

# Site Analytical Services Ltd.

**Ref: 14/22463  
August 2014**

**Basement Impact Assessment  
At  
147 Kentish Town Road, London, NW1 8PB  
For  
Ringleys Limited**

# Site Analytical Services Ltd.

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## 1.0 INTRODUCTION

### 1.1 Project Objectives

The purpose of this assessment is to consider the effects of a proposed basement construction on the local groundwater regime at the residential property at 147 Kentish Town Road, London, NW1. For this assessment a representative of SAS Limited visited the property on 21st August 2014.

The recommendations and comments given in this report are based on the information contained from the sources cited and may include information provided by the client and other parties, including anecdotal information. It must be noted that there may be special conditions prevailing at the site which have not been disclosed by the investigation and which have not been taken into account in the report. No liability can be accepted for any such conditions.

This report does not constitute a full environmental audit of either the site or its immediate environs.

### 1.2 Planning Policy Context

Camden Planning Guidance for Basements and Lightwells has recently been revised (CPG4, September 2013) and requires proposed developments to mitigate against the effects of ground and surface water flooding and to include drainage systems that do not impact neighbouring property of the site or the water environment by way of changing the groundwater regime.

Camden Guidance CPG4 sets out 5 Stages:

1. Screening
2. Scoping
3. Site Investigation
4. Impact Assessment
5. Review and decision making

This report is intended to address the scoping process set out in CPG4 and the Camden Geological, Hydrogeological and Hydrological Study (CGHHS). It will review existing site investigation data and provide a preliminary assessment of the issues identified by the Site Analytical Services Limited screening process.

This report also provides an impact assessment (4) of the geo-environmental impacts on adjacent structures and the surrounding area based on available site investigation data.

As part of this guidance a subterranean (groundwater) flow, slope stability and surface water and flooding screening chart is provided (CPG 4, Figures 1, 2 and 3 respectively). The completed charts in relation to this development are provided as Table 1, to this report.

### 1.3 Qualifications

The report has been prepared by Mr Andrew Smith, a Fellow of the Geological Society (FGS) with over 8 years post graduate experience in co-ordination with Mr Michael Davenport, a Chartered Engineer (CEng).

## 2.0 SITE DETAILS

(National Grid Reference: TQ 289 844)

### 2.1 Site Location

The site is situated on the corner of Castle Road and the A400 Kentish Town Road in North London at approximate postcode NW1 8PD. The site is currently occupied by a former public house together with rear courtyard.

### 2.2 Geology

The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area (Sheet 256, 'North London', Solid and Drift Edition) indicates the site to be underlain by the London Clay Formation.

### 2.3 Previous Reports

The results from a Phase 1 Preliminary Risk Assessment and Phase 2 Intrusive Investigation are presented under separate cover in Site Analytical Services Limited reports (Project No's. 14/22463-1 and 13/20593 respectively). The findings from these reports are described in this basement impact assessment.

### 2.4 Site Layout and History

The site was attended on 21<sup>st</sup> August 2014 for the purposes of conducting the site walkover.

The site comprises of a large three storey former public house building. The front of the property exits directly on to Kentish Town Road, whereas the rear of property is a small level concreted area that exits onto Castle Road. There is no significant vegetation surrounding the site and the area is largely dominated by hardcover and buildings. Additionally, there is no significant slope in the area and the site is essentially flat.

The property has been the location of a public house since circa 1651, it was demolished and rebuilt in 1848 and went through a series of owners and name changes. In 2011 the property was closed and has remained vacant ever since.

From the site walkover there were no obvious potentially contaminating activities on the site.

### 2.5 Proposed Development

Proposals for the site include the reinstatement of the public house façade and extension and alteration to the property to accommodate B1/A2 use at basement and ground floor levels and 8 residential units at first, second and third floor levels (C3 Use)

The maximum depth of the proposed basement is expected to be approximately 2.80m below existing ground level.

