CampbellReith
consulting engineers

74 Fortune Green Road
London, NW6 1DS

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12985-30
Revision: F1

March 2019

Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

T:+44 (0)20 7340 1700
E:london@campbellreith.com
W:www.campbellreith.com

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Author	N Simonini, BSc MSc FGS
Project Partner	E M Brown, BSc MSc CGeol FGS
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Contents

Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 74 Fortune Green Road (planning reference 2018/4600/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.

1.4. The LBC Instruction to proceed with the audit identified that the basement proposal neither involves, nor is neighbouring to, a listed building.

1.5. The Basement Impact Assessment (BIA) was undertaken by individuals that hold suitable qualifications, as required by the CPG Basement 2018. Non-technical summaries has been presented as requested in the previous version of the audit.

1.6. During the site investigation groundwater was monitored above the proposed basement depth. The BIA concludes that dewatering will be required and mitigation measures against stability impacts should be stated.

1.7. The BIA assumes that it is likely the basement foundations will increase the differential depth relatively to neighbouring properties, as no basements are present under surrounding buildings.

1.8. The GMA has been reviewed and is now accepted, as outlined in Section 4.

1.9. As requested in the previous version of the audit a utilities search and a works program with indicative project duration are presented in Appendix D of the BIA.

1.10. It is accepted the site is in an area at very low risk of flooding. It is also accepted that the percentage of hardstanding areas will not increase as result of the proposed development. However, it is noted that Thames Water should be consulted on the water surface strategy as part of the planning application.

1.11. It is accepted that the risk of disruption to the wider groundwater environment is negligible. It is accepted that there are no slope stability concerns regarding the proposed development.

1.12. Queries and requests for information are summarised in Appendix 2. Considering the updated information submitted, the BIA meets the requirements of the Camden Planning Guidance.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 19 October 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 74 Fortune Green Road, London NW6 1DS (Reference: 2018/4600/P).

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance: Basements, 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan 2017: Policy A5 Basements.

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment;

c) avoid cumulative impacts upon structural stability or the water environment in the local area;

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. LBC's Audit Instruction described the planning proposal as *"Excavation of the existing cellar for a new basement extension under the footprint of the building and installation of new shopfront."*

2.6. The audit instruction also confirmed that the proposal does not involve any listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 16 December 2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Soils Limited (ref: 17101/BIA/Rev.1.02), dated November 2018.
- Basement Construction Plan by JMS Consulting Engineers Ltd, Revision A, dated September 2018.
- Structural Calculations by JMS Consulting Engineers Ltd, Revision A, dated September 2018, and associated drawings:
  - Typical Retaining Wall Sections (EX18_132_07/501, P2)
  - Proposed Foundation Layout (EX18_132_07/500, P2)
  - Proposed Section 1-1 (EX18_132_07/504, P2)
- Noa Ram Susel Ltd Planning Application drawings:
  - Existing Elevations (sheet n° M-101),
  - Existing Section (sheet n° M-102),
  - Proposed Basement & Ground Floor (sheet n° M-103),
  - Proposed Elevations (sheet n° M-104),
  - Proposed Section (sheet n° M-105).

2.8. The following revised information was received from LBC in response to the queries raised in the initial (rev. D1) BIA audit report. All the documents are available on the planning portal and have therefore not been included on Appendix 3.

- Basement Construction Plan by JMS Consulting Engineers Ltd, Revision A, dated March 2019.
- Basement Impact Assessment by Soils Limited (ref: 17101/BIA/Rev.1.04), dated February 2019 and accompanying letter.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
Is data required by Cl.233 of the GSD presented?	Yes	Characteristics and location of the project are presented in the BIA along with characteristics of the potential impact.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	Yes	Maps and plans are provided in the BIA.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Data sources are presented in Section 2 and in Figures Section of the BIA. Justification is provided for 'No' answers.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Is a conceptual model presented?	Yes	A conceptual model has been described from the site investigation findings in the BIA. See Section 2 and 7 of the BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4 of the BIA.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4 of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4 of the BIA.
Is factual ground investigation data provided?	Yes	Section 5 of the BIA and associated appendices.
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Yes	Desk study information is presented in Section 2 and associated figures.
Has a site walkover been undertaken?	No	There is no evidence of a site walkover being undertaken.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The BIA indicates the neighbouring properties to not have a basement.
Is a geotechnical interpretation presented?	Yes	The correlation used to compare N_{10} and standards N blows to derive the undrained shear strength of the London Clay has been presented in the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Drained parameters (cohesion and friction angle) are presented in the BIA.
Are reports on other investigations required by screening and scoping presented?	NA	
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	The BIA indicates the neighbouring properties to not have a basement.
Is an Impact Assessment provided?	Yes	Section 9 and 10 of the BIA.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	Section 9.2 of the BIA.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Section 8 of the BIA.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Section 8 of the BIA.
Has the need for monitoring during construction been considered?	Yes	Section 8.2 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	The GMA has been reviewed accordingly.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However, the GMA should be reviewed and damage category reconfirmed.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) was undertaken by Soils Limited and the individuals concerned in its production hold suitable qualifications, as required by the CPG Basement 2018. Non-technical summaries were required as part of the previous audit and are now presented in Appendix D of the revision 1.04 of the BIA.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal neither involves, nor is neighbouring to, a listed building.

