Basement Impact Assessment

in connection with proposed development at

155-157 Regent's Park Road
Camden
London
NW1 8BB

for

Uchaux Ltd

LBH4540bia Ver 1.0

July 2019

LBH WEMBLEY

ENGINEERING

Document Control				
Version	Date	Comment		Authorised
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0.1	5th June 2018	Screening & Scoping	DKB	SRLB
0.2	30th July 2018	BIA Draft Issue	DKB	SRLB
1.0	19th July 2019	BIA Issue for planning		

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Contents

Contents **3**

Foreword-Guidance Notes **5**

1. Introduction **6**

1.1 Background 6

1.2 Brief 6

1.3 Policy 6

1.4 Report Structure 7

1.5 Documents Consulted 8

2. The Site **9**

2.1 Site Location 9

2.2 Topographical Setting 9

2.3 Site Description 11

2.4 Proposed Development 12

3. Desk Study **13**

3.1 Site History 13

3.2 Geological Information 14

3.3 Hydrogeological Information 15

3.4 Hydrological, Drainage and Flood Risk Information 15

4. Stages 1 & 2: Screening & Scoping Assessments **16**

4.1 Screening Assessment 16

4.1.1 Screening Checklist for Subterranean (Groundwater) Flow 16

4.1.2 Screening Checklist for Surface Flow and Flooding 17

4.1.3 Screening Checklist for Stability 17

4.2 Scoping Assessment 19

4.2.1 Scoping for Stability 19

5. Stage 3: Site Investigation **20**

5.1 Made Ground 20

5.2 London Clay Formation 20

5.3 Groundwater 20

5.4 Existing Foundations 20

6. Basement Construction **21**

6.1 Retaining Walls 23

6.2 Basement Heave 23
6.3 Basement Waterproofing 23
6.4 London Underground 23
7. Ground Movement to Neighbouring Properties 24
7.1 Structures Assessed for Ground Movement 24
7.1.1 Nos. 151 – 153 Regent's Park Road (green) 24
7.1.2 Nos. 1 – 13 Adelaide Road (yellow) 24
7.1.3 Nos. 1 – 13 Adelaide Road: Extension (dashed outline) 24
7.2 Modelled Ground Conditions 25
7.3 Short Term Movements 25
7.3.1 Demolition 25
7.3.2 Basement Excavation Heave 25
7.3.3 Piling 26
8. Building Damage Assessment 27
8.1.1 Nos. 1 – 13 Adelaide Road – Section A-A' 28
8.1.2 Nos. 1 – 13 Adelaide Road, single storey extension – Section B-B' 28
8.1.3 Nos. 151 – 153 Regent's Park Road – Section C-C' 29
8.1.4 Public Highway 29
9. Stage 4: Impact Assessment 30
9.1 Potential Hydrogeological Impacts 30
9.2 Potential Hydrological Impacts 30
9.3 Potential Stability Impacts 30
9.3.1 Pedestrian Right of Way 30
9.3.2 London Clay 30
9.3.3 Ground Movements 30
9.3.4 London Underground 30
9.4 Residual Impacts 31
10. Outline Structural Monitoring Plan 32
10.1 Criteria for assessment of Monitoring data and Comparison with Predicted Movements 32
10.2 Contingent Actions 32
11. Conclusion 33

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 Engineering 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 Engineering 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

Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances shall be at the client's sole and own 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 the future and any such reliance on the report in the future shall again be at the client's own and sole risk.

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

Following demolition of the existing building at Nos. 155 – 157 Regent's Park Road, it is proposed to construct an eight storey hotel with a two storey basement extending to an approximate depth of 7m below ground level.

1.2 Brief

LBH WEMBLEY have been appointed by Uchaux Ltd to complete a Basement Impact Assessment (BIA) for submission to London Borough of Camden, in support of a forthcoming planning application for the proposed basement development.

This BIA has been prepared to satisfy the specific requirements of the 2017 Camden Planning Policy and Supplementary Planning Guidance CPG on Basements and Lightwells, and the associated 2010 Camden Geological, Hydrogeological and Hydrological Study.

1.3 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.

Following this, the findings of an intrusive ground investigation are reported and a ground model is developed.

An outline construction methodology is then put forward. The report then concludes with an assessment of the potential impacts of the proposed scheme.

1.5 Documents Consulted

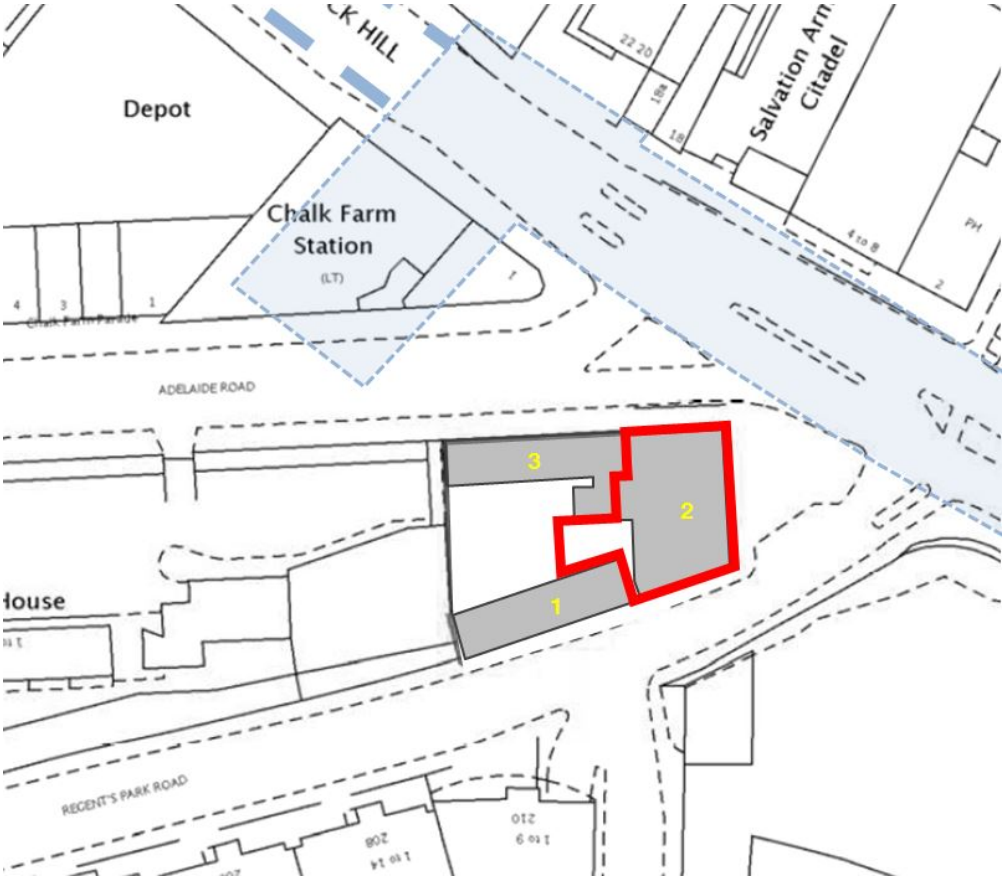
- 2019 Ground Investigation Report by LBH WEMBLEY, dated 19th July 2019, ref: LBH4540gir
- 2019 Flood Risk & SUDs Statement by LBH WEMBLEY, dated 19th July 2019, ref: LBH4540fra
- 2019 Structural Engineering Report, by Heyne Tillett Steel, dated 18th July 2019, ref: 1827 rev A
- 2019 Design & Access Statement by Piercy & Company, dated July 2019, ref: 13545
- 2019 Proposed Drawings by Piercy & Company, dated 12th July 2019
- 2018 Factual SI report by ST Consult, dated 30th July 2018, ref: JN1143

2. The Site

2.1 Site Location

The site is situated at the junction of Regent's Park Road, Haverstock Hill and Adelaide Road, approximately 15m to the south of Chalk Farm underground station.

The site may be located approximately by postcode NW1 8BB or by National Grid Reference 528155, 184380.