## 2.6 Results of Basement Impact Assessment Screening

A screening process has been undertaken for the site in accordance with CPG4 and the results are summarised in Table 1 below:

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**Table 1: Summary of screening results**

Item	Description	Response	Comment
Sub-terranean (Ground water Flow)	1a. Is the site located directly above an aquifer.	No	The Bedrock geology underlying the site (London Clay Formation) is classified as Unproductive Strata; drift deposits or rock layers with low permeability that have negligible significance for water supply or river base flow.  Superficial Head (or slope) deposits were encountered below the made ground but are not believed to be water bearing due to the cohesive element of the deposits and the lack of water seepages during drilling.
	1b. Will the proposed basement extend beneath the water table surface.	No	The maximum depth of the proposed basement floor level of 2.8m below ground level will be above the current water level of approximately 8.91m below ground level as recorded in Borehole 1A.
	2. Is the site within 100m of a watercourse, well (used / disused) or potential spring line.	Yes - refer to Section 4.2 for scoping	The nearest surface water feature is listed as Regents Canal located 354m south of the site. However, According to publications regarding Lost Rivers of London (Barton, 1992) and (Talling, 2011), the site is within 100m of the River Fleet.
	3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas.	No	The amount of hardstanding on-site is not expected to change.
	4. 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	Existing drainage paths are to be utilised where possible. Whether soakaways/SUDS are used on the proposed development is to be confirmed (beyond the scope of this report). An appropriately qualified engineer should be engaged to ensure mandatory requirements are met.
	5. 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 or spring line.	No	There are no surface water features within one kilometre of the site.
Slope	1. Does the existing site include slopes, natural or man-	No	The site is essentially flat

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Stability	made greater than 1 in 8.		
	2. Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 1 in 8.	No	Remodelling of the site elevations is not proposed.
	3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 1 in 8.	No	The surrounding area is essentially flat
	4. Is the site within a wider hillside setting in which the general slope is greater than 1 in 8.	No	There is a general slope in the wider hillside setting from north to south down towards the Thames Basin up but this is less than 1 in 8.
	5. Is the London Clay the shallowest strata at the site.	No	The site is underlain by Made Ground overlying the London Clay Formation; the London Clay is the shallowest natural strata below the site.
	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	It is understood that no trees are to be felled as part of the development.
	7. Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site	Yes - refer to Section 5.2 for scoping	The site lies above the London Clay Formation that is well know to have a high tendency to shrink and swell.
	8. Is the site within 100m of a watercourse or a potential spring line	Yes - refer to Section 4.2 for scoping	The nearest surface water feature is listed as Regents Canal located 344m south of the site. However, according to the Lost Rivers of London the site is within 100m of the River Fleet
	9. Is the site within an area of previously worked ground.	Yes - refer to Section 5.5 for scoping	Made Ground has been encountered at the site.

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	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 Bedrock geology underlying the site (London Clay Formation) is classified as Unproductive Strata; drift deposits or rock layers with low permeability that have negligible significance for water supply or river base flow.
	11. Is the site within 50m of the Hampstead Heath ponds.	No	The site is not located near Hampstead Heath.
	12. Is the site within 5m of a highway or pedestrian right of way.	Yes - refer to Section 5.6 for scoping	The site lies adjacent to the A400 Kentish Town Road and Castle Road.
	13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.	Yes - refer to Section 5.7 for scoping	The development will increase the depths of foundation at the site, although the foundation depths of adjacent properties are not known.
	14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines.	Yes - refer to Section 5.8 for scoping	The site lies adjacent to the Northern Line which runs along Kentish Town Road
Surface Water and Flooding	1. 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 amount of hardstanding on-site is not changing therefore surface water will not be impacted by the development.
	2. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.	No	The amount of hardstanding on-site is not expected to increase.
	3. 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	As no changes are occurring above the ground, surface water will not be impacted by the development.



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	4. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses.	No	As no changes are occurring above the ground, surface water will not be impacted by the development.
	5. Is the site in an area known to be at risk from surface water flooding.	No	According to the Envirocheck Report obtained as part of the desk study for the site (Site Analytical Services Report Reference 14/22463) the site is not in an area at risk from flooding.

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**The Screening Exercise has identified the following potential issues which will be carried forward to the Scoping Phase**

## *Subterranean (Groundwater) Flow*

- Is the site within 100m of a watercourse, well (used / disused) or potential spring line.

## *Slope Stability*

- Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site.
- Is the site within 100m of a watercourse or a potential spring line.
- Is the site within an area of previously worked ground.
- Is the site within 5m of a highway or pedestrian right of way.
- Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.

## 3.0 EXISTING SITE INVESTIGATION DATA

### 3.1 Records of site investigations

Ground conditions at the site were investigated by Site Analytical Services Limited in May 2013 (SAS Report Reference 13/20593) and again in August 2014 as part of this basement impact assessment (Borehole log provided at the end of this report). The ground conditions revealed by the investigation are summarised in the following table.

