

Basement Impact Assessment

Stage 1 – Screening &

Stage 2 - Scoping

Introduction

A Basement Impact Assessment (BIA) is required for all planning applications with basements in Camden.

Basement Impact Assessments must be prepared in general accordance with policies and technical procedures contained within the documents listed below.

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG): Basements (March 2018).
- [Camden Local Plan 2017](#)¹ (: Policy A5 Basements and Policy CC3 Water and flooding.

Policy A5 Basement Requirements

Camden's Local Plan 2017 Policy A5 'Basements' is the essential planning policy which must be satisfied in order for basement development to be acceptable.

The Council will only permit basement development where it is demonstrated to its satisfaction that the proposal will not cause harm to neighbouring properties or the structural, ground, or water conditions of the area.

The policy sets out that 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:

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

Exceptions to the above may be made on large comprehensively planned sites. It is recommended that development proposals are discussed with LBC at the outset of any development planning.

¹ <https://www.camden.gov.uk/localplan>

7 Oakeshott Avenue, Camden

Basement Impact Assessment Stage 1 – Screening & Stage 2 - Scoping

For

Eva Halls

Project Number: 3388

May 2020

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Additional supporting documents

Please note – the review process will be quicker if these are submitted as Word documents or searchable PDFs.

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Appendix 1: Desk Study References

1.0 Non-Technical Summary

- 1.1.1. The site location is 7 Oakeshott Avenue, Camden, N6 6NT see site location plan in Section 2.3.
- 1.1.2. The current site arrangement is a two-storey detached residential dwelling with private gardens to the front and rear of the property.
- 1.1.3. The proposal is to construct a shallow (1.5m deep) outdoor swimming pool adjacent to the western boundary and new rear extension as described in Section 2.4.
- 1.1.4. The following assessments are presented in this report:
 - Desk Study
 - Stage 1 - Screening
 - Stage 2 - Scoping
- 1.1.5. The purpose of this Stage 1 Screening and Stage 2 Scoping is to assess the hydrological, hydrogeological and land stability impacts associated with the construction of the new swimming pool.
- 1.1.6. The authors of the assessments are Claire Munns BSc, MEnvSc and reviewed by Matt Dean BEng., CEng., CEnv., C.WEM, MCIWEM and Neil Carruthers BSc, MSc, CGeol FGS, CEng MIMMM.
- 1.1.7. Given the current and historical use of the site as a dwelling with garden space, Made Ground is anticipated to be <1m thick. The Claygate Member, classed as a secondary A aquifer, is shown to be present to an approximate depth of 2m but could be thinner due to the closeness of the stratum boundary. There will be no formal water table in the Claygate Member, only discrete bands of permeable silty sand which could hold small volumes of groundwater that would be expected to rapidly purge during construction. The underlying London Clay Formation is expected to be >40m thick and is an unproductive stratum.
- 1.1.8. The introduction of swimming pool will slightly increase the angle of inclination of the garden which extends in a northerly direction behind an earth retaining wall (and plant room) that separates the garden and swimming pool.
- 1.1.9. A satisfactory understanding of the potential risks and impacts have been identified associated with the construction of the new swimming pool. There does not appear to be any significant issues that necessarily require immediate assessment as part of a planning application, as the impact from the slight change in garden inclination can be easily designed during the design of the pool structure and associated retaining wall.

2.0 Introduction

The purpose of this Stage 1 – Screening and Stage 2 – Scoping is to inform the potential impacts from proposed subterranean development works at 7 Oakeshott Avenue, Camden, N6 6NT on the local hydrology, geology, hydrogeology and wider environment. The outcomes of the Stage 1 – Screening will be used to further inform the Stage 2 – Scoping, and the need for a full Basement Impact Assessment.

The site location plan is presented in Appendix 1 and in Section 2.3. The subterranean works proposed include the construction of a shallow outdoor swimming pool. There are **no** plans to build a replacement dwelling or construct a conventional basement structure below the dwelling. The swimming pool forms part of wider refurbishment of the existing residential dwelling including a single storey extension and general landscaping. The swimming pool is the subterranean structure that is being assessed in this report.

As a subterranean structure is proposed, The London Borough of Camden (Camden) has requested a Stage 1 – Screening Assessment to be completed in line with the approach set out in the current planning procedure for basements and lightwells adopted by LB Camden. This comprises the following elements (CPG Basements):

- Desk Study;
- Screening; and
- Scoping;

2.1. Authors

2.1.1. The BIA has been authored by Claire Munns BSc, MEnvSc and reviewed by Matt Dean BEng., CEng., CEnv., C.WEM, MCIWEM and Neil Carruthers BSc, MSc, CGeol FGS, CEng MIMMM.

2.2. Sources of Information

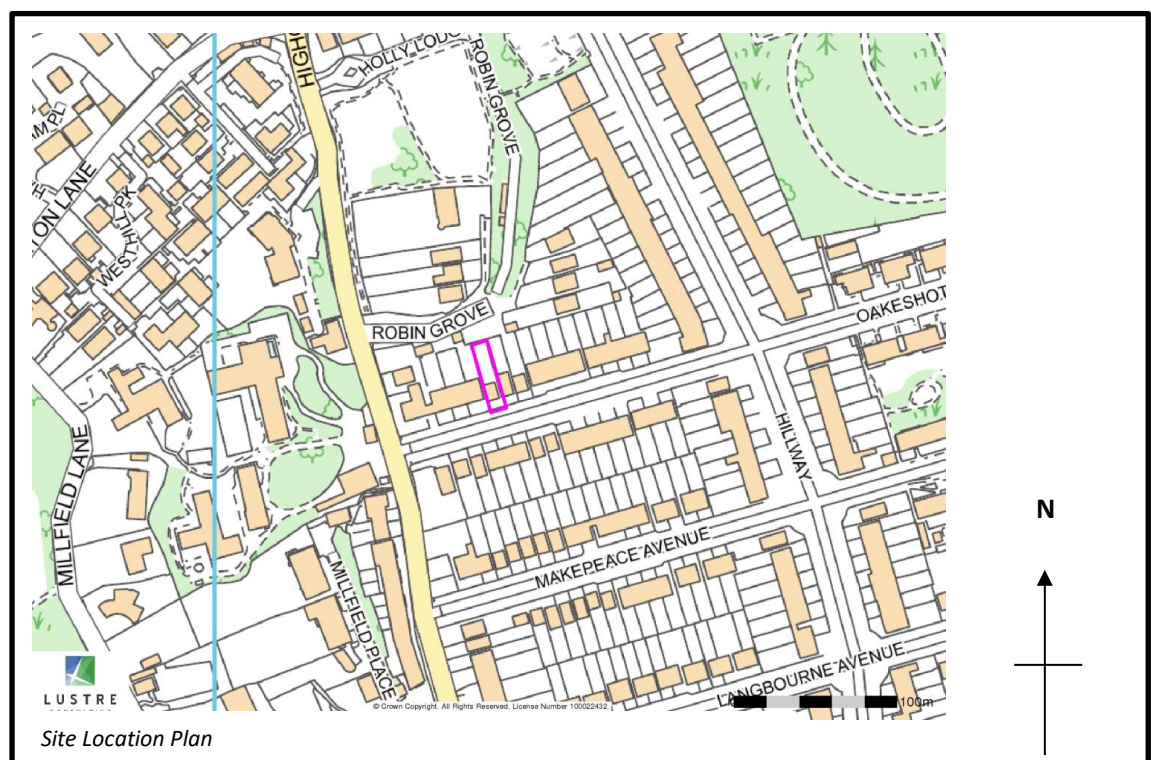
The following baseline data have been referenced to complete the BIA in relation to the proposed development:

