

4 Keats Grove, NW3 2RT

Basement Impact Assessment
Audit

For

London Borough of Camden

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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	A J Ross, MEng
Project Partner	E M Brown, BSc MSc CGeol FGS
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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 4 Keats Grove (Camden planning reference 2017/5913/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. Further information on the qualifications of the individuals involved is requested.
- 1.5. The proposal involves lowering an existing lower ground floor area within the studio building at the front of the property by underpinning. The property itself along with the neighbouring buildings are listed.
- 1.6. A construction method statement is provided, however, this is generic and retaining wall calculations have not been provided.
- 1.7. The strength value indicated for the underlying soils is not to be reasonably conservative and should be reconsidered. Other parameters for retaining wall design should also be provided.
- 1.8. A ground movement assessment has now been undertaken as requested following the initial audit, however, there are a number of comments and queries.
- 1.9. The monitoring strategy should include trigger values based on the results of the revised ground movement assessment.
- 1.10. It is accepted that there are no slope stability concerns regarding the proposed development and the site is not in an area prone to flooding.
- 1.11. An outline programme of works is now provided as requested.
- 1.12. Queries and requests for information are summarised in Appendix 2. Until the additional information and further assessments requested are presented, the BIA does not meet the requirements of the Camden Planning Guidance.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 8/1/2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 4 Keats Grove, Hampstead and 2017/5913/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 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;
 - d) 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 to include pool and plant room, alterations to fenestration and access, installation of rooflight, all to studio building in the front garden (Class C3)."*

The Audit Instruction also confirmed 4 Keats Grove, or was a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 9/3/18 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA)
- Ground Investigation Report (GI)
- Site Specific Flood Risk Assessment (SFRA)
- Arboricultural Survey Impact Assessment
- Planning Application Drawings consisting of:
 - Location Plan
 - Existing Plans
 - Demolition Plans
 - Proposed Plans
- Planning Comments and Response

2.7. The following documents were updated in response to the queries raised and comments on the initial audit. These were received on 5th June 2018. The documents are available on the planning portal and have therefore not been included on Appendix 3.

- Structural Method Statement by Richard Jackson Engineering Consultants dated November 2016
- Technical Note - Ground Movement Assessment by Richard Jackson Engineering Consultants dated May 2018
- Movement Monitoring Strategy by Richard Jackson Engineering Consultants dated May 2018.
- Basement Impact Assessment Report (Rev. D) by Richard Jackson Engineering Consultants dated May 2018.
- Construction Management Plan
- Outline Programme
- Site Location and Highway Network Plans

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	See Audit paragraphs 4.1 and 4.2.
Is data required by Cl.233 of the GSD presented?	No	An outline programme of works provided, however, structural information still requested.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Sections 1 & 3 of BIA.
Are suitable plan/maps included?	No	Relevant maps with the site location indicated not provided.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	N/A	Maps not provided.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided within BIA Section 3.15-3.17
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided within BIA Section 3.17-3.23
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided within BIA Section 3.17-3.23
Is a conceptual model presented?	Yes	Provided within BIA Section 6 and GIR.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	All scoping provided within Section 5 of BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	All scoping provided within Section 5 of BIA.