<b>Strata</b>	<b>Depth to top of strata, mbgl</b>	<b>Description</b>
Made Ground	0.00	Surface layer of concrete underlain by very soft silty clay with ashes and brick rubble
Superficial Head	1.30 to 1.90	Dense very sandy silty fine to coarse very clayey flint gravel
London Clay Formation	0.40 to 2.70	Stiff and then very stiff silty clay with occasional partings of silty fine sand, scattered gypsum crystals

Groundwater was not encountered during the drilling of the boreholes or excavation of trial pits and the material remained essentially dry throughout.

Groundwater was subsequently recorded at a depth of depth of 8.91m below ground level in the monitoring standpipe installed in Borehole 1A after a period of approximately two weeks.

## **4.0 SUBTERRANEAN (GROUNDWATER FLOW) - SCOPING ASSESSMENT**

### **4.1 Introduction**

This section addresses outstanding issues raised by the screening process regarding the presence of an ancient watercourse within 100m of the site.

### **4.2 Springs, Wells and Watercourses**

The nearest surface water feature is recorded as a Regents Canal located 354m south of the site. There are no fluvial or tidal floodplains located within 1km of the site.

With reference to 'The Lost Rivers of London' (Barton, 1992) and 'London's Lost River's (Talling, 2011), the site lies within 100m of the River Fleet which passes under Kentish Town and flows onwards to King's Cross. The river then flows down Farringdon Road and Farringdon Street, and joins the Thames beneath Blackfriars Bridge.

The River Fleet is now completely enclosed and flows through underground conduits for its entire length.

Given the predominantly clayey and low permeability nature of the near-surface soils, it is expected that there is very limited surface water infiltration potential and groundwater flow rates in the vicinity of the property will be very low. The historic development of the area for housing will have further limited surface water infiltration.

As a result it is considered that the proposed development will have minimal impact on any nearby watercourses.

## 5.0 SCOPING ASSESSMENT - SLOPE AND GROUND STABILITY

### 5.1 Introduction

This section addresses outstanding issues raised by the screening process regarding land stability (see Table 1).

### 5.2 Shrinking / Swelling Clays

Atterberg Limit tests were conducted on four samples taken from the near surface cohesive soils encountered in Boreholes 1 and 2. The samples fall into Classes CH and CV according to the British Soil Classification System. These are fine grained silty clay soils of high and very high plasticity and as such generally have a low permeability and a high susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2, April 2003, "Building near Trees".

Foundations may need to be taken deeper should they be within the zones of influence of both existing or recently felled trees and any proposed tree planting. The depth of foundation required to avoid the zone likely to be affected by the root systems of trees is shown in the recommendations given in NHBC Standards and it is considered that this document is relevant in this situation.

### 5.3 Heave of underlying soils

The main phase of uplift or heave from the cohesive soils will come immediately following the excavation of the basement when the greatest elastic rebound of the soil (caused by the loss of the overburden pressure) will occur. Heave can be reduced by proceeding with the excavation in stages and observing and recording any movement that occurs over a set period of time. It may therefore be advantageous to delay the construction until an adequate proportion of the uplift has occurred. Once this monitoring period has elapsed and a suitably qualified engineer is confident that the majority of uplift has occurred, basement construction can commence. These processes and other ways of dealing with ground movements are described at length in BS8004 (British Standard Code of Practice for Foundations).

In addition, it is understood that a suspended concrete slab will be constructed at basement level and therefore heave is unlikely to be an issue at the site.

### 5.4 Compressible/Collapsible Ground

The natural ground stability hazards dataset supplied by the BGS gives the hazard rating for collapsible ground as 'very low' and compressible ground at the site is listed as 'no hazard'.

### 5.5 Made Ground

In the exploratory holes undertaken at the site, Made Ground was found to extend down to depths of up to 1.90m below ground level and generally comprised of a surface layer of concrete underlain by very soft silty clay with ashes and brick rubble

A result of the inherent variability of uncontrolled fill, (Made Ground) is that it is usually unpredictable in terms of bearing capacity and settlement characteristics. Foundations should therefore, be taken through any Made Ground and either into, or onto suitable underlying natural strata of adequate bearing characteristics.