- Review of photographic evidence of the current site conditions provided by the owner along with aerial imagery;
- Current/historical mapping Appendix 1;
- Geological mapping Appendix 1;
- Hydrogeological data Appendix 1;
- Current/historical hydrological data Appendix 1;
- Flood risk mapping Appendix 1;
- LB Camden, Strategic Flood Risk Assessment (produced by URS, 2014);
- LB Camden, Floods in Camden, Report of the Floods Scrutiny Panel (2013);

- LB Camden, Planning Guidance (CPG) – Basements (March 2018);
- LB Camden, Camden Geological, Hydrogeological and Hydrological Study – Guidance for Subterranean Development (produced by Arup, 2010);
- LB Camden, Local Plan Policy A5 Basements (2017); and
- LB Camden’s Audit Process Terms of Reference;

2.3. Existing Site Location

- 2.3.1. The site where the swimming pool is located is generally rectangular in plan, and is centred at National Grid Reference 528170, 186790. The entire residential site occupies an approximate area of 0.05ha as shown on the site location plan included in Appendix 1 and below. The existing dwelling is a two-storey detached residential dwelling with gardens to the front and back of the property.
- 2.3.2. The Application site is located at 7 Oakeshott Avenue, London and is within hillside setting that slopes up away from the rear of the house to the north.
- 2.3.3. The site is at an elevation of approximately 85.8m AOD at the southern end of the site (front garden), rising to 90.1m AOD (approximately a 4m rise) at the far northern end of the site (back garden). Based on the entire length of the site being approximately 46m this gives an angle of inclination of approximately 6°. The back garden has an angle of inclination of approximately 7.5°.
- 2.3.4. The rise is far less pronounced going east up Oakeshott Avenue, with only a gentle inclination to the east - northeast. This results in the elevation of the neighbouring 5 Oakeshott Avenue being approximately 0.2m lower and 9 Oakeshott Avenue being 0.2m higher.



Site Inspection

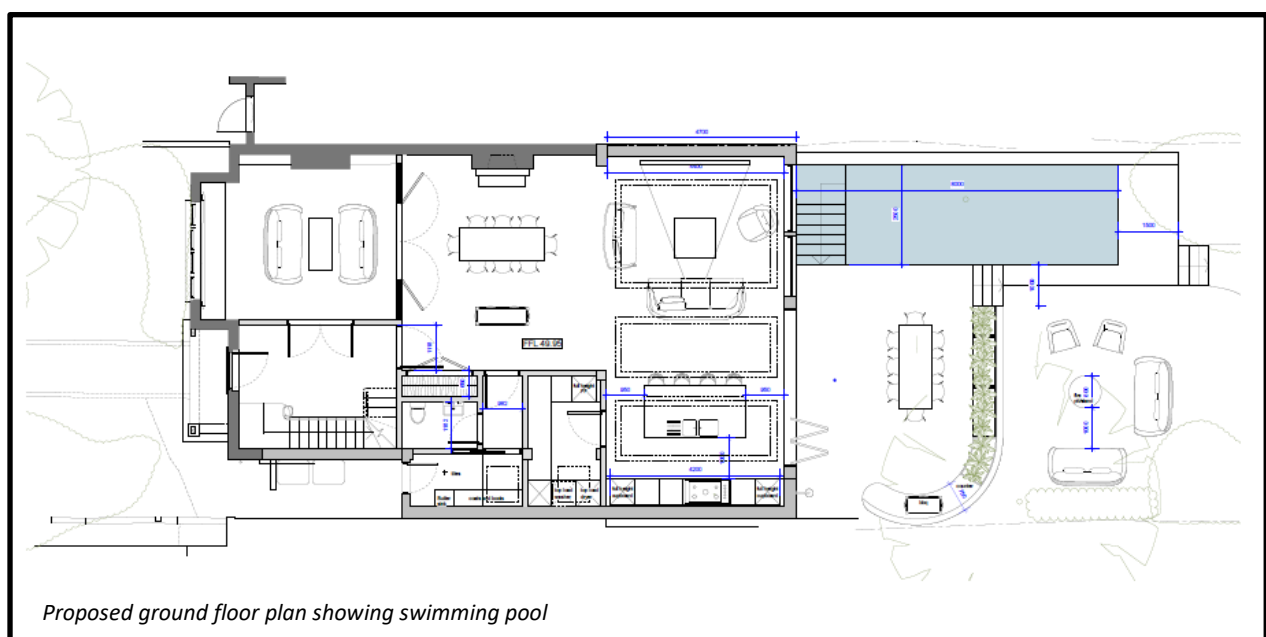
- 2.3.5. A review of the current site layout was undertaken using photographs and aerial imagery provided by the property owner.
- 2.3.6. This identified that a small flat concrete patio is present to the rear of the property (where the proposed extension will be situated). The remaining garden area is present as grass which slopes upward towards the northern boundary of the property.
- 2.3.7. There is a brick retaining wall present between the patio and lawn; the height difference is estimated to be 0.9m. Access to the garden is via steps at either end of the patio. The majority of the garden area is laid to grass; however, trees including at least two mature trees are present along the eastern and western boundaries.

Surrounding Area

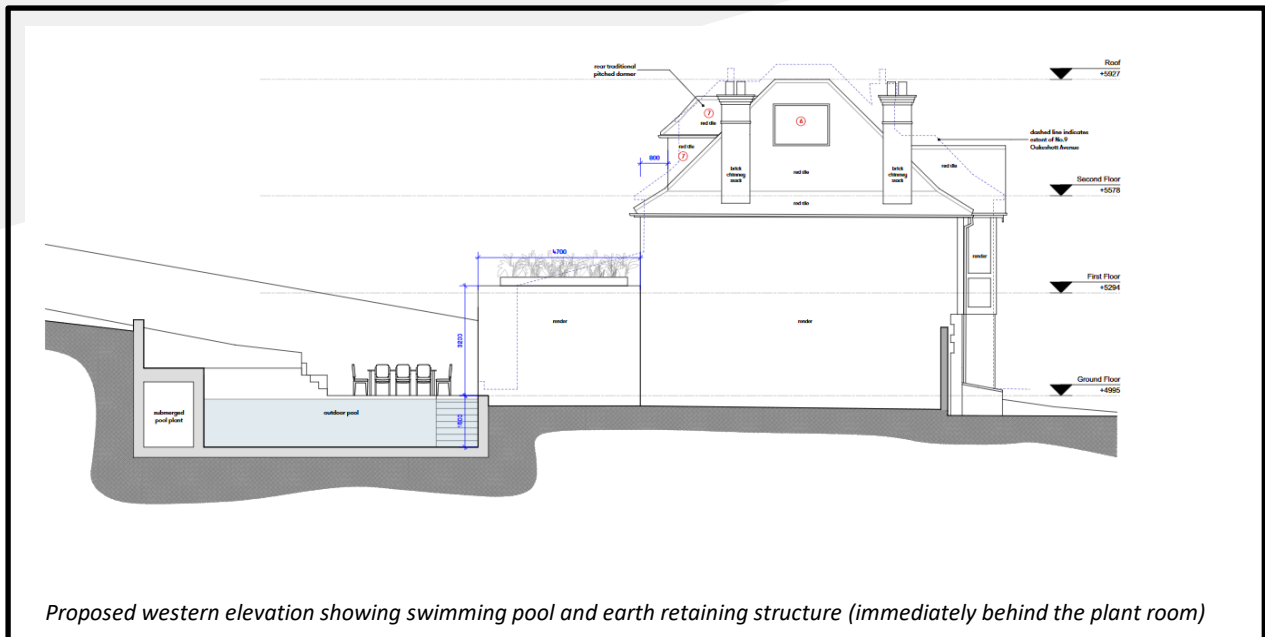
- 2.3.8. The property is located within the Holly Lodge Conservation Area (a designated heritage asset). This is predominantly residential area with a small amount of commercial land use in the form of offices.
- 2.3.9. Adjacent to the northern boundary of the site is Robin Grove beyond which are low rise residential properties. To the south of the property is Oakeshott Avenue beyond which are low rise residential properties. Residential properties also adjoin the site to the east (no 9 Oakeshott Avenue) and to west (no 5 Oakeshott Avenue).
- 2.3.10. The structural composition of the surrounding properties is not known, nor the foundation depths, but conventional shallow trench filled footings are anticipated supporting the dwellings. The presence of basements at the other surrounding properties is not known. None of the neighbouring properties are listed.

