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STAGE 1 & 2 (SCREENING & SCOPING) BASEMENT IMPACT ASSESSMENT REPORT

MORETON LODGE
HOLLY WALK
NW3 6RA

JOMAS ASSOCIATES LTD
Unit 24 Sarum Complex, Salisbury Road, Uxbridge Ub8 2RZ
www.jomasassociates.com 0333-305-9054 info@jomasassociates.com

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Prepared by: JOMAS ASSOCIATES LTD **For: MICHAEL ROBINSON**

Prepared by
James Orledge BSc (Hons), FGS

Geotechnical Engineer

Reviewed by
Derek Grange BSc (Hons), MSc, CGeol FGS RoGEP - Specialist

Senior Principal - Geotechnics

Approved by
Shaw Carter BSc (Hons), CGeol, FGS

Senior Geotechnical Engineer

Authorised by
Roni Savage BEng (Hons), MSc, SiLC, CGeol CEng, FICE, HonRIBA, MCIWM, FGS

Managing Director

Should you have any queries relating to this report, please contact

JOMAS ASSOCIATES LTD

www.jomasassociates.com

0333 305 9054

info@jomasassociates.com

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EXECUTIVE SUMMARY

Michael Robinson ("The Client") has commissioned Jomas Associates Ltd ('Jomas'), to prepare a Stage 1 & 2 (Screening & Scoping) Basement Impact Assessment for a site referred to as Moreton Lodge, Holly Walk, London, NW3 6RA.

The aim of this report is to assess whether the ground conditions within the local area represent an impediment to the proposed development.

The conclusion of this Stage 1 & 2 (Screening & Scoping) Basement Impact Assessment is that a full BIA is not required.

Our report concludes that the following further works are recommended, though these are not required to fulfil the requirements of Camden Planning Guidance: Basements at the planning application stage;

- An intrusive geotechnical ground investigation is recommended to inform foundation design.
- A drainage strategy/SUDS report is recommended.
- Whilst a ground investigation is not considered necessary to finalise the BIA, if one is conducted for geotechnical purposes then information should be used to provide further confirmation of the conclusions reached herein.
- A Ground Movement Assessment is not considered necessary given the proposed shallow excavation required to form the basement.

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.

Desk Study	
Current Site Use	The study site currently comprises a 2-storey residential extension attached to a 3-storey Victorian building with associated garden. Moreton Lodge is constructed into a wider sloping setting, with much of the house having lower ground floors. The site itself is founded at ground level and does not have a basement.
Proposed Site Use	The proposed development for this site is understood to comprise the demolition of the existing extension and construction of a new extension with a ground floor and lower ground floor levels. The FFL of the proposed lower ground floor/basement is understood to be formed at ~0.5m below ground level.
Site History	On the earliest available map (1870), the site is shown as vacant, and comprises vegetation in the north and undeveloped land in the south. The site remains devoid of feature until the maps dated 1915-1920, when a single building is developed on to the south of site which encroaches within the site boundary. By the maps dated 1972-76 where a small extension encroaches the site adjacent to the southeast boundary. On the maps dated 1986-1991 the extension appears to have been demolished and the site is devoid of any features. No observational changes then occur to the site.

Desk Study	
	Historically, the surrounding area has comprised mainly residential development, ponds have been recorded locally in the historical maps. Moreton House was first shown to be present immediately to the southeast of the site in maps from 1915-1920, and was labelled as a Nurses Home from 1951, changing to 'Moreton House' between 1972 and 1976.
Site Setting	The British Geological Survey indicates that the site is directly underlain by solid deposits of the Bagshot Formation. The underlying the Bagshot Formation is identified as a Secondary (A) aquifer. The site is located within EA flood zone 1. There is a negligible risk of surface water and groundwater flooding reported on site.
Potential Geological Hazards	The Groundsure data identifies negligible to very low risks for the potential hazards assessed. The presence of Made Ground may be a source of elevated sulphate. If such levels are noted then sulphate resistant concrete may be required. Given that the BGS has identified the area to have the 'negligible' for groundwater flooding based on underlying geological conditions, a shallow groundwater table is highly unlikely to be present. It is recommended that a geotechnical ground investigation is undertaken to inform foundation design.

Screening and Scoping (Basement Impact Assessment)	
Subterranean (Groundwater) Flow	A ground investigation would be prudent to confirm the ground conditions and groundwater levels beneath the site. This can then confirm the relative depths of the basement to the groundwater levels.
Land Stability	The site, as with the surrounding area, is generally flat. The Groundsure report has noted that there is a "very low" risk of land instability issues for the site. The investigation should also determine the possibility of encountering groundwater and the possibility of Made Ground. Atterberg Limits of the underlying clay should be determined by the ground investigation to establish shrink/swell potential.
Surface Flow and Flooding	The proposed basement will underlie and slightly extend beyond the existing footprint of the building presently on site, there will be no significant change in surface water run-off.

Basement Impact Assessment Summary	
Basement Impact Assessment	The overall assessment of the site is that the creation 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 will not be within 5m of a public pavement. It is laterally within 5m of neighbouring properties.

