



Geological & Geotechnical Consultants

**59 Redington Road, London NW3 7RP**

**Basement Screening and Scoping –  
Land Stability**

**(February 2016)**

**Prepared for ESI Ltd**



Geological & Geotechnical Consultants

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**ESI Ltd**

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**Basement Screening and Scoping - Land Stability  
(February 2016)**

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## 1.0 INTRODUCTION

Key GeoSolutions Ltd (KGS) have been commissioned by ESI Limited to undertake a land stability assessment in relation to a proposed development at 59 Redington Road, London NW3 7RP.

### 1.1 Proposed Development

The existing property is a detached four-storey house in the London Borough of Camden. The proposed development involves the construction of an indoor swimming pool at the end of the rear garden, at the furthest point from the property. The following drawings have been provided by the client;

RR29-A-00	Proposed pool plans, elevations & sections
RR29-A-02	Existing site plan
11422/1	Topographical Survey

The building will be single storey and be roughly L-shaped in plan, the main part of the building that will house the swimming pool is approximately 18m by 8m. The average level of the underside of the base of the pool will be 1.65m below the original ground level.

### 1.2 Scope of Work

The purpose of this assessment is to consider if the proposed swimming pool can be constructed without having a detrimental impact on the surroundings with respect to land stability and in particular whether the development will affect the stability of neighbouring properties. The assessment conforms to the requirements of guidance set out by The London Borough of Camden which provides comprehensive guidance on planning applications for basement extensions.

### 1.3 Qualifications

This assessment has been undertaken by Brian Duthie and Howard Clarke. Brian holds a BEng in Engineering Geology and Geotechnics, is a chartered geologist and UK Registered Ground Engineering Adviser, with 25 years' experience in geotechnical engineering. Howard holds a BEng in Civil Engineering, is a chartered engineer and Member of the Institution of Civil Engineers and Member of the Institute of Structural Engineers with over 10 years' experience in civil engineering. Both assessors satisfy the qualification requirements given in the Camden Planning Guidance 4.

## **1.4 Limitations**

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the research carried out. The results of the research should be viewed in the context of the work that has been carried out and no liability can be accepted for matters outside the stated scope of the research. The assessment does not constitute a detailed structural design for the basement structure, as would be required to allow construction to take place.

This report has been prepared for the information, benefit and use of ESI Ltd only and any liability of Key GeoSolutions Ltd to any third party, whether in contract or in tort, is specifically excluded. Any third party finding themselves in possession of this report may not rely upon it without first obtaining the written authority of Key GeoSolutions Ltd.

## 2.0 SITE DESCRIPTION

The site, 59 Redington Road, is in the London Borough of Camden, post code NW3 7RP and National Grid Reference 526620mE, 186007mN. The site covers an area of approximately 1580m<sup>2</sup>, the plot is approximately 80m long and 16m wide, although it widens at the end of the garden. The location of the site is shown on Figure 1 below.