2.4. Proposed Development

- 2.4.1. The proposed development is for a shallow outdoor swimming pool as shown in the two figures below, that form part of wider improvement and refurbishment works to the exiting dwelling.



Proposed ground floor plan showing swimming pool



- 2.4.2. The swimming pool will be 8m by 2.5m in size and 1.7m depth (including the concrete pool base). The pool is located adjacent to the western garden boundary, the steps down into the pool starting at the same finished floor level as the rear extension. Due to the northerly slope of the garden, and to keep the finished floor level of the extension the same at the patio and swimming pool steps, would therefore extend deeper into the slope compared to the current configuration. To obtain this feature, an earth retaining structure will need to be built into the garden up to 3.5m in depth/ height. The retaining structure will extend around the patio and immediately behind the submerged plant room serving the pool. The slight drop in the neighbouring 5 Oakeshott Avenue garden, will mean that the finished floor level of the extension and patio will remain largely the same as the current patio and property with a height difference of approximately 0.4m. The resulting angle of inclination directly behind the new retaining wall will increase slightly to 7.5°, up to a maximum 10.75° at the far end of the back garden.
- 2.4.3. The patio beside the swimming pool will be finished in permeable paving, with the earth retaining behind the plant room, curving back around the lawn towards the house. Steps would then lead up from the patio to the garden sloping north beyond. The pool will have its own drainage system that will be controlled by a dedicated sump and pump system in the plant room to manage and limit the flow of runoff water back into the existing surface water drainage system.

3.0 Desk Study

3.1. Site History

On Site

- 3.1.1. The site history has been assessed by reviewing historical Ordnance Survey maps provided by Envirocheck (Report No. 241156456_1_1, dated April 2020), extracts of which are in Appendix 1.
- 3.1.2. The earliest map of the site is dated 1870 to 1873; this shows the site to be undeveloped, forming part of a field containing trees. There are no notable changes until historical map record for 1935. By 1935, the site had been cleared of trees and a house had been constructed in the southern portion of the site. The remainder of the site was present as gardens. There are no further changes recorded at the site.

Off Site

Surrounding Land Use	Distance / Bearing	Date Feature Present	Date Feature Absent
Residential Houses	0m E	1935	-
	0m W		
	30m S		
Lodge	50m W	1896	1935
Villas (residential / recreational)	120m W	1870	-
Highgate Cemetery	200m NE	1870	-
Highgate Pond	250m W	1870	-
Men's Bathing Pond	300m SW	1873	-

- 3.1.3. A series of interconnected ponds known as Highgate Ponds are located from 300m west of the site orientated in a northwest/southeast direction. Other historical land uses between 250m and 500m from the site include a church, schools, and allotment gardens; only the allotment gardens are identified by present day map records.

3.2. Geology

- 3.2.1. The 1:50,000 British Geological Survey (BGS) map (Sheet 270)² and the BGS website (National Geoscience Information Service)³ show the site to be directly underlain by the Claygate Member, comprising dark grey clays with sand laminae, passing up into thin alternations of clays, silts and

² BGS Solid and Drift Map Sheet 270

³ Information from BGS website: www.bgs.ac.uk consulted in month of report issue

fine-grained sand, with beds of bioturbated silt. The Claygate Member is underlain by the London Clay Formation, comprising poorly laminated, blue-grey or grey-brown, silty to very silty clay.

- 3.2.2. It is noted that the boundary of the Claygate Member is close to the site. Therefore, the site could be directly underlain by the London Clay Formation.
- 3.2.3. Given the limited recorded development at the site, a significant layer of Made Ground (>1m) is not anticipated beneath the gardens. Localised areas of Made Ground may present beneath the building footprint and any associated hardstanding.
- 3.2.4. Historic borehole records have been identified relating to boreholes drilled within the general vicinity of the site and surrounding area. The closest historic borehole was recorded approximately 315m northwest of the site (TQ28NE42). A summary of ground conditions encountered is provided below and a copy of the borehole log is included in Appendix 1.
- Topsoil: to 1.4m bgl.
 - Claygate Member: Stiff brown mottled sandy clay to 5.6m bgl.
 - London Clay Formation: Stiff blue clay to base of the borehole at 6.1m bgl.
 - There are no groundwater strikes recorded.
- 3.2.5. Other relevant historic borehole records from the surround area were identified as follows:
- TQ28NE14 located 700m south of the site in an area directly underlain by the London Clay Formation. This record identified the London Clay Formation was proven at a depth of 72m. Depth to groundwater was 64m, it is unclear if this level was recorded during drilling or during monitoring.
 - TQ28NE412 located 1km northwest of the site in an area directly underlain by the Claygate Member. This record identified fill (brick & ash) to a depth of 2.6m bgl over stiff to very stiff fissured silty clay which remained unproven at base of the hole (20m bgl). No groundwater was encountered.
- 3.2.6. The BGS also holds data on non-coal mining areas and potential ground stability hazards for the UK that may affect the site. The Coal Authority holds data on coal mining affected areas for the UK. The non-mining and potential ground stability hazards provided by Envirocheck are summarised in the following table.

Details	On-site	Hazard Potential
Mining Instability	No	No Hazard
Man-Made Mining Cavities	No	No Hazard
Natural Cavities	No	None Recorded
Coal Mining Affected Area	No	No Hazard
Non-Coal Mining Affected Area	No	No Hazard
Potential for Collapsible Ground Stability Hazards	Yes	Very Low
Potential for Compressible Ground Stability Hazards	No	No Hazard

Potential for Ground Dissolution Stability Hazards	No	No Hazard
Potential for Landslide Ground Stability Hazards	Yes	Very Low
Potential for Running Sand Ground Stability Hazards	No	Very Low
Potential for Shrinking or Swelling Clay Ground Stability Hazards	Yes	Moderate

- 3.2.7. There are no BGS Recorded Mineral entries listed within 1km of the site.
- 3.2.8. No man-made cavities or natural cavities are recorded within 1km of the site.
- 3.2.9. The site is located within a low probability radon area, as less than 1% of homes are above the action level; no radon protective measures are considered necessary in the construction of new dwellings or extensions.

