

5 – 17 Haverstock Hill
London, NW3 2BL

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 12466-15

Revision: F1

November 2016

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

T: +44 (0)20 7340 1700
F: +44 (0)20 7340 1777
E: london@campbellreith.com
W: www.campbellreith.com

Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	November 2016	Comment	GKgk12466-15-041116-5 - 17 Haverstock Hill-D1.docx	GK	PIL/CC	AJM
F1	November 2016	For planning	GKemb12466-15-281116-5-17 Haverstock Hill-F1.docx	GK	EMB	EMB

This document has been prepared in accordance with the scope of Campbell Reith Hill LLP's (CampbellReith) appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of CampbellReith's client. CampbellReith accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of Campbell Reith Hill LLP. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

© Campbell Reith Hill LLP 2016

Document Details

Last saved	28/11/2016 10:30
Path	GKemb12466-15-281116-5-17 Haverstock Hill-F1.docx
Author	G Kite, BSc MSc DIC FGS
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12466-15
Project Name	5 – 17 Haverstock Hill
Planning Reference	2016/3975/P

Contents

1.0	Non-technical summary	1
2.0	introduction.....	3
3.0	Basement Impact Assessment Audit Check List.....	5
4.0	Discussion	8
5.0	Conclusions	10

Appendix

- Appendix 1: Residents' Consultation Comments
- Appendix 2: Audit Query Tracker
- Appendix 3: Supplementary Supporting Documents

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 submitted as part of the Planning Submission documentation for 5 – 17 Haverstock Hill, London NW3 2BL (planning reference 2016/3975/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 proposed development involves demolition of the existing structure, which includes a partial level basement, and construction of a two buildings of five and seven storeys, with a partial level basement across part of the site. The site is immediately adjacent to Chalk Farm London Underground Station.
- 1.5. The BIA has been prepared by Geotechnical and Environmental Associates Ltd with supporting documents prepared by Alan Conisbee and Associates Ltd. The authors' qualifications are in accordance with the requirements of CPG4.
- 1.6. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.
- 1.7. The BIA states that the site lies directly on a designated non-aquifer, the London Clay and it is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.
- 1.8. The proposed development incorporates an attenuation SUDS scheme which reduces peak discharge flows by 50% from existing levels. The scheme includes flood risk mitigation measures that benefit the development. The scheme offers benefit to the wider hydrological environment.
- 1.9. The adjacent street area of Haverstock Hill is classified as having a medium surface water flood risk, although the site itself is classified as very low risk. Taking into account the proposed waterproofing and attenuation SUDS flood risk mitigation measures proposed, the proposed development is accepted as being of very low risk of flooding.

- 1.10. A site investigation is presented. The exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying a varying thickness of Made Ground. Interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented.
- 1.11. Limited groundwater monitoring is presented and the BIA recommends more long term monitoring to be undertaken, combined with additional site investigation, prior to construction to assess potential perched water inflows from Made Ground during construction.
- 1.12. The BIA includes a GMA which assesses that ground movements will be minimal and that Damage Impact to structures within the proposed development's zone of influence will be Category 0 (Negligible) in accordance with the Burland Scale.
- 1.13. Control of construction activities to mitigate ground movements, including temporary works recommendations and an outline monitoring proposal, are presented in the BIA. The BIA acknowledges that London Underground Limited's (LUL) exclusion zones must be adhered to and that all works affecting LUL assets are to be undertaken in consultation with LUL. It is recommended that the guidance document G0023 (Infrastructure Protection – Special Conditions for Outside Parties Working On or Near the Railway) forms a basis for any proposals.
- 1.14. It is accepted that there are no land stability impacts related to slopes. It is accepted that there are no land or structural stability issues relating to the proposed development, assuming guidance presented within the BIA is followed, including provision of stiff propping and monitoring throughout the construction period, in accordance with best practise.
- 1.15. An outline construction programme was requested. It has been agreed that this may be provided as part of the Construction Management Plan which is to be required by means of a Section 106 agreement.
- 1.16. Queries and matters requiring further information or clarification are summarised in Appendix 2. Assuming that the works proceed in accordance with the recommendations presented the criteria contained in CPG4 and DP27 have been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 12 October 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 5 – 17 Haverstock Place, London NW3 2BL, Camden Reference 2016/3975/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 (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

