



**BASEMENT IMPACT ASSESSMENT**

**FOR**

**PROPOSED BASEMENT WORKS  
(OFFICE SCHEME)**

**AT**

**75 BAYHAM STREET  
LONDON  
NW1 0AA**



**FOR**

**W12 STUDIOS**

**Project No. P3096-OFF**

**ISSUE 1.3 – UPDATED TO REVIEW COMMENTS**

DOCUMENT CONTROL SHEET

	75 Bayham Street, London NW1 0AA	Project No.	P3096-OFF
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Issue No.	Status	Date	
0.1	Draft Issue	14/10/2015	
1.0	First Issue	23/10/2015	
1.1	Updated to Reflect Comments	26/10/2015	
1.2	Updated to Reflect Comments	26/10/2015	
1.3	Updated to reflect Review Comments  Amendments: - Clause 3.01.2 amended Clause 4.01.9 amended Clause 4.01.13 amended Clause 4.01.15 amended Clause 4.02.1 amended Clause 4.03.1 amended Clause 4.04.3 amended Clause 4.04.6a amended Clause 4.04.12 amended Clauses E01, E05 & E12 amended Appendix F added Appendix G added	07/03/2016	

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## 1.00 INTRODUCTION

- 1.01 Michael Alexander Consulting Engineers has been appointed to prepare a Basement Impact Assessment Report to support the Planning Application for the proposed new building (including a basement) at 75 Bayham Street, London NW1 0AA.
- 1.02 This document has been prepared by Giovanni Sclavi BEng MSc(Hons) GIPENZ and reviewed by Isaac Hudson MEng MA (Cantab) CEng MStructE who is a chartered structural engineer. The document has been reviewed by Seamus Lefroy-Brooks of LBH Wembley, a chartered geologist.
- 1.03 The existing property is currently occupied by offices to the upper floors and with a warehouse to the rear. The three storey building was built circa 1880.
- 1.04 The existing property is located within the Camden Town Conservation Area, but is not Listed.
- 1.05 The site is bounded by Bayham Street to the front (east), 77 Bayham Street and unit 1, 6a Pratt Street to the right (north) and 69, 71 and 73 Bayham Street to the left (south). To the rear of the property (west) the site is bounded by 1 and 2 Pratt Mews.
- 1.06 The proposed works are for the renovation, re-modelling and extension of the buildings on the site, to create offices varying in height from two to four storeys above ground. The proposed building will have a single storey basement below. This document addresses the specific issues relating to the basement construction, as described in Camden Planning Guidance CPG4 (2015 Revision).

## 2.00 BASEMENT PROPOSALS

- 2.01 The details of the existing building and proposals for the basement are shown on the following Jack Woolley Architects drawings.

1030_01_P1	Location Plan
1030_02_P1	Roof Plan (existing)
1030_03_P1	East Elevation (existing)
1030_04_P1	West Elevation (existing)
1030_05_P1	Section AA (existing)
1030_06_P1	Section BB (existing)
1030_07_P1	Section CC (existing)
1030_08_P1	Section DD (existing)
1030_09_P1	Ground Floor Plan (existing)
1030_10_P1	First Floor Plan (existing)
1030_11_P1	Second Floor Plan (existing)
1030_12_P2	Roof Plan (proposed)
1030_13_P1	East Elevation (proposed)
1030_14_P3	West Elevation (proposed)
1030_15_P2	Section AA (proposed)
1030_16_P1	Section BB (proposed)

1030_17_P3	Section CC (proposed)
1030_18_P1	Section DD (proposed)
1030_19_P3	Ground Floor Plan (proposed)
1030_20_P2	First Floor Plan (proposed)
1030_21_P3	Upper First Floor Plan (proposed)
1030_22_P3	Second Floor Plan (proposed)
1030_23_P2	Top Floor Plan (proposed)
1030_24_P3	Basement Plan (proposed)

- 2.02 The details of the existing structure and site boundaries will be subject to detailed exploratory work prior to and during the works on-site.
- 2.03 The design and construction of the building structure shall be in accordance with current Building Regulations, British Standards, Codes of Practice, Health and Safety requirements and good building practice.



3.00 SUBTERRANEAN (GROUND WATER) FLOW

3.01 Stage 1: Screening

The impact of the proposed development on ground water flows is considered here as outlined in Camden Planning Guidance CPG 4 (2015 Revision). The references are to the screening chart Figure 1 in CPG4.

3.01.1 GW Q1a *Is the site located directly above an aquifer?*

No. With reference to the Camden Geological, Hydrogeological and Hydrological Study (Figure (a)) the site is not above an aquifer.

3.01.2 GW Q1b *Will the proposed basement extend beneath the water table surface?*

No. Near-surface groundwater table was not found at the time of site investigations as stated on LBH Wembley report LBH4318 Ver 1.6. No groundwater is expected within the impermeable London Clay.

3.01.3 GW Q2 *Is the site within 100m of (i) a watercourse, (ii) a well (used or disused) or (iii) a potential spring line?*

With reference to the Camden Geological, Hydrogeological and Hydrological Study (Figures (b), (c) and (d)),

(i) The nearest surface water feature is the Grand Union Canal, located, approximately 420m to the North of the site.

The Hampstead pond chains are located to the North West approximately 2900m from the site.  
The nearest 'lost' watercourse is the River Fleet which ran approximately 390m to the east of the site.

(ii) From the British Geological Society 'Geoindex' the nearest water wells are on Pratt Street (approximately 390m to the East of the site) and on Camden Street (approximately 460m to the North of the site).

