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03 July 2023
Our Ref: 2021_55
Your Ref: 2023/1671/P

Obote Hope
London Borough of Camden
Planning Team
5 Pancras Square
London
N1C 4AG

Dear Obote Hope,

RE: 32 Willoughby Road, NW3 1RU (Planning Application Ref. 2023/1671/P)

We are writing on behalf of the applicant Mr Jimeet Patel in response to objections raised by neighbours to the above planning application. Objections from no. 30 Willoughby Road largely relate to construction concerns about previous subsidence, which are not material planning considerations for this application. Therefore, this letter primarily responds to the detailed objection written by SMPlanning dated 31st May 2023 ('the objection').

Pre-application engagement

The objection notes disappointment regarding the pre-application engagement with the local community including lack of input from the community into the design process. This is surprising because formal community engagement would be very unusual for a householder application, and there have already been several recent applications for no. 32 of which the neighbours were aware. We note that neighbours did not raise any queries or concerns with the applicant on these previous applications. The applicant has also engaged in multiple rounds of pre-application advice with the local planning authority to discuss the key planning concerns at the site and progress the designs accordingly.

The applicant has been pro-active in terms of pre-application engagement, ensuring that significant design thought has gone into the plans. The proposed development is far from being a speculative application without meaningful design input. Conversely, it is a high-quality, well thought-through design, which will have no or negligible impacts on the amenities of the neighbouring properties.

Concerning formal community engagement on householder proposals, the RTPI's Planning Aid

Good Practice Guide to Public Engagement in Development Schemes notes that "*small developments such as a change of use or householder application, may only require neighbours to be notified by the local authority once an application has been submitted*". In this regard, we find the objector's disappointment unfounded.

Procedural

In relation to works affecting the party wall, Certificate B has now been completed and the requisite notice sent to the freehold company and all leaseholders of number 30 Willoughby Road.

Amenity concerns

The objection contends that "*the subterranean nature of the development restricts the amount of sunlight and daylight available to the main living space of the dwelling*" and that "*the proposed development fails to achieve the 45-degree test*". The BRE guidelines set out the 45-degree test, which the Camden Planning Guidance (CPG) on Amenity notes that "*should be regarded as a guide rather than policy*". It is important to consider the context of the site when referring to such tests, and accordingly the CPG confirms that while the LPA "*support the aims of the BRE methodology for assessing sunlight and daylight we will consider the outcomes of the assessments flexibility where appropriate, taking into account site specific circumstances and context".*

It is noted the current arrangement was assessed by the LPA as part of the pre-application advice process and no issues were raised with regards to amenity.

The 45-degree test is typically used in the assessment the impacts on neighbouring dwellings where an extension is proposed which is perpendicular to a window in a neighbouring property. The test relates to a window with a vertical orientation rather than a horizontally positioned sky light where there would be a far greater Vertical Sky Component. It is not an appropriate test to apply in this situation. We also note that the objector's concerns do not relate to any impact on themselves, but rather the impacts on the occupants of the proposed development itself. It is odd for a neighbour to be concerned about the welfare of the occupants of the proposed development and not to raise any concerns about their own. It must be correctly concluded they have no concerns about their own amenity and this objection is speculative rather than substantive.

It should also be noted that the house as a whole benefits from plentiful daylight. If the proposal were for the creation of an entirely separate basement dwelling, there would be different implications for the level of daylight entering the basement. However, the context here is that the basement is part of a house with multiple storeys and plenty of light, so there is no issue with a lack of light for occupants of the entire multi-level home.

There would also be nothing stopping the applicant or a future occupant moving the kitchen at a future date if they preferred an alternative internal arrangement. Standards set out under BS EN 17037 require that the at least one habitable room (living room, bedroom, nursery or kitchen) in the whole dwelling should comply with its sunlight test, which would be the case for the subject property. The proposals do not bring any loss of light and it does not worsen the existing situation. Conversely, they provide additional space for the occupants which will receive substantial vertical light, and therefore the overall amenity of the occupants is improved by the proposals.

Considering some similar applications, in February 2022 permission for basement excavation for additional habitable space at 8 Daleham Gardens was granted (reference 2020/0630/P), which received daylight only via 'a small lightwell'. In June 2023, an application which included a basement extension at 30 Ferncroft Avenue was approved (reference 2021/3734/P). The Delegated Report recognised that the basement included a gym and lounge, and deemed it acceptable that the basement has no windows and therefore received no natural light. This is consistent with the advice received from the LPA which raised no concerns regarding access to natural light.

Basement impact assessment

The BIA is a thorough and professionally produced report of over 400 pages by Key Geo Solutions, part of the Richter Group. The objection states that "*the submitted BIA is seriously flawed*". The applicant welcomes the review of the BIA by LBHGEO and looks forward to the local planning authority's own assessment of the information by the relevant professionals. The applicant is committed to ensuring that the basement is constructed to the appropriate construction standards. Accordingly, the applicant has sought responses from Key Geo Solutions on the comments by LBHGEO. In summary, Key Geo Solutions have confirmed that the soils encountered were clays rather than coarse soils (sands and gravels) that would contain groundwater and have a measurable groundwater flow, and that the basement will therefore not be constructed within water bearing coarse soils and will not impede the flow of groundwater. We understand that a similar depth basement was constructed (approx. 2006) at No 34 without any adverse effects on the groundwater regime being apparent. It is also noted that predicting horizontal and vertical movements due to excavations is difficult to do with a great level of accuracy and the calculations give an approximation of the likely movements. A BIA prepared by LBHGEO for a similar basement in London Clay predicted movements similar to those predicted by Key Geo Solutions. LBHGEO, at that time, came to the same conclusion that this was not an issue. The full responses to the various issues raised are appended to this letter.

The objection also states the depth of the basement "*is 47.5% greater than allowed within Camden's basement guidance*". To clarify, the proposed basement is single storey, with proportions in line with that submitted for the second round of preapplication advice

(2022/3189/PRE), in which the reduced scale of the basement was deemed acceptable and well within the maximum depth in the Camden Planning Guidance on basements. The exception to this is the addition of a small sunken wine pod which is a non-habitable space, used only for storage This is cylindrical with an internal diameter of 1.5m, representing a very small proportion of the basement area, which does not cause harm to the neighbouring properties or the structural, ground, or water conditions of the area.

Arboricultural impacts

The objection notes that "*any impact on [the trees'] integrity need to be carefully considered*" and that the "*proposed works will inevitably impact on the root protection*". The applicant acknowledges the importance of the protection of trees, and commissioned an Arboricultural Impact Assessment by Wood Consulting, which has been submitted with the application. This considers the impacts of the basement on the surrounding trees, noting that many of the trees in the neighbouring gardens are at a higher level and, given the distances involved and the depth of existing boundary wall foundation, root activity will not be present. Any substantial impact on trees would be limited and there will be no appreciable post development pressure.

Other matters

In relation to the other objections, these relate to construction concerns and previous subsidence at no. 30 Willoughby Road. As stated above, the applicant is committed to ensuring that the basement is constructed to the appropriate standards, and such issues are addressed through the Basement Impact Assessment, the Construction Management Plan, and the Building Control process. Existing structural issues at no. 30 Willoughby Road are not a material planning consideration for this application.