Basement Impact Assessment Summary	
	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. During the construction phase careful and regular monitoring will need to be undertaken to ensure that the property above, is not adversely affected. This may mean that the property needs to be suitably propped and supported. The proposed development is not expected to cause significant problems to the subterranean drainage. It would be prudent to confirm this by a ground investigation and subsequently updated Basement Impact Assessment.

Recommended Further Work	
Works	An intrusive geotechnical ground investigation is recommended to inform foundation design. A drainage strategy/SUDS report is recommended. Whilst a ground investigation is not considered necessary to finalise the BIA, if one is conducted for geotechnical purposes then information should be used to provide further confirmation of the conclusions reached herein. A Ground Movement Assessment is not considered necessary given the proposed shallow excavation required to form the basement. It should be noted that the following items are required as part of Camden Planning Guidance Basements (January 2021) under a planning condition attached to any consent: • Plans and sections to show foundation details of adjacent structures. • Programme for enabling works, construction and restoration. • Construction Sequence Methodology. • Proposals for monitoring during construction. • Evidence of consultation with neighbours.

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Michael Robinson ("The Client") has commissioned Jomas Associates Ltd ('Jomas'), to prepare a Stage 1 & 2 Basement Impact Assessment (Screening & Scoping) at a site referred to as Moreton Lodge, Holly Walk, London, NW3 6RA.

1.1.2 Jomas' work has been undertaken in accordance with the email proposal dated 8th August 2024.

1.2 Proposed Development

1.2.1 The proposed development for this site is understood to comprise the demolition of the existing extension and construction of a new 2-storey extension with a lower ground floor level formed at approximately 0.5m below ground level.

1.2.2 It is understood the new finished floor level (FFL) will be 244mm below the existing extensions FFL, but 366mm above the adjoining main house basement.

1.2.3 Plans of the proposed development are included in Appendix 1.

1.2.4 For the purpose of geotechnical assessment, it is considered that the project could be classified as a Geotechnical Category (GC) 2 site in accordance with BS EN 1997 Part 1.

1.3 Objectives

1.3.1 The objectives of Jomas' 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 (BIA);

- The compilation of this report, which collects and discusses the above data, and presents an assessment of the site conditions, conclusions and recommendations.

1.5 Scope of Basement Impact Assessment

1.5.1 As the site lies within the purview of the London Borough of Camden, their document "Camden Planning Guidance Basements" (CPGB) (January 2021) has been used to form the methodology utilised in undertaking this BIA.

1.5.2 Jomas' BIA covers most items required under CPGB, with the exception of;

- Plans and sections to show foundation details of adjacent structures.
- Programme for enabling works, construction and restoration.
- Evidence of consultation with neighbours.
- Ground Movement Assessment (GMA), to include assessment of significant adverse impacts and specific mitigation measures required, as well as confirmatory and reasoned statement identifying likely damage to nearby properties according to the Burland Scale.
- Construction Sequence Methodology.
- Proposals for monitoring during construction.
- Drainage assessment.

1.5.3 This Jomas BIA also takes into account the Campbell Reith pro forma BIA produced on behalf of and published by the London Borough of Camden as guidance for applicants to ensure that all of the required information is provided.

1.5.4 A number of the requirements set out in the London Borough of Camden document CPGB will need to be addressed in a construction management plan, this stage is not within the scope of work that Jomas Associates have been commissioned to undertake.

1.6 Supplied Documentation

1.6.1 Jomas Associates have not been supplied with any previously produced reports at the time of writing this report.

1.7 Limitations

1.7.1 Jomas Associates Ltd has prepared this report for the sole use of Michael Robinson 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 Jomas. 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.

1.7.2 The records search was limited to information available from public sources; this information is changing continually and frequently incomplete. Unless Jomas has actual knowledge to the contrary, information obtained from public sources or provided to Jomas by site personnel and other information sources, have been assumed to be correct. Jomas 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.

1.7.3 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.

1.7.4 ***This report is not an engineering design and the figures and calculations contained in the report should be used by the Structural Engineer, taking note that variations may apply, depending on variations in design loading, in techniques used, and in site conditions. Our recommendations should therefore not supersede the Engineer's design.***

2 SITE SETTING & HISTORICAL INFORMATION

2.1 Site Information

2.1.1 The site location plan is appended to this report in Appendix 1.

Table 2.1: Site Information

Name of Site	-
Address of Site	Moreton Lodge, Holly Walk, London NW3 6RA
Approx. National Grid Ref.	526194 185826
Site Area (Approx)	0.01 hectares
Site Occupation	Residential
Local Authority	London Borough of Camden
Proposed Site Use	It is understood to comprise the demolition of the existing extension and construction of a new 2-storey extension with a ground floor level 0.5m below ground level.

