

31 Elsworthy Road,
London NW3 3BT

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13693-27

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December 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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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 31 Elsworthy Road, London NW3 3BT (planning reference 2021/1527/P). The basement is considered to fall within Category C 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: Soil Consultants Ltd, Stephen Buss Environmental Consulting Ltd and Michael Barclay Partnership LLP. The qualifications of the authors in regard to the Land Stability assessment should be demonstrated to be in accordance with LBC guidance.
- 1.5. The proposed development comprises the excavation of a basement below the building with sections beneath the front drive and the rear garden. The basement will be deepened to approximately 6.5m below ground level (bgl).
- 1.6. The BIA includes the majority of the information required from a desk study in line with LBC guidance. The presence or absence of nearby utilities should be confirmed.
- 1.7. Screening and scoping assessments have been completed.
- 1.8. A site investigation indicates that the ground conditions comprise Made Ground, overlying possible superficial deposits and the London Clay Formation.
- 1.9. Groundwater was observed in one borehole during the investigation at 4.60m bgl. Subsequent monitoring visits observed groundwater in 3 of the 4 boreholes at depths ranging from 1.84m to 3.60m bgl. There will be no impact to the hydrogeological environment; however, temporary dewatering during construction may be required to ensure stability.
- 1.10. Geotechnical interpretative information is provided.
- 1.11. The BIA includes outline temporary works information including sequencing, propping and indicative retaining wall design. Retaining walls are proposed to be constructed by contiguous piling and 2-stage underpinning. The depth of the proposed contiguous piles should be indicated.

- 1.12. A Ground Movement Assessment (GMA) has been undertaken, including a sensitivity analysis of the impacts from adopting high or intermediate stiffness retaining walls. While it is indicated that a high stiffness support system will be needed to maintain impacts to neighbours to acceptable levels, clarifications are requested as detailed in Section 4.
- 1.13. An outline methodology and guidance for monitoring structural movements during construction has been provided including proposed trigger values and contingency actions. These should be confirmed, pending review of the GMA.
- 1.14. The site is not within a Local Flood Risk Zone. The site is at very low risk of flooding. Flood mitigation measures are recommended.
- 1.15. Elsworthy Road is within a Critical Drainage Area (Group 3-005). The proposed basement development will not result in an increase in impermeable site area. Drainage proposals should be agreed with LBC and Thames Water.
- 1.16. An outline programme of works has been presented.
- 1.17. Non-technical summaries should be provided in future revisions of the BIA.
- 1.18. 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 24th May 2021 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 31 Elsworthy Road, London NW3 3BT, Camden Reference 2021/1527/P. A revised BIA submission was issued on 25th November 2021.

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: *"New basement extension to include a pool and rear lightwell, part single part two storey rear extension with balcony above, alterations to window opening to side elevation, internal extension of garage and new doors, all to dwelling."*

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

2.6. CampbellReith accessed LBC's Planning Portal on 27th November 2021 and gained access to the following relevant documents for audit purposes:

- Site Investigation Report and Basement Impact Assessment (BIA) (ref 10588/JRCB/R2) dated 29th September 2021 by Soil Consultants Ltd.
- Surface Water and Subsurface Flow Basement Impact Assessment (ref 2020-003-075-001) dated 26th March 2021 by Stephen Buss Environmental Consulting Ltd (presented in Appendix C of the BIA).
- Ground Movement Analysis Report (GMA) (ref 10588/JRCB/R1) dated 29th September 2021 by Soil Consultants Ltd.
- Existing and proposed plans and sections dated January and May 2021 by BB Partnership Ltd.
- Arboricultural Impact Assessment Report (ref BBP/31EWR/AIA/01b) dated 29th March 2021 by Landmark Trees.
- Construction Method Statement (ref MBP-8255) dated October 2021 by Michael Barclay Partnership.
- Design and Access Statement dated March 2021 by BB Partnership Ltd.
- Planning consultation comments.

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 Land Stability assessment do not meet the requirements of CPG Basements.
Is data required by Cl.233 of the GSD presented?	No	Utilities and underground infrastructure in the vicinity of the site should be identified.
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 7.1 of the Land Stability BIA. The nearest tunnel is located 120m north of the site.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4 of the Groundwater and Surface water BIA. Although the site is underlain by London Clay the site does fall within the Outer Source Protection Zone relating to a potable groundwater abstraction 427m southeast of the site.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3 of the Groundwater and Surface water BIA. The BIA states that the 'lost' River Tyburn is 160m west of the property.
Is a conceptual model presented?	Yes	Sufficient description and figures presented.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 7.2 of the Land Stability BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5 of the Groundwater and Surface Water BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No issues identified in Screening to take forward to Scoping.
Is factual ground investigation data provided?	Yes	Section 5 of the Land Stability BIA.
Is monitoring data presented?	Yes	Appendix A of the Land Stability BIA.
Is the ground investigation informed by a desk study?	Yes	Section 3 of the Land Stability BIA.
Has a site walkover been undertaken?	Yes	In conjunction with the site investigation.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	<p>The scoping section of the Land Stability BIA (Section 7.2) presumes that basements are not present beneath the adjacent properties. However, Section 2.4 of the Groundwater and Surface water BIA outlines local basements including 35 Elsworthy Road (to the southwest of the site) which was granted planning permission in 2014 for basement excavation, 37 Elsworthy Road (to the southwest) which was granted planning permission in 2011 for basement excavation, 48 Elsworthy Road (to the north of the site) which was granted planning permission in 2014 for basement excavation and 42 Elsworthy Road (to the northeast) which was granted planning permission in 2018 for basement excavation.</p> <p>The GMA assumes that the adjacent properties at 29 and 33 Elsworthy Road do not have basements.</p>
Is a geotechnical interpretation presented?	Yes	Section 6 of the Land Stability BIA.

