

BASEMENT IMPACT ASSESSMENT

GARDEN FLAT
24 KEMPLAY ROAD
CAMDEN



LBHGEO

DOCUMENT CONTROL			
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NON-TECHNICAL SUMMARY

It is proposed to extend the lower ground floor garden flat into the rear garden by approximately 3m.

This report provides an assessment of the potential impacts that the development may have upon the surrounding area, neighbouring structures and the local environment.

GEOLOGY

The proposed excavation will extend up to 2m into the lower section of the Claygate Beds, which are composed of clay.

HYDROGEOLOGICAL IMPACTS

No evidence of permeable seams has been found in the clay at this site and hence the development will not affect any potential groundwater flows.

HYDROLOGICAL IMPACTS

There will be no change to the flood risk at the site or neighbouring sites. A SuDS scheme is to be included as part of the development.

STABILITY IMPACTS

Ground movement assessments have been undertaken to demonstrate the acceptability of the proposed construction methodology upon the neighbouring structures, resulting in a prediction of Burland Category 0 (Negligible) damage.

CONCLUSION

The assessment demonstrates that no adverse residual or cumulative stability, hydrological or hydrogeological impacts of this development are expected to occur or to affect the host property, neighbouring structures or the wider environment.

FOREWORD-GUIDANCE NOTES

GENERAL

This report has been prepared for a specific client and to meet a specific brief. The preparation of this report may have been affected by limitations of scope, resources or time scale required by the client. Should any part of this report be relied on by a third party, that party does so wholly at its own risk and LBHGEO disclaims any liability to such parties.

The observations and conclusions described in this report are based solely upon the agreed scope of work. LBHGEO has not performed any observations, investigations, studies or testing not specifically set out in the agreed scope of work and cannot accept any liability for the existence of any condition, the discovery of which would require performance of services beyond the agreed scope of work.

VALIDITY

Any use of or reliance upon the report in circumstances other than those for which it was commissioned shall be at the client's sole risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should therefore not be relied upon in such altered circumstances.

THIRD PARTY INFORMATION

The report may present an opinion based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

1. INTRODUCTION

1.1 BACKGROUND

It is proposed to extend the existing lower ground floor garden flat of 24 Kemplay Road into the rear garden by approximately 3m. This will involve removal and rebuilding of the existing rear extension. As the rear garden is set at a higher level this will need to be partly excavated to make space at lower ground floor level for the extension and a patio with stepped access up to the retained rear garden.

1.2 BRIEF

LBHGEO have been appointed to prepare a Basement Impact Assessment (BIA) in support of a planning application to be submitted to the London Borough of Camden.

1.3 PLANNING POLICY

The 2017 Camden Local Plan Policy A5 Basements reads as follows:

“The Council will only permit basement development where it is demonstrated to its satisfaction that the proposal would not cause harm to:

- a) neighbouring properties;*
- b) the structural, ground, or water conditions of the area;*
- c) the character and amenity of the area;*
- d) the architectural character of the building; and*
- e) the significance of heritage assets.*

In determining proposals for basements and other underground development, the Council will require an assessment of the scheme's impact on drainage, flooding, groundwater conditions and structural stability in the form of a Basement Impact Assessment and where appropriate, a Basement Construction Plan.

The siting, location, scale and design of basements must have minimal impact on, and be subordinate to, the host building and property. Basement development should:

- f) not comprise of more than one storey;*
- g) not be built under an existing basement;*
- h) not exceed 50% of each garden within the property;*
- i) be less than 1.5 times the footprint of the host building in area;*
- j) extend into the garden no further than 50% of the depth of the host building measured from the principal rear elevation;*
- k) not extend into or underneath the garden further than 50% of the depth of the garden;*
- l) be set back from neighbouring property boundaries where it extends beyond the footprint of the host building; and*
- m) avoid the loss of garden space or trees of townscape or amenity value.*

Exceptions to f. to k. above may be made on large comprehensively planned sites.

The Council will require applicants to demonstrate that proposals for basements:

- n. do not harm neighbouring properties, including requiring the provision of a Basement Impact Assessment which shows that the scheme poses a risk of damage to neighbouring properties no higher than Burland Scale 1 'very slight';*
- o. avoid adversely affecting drainage and run-off or causing other damage to the water environment;*
- p. avoid cumulative impacts;*
- q. do not harm the amenity of neighbours;*
- r. provide satisfactory landscaping, including adequate soil depth;*
- s. do not harm the appearance or setting of the property or the established character of the surrounding area;*
- t. protect important archaeological remains; and*
- u. do not prejudice the ability of the garden to support trees where they are part of the character of the area.*

The Council will not permit basement schemes which include habitable rooms and other sensitive uses in areas prone to flooding.

We will generally require a Construction Management Plan for basement developments.

Given the complex nature of basement development, the Council encourages developers to offer security for expenses for basement development to adjoining neighbours."

The following policies in the Local Plan are also relevant to basement development and will be taken into account when assessing basement schemes:

- "Policy A2 Open space";
- "Policy A3 Biodiversity";
- "Policy D1 Design";
- "Policy D2 Heritage"; and
- "Policy CC3 Water and flooding".

In addition to the Local Plan Policy, in 2018 Camden published updated Camden Planning Guidance (CPG) on Basements and Lightwells. These documents do not carry the same weight as the main Camden Development Plan documents (including the above Policy A5) but they are important supporting documents and refer back to the 2010 Camden Geological, Hydrogeological and Hydrological "Arup" Study.

1.4 REPORT STRUCTURE

This report commences with a desk study and characterisation of the site, before progressing to BIA screening and scoping assessments, whereby consideration is given to identifying the potential hydrogeological, hydrological and stability impacts that may be associated with the proposed development.

A ground model is developed, which is followed by an outline basement construction methodology and an assessment of the potential ground movements affecting the neighbouring structures.