We hope that this provides some clarification regarding the concerns raised by the objector. If you have any questions or queries, please do not hesitate to contact us (email: info@weaplanning.co.uk/tel: 020 7993 2075).

Yours sincerely,

P Edwards

Philip Edwards
WEA Planning

Appendix
Response from Key GS

From:	David Halifax
To:	Joe Wright
Cc:	"Jim Patel"; "WEA"; Brian Duthie
Subject:	RE: 32 Willoughby Road - CMP
Date:	07 June 2023 09:10:17
Attachments:	image001.png 5-5a Camden Road Basement Impact Assessment.PDF Basement Impact Questions.pdf

Hi Joe,

I have reviewed the comments raised by LBHGEO. His main points are that the ground conditions were incorrectly described, and the movement assessment is incorrect.

The reviewer appears to be claiming that the basement construction will be within the Claygate Member and consequently could affect groundwater flow within this aquifer. Our desk study found that the property was on the boundary of the Claygate Member and our boreholes appeared to confirm this. The soils encountered were clays rather than coarse soils (sands and gravels) that would contain groundwater and have a measurable groundwater flow. We are happy that our report appears to have reached the correct conclusion that the basement will not be constructed within water bearing coarse soils and that it will not impede the flow of groundwater.

The other major point is that the movement analysis is incorrect. Predicting horizontal and vertical movements due to excavations is difficult to do with a great level of accuracy. The calculations give an approximation of the likely movements. Attached is a copy of a BIA prepared by the reviewer for a similar basement in London Clay. The movements predicted by the reviewer are similar to those predicted by ourselves.

We agree with the reviewer's comment that weekly monitoring is probably inadequate and will amend the recommendation to daily monitoring.

We will await the outcome of the check of our BIA by Campbell Reith but we are happy that what we have proposed is correct.

It is also worth noting that if the comments made by the reviewer regarding impeding groundwater flow were correct, the same comments would apply to the basement construction at No 34.

Regards
David

David Halifax
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Item	Comment	Response
2.1	The report gives the incorrect impression that the site lies on the boundary of the Claygate Member and the London Clay.	Figure 2.2-1 indicates that the site is on the mapped boundary of the Claygate Member. Section 5.1 of the report explains that sandy silty clay was encountered at the front of the property at shallow depth and this was interpreted at the Claygate Member. Both the BIA and GIR explained that the strata encountered in the intrusive investigation appear to support the desk study findings and the site is on the boundary of the Claygate Member. No groundwater was encountered in WS01 and the particle size distribution tests classified the material as a fine soil with a coarse content of 10% and 1% respectively. From the information obtained in the desk study and intrusive ground investigation it does not seem unreasonable to conclude that the property is on the boundary of the Claygate Member but the excavation will generally be formed within the London Clay Formation (as stated in Section 6) and the thin layer of the Claygate Member that was encountered was a fine soil with a low permeability so high groundwater flows would be unlikely.
2.1	There seems little doubt that the basement will encounter groundwater and that it will affect the flow of any groundwater.	As explained above, we are not disputing the fact that the basement could encounter the edge of the Claygate Member, but to imply that the basement is being constructed within a permeable aquifer and would impede the flow of groundwater would, from the information obtained in the ground investigation, be incorrect.
2.1	The report has misleadingly consulted only a small-scale map of watercourses.	The report includes a desk study which includes an Envirocheck Report. The Envirocheck Report contains mapping of surface water courses and historical maps. The report also includes the Camden Watercourses Map. There was no intention to provide misleading information and the information provided within the report shows that a reasonable level of investigation was done to determine that there are no watercourses, wells or potential spring lines within 100m of the property.

		If there is evidence that this assumption is incorrect, and that an identified watercourse, wells or spring line would affect the proposal we would of course reassess this assumption and the implications on the development.
2.2	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? Dewatering may be required and this could cause ground settlement.	The report explains that the excavation is anticipated to be generally within the London Clay Formation but may marginally encounter the Claygate Member. The London Clay Formation is a low permeability aquiclude and the soils encountered, which were interpreted as the Claygate Member, were low permeability fine soils. The report states in Section 6 that perched groundwater could be encountered within the excavation. The authors consider that it would be incorrect to imply that the site is within an aquifer and that a dewatering system is therefore required. Additionally, the authors understand that lowering the groundwater level in a coarse soil would increase the effective stress and cause settlement. However, these conditions are not anticipated that this site as the excavation is within a fine soil with low permeability.
4	Basement Heave	The authors considered the effect of heave due to the reduction in effective vertical stress and concluded that due to the depth of the excavation the effects of heave would be negligible. The reviewer, in his own BIA for a very similar basement (5m deep in London Clay) at Camden Road, stated “any short-term movements below the excavation itself will go un-noticed and the analysis suggests less than 6mm heave movement at the party walls”. So the reviewer, at that time, also didn’t think that heave was an issue.
5	Assessment methodology	The reviewer has questioned the approach to estimating the horizontal and vertical movements during construction. The reviewer, in his own BIA for a very similar basement (5m deep in London Clay) at Camden Road that was constructed with two stage underpinning used

		an approximation based on the measured performance of embedded retaining walls and predicted a horizontal movement of 5mm at the basement perimeter to zero at 22m from the perimeter. The magnitude of the horizontal movement predicted by the authors are similar to those predicted by the reviewer.
6	Mitigation	
7	Monitoring	Yes, we agree with the reviewer that daily monitoring would be more appropriate and we will amend our recommendations for the detailed design.
9	Soundness of evidence presented	The authors undertook deep boreholes at the front and rear of the property and identified the Claygate Member and London Clay Formation. The encountered soils were low permeability fine soils. The reviewer highlights the lack of groundwater monitoring in a clay soil, which is difficult due to the low permeability, but in his own BIA at Camden Road he was happy to provide a report without any site-specific ground investigation information or groundwater monitoring.
10	Reasonableness of Assessments	The reviewer states that the BIA has not sufficiently assessed the potential for ground movements, considered basal heave, or hydrogeological assessment. As stated above, for a similar site, the reviewer was happy to provide a BIA without any site-specific GI or groundwater monitoring.
11	Conclusions	The reviewer concludes that the BIA is seriously flawed but the findings are broadly similar to the reviewer's own BIA at Camden Road. We understand that a similar depth basement was constructed (approx. 2006) at No 34 without any adverse effects on the groundwater regime being apparent.

Basement Impact Assessment

in connection with proposed development at

No. 5 Camden Road
Camden
London
NW1 9LG

for

Kentish Town Spaces (UK) Ltd

LBH4577 Ver. 1.1

September 2019

LBH WEMBLEY

ENGINEERING

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Executive Summary

It is proposed to construct a single level of basement beneath the entire footprint of an existing retail premises at No. 5 Camden Road.

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

Geology

The proposed basement will extend into the London Clay.

Hydrogeological Impacts

There is no shallow groundwater table at this site and hence no scope for the basement to cause adverse hydrogeological impacts to be caused by the proposed basement construction.

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 1 “Very Slight” damage.

Conclusion

The assessment concludes 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.

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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 LBH WEMBLEY disclaims any liability to such parties.

The observations and conclusions described in this report are based solely upon the agreed scope of work. LBH WEMBLEY 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 construct a basement beneath the entire footprint of the existing property at No. 5 Camden Road.

