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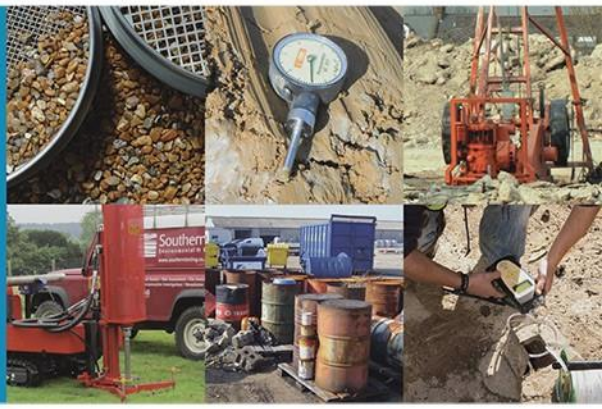
Basement Impact Assessment (BIA)



Project Name: Old Orchard Lodge Cottage

Location: Park Lane, Harefield, Uxbridge, UB9 6HJ

Client: Ammar Khaliq

Project ID: J15005

STL Report Ref: J15005-BIA

Report Date: 03 February 2022

Report Issue: 1

REVISIONS AND ADDITIONAL MATERIAL

1 Document History and Status

Issue	Date	Purpose/Status	File Ref	Author	Check/Review
1	03/02/2022	First Issue	J15005-BIA	VF	JNR

2 Document Details

Last saved	3rd February 2022	
Author	**V Francis** BSc MSc FGS	
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Check / Review	**JNR**	
STL Project Number	J15005-BIA	
STL Project Name	Old Orchard Lodge Cottage	

3 Additional Supporting Documents

3.1 Supporting Documents

Document	Date	Issue	Producer
Desk Study Report (STL Ref.:J15005-DS)	03/02/2022	1	Southern Testing Laboratories Ltd.
Geotechnical Survey Report (ref: 10269)	Dec 2016	1	Fastrack Group
Foul & SuDS Drainage Assessment (ref: 10757)	30 July 2020	1	GTA Civils and Transport Ltd.
Soakaway Testing – Infiltration Test Result Summary (ref: CS/C1454)	02 Sept 2020	1	CGS Civils

For and on behalf of Southern Testing Laboratories Limited.

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A NON-TECHNICAL SUMMARY

The site is currently a vacant plot of land, following the recent demolition of the former residential property. The site is located in Harefield, Uxbridge, approximately 500m south-west of Harefield Hospital. The approximate National Grid Reference of the site is TQ 04640 90449. The site location is indicated on Figure 1 within Appendix A.

Photographs showing the site and a detailed site description are presented in the Desk Study Report (J15005-DS).

It is proposed to construct a new two-storey detached dwelling with habitable basement space and associated parking and private garden. It is understood that the proposed basement will extend to around 3m below ground level and beneath the entire footprint of the property. A plan issued by the Client showing the existing layout and proposed development are included in Appendix A of the Desk Study report.

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

- Screening Exercise
- Additional supporting documents are included:
    - Desk Study and Walkover Survey (STL Ref. J15005-DS, dated 3rd February 2022).
- Preliminary Impact Assessment

The mapped soils indicate no superficial soils mapped across the majority of the site, but Gerrards Cross Gravels are mapped in the very south-easternmost corner. The bedrock is mapped as London Clay Formation, with Lambeth Group mapped nearby to the north-west of the site. A borehole, located just south of the recently demolished building, was undertaken by Fastrack Group in December 2016. The soils encountered consisted London Clay, with a superficial covering of gravel/cobbles (possibly Gerrards Cross Gravels) around 0.6m in thickness. In addition a trial pit located in the northern third, undertaken by CGS Civils in September 2020, found the soils to comprise loamy clay (topsoil) to 0.1m over London Clay.

Standing groundwater level was recorded at 2.65m on completion of the borehole. No long-term monitoring has been undertaken.

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

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

The desktop BIA 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 desktop BIA has not identified a risk of fluvial and surface water flooding based on the results of the Desk Study report. The site is located within an area identified as having a limited potential for groundwater flooding. No formal flood risk assessment has been carried out for the site.

B INTRODUCTION

4 Authority

Our authority for carrying out this work is contained in a Project Order Form from Mr A Khaliq (the Client), dated 20th December 2021. This was on the basis of our proposal and cost estimate (Ref Q211986-2) dated 20th December 2021.