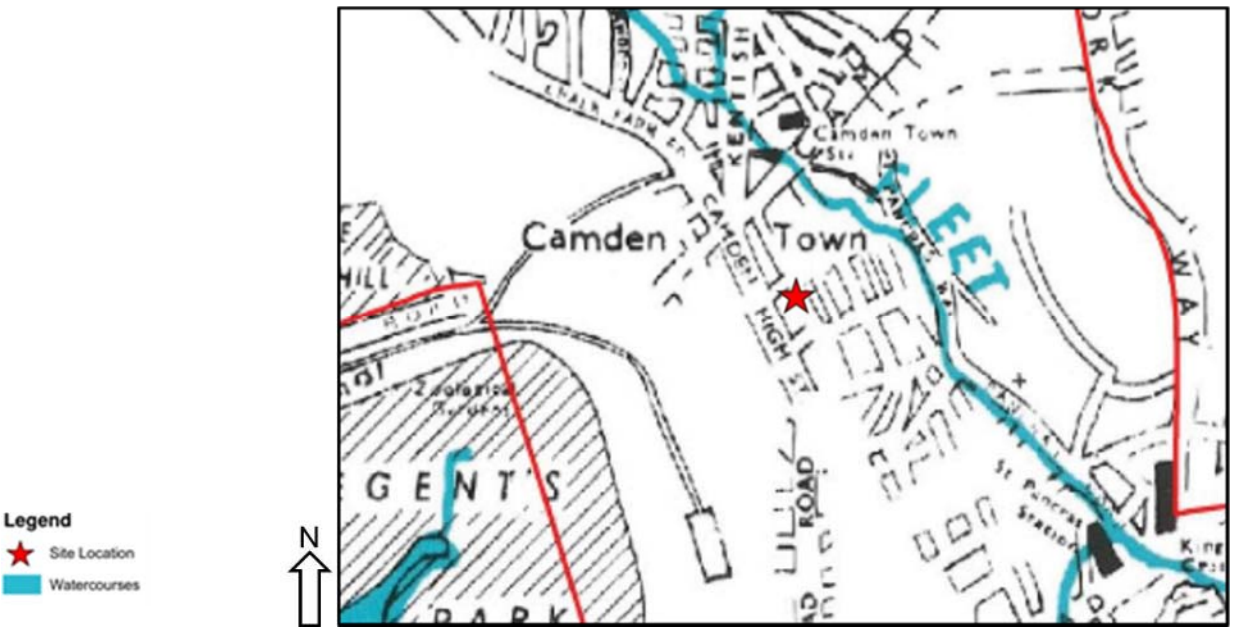
(iii) The local geology suggests that the site is not located adjacent to a potential spring line.

3.01.4 GW Q3 *Is the site within the catchment of the pond chains of Hampstead Heath?*

No. With reference to the Camden Geological, Hydrogeological and Hydrological Study, the site is not within the catchment of the pond chains on Hampstead, nor the Golder's Hill Chain.



**Figure (a)**  
Aquifer Designation Map  
(Extract from Fig 8 of Camden Geological, Hydrogeological and Hydrological Study)



**Figure (b)**  
Watercourses  
(Extract from Fig 11 of Camden Geological, Hydrogeological and Hydrological Study -Lost Rivers of London by Barton)

- 3.01.5

GW Q4

*Will the proposed basement development result in a change in the proportion of hard surface/paved areas?*
- No. The site is currently fully occupied by buildings. In the proposed condition this will be generally be the case.
- 3.01.6

GW Q5

*As part of the site drainage, will more surface water (e.g. rainfall and-runoff) than at present be discharged to the ground (e.g. via soakaways and /or SUDS)?*
- No. Currently no surface water from the site is discharged to the ground, and this will also be true after the proposed works.
- 3.01.7

GW Q6

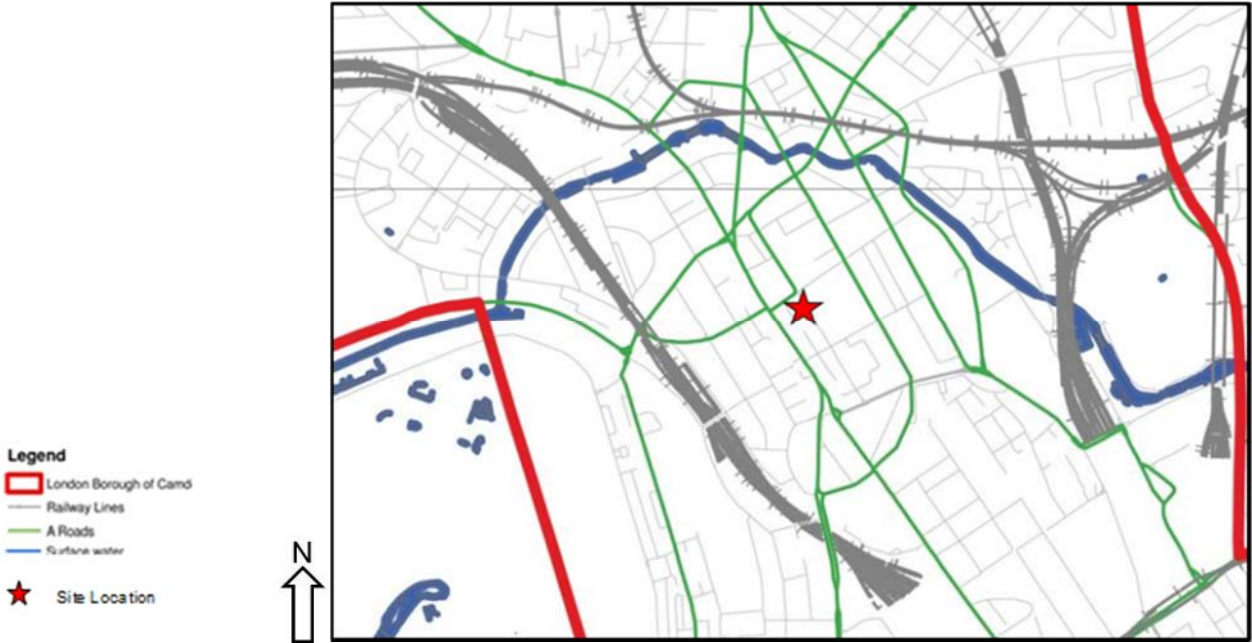
*Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond (not just the pond chains on Hampstead Heath) or spring line?*
- No. The nearest ponds in the Hampstead Chain are not in close proximity to the site, nor is the site located adjacent to a spring line.
- 3.01.8