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	All scoping provided within Section 5 of BIA.
Is factual ground investigation data provided?	Yes	Provided within Section 4 of GIR
Is monitoring data presented?	Yes	Pits dug June 2016, further monitored October 2016 (Section 6.23 of BIA).
Is the ground investigation informed by a desk study?	Yes	Summary provided of a previous report in GIR Section 3.1.
Has a site walkover been undertaken?	Yes	Provided in Section 4.1 of GIR, Section 3.0 of BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	No	Report mentions immediate proximity of proposed basement to neighbour's drive, however does not discuss any further below ground works to adjacent properties.
Is a geotechnical interpretation presented?	No	Section 5 of GIR and GMA however there are comments on this.
Does the geotechnical interpretation include information on retaining wall design?	No	As above. See Audit paragraph 4.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Survey Impact Assessment, Drainage Investigation, Flood Risk Assessment and Heritage Design & Impact Reports also conducted.
Are the baseline conditions described, based on the GSD?	No	Confirmation of existing/absence of neighbouring basements required.
Do the base line conditions consider adjacent or nearby basements?	No	Adjacent properties have not been considered, with justification of the development proposed being over 6m from other neighbouring structures.
Is an Impact Assessment provided?	Yes	Provided in Section 7 of BIA.
Are estimates of ground movement and structural impact presented?	Yes	A formal GMA has been carried out, however there are a number of comments relating to the parameters and values used within the report. See Audit paragraphs 4.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	GMA provided as part of Impact Assessment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	N/A	There are queries on the GMA.
Has the need for monitoring during construction been considered?	Yes	A generic monitoring strategy has been provided, however, this does not include trigger values which should be based on the results of the revised GMA
Have the residual (after mitigation) impacts been clearly identified?	N/A	Not all the potential impacts have been adequately addressed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	There are queries on the GMA as discussed on Section 4.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The basement is generally beneath the existing property, with only a small area of new basement extending beneath an area of existing hard standing.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Structural stability not demonstrated.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Category 0 predicted however there are queries on the GMA
Are non-technical summaries provided?	No	Not provided.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) was prepared by a firm of engineering consultants, Richard Jackson Ltd. The qualifications of the author of the BIA and the associated reports were however not given and this was requested following the initial audit. The supporting documents include a Ground Investigation Report (GI) and a site specific Flood Risk Assessment (SFRA) has also been prepared by Richard Jackson Ltd.
- 4.2. The revised BIA indicates one of the individuals involved holds CEng MICE and MIStructE qualifications. The LBC planning guidance documents however requires the input of an individual with CGeol qualifications and this does not appear to be the case. For completeness, although no potential flooding issues have been identified, the qualifications of the individuals involved in the preparation of the FRA are also requested.
- 4.3. The LBC Instruction to proceed with the audit identified that the basement proposal either involved a listed building or was adjacent to listed buildings but gave no details. Neither the BIA nor other supporting documents identified the listed status of the proposed building or a neighbouring property. A search of the Historic England Listed Buildings identified that numbers 1 to 4 Keats Grove are all listed (Grade II), along with several of the other surrounding properties.
- 4.4. The site comprises a two storey studio building located at the front of the property composed of masonry walls and assumed timber flooring which is separate from the main building. The proposal includes lowering the existing lower ground floor area within the studio building at the front of the property by 1.70m. An additional area is to be excavated to the rear of the studio building for the installation of plant. The underpinning is indicated to be undertaken in two stages along the southern boundary where deepest depth of underpinning is required. The permanent structure is to consist of watertight reinforced concrete walls and a ground bearing basement slab, which is to support a hydrotherapy pool of approximately 5.5m x 3.0m x 1.5m deep. The plant room is approximately 1m deeper in excavation than the pool area, and extends one meter beyond the studio building extent on the south elevation to provide an access hatch.
- 4.5. A plan and sections indicating the proposed underpinning sequence and construction was previously provided, however, retaining wall calculations were not included.
- 4.6. A suggested method statement is now provided, however, this information is considered to be generic and does not include calculations.
- 4.7. The existing strip footings appear to be founded in the Made Ground. Made Ground was encountered to a maximum depth of 2.25m bgl underlain by the London Clay Formation. Groundwater was not recorded during the ground investigation, however, it was encountered

during subsequent monitoring visits at 1.68 and 5.65 bgl. It is stated that the groundwater identified beneath the site and is likely to constitute local flows only within the Made Ground, and perched on top of the London Clay Formation, rather than forming wider strategic flows. Provision for dewatering has been considered if construction falls below ground water level in Section 8.11 of the BIA report.

- 4.8. Limited interpretation is given the GI report and the ground movement assessment which was provided following the initial audit. The undrained shear strength appears to be derived from Atterberg Limit tests rather than in situ SPT N value data in the absence of triaxial test results. The Cu value is considered to be too high and it is requested this is reconsidered. Other relevant parameters for retaining wall design have not been provided.
- 4.9. The BIA states it is 'Unknown' whether there is history of Shrink-swell subsidence at the site. Although no evidence was found on the property or neighbouring structures, further mitigation measures should be provided than those provided in the Assessment of Impacts.
- 4.10. A site specific FRA is included. The basement is indicated to extend beyond the perimeter of the existing building however, this is indicated to be minimal and appears to be in an area to be an area of existing hardstanding. It is therefore accepted as stated that the impact on surface water flows will be minimal or negligible. The site is not indicated to be at risk from flooding.
- 4.11. A programme of works was previously not provided and this was requested following the initial audit. An outline programme has now been provided as required by the LBC guidance documents.
- 4.12. A ground movement assessment was previously not undertaken on the basis of the distance to the neighbouring properties. Given the Grade II listed status of property along with the neighbouring properties it was requested that a full ground movement assessment be provided to demonstrate that damage to 4 Keats Grove, the property itself or any of the surrounding properties will not exceed Category 1 (Very Slight).
- 4.13. A ground movement assessment has now been provided which indicates Category 0 (Negligible) damage, however, there are a number of queries and comments on this. Oasys Pdisp and Xdisp are indicated to have been used to predict the anticipated movements although the full input and output from the analyses has not been provided. As described above, the Cu value is considered to be too high. It is requested that this is reconsidered and the Pdisp assessment updated accordingly. It is stated that ground movements due to installation of the sheet piles walls have not been considered as their effects are considered to be negligible. This is not accepted and potential movements due to all the construction activities including underpinning and sheet pile installation should be considered. The damage assessment should also include impact to the roadway and potential utilities running beneath it although it is noted a utilities search does not appear to have been undertaken.

