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Proposed Basement Extension

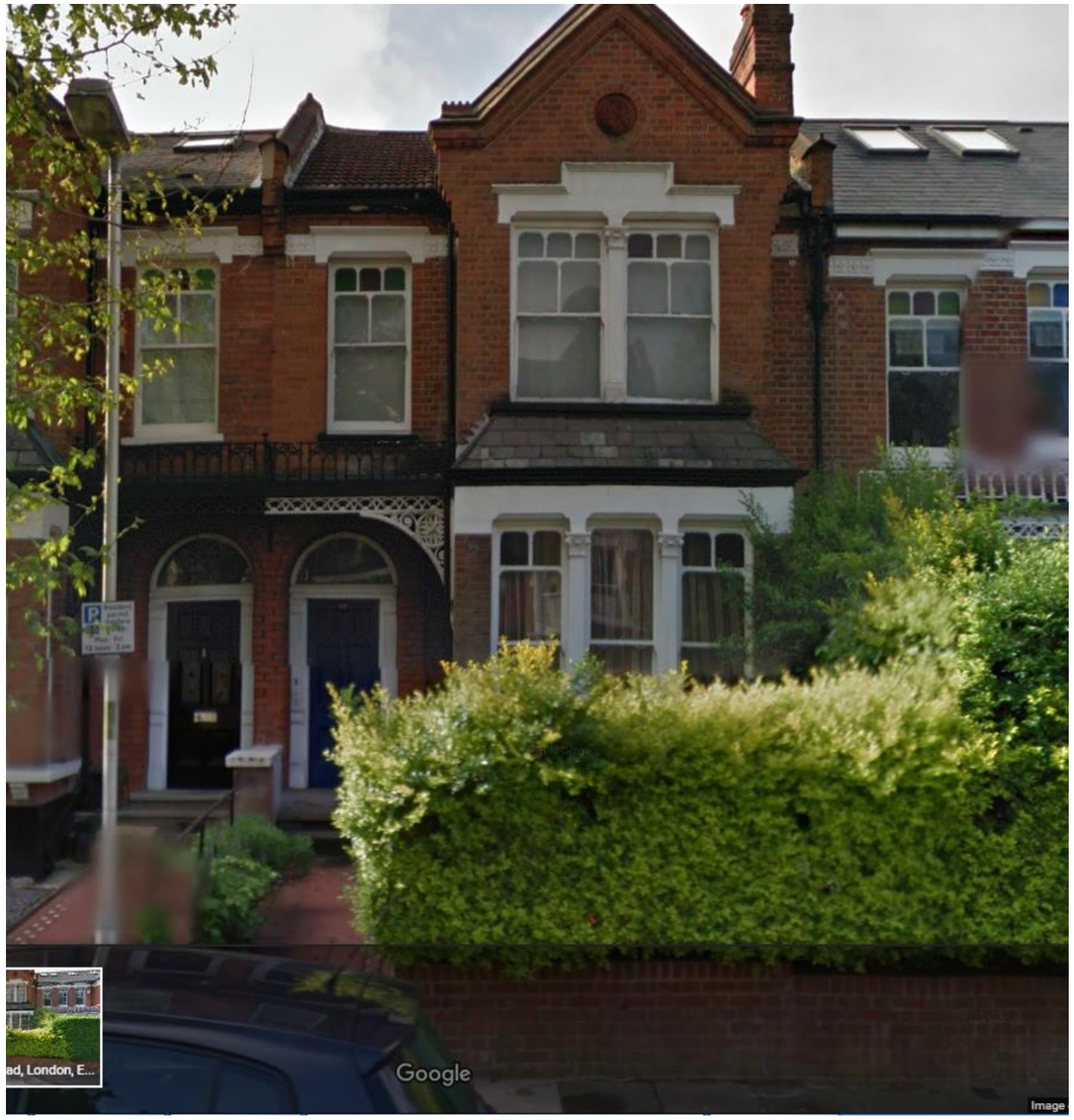
Structural Engineering Report

50 Mount View Road
London
N4 4JP

Client: Mr N Neophytou

Prepared: July 2016
Project No. 16046
Ref: AMA_REP_01

Rev 00



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Revision	*Prepared by*	*Checked by*	*Date*	*Status*
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1. Introduction

AMA Consulting Engineers have been appointed by our clients to prepare the supplementary information required to accompany the planning application for the proposed basement extension and refurbishment of No. 50 Mount View Road. The main purpose of this report is to address issues such as:

- The existing building.
- The proposed structure below ground.
- Method of construction and sequencing of construction works.
- Temporary works suggestions.

A Desk Top Basement Impact Assessment has been carried out by Jomas (report ref: P9573J878).

The below is an extract from the Jomas report. Reference should be made to the main report (Appendix 3) for detailed information and analysis.

Desk Study

Site History:

The earliest available maps of the area (1864) show the site area as undeveloped farmland with vegetated boundaries. There is no significant change until 1896 where the site has been developed and occupied by terraced residential housing. There is no significant change to the site area to the present day.

The surrounding area was occupied by farmland from 1864 until 1896 where there was significant widespread residential development comprising terraced housing. Further widespread development of the surrounding area continues from 1896 to present day including schools 120m SE and 150m north of the site.

Site Setting:

Information provided by the British Geological Survey indicates that the site is directly underlain by solid deposits of The London Clay Formation.

No superficial or artificial deposits are reported within the site.

There are no borehole records within 500m of the site.

There are no aquifers within 1000m of the site location.

A review of the Enviro Insight Report indicates the nearest reported source protection zone to be an Outer Zone 2 and Inner Zone 1 200m east of the site.

There are no groundwater abstraction zones reported within 500m of the site.

There are no detailed river entries or surface water features reported within 250m of the site.

There are no Environment Agency Zone 2 or 3 floodplains reported within 250m of the site.

What appears to be a covered service reservoir is noted within 250m to the west.

Basement Impact Assessment

Assessment:

The overall assessment of the site is that the extension of a basement for the existing development will not adversely impact the site or its immediate environs, providing measures are taken to protect surrounding land and properties during construction.

The proposed basement excavation is not within 5m of a public pavement, but it within 5m of neighbouring properties. Unavoidable lateral ground movements associated with the basement excavations must be controlled during temporary and permanent works so as not to impact adversely on the stability of the surrounding ground and any associated services.

From the studies that have been undertaken so far it is concluded that the extension of the basement will not adversely affect ground water. It is concluded that this site can be successfully developed without causing any problems to the subterranean drainage.

2. Existing Structure

50 Mount View Road is a 4 storey split level mid terrace house believed to be constructed in the late 1800's. The building comprises a lower ground, ground, first and second floor. The external site levels vary by approximately 1.2m from the footway to the end of the rear garden. The existing lower ground floor encompasses approximately 25% of the existing ground floor footprint and is currently used as a bathroom.

During the design development stage a series of trial holes and site visits were carried out to determine the nature of the existing foundations and structure. The existing structure as a hole is in good condition with no visible signs of movement or cracking.