On the basis of items 3.01.1 to 3.01.7 above, and in reference to Figure 1 of CPG4, no aspects need to be carried forward to the scoping stage.

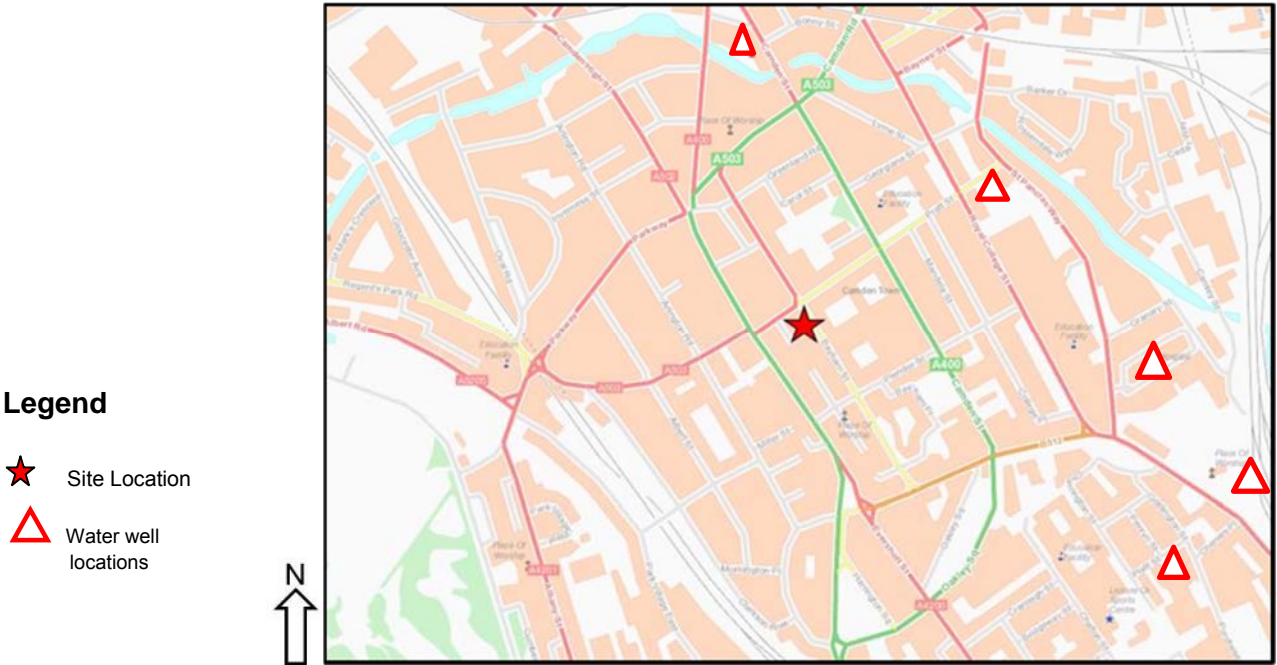
3.02 Stage 2: Scoping

- 3.02.1

No scoping is required as site investigations have been carried out on site by LBH Wembley in October 2015. Refer to their report LBH4318 Ver 1.6 of October 2015.



**Figure (c)**  
Surface Water Features  
(Extract from Fig 12 of Camden Geological, Hydrogeological and Hydrological Study)



**Figure (d)**  
Waterwells (also showing Infrastructure)

(Extract from British Geological Survey)

**3.03 Stage 3: Site Investigation and Study**

3.03.1 A site investigation was carried out by LBH Wembley in October 2015 which included trial pits and window sampling. Refer to their report LBH4318 Ver 1.6 of October 2015.

3.03.2 No groundwater was encountered during the investigations.

**3.04 Stage 4: Impact Assessment**

3.04.1 A hydrogeological assessment has been carried out by a chartered geologist and is included in section 5 of LBH Wembley's report. In summary it notes that no potential subterranean (groundwater) flow impacts associated with the construction of the proposed development have been identified.

3.04.2 It is however possible that perched water could be encountered during the excavation, at the interface of the made ground and the London Clay. Provision for this will need to be reflected in the proposed construction method – refer Appendix E.