2.2 Walkover Survey

2.2.1 The site was visited by a Jomas Engineer on 27th August 2024. The following information was noted while on site.

Table 2.2: Site Description

Area	Item	Details
On-site:	**Current Uses:**	The site currently comprises a 2-storey residential extension attached to a 3-storey Victorian building with associated garden. Moreton Lodge is constructed into a wider sloping setting, with much of the house having lower ground floors. The site itself is founded at ground level and does not have a basement.
	Evidence of historic uses:	No evidence of historic uses observed on site.
	Surfaces:	The ground cover on site predominantly comprises the extension footprint, with areas of grass and paved hardstanding also present.
	Vegetation:	There are 2No large trees approximately 15m tall located adjacent to the north of site. Other vegetation on site comprises bushes.

Area	Item	Details
	Topography / Slope Stability:	The site, along with the surrounding area, slopes down to the south. Moreton Lodge is constructed into this wider sloped setting, with a retaining wall located adjacent to the south of the extension, and lower ground floors within other parts of the building.
	Drainage:	Site appears to be connected to normal drainage facilities with no issues noted.
	Services:	Site appears to be connected to services which are in use.
	Controlled waters:	No controlled waters were observed on site.
	Tanks:	No tanks were observed on site.
Neighbouring land:	**North:**	Residential.
	East:	Place of worship, residential, educational facility
	South:	Residential.
	West:	Residential.

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 Ordnance Survey historic maps, procured from Groundsure, and these are provided in Appendix 3 of this report.

2.3.2 A summary produced from the review of the historical maps 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**
1870 - 1874 1:1,056 1:2,500 1:10,560	The site appears to comprise vegetation in the north and undeveloped land in the south.	The land in the surrounding area consists of predominantly residential houses and lodges, and occasional agricultural use. 2No wells are located between 90m-110m south of the site. Wells are also shown approximately 450m to the east. A pond is located roughly 400m to the south. The Whitestone Pond is located approximately 450m north. 3No ponds are present between 450m-520m southwest of the site.

Dates and Scale of Map	Relevant Historical Information	
	On Site	Off Site
1894 – 1896 1:1,056 1:2,500 1:10,560	The site is devoid of any features.	Wells no longer shown. Ground workings associated with North London Hospital 80m north.
1915 – 1920 1:2,500 1:10,560	The site comprises undeveloped land in the north, with the south encroaching onto a large building.	The land within the site vicinity has seen further residential developments. A building lies adjacent to the southeast of the site. 2No ponds previously located between 450m-520m southwest of the site are no longer present.
1938 1:10,560	No significant change.	No significant change.
1951 - 1958 1:1,250 1:2,500 1:10,560	The south site no longer encroaches onto an adjacent building. The entirety of site is devoid of any features.	The building immediately adjacent to the southeast of site has been redeveloped, and is now labelled as “Nurses’ Home”. 1No pond previously located 400m to the south and 1No pond previously located 450m to the southwest are no longer present.
1965 – 1970 1:1,250 1:2,500 1:10,560	No significant change.	No significant change.
1972 – 1976 1:1,250 1:10,000	A small extension encroaches onto the site from the building adjacent to the southeast.	The building immediately adjacent to the southeast of site is now labelled as “Moreton House”.
1986 – 1991 1:1,250	The extension structure appears to have been demolished and the site remains devoid of any features.	No significant change.
2001 – 2010 1:1,250 1:10,000	No significant change.	No significant change.
2024 1:10,000	No significant change.	No significant change.

2.3.4 Aerial photographs supplied as part of the Groundsure Enviro+GeoInsight report range from 1999 to 2022. These appear to show a small extension building occupying the site between the images dated 1999 and 2013. The exact conditions of the site are unclear due to the small size of the site and densely vegetated surroundings.

2.4 Previous Site Investigations

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

2.5 Planning Information

2.5.1 A review of the local authority's planning portal was undertaken on 21st August 2024 at https://planningrecords.camden.gov.uk/GeneralSearch.

2.5.2 Various planning applications were found, however, none were observed containing information pertaining to ground conditions.

2.6 Sensitive Land Uses

2.6.1 The Bishops Wood Designated Ancient Woodland is located 778m north of the site.

2.6.2 The site is located within a SSSI Impact Risk Zone. However, it is unlikely that the proposed development will require consultation.

2.6.3 No other sensitive land use was identified within 1km of the site.

2.7 Radon

2.7.1 As reported, the site is not within a radon affected area, as less than 1% of properties are above the action level.

2.7.2 Consequently, no radon protective measures are necessary in the construction of new dwellings or extensions as described in publication BR211 (BRE, 2023).

2.7.3 It should be noted however that a growing number of London Boroughs are adopting Public Health England guidance as outlined in their 'UK National Radon Action Plan' (PHE, 2018), which states that Radon measurements should be made in regularly occupied basements of properties irrespective of their geographical location. Therefore, such an assessment, or radon protection measures may be required by the London Borough of Camden.

3 GEOLOGICAL SETTING & HAZARD REVIEW

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 Superficial and Solid Geology

3.2.1 Information provided by the British Geological Survey (BGS) indicates that the site is directly underlain by solid deposits of the Bagshot Formation. An extract of the BGS description is provided below:

> *"pale yellow-brown to pale grey or white, locally orange or crimson, fine- to coarse-grained sand that is frequently micaceous and locally clayey, with sparse glauconite and sparse seams of gravel. The sands are commonly cross-bedded but some are laminated. Thin beds and lenses of laminated pale grey to white sandy or silty clay or clay ('pipe-clay') occur sporadically, becoming thicker towards the top of the formation."*

3.2.2 Although artificial deposits are not reported within the site, given the identified site history a thickness of Made Ground should be expected.