Foundations:

The foundations are of a shallow nature and are a mixture of brick corbelled foundations and mass concrete foundations. The foundations are founded directly on to the London clay formation at approximately 1mbgl.

Ground Floor:

The ground floor is a suspended timber floor construction spanning on to sleeper walls.

First Floor and Second Floor:

The first floor is of a traditional timber joist construction spanning on to the internal loadbearing wall and floor beams.

Roof:

The roof is a traditional cut and pitched timber roof. The proposals are to convert the roof space in to a habitable room (loft conversion). This is to be undertaken by using steel beams spanning from party wall to party wall with a new timber floor and roof.

External and Party Wall:

The external and party walls are constructed with solid 9" brick walls.

The existing layouts can be found in Appendix 1.

3. Proposed Structure

The current proposals include the removal of the internal loadbearing walls and floors. The existing property is small size and so the removal of these elements helps with providing access and egress for the construction of the basement in the temporary case.

Main House:

The formation of the lower ground floor is to be carried out using a traditional underpinning technique. The underpins will provide vertical support to the existing walls and foundations as well as lateral resistance to earth and water pressures. The underpins will be designed as vertical cantilevers and are rigidly fixed to the lower ground floor slab. The ground floor is to be formed using timber joists and provide no lateral restraint to the cantilevers. Therefore the underpins have been designed as un-propped.

The lower ground floor slab will be designed as a stiff raft to reduce the risk of differential movement. The raft acts to distribute the load evenly over the entire area to limits the applied load on the ground. The vertical loads from the upper floors are transferred directly on to the raft via the internal loadbearing elements (walls and columns).

The structural scheme considers similar future development of the neighbouring properties and so the underpins and the raft takes in to consideration the different loading scenarios to ensure that such developments have no adverse effects.

4. Construction Technique and Methodology for the Lowering of the Existing Basement

The works proposed to the basement require careful thought and planning prior to construction in order to aid the contractor. The works are to be undertaken by a competent contractor who has experience with the type of work being proposed.

The lowering of the basement will be undertaken with a traditional underpinning technique. Preliminary discussions have been carried out with specialist basement contractors and their proposals have been incorporated within the proposal.

The following construction sequence is suggested for the lowering of the:

a. Undertake the demolition of the internal walls.
b. All concrete to be bagged and placed on the ground floor over a designated area ready to be loaded on to a 'grab and load' skip. All bags to have a maximum of 20kg weight.
c. Once area is clear undertake traditional underpinning in numbered sequence (1m maximum bay) as noted below:
    i. Concrete underpinning to be carried out in maximum bay lengths of 1000mm
    ii. The engineer and building inspector are to be notified when excavations are ready to receive concrete and their approval obtained before concrete is placed.
    iii. The excavations are to be kept dry at all times and the bottom 100mm is to be removed immediately before concrete is placed.
    iv. The concrete is to be placed within 75mm of the underside of the existing foundation.
    v. After 24 hours the gap is to be packed and well rammed with sand and cement drypack and left for 24 hours.
    vi. Install a timber earth propping to ensure temporary lateral stability during the works.
    vii. Commence with excavations on the next bay in sequence.
d. During the underpinning works the excavated earth is to be bagged and placed on the ground floor over the designated area ready to be loaded on to a 'grab and load' skip..
e. Once all underpinning is completed the bulk excavation of the earth can commence to new the formation level starting from the rear of the property and working towards the front. During this props are to be re-aligned so that they are propped on the new earth formation level.
f. During the bulk excavation the excavated earth is to be bagged and placed on the ground floor over the designated area ready to be loaded on to a 'grab and load' skip. All bags to have a maximum of 20kg weight.
g. Once the bulk excavation has been completed the new basement slab is to be cast removing all props after 72 hours.

5. Conclusion

The construction of the basement is to be undertaken by a competent contractor who has experience with projects of this nature. With the methodology and sequencing suggested, along with good practice and well design temporary supports, the construction of the basement will have no adverse effect on the existing buildings.

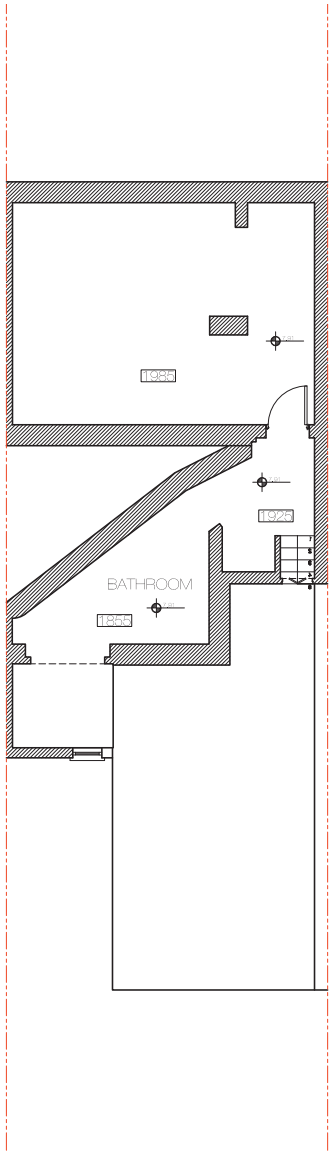
Detailed drawings, specification and method statement will be prepared in advance of any works being carried out on site. The final method statement and sequencing will be done with the input of the chosen contractor.

Appendices

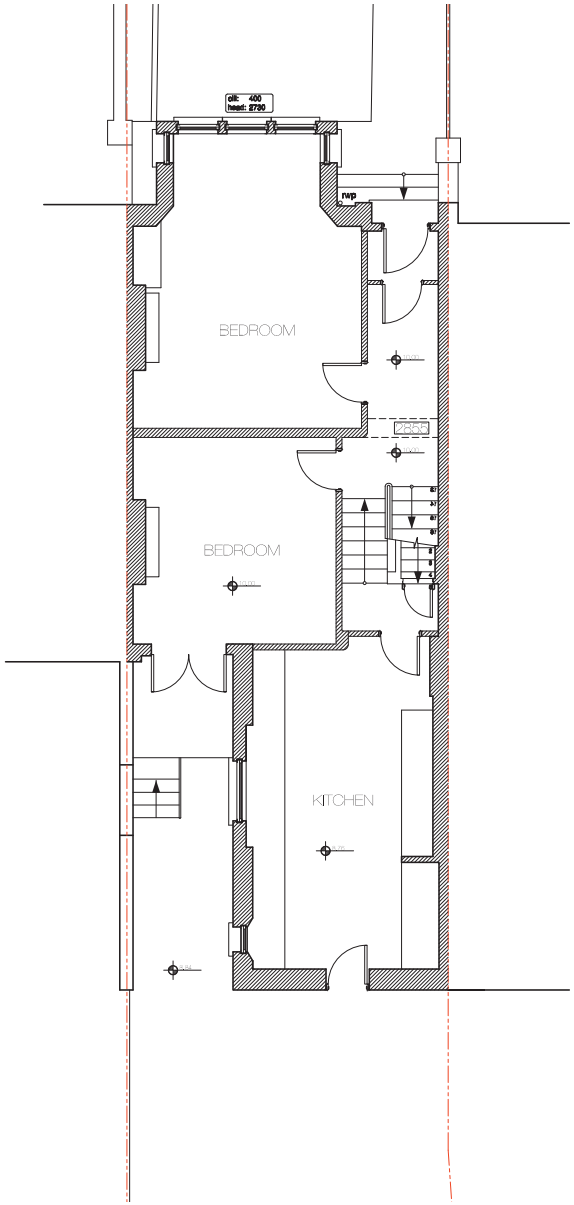
1. Existing Site Layouts
2. Proposed Layouts
3. Jomas Desk Study BIA Report

