CampbellReith consulting engineers

69 Kentish Town Road London NW1 8NY

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



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Author	Robert Morley MEng
Project Partner	E M Brown, BSc MSc CGeol FGS
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Structural a Civil a Environmental a Geotechnical a Transportation



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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 69 Kentish Town Road NW1 8NY (planning reference 2016/2424/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 gained access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.
- 1.4. The BIA has been prepared a firm of engineering consultants who hold the required accreditation for surface water and land stability, although not for ground water flow.
- 1.5. The existing building, and the neighbouring buildings, contain an existing basement level. The proposal involves construction of a two storey rear extension at basement and ground level, therefore extending the existing basement level into the rear garden.
- 1.6. No site investigation has been carried out.
- 1.7. An outline proposal for the formation of the basement walls has been provided, which include providing supporting to the neighbouring foundations. However no drawings or sketches have been provided, and the proposal is not informed by site investigation.
- 1.8. The damage potential to the neighbouring buildings is predicted to be Burland Category 2 (slight), however following site investigations this should be revisited. It is noted that, where damage greater than category 0 is predicted, CPG4 requires mitigation measures to be proposed and the damage category re-evaluated.
- 1.9. It has been confirmed that ground water flows will not be disrupted. This should be confirmed following site investigations.
- 1.10. It has been confirmed that there are no slope stability issues.
- 1.11. The surface water discharge into the sewer will increase, however an acceptable method of mitigating the impact of this has been proposed.
- 1.12. A flood risk assessment is required due to a high surface water flood risk in the area.



- 1.13. Movement monitoring has not been proposed. The requirement of which should be reconsidered following a trial pit investigation.
- 1.14. Confirmation is required as to whether or not the property falls within the London Underground safeguarding zone.
- 1.15. A number of queries are discussed in Section 4 and have been included in Appendix 2 of this audit report. It is therefore recommended that the BIA is resubmitted to satisfy these queries.



2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15/08/16 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 69 Kentish Town Road NW1 8NY, planning reference 2016/2424/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 "Extension of existing basement; erection of 2 storey upper ground and lower ground floor rear extension to create 1x basement maisonette; and erection of 1st floor closet wing extension."

The Audit Instruction also confirmed that 69 Kentish Town Road is not, or was a neighbour to, listed buildings. It has been observed that three properties in the opposite terrace of properties are grade II listed, however the closest of these is some 25m away.

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- 2.6. CampbellReith accessed LBC's Planning Portal on 05/09/16 and gained access to the following relevant documents for audit purposes:
 - Basement Impact Assessment Report Rev A (BIA)
 - Planning Application Drawings consisting of;
 - Location Plan
 - Proposed floor plans
 - Proposed elevations
 - Proposed sections
 - Existing survey drawings
 - Design & Access Statement
 - Basement Heave Assessment
 - Planning Comments and Response



3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	While the author of the BIA holds MICE and MIStructE qualifications which satisfies the surface water and land stability assessments, a Chartered Geologist has not been involved with the production of the subterranean flow assessment.
Is data required by CI.233 of the GSD presented?	No	A works programme has not been produced. Details of construction methods are vague, with no structural drawings presented.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	No detailed form of construction has been provided.
Are suitable plan/maps included?	Yes	While plans and maps from the GSD document have not been presented with the site location indicated, they generally have been referenced by their figure number to indicate that the correct sources have been consulted.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Where provided, plans and maps provide adequate detail.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Partially	Some questions remain over the conclusion to question 13.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Partially	While answers have generally been provided with an explanatory statement, however a lack of site investigation mean that answers to questions 1a and 1b are not factually supported.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A factual statement has generally been provided where required to substantiate each answer.



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Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	No	No geotechnical interpretation has been produced.
Are reports on other investigations required by screening and scoping presented?	Yes	A heave assessment has been carried out.
Are the baseline conditions described, based on the GSD?	Yes	Plans indicate the existing site constraints and layout, and a geological conceptual model has been provided.
Do the base line conditions consider adjacent or nearby basements?	Partially	The existing basements are not mentioned in relation to geology, ground water, or foundation depth.
Is an Impact Assessment provided?	Yes	Section 8 of the BIA
Are estimates of ground movement and structural impact presented?	Yes	A heave assessment has been carried out, however a ground movement assessment due to installation and excavation of basement walls has not been provided.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Due to the absence of first hand geological and trial pit investigations, an appropriate impact assessment has not been carried out with regards to differential foundation depth and ground water flows.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	The requirement for SUDS has been discussed in order to mitigate the increased sewer discharge caused by loss of permeable area.
Has the need for monitoring during construction been considered?	No	The requirement for monitoring has not been discussed.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	The increase in the differential depth between the proposed basement and the neighbouring extensions is not known as no trial pits have been carried out, it is therefore not clear if a ground



Item	Yes/No/NA	Comment
		movement assessment is warranted. The proposed method of construction can also not be assessed for its suitability given that this foundation differential is not known.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	SUDs have been proposed to mitigate an increase in surface water runoff.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Due to inadequate site investigations the impact on the hydrogeology cannot be assessed. Due to the differential depth being unknown the structural stability can also not be assessed.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	A heave assessment has been carried out that predicts a Burland damage category of 2. A ground movement assessment due to wall installation and excavation has not been produced.
Are non-technical summaries provided?	No	