3.2.3 BS5930:2015 defines Made Ground as anthropogenic ground in which the material has been placed without engineering control and/or manufactured in some way, such as through crushing or washing, or arising from an industrial process. Great variations in material type, thickness and degree of compaction invariably occur.

3.3 British Geological Survey (BGS) Borehole Data

3.3.1 As part of the assessment, publicly available BGS borehole records were obtained and reviewed from the surrounding area. The local records obtained are presented in Appendix 5.

3.3.2 The nearest such record was located approximately 162m southeast of the site, from May 1969.

3.3.3 This showed the underlying ground conditions to comprise 'Made Ground' to a depth of 0.6m bgl, overlying 'Clay/sandy Clay/micaceous Sand' (inferred to be the Bagshot Formation) to the base of the borehole, at approximately 12.7m bgl.

3.3.4 During the drilling of the borehole groundwater was first struck at 9.6m bgl.

3.3.5 All depths and measurements should be viewed as approximate, due to the age of the borehole.

3.4 Geological Hazards

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

Table 3.1: Geological Hazards

Potential Hazard	Site check Hazard Rating	Details	Further Action Required?
Shrink swell clays	Negligible	Ground conditions predominantly non-plastic.	No
Running sands	Low	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.	No
Compressible deposits	Negligible	Compressible strata are not thought to occur.	No
Collapsible Deposits	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.	No
Landslides	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.	No
Ground dissolution soluble rocks	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present	No
Coal mining	None	The study site is not located within the specified search distance of an identified coal mining area.	No
Non-coal mining	None	The study site is not located within the specified search distance of an identified non-coal mining area.	No

3.4.2 In addition, the Enviro+GeoInsight report notes the following:

- 2No. historical surface ground working features within 250m of the site. Reported 63m and 70m north as unspecified ground workings.
- 29No. historical underground working features within 1km of the site. Nearest reported 632m southeast as a tunnel.
- No other features relating to mining, ground workings, natural cavities or sinkholes are reported within 250m of the site.

3.4.3 The clearance of the site, including removal of foundations and services is likely to increase the depth of Made Ground on the site.

3.4.4 Foundations should not be formed within Made Ground or organic rich materials (i.e. Topsoil) due to the unacceptable risk of total and differential settlement.

3.4.5 The presence of Made Ground derived from demolition material may be a source of elevated sulphate results associated with plaster from the previous structures.

3.4.6 It is recommended that a geotechnical ground investigation is undertaken to inform design. This should include an assessment of shrink/swell soils at depths that could potentially affect the basement.

4 HYDROGEOLOGY, HYDROLOGY AND FLOOD RISK REVIEW

4.1 Hydrogeology & Hydrology

4.1.1 General information about the hydrogeology of the site was obtained from the MAGIC website.

Groundwater Vulnerability

4.1.2 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 superficial deposits with low permeability that have negligible significance for water supply or river base flow.

Hydrogeology

4.1.3 The baseline hydrogeology of the site is based on available hydrogeological mapping, including the BGS online mapping, and generic information obtained from the Groundsure report.

4.1.4 The available data indicates that the geology of the area consists of the Bagshot Formation. Based on BGS borehole information it would be expected that a groundwater table would be encountered at around 9m depth within this stratum.

Hydrology

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

4.1.6 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.

4.1.7 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.)

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

4.1.9 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.)

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

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

Table 4.1: Summary of Hydrogeological & Hydrology

Feature		On Site	Off Site
Aquifer	**Superficial:**	None	None within 500m
	Solid:	Secondary A	Secondary A Unproductive 400m south

Feature		On Site	Off Site
Surface Water Features		None	No surface water features within 250m of site. No detailed river networks within 250m of site.
Flood Risk	**EA Flood Zone 2**	No	Not reported within 50m of site.
	EA Flood Zone 3	No	Not reported within 50m of site.
	RoFRaS	N/A - Negligible	Not reported within 50m of site.
	Historical Flood Events	None reported within 250m of site.	
	Flood Defences	There are no areas benefiting from flood defences within 250m of the study site	
	Surface Water Flooding	Highest risk on site is 'Negligible'.	Highest risk within 50m is '1 in 1000yr, 0.3m-1.0m'.
	Groundwater Flooding	Highest risk on site is 'Negligible'.	Highest risk within 50m is 'negligible'.

4.1.12 Figure 7 of the RedFrog Hydrogeological Mapping study reports a watercourse network approximately 60m west of site, flowing roughly northeast to southwest. A watercourse (Local Knowledge) is also present at this location. The same study indicates 2No wells located approximately 90m southwest of site.