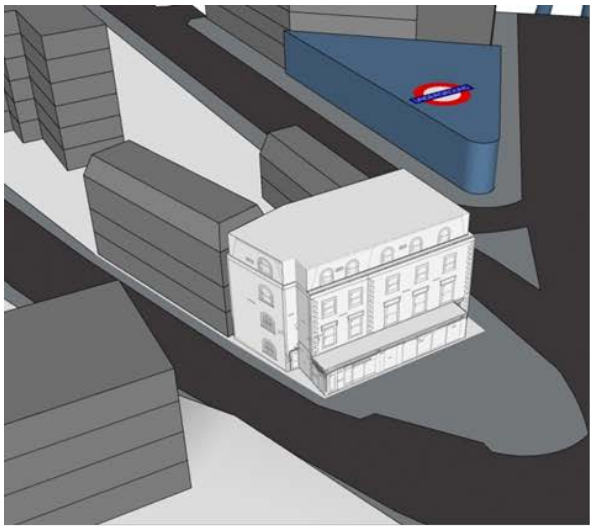


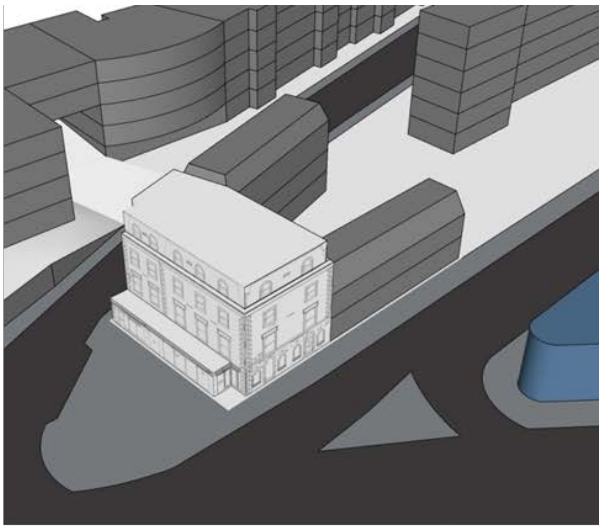
Location plan (Chalk Farm Underground Station shaded blue)

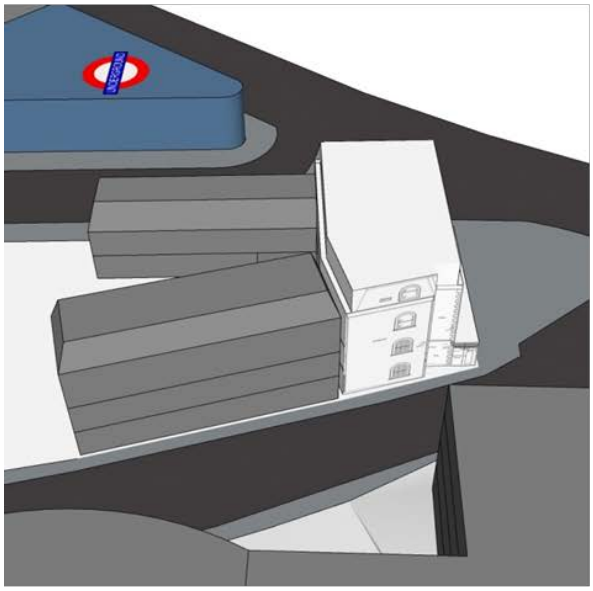
1: Nos. 151 – 153 Regent's Park Road
2: Nos. 155 – 157 Regent's Park Road
3: Nos. 1 – 13 Adelaide Road

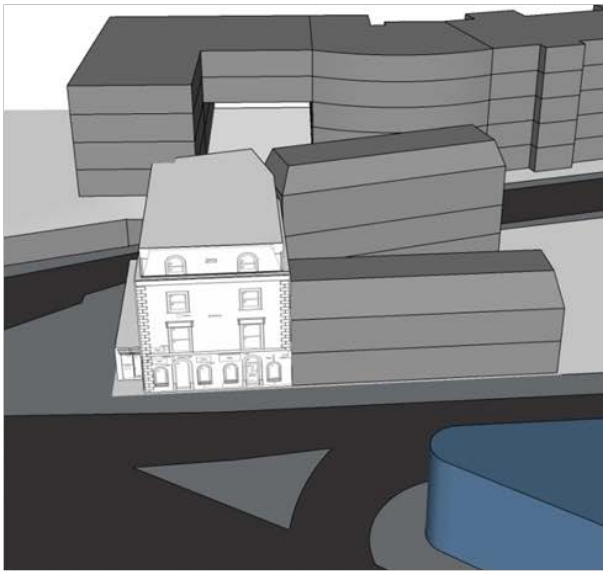
2.2 Topographical Setting

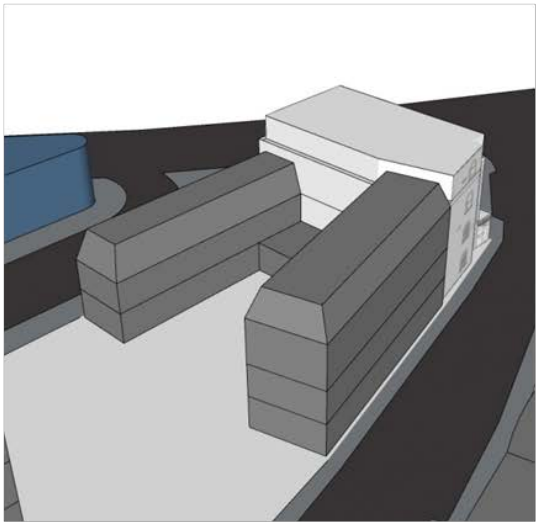
The site lies on a lower slope of Hampstead Hill that is gently falling to the southeast, towards a culverted tributary of the River Fleet. The street levels around the site fall from a maximum of around +32m OD on Regent's Park Road in the southwestern corner of the site to around +31m OD on Haverstock Hill.

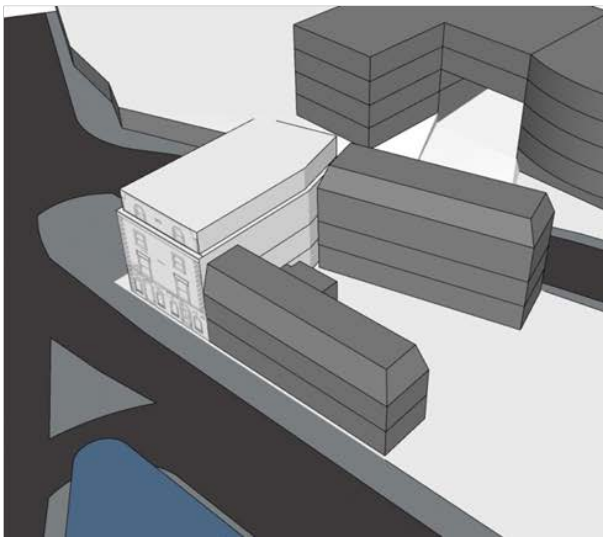












2.3 Site Description

The site is occupied by a four storey terraced building with mansard roof at Nos. 155 – 157 Regent's Park Road.

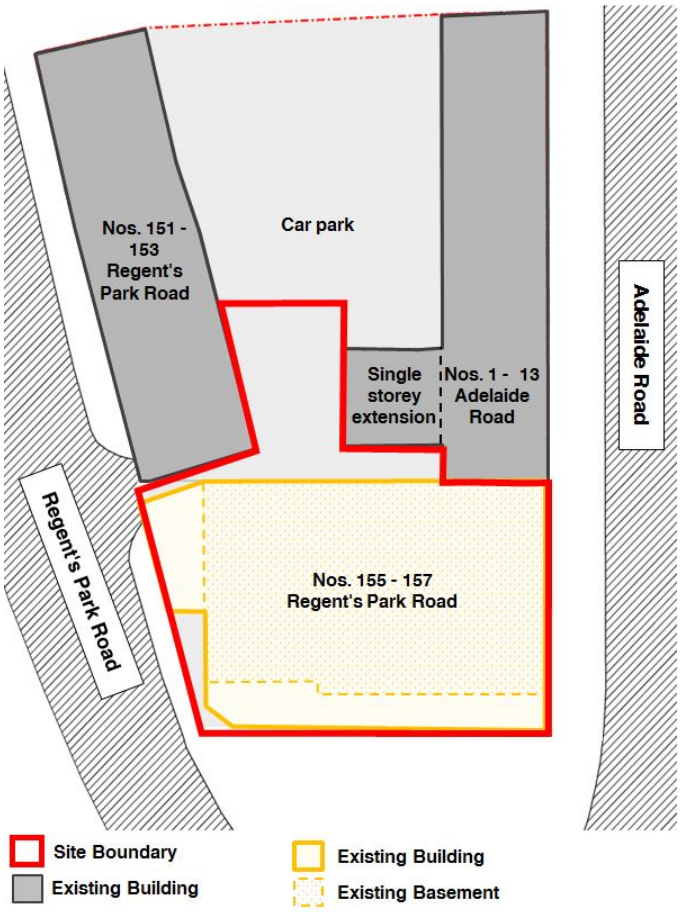
Nos. 1 – 13 Adelaide Road and Nos. 151 – 153 Regent's Park Road, both similar four storey terraces, adjoin the site to the north.

