



Stage 4 Basement Impact Assessment (BIA)

Project Name: The Grove Lawn Tennis Club,
Cascade Avenue

Location: Haringey, London, N10 3PY

Client: Rok Enterprises One Ltd.

STL Project ID: J15256

STL Report Reference: J15256-3

Report Date: 15 November 2022

Report Issue: 1

REVISIONS AND ADDITIONAL MATERIAL

1 Document History and Status

Issue	Date	Purpose/Status	File Ref	Author	Check	Review
1	15/11/2022	Basement Impact Assessment Report	J15256-3	VF	MWS	JNR

2 Document Details

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STL Project Number	J15256
STL Project Name	The Grove Lawn Tennis Club, Cascade Avenue

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3 Additional Supporting Documents

3.1 Supporting Documents

Document	Date	Issue	Producer
BIA Stage 1 Screening & Stage 2 Scoping Report (STL Ref: J15256-1)	02/11/2022	1	Southern Testing Laboratories Ltd.
BIA Stage 3 Ground Investigation Report (STL Ref: J15256-2)	08/11/2022	1	Southern Testing Laboratories Ltd.

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APPENDIX 1

Site Location Plan

A NON-TECHNICAL SUMMARY

The site is located on Cascade Avenue in the London Borough of Haringey, approximately 1.1km north-east of Highgate Underground Station. The approximate National Grid Reference for the site is TQ 29067 89202. The site location is indicated on Figure 1 in Appendix 1.

The site comprises disused tennis courts which occupy the majority of the site and a small brick built pavilion building to the north of the site. Photographs showing the site and a detailed site description are presented in the BIA Stage 1 Screening and Stage 2 Scoping Report (report ref. J15256-1).

It is proposed to redevelop the site with eight new three-storey properties with additional single-storey basement levels. Plans issued by the Client showing the existing layout and proposed development are included in the Stage 1 Screening and Stage 2 Scoping Report (report ref, J15256-1).

The following assessments are presented in this Basement Impact Assessment (BIA) report:

- Screening Exercise
- Scoping Exercise
- Impact Assessment

Additional supporting documents include:

- BIA Stage 1 Screening and Stage 2 Scoping Report (J15256-1)
- BIA Stage 3 Ground Investigation Report (J15256-2)

The ground conditions beneath the site were proven to comprise a shallow covering of Made Ground underlain by a firm to stiff silty clay of the London Clay Formation.

Groundwater was not encountered during drilling but was recorded during monitoring visits undertaken in October 2022. In WS01 water levels were recorded at 2.8mbgl and in WS02 water levels were recorded between 0.85m to 1.25mbgl.

The proposed construction methods for the basement are not known at this stage.

A Ground Movement Assessment and Building Damage Assessment has not been undertaken at this stage.

The Basement Impact Assessment has not identified significant likely hydrogeological or hydrological impacts relating to the proposed basement. Cumulative impacts of future developments in the area should be assessed on a case-by-case basis.

The Basement Impact Assessment has not identified a risk of fluvial and surface water flooding. No formal flood risk assessment has been undertaken for the site and specialist advice should be sought in relation to potential flooding issues.

B INTRODUCTION

4 Authority

Our authority for carrying out this work is contained in a completed Southern Testing project order form signed by Mr G Borukhov on behalf of Rok Enterprises One Ltd., dated 2nd September 2022, in relation to our quotation STL ref. Q221118, dated 26th August 2022.

5 Object

The object of this study was to produce a Basement Impact Assessment (BIA) as part of the Client's planning application in accordance with the requirements of the London Borough of Haringey, and to consider the effects of a proposed basement development at The Grove Lawn Tennis Club, Cascade Avenue.

The purpose of the BIA is to enable the London Borough of Haringey to consider a scheme's potential impact on local drainage and flooding and on the structural stability of neighbouring properties through its effect on groundwater conditions and ground movement in accordance with their planning policies.

6 Scope

This report references the following reports:

- Stage 1 Screening and Stage 2 Scoping Report (Southern Testing Laboratories Ltd., 2nd November 2022, Ref. J15256-1)
- Stage 3 Ground Investigation Report (Southern Testing Laboratories Ltd., 8th November 2022, Ref. J15256-2)

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

The findings and opinions conveyed via this investigation report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd believes are reliable. Nevertheless, Southern Testing Laboratories Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The investigation was conducted and this report has been prepared for the sole internal use and reliance of Rok Enterprises One Ltd. and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

7 Report Authors and Contributors

The report has been checked and reviewed by geologist holding Chartered Geologist (CGeol) status with the Geological Society of London, and a Chartered Engineer (CEng) holding MICE status with the Institution of Civil Engineers.

