

Flat A, 13 Crossfield Road,
London, NW6 4NS

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12466-54
Revision: D1

March 2017

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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 Flat A, 13 Crossfield Road, London, NW6 3EP (planning reference 2016/6426/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 (BIA) 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 BIA has been carried out by Stephen Buss Environmental Consulting Ltd. The authors' qualifications are in accordance with CPG4 requirements.
- 1.5. The proposal includes constructing a single floor basement beneath the footprint of the building and a small part of the rear garden, which is currently paved. It is proposed to construct the basement by way of sequential underpinning to the existing lower ground floor flat and CFA piling to the garden. Although this is an acceptable technique, underpinning details have not been presented.
- 1.6. Structural designs are not presented in the BIA. Outline structural calculations for the basement retaining wall, basement slab and foundations are required to determine the viability of the proposals, including soil properties and assumed water levels.
- 1.7. Temporary propping details are required based on the structural designs requested. A construction sequence with indicative sketches is also requested.
- 1.8. An outline construction programme should be provided.
- 1.9. A quantitative Ground Movement Assessment (GMA) is required. CPG4 requires mitigation measures to be considered where predicted damage exceeds Burland Category 1.
- 1.10. The presence of utility infrastructure within the development's zone of influence should be confirmed and damage impacts assessed, if applicable.
- 1.11. A monitoring strategy for adjoining structures should be established before the work starts, which may include condition surveys, trigger levels linked to the GMA and appropriate contingency measures.

- 1.12. Groundwater levels on site are about 1.9m above basement formation level. Groundwater control measures to be utilised during construction and for the permanent case should be proposed.
- 1.13. It is accepted that the surrounding slopes to the development are stable and that there are no groundwater considerations regarding the proposed development.
- 1.14. The site is within a Critical Drainage Area. In accordance with LBC guideline, the consideration of attenuation SUDS should be presented.
- 1.15. Queries and requests for clarification are discussed in Section 4 and summarised in Appendix 2. Until the additional information is presented, the BIA does not meet the criteria of CPG4.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 3 March 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Flat A, 13 Crossfield Road, London, NW6 3EP (2016/6426/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;
 - 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 basement, erection of single storey rear conservatory and replacement of side windows to lower ground floor flat.*"
- 2.6. The Audit Instruction also confirmed that the basement proposal does not involve a listed building nor does the site neighbour any listed buildings.
- 2.7. CampbellReith accessed LBC's Planning Portal on 7 March 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) dated January 2017 (First Draft) by Stephen Buss Environmental Consulting Ltd.
- Design and Access Statement dated November 2016 by Robert Savage & Associates.
- Planning Application Drawings by Robert Savage & Associates consisting of:
 - Existing Plans, Elevations and Sections (October 2016).
 - Proposed Plans, Elevations and Sections (October 2016).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA Section 1.4.
Is data required by Cl.233 of the GSD presented?	No	Outline construction programme to be provided. Utility infrastructure within the zone of influence to be confirmed.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	BIA and Appendix A.
Are suitable plan/maps included?	Yes	BIA and Appendix A (Appendix C).
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	BIA and Appendix A (Appendix C).
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Appendix A, Section 7.1.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 3.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4.
Is a conceptual model presented?	Yes	BIA Section 2 and 5.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Appendix A, Section 7.2.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 5.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No issues carried forward to scoping.
Is factual ground investigation data provided?	Yes	BIA Appendix A.
Is monitoring data presented?	Yes	BIA Section 2 and Appendix A, although further groundwater monitoring recommended.
Is the ground investigation informed by a desk study?	Yes	BIA Appendix A Section 3.
Has a site walkover been undertaken?	Yes	BIA Appendix A Section 3.2.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Section 2.4.
Is a geotechnical interpretation presented?	Yes	BIA Section 2 and Appendix A Section 6.
Does the geotechnical interpretation include information on retaining wall design?	No	Retaining wall design not presented, and no stiffness parameters are included. Other geotechnical parameters are included in BIA Appendix A Section 6.1.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation presented in BIA Appendix A. Groundwater Impact Assessment presented in BIA Section 5.
Are the baseline conditions described, based on the GSD?	Yes	BIA.
Do the base line conditions consider adjacent or nearby basements?	Yes	BIA.
Is an Impact Assessment provided?	No	Ground Movement Assessment (GMA) not presented.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	No	GMA not presented.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	N/A	Structural stability impacts to be assessed and presented.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	BIA Sections 7 and 8, although this should be updated to reflect the outcomes of the GMA.
Has the need for monitoring during construction been considered?	Yes	BIA Section 7.5, although this should be updated to reflect the outcomes of the GMA.
Have the residual (after mitigation) impacts been clearly identified?	No	Structural stability impacts to be assessed and presented.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Structural stability impacts to be assessed and presented.
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?	No	GMA not presented.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	Structural stability impacts to be assessed and presented.
Are non-technical summaries provided?	No	Although conclusions are presented in BIA Section 6.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Stephen Buss Environmental Consulting Ltd and the individuals concerned in its production have suitable qualifications as per the requirements of CPG4.
- 4.2. The existing property comprises 13A Crossfield Road which is the lower ground floor flat of a four-storey end-terrace house. Plans for the new basement development involve constructing a single floor basement beneath the footprint of the building and a small part of the rear garden, which is currently paved. The formation level of the basement (54m AOD) is expected to be 4m below the elevation of Crossfield Road (58m AOD). It is noted that groundwater levels on site were measured at 55.9m AOD, or about 1.9m above basement formation level.
- 4.3. The BIA and Ground Investigation Report has identified that on site ground conditions comprise a variable depth of Topsoil and Made Ground (1.00m to 2.70m thick) underlain by Head Deposits (0.20 to 0.90m thick) and London Clay from 1.20 to 3.60m bgl. The proposed basement will therefore be founded in London Clay.
- 4.4. It is accepted that no known ponds, springlines or wells are in close vicinity to the site and that the site is not located within the catchment area of the Hampstead Heath pond chain. An assessment of adjacent property foundation / basement depths in comparison with the groundwater level has been presented. The proposed basement will be predominantly within the London Clay, which is classified as Unproductive Strata. It is accepted that the site will not impact upon the wider hydrogeological environment.
- 4.5. It is proposed to create a new basement by way of sequential underpinning to the existing lower ground floor flat and CFA piling to the garden. Underpinning depth, width, bay sequence and type (mass or reinforced concrete) are requested. Dimensioned drawings required to provide clarity on the proposed development.
- 4.6. Structural designs are not presented in the BIA. Outline structural calculations for the basement retaining walls, basement slab and foundations are required to demonstrate the viability of the proposals, including soil properties and assumed water levels. An indicative assessment of the likely heave forces is presented Appendix A of the BIA. The potential long term effect of this heave should be considered for the basement slab design.
- 4.7. A temporary works strategy should be presented in the BIA, including temporary propping details based on the structural designs requested and suitable groundwater control methodologies, considering the likely volume and flow rates expected. The contractor should confirm groundwater conditions prior to starting works.

