



- 1.1.8 The construction methods for lowering the existing basement vary throughout the existing footprint (refer to Figure 2).
- 1.1.9 To the side of the garage adjacent 26 Redington Road (zone A), the construction method will consist of mass concrete underpins below the existing masonry wall, to be cast in hit and miss sequence. Then a new reinforced concrete wall will be installed in front of the mass concrete underpins, propping the wall above the existing ground bearing slab.
- 1.1.10 The existing slab to the rear of the garage will be retained (zone B) to avoid changing the existing support conditions on the higher side of the adjacent existing retaining structure. Elsewhere (zone C), the area will be propped by retaining walls within the footprint of building.
- 1.1.11 The perimeter wall to the back elevation and towards the boundary with No.30 Redington Road (zone D) will be underpinned with reinforced concrete walls, to be cast in hit and miss sequence as well as the new side extension foundations (zone E).
- 1.1.12 The internal load bearing masonry walls will be underpinned in similar hit/miss sequence as the aforementioned walls. Mass concrete walls will sit above reinforced concrete bases dowelled in the new reinforced concrete slab (zone F).
- 1.1.13 The foundation depth below existing front side of the building is approximately 2m below existing finishes floor level. Therefore, no underpinning is needed in this area (zone G).
- 1.1.14 The basement floor shall be formed by a reinforced concrete slab that will tie into and act as prop to the base of the retaining walls. Prior to the excavation of the basement, all existing load bearing walls will be propped and supported off steelwork in the temporary condition.

- 1.1.15 A structural monitoring strategy to monitor any building movement during the works and impacts to neighbouring structures will comprise a series of targets (points) set on the existing front, rear, and party walls of the neighbouring property from ground level to roof level at intervals not exceeding 3m centres horizontally and vertically.

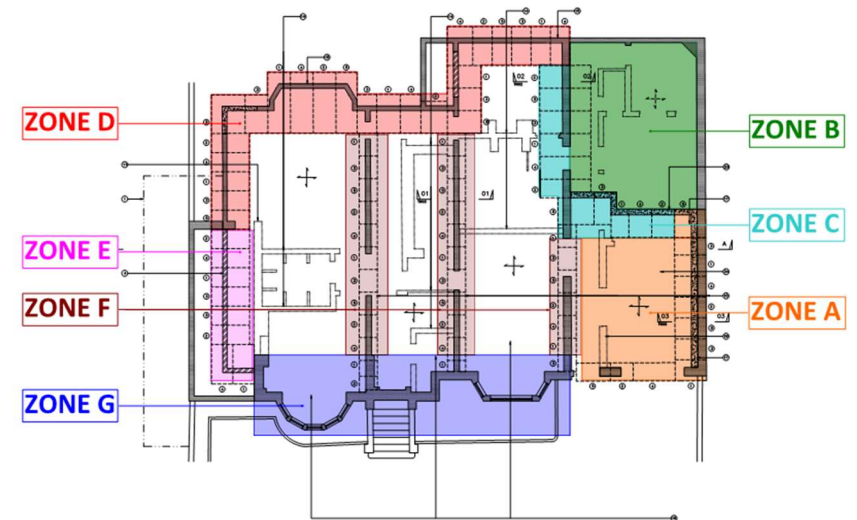


Figure 2 – Foundations reference plan.

- 1.1.16 The Contractor shall monitor the position and movements of the elevations of the adjacent properties around the perimeter of the proposed excavation. The monitoring shall be undertaken by a specialist survey company.



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- 1.1.17 The BIA has assessed land stability and the impacts of the proposed development on neighbouring structures. Based on analytical models, the predicted damage category will be Category 0 of the Burland Scale Impacts.
- 1.1.18 The BIA has identified no potential slope stability impacts.
- 1.1.19 The BIA has identified no potential hydrogeological impacts to the existing site and surroundings.
- 1.1.20 The BIA has identified low flood risk from the proposed development.
- 1.1.21 This is a live document and further detailed assessment will be ongoing as the design and construction progress.
- 1.1.22 This document is to be read in conjunction with reports by others. Refer to Architect's drawings for site layout, plans and sections of the properties.

2.0 Introduction

The purpose of this assessment is to consider the effects of a proposed basement development at 28 Redington Road, London, NW3 7RB on the local geology, hydrology and hydrogeology and potential impacts to neighbours and the wider environment. The site location is presented in Figure 3.