5 Object

The object of this study was to produce a Desktop Basement Impact Assessment (BIA) as part of the Client's planning application in accordance with the requirements of the London Borough of Hillingdon, and to consider the effects of a proposed basement development at Old Orchard Lodge Cottage, Park Lane, Harefield, Uxbridge, UB9 6HJ.

The purpose of the BIA is to enable London Borough of Hillingdon 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:

- Desk Study and Walkover Survey (Southern Testing Laboratories Ltd., 3rd February 2022, Ref. J15005-DS)

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 Ammar Khaliq 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.

The recommendations contained in this report may not be appropriate to alternative development schemes.

Detailed information on the proposed development, such as detailed final layout, loadings and serviceability limits was not provided. Accordingly, where geotechnical design advice is provided it is on the prescriptive basis allowed for by Eurocode 7: employing conventional and conservative design rules.

7 Report Authors and Contributors

This report has been reviewed by a geologist holding Chartered Geologist (CGeol) status with the Geological Society of London.

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

C SITE OVERVIEW

The site is located in Harefield, Uxbridge, approximately 500m south-west of Harefield Hospital. The approximate National Grid Reference of the site is TQ 04640 90449. The site location is indicated on Figure 1 within Appendix A.

The site is currently a vacant plot of land, following the recent demolition of the former residential property. It is proposed to construct a new two-storey detached dwelling with habitable basement space and associated parking and private garden. It is understood that the proposed basement will extend to around 3m below ground level and beneath the entire footprint of the property.

The site is within a wider hillside setting but the slope is not estimated to be greater than 7 degrees. The site itself is generally flat and level.

The neighbouring properties include Old Orchard Lodge, a single-storey residential property, located around 10m north of the site. A lock-up garage associated with this property is located adjacent to the northernmost site boundary, approximately 2m from the proposed basement. Around 4m from the southern site boundary is The Old Orchard public house, which is a two-storey building with a possible lower ground floor level. The foundation dimensions of neighbouring properties are unknown at this stage.

The BIA has not identified a risk of fluvial or surface water flooding based on the results of the Desk Study report. However, there is considered to be a limited potential for groundwater flooding. No formal flood risk assessment has been carried out for the site.

There are no public highways or pedestrian pathways within 5m of the site.

There are no known tunnels within 50m of the proposed basement. There are underground utilities, including foul water drainage, located beneath the site.

It is understood the proposed basement will extend to approximately 3m below ground level. 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?** The south-easternmost corner of the site is mapped as being underlain by Gerrards Cross Gravels which is a Secondary A Aquifer. From a previous borehole, undertaken just south of the former building, gravel material was only encountered to between 0.3 to 0.6m below current ground level. However a majority of the site is mapped as being underlain by the London Clay Formation, which are classified as unproductive strata. A shallow trial pit undertaken further north on the site did not encounter any superficial deposits.	**Desk Study Report** Envirocheck Report **Fastrack Group Geotechnical Survey Report** **CGS Civils Soakaway Testing – Infiltration Test Result Summary**
1b	**Will the proposed basement extend beneath the water table surface?** Yes. From the previous borehole undertaken on site the standing water level was at 2.65m on completion of the borehole. No long-term groundwater monitoring has been undertaken.	**Fastrack Group Geotechnical Survey Report**
2	**Is the site within 100m of a watercourse, well (used/disused) or potential spring line?** No.	**Desk Study Report** Walkover survey Envirocheck Report
3	**Is the site within the catchment of any known nearby ponds?** No.	**Desk Study Report** Walkover survey Envirocheck Report
4	**Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?** Yes, it is understood that the proposed building will cover 30% more surface than the demolished building. A new permeable driveway and parking area is also to be installed.	**Desk Study Report** Existing and proposed development plan Walkover survey
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)?** Yes. The proportion of hard or covered surfaces present on the site will increase, as such the volume of surface water produced will increase. The proposed drainage strategy is not known.	**Desk Study Report** Existing and proposed development plan

Question		Evidence
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?**	**Desk Study Report** Walkover survey Envirocheck Report
	No. The nearest surface water feature is over 250m from the site.	