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; and,
- 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: "Demolition of existing building and erection of a part-six, part-seven storey development comprising 77 residential units (8 x studio, 18 x 1-Bed, 32 x 2-Bed and 19 x 3-Bed units) (Use Class C3) and retail (Use Class A1-A5) use at ground floor with associated cycle parking, amenity space, refuse and recycling store and associated works".

2.6. CampbellReith accessed LBC's Planning Portal on 20 October 2016 and gained access to the following relevant documents for audit purposes:

- Site Investigation and Basement Impact Assessment (ref J15316, Rev 3) dated May 2016 by Geotechnical and Environmental Associates Ltd.
- Flood Risk Assessment and Sustainable Drainage Strategy (ref 140870/TG, Rev 4.0) dated 8 July 2016 by Alan Conisbee and Associates Ltd.
- Site Location Plan, Existing Plans and Elevations, Proposed Plans and Elevations, Demolition Plans and Sections dated July 2016 by Piercy & Company.
- Comments and objections to the proposed development from local residents.

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	
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 plans/maps included?	Yes	Desk Study.
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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	The site is situated within Critical Drainage Area Group 3-003. Attenuation SUDS proposed.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	The BIA recommends further groundwater monitoring plus additional SI in advance of construction to confirm groundwater inflows.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	No adjacent basements identified. However, the proposed construction will need to respect LUL's exclusions zone.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	Yes	LUL consultations.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	They consider LUL Infrastructure.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Temporary propping, monitoring, groundwater inflow assessments, Attenuation SUDS etc.
Has the need for monitoring during construction been considered?	Yes	Condition surveys of LUL assets/tunnels has been recommended by LUL within the correspondence.
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	
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Appropriate attenuation SUDS proposed to mitigate surface water discharge flow.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Damage Impact limited to Category O (Negligible).
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The BIA has been prepared by Geotechnical and Environmental Associates with supporting documents prepared by Alan Conisbee and Associates Ltd. The authors' qualifications are in accordance with the requirements of CPG4.
- 4.2. The site investigation undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying a varying thickness of Made Ground. Interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented. The site investigation and BIA have been informed by a desk study broadly in accordance with the GSD Appendix G1.
- 4.3. The site lies directly on a designated non-aquifer, the London Clay and it is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.
- 4.4. The proposed development incorporates an attenuation SUDS scheme which aims to meet targets set in the National Planning Policy Framework (NPPF). Current peak discharge rate from the site has been calculated as 28.8l/s and the scheme proposed reduces peak discharge flows by 50% from existing levels, based on a 100 year + 30% (for climate change) return period storm event. The attenuation scheme will comprise underground modular storage units, blue and green roofs, and a hydro-brake restricting flow to 14.0l/s.
- 4.5. The scheme incorporates satisfactory pollution control measures and includes flood risk mitigation measures that benefit the development. The scheme offers benefit to the wider hydrological environment.
- 4.6. The adjacent street area of Haverstock Hill is classified as having a medium surface water flood risk, due to periodic storm events surcharging the storm sewer network. The site itself is classified as very low risk although flooding of the current lower ground floor has been observed during heavy rainfall. Taking into account the proposed waterproofing and attenuation SUDS flood risk mitigation measures proposed, the proposed development is accepted as being of very low risk of flooding.
- 4.7. Limited groundwater monitoring is presented and the BIA recommends more long term monitoring to be undertaken, combined with additional site investigation, prior to construction to assess potential perched water inflows from Made Ground during construction. Mitigation in the forms of sump pumping and / or use of grout between contiguous piles is proposed in the temporary case. In the permanent case, RC liner walls will be constructed within the pile walls. Appropriate waterproofing has been allowed for, including a drained cavity between the piled walls and the liner walls.