4.00 GROUND STABILITY

4.01 Stage 1: Screening

- 4.01.1 GS Q1 *Does the existing site include slopes, natural or manmade, greater than 7°?*
- No. The site is generally level, with a slight slope from north to south and east to west. There are no slopes >7 degrees within the site.
- 4.01.2 GS Q2 *Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°?*
- No. The basement construction will not change the profile of the ground at the boundaries of the property.
- 4.01.3 GS Q3 *Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?*
- No. With reference to the Camden Geological, Hydrogeological and Hydrological Study, (refer Figure (f)), the neighbouring areas also have slopes less than 7 degrees.
- 4.01.4 GS Q4 *Is the site within a wider hillside setting in which the general slope is greater than 7°?*
- No. With reference to the Camden Geological, Hydrogeological and Hydrological Study, (refer Figure (f)), the closest slopes that are greater than 7 degrees are located approximately 340m to the West.
- 4.01.5 GS Q5 *Is the London Clay the shallowest strata at the site?*
- Yes. With reference to Camden Geological, Hydrogeological and Hydrological Study, the underlying soil stratum is indicated as being the London Clay (Figure (e)).
- 4.01.6 GS Q6 *Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?*
- No. There are no trees within the site boundary.



**Figure (e)**  
Geological Map  
(Extract from Fig 4 of Camden Geological, Hydrogeological and Hydrological Study)



**Figure (f)**  
Slope Angle Map  
(Extract from Fig 16 of Camden Geological, Hydrogeological and Hydrological Study)



4.01.7 GS Q7 *Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?*

The London Clay strata is usually classified as having a high volume change potential and hence can lead to seasonal shrink-swell subsidence where buildings are founded in desiccated soils. We have however no specific evidence of subsidence having been experienced on site or in the immediate surrounding area.

4.01.8 GS Q8 *Is the site within 100m of a water course or a potential spring line?*

No. With reference to the Camden Geological, Hydrogeological and Hydrological Study (refer Figures (b) and (c)), the site is located 390 metres from the subterranean River Fleet.

4.01.9 GS Q9 *Is the site within an area of previously worked ground?*

Yes. Geological maps show an area of worked ground on the other side of Bayham St. With reference to the Camden Geological, Hydrogeological and Hydrological Study (figure (e)).

4.01.10 GS Q10 *Is the site within an aquifer?*

No. With reference to the Camden Geological, Hydrogeological and Hydrological Study (Figure (a)) the site is not above an aquifer.

4.01.11 GS Q11 *Is the site within 50m of the Hampstead Heath ponds?*

No. With reference to the Camden Geological, Hydrogeological and Hydrological Study, the Hampstead pond chains are located to the North West approximately 2900m from the site.

4.01.12 GS Q12 *Is the site within 5m of a highway or pedestrian right of way?*

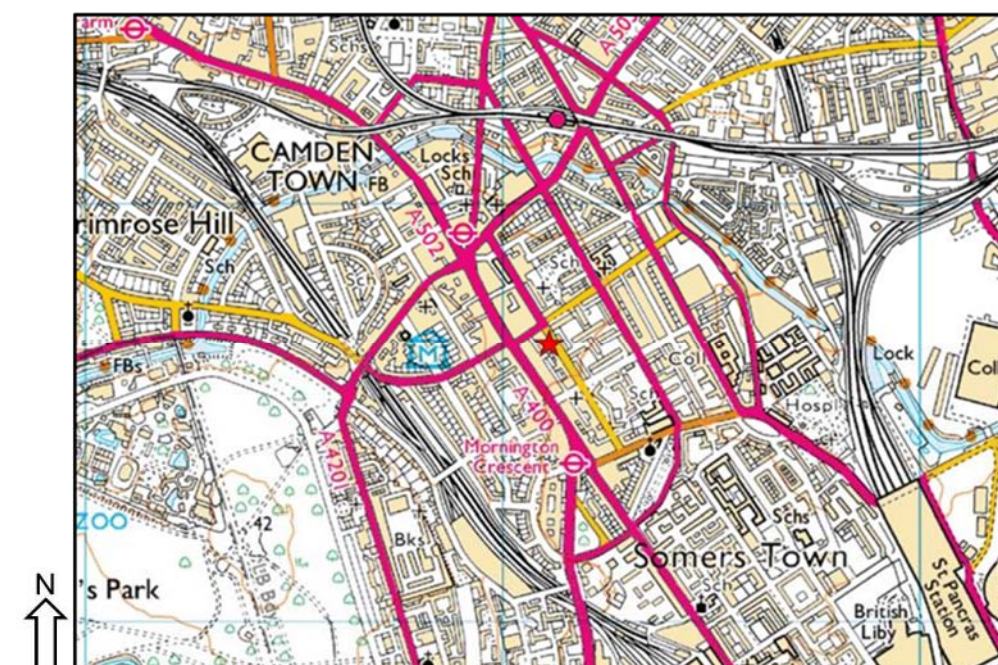
Yes. The proposed basement will be less than 5m from the public highway.

4.01.13 GS Q13 *Will the proposed basement significantly increase the differential depth of foundations relative to neighboring properties?*

Yes. It appears that no 73 Bayham Street has a lower ground floor approximately 1.4m below street level. With reference to survey drawings, we understand that the Pratt Mews properties do not have basements. It is not clear whether any of the other adjoining properties have basements. However in any event the proposed foundations will be deeper than those of the adjoining properties.

#### Legend

★ Site Location



**Figure (g)**  
Topography Map  
(Extract from Ordnance Survey Mapping)



**Figure (h)**  
1873 Map



4.01.14 GS Q14 *Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?*

No. With reference to Open Street Map (figure (i)) there are no tunnels located below the site. The nearest tunnel is the Northern Line located approximately 70m to the west of the site. The safeguarded zone for the proposed HS2 railway is approximately 350m to the south west of the site – refer figure (k).

