BASEMENT IMPACT ASSESSMENT

10 PRIMROSE HILL STUDIOS

CAMDEN

LBHGEO

LBH4601 February 2020

DOCUMENT CONTROL			
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FOREWORD-GUIDANCE NOTES

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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 excavate a basement beneath the entire footprint of the existing Grade II listed building at No. 10 Primrose Hill Studios.

1.2 BRIEF

LBHGEO have been appointed by Fiona Fisher to complete a Basement Impact Assessment (BIA) in support of a forthcoming 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, Camden published Camden Planning Guidance (CPG) on Basements in 2018, which refers to the 2010 Camden Geological, Hydrogeological and Hydrological Study (the Arup Report). While these documents do not carry the same weight as the main Camden Development Plan documents they are important supporting documents.

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 associated with the proposed development.

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

Finally, a summary of the potential impacts of the proposed scheme is presented.

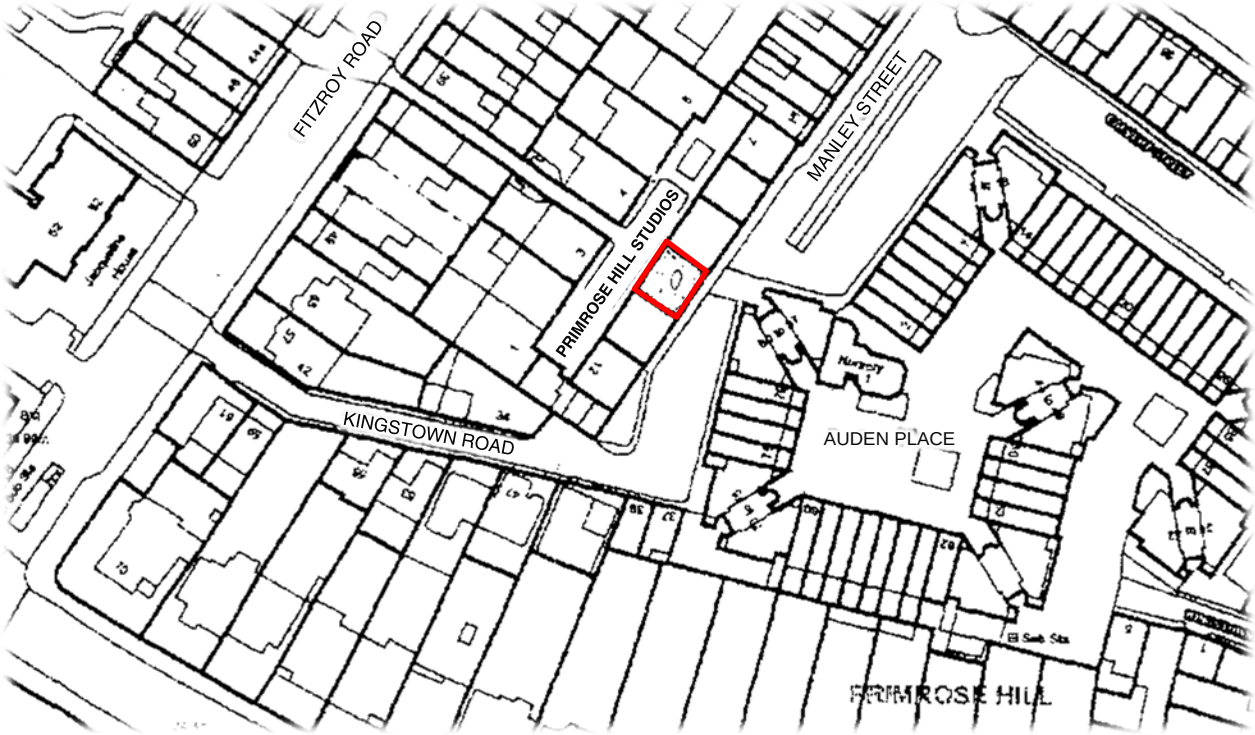
1.5 DOCUMENTS CONSULTED

- 2019 Nov. Existing Drawings by Davies Architecture Ref. PRI-EX-GA-01, 02, 03, 05, 06, 07, 08, 09, 10
- 2019 Nov. Proposed Drawings by Davies Architecture Ref. PRI-PL-GA-01, 02, 06, 08, 09, 10

2. THE SITE

2.1 SITE LOCATION

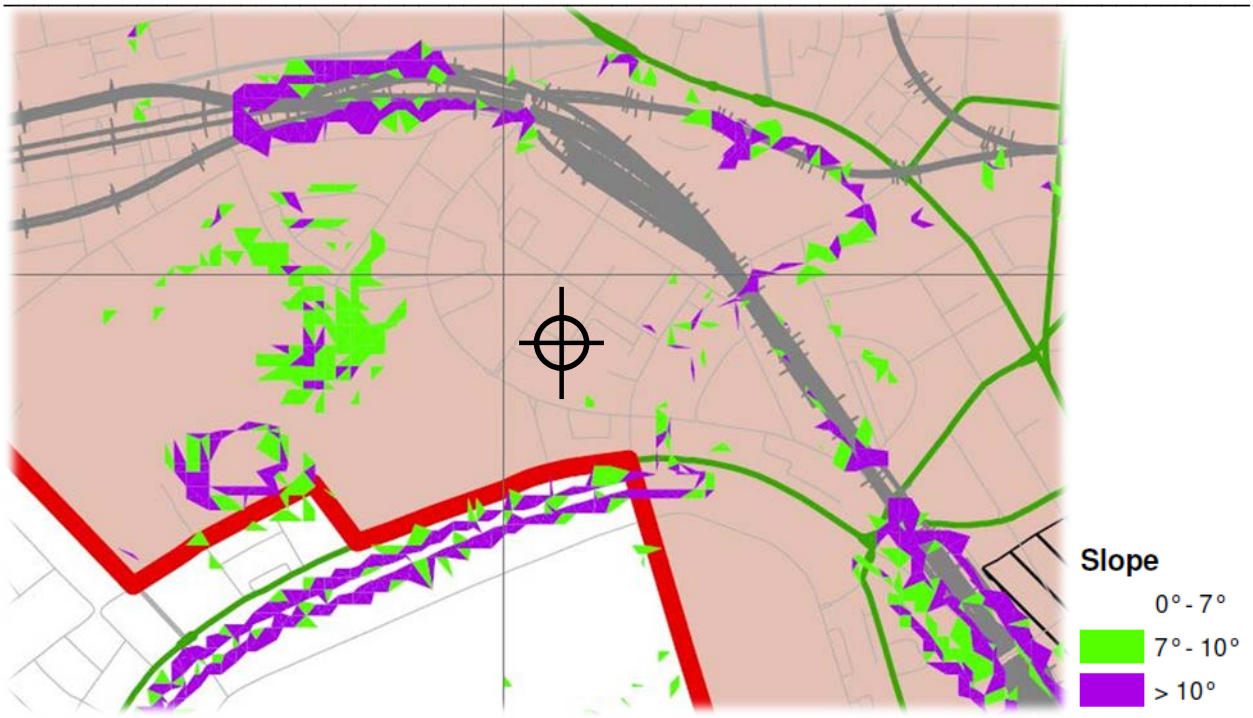
The site may be located approximately by postcode NW1 8TR or by National Grid Reference 528070, 183905.



SITE LOCATION PLAN

2.2 TOPOGRAPHICAL SETTING

The site lies on the southeastern slopes of Primrose Hill, falling towards the Regent's Canal and generally towards the valley of the now culverted River Fleet.



LOCAL SLOPES
(EXTRACT FROM CGHHS FIG. 16)

2.3 SITE DESCRIPTION

The site is occupied entirely by a late 19th Century part single and part two-storey studio building adjoining similar buildings at Nos. 9 and 11 Primrose Hill Studios. The existing ground floor level at the site is set approximately 0.2m above the street level of the Primrose Hill Studios, with the street level of Kingstown Street to the rear approximately 1m lower than that at the front.