10 Land Stability

Question		Evidence
1	**Does the existing site include slopes, natural or manmade, greater than 7 degrees? (approximately 1 in 8)**	**Desk Study Report** Walkover survey
	No.	
2	**Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees? (approximately 1 in 8)**	**Desk Study Report** Existing and proposed development plan
	No.	
3	**Does the development neighbour land, including railway cuttings and the like, slope greater than 7 degrees? (approximately 1 in 8)**	**Desk Study 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. The site is located within a wider hillside setting but the slope is not estimated to be greater than 7 degrees.	
5	**Is the London Clay the shallowest strata at the site?**	**Desk Study Report** Envirocheck Report **Fastrack Group Geotechnical Survey Report** **CGS Civils Soakaway Testing – Infiltration Test Result Summary**
	The majority of the site is mapped as being directly underlain by London Clay, apart for a small section in the south-eastern corner which has superficial Gerrards Cross Gravels mapped. The single borehole, undertaken just south of the former building, encountered superficial soils to 0.6m over London Clay. Although, an additional shallow trial pit, located slightly further north, did not encounter any superficial soils.	
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).**	**Desk Study Report** Walkover Survey Existing and proposed development plan
	Yes, it is understood that some of the smaller tress across the site are to be removed. Some of the tress around the perimeter are to be retained. Some new trees and hedges are also proposed.	
7	**Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?**	**Desk Study Report** Walkover survey
	No. No evidence of seasonal shrink/swell subsidence was noted to the buildings surrounding the site.	

Question		Evidence
8	**Is the site within 100m of a watercourse or a potential spring line?**	**Desk Study Report** Walkover survey Envirocheck Report
	No.	
9	**Is the site within an area of previously worked ground?**	**Desk Study Report** Walkover survey Historic Mapping Envirocheck Report **Fastrack Group Geotechnical Survey Report** **CGS Civils Soakaway Testing – Infiltration Test Result Summary**
	No. The site is not mapped as being within an area of previously worked ground. However, given there has been previous development onsite Made Ground soils may be present. The previous borehole indicated 0.3m of Made Ground, but no Made Ground was noted in the shallow trial pit onsite.	
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?**	**Desk Study Report** Envirocheck Report **Fastrack Group Geotechnical Survey Report** **CGS Civils Soakaway Testing – Infiltration Test Result Summary**
	The south-easternmost corner of the site is mapped as being underlain by Gerrards Cross Gravels which is a Secondary A Aquifer. From a previous borehole on site gravel material was only encountered to between 0.3 to 0.6m below current ground level. However a majority of the site is mapped as being underlain by the London Clay Formation, which is classified as unproductive strata. A shallow trial pit undertaken further north did not encounter any superficial deposits. From the previous borehole undertaken on site the standing water level was at 2.65m on completion of the borehole. No long term groundwater monitoring has been undertaken. Dewatering will be required during construction.	
11	**Is the site within 50m of the any known nearby ponds?**	**Desk Study Report** Walkover survey Envirocheck Report
	No.	
12	**Is the site within 5m of a highway or pedestrian right of way?**	**Desk Study Report** Walkover survey Existing and proposed development plan
	No.	
13	**Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?**	**Desk Study Report** Walkover survey Existing and proposed development plan
	Unknown. The nearest structure to the proposed development is a lock-up garage which is located adjacent to the northern site boundary and approximately 2m from the proposed development. It is understood that the neighbouring property around 10m to the north does not have a basement or lower ground floor. The public house, around 4m to the south, may have a lower ground floor level.	
14	**Is the site over (or within the exclusion zone of) any tunnels, e.g. Railway lines?**	**Desk Study Report** Walkover survey OS Mapping Envirocheck Report
	No.	

11 Surface Flow and Flooding

Question		Evidence
1	**Is the site within the catchment of any known nearby ponds?**	**Desk Study 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?**	**Desk Study Report** Existing and proposed development plan
	Unknown. It is assumed some increase will occur along with an increase in hard surfacing.	
3	**Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?**	**Desk Study Report** Existing and proposed development plan Walkover survey
	Yes, it is understood that the proposed building will cover 30% more land than the demolished building. A new permeable driveway and parking area is also to be installed.	
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?**	**Desk Study Report** Existing and proposed development plan
	Unknown.	
5	**Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?**	**Desk Study Report** Existing and proposed development plan 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?**	**Desk Study Report** Envirocheck Report Walkover Survey **Fastrack Group Geotechnical Survey Report**
	No. The site is located within an area at very low risk of surface water flooding. The Envirocheck report identified the site as having a limited potential for groundwater flooding to occur. No formal flood risk assessment has been undertaken for the site. The nearest surface water feature is indicated as 252m north of the site. The previous borehole undertake on site identified the standing water level at 2.65m on completion of the borehole.	