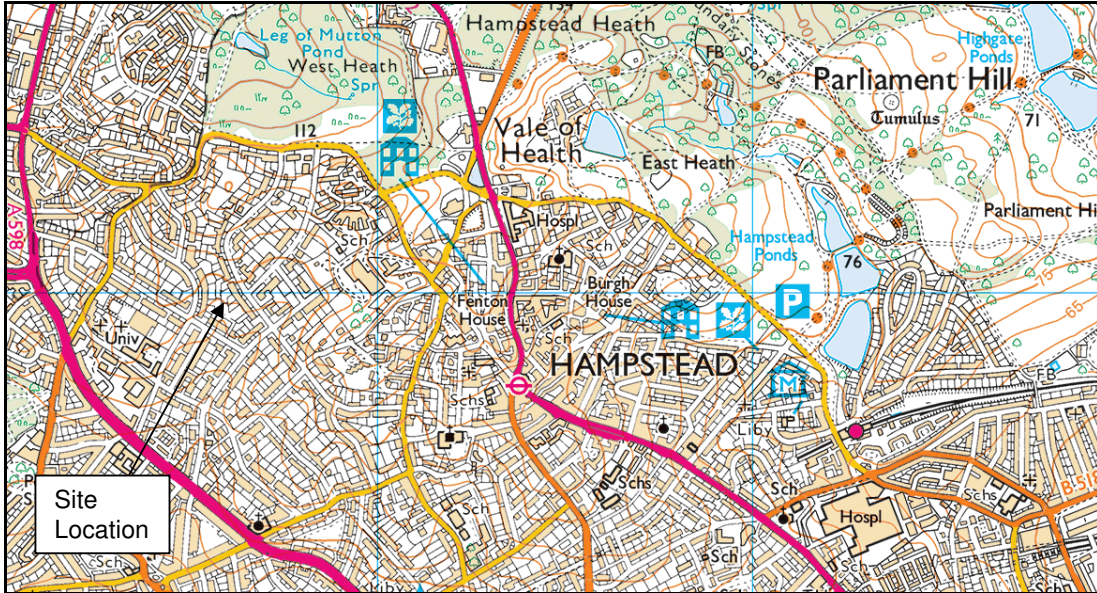


Figure 1 – Site Location

The general topography of the area slopes down from Parliament Hill 2km to the east towards the River Westbourne 2.9km to the south-west. The slope is incised with a series of valleys and the site is located on the side of one of the valleys. The ground falls from a level of 97.5mAOD at the entrance drive of the property to 94.0mAOD at the end of the rear garden.

### 3.0 PROJECT SCREENING

Following the guidance given in the London Borough of Camden document CPG4 'Basements and lightwells' (2013) it is required to identify the potential impacts of the proposed scheme. The flowchart entitled 'Slope stability screening flowchart' in Figure 2 of CPG4 assists with understanding the potential impacts that a basement may have.

<b>SLOPE STABILITY</b> (Slope stability screening flowchart (Figure 2, CPG4 (Camden Council, 2013))			
<b>Impact question</b>	<b>Answer</b>	<b>Justification</b>	<b>Reference</b>
1) Does the existing site include slopes, natural or manmade, greater than 7°?	<b>No</b>	Figure 10 Camden Topographic Map Figure 16 Slope Angle Map	Ove Arup, 2010 Ordnance Survey Mapping.
2) Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°?	<b>No</b>	No re-profiling of the site is proposed	Drawings of proposed development
3) Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	<b>No</b>		
4) Is the site within a wider hillside setting in which the general slope is greater than 7°?	<b>No</b>	Figure 10 Camden Topographic Map	Ove Arup, 2010
5) Is the London Clay the shallowest strata at the site?	<b>No</b>	Figure 5 South Camden Geological Map	Ove Arup, 2010 BGS Geoindex
6) Will any trees be felled as part of the proposed development and / or any works proposed within any tree protection zones where trees are to be retained?	<b>No</b>	Arboricultural report for the proposed development	Addendum Arboricultural Note – Marcus Foster, Dec 2015
7) Is there any history of seasonal shrink-swell subsidence in the local area, and / or evidence of such effects at the site?	<b>No</b>	Property is located on Claygate Beds.	Ove Arup, 2010

8) Is the site within 100m of a watercourse or potential spring line?	<b>Yes</b>	The site is within 100m of a hidden watercourse, Figure 2, Camden 1:10,560 Geological Map (1920) and Figure 11 Watercourses.	Ove Arup, 2010
9) Is the site within an area of previously worked ground?	<b>No</b>	Figure 4 North Camden Geological Map	Ove Arup, 2010
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?	<b>Yes</b>	Secondary aquifer, Claygate Member, Figure 8 Camden Aquifer Designation Map.	Ove Arup, 2010
11) Is the site within 50m of Hampstead Heath ponds?	<b>No</b>	Figure 12, Camden Surface Water Features	Ove Arup, 2010 OS Mapping
12) Is the site within 5m of a highway or pedestrian right of way?	<b>No</b>	The site is at the end of the rear garden and is surrounded on all sides by gardens of the neighbouring properties.	OS Mapping and Google Maps Drawings of proposed development
13) Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	<b>No</b>	The site is at the end of the rear garden and is surrounded on all sides by gardens of the neighbouring properties.	OS Mapping and Google Maps
14) Is the site over (or within the exclusion zone of) any tunnels e.g. railway lines?	<b>No</b>	Figure 18 Transport Infrastructure	Ove Arup, 2010