Nos. 1 – 13 Adelaide Road is connected to 155 – 157 Regent's Park Road, while Nos. 151 – 153 forms a separate row.

Nos. 1 – 13 also has a single storey extension to the rear of the terraced row.

Street level immediately on the corner of Regent's Park Road and Adelaide Road is situated at approximately +31m OD. The natural ground level appears to rise by some 2m towards the rear end of Nos. 151 – 153.

Nos. 155 – 157 comprises a single storey basement that occupies most of the building footprint. It appears that the basement extends to approximately 3.5m depth below ground level.



Plan showing existing features

The adjoining building at Nos. 1 – 13 also appears to comprise a basement that extends to a similar depth. The single storey extension does not appear to have a basement.

Front elevation of Nos. 155 – 157 Regent's Park Road

It is understood that Nos. 151 – 153 does not comprise a basement.

Retail units are located on ground and basement floors to Nos. 155 – 157, with the upper floors (including mansard roof) occupied by flats.

Similarly, retail units are located on ground floor to Nos. 1 – 13, with upper floors also occupied by flats. Nos. 151 – 153 is occupied by flats are ground floor level and above.

The site is entirely hard surfaced and a car park is enclosed by the three terraced buildings, which is accessed from Regent's Park Road.

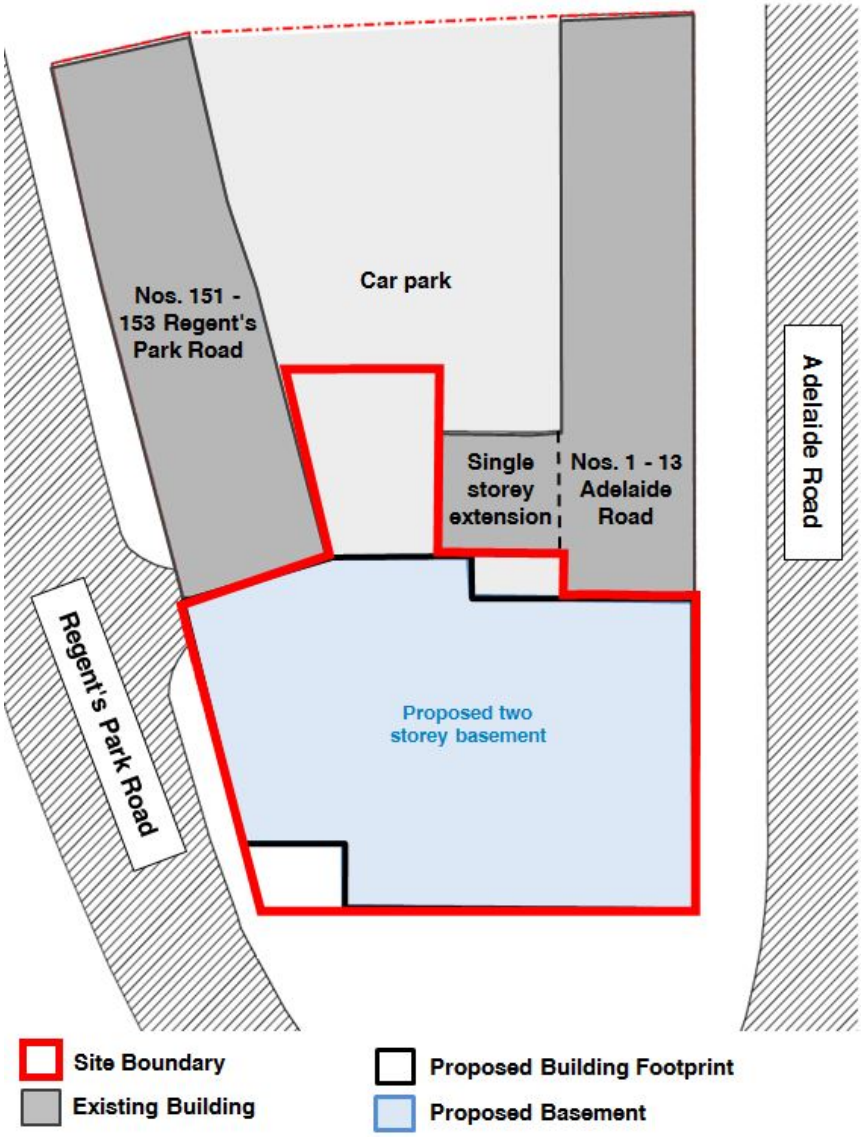
Chalk Farm Underground Station lies beneath Haverstock Hill, at the closest approximately 8m laterally to the northeast of the site.

The tunnels at the station are understood to be situated at approximately 8m depth below the street level.

2.4 Proposed Development

It is proposed to construct an eight storey hotel including a basement.

The proposed development includes demolition of the existing four storey building at Nos. 155 – 157 Regent's Park Road. This will be followed by excavation, in order to allow the construction of a two storey basement to an approximate depth of 7m (+24m OD) below existing ground level. The basement is to cover the entire building footprint aside from a small area in the southern corner, as shown on the plan below.



Plan showing proposed development

3. Desk Study

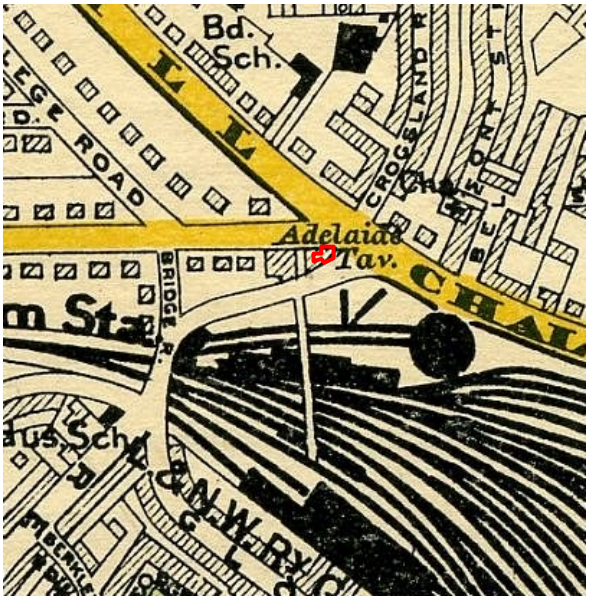
3.1 Site History

During the early 19th Century, Adelaide Tavern occupied the site on the corner of Regent's Park Road and Adelaide Road.

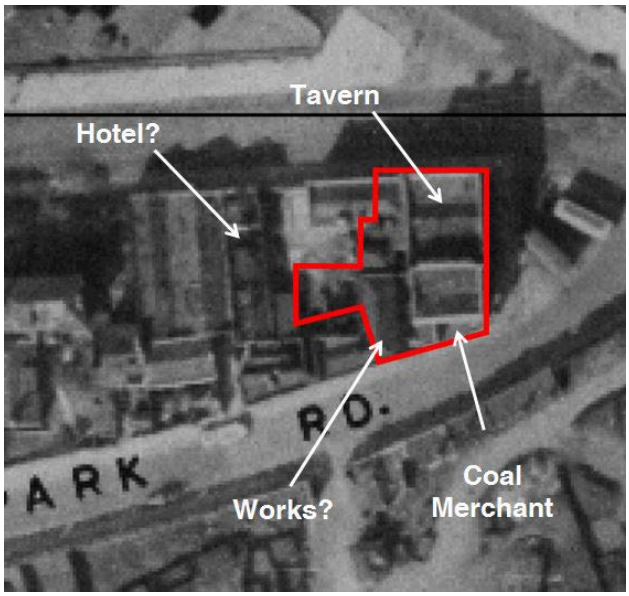
A coal merchant firm (Rickett, Smith & Co) adjoined the tavern to the south, while a hotel appeared to be situated to the rear of the tavern and coal merchants.