4.01.15 On the basis of items 4.01.01 to 4.01.14 above and in reference to Figure 2 of CPG4, the aspects that should be carried forward to a scoping stage in respect of land stability are:

- The increase in differential foundation depths.
- The basement being within 5m of a pedestrian highway.
- The site being underlain by London Clay.
- The potential for being in an area of worked ground

#### Legend

- ★ Site Location
- Rail Lines



**Figure (i)**  
Map of Underground Infrastructure  
(Extract from Open Street Map)

## 4.02 Stage 2: Scoping

4.02.1 With reference to the Camden Geological, Hydrogeological and Hydrological study Appendix F3, the potential impacts which will need to be considered will include:-

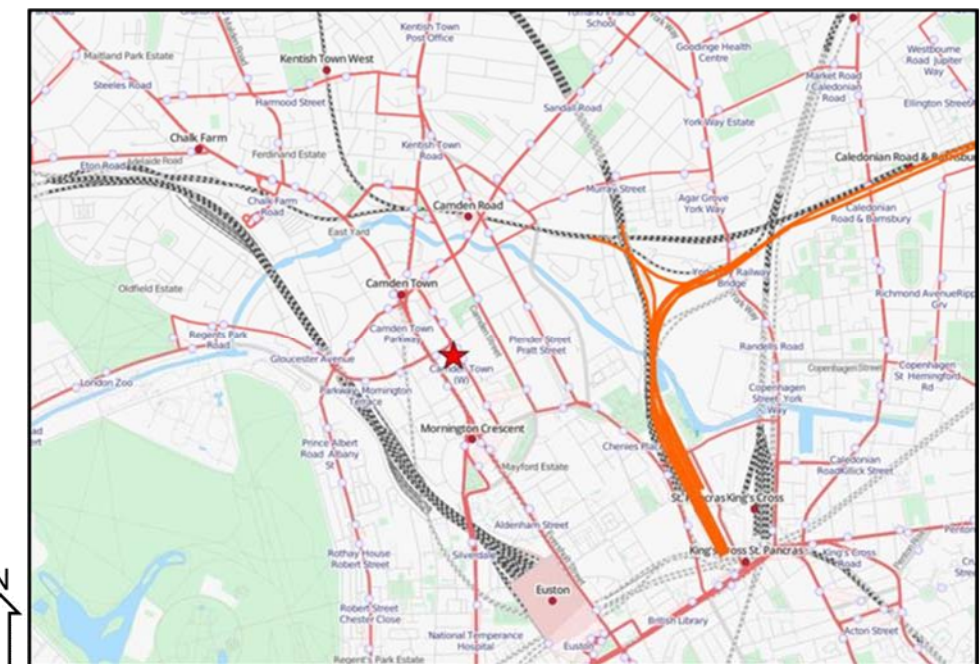
- The risk of potential seasonal shrink-swell subsidence due to the underlying subsoils being London Clay.
- The risk of structural damage to the adjoining properties during and following the basement construction.
- The risk of damage to the road or pavement, or any underground services buried under.
- Whether there are areas of extensive backfill across the site which might lead to ground instability

4.02.2 In response to the above issues: -

- Trial pits were commissioned to the party walls.
- An outline construction method statement was prepared.

#### Legend

- ★ Site Location
- Rail Lines
- High Speed Rail Link



**Figure (j)**  
High Speed Rail Link  
(Extract from Open Street Map)

### 4.03 Stage 3: Site Investigation and Study

4.03.1 The LBH Wembley Site Investigation of October is summarised in their report LBH4318 Ver 1.6 dated October 2015. In summary of the findings: -

- A varying thickness of made ground was encountered over London Clay to the full depth of the investigation.
- The made ground was deepest adjacent to the Bayham Street elevation, considered likely to be due to a former basement. Otherwise no significant areas of backfill were encountered
- The clay subsoils were found to have high plasticity.
- Existing foundations were conventional brick spread footings.
- Ground water was not encountered during the investigations

### 4.04 Stage 4: Impact Assessment

4.04.1 The proposed basement is around 3.75m deep and will be excavated through the made ground and then the well understood London Clay stratum. Provided appropriate construction methods are employed there should be no significant impact in terms of ground stability.

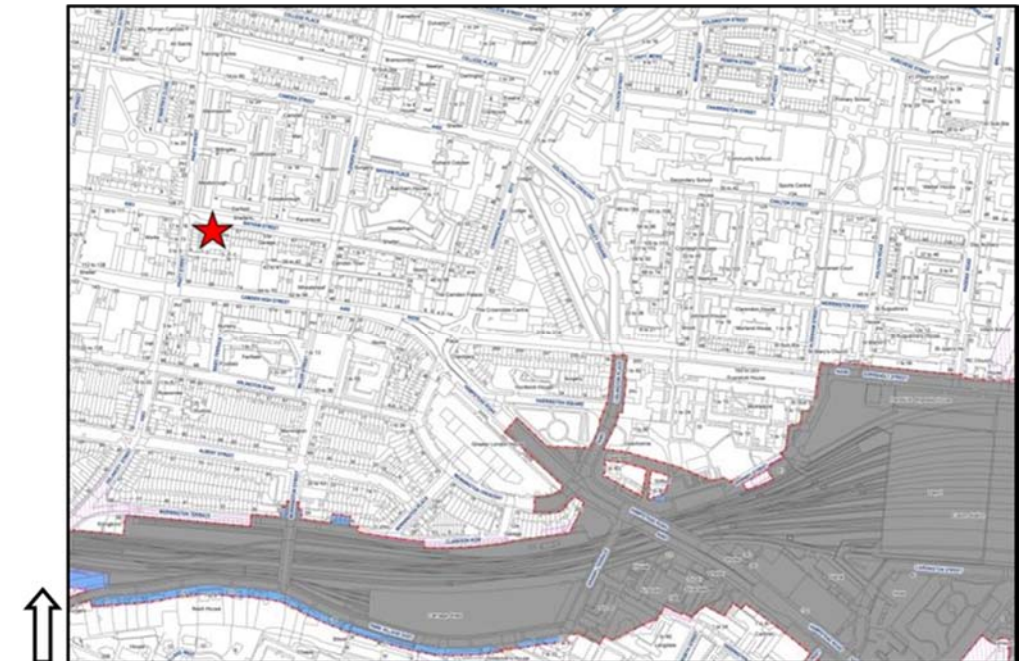
4.04.2 The new basement will be constructed by underpinning the existing party walls. This is a well-established method and used successfully on numerous single storey basements within the London Clay.