#### **4.0 GROUND CONDITIONS**

The Geological Survey map of the area indicates that the site is underlain by the Claygate Member, which is in turn underlain by the London Clay Formation. The geology in this area is generally horizontally bedded such that the boundary between the geological formations approximately follows the ground surface contour lines. The Claygate Member comprises interbedded dark grey clays, silts and fine grained sands.

A search of the Camden Borough Council planning portal found a planning submission for a basement at a property approximately 80m to the south south-east of 59 Redington Road. Boreholes drilled at that site encountered a thickness of 5.2m of the Claygate Member overlying the London Clay Formation. Given that 59 Redington Road is uphill from this property it should be located higher in the Claygate Member sequence.

## **5.0 LAND STABILITY SCOPING**

Where the screening checklist has returned as 'yes' response to any question that matter is carried forward to the scoping stage. The scoping produces a statement which defines the matters of concern identified in the screening stage.

### **5.1 Is the site within 100m of a watercourse or potential spring line?**

A hidden watercourse is shown on Figure 2, Camden 1:10,560 Geological Map (1920) and Figure 11 Watercourses of the Ove Arup guidance document. The route of the watercourse runs approximately north / south through the rear gardens of the properties on Redington Road and Hollycroft Avenue.

The route of the watercourse should be further investigated in order to determine its exact route, the scale of the mapping in the Ove Arup guidance is not accurate enough to allow this and to determine whether the watercourse was infilled or culverted.

### **5.2 Is the site within an aquifer?**

The Claygate Member is a Secondary Aquifer, the permeability of which is generally low. A rising head permeability test undertaken at the property to the south south-east measured a permeability of  $2.2 \times 10^{-7}$  m/s. The depth to groundwater at the site is unknown, however given the likely permeability it is considered that any groundwater flow encountered during excavation of the swimming pool will be low and readily controlled by traditional construction techniques.

### **5.3 Damage to adjacent properties**

Given an average excavation depth of 1.65m and the distance to neighbouring properties (>20m) it is considered that the proposed development will not cause any damage / movement to the adjacent properties. Appropriate support will be required to be provided in order to maintain the stability of boundaries to the adjacent properties.

## 6.0 CONCLUSIONS

A screening and scoping exercise has been undertaken of the potential impacts of the proposed basement construction at 59 Redington Road with respect to slope stability and ground movement. This exercise does not constitute a detailed structural design for the proposed development.

The site does not lie in an area of steep topography and the area is not one associated with slope stability issues.

From the screening process two questions returned a 'yes' answer, the first of these, the proximity to a hidden watercourse will require further investigation to determine the impact, if any, on the proposed development. For the second yes answer it should be possible to control any groundwater flows from the Claygate Member by employing best practice construction techniques.

With regard to impact on the adjacent properties it is considered that construction of the proposed development will not cause any movement or damage.

## 7.0 REFERENCES

- 7.1 CPG4 Basements and lightwells, London Borough of Camden, September 2013
- 7.2 Camden geological, hydrogeological and hydrological study, Guidance for subterranean development, Ove Arup & Partners, November 2010
- 7.3 Assessment of risk of damage to buildings due to tunnelling and excavation, Burland J B, 1995
- 7.4 Ground movements resulting from urban tunnelling: predictions and effects, Rankin W J, 1988
- 7.5 Addendum Arboricultural Note (BS5837:2012) – Marcus Foster Arboricultural Design & Consultancy, 14<sup>th</sup> December 2015
- 7.6 Drawings of proposed development;
  - RR29-A-00 Proposed pool plans, elevations & sections
  - RR29-A-02 Existing site plan
  - 11422/1 Topographical Survey