4.1.13 According to "The Lost Rivers of London" (Barton 1992), the site is located ~200m south of a tributary of the lost river Westbourne. This is considered a sufficient distance so as to cause no impact to the site. In addition, the Camden Strategic Flood Risk Assessment (URS, 2014) states that historic 'lost rivers' within LB Camden were culverted and incorporated into the local sewer network in the 19th Century.

4.2 Flood Risk Review

4.2.1 In accordance with the NPPF Guidance, below is a review of flood risks posed to and from the development and recommendations for appropriate design mitigation where necessary. Specific areas considered are based on the requirements laid out in the "Camden Guidance for Subterranean Development".

Table 4.2: Flood Risk Review

Flood Sources	Site Status	Comment on flood risk posed to / from the development
Fluvial / Tidal	Site is not within 50m of an Environment Agency Zone 2 or Zone 3 floodplain. Risk of flooding from rivers and the sea (RoFRaS) rating is negligible.	Low risk.
Groundwater	The BGS considers that the site is at negligible risk from groundwater flooding.	As SUDS will be required by NPPF, PPG and LLFA policy requirements, this will ensure that 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	No surface water features within 250m of site.	Low risk.
Surface Water / Sewer Flooding	No surface water features within 250m of site. Condition, depth and location of surrounding infrastructure uncertain.	As SUDS will be required by NPPF, PPG and LLFA policy requirements, this will ensure that the proposed development will not increase the potential risk of risk of surface and sewer flooding to the site and surrounding properties. Basement will be fully waterproofed as appropriate to industry standard. Low risk.
Climate Change	Included in the flood modelling extents. 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 Information about the risk to the study site from flooding has been obtained from the following documents produced for London Borough of Camden: London Borough of Camden Level 1 Strategic Flood Risk Assessment (SFRA) (Aecom, January 2024) ; London Borough of Camden Strategic Flood Risk Assessment (SFRA) (URS, July 2014); Preliminary Flood Risk Assessment for London Borough of Camden (Halcrow, 2011); Surface Water Management Plan (SWMP) for London Borough of Camden (Halcrow, 2011); and the Redington Frognal Neighbourhood Forum Summary Report (RedFrog - Arup, 2016). Potential impacts to the site are discussed below.

Flooding from Fluvial/Tidal Sources

4.2.3 The site is located within EA Flood Zone 1 and no water networks or surface water features have been identified by Groundsure within 250m of the site.

4.2.4 However, Figure 7 of the RedFrog Hydrogeological Mapping study reports a watercourse network approximately 60m west of site, flowing roughly northeast to southwest. A watercourse (Local Knowledge) is also present at this location. The same study indicates 2No wells located approximately 90m southwest of the site.

4.2.5 The SFRA states that all main rivers historically located within the borough are now culverted and incorporated into the TWUL (Thames Water) sewer network and therefore there is no fluvial flood risk within the borough.

Groundwater Flooding

4.2.6 Figure 19 of the SFRA (2024) shows the site is within an area with "limited potential for groundwater flooding to occur.

4.2.7 Figure 4e of the SFRA (2014) indicates the nearest EA groundwater flood incident is shown 200m southeast of site and the nearest LBC groundwater flood incident is shown approximately 800m west of site, with 7No. properties affected.

4.2.8 Groundsure reports the site to be at negligible risk of groundwater flooding.

4.2.9 Given that the site is directly underlain by stratum of the Bagshot Formation, there is limited potential for groundwater flooding to occur, but the risk is considered to be low.

Surface Water Flooding

4.2.10 Figure 15 of the SFRA (2024) indicates that risk of flooding from surface water at the site is negligible. Figure 4 of the same report shows the site being approximately 90m east, 120m south and 130m east of the nearest flooded street recorded in 1975, 2021 and 2002, respectively.

4.2.11 Figure 3iv of the SFRA (2014) shows the nearest LBC surface water flooding incident approximately 800m west of the site, with 1No property affected.

4.2.12 In addition to this, the site lies within an EA Flood Zone 1. 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.

Sewer/Artificial Flooding

4.2.13 Figure 23 of the SFRA (2024) shows the number of sewer flooding events for 4-digit postcode prefixes across the borough. For the postcode “NW3 6--” where the site is situated, 21-40 sewer incidents have been recorded between 2013 and 2023.

4.2.14 The London Borough of Camden SWMP states the postcodes at the highest risk of sewer flooding based on historic events; the list does not include “NW3 6--”.

4.2.15 The site is located approximately 450m south from the nearest Hampstead Heath Pond.

Critical Drainage Areas (CDAs)

4.2.16 A CDA is defined in the LBC SWMP as “*A discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more LFRZ during severe weather thereby affecting people, property or local infrastructure*”.

4.2.17 A Local Flood Risk Zone (LFRZ) is defined in the LBC SWMP as "*A discrete area of flooding that does not exceed the national criteria for a Flood Risk Area but affects houses, businesses and/or local infrastructure. The boundary is defined as the actual spatial extent of predicted flooding in a single location"*.

4.2.18 According to Figure 16 of the SFRA (2024), the site is situated within CDA Group3_010 and is therefore within a catchment area which contributes to a flooding hotspot.