1. Existing Site Layouts

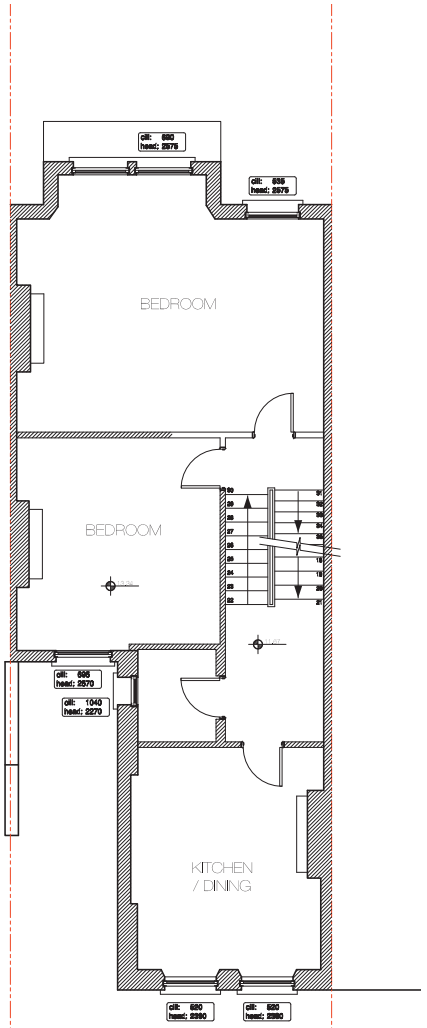
Existing Plans
Sheet 1 of 2



Basement Plan

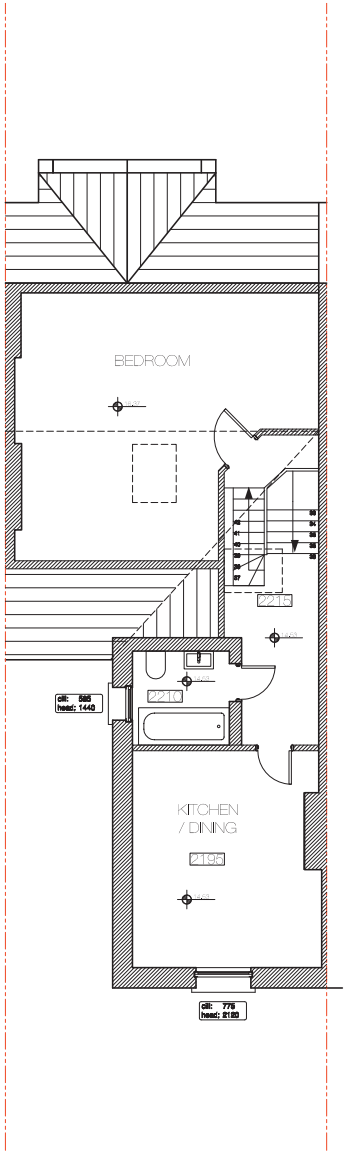


Ground Floor Plan

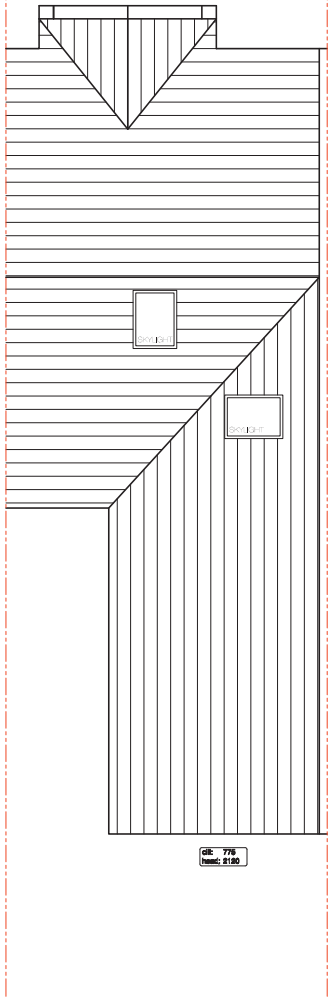


First Floor Plan

Existing Plans
Sheet 2 of 2



Second Floor Plan



Roof Plan

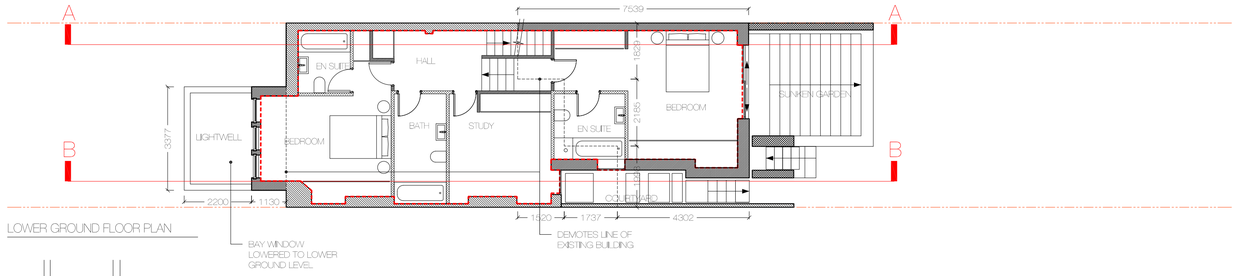
Area Summary:

TOTAL 224.1m²

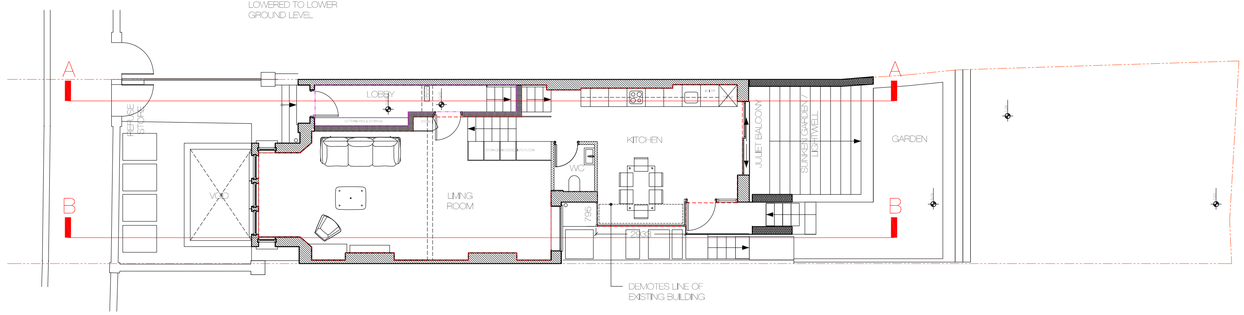
Scale Bar:



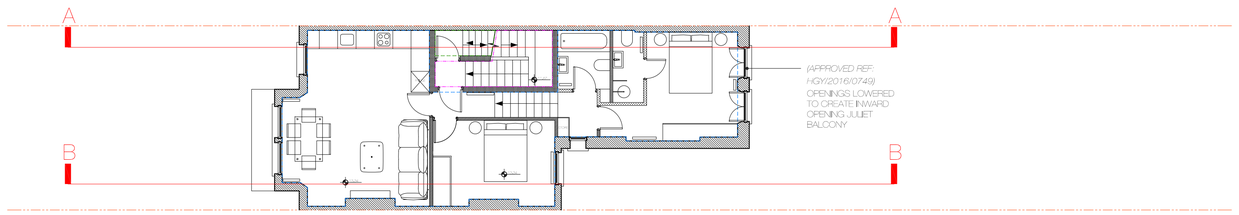
2. Proposed Layouts



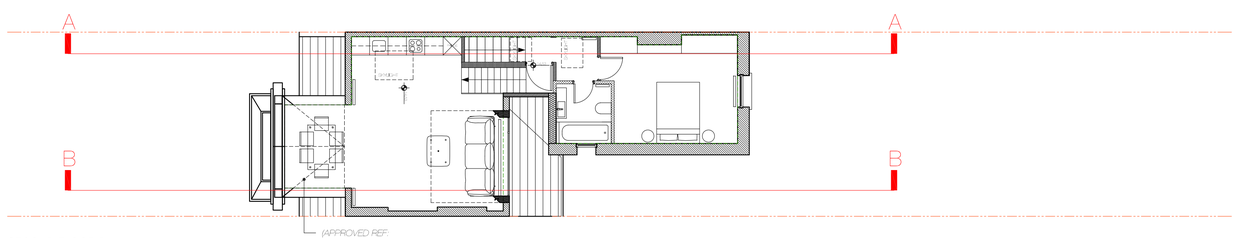
LOWER GROUND FLOOR PLAN



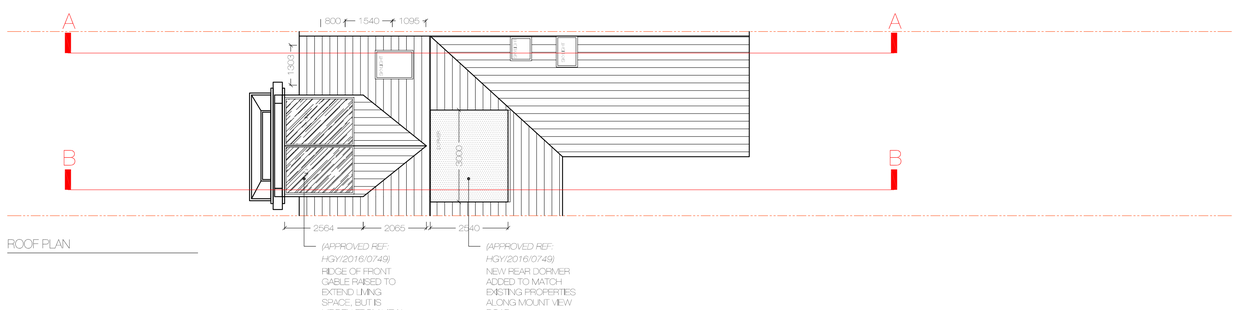
UPPER GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN



ROOF PLAN

DO NOT SCALE FROM THIS DRAWING.
The contractor shall check and verify all dimensions on site and report any descrepancies in writing to the architect before proceeding with work.

FOR ELECTRONIC DATA USE:
Electronic data/drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should be read only from those values stated in text, on the drawing.

AREA MEASUREMENT
The areas are approximate and can only be verified by a detailed dimensional survey of the completed building. Any decisions to be made on the basis of these predictions whether as to project viability, pre-letting, lease agreements or the like should include due allowance for the increases and decreases inherent in the design development and building processes. Figures relate to the likely areas of the building at the current state of the design and using Gross External Area (GEA), Gross Internal Area (GIA) and Net Internal Area (NIA) method of measurement from the Code of Measuring Practice, 5th edition (RICS code of practice). All areas are subject to Town Planning and Conservation Area Consent, and detailed Rights to Light analysis.

NOTES:

LEGEND:

UNIT 1:
UNIT 2:
UNIT 3:

REVISION	DATE	COMMENT

PROJECT:
50 MOUNT VIEW ROAD
HARINGEY, N4 4JP

CLIENT:
DG LAND SECURITIES

DRAWING:
PROPOSED
PLANS

SCALE BAR:
1m 5m 10m

DATE:	SCALE:	DRAWN:	CHECK:
21.06.16	1:100 @ A1	DW	DG

REASON FOR ISSUE:
PLANNING

NORTH:

DRAWING NO: 0045_PL_103

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3. Desk Study BIA

GEOTECHNICAL DESK STUDY
&
BASEMENT IMPACT ASSESSMENT
REPORT

FOR

50 MOUNT VIEW ROAD
LONDON
N4 4JP



Specialists in the investigation & reclamation of brownfield sites

Report Title: Geotechnical Desk Study & Basement Impact Assessment for 50 Mount View Road, London, N4 4JP.

Report Status: Final v1.0

Job No: P9573J878

Date: 08 July 2016

Quality Control: Previous Release

Version	*Date*	*Issued By*

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Technical Director

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EXECUTIVE SUMMARY

DG Land Securities Ltd ("The Client") has commissioned Jomas Associates Ltd ('JAL'), to prepare a Basement Impact Assessment at a site referred to as 50 Mount View Road, London, N4 4JP. It is proposed that the existing residential building be refurbished and the current basement extended.

It should be noted that the table below is an executive summary of the findings of this report and is for briefing purposes only. Reference should be made to the main report for detailed information and analysis.

Geotechnical Desk Study	
Current Site Use	The site is currently a residential property with an existing basement.
Proposed Site Use	The residential property is proposed to be refurbished and the current basement extended.
Site History	The earliest available maps of the area (1864) show the site area as undeveloped farmland with vegetated boundaries. There is no significant change until 1896 where the site has been developed and occupied by terraced residential housing. There is no significant change to the site area to the present day. The surrounding area was occupied by farmland from 1864 until 1896 where there was significant widespread residential development comprising terraced housing. Further widespread development of the surrounding area continues from 1896 to present day including schools 120m SE and 150m north of the site.
Site Setting	Information provided by the British Geological Survey indicates that the site is directly underlain by solid deposits of The London Clay Formation. No superficial or artificial deposits are reported within the site. There are no borehole records within 500m of the site. There are no aquifers within 1000m of the site location. A review of the EnviroInsight Report indicates the nearest reported source protection zone to be an Outer Zone 2 and Inner Zone 1 200m east of the site. There are no groundwater abstraction zones reported within 500m of the site. There are no detailed river entries or surface water features reported within 250m of the site. There are no Environment Agency Zone 2 or 3 floodplains reported within 250m of the site. What appears to be a covered service reservoir is noted within 250m to the west.
Potential Geological Hazards	The Groundsure data identifies a moderate risk of shrink / swelling clay – for full details see Section 3.6.