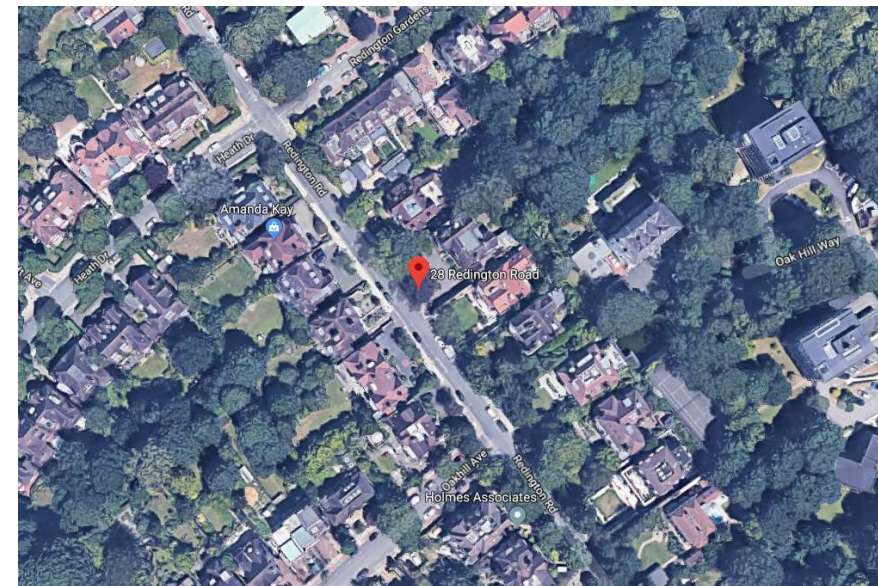


Figure 3 – Site Location.



The BIA approach follows current planning procedure for basements and lightwells adopted by LB Camden and comprises the following elements (CPG4 “Basements and Lightwells”):

- Desk Study;
- Screening;
- Scoping;
- Site Investigation, monitoring, interpretation and ground movement assessment;
- Impact Assessment

2.1 Authors

- 2.1.1 The BIA Report has been authored by Simone Boncio (BSc MSc), a Structural Engineer at Symmetrys, and the SuDS Strategy Report has been authored by Jennifer Allen, consultant at Geosmart.
- 2.1.2 It has been reviewed by David Snaith (BEng PG Cert), an Associate at Symmetrys with over 8 years of experience.
- 2.1.3 The Geotechnical Site Investigation Report was prepared and authored by Miles Martin (BSc MSc MScT CGeol EurGeol FGS), Principal Engineer at Socotec.
- 2.1.4 The Ground Movement Assessment Report was prepared by Oliver Rhodes (MSc, BEng (Hons), FSG), engineer at CGL, checked by Richard Ball (MSc BSc CEng MICE FGS), technical director at CGL, and approved by Ian Marychurch (MSc BSc CEng MICE CGeol FSG CMgr MCI MIO Dip IO), Director at CGL.
- 2.1.5 This BIA has been approved by Chris Atkins (CEng, MStructE), managing director of Symmetrys with 28 years of experience in Structural Engineering.

2.2

Sources of Information

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

- Current/historical mapping;
- Geological mapping;
- Hydrogeological data;
- Current/historical hydrological data;
- 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);
- LB Camden’s Audit Process Terms of Reference;
- The History of Lost Rivers In Camden (March 2010);
- Association of Specialist Underpinning Contractors (ASUC), Guidelines of safe and efficient basement construction directly under or near to existing structures. (October, 2013).



2.3 Existing and Proposed Development

- 2.3.1 The Application site is located on Redington Road, approximately 475 metres from the TFL Northern Line zone of influence (source: Property Asset Register Public Map, website: <https://tfl.maps.arcgis.com/apps/webappviewer/index.html?id=5129c766255941d3be16a6828faa8f18> Accessed 23.08.2019).
- 2.3.2 The site slope angle is estimated between 0 and 5 degrees.
- 2.3.3 The existing structure is a 4-storey detached house, with load bearing masonry walls supporting floors and roof timber structure. The current property shows no significant signs of deformation.
- 2.3.4 The neighbouring building at No. 26 underwent to a recent basement conversion works, with a side corridor partially excavated towards the boundary wall with No.28.
- 2.3.5 There are a number of listed building in Redington Road. The nearest to No. 28 is One Oak, a Grade II listed building, at No. 16 Redington Road (source: Historic England. Website: <https://historicengland.org.uk/listing/the-list/results/?searchType=NHLE+Simple&search=redington+road> Accessed 23.08.2019).
- 2.3.6 Neighbouring gardens are present at the rear of the properties, and will be protected in accordance with the Camden Local Plan from 2017.