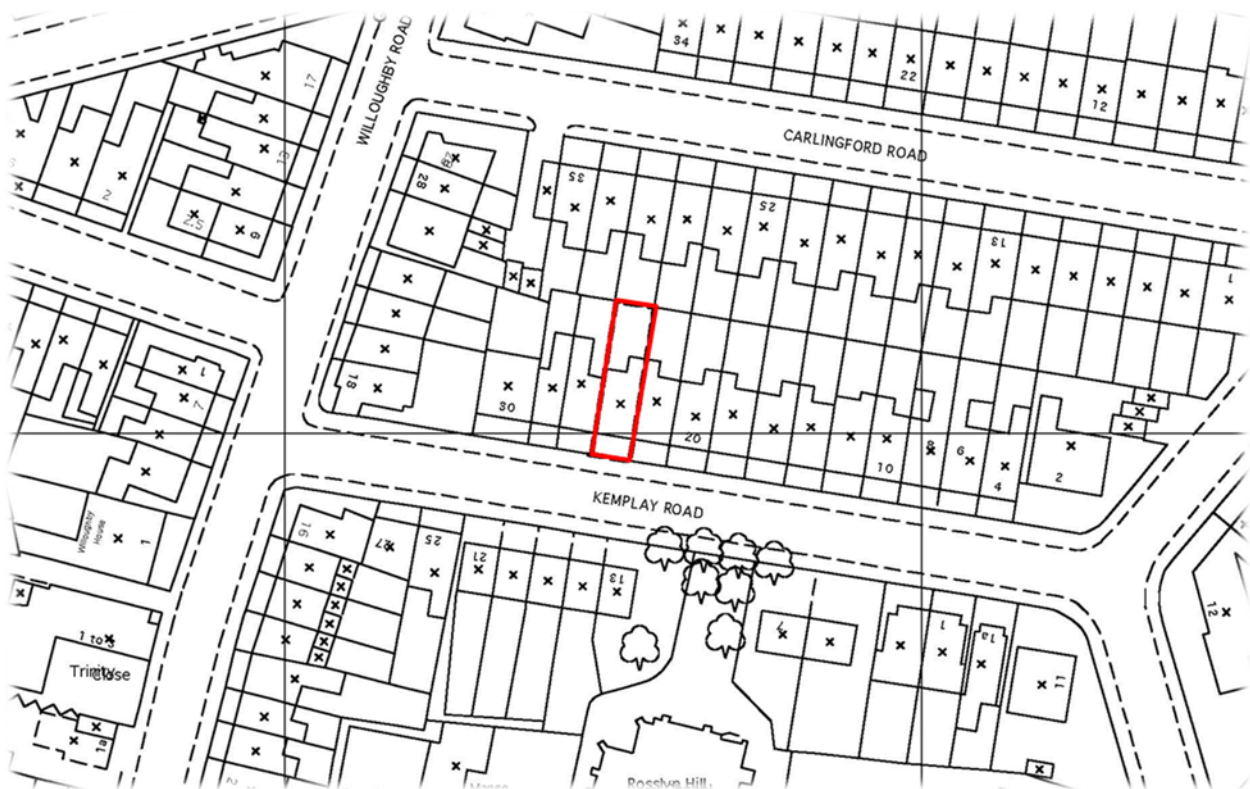
Finally, an assessment of the potential impacts of the proposed scheme is presented.

2. THE SITE

2.1 SITE LOCATION

The site is located on the northern side of Kemplay Road in western Hampstead, approximately 370m to the west of the Hampstead Underground Station.

The site may be located approximately by postcode NW3 1SY or by National Grid Reference 526755, 185715.



SITE LOCATION PLAN

2.2 TOPOGRAPHICAL SETTING

The site lies on the southeastern side of Hampstead Hill, with the ground falling eastwards towards Hampstead Heath and the River Fleet .



EXTRACT FROM FIGURE 16 OF THE CGHHS

2.3 SITE DESCRIPTION

The site is occupied by a four storey terraced Victorian building, with an elevated ground floor level set at approximately +91.1m OD, some 1.8m higher than street level. The lower ground floor is set some 1.1m lower than street level at approx. +88.2m OD.

A lightwell is present to the front of the property, including stepped access from the street to the lower ground floor flat.



A glass roofed rear extension was constructed in 2008; which occupies the majority of the former rear patio, aside from a small area, comprising a manhole cover, directly adjacent to the rear entrance. A staircase leads from this area up to the rear garden, set at approximately street level. Adjacent to the extension is a rear projection that appears to be part of the original structure.



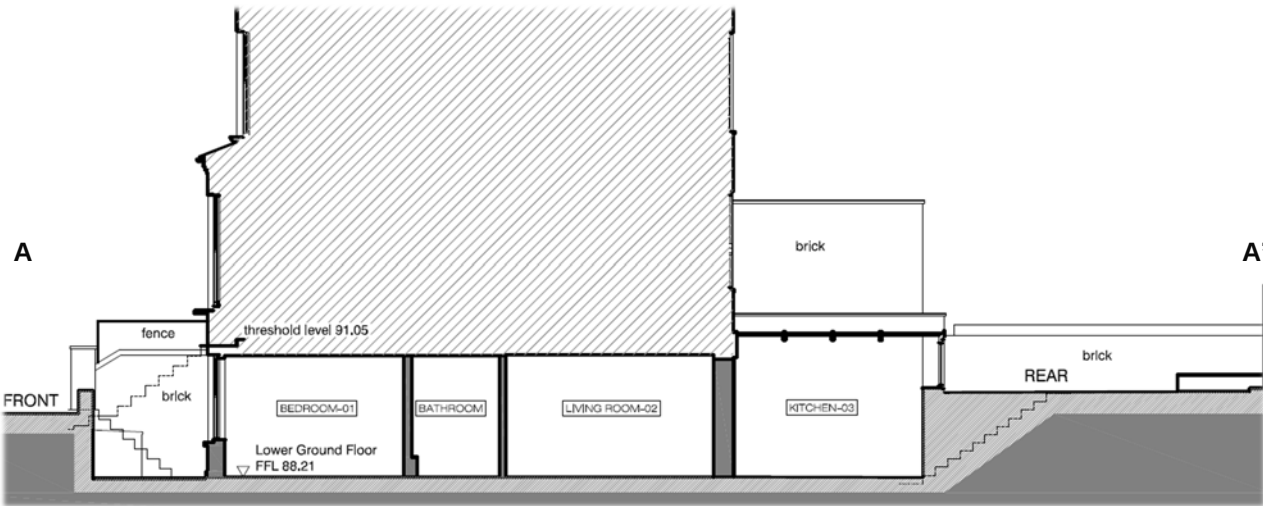
Aside from a raised empty planter in the northwestern corner of the site, the entirety of the rear garden is paved. A timber outbuilding is present in the northeastern corner of the site.