4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by a firm of civil and structural engineering consultants, Rose & Associates. The author of the report holds both MICE and MIStructE accreditation, however a Chartered Geologist has not been involved with the production of the hydrogeological aspect of the assessment as required by CPG4.
- 4.2. The LBC Instruction to proceed with the audit identified that the basement neither involved a listed building or was adjacent to listed buildings. However it has been identified that three properties in the opposite terrace are grade II listed, with the closest being some 25m away from the front elevation of 69 Kentish Town Road.
- 4.3. The building consists of a four storey terrace property, including an original basement level. The proposal involves construction of a two storey rear extension at basement and ground level, therefore extending the existing basement level into the rear garden. The remaining rear garden is to be remodelled to drop part of the garden level to basement level.
- 4.4. It has been confirmed that the neighbouring properties contain similar existing basement levels beneath the original buildings, along with single storey rear extensions at ground level. It therefore appears that there are no neighbouring basements to the single storey rear extensions that will be neighbouring the proposed basement extension.
- 4.5. Site investigations have not been carried out, with the BIA relying on publically available borehole information and geological maps to identify the ground conditions as London Clay to a considerable depth. It is therefore not known if a depth of Made Ground overlays the London Clay as often occurs to varying extents, and may affect the foundation depth. It is suggested that the ground conditions be confirmed via an intrusive ground investigation in order to confirm conclusions and assumptions made with regards to groundwater and foundation depth and design.
- 4.6. A trial pit investigation has not been carried out, therefore the depth of the neighbouring extensions foundations in relation to the basement is not known. It has been indicated that 'traditional underpinning' may be required to the neighbouring foundation, with a RC liner wall constructed in front of this in order to maintain stability. It is appreciated that the differential depth between the neighbouring extensions and the proposed basement may be significantly less than a storey height and that mass concrete underpinning along with a RC liner wall may be suitable, however this should be confirmed by way of a trial pit investigation at the planning stage as required by CGP4.
- 4.7. No structural drawings have been provided to indicate the form of the proposed basement structure, with the only indication of structure being stated as 'traditional underpinning' of the



neighbouring foundations with a RC liner wall in the BIA. As indicated in clause 233 of the GSD structural drawings showing the form of construction are generally required, which should be co-ordinated with any trial pit investigation to indicate the position of neighbours' foundations. Structural drawings or sketches showing the form of construction and retained heights are therefore required. The practicality of providing underpinning to the neighbouring extensions that may be wholly over the boundary should also be confirmed.

- 4.8. No details of the method of construction have been provided. While it is anticipated that mass concrete underpinning will be provided which is an established and common form of providing support to existing foundations, outline details of sequence, bay width, and any temporary works that may be required until the RC liner wall is providing permanent lateral stability should be provided.
- 4.9. A heave assessment has been carried out, this has predicted that a vertical heave of 3.6mm which coincides with an angular distortion at the neighbouring property of 2.7mm. It has been determined that the Burland category of damage due to heave movement is 2 (slight) although no consideration has been given to ground movements associated with the construction of the basement walls. CPG4 requires that mitigation measures are considered where the predicted damage exceeds Category 0, and the impacts reassessed.
- 4.10. Due to the extension being constructed into the existing garden the area of permeable area will be reduced. It has been concluded that a soakaway is not compatible due to the clay subsoil, and that the additional surface water will be discharged to the existing sewer system. This additional flow is proposed as being attenuated via a green roof to the rear extension, an attenuation tank, and a flow control device. It is accepted that the additional surface water will have to enter the sewer system given the likely substantial depth of clay, and that the proposed SUDS are an acceptable method of providing flow attenuation, however these will require detailed design prior to construction.
- 4.11. It has been stated that the site is underlain by London Clay which is considered an unproductive strata. This conclusion is accepted, however site investigations by via of trial pit or borehole are required in order to confirm that a significant depth of Made Ground is not present, which may contain local ground water flows or perched water.
- 4.12. The BIA states that the differential depth increase due to the basement will be zero, due to the original buildings containing basement levels to a similar depth, and the neighbouring properties being underpinned along the boundary line. While this is generally accepted, there will be elements of the neighbouring extensions that will not be underpinned, such as the rear wall, or any internal walls. However the differential depth is likely to remain low should these extensions have strip foundations to a modern depth, however this should be clarified by way

of trial pit investigation in order to determine whether or not a ground movement assessment is required.