Basement Impact Assessment	
Impact Assessment	The overall assessment of the site is that the extension of a basement for the existing development will not adversely impact the site or its immediate environs, providing measures are taken to protect surrounding land and properties during construction. The proposed basement excavation is not within 5m of a public pavement, but it within 5m of neighbouring properties. Unavoidable lateral ground movements associated with the basement excavations must be controlled during temporary and permanent works so as not to impact adversely on the stability of the surrounding ground and any associated services. From the studies that have been undertaken so far it is concluded that the extension of the basement will not adversely affect ground water. It is concluded that this site can be successfully developed without causing any problems to the subterranean drainage.

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 DG Land Securities Ltd ("The Client") has commissioned Jomas Associates Ltd ('JAL'), to prepare a Basement Impact Assessment at a site referred to as 50 Mount View Road, London, N4 4JP. It is proposed that the existing building will be refurbished and the existing basement extended.

1.1.2 Jomas' walkover and work has been undertaken in accordance with email proposal dated 14 June 2016.

1.2 Proposed Development

1.2.1 The proposed development includes the retention of the existing building, interior refurbishment and extension of an existing basement.

1.2.2 The development is subject to planning permission (ref: HGY/2016/2055) and is for

> "Works to 3 flats including, extension of existing loft space to create new dormer window (already approved under HGY/2016/0749), ground floor side extension, and lower ground floor extensions to front and rear. Associated internal works."

1.2.3 From the drawings for the scheme obtained from the London Borough of Haringey Council Planning Department planning portal, it is understood that the extension of the basement would be to the rear of the structure (south) but will not extend beyond the footprint of the existing building / extension. The proposed finished floor level of the proposed basement extension is below the current basement floor level.

1.2.4 At the time of writing a decision on the above is pending.

1.2.5 Drawings showing the existing structure and the proposed works (as submitted to London Borough of Haringey Council Planning Department) are included in Appendix 1.

1.3 Objectives

1.3.1 The objectives of JAL's investigation were as follows:

- To present a description of the present site status, based upon the published geology, hydrogeology and hydrology of the site and surrounding area;
- To review readily available historical information (i.e., Ordnance Survey maps and database search information) for the site and surrounding areas;
- To assess the potential impacts that the proposal may have on ground stability, the hydrogeology and hydrology on the site and its environs.

1.4 Scope of Works

1.4.1 The following tasks were undertaken to achieve the objectives listed above:

- A walkover survey of the site;

- A desk study, which included the review of a database search report (GeoInsight Report, attached in Appendix 2) and historical Ordnance Survey maps (attached in Appendix 3)
- A basement impact assessment.

1.5 Limitations

1.5.1 Jomas Associates Ltd ('JAL') has prepared this report for the sole use of DG Land Securities Ltd in accordance with the generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of JAL. No other third party warranty, expressed or implied, is made as to the professional advice included in this report. This report must be used in its entirety.

1.5.2 The records search was limited to information available from public sources; this information is changing continually and frequently incomplete. Unless JAL has actual knowledge to the contrary, information obtained from public sources or provided to JAL by site personnel and other information sources, have been assumed to be correct. JAL does not assume any liability for the misinterpretation of information or for items not visible, accessible or present on the subject property at the time of this study.

1.5.3 Whilst every effort has been made to ensure the accuracy of the data supplied, and any analysis derived from it, there may be conditions at the site that have not been disclosed by the investigation, and could not therefore be taken into account. As with any site, there may be differences in soil conditions between exploratory hole positions. Furthermore, it should be noted that groundwater conditions may vary due to seasonal and other effects and may at times be significantly different from those measured by the investigation. No liability can be accepted for any such variations in these conditions.

2 SITE SETTING & HISTORICAL INFORMATION

2.1 Site Information

2.1.1 The site location plan is appended to this report as Figure 1.

Table 2.1: Site Information

Name of Site	-
Address of Site	50 Mount View Road London, N4 4JP
Approx. National Grid Ref.	530972, 188093
Site Area (Approx)	0.02 hectares
Site Ownership	Unknown
Site Occupation	A brick built residential terraced two-storey.
Local Authority	London Borough of Haringey
Proposed Site Use	Residential with basement extension

2.2 Walkover Survey

2.2.1 The site was visited on 22 June 2016 along with representatives from other companies involved in the project.

Table 2.2: Site Description

Area	Item	Details
On-site:	**Current Uses:**	The site is currently occupied by a residential terraced two-storey brick build. The building internally is currently being refurbished.
	Evidence of historic uses:	It is understood that the building has remained a residential property since 1896. No visual evidence of other uses was observed to counter this presumption.
	Surfaces:	The majority of the site is covered by the building footprint. There is a small area of outside space around the front which is covered with concrete and paving. To the rear of the building is garden mainly covered b grass.
	Vegetation:	The rear garden contains small shrubs at the back with two young trees around 3-4m tall.
	Topography/Slope Stability:	The house is generally level with a slight downward slope in the garden area trending north to south.
	Drainage:	Standard drainage on site.
	Services:	The site appears to be connected to normal statutory services.

Area	Item	Details
	Controlled waters:	No controlled waters were noted on site.
	Tanks:	No tanks were observed on site.
Neighbouring land:	**North:**	Mount view road
	East:	Residential.
	South:	Residential
	West:	Residential garden of property on Albany Road

2.2.2 Photos taken during the site walkover are provided in Appendix 1.

2.3 Historical Mapping Information

2.3.1 The historical development of the site and its surrounding areas was evaluated following the review of a number of Ordnance Survey historic maps, procured from GroundSure, and provided in Appendix 3 of this report.

2.3.2 A summary produced from the review of the historical map is given in Table 2.3 below. Distances are taken from the site boundary.

Table 2.3: Historical Development

Dates and Scale of Map	Relevant Historical Information	
	On Site	**Off Site**
1864 – 1:2,500	The site is undeveloped and within farmland.	The surrounding area is undeveloped farmland with vegetated boundaries.
1872 – 1:2,500	No significant changes.	Tottenham and Hampstead Junction Railway trending west to east 250m south of the site boundary.
1896 - 1:1,056 1:2,500	The site has been developed and occupied by terraced residential housing.	Significant widespread residential development of terraced housing. Reservoir 250m west of the site boundary.
1915 – 1:2,500	Small unknown structure at the northern end of the on-site building removed.	Further widespread development of the surrounding area including schools 120m SE and 150m north including residential properties to the NE and north.
1954 – 1:1,250 1:2,500	No significant changes.	'Garage' 250m NE of the site boundary. Still predominantly a residential area. Allotment garden 260m NE of the site.
1979 – 1:1,250	Incomplete map	Incomplete Map
1991 – 1:1,250	No significant change	No significant change

Dates and Scale of Map	Relevant Historical Information	
	On Site	Off Site
1992 – 1:1,250	No significant change	Incomplete map.