A mature Sycamore tree was removed from the planter in 2017; prior to which it is understood that an additional three trees (one sycamore, two acers) were removed from the rear garden in 2011.

The property boundary with No. 26 Kemplay Road to the west is marked by a brick retaining wall with a timber fence above, while the boundary with No. 22 is marked by a timber fence.

It is noted that both neighbouring properties have similar lower ground floor level rear extensions / patios.

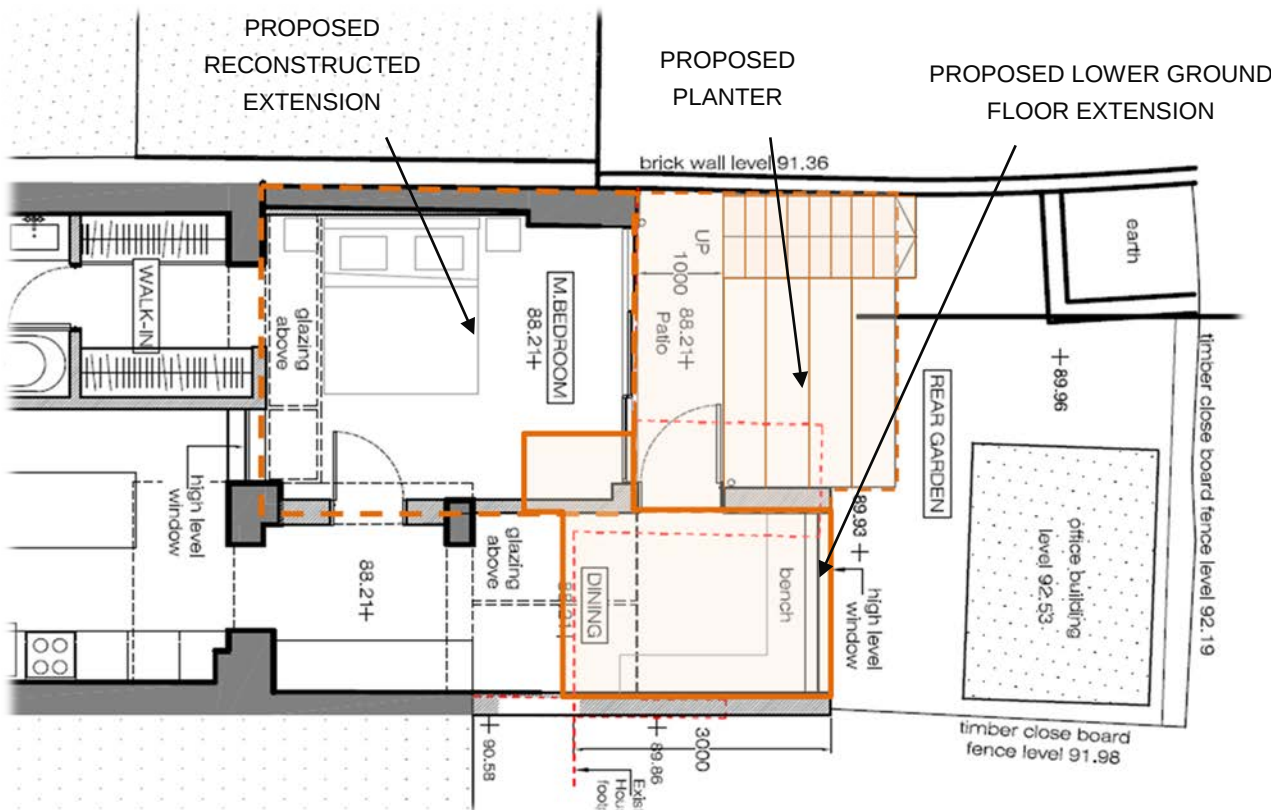


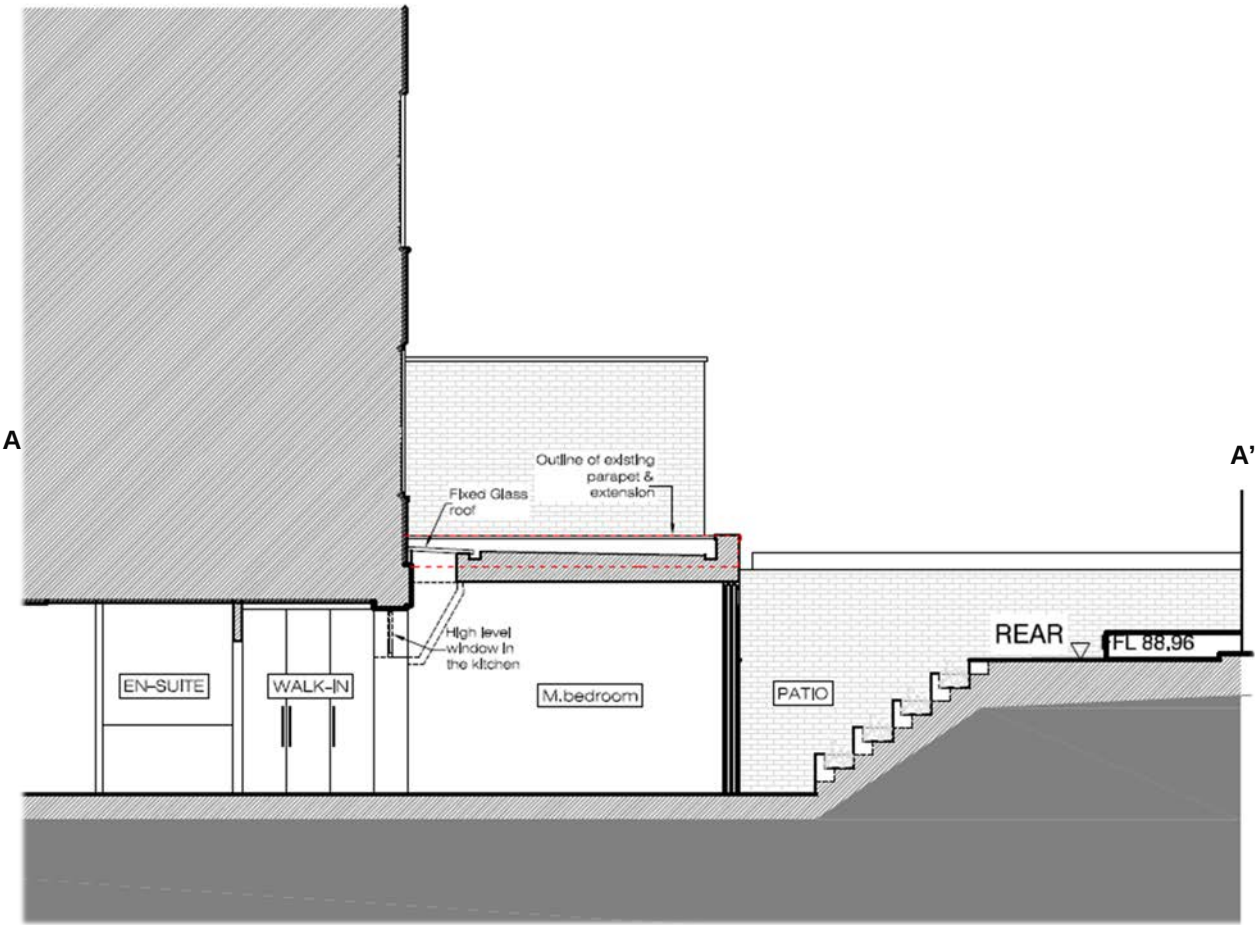
EXISTING SECTION OF THE GARDEN FLAT



2.4 PROPOSED DEVELOPMENT

It is proposed to extend the existing garden flat of 24 Kemplay Road into the rear garden by approximately 3m, including the demolition and reconstruction of the existing rear extension. The rear garden is set at a higher level and will need to be excavated by up to 2m depth to permit the extension. A sunken patio with a stepped access to the retained rear garden is also proposed, as well as a stepped planter.





PROPOSED SECTION

3. DESK STUDY

3.1 SITE HISTORY

The site appears to have remained undeveloped land on the southern slope of the Hampstead Heath until becoming parkland of the Carlile Estate, associated with Carlile House, built in the late 17th Century.

The estate was later acquired by the British Land Co. in the late 19th Century for the residential development of Kemplay, Carlingford and Denning Road. Although the area retains a relatively natural slope, the development would have inevitably involved an earthworks exercise; which may have commenced to some extent at a much earlier date to provide landscaped parkland.

Since their original construction, the site and the neighbouring properties have not seen major structural changes, aside from small extensions or refurbishments.

No. 24 is understood to have been converted to flats during the 1970s and a dormer window extension was added to the 4th floor during the 1980s.

3.2 GEOLOGICAL INFORMATION

The British Geological Survey (BGS) records indicate that the site is directly underlain by the Claygate Beds, overlying the London Clay Formation.



EXTRACTS OF FIGURE 2 (LEFT) AND FIGURE 3 (RIGHT) OF THE CGHHS

3.3 HYDROGEOLOGICAL INFORMATION

Some groundwater is expected to be present within the sandier and more permeable element of the Claygate Beds. The lower sections of the Claygate tend to be less permeable, giving rise to a spring line