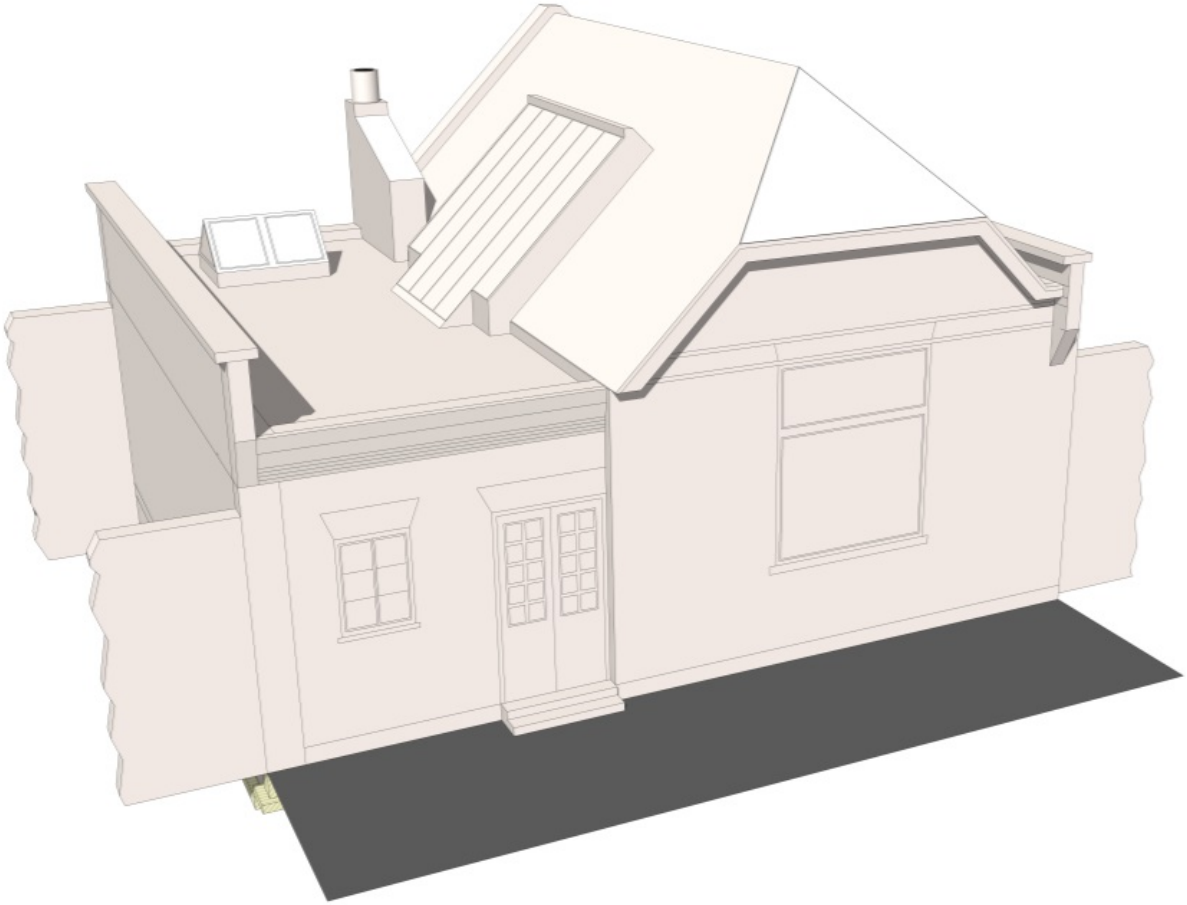
The existing structure comprises a two storey main part of the building with a pitched roof, which accommodates a mezzanine floor at first floor level, allowing a double height ground floor level at the front of the property. The single storey part of the building is flat roofed and contains the entrance and amenities.

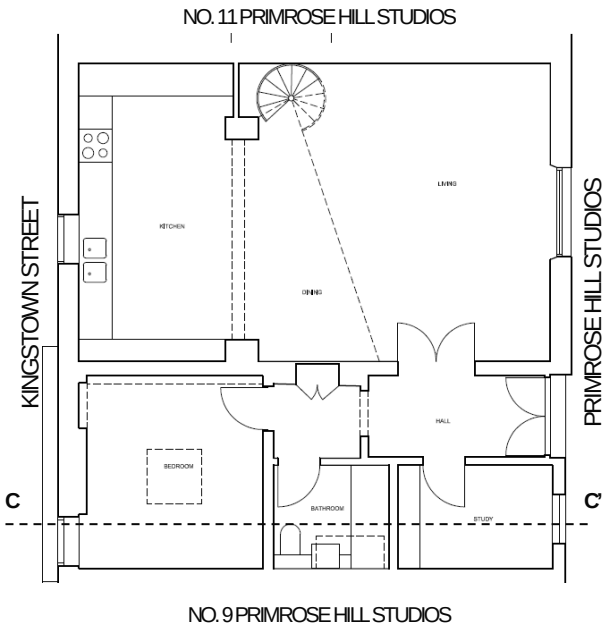
A limited crawlspace / void is present below the entire ground floor. The void is indicated to increase in height towards the rear elevation of the building, where it appears to reach approximately 1m in height.

The foundations to the building are likely to be stepped up towards the front of the property.

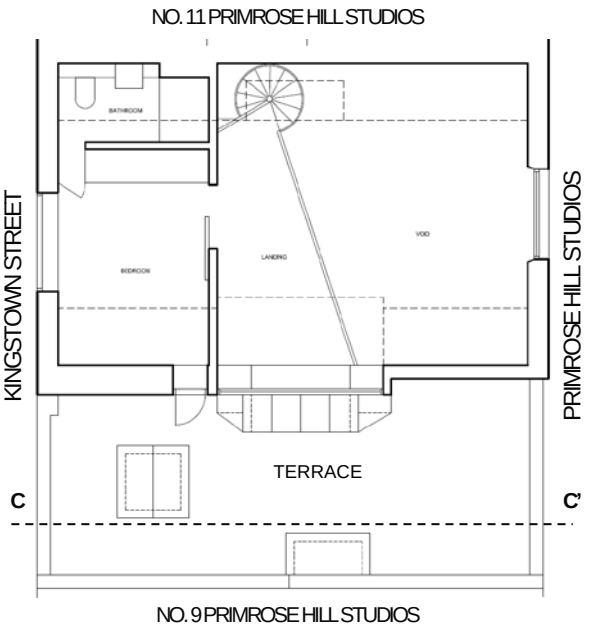
It is understood that neither of the adjacent buildings contain basements, but No. 7 and No. 8 both include basement developments.

Two trees, one a larger, semi-mature birch tree are present in the pavement of Kingstown Street to the rear of the property.