Details of the authors of the supplementary reports may be found within those respective documents.

C SITE OVERVIEW

The site is located on Cascade Avenue in the London Borough of Haringey, approximately 1.1km north-east of Highgate Underground Station. The approximate National Grid Reference for the site is TQ 29067 89202. The site location is indicated on Figure 1 in Appendix 1.

The site is a parcel of land situated between Cascade Avenue and The Chine and comprises disused tennis courts which occupy the majority of the site and a small brick built pavilion building to the north of the site. It is proposed to redevelop the site with eight new three-storey properties with additional single-storey basement levels. Plans issued by the Client showing the existing layout and proposed development are included in the Stage 1 Screening and Stage 2 Scoping Report (report ref. J15256-1).

The site is located within a wider hillside setting. The area surrounding the site sloped gently towards the south/south-east, by approximately 2-3 degrees (visually estimated). The site itself is split over two levels, separated by a retaining wall. The lower level to the east is approximately 1m lower than the western level. Each level is generally flat and level ground.

Cascade Avenue and The Chine are located immediately adjacent to the eastern and western site boundaries, respectively. No. 27 Cascade Avenue and No. 10 the Chine, both two-storey brick built end of terrace properties, are located adjacent to the northern boundary. The garages and gardens of 57-69 Etheldene Avenue are located immediately adjacent to the southern boundary. No neighbouring properties appeared to have basements or lower ground floor levels.

The desktop BIA has not identified a risk of fluvial, surface water or groundwater flooding based on the results of the desk study contained within the Stage 1 Screening and Stage 2 Scoping Report. However, no formal flood risk assessment has been undertaken for the site and specialist advice should be sought in relation to potential flooding issues.

Cascade Avenue and a small pedestrian path run adjacent to the eastern site boundary. The Chine runs adjacent to the western site boundary. There are no known tunnels within 5m of the proposed basement. Drain inspection cover and other underground utilities were noted within the adjacent highways.

It is understood the proposed basement will extend to approximately 3m below ground level. At this stage a construction method statement has not been provided for the proposed development.

The proposed construction methods for the basement are not known at this stage.

D SCREENING EXERCISE

8 Screening Framework

Using the information contained within the Desk Study, a 'Screening' process has been undertaken. The questions contained within this section are adapted from those outlined within the planning requirements of London Borough of Camden (CPG Basements, Ref [1]). It is considered that the adapted questions are pertinent to this Basement Impact Assessment.

The information in this section is based on the information in the supporting documents. A review of any issues identified is included in later sections of this report.

9 Subterranean Groundwater Flow

Question		Evidence
1a	Is the site located directly above an aquifer?	Screening & Scoping Report Envirocheck Report Ground Investigation Report Borehole logs
	No. The site is mapped as being underlain by London Clay Formation which is classified as unproductive strata. Boreholes at the site have confirmed London Clay to be the shallowest strata beneath the site.	
1b	Will the proposed basement extend beneath the water table surface?	Ground Investigation Report Groundwater monitoring
	Yes. From three groundwater monitoring visits, standing water levels were recorded between 0.85m to 2.8mbgl.	
2	Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	Screening & Scoping Report Walkover survey Envirocheck Report
	No. Nearest surface water feature is recorded as 324m north-east of the site, which appears to relate to a small pond associated with Holmewood School (potentially man-made).	
3	Is the site within the catchment of any known nearby ponds?	Screening & Scoping Report Walkover survey Envirocheck Report
	No.	
4	Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?	Screening & Scoping Report Existing and proposed development plans Walkover survey
	Yes. The site is currently covered with hard standing (asphalt/concrete) and the pavilion building. It is understood that gardens are proposed for the new dwelling as such the proportion of hard surfacing/paved areas will decrease.	
5	As part of the 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)?	Screening & Scoping Report Existing and proposed development plans Walkover survey
	No. The proportion of hard or covered surfaces present on the site will decrease, as such the volume of surface water produced will decrease.	
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 or spring line?	Screening & Scoping Report Existing and proposed development plans Walkover survey Envirocheck Report
	No.	