3.3. Hydrogeology

- 3.3.1. The Claygate Member underlying the site is classified as a Secondary A Aquifer. Secondary A aquifers may contain permeable layers of soil capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Typically, the Claygate Member is principally a clay, but does contain sandy layers and thin granular beds that contain perched water. The London Clay Formation is classified as an unproductive stratum.
- 3.3.2. LB Camden data indicates the site is not within a groundwater source protection zone.
- 3.3.3. There are no groundwater abstractions recorded within 1km of the site.

3.4. Hydrology, Drainage and Flood Risk

- 3.4.1. The site is not located within a Local Flood Risk Zone. The site is defined by the Environment Agency as having less than 1:1000 probability of fluvial and tidal flooding (the lowest level indicated on their mapping).
- 3.4.2. The site is located within critical drainage area Group3_001 but is not located within a local flood risk zone as defined by LB Camden. The flood risk from surface water maps indicate the site to be at very low risk from surface water flooding.
- 3.4.3. There are no surface water abstractions within 1km of the site.
- 3.4.4. The nearest open water features to the site are Highgate Ponds, which at their closest point are located 300 m to the west of the site. The elevation of the ponds is around 20 m lower than the site.
- 3.4.5. The Highgate ponds are situated along the line of the historic River Fleet watercourse, which is now primarily culverted and assimilated into the sewer network. A tributary (also now

culverted), shown in Figure 11 of the Camden Geological, Hydrogeological and Hydrological Study, is indicated along Swain's Lane, approximately 400 m to the east of the site.

- 3.4.6. The site is situated just outside the catchment of the Hampstead Heath Pond Chain.
- 3.4.7. The site surface area (in its entirety) is currently 35% impermeable comprising a residential dwelling and patio area. It has been assumed the surface water runoff from the roof of the property currently connects to a sewer network on Oakeshott Avenue.
- 3.4.8. The swimming pool is 20m² and will be an open outdoor pool with plant room situated in the rear garden of the site. The plant room will also contain a sump and pump system to manage and restrict any water that may overflow from the pool into the existing drainage system at the site.

3.5. Other Information

Ecology

- 3.5.1. According to data from the Envirocheck report, a Site of Special Scientific Interest known as Hampstead Heath Woods and an Ancient Woodland known as Ken Wood are located approximately 760m west of the site.
- 3.5.2. No other records of sensitive land uses (such as Sites of Special Scientific Interest, Special Areas of Conservation, Special Protection Areas, Areas of Outstanding Natural Beauty, Local Nature Reserves, Nitrate Vulnerable Zones) were identified within 1km of the site.

Environmental Regulatory Records

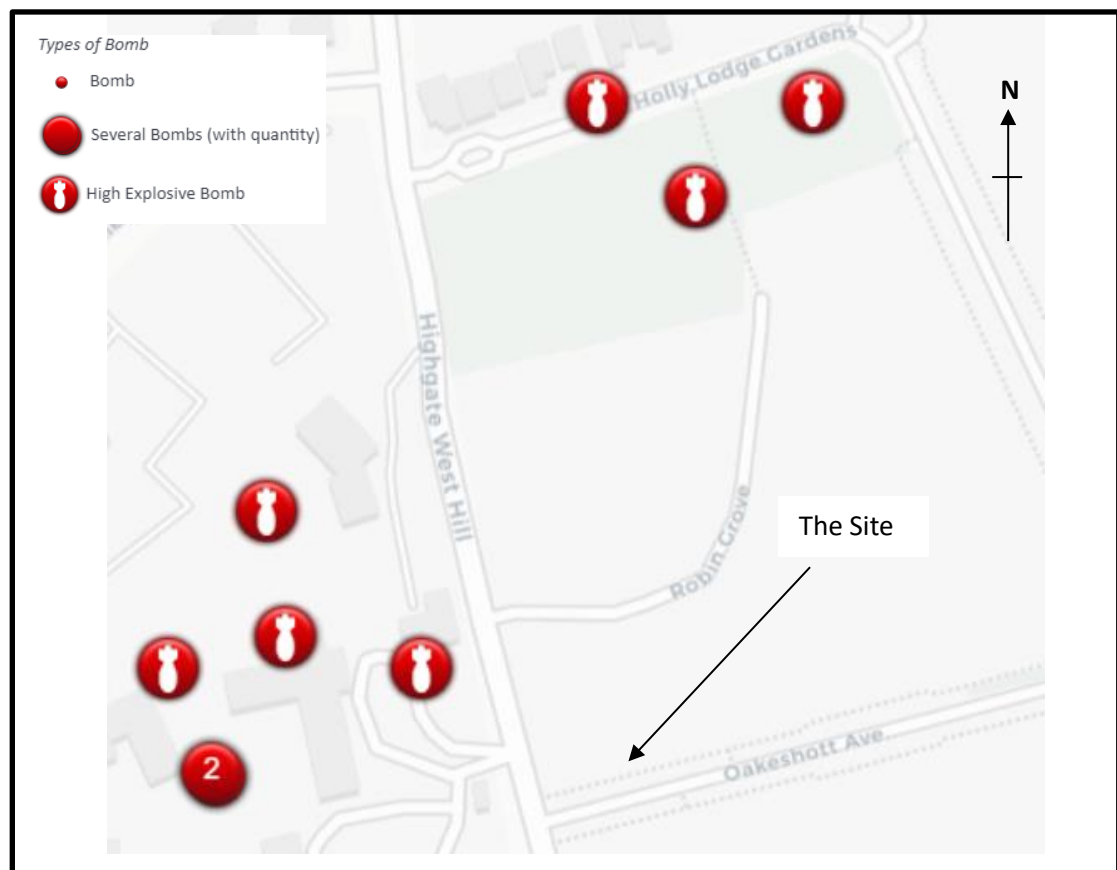
- 3.5.3. Information on potentially significant environmental issues and controls at the site and surrounding area have been sourced directly from the regulatory authorities via the Envirocheck database. Relevant extracts of the Envirocheck Report are provided in Appendix 1 and a summary provided in the table below.

Public Record	On site / Off site	Features
Environmental Permits and Controls	Off site	No Local Authority Pollution Prevention and Controls have been identified within 250m of the subject site.
Pollution Incidents to Controlled Waters	Off site	There are no pollution incidents recorded within 250m of the site.
Hazardous Substances	Off site	There are no hazardous substances (e.g. Control of Major Accident Hazards (COMAH), Notification of Installations Handling Hazardous Substances (NIHHS) or Planning Hazardous Substance Consents) recorded within 250m.
Landfill Sites	Off site	There are no landfill sites recorded within 1km of the site.
Waste Management Facilities	Off site	There are no Licensed Waste Management Facilities (LWMF) or registered waste treatment / disposal sites recorded within 250m of the site.

Public Record	On site / Off site	Features
Contemporary Trade Directory Entries	On site	None recorded.
	Off site	A total of three contemporary trade directory entries are recorded within 250m of the subject site. The closest entry is located 30m SW for an electronic engineers (Electrocoin). Other entries are for a carpet, curtain & upholstery cleaners as well as for antiques - repairing & restoring.
Petrol Filling Stations (PFS)	Off site	None recorded within 250m of the site.

Unexploded Ordnance

- 3.5.4. An historical record bomb search using bombsight.org was undertaken in the vicinity of the site. The search was limited to WW2 bombs. The results are shown below.