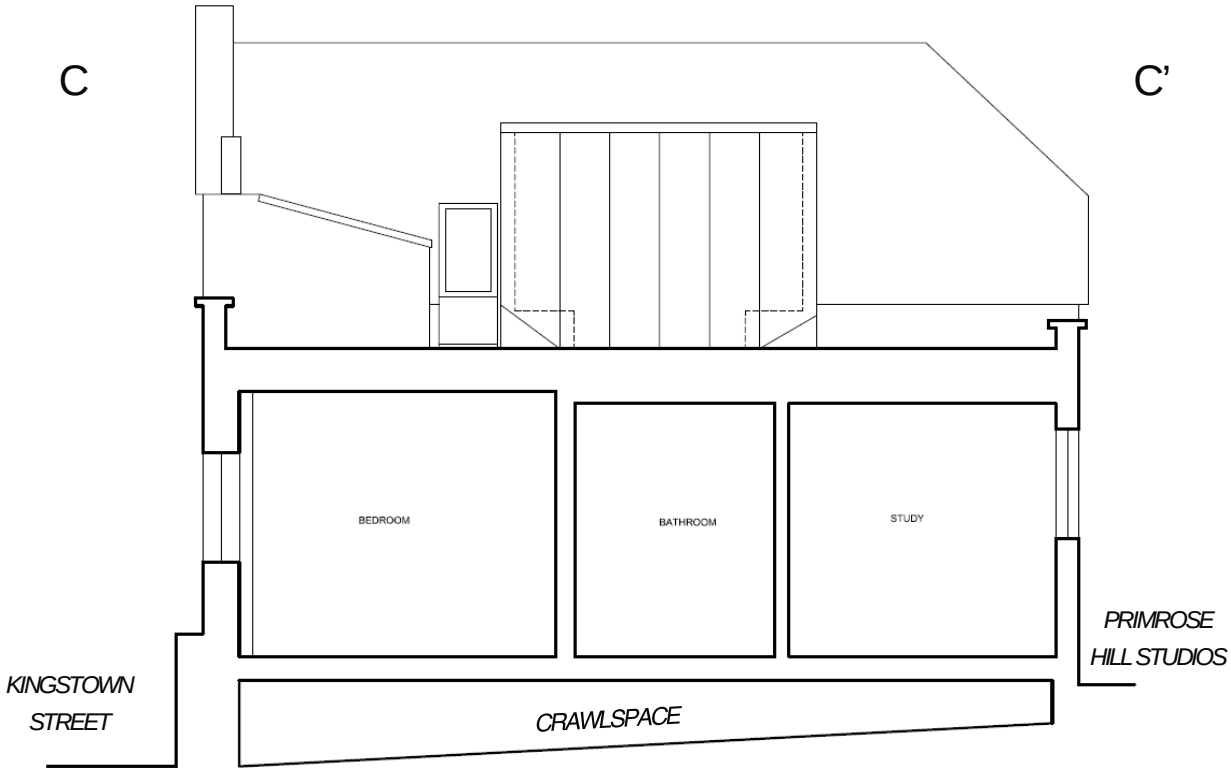




EXISTING GROUND FLOOR PLAN



EXISTING FIRST FLOOR PLAN

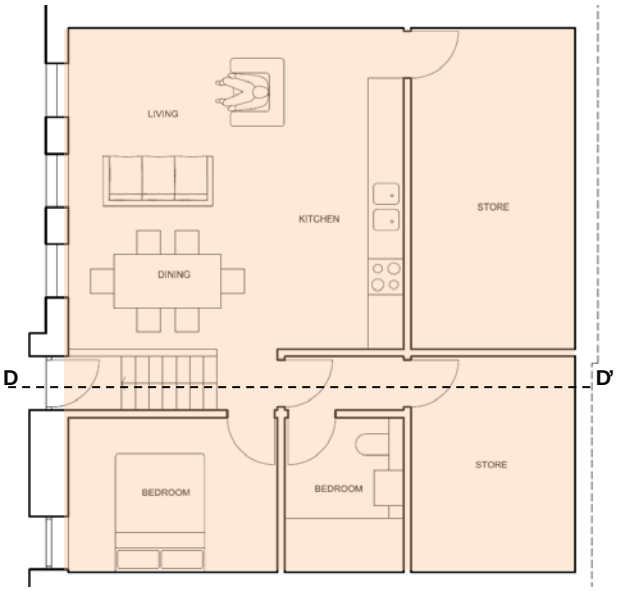


EXISTING SECTION C-C'
(SHOWING THE EXISTING CRAWLSPACE)

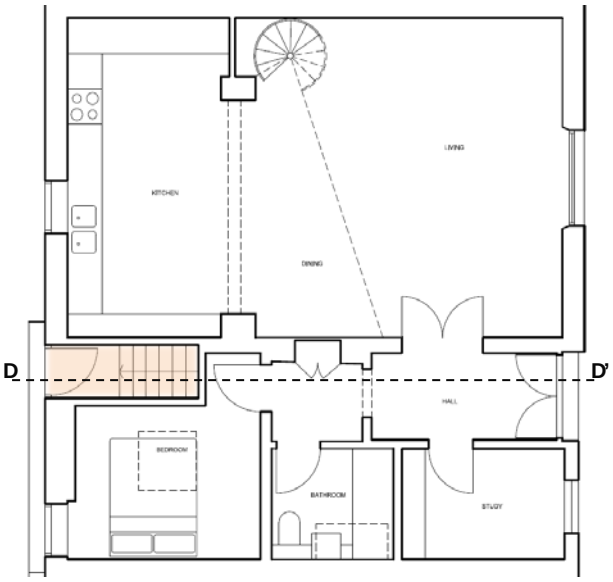
2.4 PROPOSED DEVELOPMENT

It is proposed to construct a single storey basement beneath the footprint of the property. The basement is proposed to comprise a self-contained dwelling accessed from Kingstown Street with a front door and low level windows on this elevation, taking advantage of the existing difference between the ground floor and street level.

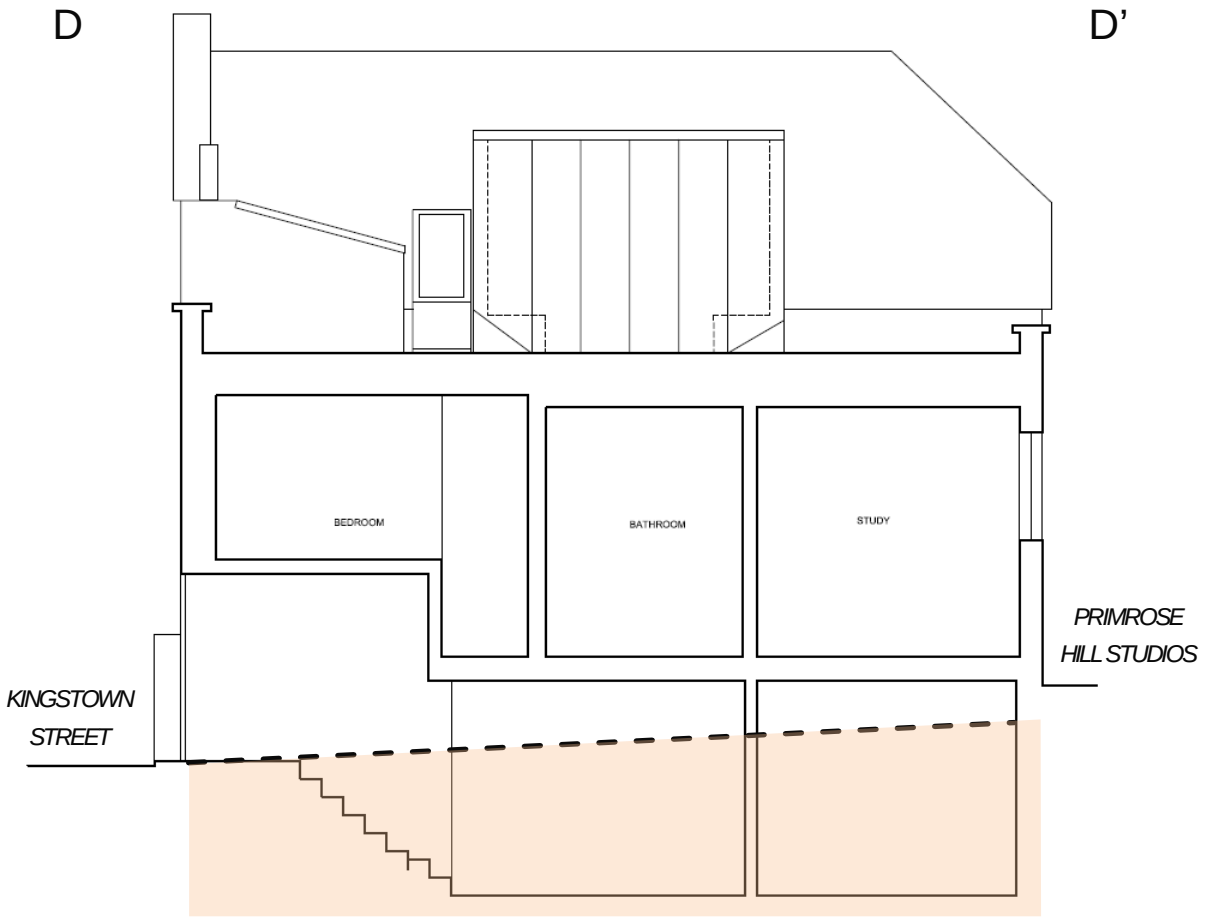
Due to the presence of the crawlspace below the building, it is expected that excavations to a depth of approximately 3.5m below the existing ground floor level will be required in order to construct the basement.



PROPOSED BASEMENT PLAN



PROPOSED GROUND FLOOR PLAN



PROPOSED SECTION D-D'
(SHOWING THE PROPOSED EXTENT OF EXCAVATIONS)

3. DESK STUDY

3.1 SITE HISTORY

It appears that despite surrounding Victorian development, the site itself remained undeveloped until the late 1870s – early 1880s. The surrounding development was noted to comprise typical terraced housing.

Following construction of the Primrose Hill Studios, no major structural change appears to have occurred to the buildings themselves until the present day.

No. 9 appears to have shared a wall with former mews buildings to the rear. These mews appear to have been demolished approximately at the turn of the century. The Kingstown Street and Manley Street area was later redeveloped with new housing constructed some distance away from the rear elevation of the building.