where waters emerges from the hillside approximately halfway through the beds in the region of Flask Walk.

3.4 HYDROLOGICAL INFORMATION

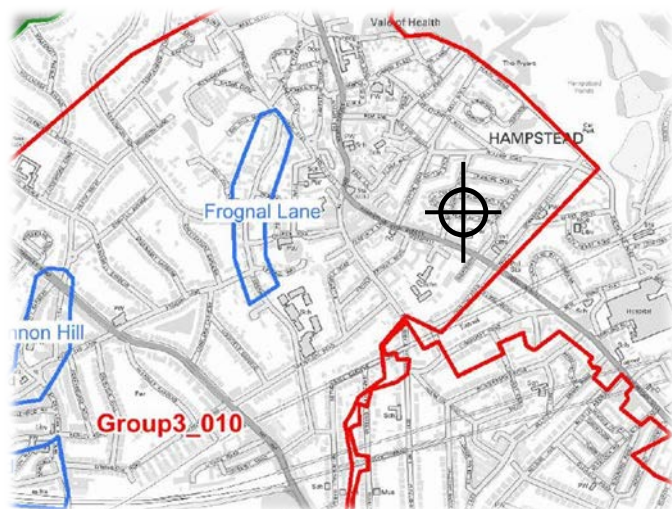
Figure 2 of the CGHHS (above) indicates that the headwaters of small tributary of the River Fleet lies approximately 100m the north of the site.

Environment Agency (EA) surface water flood maps indicate that the site is at a very low risk of surface water flooding.



EXTRACT OF EA SURFACE WATER FLOOD RISK MAP

Figure 6 of the Camden SFRA indicates that the site lies outside of any designated Local Flood Risk Zones (Blue Outline).



EXTRACT OF FIGURE 6 OF THE CAMDEN SFRA

4. SCREENING & SCOPING ASSESSMENTS

The Screening & Scoping Assessments have been undertaken with reference to Appendices E and F of the CGHSS, which is a process for determining whether or not a BIA is usually required.

4.1 SCREENING ASSESSMENT

The Screening Assessment consists of a series of checklists that identifies any matters of concern relating to the following:

- Subterranean (groundwater) flow
- Surface flow and flooding
- Slope stability

4.1.1 SCREENING CHECKLIST FOR SUBTERRANEAN (GROUNDWATER) FLOW

QUESTION	RESPONSE	JUSTIFICATION
Is the site located directly above an aquifer?	Yes	The site is underlain by the Claygate Beds, which is identified by the Environment Agency as a Secondary A Aquifer although these lower sections tend to be impermeable.
Will the proposed basement extend beneath the water table surface?	No	The proposed basement will not extend deeper than the existing lower ground floor.
Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	Yes	The site is actually located well below the elevation of the area of spring lines emanating from the Claygate Beds (Flask Walk).
Is the site within the catchment of the pond chains on Hampstead Heath?	No	See CGHHS Fig.14.
Will the proposed development result in a change in the area of hard-surfaced/paved areas?	No	The proposed development will extend rearwards into an already hard-surfaced rear garden.
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	All surface water falling within the development will be attenuated and discharged as per the existing. Advice on the incorporation of SUDS at the development is expanded upon in the Surface Water Drainage Assessment.
Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than the mean water level in any local pond?	No	See CGHHS Fig. 12, there are no nearby ponds.