4.04.3 To the front elevation of the building the existing walls will be also underpinned. A reinforced concrete liner wall will be used in board of the underpinning which will span laterally between adjoining supports. Additional temporary propping will be provided to minimise any local ground movements which might affect services in the pavement. The services in the pavement will be scanned and marked prior to the commencement of the works. Further trial pits to the walls adjacent to the street will be carried out in advance of the works to confirm that these have similar depth and profile to the adjoining walls.

4.04.4 The unloading of the ground due to the basement excavation may cause some heave of the underlying clay subsoils in both short and long term. To a certain extent, heave forces acting on the basement under the building will be counteracted by the weight of the building over. This is considered in more detail in LBH's report within the ground movement assessment, which shows that short term heave movements to the centre of the site will be up to 10mm, with smaller predicted movements for the party walls and beyond.

#### Legend

-  Safeguarded Area: Sub-surface
-  Safeguarded Area: Surface
-  Site Location
-  Rail Lines



**Figure (k)**  
High Speed Rail Safeguarding Map  
(Extract from gov.uk)



To mitigate the effect of heave on the building, the 'hybrid' approach as set out in the LBH report will be adopted:-

- The underpinning will be constructed with an enlarged toe. The heave pressures acting on this toe will be resisted by the weight of the building above.
- The main part of the basement will be constructed later in the construction process to allow for a greater part of the heave to occur before its construction.

The raft will be designed to resist the remaining component of the ground heave, spanning between and connected the toes of the underpinning.

4.04.5 The new basement will not suffer from seasonal shrink swell subsidence as the depth of the proposed basement will be below the level of any tree root activity. The nearest trees are within Bayham St, and there is no reason to suggest that the construction of the basement will cause adjoining properties to become more susceptible to subsidence, particularly since the adjoining buildings to Bayham Street have been shown to have deeper foundations due to their part basements.

#### Ground Movements

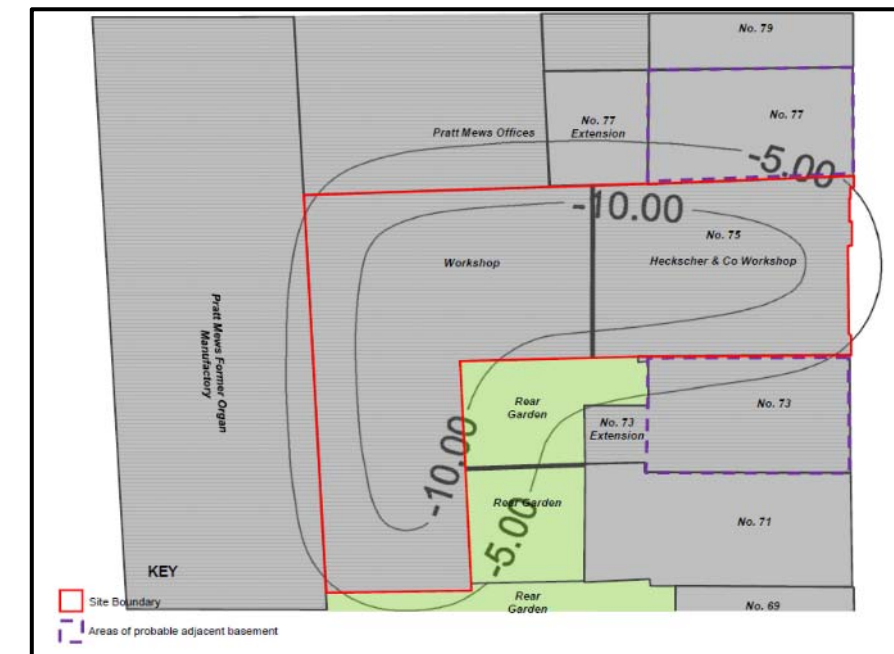
4.04.6a Consideration has been given as to the foundation and slab levels of the adjoining properties, as described in clause 4.01.13. Where the floor levels to adjoining properties are not known, this information will be requested through the party wall process prior to commencement of construction.

4.04.6 To assist in determining the impact of the proposals, LBH have carried out a Ground Movement Analysis and Damage Assessment - refer sections 7 & 8 of their report respectively.

4.04.7 The report notes that it is hard to accurately predict the ground movements associated with basements formed by underpinning. However they suggest that the damage to adjoining properties could be 'Category 1-Very Slight' or worst case 'Category 2 -Slight' as defined by Burland.

4.04.8 In section 9 of LBH's report, they set out the methods by which ground movements – and hence building damage – will be mitigated. This has been reflected in our structural proposals.

4.04.9 An outline construction method has been developed, which is included in Appendix D. This sets out the measures which will be taken to mitigate the impact of the works, with specific reference to avoiding any adverse impact on the pavement or buried services.