- 4.14. The CIRIA guidance C760 which the Xdisp software is based on is intended for embedded retaining walls. It is however accepted that this may provide a basis for which to undertake an assessment of an underpinned construction should the ground movements following the revised assessment be within the range typically anticipated for underpinning techniques carried out with good control of workmanship.
- 4.15. A formal movement monitoring strategy was not proposed. An outline monitoring strategy with appropriate trigger levels based on the predicted anticipated ground movements was requested.
- 4.16. A monitoring strategy is now provided, however, this does not include site specific proposals and is considered to be generic. The monitoring strategy should include trigger levels based on the revised ground movement assessment.
- 4.17. It is accepted that there are no slope stability concerns regarding the proposed development and the site is not indicated to be in an area at risk from flooding.

5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) was prepared by Richard Jackson Ltd and although information on the qualifications of the individuals involved were provided as requested following the initial audit, this still does not meet the requirements of the planning guidance.
- 5.2. The property, 4 Keats Grove, along with a number of the neighbouring properties are Grade II listed although this is not indicated on the BIA or other supporting documents. The proposal involves lowering an existing lower ground floor area within the studio building at the front of the property by underpinning.
- 5.3. The method statement provided is considered to be generic and retaining wall calculations have not been provided.
- 5.4. The issue of shrink/swell and potential impacts has not been adequately addressed in the BIA and this is requested.
- 5.5. The undrained shear strength value is not considered to be reasonably conservative and should be reconsidered. Other parameters for retaining wall design should also be provided.
- 5.6. A ground movement assessment has now been undertaken as requested following the initial audit, however, there are a number of comments and queries on this as discussed in Section 4.
- 5.7. The monitoring strategy should include trigger values based on the results of the revised ground movement assessment.
- 5.8. It is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.
- 5.9. An outline programme of works is now provided. A detailed programme should be provided by the appointed contractor at a later date.
- 5.10. Queries and requests for information are summarised in Appendix 2. Until the additional information and further assessments requested are presented, the BIA does not meet the requirements of the Camden Planning Guidance.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Katz	1 Keats Grove	9/12/17	Absence of Ground movement assessment to neighbouring properties, after numerous incidences of subsidence.	See Section 4.
Paterson	5 Keats Grove	15/12/17	Impact to Drainage Services before and after construction.	The FRA provided indicates the impact on surface water drainage will be negligible due to the majority of the basement being beneath the existing building or hardstanding areas.
Paterson	5 Keats Grove	15/12/17	Qualifications of author of BIA	See Audit paragraphs 4.1 and 4.2
Day (on behalf of Rosefield)	3 Keats Grove	13/12/17	Qualifications of author of BIA	See Audit paragraphs 4.1 and 4.2.
Day (on behalf of Rosefield)	3 Keats Grove	13/12/17	Absence of Ground movement assessment to neighbouring properties, after numerous incidences of subsidence.	See Section 4. A ground movement assessment has been requested of the applicant.

Appendix 2: Audit Query Tracker

Audit Query Tracker*

Query No	Subject	Query	Status	Date closed out
1	BIA format	No qualifications of the author of the basement impact assessment report are listed. Qualifications are required to be demonstrated to be in accordance with Camden Planning Guidance Basements.	Open – See Audit paragraph 4.1 and 4.2.	
2	BIA format	An outline programme of works indicating the main phases of works and approximate anticipated durations is required.	Closed – Outline programme provided. Detailed programme to be provided by appointed contractor at a later date. The programme of works is generic and does not coordinate with the programme issued by the contractor.	20/07/2018
3	Stability	A ground movement assessment is required to demonstrate that the applicant's property as well as all neighbouring properties within the influence zone will not experience damage exceeding Burland category 1	Open – Provided however there are several queries on this as discussed on Section 4. Retaining wall parameters to be provided together with outline structural calculations.	
4	Stability	An outline movement monitoring strategy is required to demonstrate that damage to the surrounding buildings will not be greater than Burland category 1.	Open – See Section 4. Monitoring strategy with trigger values based on revised GMA to be provided.	

Please provide complete and clear responses to the above which is discussed in detail in Section 4.

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