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The bearing capacity of the Made Ground should therefore be assumed to be less than 50kN/m<sup>2</sup> because of the likelihood of extreme variability within the material.

Contamination testing of the Made Ground is likely to be required during any second phase of ground investigation.

## 5.6 Location of public highway

The proposed basement is not to be extended below Kentish Town Road or Castle Road and therefore it is suggested that the impact on these access roads is likely to be minimal.

There is nothing unusual in the proposed development that would give rise to any concerns with regard to the stability of public highways.

## 5.7 Structural Stability of Adjacent Properties

The excavation and construction of the basement at the site has the potential to cause some movements in the surrounding ground. However, it is understood that ground movements and/or instability will be managed through the proper design and construction of mitigation measures.

The proposed development may also result in differential foundation depths between the site and adjacent property and as such it is recommended that the Party Wall Act will be used and considered during the design phase. For basement developments in densely built urban areas, the Party Wall Act (1996) will usually apply because neighbouring houses would typically lie within a defined space around the proposed building works. Specifically, the Party Wall Act applies to any excavation that is within 3m of a neighbouring structure; or that would extend deeper than that structure's foundation; or which is within 6m of the neighbouring structure and which also lies within a zone defined by a 45° line from the foundation of that structure. The Party Wall process should be followed and adhered to during this development.

## 5.8 Tunnels

The site lies adjacent to the Northern Line which runs along Kentish Town Road. Transport for London must be contacted prior to any structural design work to approve and make comments on the scheme.

A full statutory services search was outside the scope of this report but must be completed prior to design.

## **6.0 CONCLUSIONS**

1. Proposals for the site include the reinstatement of the public house façade and extension and alteration to the property to accommodate B1/A2 use at basement and ground floor levels and 8 residential units at first, second and third floor levels (C3 Use).
2. With reference to 'The Lost Rivers of London' (Barton, 1992) and 'London's Lost River's (Talling, 2011), the site lies within 100m of the River Fleet. Given the predominantly clayey and low permeability nature of the near-surface soils, it is expected that there is very limited surface water infiltration potential and groundwater flow rates in the vicinity of the property will be very low.
3. Foundations may need to be taken deeper should they be within the zones of influence of both existing or recently felled trees and any proposed tree planting.
4. The proposed basement is not to be extended below Kentish Town Road or Castle Road and therefore it is suggested that the impact on these access roads is likely to be minimal.
5. The excavation and construction of the basement at the site has the potential to cause some movements in the surrounding ground. However, it is understood that ground movements and/or instability will be managed through the proper design and construction of mitigation measures.
6. The site lies adjacent to the Northern Line which runs along Kentish Town Road. Transport for London must be contacted prior to any structural design work to approve and make comments on the scheme.

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Senior Geologist

## **7.0 REFERENCES**

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9. CIRIA, 2000. Sustainable Urban Drainage Systems: Design Manual for England and Wales. CIRIA C522, Construction Industry Research and Information Association, London
10. Camden Planning Guidance, 2011. CPG 4; Basements and lightwells. London Borough of Camden
11. Environment Agency Status Report 2010. Management of the London Basin Chalk Aquifer. Environment Agency
12. NHBC Standards, Chapter 4.1, "Land Quality - managing ground conditions", September 1999.
13. NHBC Standards, Chapter 4.2, "Building near Trees", April 2010.