1.2 Brief

LBH WEMBLEY have been appointed by Kentish Town Spaces (UK) Ltd to complete a Basement Impact Assessment (BIA) in support of a forthcoming planning application to be submitted to the London Borough of Camden, in order to satisfy the specific requirements of the 2018 Camden Planning Guidance (CPG) on Basements, and associated 2010 Camden Geological, Hydrogeological and Hydrological Study.

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 publishes Camden Planning Guidance on Basements and Lightwells. These CPG 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.

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 to be 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 neighbouring structures.

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

1.5 Documents Consulted

2019 Sep	Outline SuDS Strategy by LBH WEMBLEY ENGINEERING	Ref: LBH4577suds v1.0
2019 Sep	Existing Plans & Sections by Ambigram Architects	
2019 Sep	Proposed Plans & Sections by Ambigram Architects	

2. The Site

2.1 Site Location

The site is situated on the northwestern side of Camden Road, approximately 60m to the northeast of Camden Town underground station.

The site may be located approximately by postcode NW1 9LG or by National Grid Reference 528950, 183940.

Location Plan

2.2 Topographical Setting

The site lies on a very gentle southeastwards falling slope on the west bank of the now culverted River Fleet, which runs approximately 200m from the site.

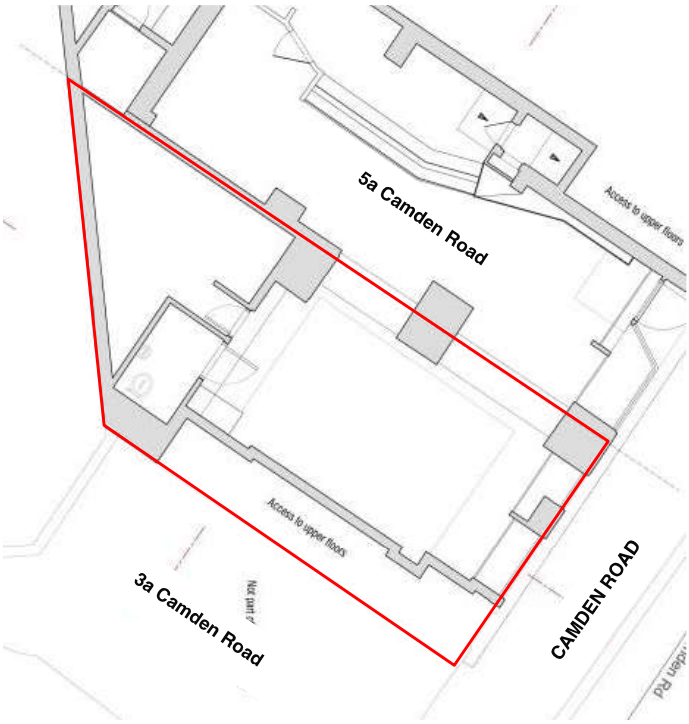
Extract from Figure 16 of the CGHHS

2.3 Site Description

The site is occupied by a late 19th Century three storey terraced building with ground floor level set at approximately +26.4m OD. The property is occupied by a commercial unit at ground level, with residential flats above.

A single storey extension, roughly triangular in shape, is present to the rear of the site. A manhole connecting to a combined sewer running along the backs of the properties along Camden Road is understood to be present underneath the rear of this extension.

The building is adjoined to the north by a similarly constructed three storey building located at No. 5a Camden Road. No. 5a also comprises a single storey extension to the rear. The ground floors of Nos. 5 & 5a Camden Road are joined together with no separating wall, except between the rear extensions, forming a single open plan ground floor occupied by a commercial unit.



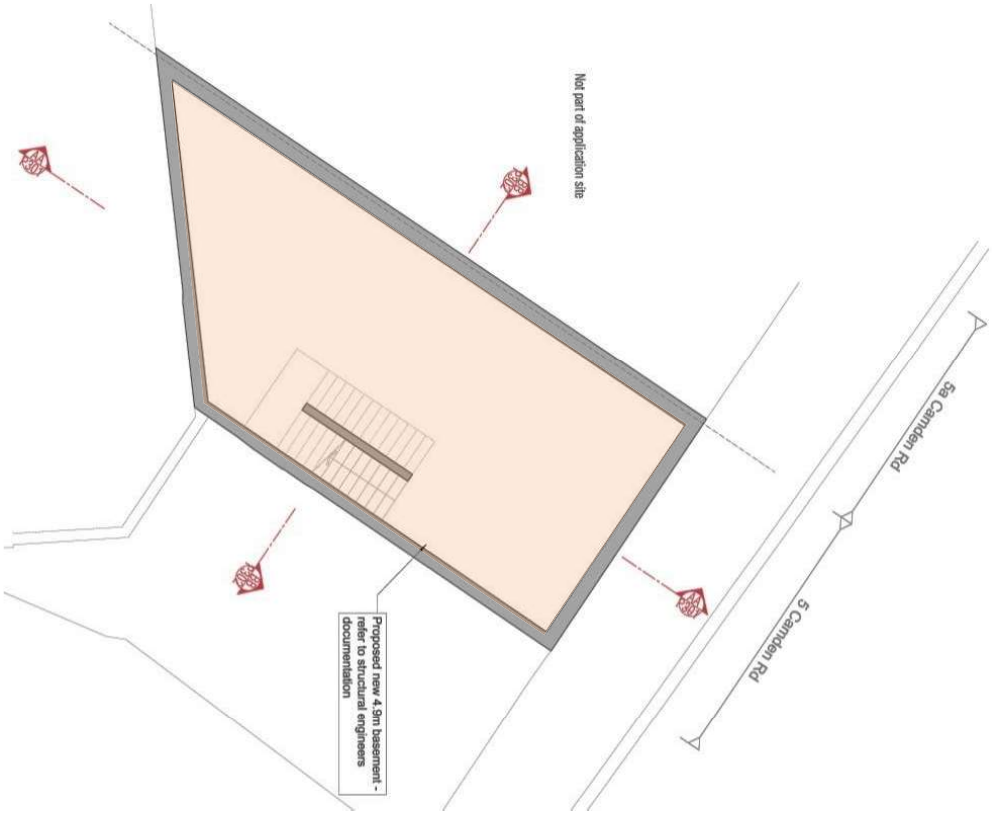
Existing Ground Floor Layout

To the south the building adjoins a similarly constructed three storey terraced property at No. 3a Camden Road. It is understood that a planning application has been submitted to construct a single storey basement beneath the entire footprint of this property. This development is expected to be completed prior to any proposed works at No. 5; hence the party wall is expected to be underpinned to basement level as part of the proposals for No. 3a.