4.2.19 The site is located approximately 80m of the Frognal Lane LFRZ.

Sustainable Drainage Systems (SuDS)

4.2.20 The proposed basement footprint will extend over existing soft landscaping and have a slightly larger area than the existing building; it is likely to marginally increase the impermeable areas on site.

4.2.21 In accordance with the NPPF, PPG and LLFA policy requirements, sustainable drainage systems (SuDS) should be incorporated wherever possible to reduce positive surface water run-off and flood risk to other areas.

4.2.22 Given the expected underlying ground and hydrogeological conditions it is considered that infiltration drainage may be suitable. This would need to be confirmed by a ground investigation.

4.2.23 This may include the replacement of hard cover with permeable hardstanding and/or the use of conventional soakaways, which should be designed in accordance with BRE DG365.

Conclusion

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

4.2.25 Excerpts of figures from the Camden documents are included in Appendix 5.

4.3 Sequential and Exception Tests

4.3.1 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.

4.3.2 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, the 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 vapour and double the thermal resistance of the cavity.

5 SCREENING AND SCOPING 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. 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.

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

5.1.3 This Jomas BIA also takes into account the Campbell Reith pro forma BIA produced on behalf of and published by the London Borough of Camden as guidance for applicants to ensure that all of the required information is provided. Within the pro forma a series of tables have been used to identify what issues are relevant to the site.

5.1.4 Each question posed in the tables 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 5.1 below. Where further discussion is required the items have been carried forward to scoping.

5.1.6 The numbering within the questions refers the reader to the appropriate question / section in the London Borough of Camden BIA pro forma.

5.1.7 A ground 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 5.1: Screening Assessment

Query	Y / N	Comment
Subterranean (Groundwater) Flow (see London Borough of Camden BIA Pro Forma Section 4.1.1)		
1a) Is the site located directly above an aquifer?	Yes	The site is directly underlain by the Bagshot Formation, a Secondary (A) aquifer.
1b) Will the proposed basement extend below the surface of the water table?	Unknown	The basement may potentially extend below a water table within the superficial deposits although this is highly unlikely given the proposed FFL is ~0.5m bgl.
2) Is the site within 100m of a watercourse, well (disused or used) or a potential spring line?	Yes	Figure 7 of the RedFrog Hydrogeological Mapping study reports a watercourse network approximately 60m west of site, flowing roughly northeast to southwest. A watercourse (Local Knowledge) is also present at this location. The same study indicates 2No wells located approximately 90m southwest of the site. However, given the small size of basement proposed, no impact is anticipated to groundwater flow.
3) Is the site within the catchment of any surface water features?	No	No surface water features within 250m of site.
4) Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?	Yes	The proposed development will comprise a basement with a slightly larger footprint than the existing extension structure.
5) As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No	The proposed development will comprise a basement with a slightly larger footprint than the existing extension structure.
6) 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 (not just the pond chains on Hampstead Heath or spring line?	No	No surface water features within 250m of site.
Slope Stability ((see London Borough of Camden BIA Pro Forma Section 4.2)		
1) Does the existing site include slopes, natural or manmade, greater than 7 degrees? (approximately 1 in 8)	Yes	The site, along with the surrounding area, slopes down to the south. Moreton Lodge is constructed into this wider sloped setting, with a retaining wall located adjacent to the south of the extension, and lower ground floors within other parts of the building.
2) Will the proposed re-profiling of landscaping change slopes at the property to more than 7 degrees? (approximately 1 in 8)	No	Re-profiling of change of slopes is not anticipated as the proposed development is to take place within the footprint of the existing building.

Query	Y / N	Comment
3) Does the developments' neighbouring land include railway cuttings and the like, with a slope greater than 7 degrees? (approximately 1 in 8)	No	Nearest entry of a railway line is 110m northeast. Other land uses neighbouring site are residential.
4) Is the site within a wider hillside setting in which the general slope is greater than 7 degrees? (approximately 1 in 8)	Yes	Surrounding area is sloped down to the south.
5) Is the London Clay the shallowest strata at the site?	No	The site is directly underlain by solid deposits of Bagshot Formation, these deposits are underlain by the London Clay Formation.
6) Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?	No	2No large trees approximately 15m tall are located adjacent to the north of site.
7) Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	No	The site is reported to be in area at negligible risk from shrink-swell clays. No evidence of structural distress caused by seasonal shrink / swell was noted during the external walkover.
8) Is the site within 100m of a watercourse or a spring line?	Yes	Figure 7 of the RedFrog Hydrogeological Mapping study reports a watercourse network approximately 60m west of site, flowing roughly northeast to southwest. A watercourse (Local Knowledge) is also present at this location. The same study indicates 2No wells located approximately 90m southwest of the site. However, given the small size of basement proposed, no impact is anticipated in this regard.
9) Is the site within an area of previously worked ground?	No	Site has only had the current development in place.
10) 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?	Unknown	The site is directly underlain by Secondary (A) aquifer of the Bagshot Formation, underlain by unproductive London Clay Formation. Groundwater is highly unlikely to be present at shallow depths where the basement is to be formed (FFL at ~0.5mbgl).
11) Is the site within 50m of the Hampstead Heath ponds (or other waterbody)?	No	-
12) Is the site within 5m of a highway or pedestrian 'right of way'?	Yes	The site is not located within tm of a highway.
13) Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No	Adjoining building has deeper lower ground floor already present. No other buildings in proximity.