Chalk Farm railway station was situated just to the south of the site, with various coal-sheds and depots situated adjacent to Regent's Park Road.

The Northern underground line ran beneath Haverstock Hill, Chalk Farm underground station open in the early 1900s and was located adjacent to the site.



Stanford Map of London, 1897



Aerial Photo, 1945

The area suffered heavy bombing during the Second World War and the hotel is understood to have received a direct hit. The tavern is recorded to have received blast damage.

Following the war, the hotel was cleared. A building to the rear of the former coal merchant firm appeared to have been occupied by a works.

By the 1960s, the existing blocks of flats, known as Bridge House, were built just to the west of the site.

By the 1980s, the existing buildings at Nos. 1 – 13 Adelaide Road and Nos. 151 – 155 Regent's Park Road were built.

The tavern also closed by this time and stood derelict until the 1990s. By this time, the tavern and former coal merchant were demolished and replaced by the existing building at Nos. 155 – 157 Regent's Park Road, which was designed in a mock-Edwardian style.

Front elevation of Adelaide Tavern, 1903

Front elevation of Nos. 155 – 157 Regent's Park Road, 21st Century

3.2 Geological Information

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

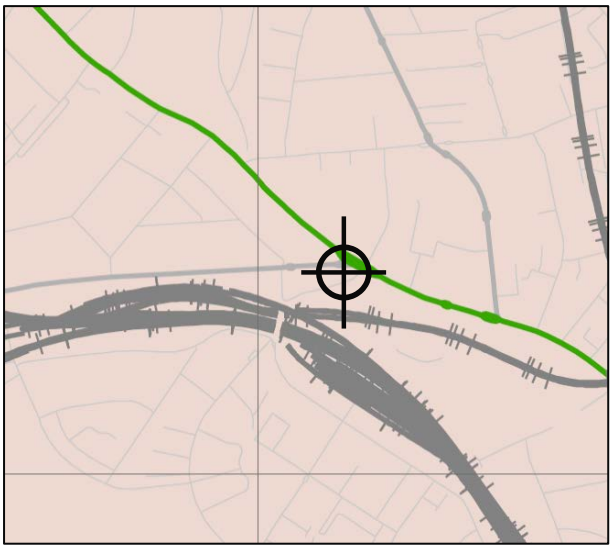


Figure 3 of the CGHHS

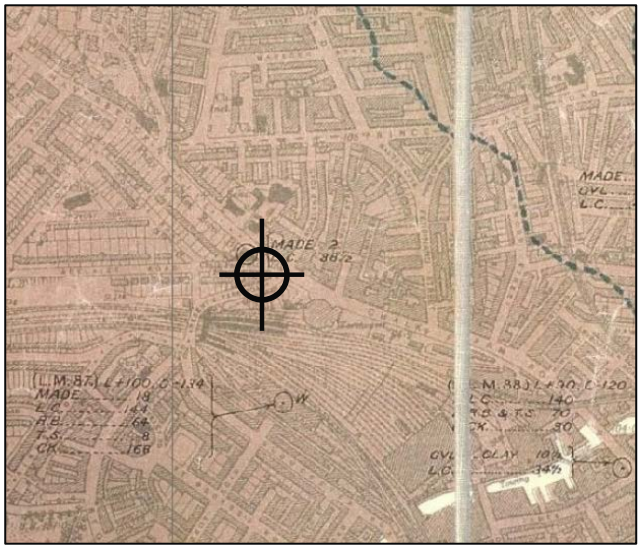


Figure 2: Camden 1920 Geological Map (CGHHS, 2010)
(dashed blue line shows the River Fleet)

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

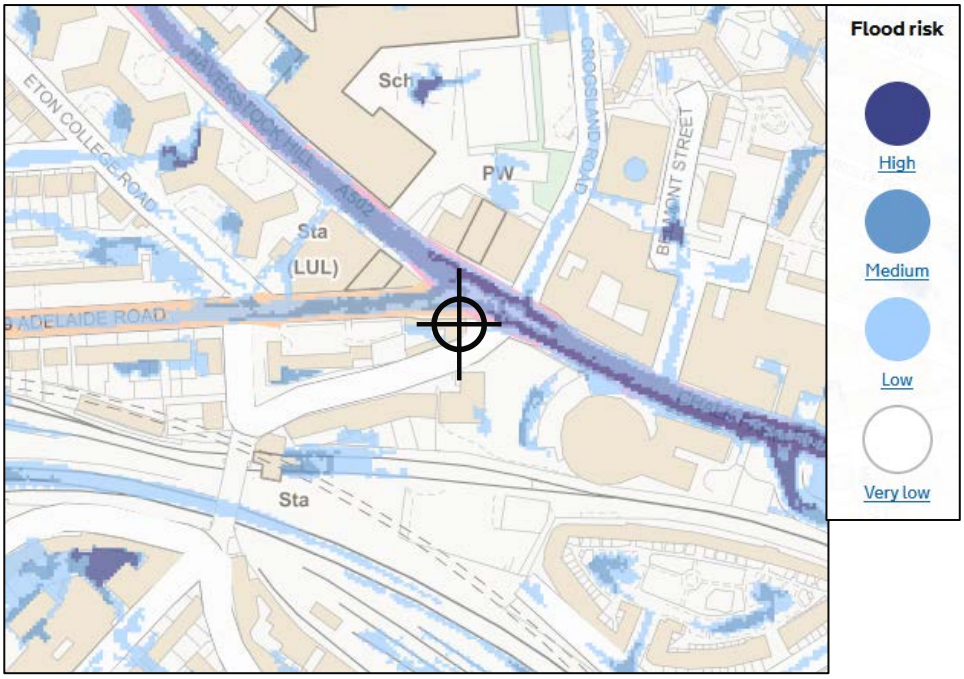
Figure 2 of the CGHHS indicates that the River Fleet passes approximately 350m to the northeast of the site. There are no surface water features in the vicinity of the site.

The site is entirely hard surfaced.

Rainfall incident on the roof is collected via pipework down the front and rear sides of the terraced buildings, where it appears to then discharge to a combined sewer beneath Regent's Park Road.

Environment Agency (EA) surface water flood maps indicate that the site is at a very low to low risk of surface water flooding, as shown below. A flood risk assessment has been presented as a separate report (LBH4540fra).

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



Extract of the EA surface water flood risk map

4. Stages 1 & 2: 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 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 350m 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**	Environment Agency (EA) surface water flood maps indicate that the site is at a low risk of surface water flooding.

4.1.3 Screening Checklist for Stability

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

Is the site within a wider hillside setting in which the general slope is greater than 7 degrees?	**No**	Although Figure 16 of the CGHHS indicates that part of the general slope to the south of the site is greater than 7 degrees, a visual inspection indicates that the surrounding area is generally flat.
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 350m 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 pavement on Regent's Park Road and Adelaide 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 Nos. 1 – 13 Adelaide Road and Nos. 151 – 153 Regent's Park Road.
Is the site over (or within the exclusion zone of) tunnels, e.g. railway lines?	**Yes**	Chalk Farm Underground stations is present beneath the Haverstock Hill, around 8m to the northeast of 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 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 at-surface 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.

- **Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?**

The guidance advises that excavation for a basement may result in damage to the tunnel.

5. Stage 3: Site Investigation

A ground model has been developed on the basis of an intrusive site investigation undertaken in July 2018 by ST Consult and from other nearby boreholes.

The site plan below indicates the approximate exploratory positions, while the associated factual site investigation report is appended.

5.1 Made Ground

Outside of any existing or former basement areas there appears to be approximately 1m of made ground beneath the car park, consisting of dark brown sandy clay with extraneous fragments of brick and concrete.

