CampbellReith
consulting engineers

109 Goldhurst Terrace
London, NW6 3HA

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-88
Revision: D1

August 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	August 2016	Comment	GKemb12336-88-220816-109 Goldhurst Terrace-D1.docx	GK	PIL/CC	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	22/08/2016 14:25
Path	GKemb12336-88-220816-109 Goldhurst Terrace-D1.docx
Author	G Kite, BSc MSc DIC FGS MAPM
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12366-88
Project Name	109 Goldhurst Terrace
Planning Reference	2016/0421/P

Contents

1.0 Non-technical summary 1
2.0 introduction 3
3.0 Basement Impact Assessment Audit Check List 5
4.0 Discussion 9
5.0 Conclusions 11

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 109 Goldhurst Terrace, London NW6 3HA (planning reference 2016/0421/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 is a new single storey basement across the majority of the site area. The existing two storey house will also undergo significant structural changes, within the existing building footprint. The BIA states that the proposed development is primarily for residential use but will include a small dental surgery with separate access at the rear.

1.5. The BIA has been prepared by Chelmer Consultancy Services. The authors' qualifications are in accordance with LBC's requirements.

1.6. A desk study broadly in accordance with the GSD Appendix G1 has been presented. However, the presence or absence of the NW Storm Relief Sewer and / or other infrastructure potentially within the zone of influence of the proposed development should be confirmed as part of the BIA, and the impact assessment updated if required.

1.7. A ground investigation confirms the desk study findings that the site is underlain by Made Ground over the London Clay Formation. However, the BIA states that the hand vane readings in the London Clay cannot be relied upon for design purposes. The BIA should present geotechnical parameters in line with the GSD Appendix G3.

1.8. The BIA indicates the site to be at very low risk of surface water flooding or impacting the wider surface water flow environment. However, the desk study has identified a historic drainage ditch or culvert that may be present along the eastern site boundary, which if encountered could impact the development and surrounding area. Further investigation along the eastern boundary to confirm site conditions is required.

1.9. The BIA notes that Goldhurst Terrace was subject to surface water flooding in 1975 and 2002, and that the site is located within the Goldhurst Local Flood Risk Zone, as defined by LBC. In

line with CPG4 (section 3.48), as the proposed development is located within a defined Local Flood Risk Zone, a site specific Flood Risk Assessment is required.

1.10. The BIA concludes that there is no risk of groundwater flooding at the site or impact to the wider hydrogeological environment, which is accepted based on current assumptions. However, further SI should confirm if Alluvium is present along the eastern site boundary and the impact assessment updated, if required.

1.11. The BIA includes a Ground Movement Assessment (GMA) that indicates there will be no land stability impacts caused by the proposed development. Although the GMA is based upon reasonably conservative soil stiffnesses, the GMA conclusions should be confirmed when the geotechnical interpretation has been revised.

1.12. The BIA discusses the requirement for survey and monitoring during construction, in line with best practise, and the requirement for employing competent and experienced contractors.

1.13. Queries and matters requiring further information or clarification are summarised in Appendix 2.

1.14. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met. Queries and requests for further information/clarification are discussed in Section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 11 May 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 109 Goldhurst Terrace, London NW6 3HA, Camden Reference 2016/0421/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: "Excavation of a single storey basement level extension for residential use (C3)".

2.6. CampbellReith accessed LBC's Planning Portal on 5 August 2016 and gained access to the following relevant documents for audit purposes:

· Basement Impact Assessment (ref BIA/5673) dated November 2015 by Chelmer Consultancy Services.

