

40 Leighton Road,
London NW3 2PH

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13693-08

Revision: D1

October 2021

Campbell Reith Hill LLP
15 Bermondsey Square
London
SE1 3UN

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

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Author	G Kite, BSc MSc DIC FGS
Project Partner	E M Brown, BSc MSc CGeol FGS
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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	9
5.0	Conclusions	12

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 40 Leighton Road, London NW5 2QE (planning reference 2021/2410/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 prepared by a number of sources. The authors' qualifications for the Groundwater and Surface Water assessments meet the requirements of CPG Basements. However, the qualifications of the author of the Land Stability assessment do not meet the requirements.
- 1.5. The proposed development comprises the deepening and extending of the existing basement and the installation of lightwell to the front. The basement will be deepened to approximately 3.5m below ground level (excavating approximately 1m deeper than existing, where present).
- 1.6. The BIA includes the majority of the information required from a desk study in line with LBC guidance.
- 1.7. A site investigation indicates ground conditions of Made Ground overlying the London Clay Formation. Groundwater was not encountered during drilling nor during the subsequent monitoring visit.
- 1.8. Geotechnical interpretative information is provided.
- 1.9. The BIA includes temporary works information including sequencing, and structural calculations including retaining wall design. It is noted that the geotechnical parameters interpreted in the Land Stability BIA from the factual site investigation data have not been adopted in the structural calculations, which requires further clarification.
- 1.10. A Ground Movement Assessment (GMA) has been undertaken and damage impacts to neighbouring properties are predicted to be within LBC's policy requirements. Queries are raised and further assessment should be presented, as discussed in Section 4.

- 1.11. An outline methodology and guidance for monitoring structural movements during construction has been provided including proposed trigger values. It is noted that these are inconsistently presented between documents and should be confirmed, once the queries in regard to the GMA have been concluded (as 1.11).
- 1.12. Leighton Road is within Critical Drainage Area (Group 3-003) but not within a Local Flood Risk Zone. The flood risk assessment indicates that flood mitigation measures should be implemented.
- 1.13. The proposed basement development will result in an increase in impermeable site area. Attenuation SUDS will be implemented to mitigate impacts to the hydrological environment. Drainage proposals should be agreed with LBC and Thames Water.
- 1.14. The BIA should specifically comment on whether there may be any cumulative impacts to the wider hydrogeological environment, due to the presence of adjacent basements either side of the proposed basement.
- 1.15. An outline programme of works has been presented.
- 1.16. Non-technical summaries should be provided in any revisions to the BIA.
- 1.17. Queries and matters requiring further clarification are discussed in Section 4 and summarised in Appendix 2. Until the additional information requested is provided, the BIA does not meet the requirements of CPG: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 6th August 2021 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 40 Leighton Road, London NW5 2QE, Camden Reference 2021/2410/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): Basements. January 2021
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The Local Plan (2017): 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; 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 planning portal describes the proposal as: *"Erection of mansard roof extension with 1 dormer to front elevation, 2 dormers to the rear elevation and 2 skylights; basement excavation and extension with front lightwell with railings, bifold crittall doors and skylight to rear basement level extension; first floor rear extension with new sash windows to rear elevation."*

The planning portal also confirmed the site lies within Kentish Town Conservation Area and neither the subject site nor neighbouring properties are listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 11th October 2021 and gained access to the following relevant documents for audit purposes:

- Groundwater and Surface Water Basement Impact Assessment (ref 30501R1D1.1) dated 21 April 2021 by H Fraser Consulting Ltd.
- Basement Impact Assessment – Land Stability (ref 70572) dated 22 April 2021 by Ground and Project Consultants Ltd including:
 - Ground Investigation Factual Report (ref GWPR4128/GIR V1.01/April 2021) dated 1 April 2021 by Ground & Water Ltd.
- Basement Impact Assessment (Construction Methodology and Engineer Statements) (ref 210223) dated 13 April 2021 by Croft Structural Engineers.
- Ground Movement and Building Damage Assessment Report (ref 70572-2) dated August 2021 by Ground and Project Consultants Ltd.
- Existing and proposed plans dated 13 May 2021 by Proficiency Design & Build.
- Arboricultural Report, Tree Constraints Plan & Impact Assessment dated 31 March 2021 by Central London Tree Surveys.
- Design Statement dated 12 May 2021 by Proficiency Design & Build.
- 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?	No	The authors' qualifications for the Groundwater and Surface Water BIA meet the requirements of CPG Basements. However, the qualifications of the author of the Land Stability BIA do not meet the requirements.
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	
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	Section 3 of the Land Stability BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1 of the Groundwater and Surface water BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.2 of the Groundwater and Surface water BIA.
Is a conceptual model presented?	Yes	A conceptual ground model is included as Section 5 of the Land Stability BIA and Section 6.1 of the Groundwater and Surface water BIA.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 3 of the Land Stability BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.1 of the Groundwater and Surface water BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.2 of the Groundwater and Surface water BIA.
Is factual ground investigation data provided?	Yes	Section 4 of the Land Stability BIA. The BIA states that this was undertaken by Fastrack on 22 June 2020. However, the report within Appendix C of the BIA indicates that the investigation was undertaken by Ground & Water Ltd on 8 March 2021.
Is monitoring data presented?	Yes	Appendix E of the Land Stability BIA. One groundwater monitoring visit was undertaken on 19 March 2021.
Is the ground investigation informed by a desk study?	Yes	Sections 2 and Appendix B of BIAs.
Has a site walkover been undertaken?	Yes	In conjunction with the site investigation.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 4.2.3 of the BIA prepared by Croft Structural Engineers confirms that both 42 and 38 Leighton Road have full height basements. The Land Stability BIA states that 38 Leighton Road has a basement of same depth of the proposed basement and that starts approximately 5m or 6m back from the front of the property extending below a rear extension and external patio. The Land Stability BIA also states that 42 Leighton Road has a partial basement which will be c. 1.5m above the proposed basement and that extends beneath the footprint of the main building.
Is a geotechnical interpretation presented?	Yes	Section 5 of the Land Stability BIA.

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	Yes	Outline retaining wall design in Appendix A of the BIA prepared by Croft Structural Engineers. It is noted that the geotechnical parameters interpreted in the Land Stability BIA from the factual site investigation data have not been adopted in the structural calculations, which requires further clarification.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Report, Tree Constraints Plan & Impact Assessment and Ground Movement Assessment.
Are baseline conditions described, based on the GSD?	Yes	
Do the baseline conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	Section 6 of Land Stability BIA and Section 6 of the Groundwater and Surface water BIA.
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement and Building Damage Assessment Report.
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	
Has the need for monitoring during construction been considered?	Yes	Section 5 of GMA and Section 5.5.4 of BIA prepared by Croft Structural Engineers. However, these require clarification.
Have the residual (after mitigation) impacts been clearly identified?	No	GMA and potential for cumulative impacts to be clarified.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Queries in relation to the GMA are presented in Section 4.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Final proposed drainage design will require approval from LBC and Thames Water.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Specific comment on potential for cumulative impacts to the hydrogeological environment should be made.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Queries in relation to the GMA are presented in Section 4.
Are non-technical summaries provided?	No	Non-technical summaries are provided with BIA on Groundwater and Surface water but not within the Land Stability BIA.