4.1.2 SCREENING CHECKLIST FOR SURFACE FLOW AND FLOODING

QUESTION	RESPONSE	JUSTIFICATION
Is the site within the catchment area of the pond chains on Hampstead Heath?	No	See CGHHS Fig.14.
As part of the site drainage, will surface water flows (e.g. rainfall and run-off) be materially changed from the existing route?	No	The existing drainage arrangement discharging to the public sewer will be maintained. A separate Surface Water Drainage Assessment and Outline SuDS Strategy was prepared by LBHGEO to address this issue as well as to provide advice on feasible SuDS measures to reduce discharge rates.
Will the proposed basement development result in a change in the proportion of hard-surfaced/paved areas?	No	The proposed development will extend rearwards into an already hard-surfaced rear garden.
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	The existing drainage arrangement discharging to the public sewer will be maintained. A separate Surface Water Drainage Assessment and Outline SuDS Strategy was prepared by LBHGEO to address this issue.
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	The existing drainage arrangement discharging to the public sewer will be maintained. A separate Surface Water Drainage Assessment and Outline SuDS Strategy was prepared by LBHGEO to address this issue.
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	The EA Flood Risk maps indicate the area of No. 24 Kemplay Road to be at a Very Low risk of flooding.

4.1.3 SCREENING CHECKLIST FOR STABILITY

QUESTION	RESPONSE	JUSTIFICATION
Does the existing site include slopes, natural or manmade, greater than 7 degrees?	No	There are no slopes greater than 7 degrees within the site.
Does the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees?	No	No re-profiling is planned at the site.
Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees?	No	There are no slopes greater than 7 degrees within the neighbouring land.

Is the site within a wider hillside setting in which the general slope is greater than 7 degrees?	No	Figure 16 of the CGHHS indicates that the general slope of the wider hillside is less than 7 degrees.
Is London Clay the shallowest strata at the site?	No	The site is underlain by the Claygate Beds.
Will trees be felled as part of the proposed development and/or are works proposed within tree protection zones where trees are to be retained?	No	No trees are present in the existing rear garden of the property, although several trees, including a mature Sycamore removed in 2017, are known to have been present in the past.
Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	No	
Is the site within 100m of a watercourse of a potential spring line?	Yes	The site is located in an area known to comprise numerous potential spring lines, originating from the Claygate Beds.
Is the site within an area of previously worked ground?	No	See CGHHS Fig. 3
Is the site within an aquifer?	Yes	The site is underlain by the Claygate Beds, which is classified as a Secondary A Aquifer.
Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No	The proposed basement requires excavation of the rear garden, set at a higher level, but will not extend deeper than the existing lower ground floor.
Is the site within 50m of the Hampstead Heath ponds?	No	See CGHHS Fig.14.
Is the site within 5m of a highway or pedestrian right of way?	No	Although the property fronts Kemplay Road, the proposed excavation takes place to the rear of the building, some 20m distant.
Will the proposed basement significantly increase the differential depth of foundations relative to the neighbouring properties?	No	The proposed extension to the lower ground floor will not extend in depth below the existing foundations at No. 24 and the neighbouring properties.
Is the site over (or within the exclusion zone of) tunnels, e.g. railway lines?	No	The tunnels of the Edgware Branch of the Northern Line run beneath Rosslyn Hill, approx. 110m to the South of the site at the closest point.

4.2 SCOPING ASSESSMENT

Where the checklist is answered with a “yes” or “unknown” to any of the questions posed in the flowcharts, these matters are carried forward to the scoping stage of the BIA process. The other potential concerns considered within the screening process have been demonstrated to be not applicable or not significant when applied to the proposed development.

The scoping produces a statement which defines further the matters of concern identified in the screening stage. This defining should be in terms of ground processes, in order that a site specific BIA can be designed and executed (Section 6.3 of the CGHHS).

4.2.1 SCOPING FOR SUBTERRANEAN (GROUNDWATER) FLOW

- *The site is located directly above an aquifer.*

The guidance advises that the basement may extend into the underlying aquifer and thus affect the groundwater flow regime.

- *The site is within 100m of a watercourse, well (used/disused) or potential spring line.*

The guidance advises that flow from a spring, well or watercourse may increase or decrease if the groundwater flow regime which supports that water feature is affected by a proposed basement.

If the flow is diverted, it may result in the groundwater flow finding another location to issue from with new springs forming or old springs being reactivated.

A secondary impact is on the quality of the water issuing or abstracted from the spring or water well respectively.

4.2.2 SCOPING FOR SURFACE FLOW AND FLOODING

No concerns have been identified.