5.2 London Clay Formation

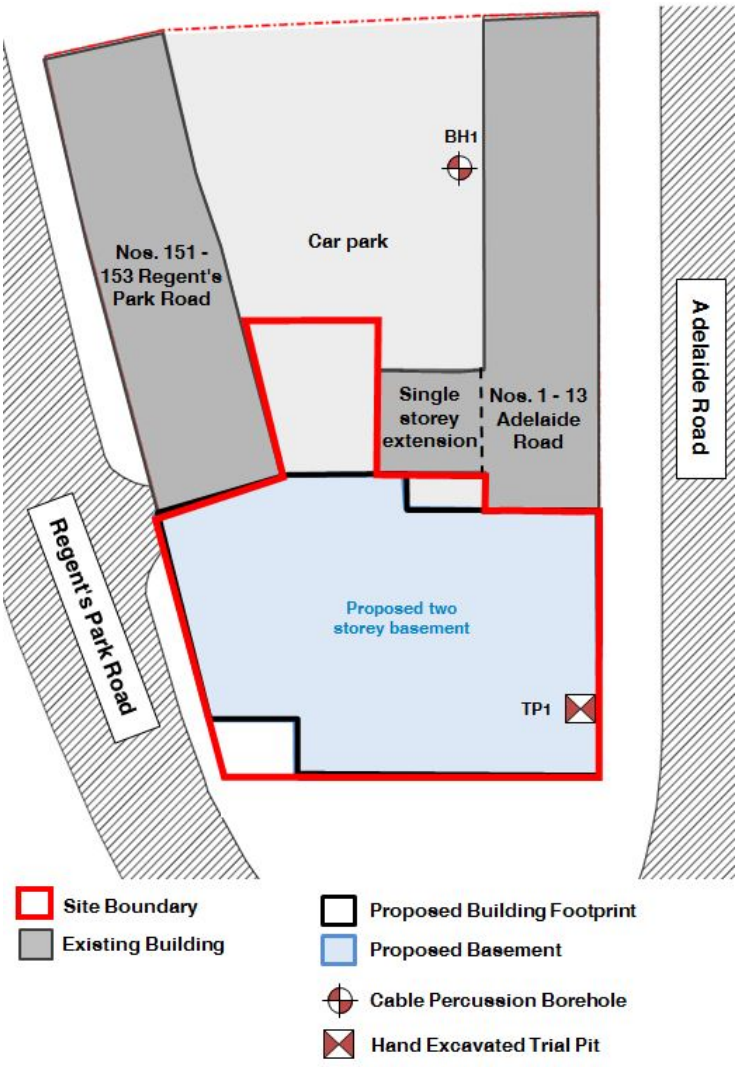
The London Clay underlies the made ground and consists of typical firm becoming stiff, grey fissured silty clay with occasional claystones.

5.3 Groundwater

No groundwater table is present beneath the site.

5.4 Existing Foundations

The basement perimeter walls appear to be supported by shallow concrete strip foundations that extend to around 0.3m depth below existing basement level.

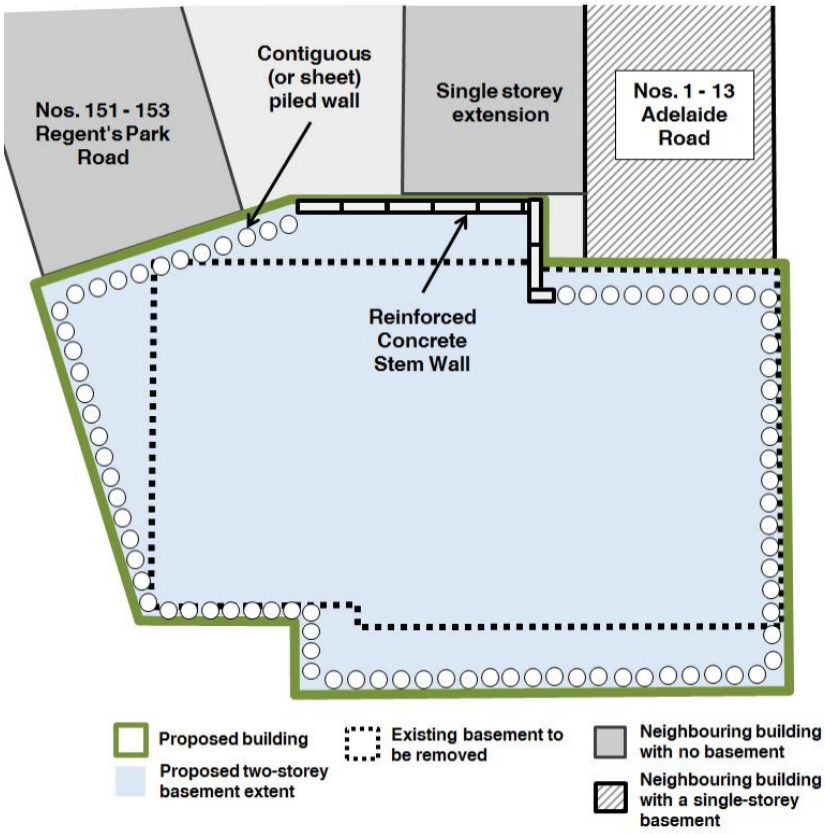


6. Basement Construction

Following demolition of the entirety of the existing building, it is proposed to construct a new eight storey hotel.

The hotel will comprise a two storey basement, which will extend to an approximate depth of 7m below ground level (approximately +24m OD) and will be present beneath the entire footprint of the new structure.

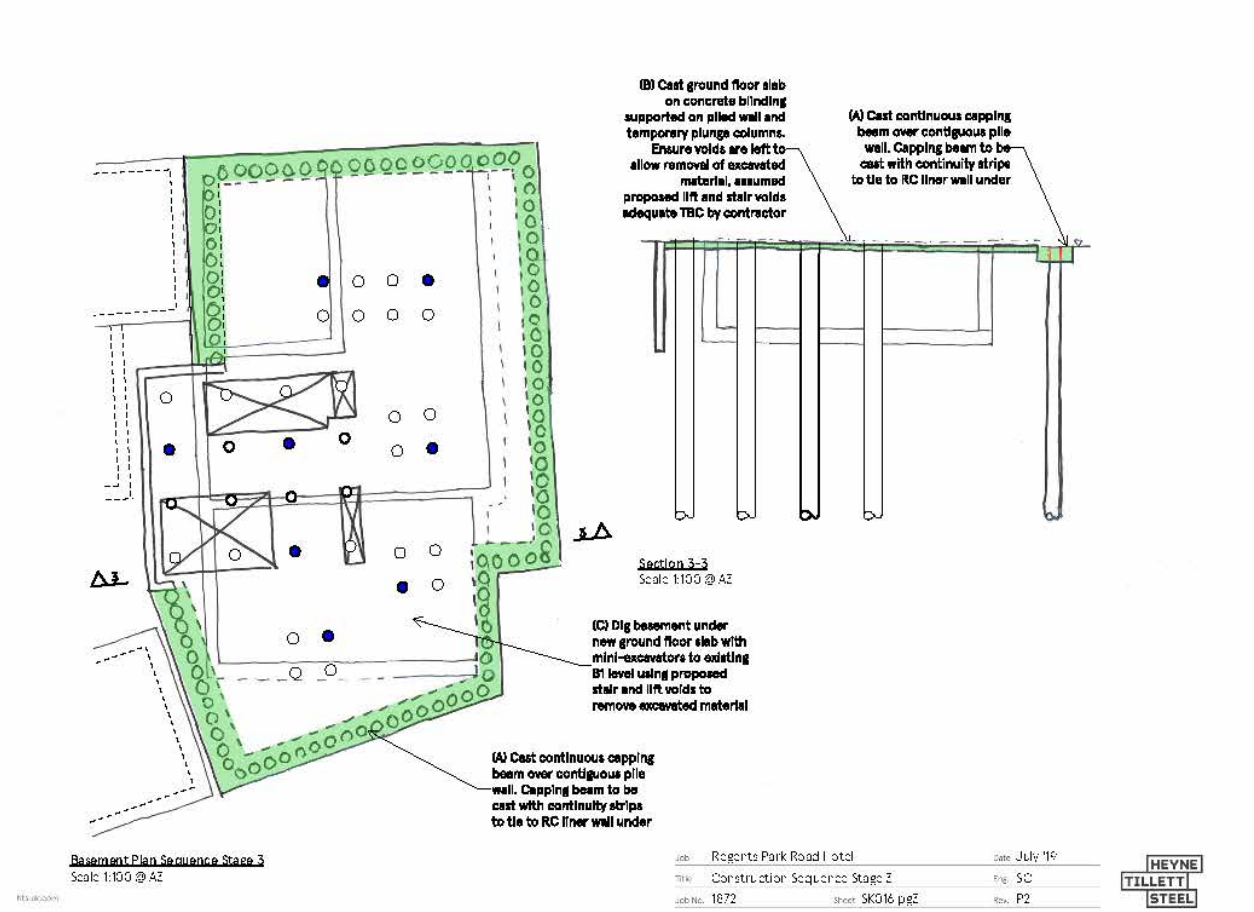
The new building will be supported by a perimeter contiguous bored pile retaining wall, located 1m or so away from the adjacent buildings, in conjunction with a section of underpinning where the adjacent buildings are closer and internal piles. The latter will be undertaken in two stages and will result in a section of 250mm thick reinforced stem wall.