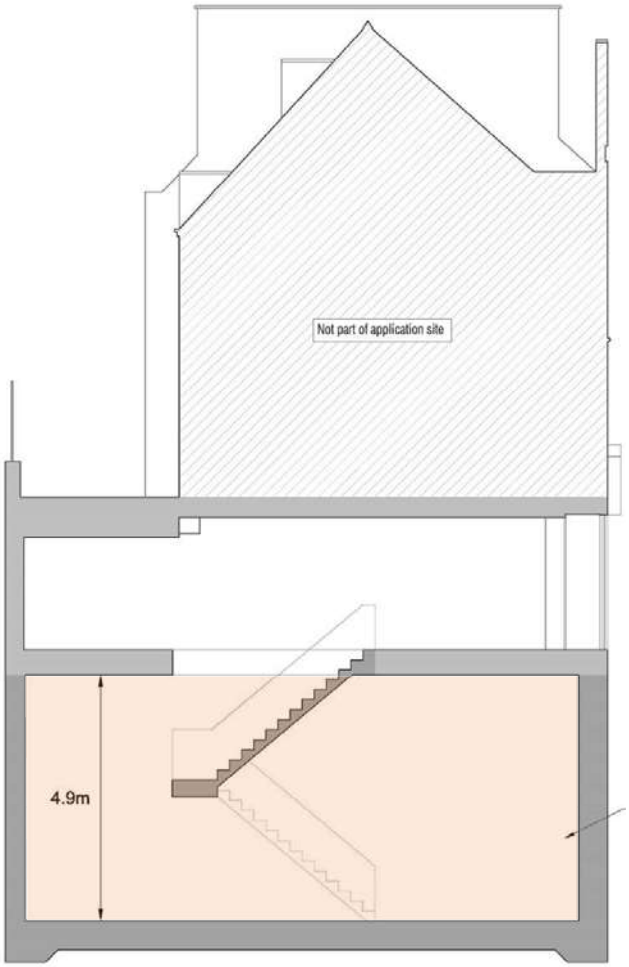
To the rear the site backs onto No. 8 and Nos. 10-12 Kentish Town Road, part two part three storey terraced buildings with mansard roofs. A recent redevelopment of both of these properties included excavation and construction of an approximately 4m deep basement beneath the entire footprints. As a result, the rear party wall to No. 5 has been underpinned to proposed basement level.

2.4 Proposed Development

It is proposed to construct a basement floor with internal headroom of 4.9m beneath the entire footprint of the building, including the rear extension. The proposed basement excavation will extend to approximately 5.5m depth beneath the ground floor (+21.0m OD).



Proposed Basement Plan



Section showing proposed basement

3. Desk Study

3.1 Site History

Earlier buildings on and adjacent to the site were demolished at the end of the 19th century and replaced by the existing row of terraced buildings.

No. 5 and No. 5a Camden Road were originally constructed with separate ground floor areas, divided by a party wall, until the 1970s.

A major refurbishment to combine the two properties at every floor level was approved in July 1939, but it appears this was never undertaken; which is most likely due to the breaking out of the Second World War.

The ground floor of No. 5 Camden Road therefore remained a single commercial unit until the ground floors of No. 5 and 5a were combined during the 1970s to provide a larger open plan commercial unit. The party wall was therefore removed and the loads transferred to a single central column.

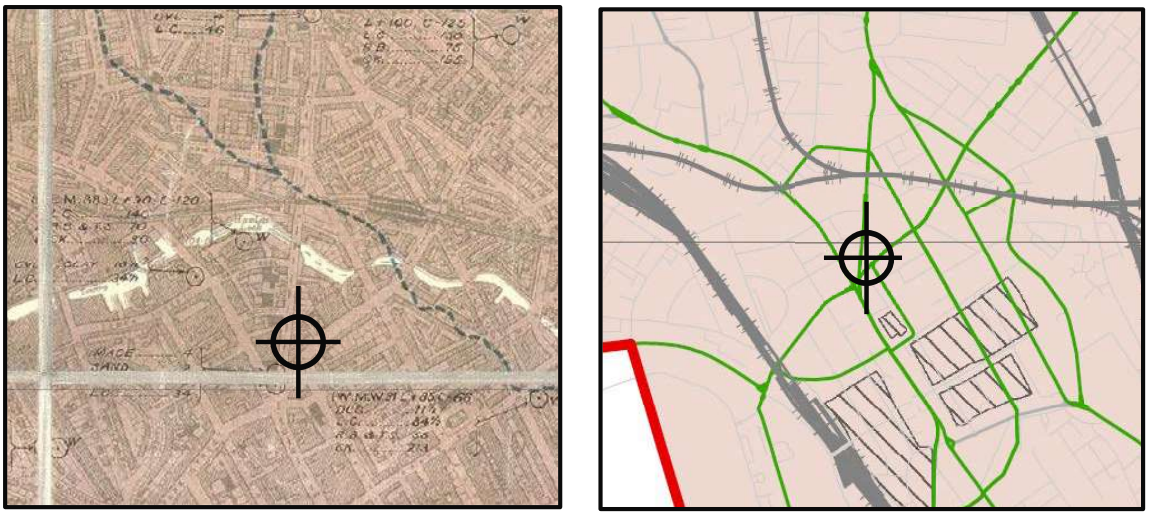
The site itself has remained relatively unchanged, albeit extensive redevelopment has recently taken place in the surrounding area.

No. 3 Camden Road has recently been developed, including conversion of the upper floors to provide residential accommodation and excavation of a single storey basement.

Basements have also recently been excavated beneath No. 8 & Nos. 10-12 Kentish Town Road, adjoining the site to the rear, and it is understood that a basement is proposed beneath No. 3a Camden Road, adjoining the site to the southwest.

3.2 Geological Information

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



Extracts of Figure 2 (left) and Figure 3 (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.

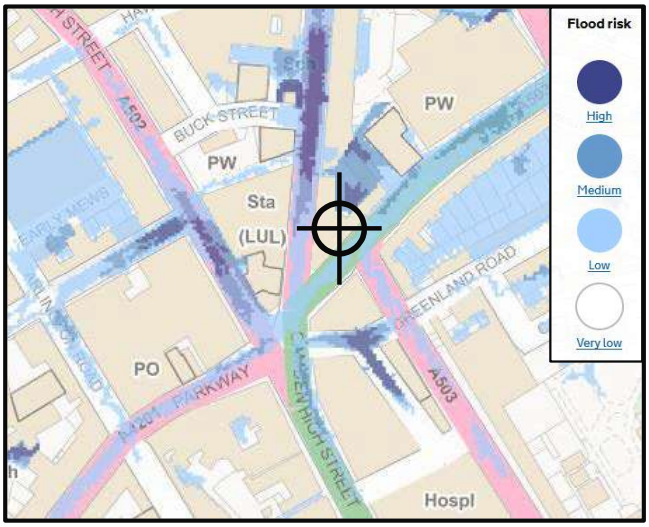
3.4 Hydrological, Drainage and Flood Risk Information

Figure 2 of the CGHHS indicates that the River Fleet passes approximately 200m to the northeast of the site. There are no surface water features in the vicinity of the site.

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

Figure 6 of the Camden SFRA indicates that the site lies within a Critical Drainage Area (Group 3 003).

The existing building occupies the entirety 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 located directly above an aquifer?	**No**	The Environment Agency (EA) maps indicate that 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 culverted River Fleet, approximately 200m to the northeast of the site.
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**	Both the existing site and proposed development are entirely hard surfaced.
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 to the Thames Water combined sewer.
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.

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 will be maintained.
Will the proposed basement development result in a change in the proportion of hard-surfaced/paved areas?	**No**	Both the existing site and proposed development are entirely hard surfaced.
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 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 drainage arrangement 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?	**No**	Although Camden Road is indicated to be at a low risk of surface water flooding, the site itself is indicated to be at a very low risk.

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 development land.