- 4.8. A quantitative Ground Movement Assessment (GMA) is required. The engineering interpretation requires calculations of predicted ground movements and structural impacts to be provided. A Damage Category Assessment as per CIRIA C580 is required to assess the effects that the construction of the proposed basement will have on both Crossfield Road and adjacent properties. Furthermore, CPG4 requires mitigation measures to be considered where predicted damage of Burland Category 1 or greater is predicted, and for the impacts to be then reassessed, if applicable.
- 4.9. A programme of monitoring the adjoining structures should be established before the work starts, which may include condition surveys, and this should be incorporated in the BIA. The monitoring strategy should include trigger levels linked to the GMA and appropriate contingency measures.
- 4.10. It is accepted that the proposal will not alter the existing proportion of hard surfaces and paved areas, and hence, the quantity of local rainfall entering the existing sewer system. However, the site is within a Critical Drainage Area. In accordance with CPG4, Section 3.51, consideration of attenuation SUDS to reduce surface water discharge flow rates to sewers should be presented.
- 4.11. It is accepted that there are no slope stability concerns regarding the proposed development.
- 4.12. No known tunnels or railway lines are located within the vicinity of the site. The BIA should identify any utility infrastructure within the zone of influence of the development and assess damage impacts, if applicable.
- 4.13. It is acknowledged that no trees will be removed due to the proposed development.

5.0 CONCLUSIONS

- 5.1. The BIA was undertaken by Stephen Buss Environmental Consulting Ltd. The authors' qualifications are in accordance with CPG4 requirements.
- 5.2. The proposal includes constructing a single floor basement beneath the footprint of the building and a small part of the rear garden by way of sequential underpinning and CFA piling to the garden. Temporary works details should be presented, including propping and sequencing.
- 5.3. Outline structural calculations for the basement retaining wall, basement slab and foundations are required to determine the viability of the proposals.
- 5.4. Dimensioned drawings are not presented and these should be included in the BIA to provide clarity on the proposed development.
- 5.5. An outline construction programme should be provided.
- 5.6. A quantitative Ground Movement Assessment and Damage Impact Assessment is required, which should include all structures within the zone of influence.
- 5.7. The presence of utility infrastructure within the development's zone of influence should be confirmed and damage impacts assessed, if applicable.
- 5.8. A monitoring strategy for structures within the zone of influence should be established before the work starts.
- 5.9. Groundwater control measures to be utilised during construction and for the permanent case should be proposed.
- 5.10. It is accepted that the surrounding slopes to the development are stable.
- 5.11. It is accepted that the development will not impact on the wider hydrogeological environment.
- 5.12. The site is within a Critical Drainage Area. In accordance with LBC guideline, the consideration of attenuation SUDS should be presented.
- 5.13. Queries and requests for further information are summarised in Appendix 2. Until the additional information is presented, the BIA does not meet the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Ziffo, E	Flat 3, 12 Crossfield Road, London, NW3 4NS	20.02.17	Stability concerns.	See response in Section 4.6, 4.8 to 4.9
Cooke, D	Flat 1, 12 Crossfield Road, London, NW3 4NS	22.02.17	Flooding and general groundwater concerns.	See response in Section 4.7 and 4.10
Pomeroy, G	12a Crossfield Road, London, NW3 4NS	22.02.17	General stability, surface water and flooding concerns.	See response in Section 4.6 to 4.10

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	Works programme not provided. Outline duration to be provided.	Open	
2	Stability	Underpinning depth, width, bay sequence and type requested for all areas. Dimensioned drawings required to provide clarity on the proposed development.	Open	
3	Stability	Outline structural calculations for the basement retaining wall, basement slab and foundations are required to demonstrate the viability of the proposals, including soil properties and assumed water levels. Geotechnical parameters as per GSD Appendix G3 to be provided.	Open	
4	Stability	Indicative temporary works propping scheme to be provided. Groundwater control measures to be provided.	Open	
5	Stability	Ground Movement Assessment and Structural Impact Assessment to be presented and justified. Appropriate mitigation measures to be considered, as required.	Open	
6	Stability	The presence of utility infrastructure within the zone of influence should be confirmed. Damage impact should be assessed, if applicable.	Open	
7	Stability	Movement Monitoring Strategy is requested, to consider the existing and neighbouring properties.	Open	
8	Surface Water Flow	Consideration of attenuation SUDS to be presented as per CPG4 3.51.	Open	

Appendix 3: Supplementary Supporting Documents

None

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