13 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 level of 2.65m, the basement construction will intersect the groundwater surface. Therefore appropriate dewatering and construction requirements will need to be considered.
- The proposed development will increase the proportion of hard services and consequently will increase the volume of surface water produced. Suitable surface water drainage at the site will need to be carefully considered to allow for the increase surface water.
- 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.
- It is understood that some of the trees on the site are to be felled as part of the development and some new planting. The designer should be aware that precautions regarding swelling and shrinkage are applicable, and in this respect NHBC precautions provide a helpful guide with respect to minimum foundation depths and deepening particularly within the zone of influence of trees. Assessment of foundation depths should take into account trees, hedgerow and shrubs which are to be removed, remaining or are proposed which may be allowed to reach maturity.
- The foundation to the proposed basement is likely to be greater than those of the nearby garage and houses. An assessment should be made, if possible, of the depths of the neighbouring foundation to inform the structural designs for the proposed basement.
- A Ground Movement Assessment (GMA) may be required in order to assess the potential damage to neighbouring buildings.

E INITIAL SCOPING EXERCISE

14 Initial Basement Impact Assessment

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

Item	Description
Ground conditions	The mapped soils indicate no superficial soils mapped across the majority of the site, but Gerrards Cross Gravels are mapped in the very south-easternmost corner. The bedrock is mapped as London Clay Formation, with Lambeth Group mapped nearby to the north-west of the site. The recorded soils from a borehole, located just south of the former building, consisted London Clay, with a superficial covering of gravel/cobbles (possibly Gerrards Cross Gravels) around 0.6m in thickness. A trial pit located in the northern third of the site indicated loamy clay (topsoil) to 0.1m over London Clay.
Groundwater level	From the previous site investigation standing water level was recorded at 2.65m below ground level on completion of the borehole. No long-term monitoring has been undertaken
Topography	The site is within a hillside setting which slopes towards the west, but not estimated to be greater than 7 degrees. The site itself is generally flat and level.
Existing foundations on site	The depth of existing foundations, from the recently demolished building, are currently unknown.
Proposed foundations on site	The proposed formation level of the basement is understood to be around 3.0m below ground level. Construction details are unknown at this stage.
Neighbouring basements and foundations	The foundation dimensions of neighbouring properties are unknown at this stage. The nearest structure is a lock-up garage likely to have very shallow foundations. The Old Orchard Lodge does not appear to have a basement but the Old Orchard Public House may have a basement/lower ground floor level.
Highways and infrastructure	The nearest public highway is a lane around 30m from the northern site boundary.
Tunnels and utilities	There are no known tunnels within 50m of the site. Buried services, including sewer pipes, are located on site.
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 buildings. Based on the limited ground investigation to date, 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.
Proposed mitigation	At this stage no structural details have been provided. A ground movement assessment of any impacts relating to adjacent structures/buildings. Construction methods will need to be assessed to ensure that the stability of the surrounding land is maintained. 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. Liaison may be require with the local utility companies.
Residual impacts	n/a

15 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 any underground 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 be basement construction are kept as small as practicable.

16 Hydrogeology and Groundwater Flooding

The BIA has concluded, based on the results of the Desk Study, that the site is located within an area with limited potential for groundwater flooding. A formal flood risk assessment should be carried out for the site.

The BIA has concluded that there should be no significant impacts to the wider hydrogeological environment.

17 Hydrology, Surface Water Flooding, and Sewer Flooding

The BIA has concluded, based on the results of the Desk Study, there is not considered to be a significant risk of flooding related to surface water or sewers to the subject site. However, a formal flood risk assessment is recommended to be carried out for the site.

The BIA has concluded that there should be no significant impacts to the wider hydrological environment.

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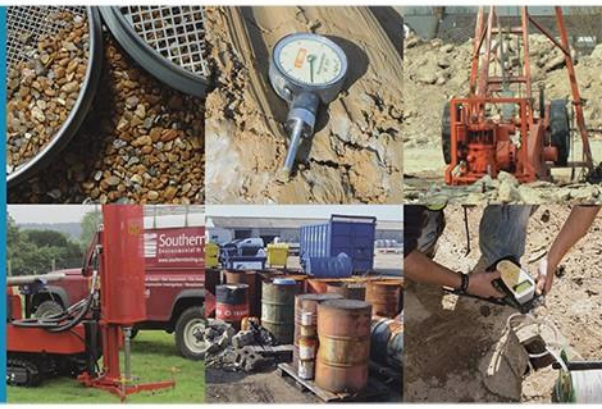
APPENDIX 1

Site Location Plan



1

Site:	Old Orchard Lodge Cottage, Harefield	Project ID	J15005
Figure 1	Site Location Plan	Date:	01/02/2022

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