- Site Location Plan, Existing Plans and Elevations, Proposed Plans and Elevations (Rev Planning) dated December 2015 by Eksalta Architectural Services.
- Planning Statement dated 26 January 2016 by Edge Planning & Development LLP.
- Structural Drawings and Sections (Rev Preliminary) dated October 2015 by Devise Engineers.
- Construction Method Statement (Rev Planning iii) dated July 2016 by Devise Engineers.
- Comments and objections to the proposed development from local residents and residents' associations.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The author's qualifications are in accordance with CPG4 guidelines for all sections.
Is data required by Cl.233 of the GSD presented?	No	A desk study broadly in line with the GSD Appendix G1 has been provided. Utility companies have not been approached in regards to underground infrastructure.
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	
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	A historical drainage ditch / stream has been identified as potentially having run along the eastern boundary of the development site.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A historical drainage ditch / stream has been identified as potentially having run along the eastern boundary of the development site, which may include local Alluvial deposits.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A historical drainage ditch / stream has been identified as potentially having run along the eastern boundary of the development site.
Is a conceptual model presented?	Yes	However, a shear strength profile for the London Clay should be confirmed.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Potential for Alluvium / softer soils / underground infrastructure (culvert) identified. Additional investigation is required to confirm the conditions along the eastern site boundary.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Potential for Alluvium. Additional investigation is required to confirm the conditions along the eastern site boundary.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	It is accepted that the development will not materially change run-off from the current site arrangements. However, in line with CPG4 (section 3.48), as the proposed development is located within LBC's defined 'Goldhurst' Local Flood Risk Zone, a detailed Flood Risk Assessment is required.
Is factual ground investigation data provided?	Yes	Additionally, site investigation data from other local developments is also provided. However, additional investigation is required to confirm the conditions along the eastern site boundary.
Is monitoring data presented?	Yes	
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	There are no other basements in the immediately adjacent to the development, other than partial cellars of restricted depth. Local basements in the wider area have been identified.
Is a geotechnical interpretation presented?	No	The BIA states that the given shear strengths for the London Clay should not be used for design purposes. Bearing capacities are not presented.
Does the geotechnical interpretation include information on retaining wall design?	Yes	The Construction Method Statement includes outline proposals for temporary and permanent propping to retaining walls.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	Yes	
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Based on a combination of bored pile retaining walls and underpinned walls. The shear strength of the London Clay is taken as more conservative than those indicated in the site investigation.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Consideration of potential land stability and hydrological impacts along the eastern site boundary require further consideration.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Structural propping, monitoring and trigger levels for contingency actions during construction are discussed. Drainage mitigation measures to protect the basement from flooding are discussed. Further consideration of site conditions along the eastern site boundary required.
Has the need for monitoring during construction been considered?	Yes	
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?	No	Further consideration of site conditions along the eastern site boundary required. A shear strength profile for the London Clay should be confirmed.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	It is accepted that the development will not materially change run-off from the current site arrangements. However, further consideration of site conditions along the eastern site boundary required.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Further consideration of site conditions along the eastern site boundary required.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Based on reasonably conservative soil stifnesses. Further consideration of site conditions along the eastern site boundary required.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Chelmer Consultancy Services with a Construction Method Statement by Devise Engineers. The BIA authors have suitable qualifications.

4.2. The LBC Instruction to proceed with the audit advise that the basement proposals do not involve a listed building, nor does the site neighbour any listed buildings.

4.3. Unit 1 of 109 Goldhurst Terrace is a two-storey house to the rear of Nos 111 and 113 and is accessed via an arch between 107 and 111 Goldhurst Terrace. The proposed development involves the construction of a single storey basement beneath the entire site which will be used mainly for residential purposes, with a small dental surgery. The proposed slab will be approximately 3.50m below ground level and it is intended to underpin the party walls with reinforced concrete lining walls providing lateral support. A compressible medium is to be placed beneath the slab to accommodate potential heave.

4.4. A desk study has been presented, which includes searches for local rail infrastructure/tunnels that may run beneath the site. No rail tunnels were identified. However, the BIA states that: "the NW Storm Relief Sewer is understood … to run beneath part of Goldhurst Terrace…", and "Other infrastructure (including tunnels) for cables or communications might be present within the zone of influence of the proposed basement, so an appropriate services search should be undertaken". The presence or absence of the NW Storm Relief Sewer and/or other infrastructure potentially within the zone of influence should be confirmed as part of the BIA, and the impact assessment updated if required.

4.5. The BIA states that a drainage ditch/stream may have formed the eastern boundary of the site, and may have been culverted. Site investigation to date has not identified any Alluvium or similar deposits that would identify if the stream/ditch/culvert is present along the site boundary. Given that the presence of Alluvium or a historic culvert could cause significant land stability and hydrological impacts if encountered (e.g. by piles/foundations) then more extensive site investigation along the eastern boundary is required to confirm site conditions. It is also recommended that all excavations during the construction along that boundary of the site are inspected by an appropriately qualified engineer. If site investigation/excavations indicates the presence of a drainage flow path, softer deposits or a culvert, then the impact assessment should be updated and the design revised appropriately.

4.6. Should further site investigation indicate the presence of Alluvium along the eastern boundary then the hydrogeological impact assessment and design should also be revised accordingly.

4.7. The BIA notes that Goldhurst Terrace was subject to surface water flooding in 1975 and 2002, and that the site is located within the Goldhurst Local Flood Risk Zone, as defined by LBC. Within the BIA, the site itself is noted to be topographically higher than Goldhurst Terrace, with runoff falling towards the road. The site itself has no historical records of flooding and the Environment Agency indicates the site to be at a 'Very Low' risk of surface water flooding.

4.8. The BIA indicates that detailed drainage design will include perimeter drainage, upstands to the ground floor and profiling of the car port area to prevent runoff onto the site, and pumped drainage including non-return valves in the basement (to prevent sewer flooding during surcharging). Assuming the historical drainage flow path or culvert on the eastern boundary is not encountered, hydrological impacts to the proposed development or surrounding area may be covered by the mitigation proposals within the BIA. However, in line with CPG4 (section 3.48), as the proposed development is located within LBC's defined 'Goldhurst' Local Flood Risk Zone, a detailed Flood Risk Assessment is required. The recommendations in 4.2 should also be adhered to and the BIA and subsequent mitigation design updated, if required.