Is the site within a wider hillside setting in which the general slope is greater than 7 degrees?	**No**	Figure 6 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?	**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?	**No**	There are no trees on the site.
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 culverted River Fleet, roughly 200m to the northeast of the site.
Is the site within an area of previously worked ground?	**No**	The British Geological Survey (BGS) records do not indicate that the site lies within an area of previously worked ground.
Is the site within an aquifer?	**No**	The Environment Agency (EA) maps indicate that the site is not underlain by an aquifer.
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 proposed basement adjoins the pedestrian right of way on Camden Road.
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 to foundations to No. 5a Camden Road.
Is the site over (or within the exclusion zone of) tunnels, e.g. railway lines?	**No**	The site is approx. 25m away from the LUL Northern Line tunnels which run beneath Kentish Town Road.

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 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).

- **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 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

Due to existing access restrictions to the site, a site specific ground investigation has not yet been undertaken. It is understood a series of trial pits will be undertaken at the beginning of the construction programme in order to confirm the expected ground conditions.

Recent investigations were carried out in the adjacent properties of 3a Camden Road and 8 Kentish Town Road, comprising a total of four window sample boreholes and six hand excavated trial pits, including a trial pit against the party wall between No. 3a and No. 5 Camden Road, and another between No. 8 Kentish Town Road and No. 5 Camden Road.

5.1 Ground Conditions

Below a cover of made ground, the London Clay Formation is expected to be present at shallow depth and to consist of typical firm, becoming stiff, pale brown silty clay.

5.2 Groundwater

No shallow groundwater table is expected beneath the site.

6. Outline Basement Construction Methodology

6.1 Excavation

The basement excavation will require approximately 5.5m of excavation and will extend down into the London Clay Formation.

The basement perimeter walls will 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 1m wide sections.

The rear party wall with No. 8 and Nos. 10-12 Kentish Town Road is known to be already underpinned to approximately 4m depth below ground level; therefore only a single stage underpinning of no more than 2m is envisaged.

At the boundary between No. 5 and No. 5a, the upper floors are supported by a single, centrally placed column. It is expected the column can be retained and accommodated in the permanent scenario, with underpinning of the existing column foundation connecting to the new basement wall.

Previous investigations undertaken at No. 8 Kentish Town Road indicated that, prior to underpinning, the party wall with No. 5 Camden Road was supported by a 1.8m deep strip foundation. It is therefore likely that the strip foundations supporting No. 5 that are yet to be underpinned extend to a similar depth.

On this basis, the required depth of underpinning of the party wall with No. 5a Camden Road and the front wall of the property is likely to be around 4m; however, in order to model a worst case scenario, the existing foundations are assumed to extend to 0.5m depth below existing ground floor level, including the necessity for two stages of underpinning.

During the works, propping will be installed to ensure that lateral ground movements are minimised. As a precursor to the main basement excavation, it is envisaged full width propping will be provided at ground floor level to restrain the newly underpinned walls during the main basement excavation.

As the main basement excavation proceeds, additional temporary propping will be installed at lower levels where necessary to ensure that lateral ground movements are prevented.

In the permanent situation the reinforced concrete underpins will connect to the basement slab and the new ground floor slab to form a rigid concrete box to support the vertical structural loading of the overlying building. Both the basement raft slab and the ground floor slab will act as props.

6.1.1 Waterproofing

There is potential for water to collect around the basement in the long term. Hence, the basement 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 1m depth is to be adopted for the purposes of assessing hydrostatic pressures.

6.1.2 Basement Heave

Given the depth of excavation, it is evident that the self-weight of the new structure will not match the weight of soil removed and that there may as a result be some potential for residual net uplift.

An assessment of the likely extent of any long term uplift is made 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 in an extended 1, 3, 5, 2, 4 & 6 type numbering sequence, such that any given underpin will be completed, dry packed, and a minimum period of 48 hours lapsed before and 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 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	20

6.4 Underground Infrastructure

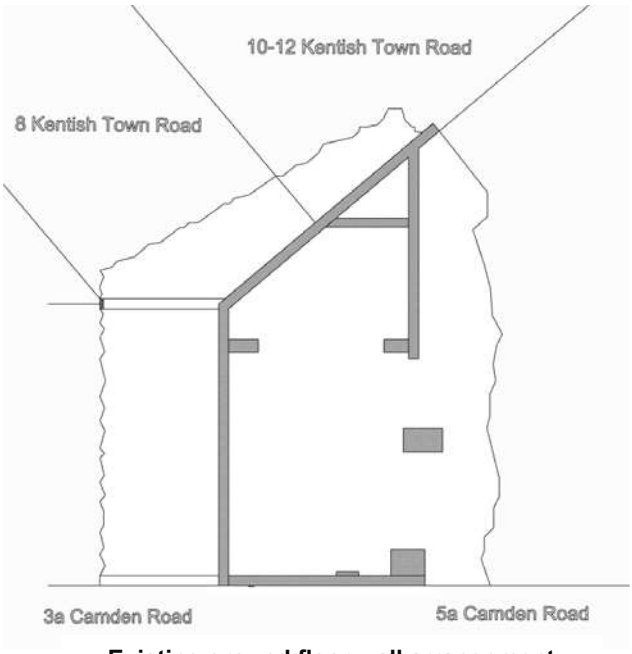
The southbound and northbound tunnels of the Northern Line, High Barnet branch are present approximately 30m to the west of the property, beneath Kentish Town Road.

A 230mm diameter combined sewer is indicated beneath the rear extension of the property, running parallel to the rear boundary. A manhole is present in the small yard connecting to a manhole beneath the rear extension at No. 5a.

This sewer will need to be investigated further and, if still in use, it will be necessary to re-route the sewer as part of the development.