- 3.5.5. The findings of the search identified no potential bomb sites associated with WW2 bombs within the site boundary.
- 3.5.6. However, potential bomb sites were located in close proximity to the site as shown in the above figure. The nearest bomb site (a high explosive bomb) is located 75m west of the site. The historical review did not identify any evidence of bomb damage to buildings in Oakeshott Avenue and the site. Overall, this suggests there is a Low UXO risk on this site

4.0 Screening

A screening process has been undertaken and the findings are described below.

Question	Response	Details
1a. Is the site located directly above an aquifer?	Yes	The site is underlain by the Claygate Member which is classified as a Secondary A Aquifer. This is expected to comprise sandy layers in the Claygate Member with relatively small quantities of isolated perched groundwater only.
1b. Will the proposed basement extend beneath the water table surface?	No	A water table is not expected to be present in the Claygate Member. Only isolated perched groundwater in sandy layers in the clay.
2. Is the site within 100m of a watercourse, well (used / disused) or potential spring line?	No	Based on available desk study information and Envirocheck report, no watercourses, reservoirs, wells or springs within 100m.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No	The site is located just outside to the east of the catchment. The nearest pond is 300m away and at an elevation 20m below the level of the site.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No	The proposed swimming pool will cover an area of 20 m ² and will be an open outdoor pool. The pool will receive rainwater and any excess water will run into the pool's own drainage system that will be controlled by a dedicated sump and pump system to manage an expected negligible flow of water back into the existing surface water drainage system.
5. As part of site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No	Surface water will continue to be discharged via existing sewers.
6. 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	There are no ponds or surface water features within 100 m of the site.

4.1. Slope Stability

Question	Response	Details
1. Does the existing site include slopes, natural or man-made greater than 7 degrees (approximately 1 in 8)?	Yes	The topography at the back garden has an angle of inclination of approximately 7.5° (near the house) rising to 10.75° at the end of the back garden, so slightly greater than 7° where the swimming pool is to be located.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees (approximately 1 in 8)?	Yes	The proposed development will result in a new angle of inclination for the length of the back garden of approximately 9.5° behind

		the swimming pool earth retaining wall up to the end of the back garden.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees (approximately 1 in 8)?	No	All transport infrastructure is outside the zone of influence from development at the site and the neighbouring dwellings generally all gently slope up together up Oakeshott Avenue.
4. Is the site within a wider hillside setting in which the general slope is greater than 7 degrees (approximately 1 in 8)?	Yes	Areas of land to the north, east and west of the site indicate slopes that may be greater than 7 degrees.
5. Is the London Clay the shallowest strata at the site?	No	Based on BGS map records the Claygate Member is the shallowest strata at the site (expected to be <2m), with the strata boundary close to the south western boundary.
6. Will any trees be felled as part of the development and/or are any works proposed within any tree protection zones where trees are to be retained?	No	No trees are to be felled as part of the swimming pool (or wider refurbishment works).
7. Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?	No	However, London Clay Formation and Claygate Member has a high to very high volume change potential soil and is prone to shrink and swelling.
8. Is the site within 100m of a watercourse or a potential spring line?	No	Based on EA website and Envirocheck report, no watercourses, reservoirs, wells or springs within 100m.
9. Is the site within an area of previously worked ground?	No	The only development works on the site were to construct the current building.
10. 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?	Yes	Whilst the Claygate Member is a Secondary A Aquifer and is expected to be relatively thin. Therefore, a formal groundwater table will not be present and is only likely to contain some groundwater in confined sandy beds.
11. Is the site within 50m of the Hampstead Heath Ponds?	No	The site is located 300m east of the Hampstead Heath Ponds.
12. Is the site within 5m of a highway or pedestrian right of way?	No	The site is located within a private road
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No	Planning History does not state that neighbouring properties have basements. As the surrounding properties are low rise they are likely to have shallow spread foundations. Swimming pool will be of a shallow depth, the underside of the base slab is therefore likely to be similar to existing foundations.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No	According to the LUL Property Asset Register the site is not within an Exclusion Zone.

4.2. Surface Water and Flooding

Question	Response	Details
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1. Is the site within the catchment of the ponds chains on Hampstead Heath?	No	The site is situated to the east of the catchment.
2. 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	The site is understood to discharge to an external sewer network. This arrangement is proposed to continue the same post refurbishment and construction of the swimming pool, with no changes in the drainage route.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	The proposed swimming pool will cover an area of 20 m ² and will be an open outdoor pool. The pool will receive rainwater and any excess water will run into the pool's own drainage system that will be controlled by a dedicated sump and pump system to manage an expected negligible flow of water back into the existing surface water drainage system.
4. 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 swimming pool is an open body of water and therefore will not materially change inflows into the existing drainage system. There will also be a sump and pump system to manage and restrict any overflow of water that may occur back into the existing drainage, as with any swimming pool in a garden location.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	All foul sewerage will be connected to the public sewer network. Surface water quality will not be affected.
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature.	No	The site located within critical drainage area Group3_001 but is not located within a local flood risk zone. The flood risk from surface water maps indicate the site to be at very low risk from surface water flooding.

4.3. Non-Technical Summary of Screening Process

4.3.1. The screening process identifies the following issues to be carried forward to scoping for further assessment:

- The site is be situated over Claygate Member which is recorded as a Secondary A aquifer that may contain small quantities of confined groundwater (no formal water table). The London Clay Formation may be present at a shallow depth (<2m) and is an unproductive stratum.
- The introduction of the extension and swimming pool will increase the angle of inclination to 9.5 degrees, overall to the northerly sloping garden which will be supported by a retaining wall immediately behind the swimming pool and plant room.

4.3.2. The other responses to the questions considered within the screening process have been demonstrated to be not applicable or not significant when applied to the construction of the swimming pool.

5.0 Scoping

5.1. Introduction

- 5.1.1. The main issues raised at the Screening Stage with an answer of either 'Yes' or 'Unknown' have been brought forward for further evaluation and scoping out. The Scoping Stage is to better conceptualise how the subterranean structures could impact on hydrological, hydrogeological and land stability of the site and surrounding environment. The outcomes of the scoping will be used to inform the need for further detailed investigation and assessment to clarify the issues raised during the desk study and Screening Stage.

5.2. Geological, Hydrogeological and Land Stability

- 5.2.1. The desk study has shown that the site is expected to be directly underlain by the Claygate Member, with the strata's boundary located close to the southern boundary of the site. The depth of Claygate Member is unclear but could be shallow (<2m), with the London Clay Formation underlying the site at a depth that could be encountered during the excavation of the swimming pool and its earth retaining structure. The London Clay Formation is likely to be >40m deep and so any deeper strata will not be affected. The resultant angle of inclination after construction of the extension and pool shows the back garden falling to the south and the dwelling at an angle of approximately 7.5 (immediately behind the pool's retaining structure) to 10.75 degrees at the end of the back garden where the slope is at its greatest. This slope angle would need to be considered in the final design of the retaining wall structure (up to 3.5m in height and depth) which may have to be designed to retain earth pressures being exerted from two different strata with different engineering properties. The angle of inclination may also follow the natural dip of the bedding in the stratum, meaning that potential failure surfaces could develop if the bedding planes have lower frictional properties than the surrounding soil mass or higher porewater pressures due to the presence of perched water.
- 5.2.2. No formal groundwater table is expected to be present given the nature of the geological conditions, only perched groundwater may be encountered during the construction of the swimming pool and its earth retaining structure. Groundwater should only be confined to discrete layers of sand and gravel most notably in the Claygate Member. This will not significantly change the hydrogeological nature of the site.
- 5.2.3. Both the Claygate Member and London Clay Formation will also be present at a depth that the effect of shrinkage and swelling from root influence, changes in moisture content or other heave risk factors such as release of overburden pressure following notable changes in ground level. The London Clay Formation and Claygate Member can have a high and very high plasticity, and this would also need to be factored into the design and build of the swimming pool and its earth retaining structure. These factors will require the Structural Engineer to design the swimming pool to accommodate heave. This may include the placement of a foundation protection board

and void former around foundations, under the base of the swimming pool. A similar means of protection may also be needed behind the retaining wall to also manage groundwater build-up/seepage. The clayey stratum is also a known pyritic soil, and this will need to be considered when choosing the concrete to be used in the construction of the structures.