4.2.3 SCOPING FOR STABILITY

- *The site is within 100m of a watercourse or potential spring line.*

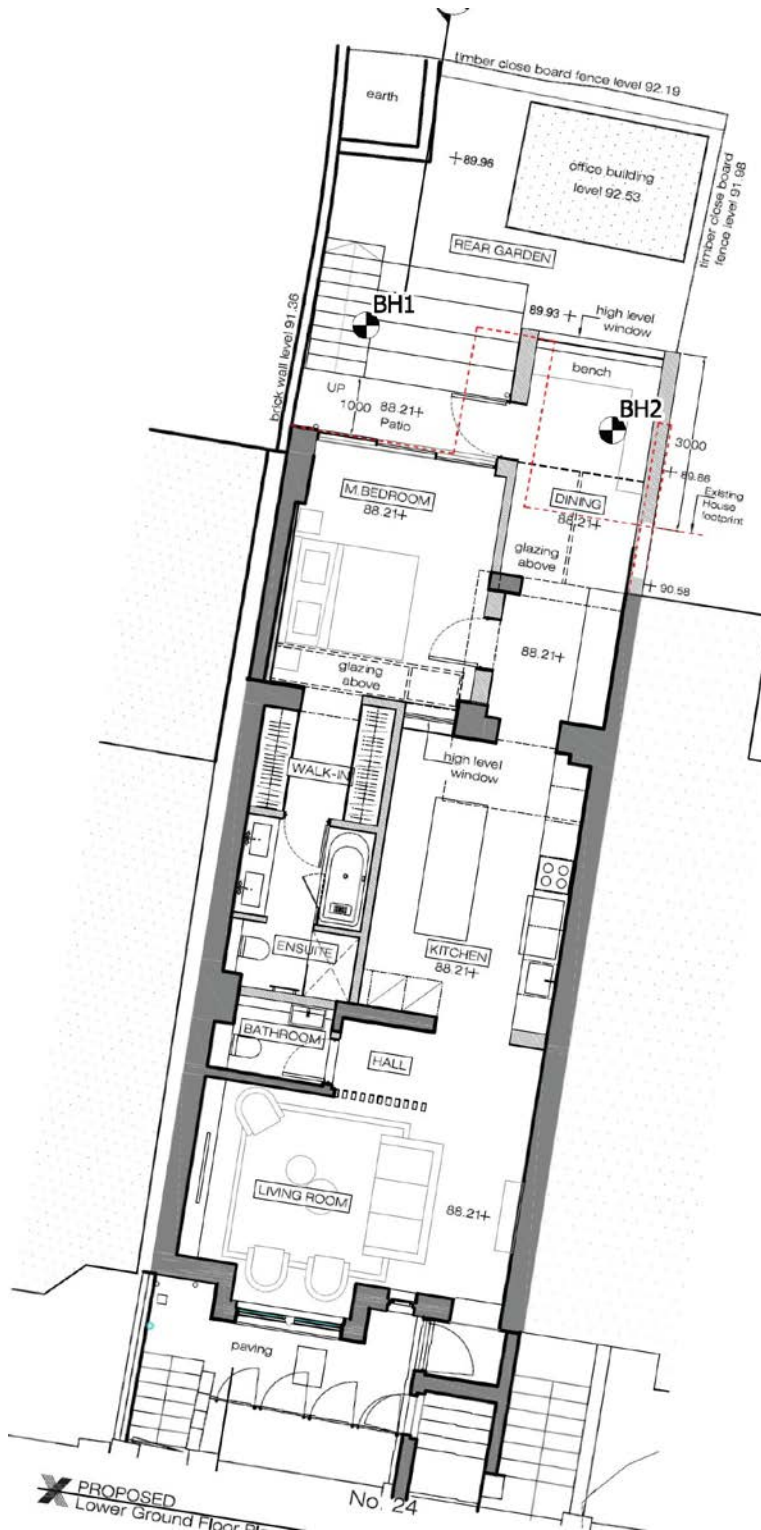
The guidance advises that seasonal spring lines and changes to groundwater regimes within slopes can affect slope stability.

- *The site is located directly above an aquifer.*

The guidance advises that dewatering can cause ground settlement. The zone of settlement will extend for the dewatering zone, and thus could extend beyond a site boundary and affect neighbouring properties. Conversely, any increase in water levels can have a detrimental effect on stability.

5. SITE INVESTIGATION

An intrusive ground investigation comprising two window sample boreholes (BH1, BH2) was undertaken by Land Science in order to confirm the ground conditions at the site.



5.1 GROUND CONDITIONS

Below a limited cover of made ground, of up to approximately 1m thickness below the raised rear patio, the Claygate beds appear to be present, as a pale orange brown sandy clay. As is typical for this lower section of the Claygate beds, no substantial water-bearing seams of sand seams appear to be present.

It is noted that the site investigation has probably mistakenly logged the observed Claygate clay as soft, whereas both the hand penetrometer and the shear vane tests suggest that it is in fact for the most part firm or stiff. It is also noted the logging has recorded refusal of both boreholes at 3.00 m depth exactly. This is very unlikely to be correct.

On the basis of nearby archive data, it is anticipated that the London Clay that underlies the Claygate Beds may be expected at around +78m OD (i.e. at approximately 10m below the basement floor).

Despite its reported sandiness, the laboratory test results suggest the clay to be of a high plasticity.

5.2 GROUNDWATER

No groundwater was recorded during the investigation. However, it is noted that there does appear to have been some possible water-softening of some of the borehole samples.

6. BASEMENT CONSTRUCTION

6.1 EXCAVATION AND FOUNDATION CONSTRUCTION

The excavation of the rear garden to accommodate the extension will be approximately 2m in depth to reach the proposed formation level and will extend down into the Claygate beds.

On the basis of the borehole evidence, any groundwater presence in these Beds is likely to be limited to small discontinuous sand layers and lenses, with a no likelihood of any sustained groundwater presence.

As the proposed extension is to be set at the same level as the existing lower ground floor and as it is not adjacent to any structural walls to either of the neighbouring structures, no underpinning of existing building walls is required.

It is, however, suggested that the boundary garden walls / fences are removed and rebuilt as necessary as part of the proposed development, subject to agreement with the owners of the neighbouring properties.

The below-ground section of the new walls forming the proposed rear extension are to be constructed with reinforced concrete, using a hit-and-miss excavation methodology.

The development will include a section of lower ground floor level patio behind the extension, with a stepped planter and stair access up to the retained part of the rear garden. Approximately 2m depth of soil is to be retained to the rear and will require a retaining wall to be designed.

Temporary soil retention of the soil adjacent to the new patio area will be required at the boundaries with No. 22 and No. 26 unless these walls are formed prior to the main excavation by an extension of the hit and miss excavations.

6.2 RETAINING WALLS

The following parameters may be considered in the design of new retaining walls:-

SUGGESTED RETAINING WALL DESIGN PARAMETERS			
STRATUM	BULK UNIT WEIGHT	EFFECTIVE COHESION	EFFECTIVE FRICTION ANGLE
	(kN/m ³)	(c' - kN/m ²)	(φ'- degrees)
Claygate beds	19	Zero	25

6.3 WATERPROOFING

As there will be scope for water to collect behind the extension and the retaining walls in the long term, it is to be waterproofed and designed to withstand hydrostatic pressures in accordance with BS8102:2009, Code of Practice for the Protection of Below-Ground Structures against Water from the Ground. A design

hydrostatic level at approximately the surface level of the retained rear garden (approx. +90.0m OD) is to be adopted for the purposes of assessing these hydrostatic pressures.