4.9. The BIA states that the hand vane testing for determining shear strength of the London Clay should not be relied upon for design purposes. Geotechnical parameters, including a shear strength profile and bearing capacities, as outlined in the GSD Appendix G3 should be presented.

4.10. The ground movement assessment (GMA) adopts conservative stiffness values and is therefore considered to provide a reasonably conservative assessment. However, in order to progress detailed design of the retaining walls and foundations reliable shear strength values for London Clay will need to be obtained by further site investigation and/or laboratory testing. The GMA conclusions should be confirmed when the geotechnical interpretation has been revised.

4.11. The BIA advises that the contractor should make suitable contingency plans to deal with any perched water encountered during construction. In the long term, the permanent structure will require suitable waterproofing to be provided in line with best practice. More detailed recommendations may be required, dependent upon the final assessment of the ground and groundwater conditions along the eastern site boundary.

4.12. It is accepted that the development is not in an area subject to flooding or slope instability.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by Chelmer Consultancy Services. The authors' qualifications are in accordance with LBC's requirements.

5.2. Within the desk study the presence or absence of the NW Storm Relief Sewer and/or other infrastructure potentially within the zone of influence of the proposed development should be confirmed, and the impact assessment updated if required.

5.3. The BIA states that the shear strength readings in the London Clay, obtained during the site investigation, cannot be relied upon for design purposes. The BIA should present geotechnical parameters in line with the GSD Appendix G3.

5.4. The desk study has identified a historic drainage ditch or culvert that may be present along the eastern site boundary, which if encountered could impact the development and surrounding area. Further investigation along the eastern boundary to confirm site conditions is required.

5.5. In regards to surface water flow, in line with CPG4 (section 3.48), as the proposed development is located within a defined Local Flood Risk Zone, a site specific Flood Risk Assessment is required.

5.6. The BIA concludes that there is no risk of groundwater flooding at the site or impact to the wider hydrogeological environment, which is accepted based on current assumptions. However, further SI should confirm if Alluvium is present along the eastern site boundary and the impact assessment updated, if required.

5.7. The BIA includes a Ground Movement Assessment (GMA) that indicates there will be no land stability impacts caused by the proposed development. Although the GMA is based upon reasonably conservative soil stiffnesses, the GMA conclusions should be confirmed when the geotechnical interpretation has been revised.

5.8. Queries and matters requiring further information or clarification are summarised in Appendix 2.

5.9. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Symonds / CRASH	48 Cranfield Gardens, NW6 3EB	19 March 2016	Objections (inter alia): drainage and flood risk.	Refer to audit report para 4.4 & 4.5
Catterall	9 Fairfax Place, NW6 4EJ	17 March 2016 and 31 May 2016	Objections (inter alia): ground movement impact to surrounding structures; drainage and flooding impacts.	Refer to audit report para 4.4, 4.5 & 4.7
Qui	10 Fairhazel Gardens	8 March 2016	Concerned about structural stability of their property due to basement construction.	Refer to audit report para 4.7
Prooth	15 Fairfax Place, NW6 4EJ	10 March 2016	Objections (inter alia): instability caused by construction; groundwater impact and flooding.	Refer to audit report para 4.4, 4.5 & 4.7
Payne	11 Fairfax Place, NW6 4EJ	2016	Concerned about removal of shared party wall and impact during construction.	Refer to audit report para 4.7
Read	13 Fairfax Place, NW6 4EJ	30 May 2016	Objections (inter alia): structural instability.	Refer to audit report para 4.7
Whittaker	111D Goldhurst Terrace, NW6 3HA	23 March 2016	Objections (inter alia): structural instability caused by construction.	Refer to audit report para 4.7
Fischer	111A Goldhurst Terrace, NW6 3HA	23 March 2016	Objections (inter alia): potential flooding risks.	Refer to audit report para 4.4 & 4.5
Bruck	111C Goldhurst Terrace, NW6 3HA	24 March 2016	Objections (inter alia): structural instability caused by construction.	Refer to audit report para 4.7

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Desk Study	The presence or absence of the NW Storm Relief Sewer and/or other infrastructure potentially within the zone of influence should be confirmed as part of the BIA, and the impact assessment updated if required.	Open	
2	Land Stability/Surface Water Flow/Hydrogeology	Given that the presence of Alluvium or a historic culvert could cause significant land stability, hydrogeological and hydrological impacts if encountered (e.g. by piles/ foundations) then more extensive site investigation along the eastern boundary is required to confirm site conditions.	Open	
3	Land Stability	The BIA states that the hand vane readings in the London Clay cannot be relied upon for design purposes. The BIA should present geotechnical parameters in line with the GSD Appendix G3.	Open	
4	Surface Water Flow/Flood Risk	In line with CPG4 (section 3.48), as the proposed development is located within LBC's defined 'Goldhurst' Local Flood Risk Zone, a detailed Flood Risk Assessment is required.	Open	
5	Ground Movement Assessment	The GMA conclusions should be confirmed when the geotechnical interpretation has been revised.	Open	

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