- 5.2.4. A detailed construction method statement will need to be produced by the Structural Engineer/builder to state how the ground stability risk will be mitigated during the construction of the swimming pool and its earth retaining structure. The temporary stability of the excavation will require careful planning to ensure that the works do not impact the existing properties including neighbouring gardens. This could, for example, require a temporary or permanent embedded retaining wall to be installed prior to the main excavation and construction works. The deflection of the retaining wall and swimming pool walls will need to be calculated to ensure that any movement will be within acceptable limits during construction and after completion. An instrumentation and monitoring plan detailing the monitoring regime, allowable limits/trigger levels and mitigation measures should be included.

5.3. Hard Surfaced and Paved External Areas

- 5.3.1. The proposed swimming pool will cover an area of 20m² and any overflow of water will be controlled by a sump and pump system to manage and control the flow of water from the pool entering the existing drainage system that serves the site. This, coupled with the areas of permeable paving proposed as part of the wider landscaping, will help maintain the status quo in terms of surface water runoff from the external areas and encouraging water to ground.

5.4. Summary of Findings and Outcomes

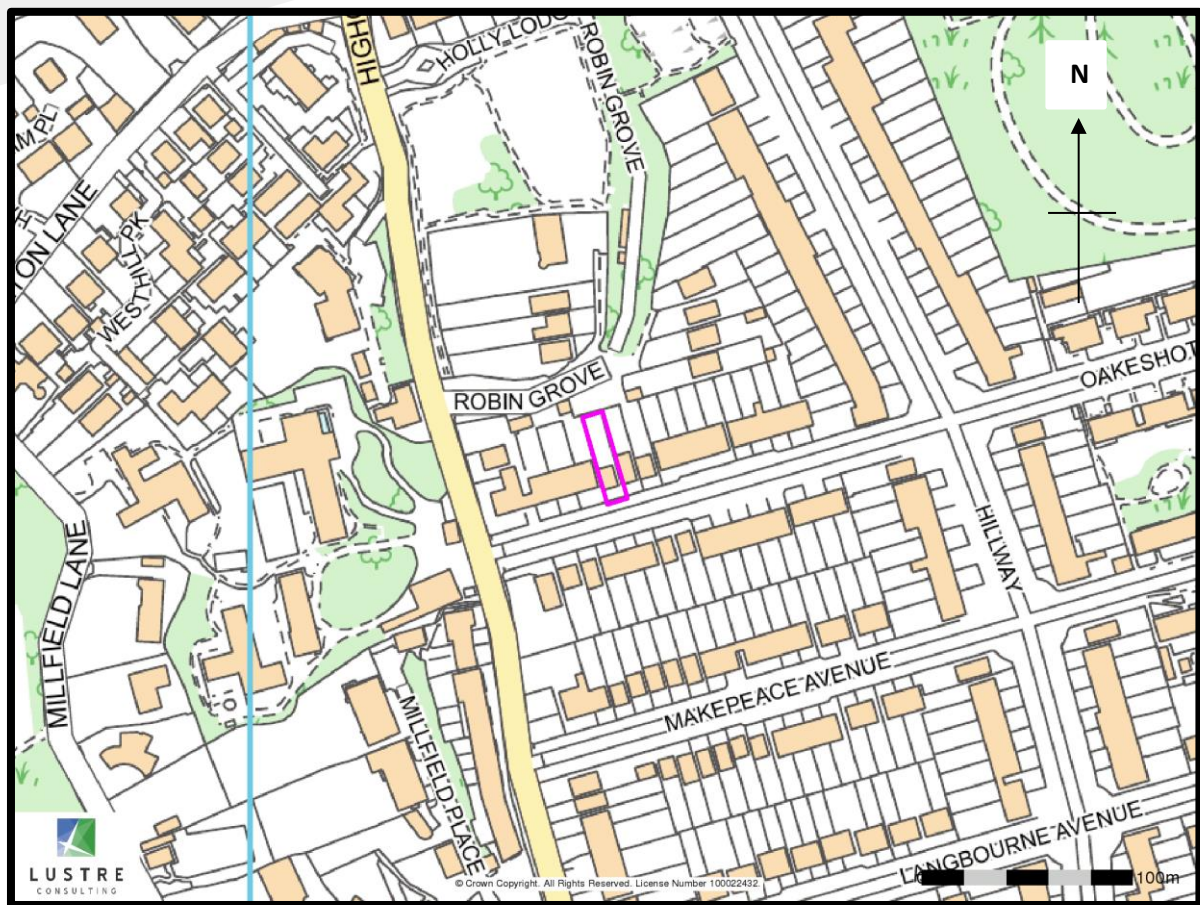
- 5.4.1. The scoping process identifies the following findings and outcomes that should be addressed at detailed design stage and prior to the development of the structures:
- The main observations relating to the swimming pool and its retaining earth wall is determination on the depth and strength of the Claygate Member and how the inclination of the back garden could affect its detailed design.
 - To help further understand this, an investigation of the strength and thicknesses of the Claygate Member and depth to London Clay Formation relative to the deepest part of the retaining wall and underlying the base of the swimming pool is recommended. This should be undertaken as part of a wider assessment for the refurbishment of the property following planning permission and instruction of a structural engineer.
 - Recover soil samples to check moisture content, plasticity and shear strength to verify the potential for any heave and pore water pressures/shearing resistance of soils being retained by the swimming pool and its earth retaining structure. Including Installation of wells to check groundwater confined in discrete permeable layers.

- Check the potential for ground movements and stability behind the retaining structure in relation to natural angle of inclination in the back garden slope (including potentially neighbouring slopes).