6.4 EFFECT OF TREES

A mature sycamore tree was removed in 2017 and was reported to be approximately 18m high when felled.

Given this relatively recent removal, subsequent recovery of the clay moisture levels following prolonged moisture extraction by tree roots will be ongoing for many years and will result in swelling of the affected clay.

In line with the requirements outlined in Chapter 4.2 of the NHBC guidance for soils of high volume change potential, the required depth of new foundations in the proposed development area should be approximately 2.1m below the tree level. This equates to approximately 0.1m below the proposed extension level and it is therefore expected that the excavation to the formation level of the extension will be sufficiently deep below the level of the former tree to obviate stability concerns due to any residual effect of the tree roots.

6.5 CONSTRUCTION SEQUENCE

The following indicative construction sequence is proposed, and will be subject to detailed design by a structural engineer.

1. Remove the existing glass-roofed extension, stairs and existing rear retaining wall.
2. Extend the excavation rearwards, replacing the existing brick garden walls as necessary with the new walls, constructed by hit-and-miss methods and designed for soil retaining where necessary.
3. Construct the extension superstructure, paving to the terrace and the new stairs and forming the stepped planter in front of the retaining wall.

7. GROUND MOVEMENT ASSESSMENT

Camden Council seeks to ensure that harm will not be caused to neighbouring properties by basement development. Camden Local Plan (June 2017) states that the BIA must demonstrate that the proposed basement scheme has a risk of damage to the neighbouring properties no higher than Burland Scale 1 'Very Slight'.

No underpinning is to be undertaken; therefore, the only source of ground movement resultant from the development both in the short and long term will be heave due to the unloading as a result of the soil excavation.

7.1 STRUCTURES CONSIDERED FOR EFFECT OF GROUND MOVEMENT

7.1.1 NO. 24 KEMPLAY ROAD

No. 24 Kemplay Road, the host property for the proposed development, is a four-storey terraced property with a lower ground floor set some 1m lower than the street level at approximately +88.2m OD.

7.1.2 NO. 22 KEMPLAY ROAD

No. 22 Kemplay Road is a similarly built property directly adjacent to the east of No. 24, sharing a party wall. No. 22 includes a lower ground floor set at the same level and a rear extension similar to the existing extension at No. 24.

7.1.3 NO. 26 KEMPLAY ROAD

No. 26 Kemplay Road is a three-storey property to the west and uphill of No. 24. Although directly adjacent to one another, they do not appear to share a party wall. No. 26 does not include a lower ground floor, although it is assumed that of necessity the existing foundations extend to at least the level of the lower ground floor of No. 24.

A rear extension is present and extends rearwards to the same extent as the existing extension at No. 24.

7.2 MODELLED GROUND CONDITIONS

Excavation for the rear extension will result in unloading of the clay leading to theoretical heave movement of the underlying soil in both the short and long term. An analysis of the vertical movements has been carried out using the soil stiffness model detailed in the table below.

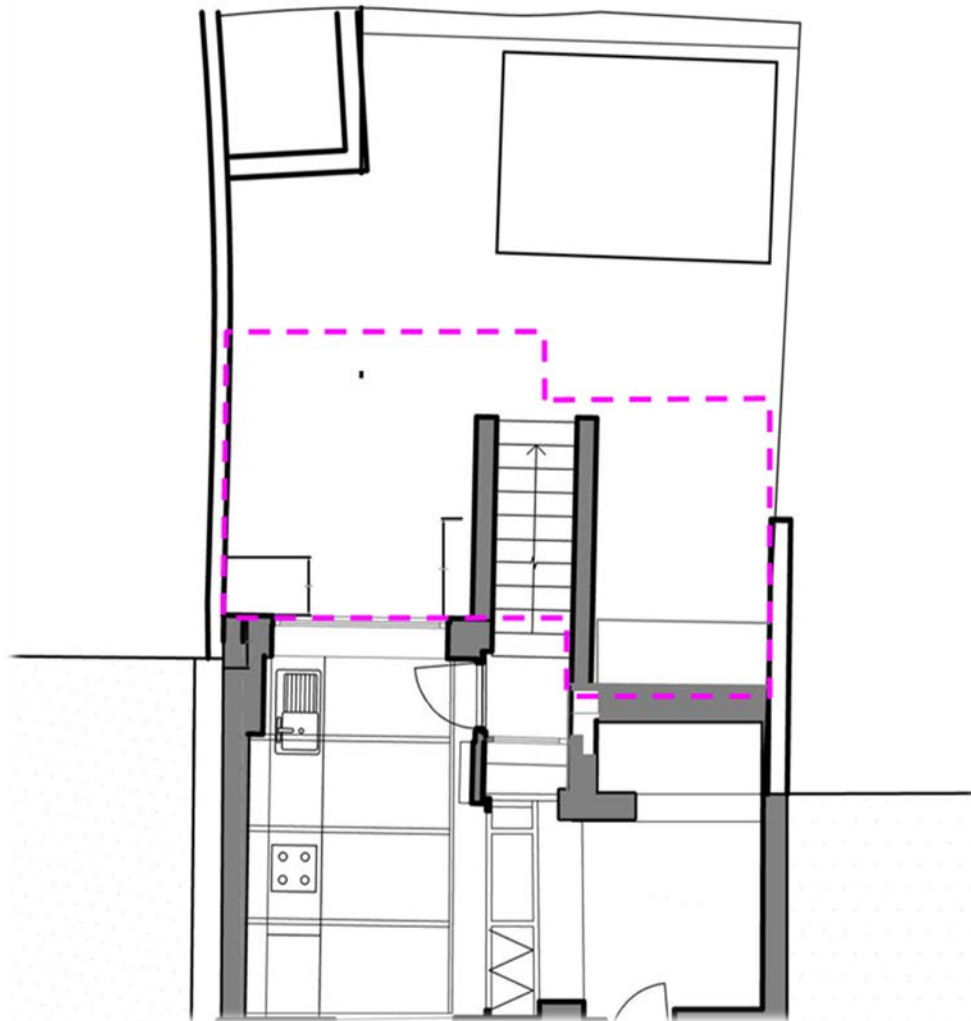
STRATUM:	UNDRAINED ELASTIC MODULUS E_u (kN/m ²)	DRAINED ELASTIC MODULUS E' (kN/m ²)
Claygate Beds	15,200N/m ² at surface increasing linearly to 67,200N/m ² at 10m depth	12,160kN/m ² at surface increasing linearly to 53,760kN/m ² at 10m depth
London Clay	67,200N/m ² at stratum surface increasing linearly to 140,000kN/m ² at 25m depth	53,760kN/m ² at stratum surface increasing linearly to 112,000kN/m ² at 25m depth