2.3.4 A review of readily available aerial photographs from the internet suggests that the reservoir to the west of the site is still present as a covered service reservoir.

2.4 Previous Site Investigations

2.4.1 No previous site investigation reports were provided at the time of writing.

3 GEOLOGY, HYDROGEOLOGY & HYDROLOGY

3.1.1 The following section summarises the principal geological resources of the site and its surroundings. The data discussed herein is generally based on the information given within the Groundsure Report (in Appendix 2).

3.2 Solid and Drift Geology

3.2.1 Information provided by the British Geological Survey indicates that the site is directly underlain by the London Clay Formation.

3.2.2 Superficial and artificial deposits are not reported within the site.

3.3 British Geological Survey (BGS) Borehole Data.

3.3.1 There are no BGS borehole records within 250m of the site.

3.4 Hydrogeology & Hydrology

3.4.1 General information about the hydrogeology of the site was obtained from the Environment Agency website.

Groundwater Vulnerability

3.4.2 Since 1 April 2010, the EA's Groundwater Protection Policy uses aquifer designations that are consistent with the Water Framework Directive. This comprises;

- **Secondary A** - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;
- **Secondary B** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
- **Secondary Undifferentiated** - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
- **Principal Aquifer** – this is a formation with a high primary permeability, supplying large quantities of water for public supply abstraction.
- **Unproductive Strata** - These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Source Protection Zones (SPZ)

3.4.3 In terms of aquifer protection, the EA generally adopts a three-fold classification of SPZs for public water supply abstraction wells.

- Zone I - or 'Inner Protection Zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source.
- Zone II - or 'Outer Protection Zone' is defined by a 400-day travel time to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants.
- Zone III - or 'Total Catchment' is the total area needed to support removal of water from the borehole, and to support any discharge from the borehole.

Hydrology

3.4.4 The hydrology of the site and the area covers water abstractions, rivers, streams, other water bodies and flooding.

3.4.5 The Environment Agency defines a floodplain as the area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas.

3.4.6 There are two different kinds of area shown on the Flood Map for Planning. They can be described as follows:

Areas that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5 per cent (1 in 200) or greater chance of happening each year;
- or from a river by a flood that has a 1 per cent (1 in 100) or greater chance of happening each year.

(For planning and development purposes, this is the same as Flood Zone 3, in England only.)

- The additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1 per cent (1 in 1000) chance of occurring each year.

(For planning and development purposes, this is the same as Flood Zone 2, in England only.)

3.4.7 These two areas show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements.

3.4.8 Outside of these areas flooding from rivers and the sea is very unlikely. There is less than a 0.1 per cent (1 in 1000) chance of flooding occurring each year. The majority of England and Wales falls within this area. (For planning and development purposes, this is the same as Flood Zone 1, in England only.)

3.4.9 Some areas benefit from flood defences and these are detailed on Environment Agency mapping.

3.4.10 Flood defences do not completely remove the chance of flooding, however, and can be overtopped or fail in extreme weather conditions.

Table 3.1: Summary of Hydrogeological & Hydrology

Feature		On Site	Off Site	Potential Receptor ?
Aquifer	**Superficial:**	None	None within 1000m	N
	Solid:	None	None within 1000m	N
Source Protection Zone		None	Outer Zone 2 and Inner Zone 1 200m east of the site.	N
Abstractions		None	No groundwater abstractions within 500m	N
Flood Risk	Zone 2	None	None within 500m of the site	N
	Zone 3	None	None within 500m of the site	N
	Susceptibility to Groundwater Flooding			

3.5 Radon

3.5.1 The site is reported not to lie within a Radon affected area, as less than 1% of properties are above the action level.

3.5.2 Consequently, no radon protective measures are necessary in the construction of new dwellings or extensions as described in publication BR211 (BRE, 2007).

3.6 Geological Hazards

3.6.1 The following are brief findings extracted from the GroundSure GeoInsight Report, that relate to factors that may have a potential impact upon the engineering of the proposed development.

Table 3.2: Geological Hazards

Potential Hazard	Site check Hazard Rating	Details	Further Action Required?
Shrink swell	Moderate	Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.	YES

Potential Hazard	Site check Hazard Rating	Details	Further Action Required?
Landslides	Very low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.	No
Ground dissolution soluble rocks	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks.	No
Compressible deposits	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.	No
Collapsible Rock	Very Low	Deposits with the potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required.	No
Running sand	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.	No
Coal mining	No	There are no coal mining areas identified within 1000m of the site boundary.	No
Non-coal mining	No	-	No
Brine affected areas	No	-	No

3.6.2 In addition, the GeoInsight report notes the following:

- The site is reported to lie within an area where Johnson Poole & Bloomer (JPB) hold information relating to mining.
- The site is reported to be within 500m of historical railway and tunnel features, the nearest 274m SE identified as a Railway from 1915.

3.6.3 The site is identified as being underlain by London Clay. This material is usually of high plasticity and a medium or high volume change potential as defined by BS1377 and NHBC Chapter 4.2 respectively.

3.6.4 It is likely that the foundations for the basement will be formed at such a depth as not to be adversely affected by the presence of trees in the area. This should however be confirmed by a tree survey (identifying location, species and height) and a ground

investigation to confirm the volume change potential of the underlying ground. As an alternative a worst case of a "high volume change potential" should be assumed.

3.6.5 Assuming a high volume change for the London Clay beneath the site it is considered that the use of suspended floor slabs will be required in accordance with NHBC Chapter 4.2. Under suspended in-situ concrete ground this would need to be 150mm and under suspended precast concrete and timber floors 300mm

3.6.6 Voids or compressible material will need to be emplaced adjacent to foundations consisting of 35mm

4 HYDROLOGY AND FLOOD RISK

4.1 Basis of Assessment

4.1.1 It should be noted that the Haringey's Cabinet decided on 15 July 2014 to withdraw a number of documents which had been drafted but not adopted. These included the "Basement Guidance Note". Public consultation has been undertaken with regard to a new "Development Management DPD". It is understood that this is intended to introduce strict rules on basement developments to stop unsociable or ugly underground extensions. It does not appear to cover technical issues relating to basement development.