The site and adjacent properties have essentially remained unchanged until the present day and the entire development of the Primrose Hill Studios was Grade II Listed in June 2004.

3.2 GEOLOGICAL INFORMATION

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

EXTRACTS OF FIGURE 2 (LEFT) AND FIGURE 5 (RIGHT) OF THE CGHHS

3.3 HYDROGEOLOGICAL INFORMATION

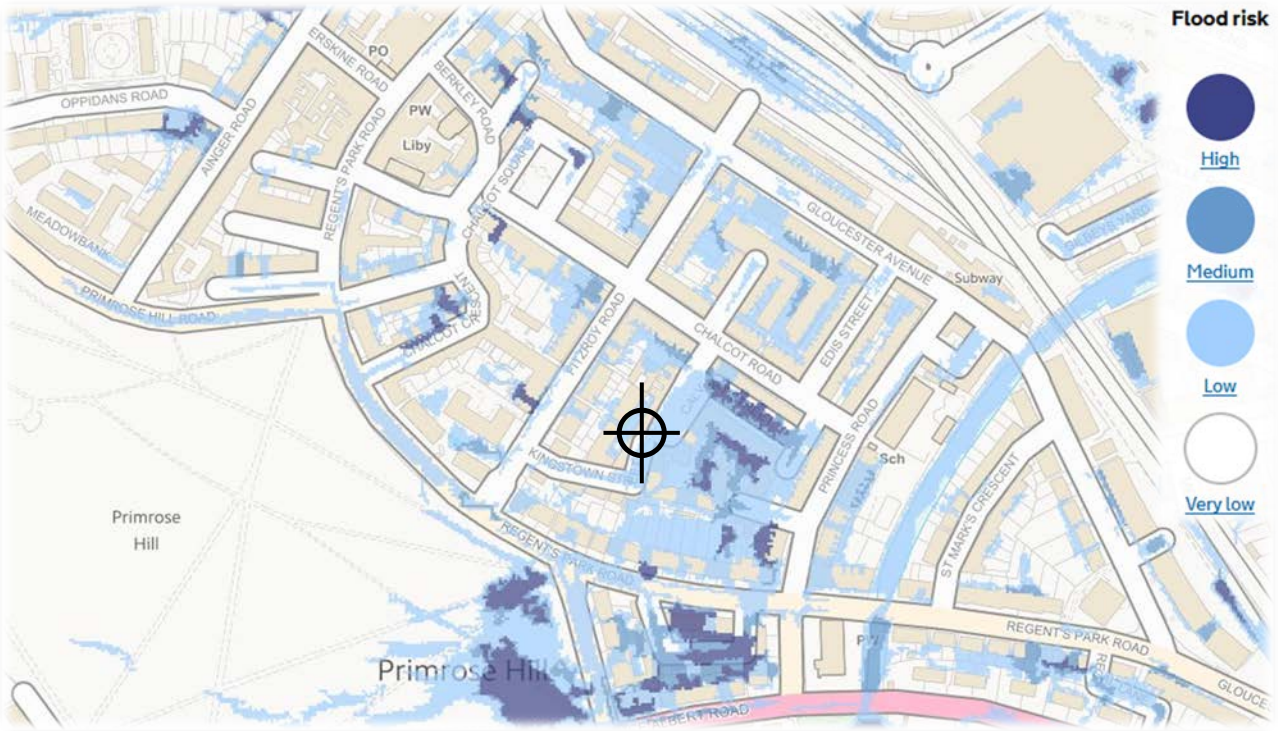
The London Clay Formation may be considered virtually impermeable; hence no significant groundwater flow is expected to occur beneath the site.

3.4 HYDROLOGICAL, DRAINAGE AND FLOOD RISK INFORMATION

Figure 2 of the CGHHS (above) indicates that the closest surface water feature to the site is the culverted River Fleet, which flows through Camden Town some distance to the east of the site.

Figure 6 of the Camden SFRA indicates that the site lies within the Primrose Hill Flood Risk Area.

Environment Agency (EA) surface water flood maps indicate that the Primrose Hill Studios square on which the site fronts is at low risk of surface water flooding. The area to the rear of the site is identified to be mainly at low risk of surface flooding as well, with local areas of medium and high risk of flooding located further along Calvert Street to the east of the site.



EXTRACT OF EA SURFACE WATER FLOOD RISK MAP

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 is located directly above an aquifer?	**No**	The site is not underlain by an aquifer.
Will the proposed basement extend beneath the water table surface?	**No**	
Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	**No**	The nearest watercourse is the River Fleet.
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 entirety of the existing site is occupied by the existing building footprint and no changes to this are proposed.
Will more surface water (e.g. rainfall and run-off) than at present will 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 Requirements document.
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 ponds local to the site.

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 roof drainage arrangement discharging to the public sewer will be maintained.
Will the proposed basement development result in a change in the proportion of hard-surfaced/paved areas?	**No**	The entirety of the existing site is occupied by the existing building footprint and no changes to this are proposed.
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 roof drainage arrangement discharging to the public sewer will be maintained.
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	**No**	The existing roof drainage arrangement discharging to the public sewer will be maintained.
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?	**Yes**	The site lies within the Primrose Hill Flood Risk Area. The area of the site is identified by the Environment Agency to be at low risk of surface water flooding, with areas of higher risk located downgradient of the site.

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 land neighbouring the development.

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 in the area of the site is less than 7 degrees.
Is London Clay the shallowest strata at the site?	**Yes**	The site is underlain by London Clay.
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?	**Yes**	A small tree is present in the pavement to the rear of the site. A second, larger tree is also present to the rear, albeit further away.
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?	**No**	The nearest watercourse is the River Fleet, in Camden Town.
Is the site within an area of previously worked ground?	**No**	The British Geological Survey (BGS) records as well as Fig. 3 of the CGHHS do not indicate that the site lies within an area of previously worked ground.
Is the site within an aquifer?	**No**	Fig. 8 of the CGHHS indicates the site is underlain by unproductive strata.
Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	**No**	
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?	**Yes**	The site is adjacent to the Primrose Hill Studios square to the front and to Manley Street and Kingstown Street to the rear.
Will the proposed basement significantly increase the differential depth of foundations relative to the neighbouring properties?	**Yes**	The proposed basement will increase the differential depth of foundations when compared to both of the adjacent properties at No. 11 and No. 9 Primrose Hill Studios.
Is the site over (or within the exclusion zone of) tunnels, e.g. railway lines?	**No**	There are no tunnels recorded nearby and the the line of the proposed HS2 railway tunnel is approximately 240m away from the site.

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

No issues were identified by the Screening Assessment.

4.2.2 SCOPING FOR SURFACE WATER FLOW AND FLOODING

- **The site is 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.**

The guidance advises that the developer should undertake a Flood Risk Assessment (FRA).

4.2.3 SCOPING FOR STABILITY

- **Is the London Clay the shallowest strata at the site?**

The guidance advises that of the soil strata present in LB Camden, the London Clay is the most prone to seasonal shrink-swell (subsidence and heave).

- **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?**

The guidance advises that the soil moisture deficit associated with felled tree will gradually recover. In high plasticity clay soils (such as London Clay) this will lead to gradual swelling of the ground until it reaches a new value. This may reduce the soil strength which could affect the slope stability. Additionally the binding effect of tree roots can have a beneficial effect on stability and the loss of a tree may cause loss of stability.

- **Is the site within 5m of a highway or pedestrian right of way?**

The guidance advises that excavation for a basement may result in damage to the road, pathway or any underground services buried in trenches beneath the road or pathway.

- **Will the proposed basement significantly increase the differential depth of foundations relative to the neighbouring properties?**

The guidance advises that excavation for a basement may result in structural damage to neighbouring properties if there is a significant differential depth between adjacent foundations.

5. SITE INVESTIGATION

An intrusive ground investigation was undertaken in December 2019, comprising a small diameter window sample borehole drilled to a depth of 5.45m below ground level.

5.1 GROUND CONDITIONS

Less than one metre of made ground was found to be present, resting upon the London Clay. The clay was reported to comprise typical firm, becoming stiff, brown and grey silty clay of high plasticity.

5.2 GROUNDWATER

No groundwater was encountered.

6. BASEMENT CONSTRUCTION

6.1 EXCAVATION

The basement excavations will extend to approximately up to 3.5m depth below the existing ground floor level.

The existing foundations are expected to comprise shallow strip foundations placed no more than 1m below the local ground level.