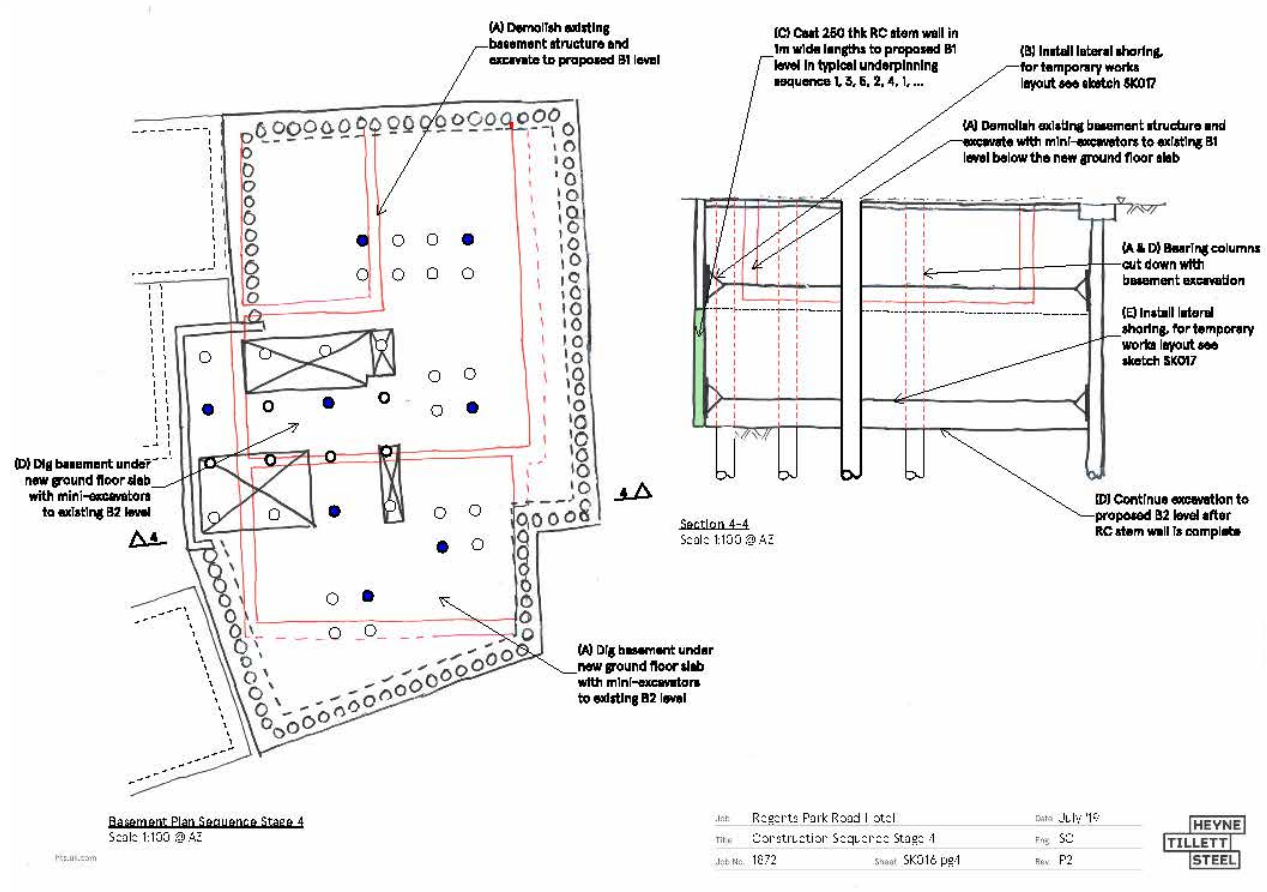


Plan showing the proposed basement structure

A structural method statement has been prepared by HTS and that should be read in conjunction with this report.

As can be seen from the extracts of the method statement shown on the following page, a top-down system of excavation is proposed in order to provide lateral support to brace the retaining walls before and during the basement excavation. In addition, temporary bracing is to be used to support the stem wall section.


(B) Cast ground floor slab on concrete blinding supported on piled wall and temporary plunge columns. Ensure voids are left to allow removal of excavated material, assumed proposed lift and stair voids adequate TBC by contractor
(A) Cast continuous capping beam over contiguous pile wall. Capping beam to be cast with continuity stripe to tie to RC liner wall under
Section 3-3
Scale 1:100 @ A3
(C) Dig basement under new ground floor slab with mini-excavators to existing B1 level using proposed stair and lift voids to remove excavated material
(A) Cast continuous capping beam over contiguous pile wall. Capping beam to be cast with continuity strips to tie to RC liner wall under
Basement Plan Sequence Stage 3
Scale 1:100 @ A3
Job Regents Park Road Hotel
Title Construction Sequence Stage 3
Job No. 1872
Sheet SK016 pg3
Date July '19
Eng SC
Rev P2
HEYNE TILLETT STEEL


(A) Demolish existing basement structure and excavate to proposed B1 level
(C) Cast 250 thk RC stem wall in 1m wide lengths to proposed B1 level in typical underpinning sequence 1, 3, 5, 2, 4, 1, ...
(B) Install lateral shoring, for temporary works layout see sketch SK017
(A) Demolish existing basement structure and excavate with mini-excavators to existing B1 level below the new ground floor slab
(A & D) Bearing columns cut down with basement excavation
(E) Install lateral shoring, for temporary works layout see sketch SK017
(D) Continue excavation to proposed B2 level after RC stem wall is complete
Section 4-4
Scale 1:100 @ A3
(D) Dig basement under new ground floor slab with mini-excavators to existing B2 level
(A) Dig basement under new ground floor slab with mini-excavators to existing B2 level
Basement Plan Sequence Stage 4
Scale 1:100 @ A3
Job Regents Park Road Hotel
Title Construction Sequence Stage 4
Job No. 1872
Sheet SK016 pg4
Date July '19
Eng SC
Rev P2
HEYNE TILLETT STEEL

6.1 Retaining Walls

The retaining walls should be designed for k_0 conditions, in conjunction with the following parameters:-

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

6.2 Basement Heave

Approximately 10mm of short term soil heave due to soil unloading is predicted at the centre of the new basement excavation. A similar amount of long term heave would theoretically be expected, but will be restricted by the effect of the internal piles. Nevertheless, both pile caps and the suspended basement floor will be required to be provided with an appropriate thickness of heave protection material to accommodate these movements.

6.3 Basement Waterproofing

Groundwater is not expected to be encountered within the envisaged depth of the basement excavation.

Nevertheless, there is potential for water to collect around the basement structure in the long term. The basement is therefore to be fully waterproofed and designed to withstand hydrostatic pressures in accordance with Guidance provided in BS8102:2009, Code of Practice for the Protection of Below-Ground Structures against Water from the Ground with a design groundwater level at 1m depth.

6.4 London Underground

A key factor for the proposed development is the need to avoid any undue loading of London Underground infrastructure.

Separate assurance is being provided to TfL, by means of an asset impact assessment, that the proposed construction and construction methodology will not produce any unacceptable impact upon the system.

7. Ground Movement to Neighbouring Properties

7.1 Structures Assessed for Ground Movement

7.1.1 Nos. 151 – 153 Regent's Park Road (green)

Nos. 151 – 153 Regent's Park Road is a 1980s residential four storey terraced building, including a mansard roof. This building lies approximately 0.5m from the proposed basement.

This building is understood not to comprise a basement and, therefore, it is assumed that the foundations to this building are situated at approximately 1m depth.