4.1.2 Consequently the NPPF and Camden Guidance for Subterranean Development has been utilised as this is both comprehensive and used by a number of other London Local Authorities,

4.2 Hydrology and Flood Risk

4.2.1 In accordance with the NPPF and Camden Guidance for Subterranean Development, below is a review of flood risks posed to and from the development and recommendations for appropriate design mitigation where necessary

Table 4.1: Flood Risks

Flood Sources	Site Status	Comment on flood risk posed to / from the development
Fluvial / Tidal	Site is not within 250m of an Environment Agency Zone 2 or Zone 3 floodplain. No risk of flooding from rivers and the sea (RoFRaS).	Proposed development is to an existing property including a basement extension. No increase in impermeable areas hence no additional SUDS required.
Groundwater	The site location is indicated by the BGS to not be susceptible to groundwater flooding.	The proposed development will not increase the potential risk of groundwater flooding. Basement will be fully waterproofed as appropriate to industry standard Low Risk
Artificial Sources	A reservoir is identified on the 1896 plan 250m west. The EA indicate that the area is at risk from flooding reservoirs.	Negligible Risk - Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers (under the Reservoirs Act (1975)). In the highly unlikely event that a reservoir dam failed, a large volume of water would escape at once and flooding could happen with little or no warning affecting a very large area.
Surface Water / Sewer Flooding	The historical map review has identified a reservoir approximately 250m west of the site (see above).	No increase in impermeable areas – no SUDS required Development will utilise existing connection to sewers, gravity drainage and non-return valves

		Development unlikely to significantly increase the peak flow/volume of discharge from the site: Low Risk No further drainage assessment required
Climate Change	Site not within climate change flood extent area	Development will not significantly increase the peak flow and volume of discharge from the site Low risk posed to and from the development

4.2.2 Based on the available data, the site is considered to be at low risk from all sources of flooding. The basement can be extended and operated safely in flood risk terms without increasing flood risk elsewhere and is therefore considered NPPF compliant.

Surface Water Flood Risk

Based on EA mapping, the site and highways surrounding the site are not within an area identified as a high risk for surface water flooding potential; the site itself not likely to be inundated during "normal" **surface water.**

The site would be affected by flooding from the failure of the nearby covered service reservoir. However the regular statutory inspections should ensure that instant catastrophic failure does not occur. Therefore there is considered to be a negligible risk of this occurring.

No increase in impermeable areas

The site is defined by the footprint of the existing building; there is no opportunity to increase impermeable areas and hence no further SUDS are required. The SUDS toolkit does not apply to this site.

4.3 Hydrogeology

4.3.1 The baseline hydrogeology of the site is based on available hydrogeological mapping, including the BGS online mapping, and London Borough of Haringey SFRA.

4.3.2 The available data indicates that the site area is directly underlain by the London Clay Formation. This acts as an aquitard up to 150m in thickness to the main London chalk aquifer. No superficial or artificial deposits are located on site.

4.3.3 The existing basement is founded on London Clay. The extension of the basement will not come into contact with any aquifers or be at practical risk from any flooding. Any perched groundwater lenses that might be encountered can be dealt with appropriately through industry standard localised de-watering.

4.3.4 The proposed basement does not extend into a sensitive groundwater body; there is unlikely to be a risk posed to or from the development to groundwater based on following industry standard basement construction techniques.

4.3.5 No groundwater flows will be impeded by the basement.

4.3.6 The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available.

Sequential Test: **within FZ1 and no additional dwelling hence pass by default.**

4.3.7 Paragraph 19 of PPS25 recognizes the fact that wider sustainable development criteria may require the development of some land that cannot be delivered through the sequential test. In these circumstances, the Exception Test can be applied to some developments depending on their vulnerability classification (Table D.2 of PPS25). The Exception Test provides a method of managing flood risk while still allowing necessary development to occur.

Exception Test: **FZ1 hence pass by default and low risk posed to and from other sources**

4.4 Flood Resilience

4.4.1 **In accordance with general basement flood policy and basement design, t**he proposed development will utilize the flood resilient techniques recommended in the NPPF Technical Guidance where appropriate and also the recommendations that have previously been issued by various councils.

4.4.2 These include:

- **Basement to be fully waterproofed (tanked) and waterproofing to be tied in to the ground floor slab as appropriate:** to reduce the turnaround time for returning the property to full operation after a flood event.
- Plasterboards will be installed in horizontal sheets rather than conventional vertical installation methods to minimise the amount of plasterboard that could be damaged in a flood event
- Wall sockets will be raised to as high as is feasible and practicable in order to minimise damage if flood waters inundate the property
- Any wood fixings on basement / ground floor will be robust and/or protected by suitable coatings in order to minimise damage during a flood event
- The basement waterproofing where feasible will be extended to an appropriate level above existing ground levels.
- **The concrete sub floor as standard will likely be laid to fall to drains or gullies which will remove any build-up of ground water to a sump pump where it will be pumped into the mains sewer. This pump will be fitted with a non-return valve to prevent water backing up into the property should the mains sewer become full**
- **Insulation to the external walls will be specified as rigid board which has impermeable foil facings that are resistant to the passage of water vapor and double the thermal resistance of the cavity**

5 BASEMENT IMPACT ASSESSMENT

5.1 Screening Assessment

5.1.1 Screening is the process of determining whether or not there are areas of concern which require a BIA for a particular project. This was undertaken in previous sections by the site characterisation.

5.1.2 Scoping is the process of producing a statement which defines further matters of concern identified in the screening stage. This defining is in terms of ground processes in order that a site specific BIA can be designed and executed by deciding what aspects identified in the screening stage require further investigation by desk research or intrusive drilling and monitoring or other work.

5.1.3 The scoping stage highlights areas of concern where further investigation, intrusive soil and water testing and groundwater monitoring may be required.

5.1.4 A series of flowcharts have been used to identify what issues are relevant to the site. Each question posed in the flowcharts is completed by answering “Yes”, “No” or “Unknown”. Any question answered with “Yes” or “Unknown” is then subsequently carried forward to the scoping phase of the assessment.

5.1.5 The results of the screening process for the site are provided in Table 6.1 below. Where further discussion is required the items have been carried forward to scoping.

5.1.6 A Site Investigation is undertaken where necessary to establish base conditions and the impact assessment determines the impact of the proposed basement on the baseline conditions, taking into account any mitigating measures proposed.

Table 6.1: Screening Assessment

Query	Y / N	Comment
Surface Flow and Flooding		
Is the site within the catchment of any ponds?	No	No evidence of any ponds or natural surface water features on historical or current OS maps.
As part of the site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially different from the existing route?	No	The proposed development will add a basement within the existing footprint and not affect the run off at ground level.
Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	No	There are no nearby surface water features.
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	No surface waters in the area to be impacted.

Query	Y / N	Comment
Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?	No	No nearby surface water features. The site not within an EA Flood Zone 2 or 3.
Subterranean (Groundwater) Flow		
Is the site located directly above an aquifer?	No	The site is not located directly above an aquifer.
Will the proposed basement extend below the surface of the water table?	Unknown	Considered highly unlikely that the basement would be formed beneath the groundwater table.
Is the site within 100m of a watercourse, well (disused or used) or a potential spring line?	No	No nearby subterranean water features.
Is the site within the catchment of any pond?	No	No nearby natural surface water features.
Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?	No	The proposed development is to extend the existing basement under an existing building.
As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No	There is no reason to believe that more water than at present will be discharged to the ground.
Is the lowest point of the proposed excavation (allowing of any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond or spring line?	No	No nearby water features.
Slope Stability		
Does the existing site include slopes, natural or manmade, greater than 7 degrees?	No	
Will the proposed re-profiling of landscaping change slopes at the property to more than 7 degrees?	Yes	On the drawings supplied to the Planning department the basement includes a small terraced cut at approximately 45° adjacent to structure to act as a light well. The relatively small terraced nature of the light well and the expected ground conditions means that it is not considered to be an issue.
Does the developments neighbouring land include railway cuttings and the like, with a slope greater than 7 degrees.	No	Surrounding land is mostly residential in nature.