4.0 DISCUSSION

- 4.1. The BIA has been prepared by a number of sources: Ground and Project Consultants Ltd, Ground and Water Ltd, H Fraser Consulting Ltd and Croft Structural Engineers. The BIA has not been presented in a single, coherent format, and non-technical summaries have not been provided for all aspects of the reporting, and are required in line with CPG: Basements.
- 4.2. The authors' qualifications for the Groundwater and Surface water BIA meet the requirements of CPG Basements. However, the qualifications of the author of the Land Stability do not meet the requirements.
- 4.3. Both the BIA for Groundwater and Surface Water and the BIA for Land Stability refer to CPG Basements dated March 2018. It should be noted that this has now been superseded by CPG Basements dated January 2021. Reference to this should be made in all the future BIA revisions.
- 4.4. The site currently comprises a two storey (with basement) terraced property with front yard and rear garden on the southern side of Leighton Road. The proposed development comprises the deepening and extending of the existing basement including a skylight and the installation of a lightwell to the front. The basement will be deepened to approximately 3.5m below ground level (excavating approximately 1m deeper than the existing basement level).
- 4.5. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1, to inform the screening process.
- 4.6. A site investigation was undertaken on 8 March 2021 by Ground & Water Ltd comprising one borehole to a maximum depth of 10.45m below ground level (bgl). The ground conditions comprise Made Ground (from ground level to 1.40m bgl) overlying the London Clay Formation (to the full depth of the borehole). At the rear of the property the trial pit encountered sandy gravelly clay attributed to Made Ground which may represent Head Deposits.
- 4.7. Groundwater was not encountered during drilling nor during the subsequent monitoring visit (standpipe installed to 5.32m bgl) on 19 March 2021. The Groundwater and Surface Water BIA states that there is a potential spring line at the geological boundary between the Head Deposits and London Clay, approximately 75m northeast (uphill) of the site. Mitigation measures have been outlined in Section 6.2 of the BIA on Groundwater and Surface Water regarding the waterproofing of the basement given the risk of inundation from seepage within the London Clay and the overlying Made Ground / Head Deposits. The BIA should specifically comment on whether there may be any cumulative impacts to the wider hydrogeological environment, due to the presence of adjacent basements either side of the proposed basement.

- 4.8. Interpretative geotechnical information is presented, broadly in accordance with the GSD Appendix G3.
- 4.9. The construction method proposed includes casting new retaining walls by underpinning in a hit and miss sequence, installing lateral props at high and low level as the excavations progress. In the permanent case, the retaining walls will be propped by the basement slab and cantilever.
- 4.10. It is noted that the geotechnical parameters interpreted in the Land Stability BIA from the factual site investigation data have not been adopted in the structural calculations, which requires further clarification. In particular, an allowable bearing capacity of 100 and 125kPa has been indicated in the Land Stability BIA and Croft BIA respectively.
- 4.11. A Ground Movement Assessment (GMA) has been undertaken. The GMA indicates that structural damage to the adjacent buildings at 38 and 42 Leighton Road will not exceed Burland Category 1 (Very Slight), as required by CPG: Basements. However, the following queries are raised:
- The GMA assumes a 'high stiffness' wall, with the retaining wall propped at floor and ceiling levels in both the temporary and permanent cases. The permanent structure appears to adopt cantilever walls, which are considered 'low stiffness'.
 - There is a discrepancy on the differential depth between the proposed basement and the existing basement at No. 42 between the GMA (which states 2.00m) and the Land Stability BIA (which states 1.5m) and this should be clarified.
 - The GMA methodology excludes movements due to installation of the wall, citing that walls are not 'installed' as an embedded wall would be. However, it's noted that movements due to construction and workmanship, especially when underpinning Party Walls, should be allowed for. Typically vertical and horizontal movements in the range of 5mm to 10mm per stage of underpinning would be anticipated for high stiffness walls.
 - It is noted that sensitivity analyses have been presented, for which the inputs and outputs should be provided for review. The GMA methodology indicates that the sensitivity analyses also assume 'high stiffness' retaining walls, and do not account for any construction related movements.
 - Calculations including contour plots should be provided with any updated GMA presented.
 - Impacts to the highway and underground infrastructure (utilities) within the zone of influence should also be assessed and presented, as required.
- 4.12. An outline methodology and guidance for monitoring structural movements during construction has been provided including proposed trigger values and contingency actions, in both the GMA and the Croft BIA. It is noted that these are inconsistently presented between documents and should be confirmed, once the queries in regard to the GMA have been concluded.
- 4.13. Leighton Road is not within a Local Flood Risk Zone. The BIA has identified that the site is at very low risk of flooding from rivers and sea and at no risk of reservoir flooding. The long-term flood

risk mapping indicates there is a high risk of surface water flooding within 20m of the property to the east of the property (rear gardens of 44 to 54 Leighton Road). The BIA also states that there may be a similar risk in the rear garden of the property as the direction of slope is towards the house. There is also a medium risk of surface water flooding originating from Leighton Road.