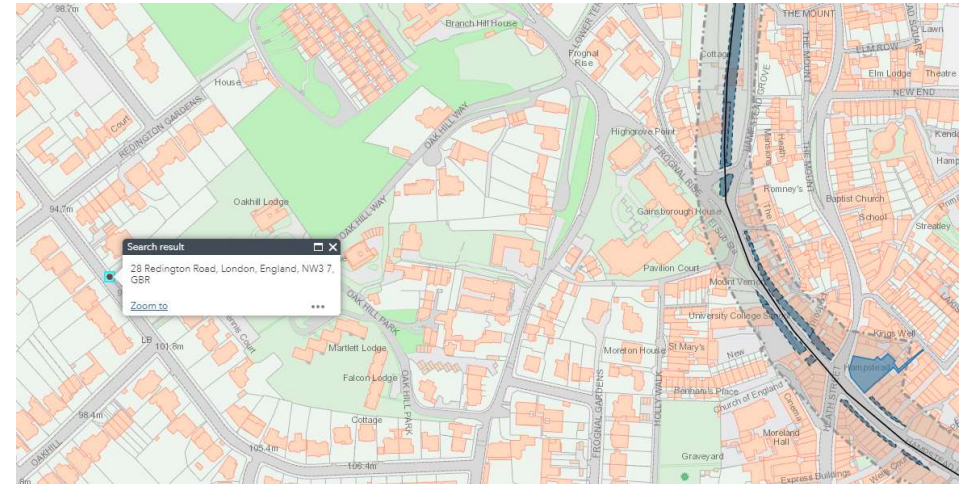


Figure 4 – Site location relative to railway lines.

- 2.3.7 Existing and Proposed development drawings are presented in Appendix 1.
- 2.3.8 The proposed development will utilise sequential reinforced concrete underpins to form the new level of the basement. The use of temporary propping will ensure that the works to the basement does not cause any local ground movements whilst construction is taking place.
- 2.3.9 The underpinning sequence is proposed to be carried out in maximum 1.0m width bays to avoid undermining the adjoining properties.
- 2.3.10 The new basement floor will be formed with a reinforced concrete slab.
- 2.3.11 All subjected to structural engineer detailed design and drawings.



- 2.3.12 The outline construction programme for the proposed development is as shown below (indicative only):

The works are expected to be completed over 18 months program split in the four phases listed below (All subject to successful/appointed Contractors schedule of works):

- No.1 month for demolition
- No.1 month for excavation
- No.8 months for construction
- No.8 months for fit-out.

3.0 Desk study

3.1 Site History

- 3.1.1 The existing building was build approximately around 1915. neighbouring buildings surrounding the site were constructed around the same period.
- 3.1.2 The buiding is within a predominantly residential area.
- 3.1.3 The web site “Bomb Sight” records bombs dropped in the area during the period of the London Blitz, between 7th October 1940 to 6th June 1941.

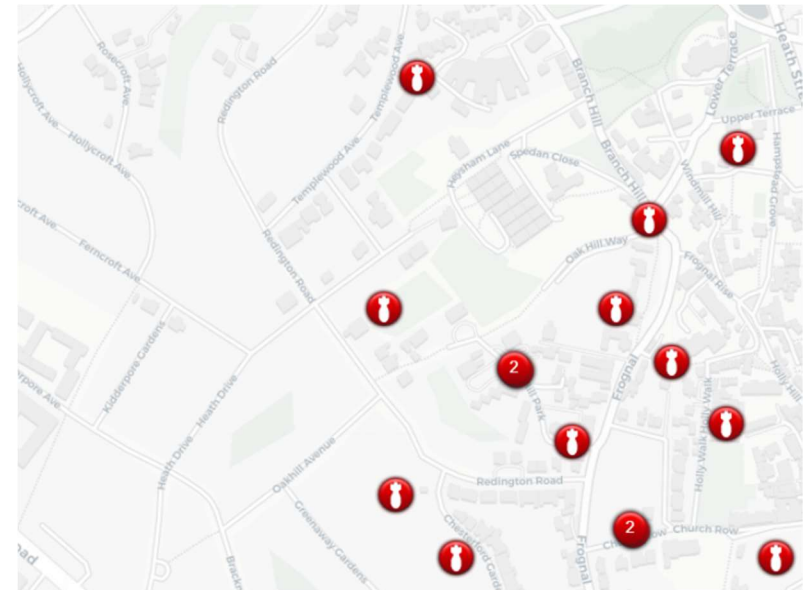


Figure 5 – Map of the WW2 bomb census (source <http://bombsight.org/?#16/51.5575/-0.1879>., accessed on 23.08.2019).