10 Land Stability

Question		Evidence
1	Does the existing site include slopes, natural or manmade, greater than 7 degrees? (approximately 1 in 8)	Screening & Scoping Report Walkover survey
	No.	
2	Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degs? (approximately 1 in 8)	Screening & Scoping Report Existing and proposed development plans
	No.	
3	Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees? (approximately 1 in 8)	Screening & Scoping Report Walkover survey Envirocheck Report OS Maps
	No.	
4	Is the site within a wider hillside setting in which the general slope is greater than 7 degrees? (approximately 1 in 8)	Desk Study Report Walkover survey OS Maps
	No.	
5	Is the London Clay the shallowest strata at the site?	Ground Investigation Report Borehole logs
	Yes. The soils beneath the site comprises a covering of Made Ground (0.8-1.2m tick) underlain by London Clay.	
6	Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained? (Note that consent may be required to undertake work to any tree/s protected by a Tree Protection Order or to tree/s in a Conservation Area if the tree is over certain dimensions).	Screening & Scoping Report Walkover Survey Existing and proposed development plans
	Yes. All trees within the site are to be retained; only mixed shrubs and Buddleia to be removed to facilitate development. Approximately 9 and 17% of the theoretical root protection areas (T4 & T11 respectively) shall be affected by 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?	Screening & Scoping Report Walkover Survey
	No. No evidence of seasonal shrink/swell subsidence was noted to the buildings surrounding the site.	
8	Is the site within 100m of a watercourse or a potential spring line?	Screening & Scoping Report Walkover survey Envirocheck Report
	No. Nearest surface water feature is recorded as 324m north-east of the site, which appears to relate to a small pond associated with Holmewood School (potentially man-made).	
9	Is the site within an area of previously worked ground?	Screening & Scoping Report Walkover survey Historic Mapping Envirocheck Report Ground Investigation Report Borehole logs
	No. The site is not mapped as being within an area of previously worked ground. However, there is evidence of previous development onsite which indicated Made Ground may be present. The intrusive investigation encountered made ground up to 1.2mbgl.	

Question		Evidence
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?	Screening & Scoping Report Envirocheck Report Ground Investigation Report Borehole logs Groundwater Monitoring
	No. The site is mapped as being underlain by London Clay Formation which is classified as unproductive strata. The intrusive ground investigation confirmed London Clay to be the shallowest strata. Based on the monitoring undertaken to date the groundwater level is recorded between 0.85m and 2.8mbgl, therefore dewatering will be required during construction.	
11	Is the site within 50m of the any known nearby ponds?	Screening & Scoping Report Walkover survey Envirocheck Report
	No.	
12	Is the site within 5m of a highway or pedestrian right of way?	Screening & Scoping Report Walkover survey Existing and proposed development plans
	Yes. Cascade Avenue bounds the site to the east, and The Chine and bounds the site to the west. However, the proposed basements are further than 5m from the highways.	
13	Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Screening & Scoping Report Walkover survey Existing and proposed development plans
	Unknown. However, the neighbouring properties do not have apparent basements or lower ground floor levels.	
14	Is the site over (or within the exclusion zone of) any tunnels, e.g. Railway lines?	Screening & Scoping Report Walkover survey Envirocheck Report OS Mapping
	No.	

11 Surface Flow and Flooding

Question		Evidence
1	Is the site within the catchment of any known nearby ponds?	Screening & Scoping Report Walkover survey Envirocheck Report
	No.	
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?	Screening & Scoping Report Existing and proposed development plans
	Unknown. No details have been provided for proposed or existing drainage routes.	
3	Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	Screening & Scoping Report Existing and proposed development plans Walkover survey
	Yes. The site is currently covered with hard standing (asphalt/concrete) and the pavilion building. It is understood that gardens are proposed for the new dwelling as such the proportion of hard surfacing/paved areas will decrease.	
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?	Screening & Scoping Report Existing and proposed development plans
	Unknown. No details have been provided for proposed or existing drainage routes.	
5	Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	Screening & Scoping Report Existing and proposed development plans Walkover survey
	No.	
6	Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?	Screening & Scoping Report Envirocheck Report
	No. The Desk Study has not identified a risk of surface water flooding or groundwater flooding of a property situated below ground level. No formal flood risk assessment or site specific groundwater monitoring has been undertaken for the site.	

12 Non-Technical Summary of Screening Process

The screening process has identified the following issues to be carried forward to Scoping for further assessment:

- Based on a recorded standing water levels, the basement construction will intersect the groundwater surface. Therefore appropriate dewatering and construction requirements will need to be considered during design.
- The foundation to the proposed basement may intersect underground utility services and drainage routes. A utility investigation should be carried out to assess the position and direction of these potential underground services and relevant utility may need to be informed of the works in order to determine their requirements.
- The foundation to the proposed basement is likely to be greater than those of the nearby houses. An assessment should be made, if possible, of the depths of the neighbouring foundation to inform the structural designs for the proposed basement.
- There are a number of trees around the perimeter of the site which have Tree Protection Orders. Consent may be required to undertake work on or nearby to any trees protected by a Tree Protection Order.
- A formal flood risk assessment should carried out for the site and specialist advice should be sought in relation to potential flooding issues.
- A Ground Movement Assessment (GMA) may be required in order to assess the potential damage to neighbouring building.