For design purposes, the undrained Young's modulus (E_u) (in kN/m^2) was taken as $10,000 + 5,200z$ for the Claygate Beds and London Clay Formation (where z is the depth in m below the surface of the Claygate Beds), based on Burland and Kalra (1986). Drained Young's modulus (E') was taken as $0.8 E_u$ for both the Claygate Beds and London Clay Formation

Poisson's Ratios of 0.5 and 0.1 have been used for short term (undrained) and long term (drained) conditions respectively. The analysis uses the above parameters for stratified homogeneity with the introduction of an assumed rigid boundary at approximately 25m depth.

7.3 MODELLED GROUND MOVEMENT

Elastic heave of the ground in both the short term and long term scenario is predicted to occur as a direct response to a net soil unloading of up to approximately -38kN/m^2 caused by a maximum of 2m deep excavations of the rear garden. The excavation area is highlighted on the plan below.



MODELLED EXCAVATION EXTENT
(MAGENTA DASHED LINE)

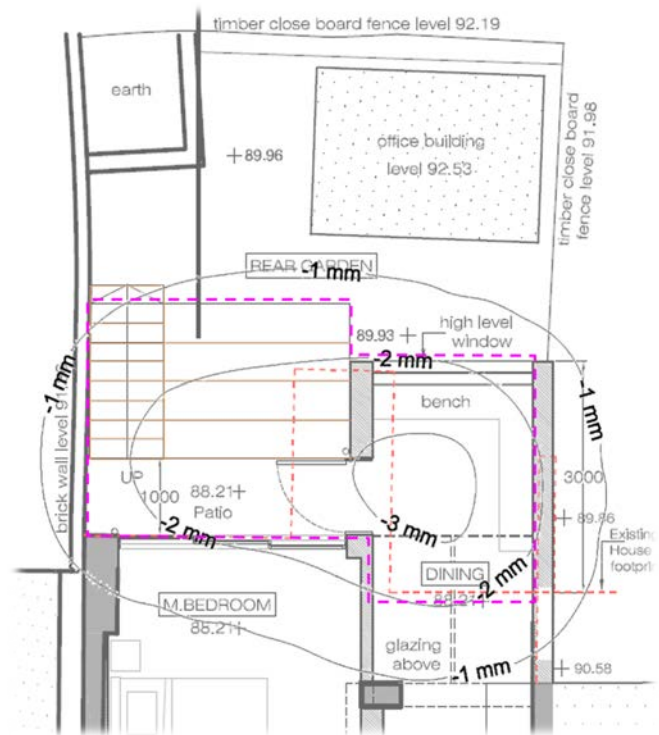
7.3.1 SHORT TERM MOVEMENTS DUE TO EXCAVATION HEAVE

The analysis suggests that up to 3mm of short term heave is expected.

7.3.2 POST CONSTRUCTION MOVEMENTS

There will be a permanent mismatch between the weight of soil that is removed and the weight of the new structure. In this situation, long term heave will occur, amounting to a similar figure to the short term.

Only the post construction heave (of <5mm) will affect the host property, whereas the neighbouring properties will be affected by both components amounting to a predicted maximum of approximately 1 mm + 1mm = 2mm.



THEORETICAL PREDICTED SHORT
TERM HEAVE CONTOURS

7.4 IMPACT ON NEIGHBOURING STRUCTURES

As demonstrated above, the excavations and subsequent construction of the proposed development are not predicted to result in any appreciable ground movement to either the host building at No. 24 Kemplay Road or to the neighbouring buildings at No.22 and No. 26 Kemplay Road.

Therefore, the potential degree of damage due to the proposed development can be assessed for all of these structures as Burland Category 0 - 'Negligible'.

8. IMPACT ASSESSMENT

The screening and scoping stages identified potential aspects of the geological, hydrogeological and hydrological environment that could lead to the development having an unacceptable impact.

This stage is concerned with evaluating the direct and indirect implications of each of these potential impacts.

8.1 HYDROGEOLOGICAL IMPACT ASSESSMENT

The proposed extension will be constructed within the lower beds of the Claygate and there is no expectation of any significant groundwater flows within these soils.

It is therefore considered that the development will not have any impact upon groundwater flow and there is additionally no scope for any cumulative impact.

8.2 HYDROLOGICAL IMPACT ASSESSMENT

There will be no change to the flood risk at the site or neighbouring sites as a result of the proposed development.

Nevertheless, there will be a need to maintain the present water discharge regime and provide Sustainable Drainage Systems (SuDS) and to provide an overall reduction in discharge rates as per the planning policy requirements.

A SuDS Assessment addressing this is presented as a separate report (LBH4606suds).

8.3 POTENTIAL STABILITY IMPACTS

The Local Plan states that proposed basements should not pose a risk of damage to neighbouring properties any higher than Burland scale Category 1 'Very Slight'.

The predicted damage levels to both the host property and to neighbouring buildings due to the ground movements associated with the proposed development have been assessed as negligible (Burland scale Category 0).

8.4 RESIDUAL IMPACTS

The proposed development has been shown to have no expected unacceptable residual impacts upon the surrounding structures, infrastructure and environment.

9. CONCLUSION

The assessment has demonstrated that no adverse residual or cumulative stability, hydrological or hydrogeological impacts are expected to either neighbouring structures or the wider environment as a result of this development.