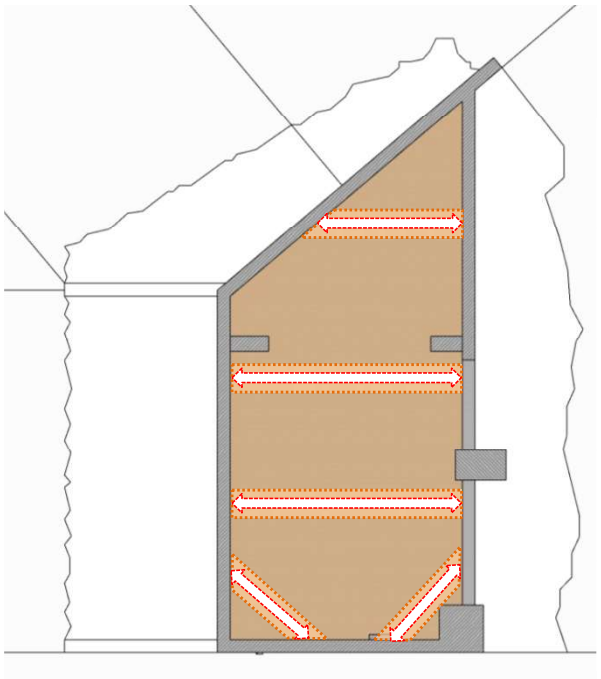
6.5 Construction Sequence

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



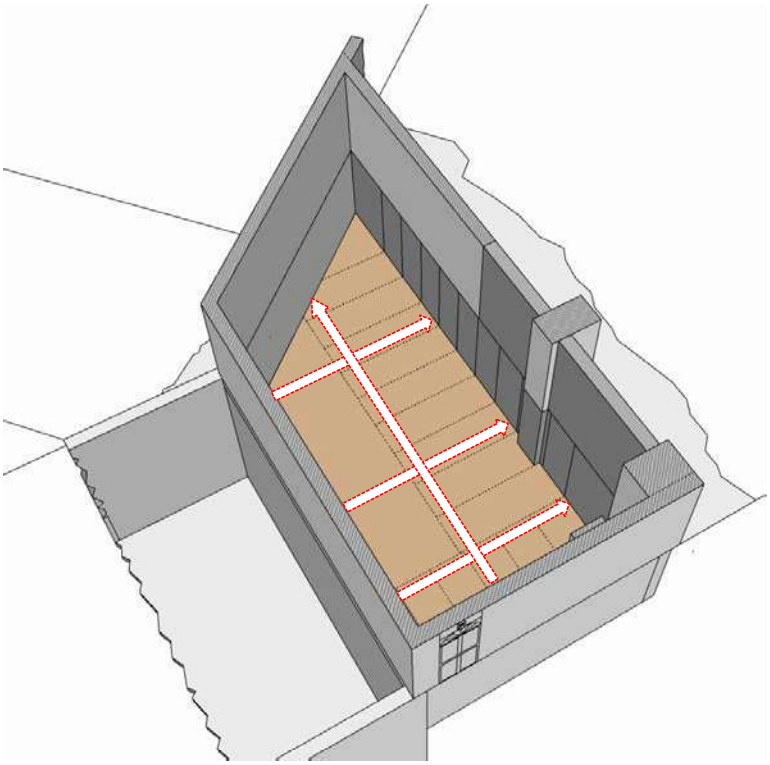
Existing ground floor wall arrangement

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



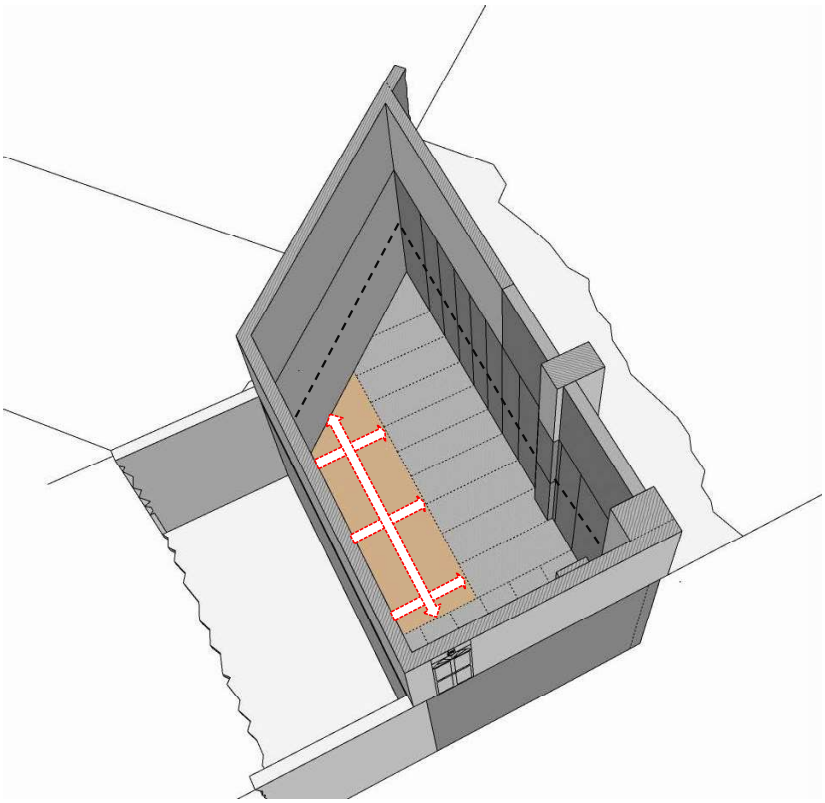
2. Excavate the area adjacent to the existing basements and underpin the façade and the party wall with No. 5 Camden Road in reinforced concrete L-sections as the first stage of underpinning. Suggested underpinning sequence presented below.

3. Install basement level propping across the constructed underpinning.



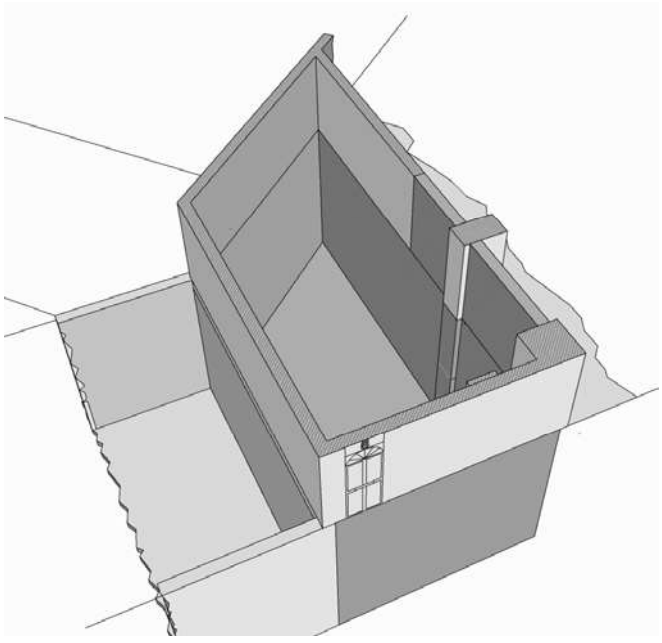
4. Commence the second stage of underpinning to reach the proposed final basement depth. Similarly to the previous stage, first excavate the area adjacent to the existing neighbouring basements, followed by underpinning of the front wall and the party wall with No. 5a.

5. Construct basement level lateral propping to the second stage underpins.

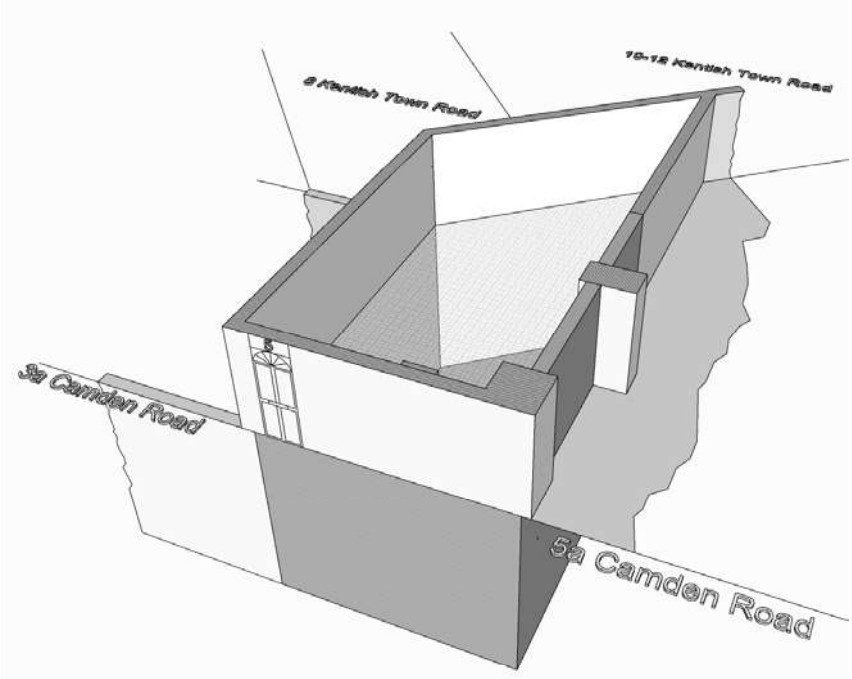


6. Install below-slab drainage for foul and ground water, sumps and pumps.

7. Place slab reinforcement and cast remaining basement slab.



8. Remove low level temporary propping.
9. Construct basement liner walls, membranes, cavity drainage, insulation and screed.
10. Construct ground floor slab.
11. Remove ground level propping.