The new basement perimeter walls will therefore be formed by conventional underpinning and the construction of L-shaped reinforced concrete segments excavated and cast in-situ in a 'hit and miss' sequence of approximately 1m wide sections. A single stage of underpinning up to 2.5m deep is envisaged.

During the works, temporary propping will be installed to ensure that lateral ground movements are minimised. Following the underpinning exercise it is envisaged full width propping will be provided to restrain the newly underpinned walls during the main basement excavation.

As the main basement excavation proceeds, additional temporary propping is to be installed to ensure lateral ground movements are prevented.

In the permanent situation the reinforced underpins will connect to the basement slab and it is envisaged that a new reinforced concrete ground floor slab will be cast. Both the basement raft slab and the ground floor slab will also act as horizontal props, with the whole basement structure forming a rigid concrete box

6.1.1 WATERPROOFING

There is potential for water to collect around the proposed basement in the long term. Hence, it is to be fully 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. An assumed hydrostatic level at approximately 1m depth below the Primrose Hill Studios street level is to be adopted for the purposes of assessing hydrostatic pressures.

6.1.2 BASEMENT HEAVE

There will be a mismatch between the weight of the soil that is to be removed and the basement structure that is to replace it and therefore it is inevitable that heave movement of the underlying soil will occur.

An assessment of the potential extent of this is presented in Section 7 of this report.

6.2 UNDERPINNING

Underpinning sections will be excavated in short widths not exceeding 1000mm.

The sequence of the underpinning will be an extended 1, 3, 5, 2, 4 & 6 type numbering, such that any given underpin will be completed, dry packed, and a minimum of 48 hours lapsed before an adjacent excavation is commenced to form another underpin.

Each pin excavation will be undertaken only under the direct supervision of a suitably experienced and competent person. In the event that the vertical soil face to an underpin is judged to be potentially unstable, face support and lateral propping will be provided by 18mm perforated plywood sheeting supported by timber walings held by adjustable steel trench “acrow” props.

6.3 RETAINING WALLS

The following parameters may be considered in the design of the 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)
London Clay	20	Zero	25

6.4 EFFECT OF TREES

Although there are trees present to the rear of the property, the foundations to the basement will extend to at least 2.5m below the local ground level.

It is therefore expected that the depth of the foundations to the proposed basement will obviate the risk of the basement structure being affected by way of moisture extraction from the clay due to future tree root growth.

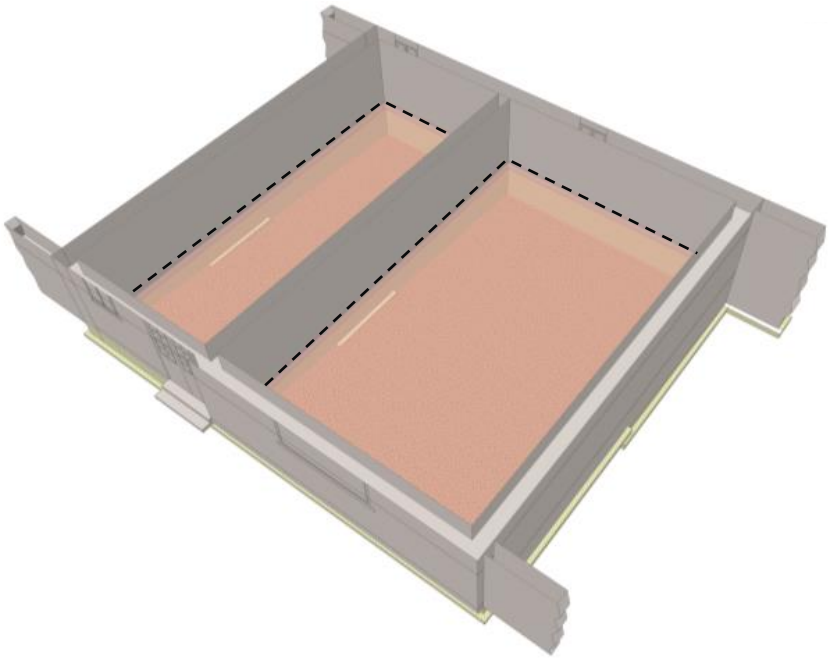
6.5 CONSTRUCTION SEQUENCE

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

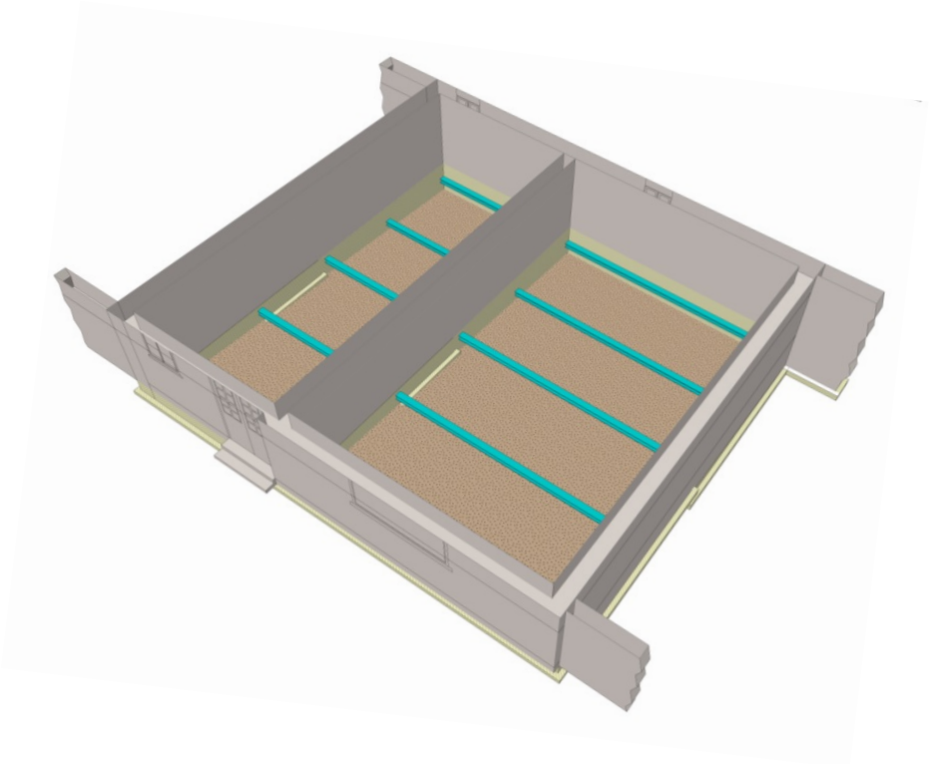
The existing foundations presented in the sequence are highlighted in order to indicate the assumed (and as yet unconfirmed) arrangement. It is expected stepped shallow strip foundations were used in order to account for the natural slope of the ground, as shown below.

The indicative construction sequence (shown using cutaway drawings) is as follows:

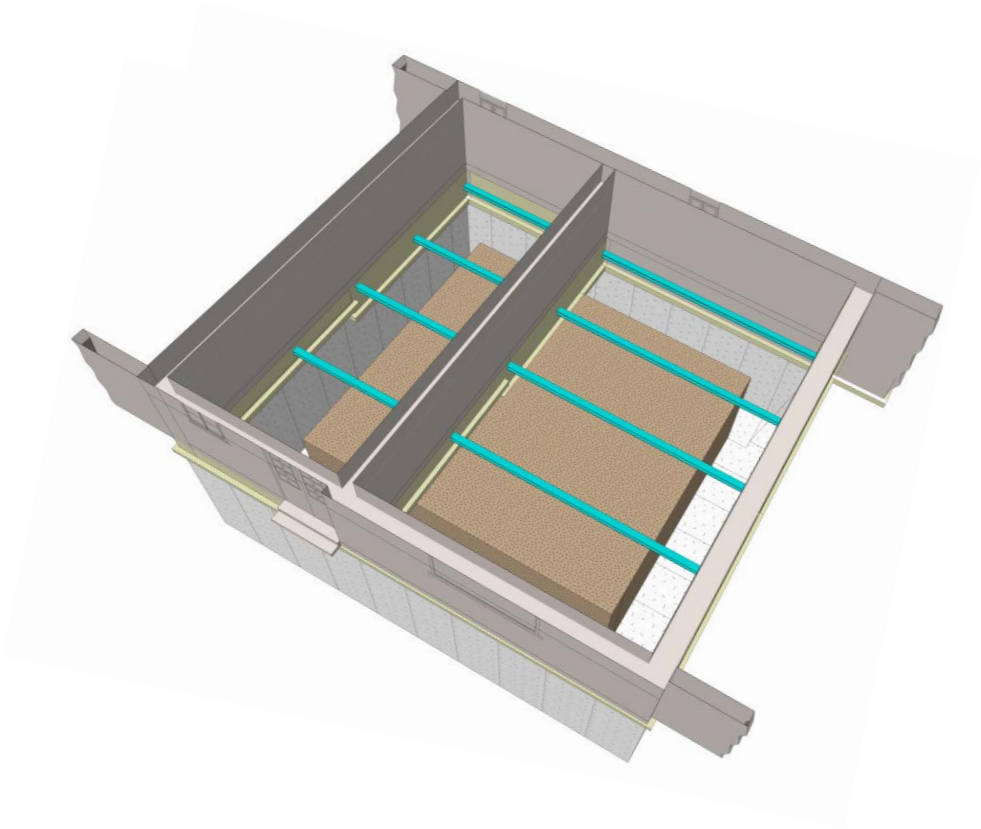
1. Remove the existing ground floor slab.