- 4.14. Leighton Road flooded in 1975 (although this has not been identified in any of the BIA documents provided). Flood mitigation measures are outlined in Section 6.3 of the Groundwater and Surface Water BIA which include raised thresholds and lightwells to levels 400mm above the road surface, implementation of waterproof render or tanking of external brickwork, provision of flood resistant front and rear doors, and a drained cavity sump and positively pumped device.
- 4.15. Leighton Road is within Critical Drainage Area (Group 3-003). The proposed basement development will result in a 26m² increase in impermeable site area. Attenuation SUDS will be implemented to mitigate impacts to the hydrological environment. Drainage proposals should be agreed with LBC and Thames Water.
- 4.16. Non-technical summaries have not been included within the BIA for Land Stability and should be provided within any revisions to the BIA submitted.
- 4.17. Queries and matters requiring further information or clarification are summarised in Appendix 2.

5.0 CONCLUSIONS

- 5.1. The land stability authors' qualifications should be demonstrated to be in accordance with the requirements of CPG Basements.
- 5.2. The BIA includes the majority of the information required from a desk study in line with LBC guidance.
- 5.3. A site investigation indicates ground conditions of Made Ground overlying the London Clay Formation.
- 5.4. Groundwater was not encountered during drilling nor during the subsequent monitoring visit. The BIA should specifically comment on the potential for any cumulative impacts to the hydrogeological environment.
- 5.5. Geotechnical interpretative information is provided.
- 5.6. The BIA includes temporary works information including sequencing, and structural calculations including retaining wall design. Further clarification is required in regards to the adopted geotechnical parameters.
- 5.7. A Ground Movement Assessment (GMA) has been undertaken. Queries are raised and further assessment should be presented, as discussed in Section 4.
- 5.8. An outline methodology and guidance for monitoring structural movements during construction has been provided. It is noted that these are inconsistently presented between documents and should be confirmed, once the queries in regard to the GMA have been concluded.
- 5.9. Leighton Road is within Critical Drainage Area (Group 3-003) but not within a Local Flood Risk Zone. The flood risk assessment indicates that flood mitigation measures should be implemented.
- 5.10. The proposed basement development will result in an increase in impermeable site area. Attenuation SUDS will be implemented to mitigate impacts to the hydrological environment. Drainage proposals should be agreed with LBC and Thames Water.
- 5.11. An outline programme of works has been presented.
- 5.12. Non-technical summaries should be provided in any update to the BIA.
- 5.13. Queries and matters requiring further clarification are discussed in Section 4 and summarised in Appendix 2. Until the additional information requested is provided, the BIA does not meet the requirements of CPG: Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Tindall	Not provided	Not provided	States that no basement currently exists at Number 40.	The authors of the BIA indicate the existing basement arrangements at the site.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA Format	BIA authors' qualifications	Open – to be demonstrated as 4.2	
2	BIA format	Non-technical summaries should be provided. Reference to CPG Basements dated January 2021 should be made in all the future BIA revisions.	Open – to be provided as 4.1 and 4.3.	
3	Land Stability	The interpreted geotechnical parameters are not adopted within the structural calculations. This should be clarified.	Open – as 4.10	
4	Land Stability	The GMA should be reviewed and updated, as indicated in Section 4.	Open – as 4.11	
5	Land Stability	The monitoring proposals should be consistently presented between documents. This should be updated once the GMA has been reviewed and updated.	Open – as 4.12	
6	Surface Water	The proposed basement development will result in an increase in impermeable site area. Drainage proposals should be agreed with LBC and Thames Water.	Note Only	N/A
7	Groundwater Flow	The BIA should specifically comment on the potential for cumulative impacts to the hydrogeological environment.	Open – as 4.7	

Appendix 3: Supplementary Supporting Documents

None

London

15 Bermondsey Square
London
SE1 3UN

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

Unit 5.03,
HERE,
470 Bath Road,
Bristol BS4 3AP

T: +44 (0)117 916 1066
E: bristol@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: 15 Bermondsey Square, London, SE1 3UN
VAT No 974 8892 43