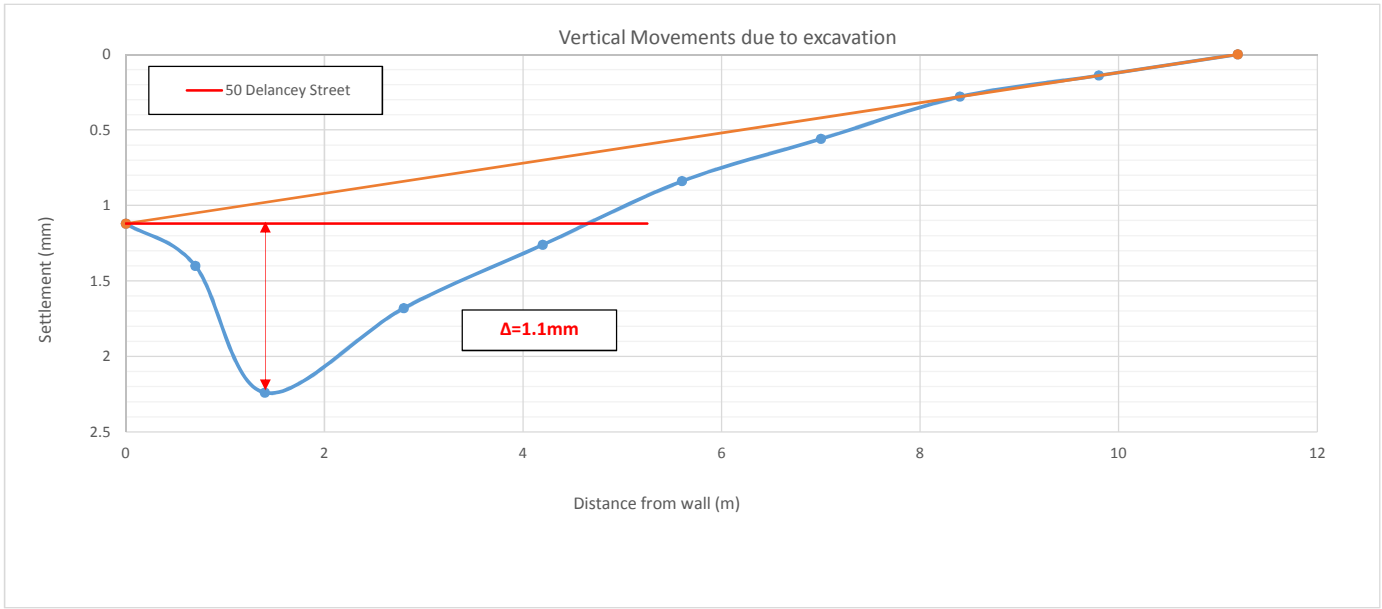


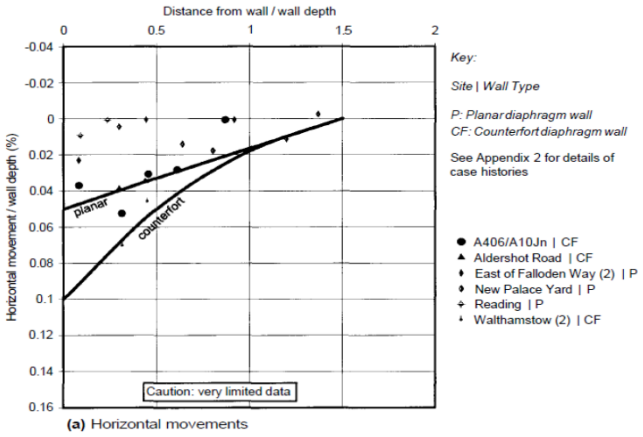
Calc No.	Sheet No.	Rev
	5	A

Calculation Sheet

Project	Ground Movement Assessment	Made by	CC
Location	52 Delancey Street - London	Date	07.06.17







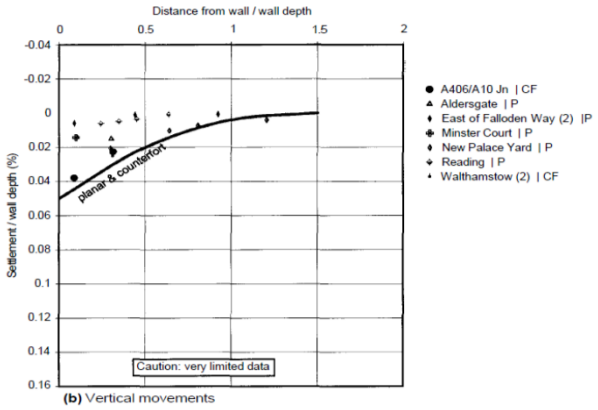
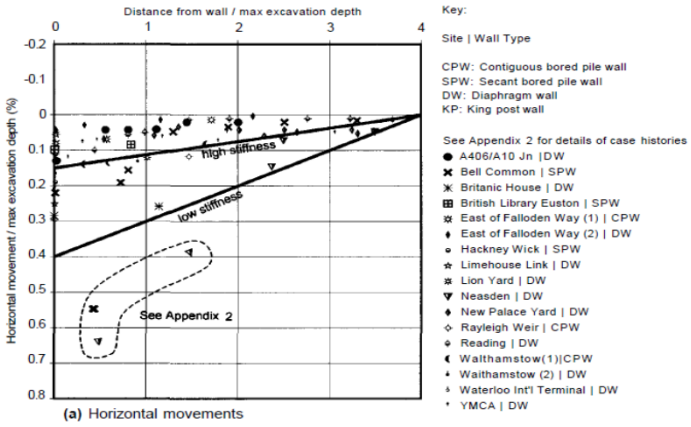


Figure 2.9 *Ground surface movements due to diaphragm wall installation in stiff clay*



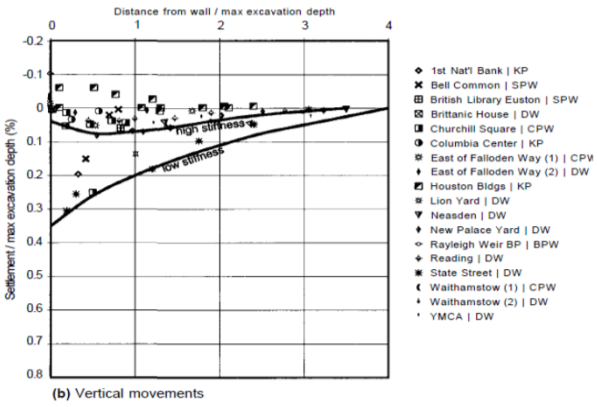


Figure 2.11 *Ground surface movements due to excavation in front of wall in stiff clay*