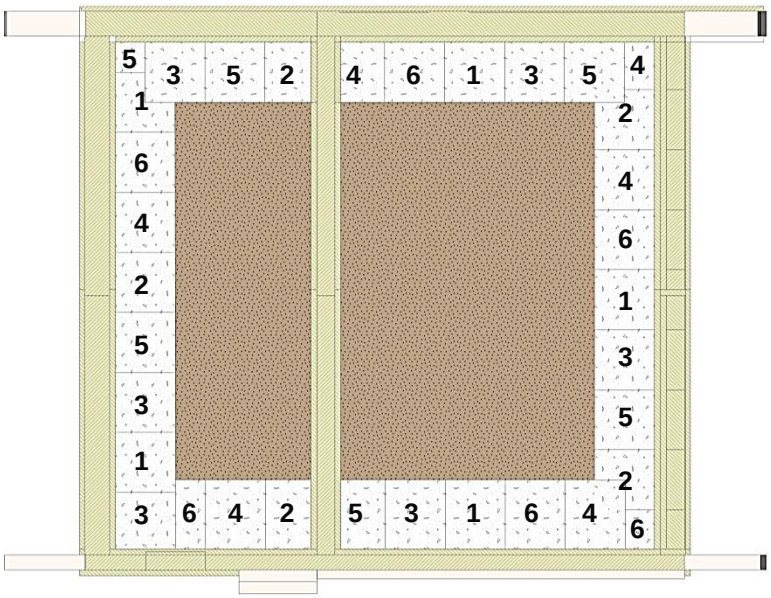


2. Install temporary ground floor level propping in shallow trenches across the building footprint.

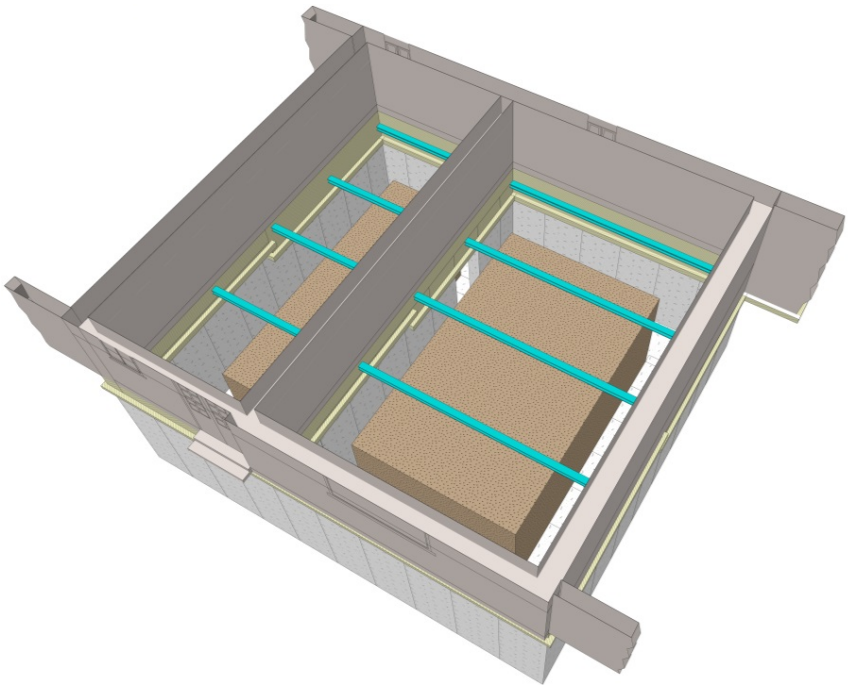


3. Underpin the perimeter of the proposed basement in reinforced concrete L-sections. Suggested sequence presented below,



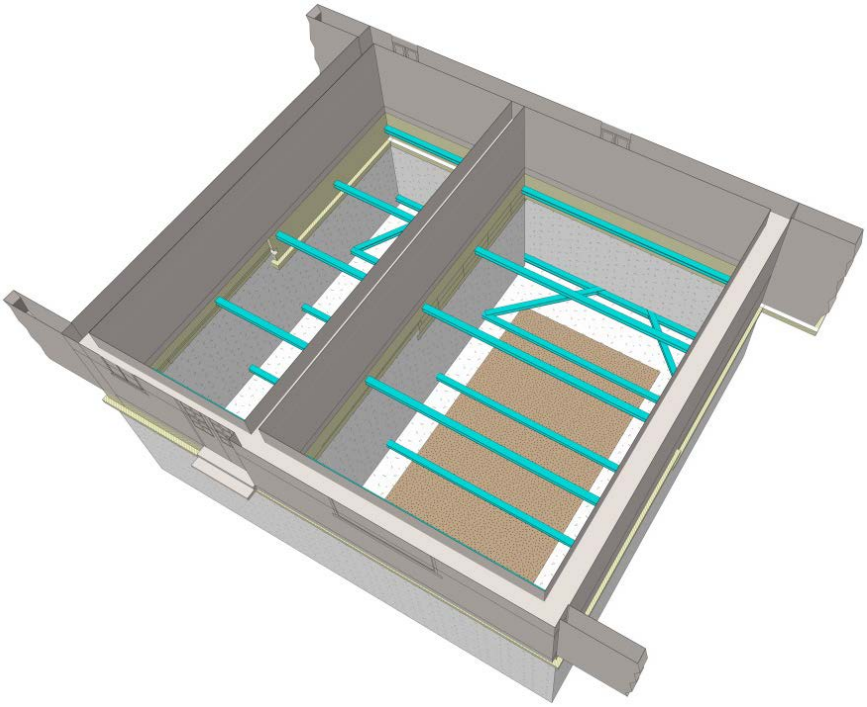


4. Underpin the spine wall in a similar sequence, with excavation for individual pins undertaken from both sides of the wall.



5. Undertake the main excavations for the basement.

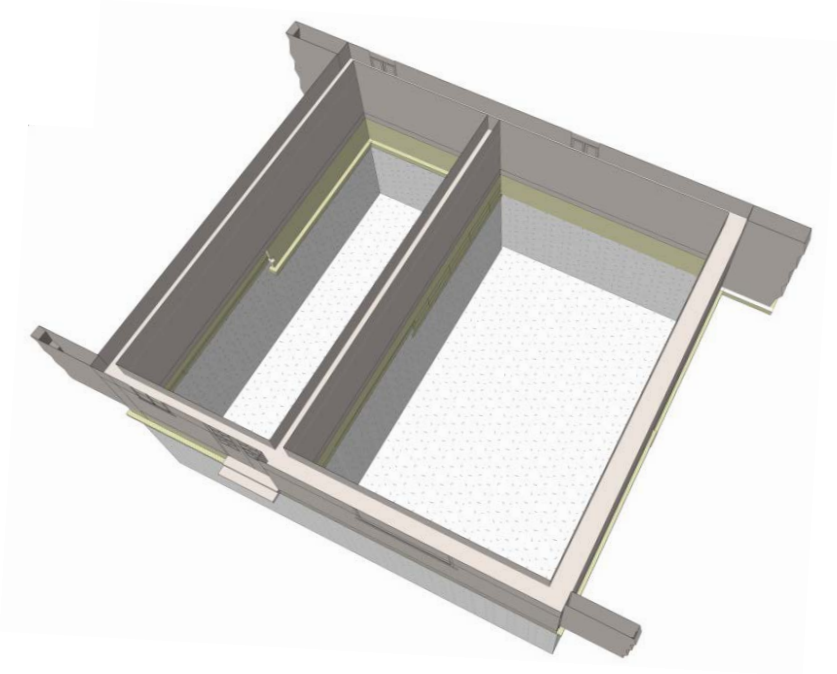
6. Install basement level lateral propping across the constructed underpinning.