3.2 Geology

- 3.2.1 The British Geological Survey Map indicates that the site is located on the boundary between the Claygate Member and the Bagshot Formation.



3.2.2 The findings of the boreholes confirm the data available on the afore mentioned web site, highlighting the presence of deeper units of the London Clay Formation at specific location on the front side of the main building (refer to Socotec report, boreholes BH5 / BH5A in Socotec report).

3.2.3 Refer to the Soil Investigation by Socotec in Appendix 3 for details of the local Geology.

3.3 Hydrogeology

The Claygate Member and the Bagshot Formation underlying the site constitute a Secondary A Aquifer. It must be noted that the majority of the London Clay Formation below the Claygate Member is designated 'unproductive'.

Refer to Soil Investigation in Appendix 3 and Flood Risk Assessment in Appendix 5 for details of the local Hydrogeology.

3.4 Hydrology, Drainage and Flood Risk

3.4.1 The site is located approximately 600m from the catchment of the pond chains on Hampstead Heath.

3.4.2 There are no mapped surface water features within 500m of the site, with the exception of the River Kilburn, which runs underground and approximately in line with Redington Gardens (Figure 6). There is no record of flooding in relation to the aforementioned river.

3.4.3 The site is located approximately 50 metres from the River Tyburn, which is a historical underground watercourse.

3.4.4 The proposed basement does not extend over the footprint of the proposed ground floor, hence the amount of impermeable area is unchanged.

3.4.5 The drainage strategy is to be confirmed. All subject to Thames Water approval.

3.4.6 The site is classified as "very low risk" of flooding due to rivers or the sea.

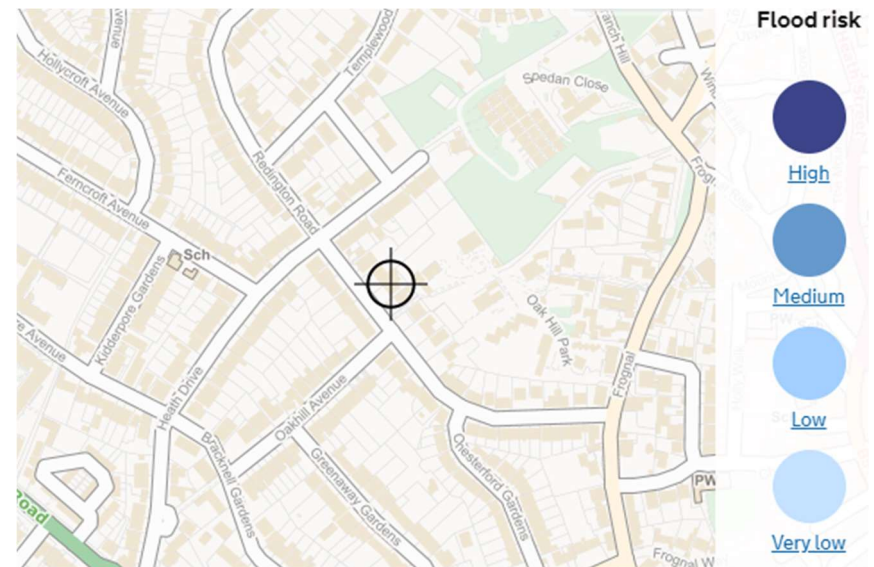


Figure 6 - Extract of long-term flood risk map due to rivers or the sea from gov.uk website.