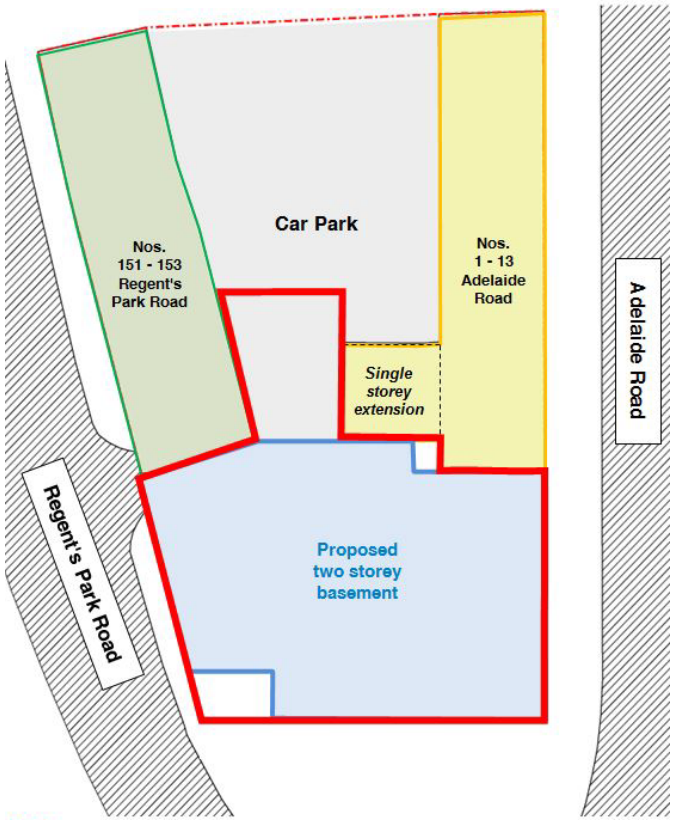
7.1.2 Nos. 1 – 13 Adelaide Road (yellow)

Nos. 1 – 13 Adelaide Road is also a 1980s residential four storey terraced building, including a mansard roof. This building lies less than 1m from the proposed basement.

This building is understood to have a basement that extends to approximately 3.5m depth below ground level.

7.1.3 Nos. 1 – 13 Adelaide Road: Extension (dashed outline)

A single storey extension is present to the rear of Nos. 1 – 13 Adelaide Road and lies approximately 0.5m to the north of the proposed basement.



Plan showing neighbouring structures assessed for ground movement

This extension does not appear to have a basement and for the purpose of this assessment it has been assumed that the foundations to this extension are situated at 1m depth.

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, depending upon the reapplication of loading.

Stratum:	**Undrained Elastic Modulus Eu (kN/m^2)**	**Drained Elastic Modulus E' (kN/m^2)**
London Clay Formation	79,500kN/m^2 at existing basement level increasing linearly to 259,500kN/m^2 at 30m depth	53,000kN/m^2 at existing basement level increasing linearly to 173,000kN/m^2 at 30m depth

Poisson's Ratios of 0.5 and 0.1 have been used for short term (undrained) and long term (drained) conditions respectively.

The analysis uses the above parameters for stratified homogeneity with the introduction of an assumed rigid boundary at approximately 30m depth.

7.3 Short Term Movements

There are several potential components of ground movement that may interact to affect the neighbouring structures, which comprise:

- Heave movement associated with unloading of the soil due to demolition of the existing structures and basement excavation
- Settlement and horizontal movements due to the installation of piles
- Settlement and horizontal movements due to the yielding of the new piled retaining wall during excavation of the new basement.

7.3.1 Demolition

Minimal (less than 5mm) of soil heave is predicted to affect the adjoin buildings as a result of demolition of the existing building.

7.3.2 Basement Excavation Heave

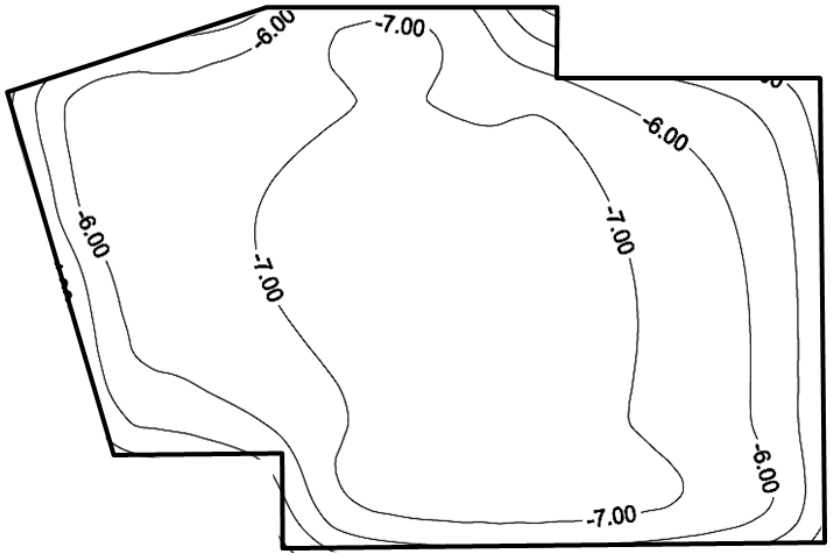
The basement excavation will extend to approximately 7m depth below the existing ground level over the entire building footprint. A reduced excavation depth of approximately 3.5m will apply within the footprint of the existing single storey basement.

The effect of the excavation has accordingly been considered as an unloading of -70kN/m^2 within the existing basement area, increasing to -140kN/m^2 outside of this.

Up to approximately 8mm of short heave is theoretically expected in the centre of the basement excavation, reducing to 6mm at the perimeter retaining walls, but these movements will be restricted by the presence of the internal piling.

The ground heave movements due to soil unloading are not expected to have any discernible impact on the neighbouring structures as the heave movements will confined by the perimeter retaining walls. An

exception is the single storey extension to Nos. 1 – 13 Adelaide Road, where theoretical movement heave of 6mm could affect the perimeter wall.



Predicted theoretical short-term heave contours
(values in mm)

7.3.3 Piling

7.3.3.1 Installation of Piles

Given the distance between the piling and the neighbouring buildings, the latter are not expected to be affected by the installation of the bored pile retaining wall.

7.3.3.2 Retaining Wall Yielding

The ground surface movements arising from excavation in front of a bored pile retaining wall and consequent yielding of the piled wall have been estimated using default values contained within CIRIA report C760.

In addition, the curves presented in Figure 6.15 of that document allow for the profile of ground movement behind the wall to be estimated.

The amount of predicted movement is related to the excavation depth and wall support stiffness. The predictions are made on the basis of an excavation depth of 7m and high stiffness wall support.

As the foundations of the neighbouring buildings are lower than the external ground level of the site, the predicted ground movements due to pile wall yielding have been reduced in order to provide a better estimation of the ground movements at this depth.

8. Building Damage Assessment

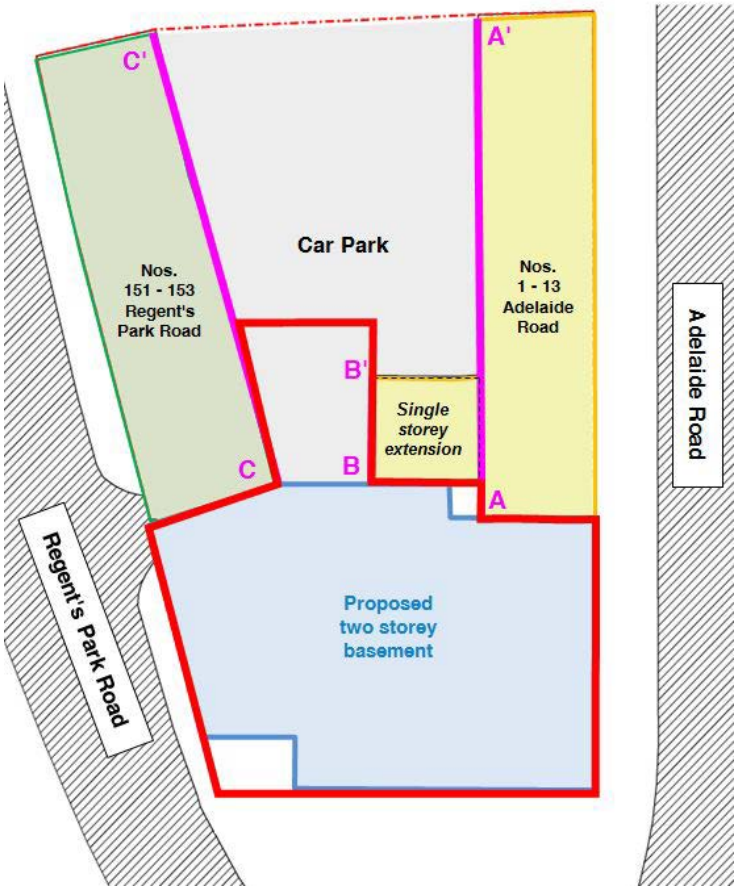
Camden Council seeks to ensure that harm will not be caused to neighbouring properties by basement development.