7. Install below slab drainage for foul and ground water, sumps and pumps.

8. Place slab reinforcement and cast the remainder of the basement slab.

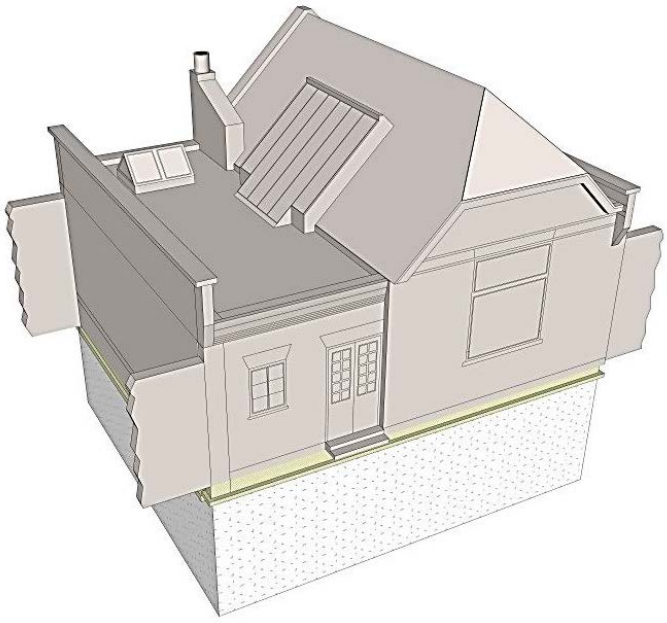
9. Remove low level temporary propping.



10. Construct basement liner walls, membranes, cavity drainage, insulation and screed.

11. Construct ground floor slab.

12. Remove ground level propping and construct the stairs to the rear entrance to the basement flat.



7. GROUND MOVEMENTS

Camden Council seeks to ensure that harm will not be caused to either the host building or 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'.

7.1 NEIGHBOURING PROPERTIES

7.1.1 NO. 11 PRIMROSE HILL STUDIOS

No. 11 Primrose Hill Studios is similarly built and directly adjacent to the southwest of No. 10, sharing a party wall.

It is understood that the internal structure is similar to the one at No. 10, inclusive of the existing crawlspace and the approximate depth of foundations.

7.1.2 NO. 9 PRIMROSE HILL STUDIOS

No. 9 Primrose Hill Studios is another in a row of studios comprising No.10 and No.11 Primrose Hill Studios, with an identical overall structure, and adjacent to the northeast of No.10.

It is also therefore understood that the foundations to this structure extend to a similar depth.

7.2 MODELLED GROUND CONDITIONS

Excavation for the basement 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.

For design purposes a conservative undrained strength profile has been adopted, assuming an average Cu of 75kN/m^2 at the surface of the London Clay Formation, increasing by 8kN/m^2 per m depth.

MODELLED SOIL STIFFNESS PARAMETERS		
Stratum:	Undrained Elastic Modulus Eu (kN/m^2)	Drained Elastic Modulus E' (kN/m^2)
London Clay	39,200kN/m^2 at surface increasing linearly to 124,600kN/m^2 at 30m depth	27,400kN/m^2 at surface increasing linearly to 87,200kN/m^2 at 30m depth

Poisson's Ratios of 0.5 and 0.2 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 30m depth.

7.3 SHORT TERM VERTICAL MOVEMENTS

There are two components of short term movement that will interact to affect the host building and the neighbouring structures.

These components are firstly progressive sagging movements of the underpinned party walls due to imperfections in the underpinning process itself, then secondly elastic heave of the ground within the new excavation as a direct response to the net unloading of the weight of soil removed in the basement excavation.

Up to 2.5m deep excavations will be required to create the new basement and the potential effect may be considered by application of unloading of up to -50kN/m^2 due to soil removal.

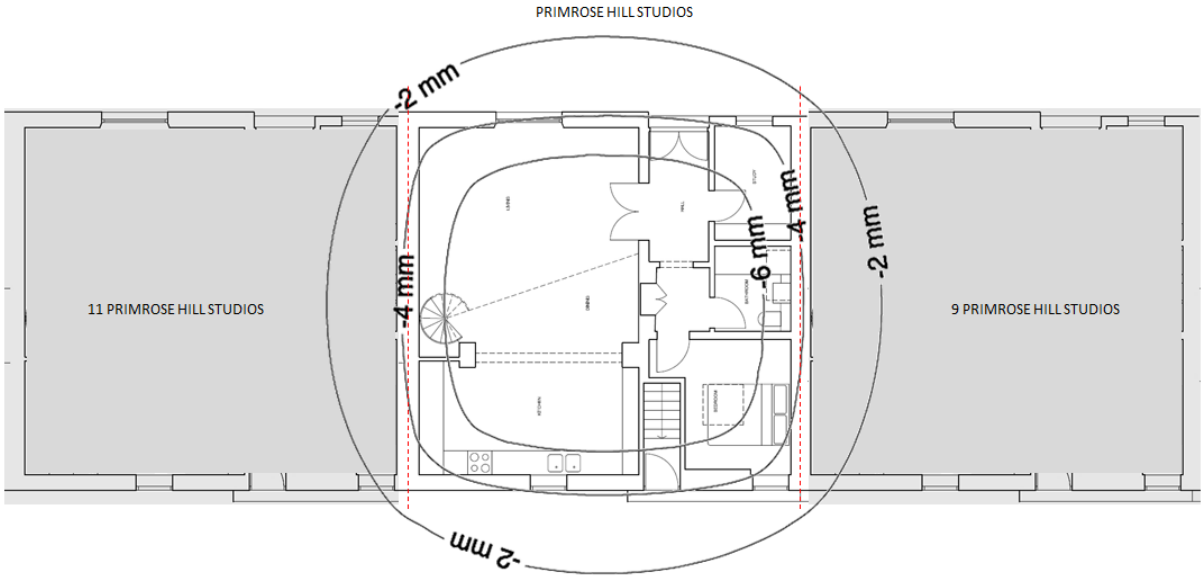
7.3.1 SHORT TERM MOVEMENTS DUE TO UNDERPINNING

It is not possible to rigorously model the extent of party wall settlement arising from underpinning and experience indicates that the amounts of any movement are very much dependent on workmanship. However, it is suggested that given dry conditions and good workmanship, the amount of vertical movement of the party wall can reasonably be expected to be a maximum of 5mm per stage of underpinning.

As a first approximation, the magnitude of the vertical movement associated with this underpinning is assumed to reduce to zero at a distance of 3.5 x 2.5 m = 8.75m behind the new basement walls.

7.3.2 SHORT TERM MOVEMENTS DUE TO EXCAVATION HEAVE

Any short term movements below the excavation itself will go un-noticed. The analysis suggests up to 8mm of heave movement below the centre of the excavated area, reducing to less than 5mm around the perimeter of this area.