**Figure (l)**  
Short Term Ground Movement Contours  
(from LBH's ground movement assessment)



**Figure (m)**  
Long Term Ground Movement Contours  
(from LBH's ground movement assessment)

**Monitoring**

- 4.04.10
- Measurement monitoring of the temporary works, Party Walls and adjoining structures will be carried out during the construction period. The precise scope of monitoring will be prepared in conjunction with the advisors to the Adjoining Owners.
- 4.04.11
- The ‘monitoring and contingency plan’ will include trigger values for vertical and horizontal movement and frequency of measurement. There will be an increased frequency of monitoring during the excavation works to enable mitigation to be effectively implemented if trigger values are exceeded. If ‘Amber’ trigger values are exceeded then the monitoring frequency will be further increased and a detailed review of construction methods will be carried. If ‘Red’ trigger values are exceeded then all further excavation will be stopped, and the excavation made safe before a revised plan of works can be implemented.
- 4.04.12
- The scope and locations of monitoring will be agreed with the neighbours through the party wall process.

5.00 SURFACE FLOW AND FLOODING

5.01 Stage 1: Surface Flow and Flooding Screening

5.01.1 SF Q1 *Is the site within the catchment of the pond chains on Hampstead Heath?*

No. With reference to the Camden Geological, Hydrogeological and Hydrological Study, the site is not within the catchment of the pond chains on Hampstead, nor the Golder's Hill Chain.

5.01.2 SF Q2 *As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?*

No. On completion of the development, the surface water flows will be routed in the same way as the existing condition, with rainwater run-off collected in a surface water drainage system and ultimately discharged to the combined sewer in Bayham Street (Refer to Thames Water Asset Search in Appendix B).

5.01.3 SF Q3 *Will the proposed basement development result in a change in the proportion of hard surface/paved external areas?*

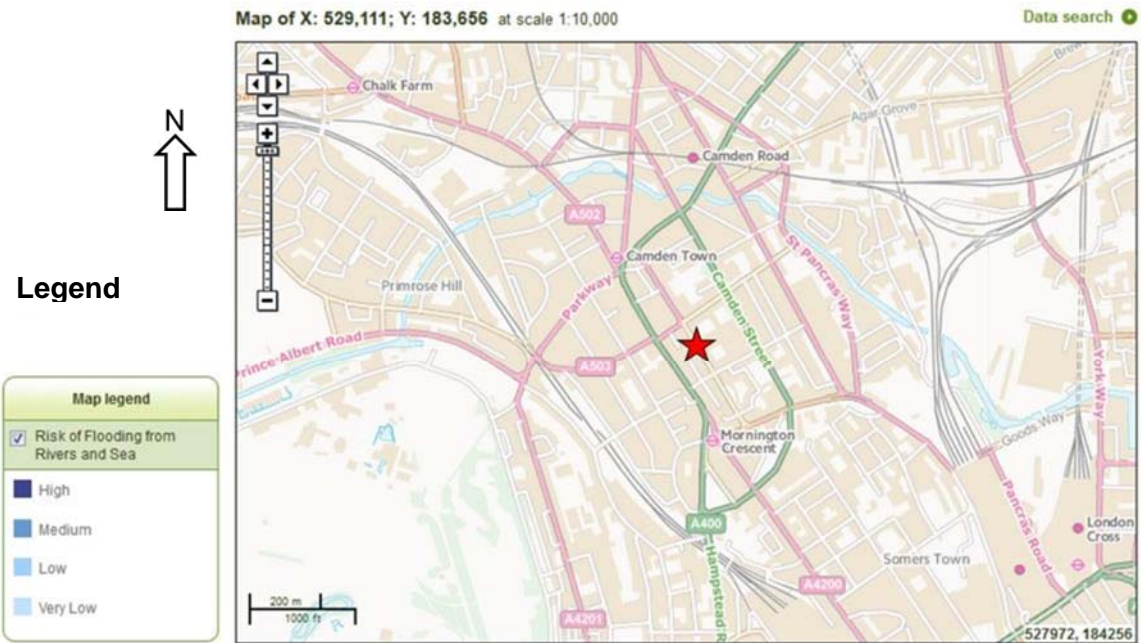
No. There will be no change in the proportion of hard landscaped areas. Refer figures A1 and A2 in Appendix A.

5.01.4 SF Q4 *Will the proposed basement result in changes to the profile of inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?*

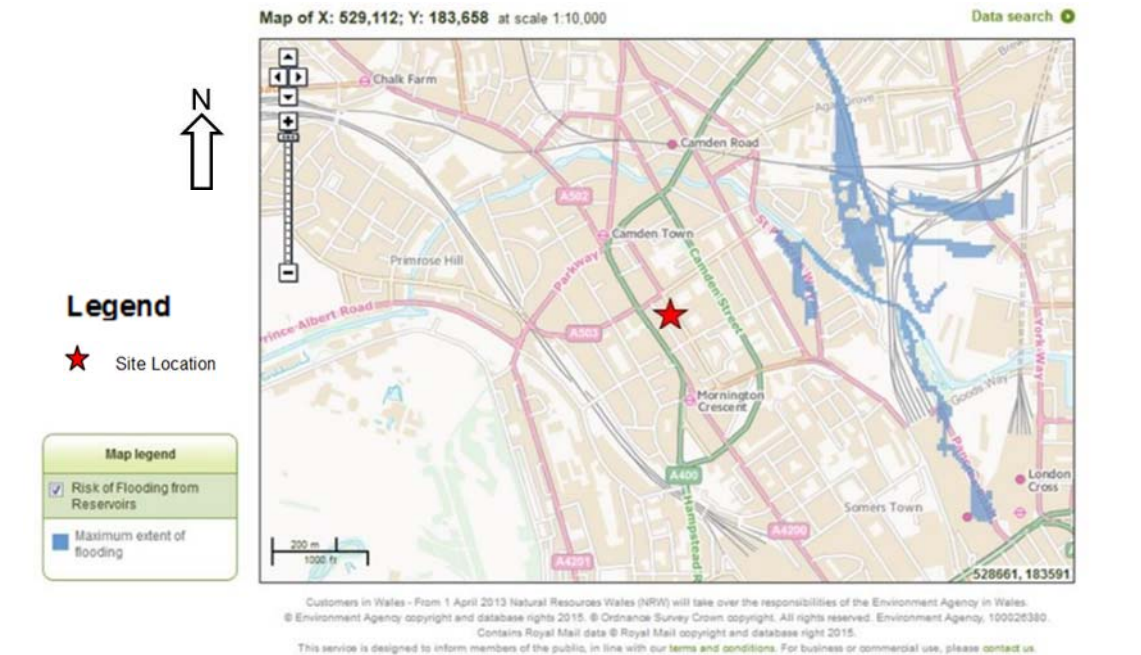
No. There will be no change in the areas of hard landscaping.