- 4.13. No proposal for movement monitoring of the neighbouring properties during construction has been proposed, while it is accepted that the wall along the boundary line is to be underpinned the depth of this should be confirmed by trial pit investigation, with the requirement for movement monitoring reviewed when this information is available.
- 4.14. The BIA confirms that the site lies within 100m of the River Fleet, however it has been confirmed that this river is culverted implying that this river will have no impact on the proposal. This conclusion is accepted.
- 4.15. Due to the remodelling of the garden a change in level of 1.74m will be introduced within the garden, and of 1.40m from the neighbouring garden levels. While details of these level changes are not provided it is accepted that these modest heights can be retained by either masonry or RC walls. It is therefore accepted that no slope stability concerns are present assuming comprehensive detailed design and good workmanship.
- 4.16. The BIA has identified Kentish Town Road as being flooded in 1975, although not in 2002. The area is also identified as being at a medium to high risk of surface water flooding. A flood risk assessment in accordance with PPS25 is therefore required.
- 4.17. A Northern line London Underground tunnel is located approximately 60m from the rear of the property. It should be confirmed whether or not the property falls within the London Underground safeguarding zone, and if so London Underground approval is required.



5.0 CONCLUSIONS

- 5.1. The BIA has been produced by an engineer holding both MICE and MIStructE accreditation, however a Chartered Geologist has not been involved with the reports production.
- 5.2. The existing building, and the neighbouring buildings, contain an existing basement level.
- 5.3. The proposal involves construction of a two storey rear extension at basement and ground level, therefore extending the existing basement level into the rear garden. The neighbouring buildings have existing single storey extensions that don't appear to have basement levels.
- 5.4. No site investigations have been carried out, with geological data taken from publicly available sources. Likewise the depth of foundations to the neighbouring extensions is not known.
- 5.5. The proposed basement structure is to be formed from underpinning to the neighbouring buildings foundations, and formation of an RC liner wall. The suitability of this construction method should be confirmed via a trial pit investigation.
- 5.6. Structural drawings or sketches indicating the form of construction have not been provided and therefore should be provided.
- 5.7. It has been stated that the worst case damage experienced by neighbouring properties due to heave movements will be Burland category 2 although a ground movement assessment due to wall excavation and installation has not been produced, the requirement for which should be reconsidered once a trail pit investigation has been carried out. It is noted that CPG4 requires mitigation measures where predicted damage exceeds category 0.
- 5.8. It has been confirmed that ground water flows will not be disrupted due to the basement being underlain by impermeable London Clay. This should be confirmed following site investigations.
- 5.9. It has been confirmed that there are no slope stability issues. This is accepted however the remodelling and lowering of the garden level should be carried out with care and to a detailed structural design.
- 5.10. The amount of permeable area is to reduce, with a soakaway not being appropriate due to the depth of London Clay. SUDS have been proposed in order to attenuate additional discharge into the sewer system, this method of surface water management is accepted, with the SUDS requiring detailed design in due course.
- 5.11. The area is known to be at risk of surface water flooding, therefore a flood risk assessment should be produced.



- 5.12. Movement monitoring has not been proposed. The requirement of which should be reconsidered following a trial pit investigation.
- 5.13. Confirmation is required as to whether or not the property falls within the London Underground safeguarding zone due to a North Line tunnel located some 60m away.
- 5.14. A number of queries have been raised and included in appendix 2 of this audit report. It is therefore suggested that the BIA be resubmitted to address these queries.



Appendix 1: Residents' Consultation Comments



Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
McCarthy	Unknown	14/08/16	BIA does not adequately consider groundwater flows	Site investigations have been requested to confirm the conclusions with regards to groundwater flows.
Unknown	Unknown	Unknown	Property is not simply on London Clay, and stands near the River Fleet	Site investigations have been requested to confirm the conclusions with regards to groundwater flows and the geology.
Unknown	Unknown	Unknown	The proposal may need piling or deeper excavations than indicated	Site investigations have been requested to confirm the conclusions with regards to the geology, and structural drawings or sketches showing the form of construction have been requested.
Unknown	Unknown	Unknown	Approval required due to proximity to London Underground tunnel	Confirmation has been requested as to whether or not the property lies within the London Underground safeguarding zone.



Appendix 2: Audit Query Tracker



Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Ground water	A Hydrogeologist holding the 'CGeol' accreditation is required to assess the hydrogeological aspect of the proposal	Open	
2	Site investigations	Either borehole or trial pit investigation required to confirm ground conditions	Open	
3	Site investigations	Trial pit investigation required to confirm neighbouring foundations and therefore suitability of proposed form of construction	Open	
4	Stability	Outline details of construction method and any temporary works required	Open	
5	Stability	Drawings or sketches required indicating structural form, co-ordinated with site investigations identifying neighbouring foundations	Open	
6	Stability	Ground movement assessment to be completed and predicted damage re- evaluated after incorporation of mitigation measures.	Open	
7	Surface water	A flood risk assessment in accordance with PPS25 is required due to historic flooding in the area.	Open	
8	Approvals	Confirmation is required as to whether or not the property falls within the London Underground safeguarding zone due to the nearby Northern Line tunnel.	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

Surrey

Raven House 29 Linkfield Lane, Redhill Surrey RH1 1SS

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

Bristol

Wessex House Pixash Lane, Keynsham Bristol BS31 1TP

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

Birmingham

Chantry House High Street, Coleshill Birmingham B46 3BP

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

Manchester

No. 1 Marsden Street Manchester M2 1HW

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

UAE

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

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

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