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 6.1 of the Land Stability BIA and Appendix C of the Construction Method Statement includes outline retaining wall design. However, depth of proposed piling to be confirmed.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Impact Assessment Report and Ground Movement Assessment.
Are baseline conditions described, based on the GSD?	No	Depth of piling to be confirmed.
Do the baseline conditions consider adjacent or nearby basements?	Yes	Assumptions have been made on the absence of adjacent basements.
Is an Impact Assessment provided?	Yes	Section 7.4 of Land Stability BIA and Section 5.2 of the Groundwater and Surface water BIA.
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement Analysis Report. However, depth of piling to be confirmed.
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	Protection to the basement will be provided by a non-return valves.
Has the need for monitoring during construction been considered?	Yes	Appendix D of the Construction Method Statement. To be confirmed pending review of GMA.
Have the residual (after mitigation) impacts been clearly identified?	No	To be confirmed pending review of GMA.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	To be confirmed pending review of GMA.

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	To be confirmed pending review of GMA.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Assuming high stiffness retaining walls. To be confirmed pending review of GMA.
Are non-technical summaries provided?	No	Non-technical summaries are not provided.

4.0 DISCUSSION

- 4.1. The BIA has been prepared by a number of sources: Soil Consultants Ltd, Stephen Buss Environmental Consulting Ltd and Michael Barclay Partnership LLP. The qualifications of the authors of the Groundwater and Surface Water BIA meet the requirements of CPG Basements. However, the qualifications of the authors in regard to the Land Stability assessment should be demonstrated to be in accordance with LBC guidance.
- 4.2. The site currently comprises a three-storey detached dwelling on the southeast side of Elsworthy Road. The proposed development comprises the excavation of a basement below the building with sections beneath the front drive and the rear garden. The proposed basement is to include a swimming pool beneath the rear garden. The basement will be deepened to approximately 6.5m below ground level.
- 4.3. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1. However, utility companies have not been approached with regards to the presence of underground infrastructure within the development's zone of influence. These records should be obtained and presented, including an impact assessment and mitigation proposals, if required.
- 4.4. Screening and scoping assessments have been completed.
- 4.5. A site investigation was undertaken on 17 February 2021 by Soil Consultants Ltd comprising four boreholes to depths of between 4.00m and 5.00m below ground level (bgl). The ground conditions comprise Made Ground overlying potential superficial deposits (although these have been interpreted within the BIA as probable Made Ground) and the London Clay Formation. It is noted that, whilst the site investigation is adequate for preliminary assessment purposes, further investigation may be required to confirm design parameters for the proposed piling.
- 4.6. Groundwater was observed in one borehole during the investigation at 4.60m bgl. Subsequent monitoring visits were undertaken on 18th March and 26th March 2021 with groundwater observed in 3 of the 4 boreholes at depths ranging from 1.84m to 3.60m bgl. The BIA states that whilst this is probably perched water within the Made Ground, significant inflows could potentially occur which could compromise the stability of the underpinning. The BIA recommends that 'trial excavations to at least the top of the London Clay are undertaken in advance of the underpinning/excavation to confirm the groundwater conditions and to allow appropriate water control measures to be designed and implemented'.
- 4.7. The hydrogeological assessment states that there will be no impact to groundwater flow, as there is no designated shallow aquifer beneath the site. It also indicates that since there are no adjacent basements, local perched water / drainage routes through Made Ground will not be significantly

affected, and assessment, including consideration of the local topography, soil permeabilities and geometry of the proposed site and adjacent structures, is presented.