5.01.5 SF Q5 *Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream water courses?*

No. The surface water quality will not be affected by the development, as in the permanent condition collected surface water will be generally be from roofs, or external hard landscaping as existing.



**Figure (n)**  
Areas at Risk of Flooding from Rivers or Sea  
(Extract from Environment Agency flood map)



**Figure (o)**  
Areas at Risk of Flooding from Reservoirs  
(Extract from Environment Agency flood map)



- 5.01.6

On the basis of items 5.01.1 to 5.01.5 above and in accordance with the Figure 3 in Camden Planning Guidance CPG 4 (2013 Ravision), there are no aspects that should be carried forward to a scoping stage in respect of Surface Flow and Flooding.
- 5.01.7

SF Q6

*Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, 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. Bayham Street is not one of the streets noted within the Camden Planning Guidance CPG 4 (2013 Revision) as a street “at risk of surface water flooding” (Figure (p)).

A ‘Sewer History’ enquiry to Thames Water (Appendix A) gave no record of surcharge of sewers having previously affected this particular property.

With reference to the EA Rivers and Sea Flood Maps (Figure (n)), the site is not located within a flood risk zone. The EA Reservoir flood map (Refer figure (o)), shows that the site is not at risk of flooding from reservoirs.

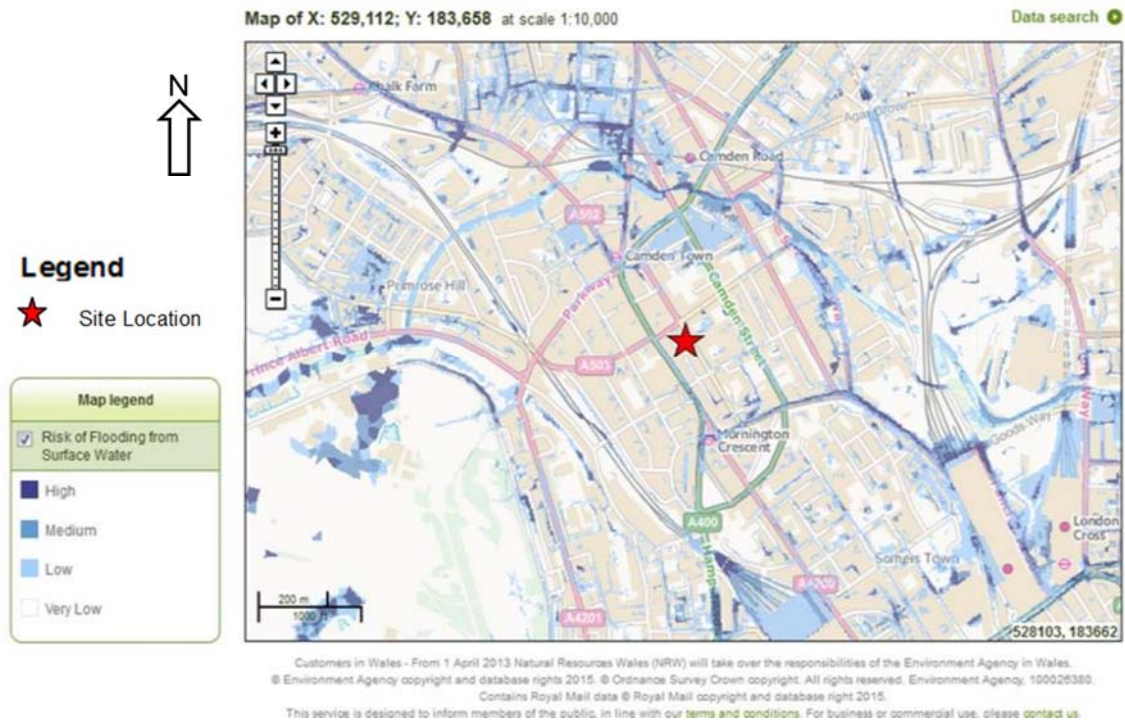
With reference to the EA surface water flooding maps (Figure (q)) the site is at ‘low risk’ of flooding.

- 5.01.8

On the basis of the above and in accordance with the Figure 3 in Camden Planning Guidance CPG 4 (2013 Revision), a flood risk assessment in accordance with PPS25 is not required.



**Figure (p)**  
Flood Map  
(Extract from Fig 15 of Camden Geological, Hydrogeological and Hydrological Study)



**Figure (q)**  
Flooding from Surface Water  
(Extract from Environment Agency flood map)



**APPENDIX A**  
**IMPERMEABLE AREA PLANS**