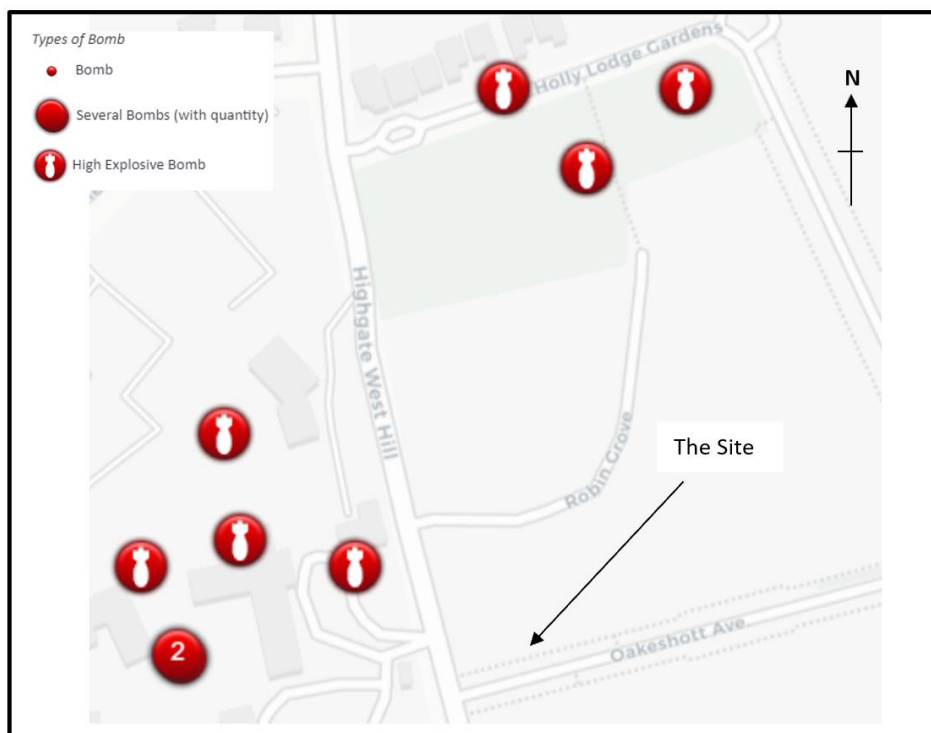
5.4.2. A sufficient understanding of the potential risks and impacts have been identified which will need to be further investigated following granting planning permission. There does not appear to be any significant issues that necessarily require immediate assessment as part of a planning application, as any potential impacts should be easily designed out based on the size and extent of the development proposals limited only to a shallow swimming pool (1.5m deep) and a new slightly deeper garden retaining wall immediately behind the pool. The pool is external and relatively small and so any impacts are going to be relatively small and negligible.