E BASEMENT IMPACT ASSESSMENT

13 Basement Impact Assessment

The conceptual site model (CSM) is described in the table below:

Item	Description
Ground conditions	Boreholes on site confirm the ground conditions to comprise a covering (up to 1.2m, of Made Ground over a silty CLAY of the London Clay Formation.
Groundwater level	No groundwater was encountered during drilling. Standing groundwater levels were recorded between 0.85-2.8mbgl.
Topography	The site is located within a wider hillside setting. The area surrounding the site sloped gently towards the south/south-east, by approximately 2-3 degrees (visually estimated). The site itself is split over two levels, separated by a retaining wall. The lower level to the east is approximately 1m lower than the western level. Each level is generally flat and level ground.
Existing foundations on site	A majority of the site is covered with Tennis Courts. A small single-storey pavilion building is located to the north of the site; the foundations details of this are unknown.
Proposed foundations on site	The proposed formation level of the basement is about 3.0m below ground level. Construction details are unknown at this stage.
Neighbouring basements and foundations	Unknown. The neighbouring building do not appear to have basements or lower ground floors. Their foundation dimensions are unknown at this stage.
Highways and infrastructure	Cascade Avenue is located adjacent to the eastern site boundary and The Chine is located adjacent to the western site boundary.
Tunnels and utilities	Drain inspection cover and buried services are located within the neighbouring roads.
Potential impacts	The formation of the proposed basement will cause horizontal and vertical ground movements in the surrounding area. Structural damage such as subsidence may occur to the walls and foundations of the adjacent residential dwellings. The proposed basement would penetrate below the groundwater surface. The formation and excavation of the proposed basement may have an effect on the current routes of potential underground services that may be situated underneath the site. The proposed building foundations may impact the root protection areas of certain trees on site.
Proposed mitigation	At this stage no structural details have been provided. A ground movement assessment may be required in order to assess the potential impacts relating to adjacent structures/buildings. Based on the ground investigation undertaken to date, bored pile retaining walls would be suitable for use on this site. A top-down construction sequence would help to reduce potential ground movements related to the construction of the basement. The presence of groundwater should be considered in the design of any temporary and permanent retaining systems and the effects of hydrostatic uplift should be considered in the design of the basement. The basement will need to be fully tanked. Construction methods will need to be assessed to ensure that the stability of the surrounding land is maintained. It may be required to liaise with the local residents regarding the private roads. Liaison may be required with the local utility companies. Consent may be required to undertake work on or nearby to any trees protected by a Tree Protection Order.
Residual impacts	n/a

14 Land Stability / Slope Stability

This Basement Impact Assessment has identified potential issues relating to ground movements in the surrounding soils.

At this stage no detailed design of the proposed development or construction methods have been provided.

A Ground Movement Assessment has not been undertaken and may be required in order to estimate the potential category of damage to the neighbouring buildings, and to estimate the ground movements affecting the adjacent highway and associated utilities.

The BIA has concluded that there will not be risks or slope stability impacts to the development or adjacent sites.

Construction controls are required to help ensure that ground movements related to basement construction are kept as small as practicable.

15 Hydrogeology and Groundwater Flooding

The screening and scoping report has concluded that there is a low risk from groundwater flooding for a property situated below ground level. Although, no formal flood risk assessment has been undertaken for the site and a site specific flood risk assessment should be carried out.

Based on the groundwater monitoring undertaken to date, the proposed basement would penetrate below the groundwater surface. The presence of groundwater should be considered in the basement design.

The BIA has not been able to assess the impact to the hydrogeological environment.

16 Hydrology, Surface Water Flooding, and Sewer Flooding

The BIA has concluded, based on the results of the screening and scoping report, there is not considered to be a risk of flooding related to surface water or sewers. A flood risk assessment should be carried out for the site.

The BIA has concluded that there are no likely impacts to the wider hydrological environment.

APPENDIX 1

Site Location Plan



1



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Site:	The Grove Lawn Tennis Club, Cascade Avenue, Haringey	Project ID	J15256
Figure 1	Site Location Plan	Date:	15/11/2022



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EMS 506775



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