7. Ground Movement to Neighbouring Properties

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'.

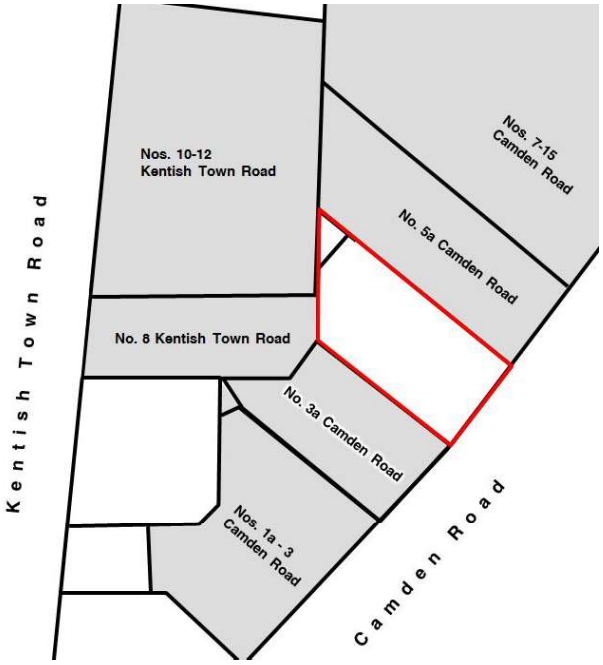
7.1 Structures Assessed for Ground Movement

7.1.1 No. 3a Camden Road

No. 3a Camden Road is a three storey terraced building that adjoins the site to the southwest.

This building is expected to comprise a single storey basement to approximately 5.5m depth (+21m OD) by the time the development at No. 5 commences. In this case no underpinning of the party wall between the properties would be necessary, resulting in negligible movement and damage to the neighbouring building.

Nevertheless, an assessment of the worst case scenario has been undertaken, assuming the basement has not been excavated and No. 3a is therefore is supported by shallow strip foundations extending to approx. 0.5m below ground level.



Plan showing the nearby buildings

Two stages of underpinning will therefore be required in this case.

7.1.2 No. 5a Camden Road

No. 5a Camden Road is a three storey terraced building, which adjoins the site to the northeast.

No. 5 and 5a currently share an open plan ground floor, with what is understood to be a single load bearing column present at the midpoint of the boundary between the two. It is expected that the column, as well as the remaining load bearing walls at No. 5a, are supported by shallow pad/strip foundations, where not adjoining recently excavated basements such as at Nos 10-12 Kentish Town Road. Two stages of underpinning will therefore be required.

7.1.3 No. 8 Kentish Town Road & Nos. 10-12 Kentish Town Road

No. 8 and Nos. 10-12 Kentish Town Road located to the northwest of No. 5 Camden Road are already underpinned to the required depth by virtue of the existing basement at these properties.

7.2 Modelled Ground Conditions

Excavation of 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 overleaf.

For design purposes a conservative undrained strength profile has been adopted, assuming an average Cu of 70kN/m^2 at the surface of the London Clay Formation, increasing by 8kN/m^2 per m depth.

The Undrained Modulus of Elasticity (Eu) has been based upon an empirical relationship of Eu = 750 x undrained cohesion (Cu), and the Drained Modulus of Elasticity (E') has been based upon an empirical relationship of 350 x Cu.

Stratum:	**Undrained Elastic Modulus Eu (kN/m^2)**	**Drained Elastic Modulus E' (kN/m^2)**
London Clay Formation	52,500kN/m^2 at surface increasing linearly to 232,500kN/m^2 at 30m depth	35,000kN/m^2 at surface increasing linearly to 155,000kN/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 neighbouring structures.

These components are firstly progressive sagging movements of the underpinned walls due to imperfections in the underpinning process itself and then secondly elastic heave of the ground as a direct response to a net unloading of -110kN/m^2 unloading caused by excavation of the new basement.

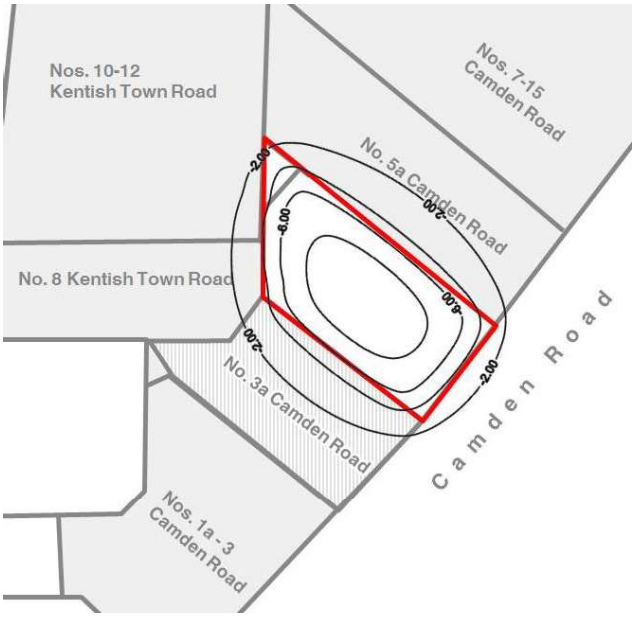
7.3.1 Short Term Movement due to Underpinning

It is not possible to rigorously model the extent of party wall settlement arising from underpinning and experience indicates that amount of any movements 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 walls can reasonably be expected to be a maximum of 5mm per stage of underpinning.

On the simplistic assumption of a 45 degree angle of support to any walls extending away in a direction perpendicular to the party walls, the scale of this vertical movement associated with the underpinning process itself is assumed to extend to a distance of 5.5m behind the wall.

7.3.2 Short Term Movements due to Excavation heave

Any short term movements below the excavation itself will go un-noticed, and the analysis suggests less than 6mm heave movement at the surrounding party walls and new underpinning.