Camden Local Plan (June 2017) states that the proposed basement scheme must not cause a risk of damage in exceedance of Burland Scale 1 'Very Slight' to any of the neighbouring properties.

It has been noted that the perimeter bored pile retaining walls adjacent to Nos. 1 – 13 Adelaide Road and Nos. 151 – 153 Regent's Park Road are to be set back by 1225mm away from these neighbouring structures. The basement wall next to the single storey extension, however, is expected to be constructed by hit and miss excavation akin to conventional underpinning techniques.

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).



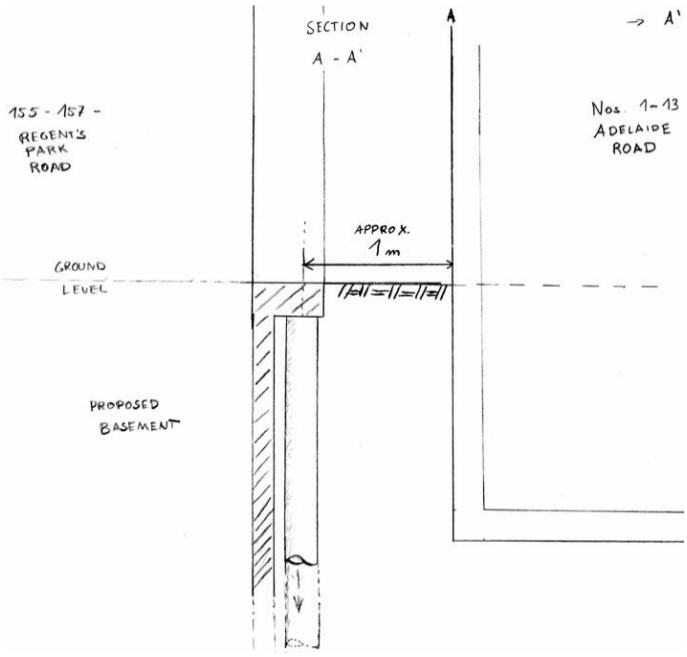
Plan showing line of sections used for damage category assessment

8.1.1 Nos. 1 – 13 Adelaide Road – Section A-A'

The length of section (L) is taken as 24m and the wall height (H) as 7m.

The assumed founding level is approximately 3.5m above the proposed basement depth. Therefore, the predicted ground surface movements due to yielding of the retaining wall can be reduced by 50%.

The analysis suggests that as a result of pile wall yielding, Nos. 1 -13 Adelaide Road may experience up to 5mm of settlement, in conjunction with less than 5mm of horizontal movement.



SECTION A-A' SKETCH

The maximum horizontal strain, εh (Δh / L) is assessed as 0.0206%, producing a maximum deflection ratio Δ / L = -0.0033, within a limiting tensile strain of 0.025%, for a Burland Category 0 "Negligible" condition.

8.1.2 Nos. 1 – 13 Adelaide Road, single storey extension – Section B-B'

The length of section (L) is taken as 7m and the wall height (H) as 4m.

The analysis suggests that as a result of pile wall yielding, the single-storey extension to Nos. 1 -13 Adelaide Road may experience approximately 7mm of settlement, in conjunction with up to 10mm of horizontal movement.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.0364%, producing a maximum deflection ratio Δ / L = -0.035714, within a limiting tensile strain of 0.075%, for a Burland Category 1 "Very Slight" condition.

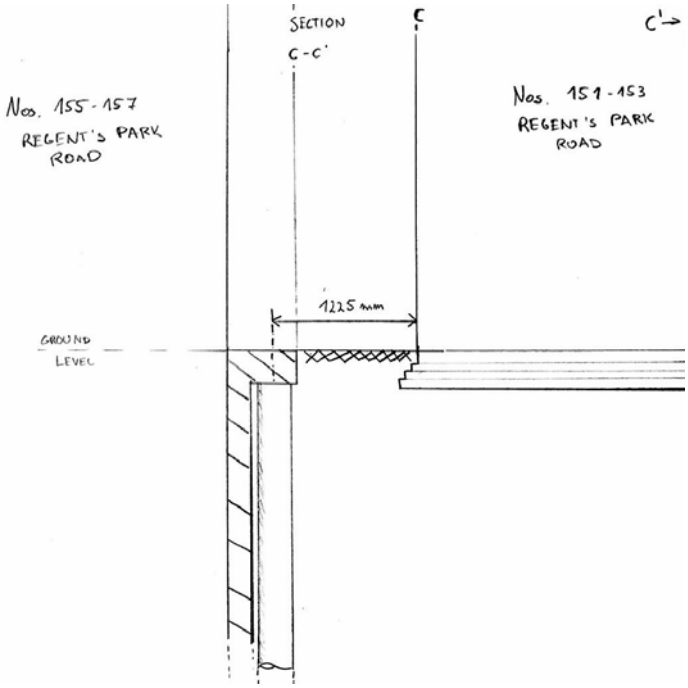
8.1.3 Nos. 151 – 153 Regent's Park Road – Section C-C'

The length of section (L) is taken as 23m and the wall height (H) as 10m.

The assumed founding level is approximately 1m above the proposed basement depth. Therefore, the predicted ground surface movements can also be reduced by around 15%.

The analysis suggests that as a result of pile wall yielding, Nos. 151 – 153 Regent's Park Road and the extension may experience up to 5mm of settlement, in conjunction with up to 10mm of horizontal movement.

The maximum horizontal strain, εh (Δh / L) is as10ssed as 0.043%, producing a maximum deflection ratio Δ / L = -0.007, within a limiting tensile strain of 0.050%, for a Burland Category 0 "Negligible" condition.



SECTION C-C' SKETCH

8.1.4 Public Highway

The proposed basement lies approximately 1.5m away from the pavement at the closest point, where there is expected to be various buried utilities located.

Given reasonable standards of workmanship during the piling works and introduction of high level propping prior to basement excavation, negligible movement (<5mm settlement) is anticipated.

9. Stage 4: 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.

9.1 Potential Hydrogeological Impacts

No groundwater table is present at the site therefore, the development is not expected to have any impact upon groundwater flow and there is additionally expected to be no cumulative impact.

9.2 Potential Hydrological Impacts

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

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.

A Flood Risk Assessment & SUDs Statement is presented as a separate report (LBH4540fra Ver. 1.0).

9.3 Potential Stability Impacts

9.3.1 Pedestrian Right of Way

Given the construction of a high stiffness basement retaining wall, it is concluded that there will be no significant risk to the integrity of the adjacent highways or underlying buried utilities.

9.3.2 London Clay

The London Clay soils beneath the site are of high volume change potential.

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

9.3.3 Ground Movements

The predicted building damage levels resulting from ground movements associated with the proposed development have been analysed and found to be acceptable.

Nevertheless, a structural monitoring scheme will be instigated to provide an early warning of any movements and to allow the timely application of mitigation measures to prevent any unacceptable movements.

9.3.4 London Underground

An Asset Impact Assessment of the London Underground Chalk Farm station tunnels is currently being prepared and will be submitted to Transport for London (TfL) to ensure that the proposed scheme will not adversely impact the structure of the tunnels.

9.4 Residual Impacts

It is concluded that the proposed basement will have no residual unacceptable impacts upon the surrounding structures, infrastructure and environment. No cumulative impacts are envisaged.

10. Outline Structural Monitoring Plan

The ground movement assessment suggests up to 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.

10.1 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 5mm in any direction		Green
Total movement in excess of 5mm in any direction or additional movement of 5mm in any direction	Notify Structural Engineer and Party Wall Surveyor	Red

10.2 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

11. 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.