- 4.8. The BIA confirms that full propping of the basement walls has been allowed for, both in the permanent and temporary conditions. Suitable analysis has been presented. The BIA includes a GMA which assesses that ground movements will be minimal and that Damage Impact to structures within the proposed development's zone of influence will be Category 0 (Negligible) in accordance with the Burland Scale.
- 4.9. Control of construction activities to mitigate ground movements, including temporary works recommendations and an outline monitoring proposal, are presented in the BIA. The BIA acknowledges that London Underground Limited's (LUL) exclusion zones must be adhered to and that all works affecting LUL assets are to be undertaken in consultation with LUL. It is recommended that the guidance document G0023 (Infrastructure Protection – Special Conditions for Outside Parties Working On or Near the Railway) forms a basis for any proposals.
- 4.10. It is accepted that there are no land stability impacts related to slopes. It is accepted that there are no land or structural stability issues relating to the proposed development, assuming guidance presented within the BIA is followed, including provision of stiff propping and monitoring throughout the construction period, in accordance with best practise.
- 4.11. Subsequent to the issue of the initial audit report, it was agreed that the construction programme could be provided as part of the Construction Management Plan.

5.0 CONCLUSIONS

- 5.1. The authors' qualifications are in accordance with the requirements of CPG4.
- 5.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.
- 5.3. It is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.
- 5.4. The proposed development incorporates an attenuation SUDS scheme which includes flood risk mitigation measures that benefit the development. The scheme offers benefit to the wider hydrological environment.
- 5.5. The proposed development is accepted as being of very low risk of flooding.
- 5.6. A site investigation and interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented.
- 5.7. Limited groundwater monitoring is presented and the BIA recommends more long term monitoring to be undertaken, combined with additional site investigation, prior to construction to assess potential perched water inflows from Made Ground during construction.
- 5.8. The BIA assesses that ground movements will be minimal and that Damage Impact to structures within the proposed development's zone of influence will be Category 0 (Negligible) in accordance with the Burland Scale.
- 5.9. Appropriate mitigation measures are presented in the BIA, including control and monitoring of works during construction. The BIA acknowledges that LUL exclusion zones must be adhered to and that all works affecting LUL assets are to be undertaken in consultation with LUL. It is recommended that the guidance document G0023 (Infrastructure Protection – Special Conditions for Outside Parties Working O or Near the Railway) forms a basis for any proposals.
- 5.10. It is accepted that there are no land stability impacts related to slopes. It is accepted that there are no land or structural stability issues relating to the proposed development, assuming guidance presented within the BIA is followed in accordance with best practise.
- 5.11. An outline construction programme is to be provided in the Construction Management Plan.
- 5.12. Queries and matters requiring further information or clarification are summarised in Appendix 2. Assuming that the works proceed in accordance with the recommendations presented the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Groundwater	In accordance with the BIA's own recommendations, long term groundwater monitoring should be undertaken. Additional investigation to confirm inflow rates should be undertaken prior to construction.	Ongoing	N/A
2	Land Stability	Ongoing discussions with LUL should continue to ensure works proceed in accordance with LUL requirements.	Ongoing. Note that LUL correspondence indicates that pre and post construction condition surveys of their assets and tunnels should be undertaken.	N/A
3	Construction Programme	An outline construction programme should be provided, suitable for consideration during the planning process.	Closed – to be provided in Construction Management Plan	28/11/16

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

Campbell Reith Hill LLP. Registered in England & Wales. Limited Liability Partnership No OC300082
A list of Members is available at our Registered Office at: Friars Bridge Court, 41- 45 Blackfriars Road, London SE1 8NZ
VAT No 974 8892 43