Query	Y / N	Comment
14) Is the site over (or within the exclusion of) any tunnels e.g. railway lines?	No	The nearest tunnel is reported 110m northeast of site, identified as a northern line underground railway.
Surface Flow and Flooding (see London Borough of Camden BIA Pro Forma Section 4.3)		
1) Is the site within the catchment of the pond chains on Hampstead Heath?	No	No surface water features within 250m of site.
2) 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 comprise a basement slightly outside the existing footprint of the building and therefore surface water flow is unlikely to be affected. The regulatory requirement to incorporate SuDS should also reduce peak rainfall flows and volume.
3) Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	Yes	The proposed development will comprise a basement slightly larger than existing footprint of a building, increasing the hard surfaced external areas. If applicable, replacement of existing hardstanding with permeable paving as part of SuDS would reduce the amount of impermeable paved areas.
4) 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	No surface waters in the area to be impacted.
5) Will the proposed basement result in changes to the quality of surface waters being received by adjacent properties or downstream watercourses?	No	No surface waters in the area to be impacted.
6) Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or Strategic Flood Risk Assessment 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 and not within an EA flood zone.

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 5.1 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.

Subterranean (Groundwater) Flow

5.2.3 It would be prudent to conduct a ground investigation to confirm the ground conditions and groundwater levels (if any) beneath the site. This can then be used to confirm the relative depths of the basement to the groundwater levels.

Land Stability

5.2.4 The site, as with the surrounding area, is sloped to the west. The Groundsure report has noted that there is a "very low" risk of land instability issues for the site.

5.2.5 The ground investigation should also determine the possibility of encountering groundwater and the possibility of Made Ground and/or clay. Atterberg Limits of the underlying clay should be determined by the ground investigation to assess shrink/swell potential of the soils.

5.2.6 It is noted that the London Borough of Camden's guidance documents requires a Ground Movement Assessment to be undertaken as part of the Basement Impact Assessment. Such an assessment uses a ground model based on a zone of influence equivalent of four times the proposed depth of excavation. As the excavation will be <1m, such a study is not considered necessary given the absence of buildings in proximity.

Surface Flow and Flooding

5.2.7 The proposed basement will underlie the existing hardstanding of the current structure on site but also will be slightly larger than the existing footprint, in turn creating a larger hardstanding area; there will be no significant change in surface water run-off.

5.2.8 As SuDS will be required by NPPF, PPG and LLFA policy requirements, this will ensure that the proposed development will not increase the potential risk of flooding.

6 PRELIMINARY BASEMENT IMPACT ASSESSMENT

6.1 Proposed Changes to Areas of External Hardstanding

6.1.1 The proposed development will comprise a basement slightly larger than the existing footprint of the building. As a result, there will be a small increase in hardstanding areas. However, it is not considered necessary to undertake any further investigations, studies or impact assessment in relation to the proposed changes to areas of external hardstanding.

6.1.2 As SUDS will be required by NPPF, PPG and LLFA policy requirements, surface water will be managed to reduce overall flood risk.

6.2 Past Flooding

6.2.1 The National Planning Policy Framework sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow.

6.2.2 When assessing the site-specific flood risk and the potential for historic flooding to reoccur the above guidance recommends that, historic flooding records and any other relevant and available information including flood datasets (e.g. flood levels, depths and/or velocities) and any other relevant data, which can be acquired are assessed.

6.2.3 Figure 4e of the SFRA (2014) indicates the nearest EA groundwater flood incident is shown 200m southeast of site and the nearest LBC groundwater flood incident is shown approximately 800m west of site, with 7No. properties affected.

6.2.4 Figure 3iv of the SFRA (2014) shows the nearest LBC surface water flooding incident approximately 800m of the site, with 1No property affected.

6.2.5 Figure 23 of the SFRA (2024) shows the number of sewer flooding events for 4-digit postcode prefixes across the borough. For the postcode “NW3 6--” where the site is situated, 21-40 sewer incidents have been recorded between 2013 and 2023.

6.2.6 The site is therefore considered to be at low risk of flooding based on historic flooding.

6.3 Geological Impact

6.3.1 The published geological maps indicate that the site is directly underlain by solid deposits of the Bagshot Formation. This should be confirmed by an intrusive investigation.

6.3.2 Based on historic boreholes within 250m of the site, a groundwater table is anticipated. The nearest borehole record states the groundwater was encountered at 9.2m bgl, but due to the distance from the site (162m), this depth of water encountered may not be accurate to this site. However, the proposed FFL of the basement is due to be formed at ~0.5m below ground level and therefore it is highly

unlikely that this would intercept groundwater, especially given the very low risk of groundwater flooding identified.

6.4 Hydrology and Hydrogeology Impact

6.4.1 Based on the information available at the time of writing, the risk of flooding from groundwater is considered to be very low. The proposed basement is unlikely to have a detectable impact on the local groundwater regime, especially given the neighbouring basement is lower.