Query	Y / N	Comment
Is a clay stratum the shallowest stratum at the site?	Yes	The site is directly underlain by the London Clay Formation.
Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?	No	No trees will be felled as part of this development.
Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	Unknown	The site is reported to be in an area with moderate risk of shrink-swell clays. However the exact volume change potential and the effects of nearby trees are not currently known.
Is the site within an area of previously worked ground?	No	There is no evidence from the historical data that the ground in this area has been worked other than regarding the existing residential development.
Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No	The site is not directly underlain by an aquifer.
Is the site within 50m of ponds?	No	No natural ponds are identified.
Is the site within 5m of a pedestrian 'right of way'?	Yes	Whilst the site is adjacent to Mount View Road, where there is a public footpath outside the front gate, the actual area for excavation is beyond 5m .
Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Yes	It is likely that the basement foundations will increase the differential depth of foundations relative to neighbouring properties however this is dependent on the type of foundations used at the neighbouring properties and this is currently unknown.
Is the site over (or within the exclusion of) any tunnels e.g. railway lines?	No	No tunnels or railways identified.

5.2 Scoping

5.2.1 Scoping is the activity of defining in further detail the matters to be investigated as part of the BIA process. Scoping comprises of the definition of the required investigation needed in order to determine in detail the nature and significance of the potential impacts identified during screening.

5.2.2 The potential impacts for each of the matters highlighted in Table 6.1 above are discussed in further detail below together with the requirements for further investigations. Detailed assessment of the potential impacts and recommendations are provided where possible.

5.2.3 These issues include proposed changes to hard standing, the possibility of made ground and/or gravel immediately beneath the site, the shrink/swell nature of the London Clay.

5.3 Proposed Changes to Areas of External Hardstanding

5.3.1 The site is currently covered by the building footprint with exception to the rear garden area. It is not thought that the proposed development will result in any greater area of hard-standing cover than is currently present on the site.

5.3.2 It is not considered that there is a requirement for undertaking any further investigations, studies or impact assessment in relation to the proposed changes to areas of external hard-standing.

5.4 Past Flooding

5.4.1 Planning Policy Statement PPS25 “Development and Flood Risk” seeks to protect development from flooding as well as preventing flooding. PPS25 states that developers are responsible for providing a flood risk assessment:

- demonstrating whether any proposed development is likely to be affected by current or future flooding from any source;
- satisfying the local planning authority that the development is safe and where possible reduces flood risk overall;
- demonstrating whether the development will increase flood risk elsewhere;
- demonstrating measures proposed to deal with these effects and risks.

5.4.2 The site is not in an area which has been knowingly affected by flooding in the past. Nor is it located within 250m of a known area of flood risk. (London Borough of Haringey Preliminary Flood Risk Assessment document, May 2011).

5.4.3 Geological Impact

5.4.4 The published geological maps indicate that the London Clay Formation directly underlies the site.

5.4.5 The current basement construction is founded within the London Clay Formation and the basement extension will also be within the London Clay Formation.

5.5 Impacts of Basement on Adjacent Properties and Pavement

5.5.1 The proposed basement excavation will be further than 5m from a public pavement.

5.5.2 The proposed basement excavation will be within 5m of neighbouring properties. Unavoidable lateral ground movements associated with the basement excavations must be controlled during temporary and permanent works so as not to impact adversely on the stability of the surrounding ground and any associated services.

5.5.3 It will be necessary to ensure that the basements are designed in accordance with the NHBC Standards and take due cognisance of the potential impacts highlighted above. This may be achieved by ensuring best practice engineering and design of the

proposed scheme by competent persons and in full accordance with the Construction (Design and Management) Regulations. This will include:

- Establishment of exact ground conditions beneath the site;
- Establishment of the likely ground movements arising from the temporary and permanent works and the mitigation of excessive movements;
- Assessment of the impact on any adjacent structures (including adjacent properties and the adjacent pavement with potential services);
- Determination of the most appropriate methods of construction of the proposed basements;
- Undertake pre-condition surveys of adjacent structures;
- Monitor any movements and pre-existing cracks during construction;
- Establishment of contingencies to deal with adverse performance;
- Ensuring quality of workmanship by competent persons.

5.5.4 Full details of the suitable engineering design of the scheme in addition to an appropriate construction method statement should be submitted by the Developer to the London Borough of Haringey

6 SUMMARY AND RECOMMENDATIONS

6.1.1 It is understood that the proposed development comprises the refurbishment of the existing residential building and the extension of the existing basement further south under the existing building footprint.

6.1.2 The earliest available maps of the area (1864) show the site area as undeveloped farmland with vegetated boundaries. There is no significant change until 1896 where the site has been developed and occupied by terraced residential housing. There is no significant change to the site area to the present day.

6.1.3 The surrounding area was occupied by farmland from 1864 until 1896 where there was significant widespread residential development comprising terraced housing. Further widespread development of the surrounding area continues from 1896 to present day including schools 120m SE and 150m north of the site and what appears to be a covered service reservoir less than 250m to the west.

6.1.4 The site is not located within a flood risk area and has not been prone to historic flooding. There are no nearby water features that will be affected by the extension of the existing basement at the site.

6.1.5 Published data indicate that the site is directly underlain by solid deposits of the London Clay Formation with no artificial of superficial deposits reported. There are no nearby groundwater abstractions. The basement extension is anticipated to be constructed within the London Clay Formation, which is an unproductive strata from a groundwater perspective.

6.1.6 As the proposed basement does not extend into a sensitive groundwater body; there is unlikely to be a risk posed to or from the development to groundwater if industry standard basement construction techniques are followed as previously identified.

6.1.7 The methodology of construction will mitigate risks to neighbouring properties as will be submitted by the Engineers

7 REFERENCES

Groundsure EnviroInsight Report Ref HMD-377-2630082 December 2015

Groundsure GeoInsight Report Ref HMD-377-2630083 December 2015

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National Planning Policy Framework. Department for Communities and Local Government, March 2012

Code of Practice for Site Investigations BS5930: 2015

Investigation of Potentially Contaminated Sites – Code of Practice BS10175: 2011

BRE Report BR211 ;Radon: Protective measures for new dwellings, 2007

British Standards Institution (1999) BS 5930:2015 *Code of practice for site investigations*. Milton Keynes: BSI

APPENDICES

APPENDIX 1 – FIGURES

(INCLUDING DRAWINGS OBTAINED FROM THE LONDON BOROUGH OF HARINGEY PLANNING PORTAL)