- 4.8. The Groundwater and Surface Water BIA states that the 'lost' River Tyburn is approximately 160m west of the property but has since been culverted.
- 4.9. The site is not within a Local Flood Risk Zone. The Surface Water BIA has identified that the site is at very low risk of flooding from rivers and sea and at no risk of reservoir flooding; however, the Construction Method Statement has identified that the site is at high risk of flooding from surface water. The carriageway of Elsworthy Road is at low to medium risk of flooding from surface water outside the subject site increasing to high risk further to the southwest. Elsworthy Road did not flood in 1975 or 2002 (although this has not been identified in any of the BIA documents provided). The Surface Water BIA and mapping provided states that the site itself is at very low risk of flooding from all sources. Flood mitigation measures are recommended. The proposed works would not increase the risk of flooding to the surrounding properties.
- 4.10. It is noted that the Construction Method Statement references a flood risk assessment document that has not been provided for review. However, this has been considered superseded by the Surface Water BIA provided.
- 4.11. Elsworthy Road is within Critical Drainage Area (Group 3-005). The proposed basement development will not result in an increase in impermeable site area. Drainage proposals should be agreed with LBC and Thames Water.
- 4.12. Interpretative geotechnical information is presented, broadly in accordance with the GSD Appendix G3.
- 4.13. The Construction Method Statement (CMS) indicates that the proposed basement will be an entirely new construction using reinforced and unreinforced concrete. Beneath the main house the existing walls will be underpinned following a traditional techniques and hit-and-miss sequences. Two stages of underpinning are indicated for the deeper section of basement. The front and rear retaining walls, outside of the existing site footprint, are proposed to be formed by contiguous bored piles, although the proposed length of piles is not indicated. The new basement slab, along with the ground floor slab it will support, will be cast in reinforced concrete with the basement slab being ground bearing rather than suspended. The retaining walls will be propped in the temporary and permanent condition.
- 4.14. A Ground Movement Assessment (GMA) has been undertaken by Soil Consultants Ltd to predict movements that may impact the adjacent properties at 29 and 33 Elsworthy Road in order to allow an assessment of the potential damage. The GMA assumes that the adjacent properties do not have basements. The category of damage is determined using Burland's classification and has been

carried out for two cases, considering 'intermediate' stiffness and 'high' stiffness support systems. The predicted damage for the perpendicular walls at both No. 29 and No. 33 based on an 'intermediate' stiffness is Category 2 (Slight). CPG: Basements requires that damage may not exceed Category 1 (Very Slight) and the GMA concludes that a high stiffness support system will be needed to limit ground movements and consequential damage to adjacent properties within acceptable levels.

4.15. The following clarifications of the GMA are required:

- The use of piles to construct the basement is referenced in the CMS, however ground movements associated with piling do not appear to be included in the GMA. This should be confirmed and the impact from this construction methodology included in the GMA.
- The length of the proposed contiguous piles have not been stated and should be confirmed.
- Whilst the GMA methodology is intended for use with embedded pile walls, it is accepted that it can provide predictions for ground movements within the typical range generated by retaining walls formed by underpinning. Underpinning formed in multiple lifts would be anticipated to generate movements in excess of underpinning formed in a single lift, and the movements allowed for should be clearly stated.
- Tables or predicted movement calculations and graphical outputs of movements / delta values along the adjacent property walls are provided. For clarity, contour plots of predicted movements should be provided.
- It is noted that the predicted movements for the high stiffness support system are close to the damage classification boundary of Category 1 / Category 2 for the adjacent properties, and as such it would be prudent to clearly state limiting maximum movements to control the proposed construction.

4.16. An outline methodology and guidance for monitoring structural movements during construction has been provided including proposed trigger values and contingency actions. These should be confirmed, pending review of the GMA. As noted above, the predicted damage to adjacent properties is close to the boundary of Category 1 / Category 2, and as such robust contingency measures for limiting ground movements and damage should be proposed and maintained on site.

4.17. An outline construction programme has been provided.

4.18. Non-technical summaries should be provided within any revisions to the BIA submitted.

5.0 CONCLUSIONS

- 5.1. The authors' qualifications should be demonstrated to be in accordance with the requirements of CPG Basements.
- 5.2. The presence or absence of nearby utilities should be confirmed.
- 5.3. A site investigation indicates ground conditions of Made Ground overlying the London Clay Formation.
- 5.4. There will be no impact to the hydrogeological environment; however, temporary dewatering during construction may be required to ensure stability.
- 5.5. Geotechnical interpretative information is provided.
- 5.6. Temporary works information is provided. The depth of the proposed contiguous piles should be indicated
- 5.7. A Ground Movement Assessment (GMA) has been undertaken. Clarifications are requested as detailed in Section 4.
- 5.8. An outline methodology and guidance for monitoring structural movements has been provided. This should be confirmed, pending review of the GMA
- 5.9. The site is not within a Local Flood Risk Zone. The site is at very low risk of flooding. Flood mitigation measures are recommended.
- 5.10. The BIA indicates there will be no increase in impermeable site area. 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.
- 5.13. Queries and matters requiring further clarification are 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
Prooth	Not provided	25 May 2021	Concerned about ground movements and impacts to properties.	4.14 – 4.16
Findlay	Not provided	08 June 2021	Potential impact to the water environment	4.6 – 4.11

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 4.1	
2	BIA Format	Non-technical summaries	Open – to be provided as 4.18	
3	Desk Study	Underground utility and infrastructure information should be provided.	Open – to be provided as 4.3	
4	Land Stability	The depth of the proposed contiguous pile wall should be provided.	Open – to be provided as 4.13	
5	Land Stability	GMA – clarifications to be provided as per the comments in Section 4.	Open – to be provided as 4.15	
6	Land Stability	Monitoring proposals to be clarified pending review of GMA.	Open – to be provided as 4.16	

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