Appendix 1: Desk Study References

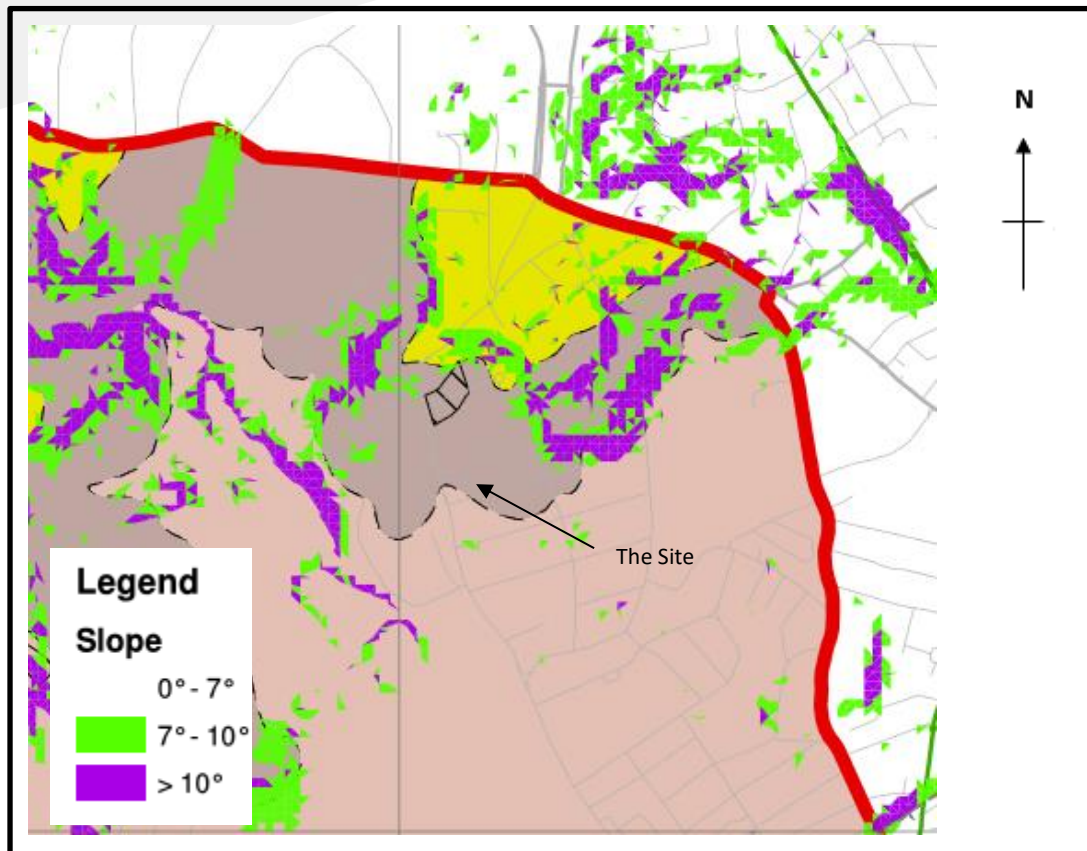
Site Location Plan



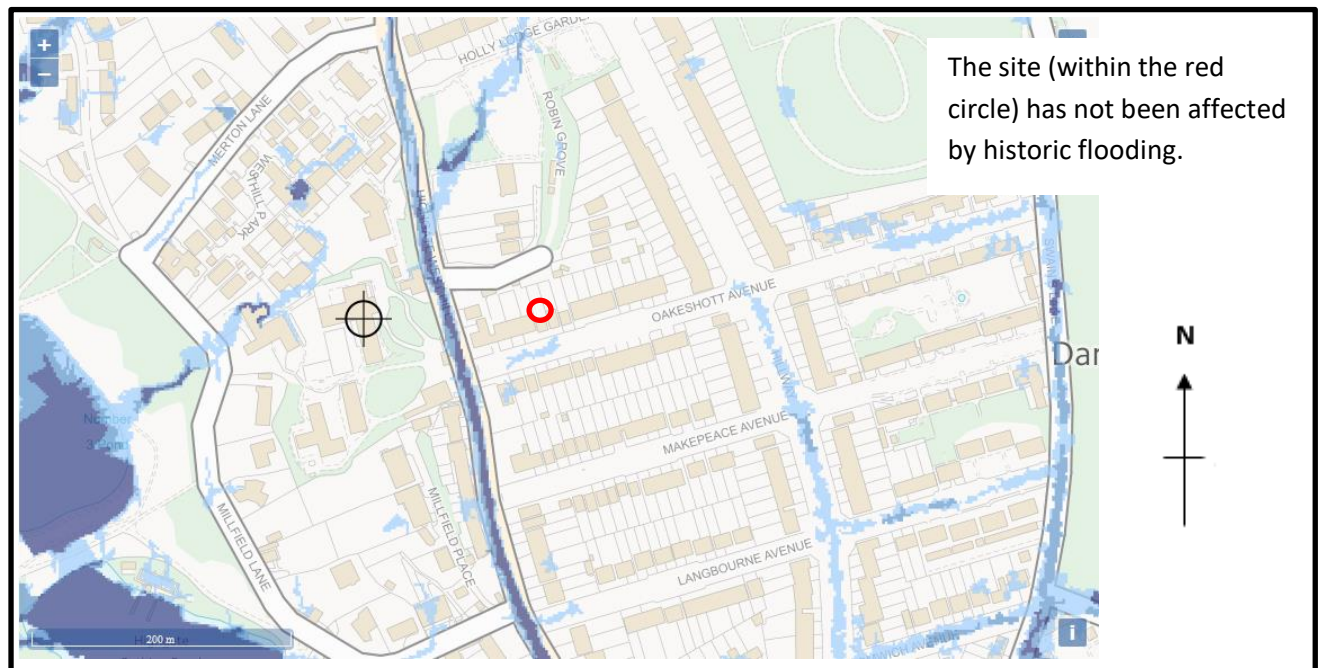
WW2 Bomb Damage Map Extract



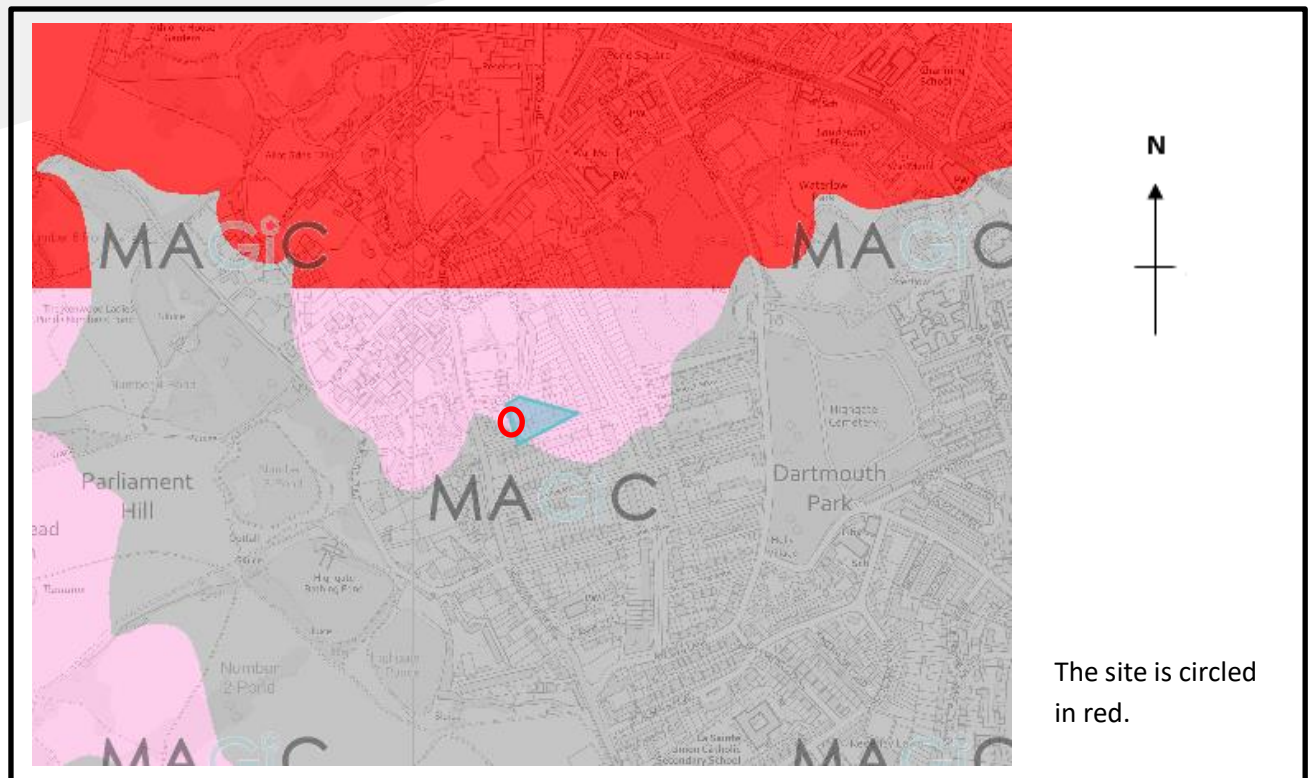
Slope Angle and Worked Ground Map (LB Camden GHHS figure 16)



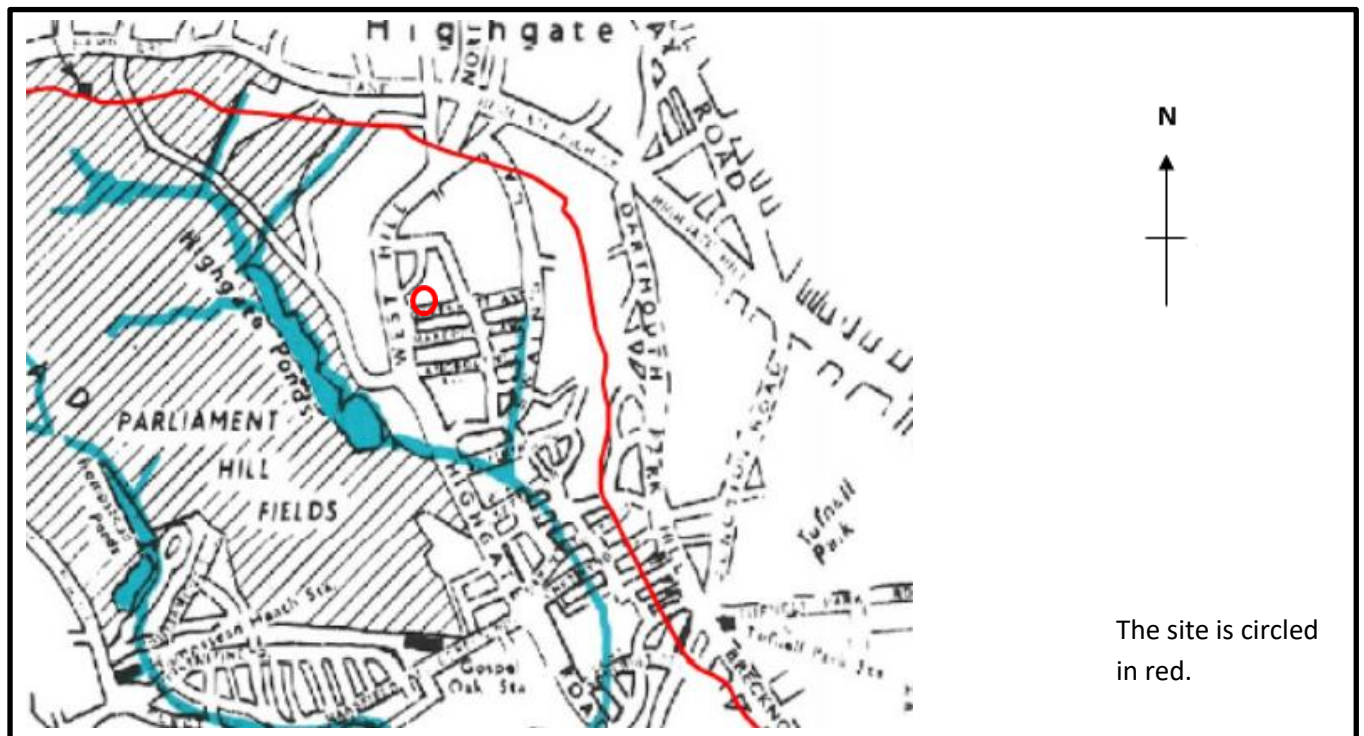
Flooded Streets Map (Flood Warning Information – Environment Agency)



Groundwater Source Protection Zone



Historical Water Courses (LB Camden GHHS Figure 11)



Transport for London Property Asset Register