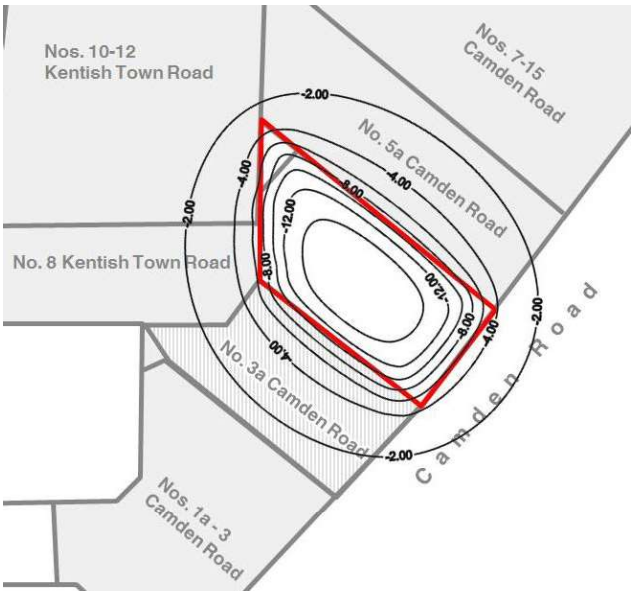


Plan showing theoretical approximate short term heave contours (mm) due to basement excavation

7.4 Post Construction Vertical Movements

There will be a mismatch between the weight of soil that is removed and the weight of the new 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 the scale of this post-construction heave will potentially amount up to 15mm within the new basement, decreasing to approximately 10mm beneath the party walls to No. 3a Camden Road, No. 5a Camden Road and No. 8 Kentish Town Road.



Plan showing theoretical approximate post-construction heave (mm) due to basement excavation

7.4.1 Cumulative Post Construction Movements

Given the recent basement excavation at No. 8 Kentish Town Road and Nos. 10-12 Kentish Town Road, as well as the proposed basement excavation at No. 3a Camden Road, consideration has been given to the potential cumulative movements.

The results suggest that the scale of the cumulative post-construction heave may theoretically reach up to 15mm beneath the party walls to No. 3a Camden Road, No. 8 and Nos. 10-12 Kentish Town Road.

7.5 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 basement perimeter is assumed to be 5mm, which is equal to the vertical movement at the underpinned wall

This horizontal movement is assumed to reduce to zero at a maximum distance of 4 x 5.5m (excavation depth) = 22m behind the wall.

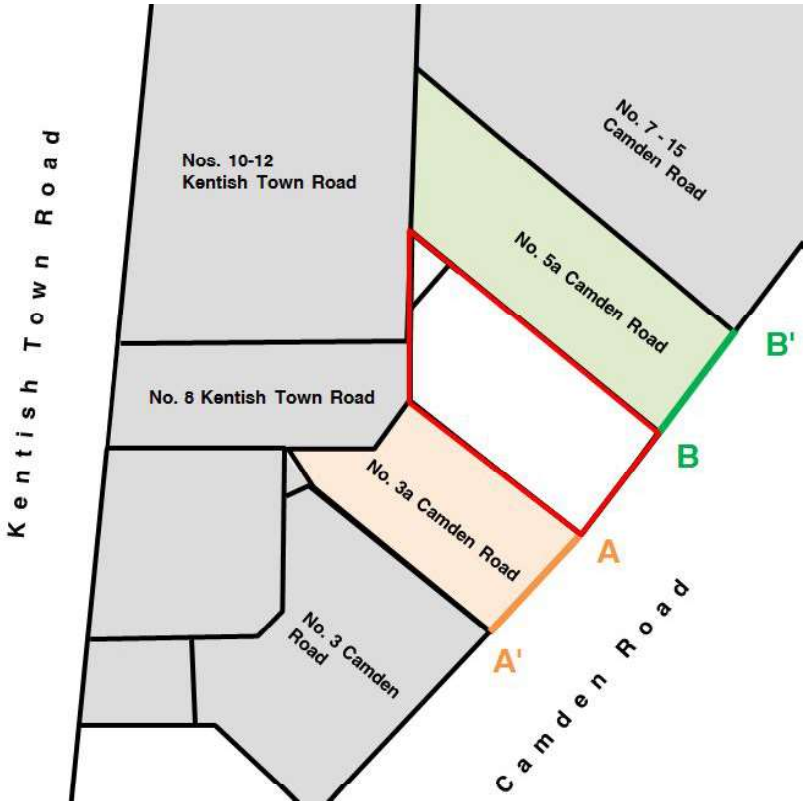
7.6 Impact on Neighbouring Structures

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 shown below.



Plan showing line of sections used for damage category assessment

7.6.1 No. 3a Camden Road – Section A-A'

The length of section (L) is taken as 7m and the wall height (H) as 10m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.041%, producing a maximum deflection ratio Δ / L = -0.024, within a limiting tensile strain of 0.050%, for a Burland Category 0 "Negligible" condition.

7.6.2 No. 5a Camden Road – Section B-B'

The length of section (L) is taken as 6m and the wall height (H) as 10m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.045%, producing a maximum deflection ratio Δ / L = -0.05, within a limiting tensile strain of 0.075%, for a Burland Category 1 "Very Slight" condition.

7.6.3 Public Highway

The proposed basement lies directly adjacent to the pavement, where there is expected to be various buried utilities located.

Given reasonable standards of workmanship during the underpinning works, negligible movement (<5mm settlement) is anticipated and this may be counteracted in practice by some small amounts of heave.

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 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

There will be no change to the flood risk at the site or neighbouring sites.

Nevertheless, there will be a need to maintain the present water discharge regime and provide Sustainable Drainage Systems (SuDS) to meet the planning policy requirements.

An Outline SuDS Strategy is presented as a separate report (LBH4577suds).

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 proposed construction will obviate any concerns regarding potential seasonal movement.

8.3.2 Ground Movements

The Local Plan states that proposed basements should pose a risk of damage to neighbouring properties no higher than Burland scale Category 0 ‘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 0 ‘Negligible’).

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

8.4 Residual Impacts

The proposed basement will have no residual unacceptable impacts upon the surrounding structures, infrastructure and environment. The cumulative impact of this development, in conjunction with the recent developments at No. 8 and Nos. 10-12 Kentish Town Road as well as the proposed basement development at No. 3a Camden Road, have been analysed and are assessed to be acceptable.

9. Outline Structural Monitoring Plan

The ground movement assessment suggests Burland Scale Category 1 (Very Slight) damage may be expected to the neighbouring properties.

Nevertheless, structural monitoring should be undertaken to ensure the movements remain within acceptable limits and to enable mitigation to be effectively implemented in the event of agreed trigger values for movement being exceeded.

Monitoring positions should be located along all the perimeter party walls.

Before any excavation or construction works commence, monitoring is to be undertaken in order to establish a baseline situation.

During all underpinning works and basement excavation works, monitoring should be undertaken daily at the start and end of every work shift. At other times monitoring should be undertaken weekly to cover a period prior to commencement of any works and ceasing after completion of the works, by agreement of all interested parties.

Precise survey equipment should be used to record all vertical and horizontal components of movement (in three perpendicular directions) to a minimum accuracy of 1mm.

9.1 Criteria for assessment of Monitoring data and Comparison with Predicted Movements

The cumulative movements in any direction of any monitoring point are to be compared with the predicted movements at any stage and using the following decision table:

MONITORING CRITERIA		
Total movement less than 10mm in any direction		Green
Total movement in excess of 10mm in any direction or additional movement of 10mm in any direction	Notify Structural Engineer and Party Wall Surveyor	Red

9.2 Contingent Actions

Contingency actions should be undertaken using the following decision table:

CONTINGENT ACTIONS	
Green	None
Red	Cease work and Notify Structural Engineer and Party Wall Surveyor immediately. Commence backfilling / installation of additional propping. Undertake repeated monitoring as necessary to ensure that movement has ceased. Works to commence only once a revised construction methodology has been agreed with the Structural Engineer

10. 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.