6.4.2 Appropriate water proofing measures should be included within the whole of the proposed basement wall/floor design as a precaution.

6.4.3 The proposed development will lie outside of flood risk zones and is therefore assessed as being at a low probability of fluvial flooding.

6.4.4 The Groundsure report indicates that there are no surface water features on or within 250m of the site. However, Figure 7 of the RedFrog Hydrogeological Mapping study reports a watercourse network approximately 60m west of site, flowing roughly northeast to southwest. A watercourse (Local Knowledge) is also present at this location. The same study indicates 2No wells located approximately 90m southwest of site. Although groundwater underlying the site may be in hydraulic continuity with this watercourse, due to the small scale of development and shallow founding depth, the proposed basement is not anticipated to have an impact upon the hydrology of the area.

6.4.5 The London Borough of Camden SWMP indicates that overall groundwater flooding across the Borough is considered to be a relatively low risk.

6.4.6 The site is situated within CDA Group3_010 and is therefore within a catchment area which contributes to a flooding hotspot.

6.4.7 The information available suggests that the site lies in an area that is at low risk of surface water flooding.

6.4.8 The proposed basement construction is considered unlikely to create a reduction of impermeable area in the post development scenario.

6.4.9 No risk of flooding to the site from artificial sources has been identified.

6.5 Impacts of Basement on Adjacent Properties and Pavement

6.5.1 The proposed basement excavation will not be within 5m of a public pavement. It is within 5m of neighbouring properties.

6.5.2 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, any associated services and structures.

6.5.3 It is recommended that the site is supported by suitably designed temporary support with a basement box construction. This will ensure that the adjacent land is adequately supported in the temporary and permanent construction.

6.5.4 Careful and regular monitoring of the structure will need to be undertaken during the construction phase to ensure that vertical movements do not adversely affect neighbouring structures. If necessary, the works may have to be carried out in stages with the above structure suitably propped and supported.

6.5.5 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 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.

6.5.6 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 Camden.

6.6 Cumulative Impacts

6.6.1 The above individual effects could potentially interact to form a greater issue.

6.6.2 The site has been identified as being directly underlain by a Secondary A aquifer (Bagshot Formation).

6.6.3 However, no sensitive uses have been identified in the surrounding area.

6.6.4 Furthermore, the modest size of the proposed basement will not significantly alter the existing groundwater regime.

6.6.5 The development of the basement will therefore not significantly affect the groundwater flow on or surrounding the site.

6.7 Size of Basement

6.7.1 The London Borough of Camden document "Camden Planning Guidance Basements" (January 2021) outlines how Local Plan Policy A5 on basements limits the size of basement developments.

Table 5.2: Screening Assessment

Criterion from LBC Policy A5	Jomas Comments on the Proposed Development in relation to LBC Policy A5
f. not comprise of more than one storey;	The proposed basement is only a single storey.
g. not be built under an existing basement;	The proposed basement is under an area of paved garden and not beneath an existing basement.
h. not exceed 50% of each garden within the property;	The Camden guidance notes that this applies to the front garden, the rear garden and gardens to the side of the property individually, rather than calculated as an aggregated garden area for the whole property. The front garden is the smallest garden, and is approximately 86m^2 with the proposed basement being approximately 18m^2 and therefore passes.
i. be less than 1.5 times the footprint of the host building in area;	As noted above the proposed basement is approximately 18m^2 and will therefore not exceed this.
j. extend into the garden no further than 50% of the depth of the host building measured from the principal rear elevation;	The proposed basement is indicated to protrude 3m from the face of the building so therefore passes.
k. not extend into or underneath the garden further than 50% of the depth of the garden;	The proposed basement extends from the existing structure to the site boundary.
l. be set back from neighbouring property boundaries where it extends beyond the footprint of the host building;	The proposed basement extends from the existing structure to the site boundary with No 21.
m. avoid the loss of garden space or trees of townscape or amenity value	The proposed basement extends beneath an area of hardstanding garden, It is assumed that this or similar will be reinstated over the top of the basement,

6.8 Conclusion

6.8.1 The overall assessment of the site is that the creation 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.

6.8.2 The proposed development is not expected to cause significant problems to the subterranean drainage. A SUDS/drainage strategy report is recommended.

6.8.3 It would be prudent to confirm ground conditions via an intrusive ground investigation, however given the small scale of development and shallow founding depth, it is not considered this would change the outcome of this assessment.

7 REFERENCES

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APPENDICES

APPENDIX 1 – FIGURES

APPENDIX 2 – GROUNDSURE REPORTS

APPENDIX 3 – OS HISTORICAL MAPS

APPENDIX 4 – BGS BOREHOLE RECORDS

APPENDIX 5 – LOCAL AUTHORITY MAP EXCERPTS

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JOMAS ASSOCIATES LTD

24 Sarum Complex

Salisbury Road

Uxbridge

UB8 2RZ

CONTACT US

Website: www.jomasassociates.com

Tel: 0333 305 9054

Email: info@jomasassociates.com