4.3. The site comprises a mid-terraced building distributed over three floors. A small cellar is located at the lower ground floor along the northern party wall to the front of the building. The property is bounded by 72 and 76 Fortune Green Road to the south and to the north respectively and it does not comprise any soft landscaped area. The proposals include the enlargement of the lower ground floor under the entire footprint of the existing building.

4.4. A ground investigation undertaken by Soils Ltd in August 2018 identified Made Ground to a maximum 1.50m bgl underlain by London Clay which was proven to 4.50m bgl. Groundwater was not struck during the site investigation. However, during one monitoring visit after groundworks, groundwater was monitored up to 2.54m bgl which is above the proposed basement depth. The BIA concludes that equilibrium conditions may be established only after a sequence of observations via groundwater monitoring wells and that dewatering with pumps may be required during the excavation. Although the BIA consider the potential for unwanted settlement to occur as a result of dewatering works, mitigation measures against this are not indicated in the report.

4.5. The BIA states: '*In the absence of robust long-term groundwater monitoring data from the well installed, full hydrostatic pressure (worst credible case) must be taken into account for the design of the proposed basement slab/walls or the worst credible levels as defined in EC-7.*' In the structural calculations a full hydrostatic profile has been modelled to start at 2/3 the height of the retaining wall.

4.6. The majority of the basement perimeter walls will be positioned directly beneath the existing masonry walls. The proposal is to form these walls of reinforced concrete, by construction in individual bays in an underpinning type sequence. Existing foundations at the party walls which extend within the property, are to be trimmed. Two levels of temporary props are proposed at the top and at the middle of the retaining wall.

4.7. The BIA assumes that it is likely the basement foundations will increase the differential depth relatively to neighbouring properties. The previous audit requested confirmation of whether the

neighbouring properties have a basement or not. From the updated information received, it is understood that no basements are present underneath the surrounding buildings.

4.8. It is understood that the basement slab is to be a ground bearing reinforced concrete slab tied into the toes of the underpinning section and will provide a permanent base prop to the underpins. A gross value of 150kPa was calculated for bearing capacity of the London Clay at a depth of 3.0m bgl. Structural pressures applied on the raft are between c. 45 and 75 kPa.

4.9. A summary of geotechnical parameters is presented in the BIA. Values for the undrained shear strength of the London Clay have been determined using a typical correlation with standard SPT N values (Appendix B). However, these have been obtained using a dynamic probe apparatus (DPH). It is understood that results obtained by dynamic probing were converted to equivalent SPT 'N' values based on dynamic energy using a commercial software (Geostru).

4.10. Geotechnical parameters for the retaining wall design presented in the BIA were considered to be incomplete in the previous BIA. Values for the friction angle and drained cohesion of the soil were requested to inform the retaining wall design. The parameters have been provided and are accepted.

4.11. A Ground Movement Assessment (GMA) was undertaken by Soils Ltd. The GMA has been updated as requested in the previous audit. Vertical movements induced by the excavation of the soil have been calculated using the software PDisp. Immediate settlement of underpinned walls due to construction activities has been estimated to be 5mm and included in the analysis. An updated version of the Basement Construction Plan has been submitted. This indicates the construction sequence to include a single stage of underpinning, validating the GMA conclusions.

4.12. It is noted that the BIA indicates differential settlement has been estimated considering the variation of the imposed loads across the foundations as specified in paragraph 4.8. The BIA indicates a maximum value for the differential settlement of 5mm.

4.13. The full output for every software analysis undertaken was requested in the previous audit along with a damage category assessment for each wall of the neighbouring properties within the zone of influence of the proposed basement. The BIA demonstrates the damage categories to the neighbouring properties to be within Category 1 of the Burland Scale.