## **Appendix A – Record of Borehole Drilled 8<sup>th</sup> August 2014**



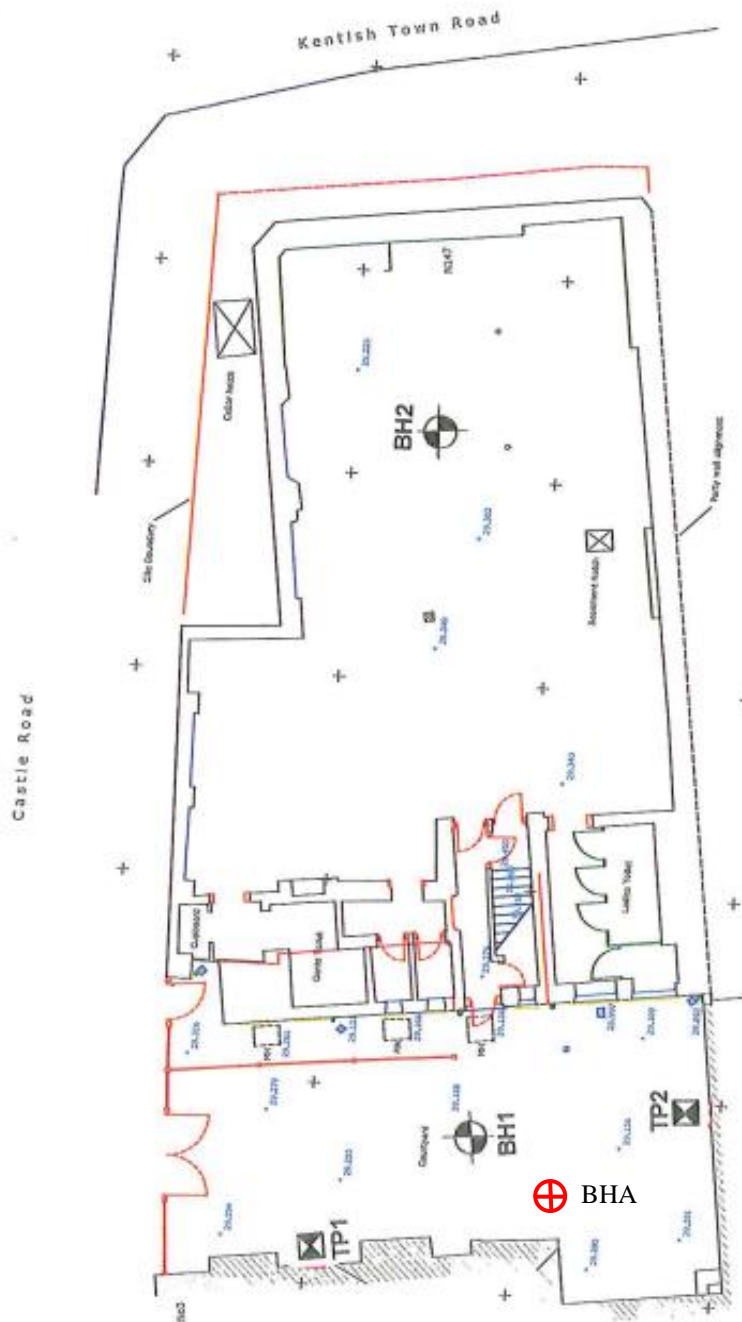
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<b>Site Analytical Services Ltd.</b>						Site 147 KENTISH TOWN ROAD, LONDON, NW1 8PB		Borehole Number <b>BHA</b>	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m		Ground Level (mOD)		Client RINGLEYS LIMITED		Job Number 1422463	
		Location TQ 289 844		Dates 08/08/2014		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.25	D1					(0.12)	MADE GROUND : Concrete surface		
0.50	D2					0.12	MADE GROUND : Black ashes with crushed concrete and clinker		
0.75	D3					(0.18)			
1.00	D4					(1.40)	MADE GROUND : Very soft black silty clay with ashes and brick rubble		
1.50	D5					1.70	Dense brown very sandy silty sub angular fine to coarse very clayey flint GRAVEL.		
2.00	D6					(1.00)			
2.50	D7					2.70	Stiff becoming very stiff brown and mottled orange brown beined blue grey silty CLAY with occasional partings of light brown silty fine sand and occasional small gypsum crystals		
3.00	D8								
3.50	D9								
4.00	D10								
4.50	D11						Very stiff dark grey brown fissured silty clay with occasional partings of light brown silty fine sand and scattered small gypsum crystals		
5.00	D12					(4.80)			
6.00	D13								
7.00	D14					7.50			
8.00	D15								
9.00	D16					(2.50)			
10.00	D17			08/08/2014-DRY					

<b>Remarks</b> Groundwater was not encountered during drilling D = Disturbed Sample	Scale (approx) 1:50	Logged By APS
Figure No. 1422463.BHA		

## Appendix B – Exploratory Hole Location Plan

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-  Boreholes drilled in May 2013 investigation
-  Trial Pits excavated in May 2013 investigation
-  Borehole drilled in August 2014 investigation

## Appendix C – Monitoring Data from Borehole 1A August 2014

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Date	Borehole	Water Level (m.bgl)	Depth to Base of Well (m.bgl)
12 <sup>th</sup> August 2014	1	9.97	10.15
18 <sup>th</sup> August 2014	1	8.91	10.15