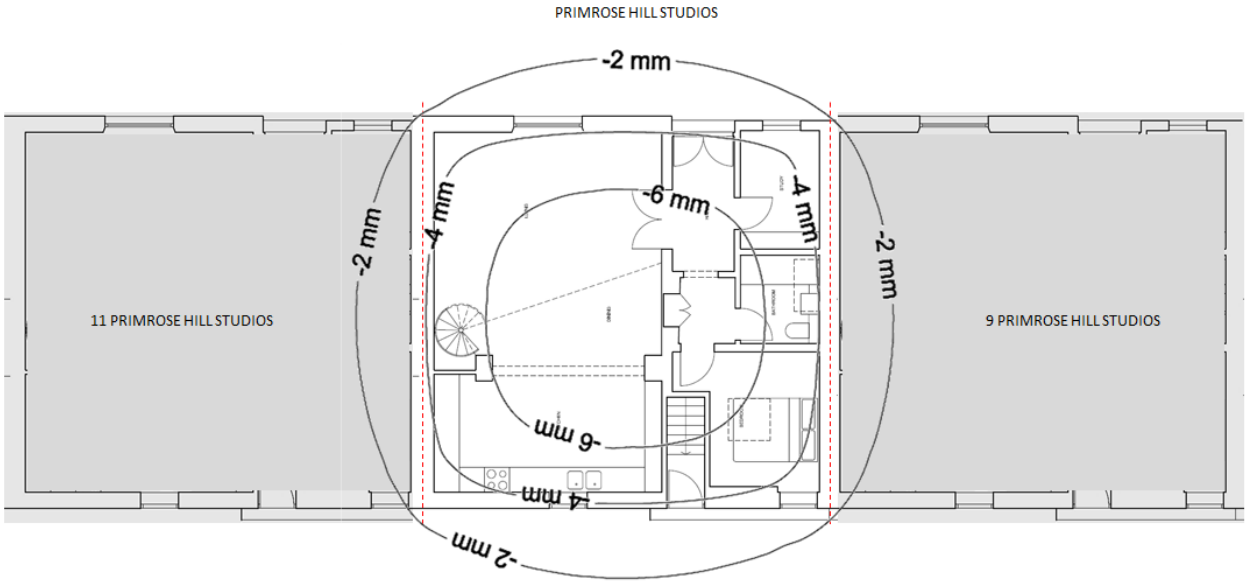


THEORETICAL PREDICTED SHORT TERM HEAVE CONTOURS

7.3.3 POST CONSTRUCTION VERTICAL MOVEMENTS

There will be a long term mismatch between the weight of soil that is removed and the weight of the new basement structure. In this situation, a component of long term heave is inevitable and this could proceed for decades.

The results of the heave analysis, as presented on the plan shown below, suggest that there will be less than approximately 8mm post-construction heave movement beneath the centre of the new basement area, reducing to less than 4mm at the perimeter walls.



THEORETICAL PREDICTED POST CONSTRUCTION HEAVE CONTOURS

7.4 HORIZONTAL MOVEMENTS

Horizontal soil movements are expected to occur due to yielding of the soil behind the underpinned wall during the basement excavation. For embedded retaining walls, this yielding has been found to extend to a distance approximately equivalent to four times the depth of excavation in front of the wall.

As a first approximation, the magnitude of the horizontal movement at the underpinned party wall is assumed to be 5mm, which is equal to the vertical movement at the wall.

This horizontal movement is assumed to reduce to zero at a maximum distance of 4 x 2.5m = 10m behind the wall.

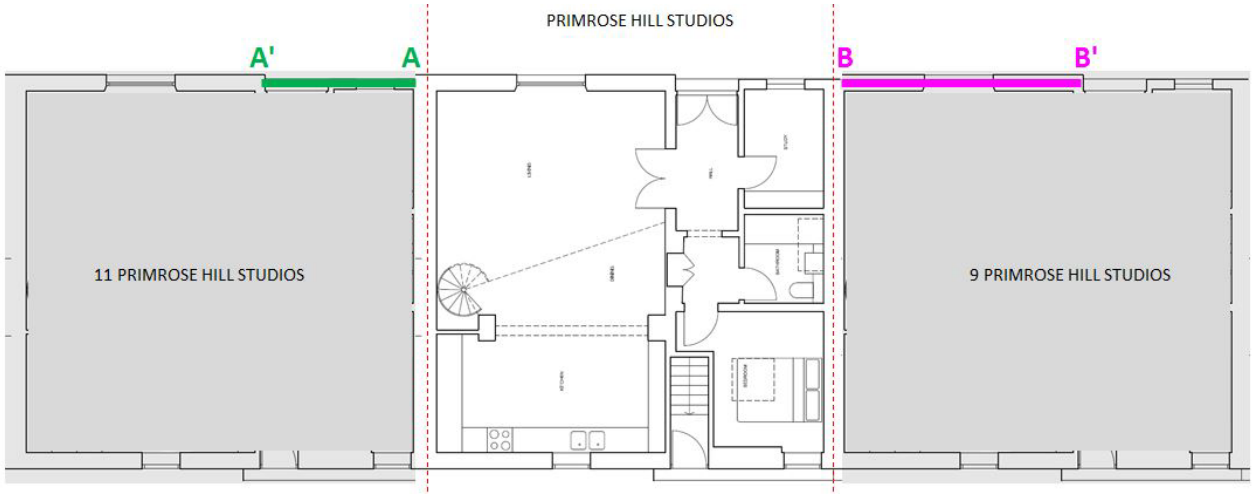
It is essential that lateral propping is provided both at ground level (high level) prior to any excavation and also at or just above the basement level (low level) as soon as is possible in order to prevent lateral movements of the new underpinning. This propping must remain in place and only be removed once some other permanent system, such as a suitably designed reinforced concrete basement or ground floor, has been installed.

7.5 IMPACT ON NEIGHBOURING STRUCTURES

In practice, although the various movements described above will interact so that the soil basement heave effects will tend to counteract the underpinning wall settlement movements, it is considered prudent to ignore this counteraction for the assessment of building damage.

The effect of the predicted vertical and horizontal deflections have been assessed using the Burland damage category assessment process, which is based upon consideration of a theoretical masonry panel of a given length (L) and height (H).

The potential degree of the predicted ground movements on the assessed structures can be estimated by the correlation of maximum horizontal strain, εh, with the maximum deflection ratio, Δ/L, where Δ is the vertical distortion over the wall length under assessment (where the wall length L is actually less than the distance to the point at which zero vertical movement is assumed, a minimum distortion of 1mm is assumed).



The potential degree of damage due to the proposed basement construction has been assessed and a summary is given below.

7.5.1 NO. 11 PRIMROSE HILL STUDIOS – SECTION A-A'

The length of section (L) is taken as 4m and the wall height (H) as 3.5m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.050%, producing a maximum deflection ratio Δ / L = -0.025, within a limiting tensile strain of 0.70%, for a Burland Category 1 "Very Slight" condition.

7.5.2 NO. 9 PRIMROSE HILL STUDIOS – SECTION B-B'

The length of section (L) is similarly taken as 6m and the wall height (H) as 4.5m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.050%, producing a maximum deflection ratio Δ / L = -0.01667, within a limiting tensile strain of 0.065%, for a Burland Category 1 "Very Slight" condition.

7.5.3 PUBLIC HIGHWAY

The proposed development adjoins both Kingstown Road and Primrose Hill Studios. Given the proposed limited depths of excavation and temporary propping arrangements it is not envisaged that any significant ground movement will occur to the pavement or public highway.

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 site is underlain by essentially impermeable clay soils and there is consequently no shallow groundwater table at this site.

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

A surface water drainage assessment and pro-forma is presented in a separate report (LBH4601suds) in line with planning policies for Sustainable Drainage Systems (SuDS).

Although it can be demonstrated that the proposed development will not increase the risk of flooding, planning policy does not support the construction of self-contained basement developments in areas that have been designated at being at risk of flooding.

A detailed Flood Risk Assessment will need to be prepared in order to demonstrate how the potential risks of flooding are to be mitigated and how a sensitive habitable use can be safely assigned to the completed development.

8.3 POTENTIAL STABILITY IMPACTS

8.3.1 LONDON CLAY

The London Clay soils are of high volume change potential.

However, the depth of the underpinning for the proposed basement will obviate any concerns regarding potential seasonal movement.

8.3.2 EFFECT OF TREES

It is assessed that, by virtue of the proposed depth of excavations, the foundation depth to the new extension will obviate any issues with potentially desiccation and clay shrinkage due to tree roots.

8.3.3 GROUND MOVEMENTS

The Local Plan states that proposed basements should pose a risk of damage to neighbouring properties no higher than Burland scale Category 1 ‘Very Slight’, and mitigation measures should be incorporated if the assessed damage is not acceptable.

The predicted neighbouring buildings damage levels due to ground movements associated with the proposed development have been analysed in section 7 and found to be acceptable (Limited to Burland scale Category 1 ‘Very Slight’).

In addition, negligible movement to the public highway due to the proposed basement development is anticipated.

8.4 RESIDUAL IMPACTS

The proposed development will have no residual unacceptable 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.

The BIA screening has revealed that the site lies within a designated flood risk area. A Flood Risk Assessment has been prepared separately to provide a basis for further discussion of the proposed development at this site, in order to explore whether and how potential future users of the intended development can be provided with an appropriate degree of protection against flood risk.