4.14. The BIA states that no underground structures, tunnels or vaults are expected near the proposed works. As requested in the previous version of the audit a utilities search and a works program with indicative project duration are presented in Appendix D of the BIA.

4.15. The site is reported to be in area of moderate to high risk from shrink-swell clays. However, no evidence of structural damage caused by seasonal shrink-swell was noted during the walkover. The site investigation confirmed the London Clay to have a high volume change potential.

Considering no trees were noted on site and the proposed foundation depth, it is accepted that seasonal shrink and swell of the London Clay do not represent an issue for the development.

4.16. It is accepted the site is in an area at very low risk of flooding. It is also accepted that the percentage of hardstanding areas will not increase as result of the proposed development and there will be no impact to the wider hydrological environment.

4.17. As the basement will be founded within the London Clay, which is considered to hydrogeologically unproductive, it is accepted that the risk of disruption to the wider groundwater environment is negligible.

4.18. It is accepted that there are no slope stability concerns regarding the proposed development.

4.19. Queries and requests are described in Section 4 and summarised in Appendix 2.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) was undertaken by individuals that hold suitable qualifications, as required by the CPG Basement 2018. Non-technical summaries has been presented as requested in the previous audit.

5.2. During the site investigation groundwater was monitored above the proposed basement depth. The BIA concludes that dewatering will be required and mitigation measures against stability impacts should be stated.

5.3. The BIA assumes that it is likely the basement foundations will increase the differential depth relatively to neighbouring properties, as no basements are present under surrounding buildings.

5.4. Values for the undrained shear strength of the London Clay have been determined using a dynamic probe apparatus. Clarification regarding how the dynamic probing data was interpreted has been presented in the BIA.

5.5. The GMA has been reviewed and is now accepted, as outlined in Section 4.

5.6. As requested in the previous audit a utilities search and a works program with indicative project duration are presented in Appendix D of the BIA.

5.7. It is accepted the site is in an area at very low risk of flooding. It is also accepted that the percentage of hardstanding areas will not increase as result of the proposed development. However, it is noted that Thames Water should be consulted on the water surface strategy as part of the planning application.

5.8. It is accepted that the risk of disruption to the wider groundwater environment is negligible. It is accepted that there are no slope stability concerns regarding the proposed development.

5.9. Queries and requests for information are summarised in Appendix 2. Considering the updated information submitted, the BIA meets the requirements of the Camden Planning Guidance.

Appendix 1: Residents' Consultation Comment

None

Appendix 2: Audit Query Tracker

CampbellReith
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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	Non-technical summaries should be included in the BIA.	Closed	22/03/19
2	BIA baseline conditions	The BIA should investigate neighbouring foundations and reassess the impacts with the information obtained.	Closed	22/03/19
3	Geotechnical parameters	The BIA should clarify how the dynamic probing data was interpreted in the derivation of the undrained shear strength for the London Clay. Value for the friction angle and drained cohesion to be used in the retaining wall design should also be presented.	Closed	22/03/19
4	Ground Movement Assessment	The GMA and building damage assessment should be reviewed considering the comments in Section 4.	Closed	22/03/19
6	BIA baseline conditions	Utility search should be presented to inform baseline conditions.	Closed	22/03/19
7	Working program	An outline working program with the works duration should be presented in the BIA.	Closed	22/03/19

Appendix 3: Supplementary Supporting Documents

None

London

Friars Bridge Court
41- 45 Blackfriars Road
London, SE1 8NZ

T: +44 (0)20 7340 1700
E: london@campbellreith.com

Birmingham

Chantry House
High Street, Coleshill
Birmingham B46 3BP

T: +44 (0)1675 467 484
E: birmingham@campbellreith.com

Surrey

Raven House
29 Linkfield Lane, Redhill
Surrey RH1 1SS

T: +44 (0)1737 784 500
E: surrey@campbellreith.com

Manchester

No. 1 Marsden Street
Manchester
M2 1HW

T: +44 (0)161 819 3060
E: manchester@campbellreith.com

Bristol

Wessex House
Pixash Lane, Keynsham
Bristol BS31 1TP

T: +44 (0)117 916 1066
E: bristol@campbellreith.com

UAE

Office 705, Warsan Building
Hessa Street (East)
PO Box 28064, Dubai, UAE

T: +971 4 453 4735
E: uae@campbellreith.com