3.4.7 The site is classified as “very low risk” of flooding due surface water.

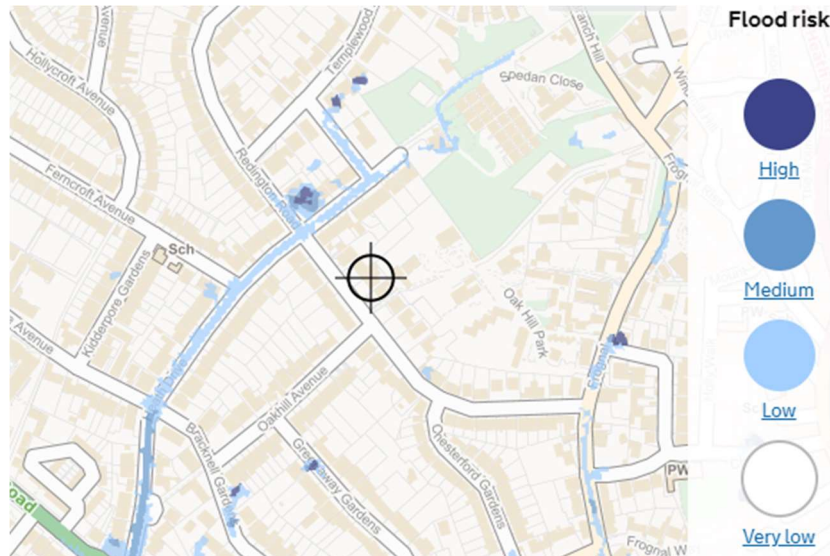


Figure 7 – Extract of long-term flood risk map due to surface water from gov.uk website.

4.0 **Screening**

4.1 **Subterranean ground water flow**

4.1.1 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 located above a Secondary A Aquifer, defined as permeable layers capable of supporting water supplies at a local scale. Refer to Desk Study at point 3.2
1b. Will the proposed basement extend beneath the water table surface?	No	Groundwater was recorded at a depth of 4.9m at the front of the property and 5.8m at the rear of the property. This is below the proposed basement extent. Refer to SOCOTEC report in Appendix 3.
2. Is the site within 100m of a watercourse, well (used / disused) or potential spring line?	No	No – Refer to 3.4.2. Groundwater was not recorded during the site investigation. During monitoring visits, it was recorded at a deeper level than new formation level. Refer to SOCOTEC report in Appendix 3.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No	Refer to 3.4.1



4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No	No, the proposed basement will not exceed the footprint of the existing/proposed building, hence it will no change the amount of permeable and impermeable surface of the site.
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	Rainwater attenuation tanks will be utilised in order to decrease the volume and velocity of water runoff, and released at a controlled rate of 1L/s. Refer to SuDS Strategy report in Appendix 5.
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	Groundwater was recorded at depth 4.9m BGL during monitoring visits. The new basement to be founded at approximately 1.0m BGL, and 1.5m BGL underneath the lift pit.

4.2

Slope Stability

Question	Response	Details
1. Does the existing site include slopes, natural or man-made greater than 7 degrees (approximately 1 in 8)?	No	The existing site does not have any slopes greater than 1.8°. The existing site measures approximately 100m from front to rear. Redington Road has a slope of 4°.
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)?	No	There are be no proposed changes in slope. The only re-profiling proposed work is in relation to minor landscaping works.
3. Does the development neighbour land, including railway cuttings and the like, have a slope greater than 7 degrees (approximately 1 in 8)?	No	The adjoining property at No. 26 Redington Road is terraced from front to rear, with an internal garage at street level rising to raised ground floor level. The only slopes exceeding 7° are stairs along narrow access footways.
4. Is the site within a wider hillside setting in which the general slope is greater than 7 degrees (approximately 1 in 8)?	No	The site is not located on a wider hillside with slope greater than 7 degrees.
5. Is the London Clay the shallowest strata at the site?	No	Bagshot Formation is the shallowest strata at the site. Refer to Appendix 3.



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	Refer to Landscape Architect report as well as Arboricultural report
7. Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?	No	No evidence of shrink swell subsidence at the site or neighbouring buildings.
8. Is the site within 100m of a watercourse or a potential spring line?	Yes	An existing watercourse is present at approximately 50m from the site. The river line would seem to follow nearby Redington Gardens.
9. Is the site within an area of previously worked ground?	No	Refer to Appendix 3
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?	No	The Bagshot Formation and Claygate Formation are classed as Secondary A aquifer. The proposed basement would not extend beneath the water table. Refer to SOCOTEC report in Appendix 3.
11. Is the site within 50m of the Hampstead Heath Ponds?	No	Refer to 3.4.1

12. Is the site within 5m of a highway or pedestrian right of way?	No	The extent of the proposed basement is not within 5m from the highway. Refer to Figure 1.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No	The existing finishes floor level will be lowered of approximately 500mm. Therefore, the proposed excavation would be approximately 1.0m below existing finishes floor level.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No	Refer to 2.3.6.

4.3

Surface Water and Flooding

Question	Response	Details
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No	Refer to 3.4.1
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	Drainage routes within the site have been altered to suit the works. The surface water from the rear of the site will be collected into an attenuation tank and released at a controlled rate of 1L/s, resulting in a decrease in peak run-off. This