CampbellReith
consulting engineers

Basement Impact Assessment Audit

45 Elsworthy Road, London NW3 3BS

For
London Borough of Camden

Project No.
14006-90

Revision F1

Date
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CONTENTS

APPENDICES

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 45 Elsworthy Road, London NW3 3BS (planning reference 2024/4331/P). The basement is considered to fall within Category C as defined by the Terms of Reference. A BIA submitted under a Planning Application (reference 2024/1352/P) was previously reviewed in the Audit Revision D1.

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 The Basement Impact Assessment has been produced by Green Structural Engineering (GSE) and Chelmer Global.

1.5 The proposed development will include the extension of the single-storey basement along with several internal alterations to the main building.

1.6 Screening and scoping assessments are presented, supported by desk study information.

1.7 Clarification regarding tree removal has been provided in the updated submissions.

1.8 The BIA states that the ground conditions on site consists of Made Ground over London Clay.

1.9 It is likely that some perched groundwater could be encountered during construction of the basement. There should be no impact to groundwater flows.

1.10 Geotechnical parameters to inform retaining wall design have been provided.

1.11 It is accepted that, with the inclusion of the proposed attenuated drainage scheme, the basement will not adversely impact off-site surface water flows.

1.12 The BIA identifies that a historic culverted river runs beneath or close to the site. The BIA indicates further survey will be required prior to construction which should be undertaken in liaison with Thames Water and asset protection measures agreed, if required.

1.13 Outline construction information including temporary works propping and sequencing has been provided.

1.14 A Ground Movement Assessment (GMA) has been carried out to assess the impact of the basement construction on neighbouring properties and infrastructure.

1.15 Based on the updated submissions, damage to neighbouring buildings will not exceed Burland Damage Category 1 (very slight).

1.16 It is understood that a ground movement monitoring scheme is to be adopted to ensure that movements generated are maintained within the predicted limits.

1.17 The BIA complies with the requirements of CPG: Basements. Queries and comments on the BIA are described in Section 4 and Appendix 2.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 12 November 2024 to carry out a Category C audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 45 Elsworthy Road, London, NW3 3BS (planning reference 2024/4331/P). A BIA submitted under a Planning Application (reference 2024/1352/P) was previously reviewed in the Audit Revision D1.

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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance (CPG): Basements. January 2021.
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

2.4 The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment;

c) avoid cumulative impacts upon structural stability or the water environment in the local area;

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5 LBC's Audit Instruction described the planning proposal as *"Excavation of basement extension"*.

2.6 The Audit Instruction confirmed 45 Elsworthy Road neither involves, nor is a neighbour to, listed buildings but does lie within the Elsworthy Conservation Area.

2.7 CampbellReith accessed LBC's Planning Portal on 11 December 2024 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment and Engineering Method Statement by Green Structural Engineering Ltd (GSE), Ref. 20230188 (Rev 02), dated 23 October 2024.
- Basement Impact Assessment Report by Chelmer Global Ltd, ref. BIA/13535, dated May 2024. Presented in Appendix G of the GSE BIA report.
- Construction Method Statement by Green Structural Engineering, ref 20230188, rev – 02, dated October 2024.

- Design and access statement by Wolff Architects Ltd, undated.
- Planning Application Drawings consisting of:
  - Existing Plans and elevations by Wolff Architects Ltd, dated 2 October 2024.
  - Demolition Plans by Wolff Architects Ltd, dated 2 October 2024.
  - Proposed Plans by Wolff Architects Ltd, dated 2 October 2024.
- Flood Risk Assessment and Drainage Strategy by Green Structural Engineering, ref. 20230188 rev 2, dated 21 October 2024.
- Planning statement by SM Planning, dated October 2024.
- Tree survey, Arboricultural Implications Assessment and Method Statement by Indigo Surveys Ltd, ref. 231829/A2_AIA_Rev.B, dated 11 October 2024.

2.8 CampbellReith were provided with the following relevant documents for audit purposes:

- Basement Impact Assessment Report by Chelmer Global Ltd, ref. BIA/13535 Version 4.0, dated 23 December 2024.
- Flood Risk Assessment and Drainage Strategy by Green Structural Engineering, ref. 20230188 rev 3, dated 19 December 2024.
- Updated Ground Movement Assessment Model Outputs dated January 2025.
- Technical Note by Green Structural Engineering ref. 20230188 dated 20 February 2025 (Appendix 3).
- Letter by Chelmer Global Ltd ref LTR/13535 (received 20 February 2025) (Appendix 3).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Updated Assessments.
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 plan/maps included?	Yes	Desk Study provided.
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 8 of the BIA. Clarification required on Q6 as Arboricultural Statement states that two trees will be removed.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 7 of the BIA
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 6 of the BIA
Is a conceptual model presented?	Yes	Section 5 of the Chelmer BIA (Appendix G)
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	Section 5 of the Chelmer BIA (Appendix G).
Is monitoring data presented?	Yes	Section 5.1 of the Chelmer BIA (Appendix G).
Is the ground investigation informed by a desk study?	Yes	Appendix B of the BIA.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	
Is a geotechnical interpretation presented?	Yes	Table 11 of the Chelmer BIA (Appendix G).
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	Yes	
Are the 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 7 of the Chelmer BIA (Appendix G).
Are estimates of ground movement and structural impact presented?	Yes	GMA provided.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Updated Assessments.
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	
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Updated Assessments.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Updated Assessments.
Are non-technical summaries provided?	Yes	Executive summary provided

4.0 DISCUSSION

4.1 The Basement Impact Assessment has been produced by Green Structural Engineering (GSE) and Chelmer Global. For surface water flow assessments (Flood Risk and Drainage Strategy), the updated assessment demonstrates that the authors' hold qualifications in accordance with CPG Basements.

4.2 The subject site and neighbours are not listed buildings, but the site does lie within the Elsworthy Conservation Area.

4.3 The site lies in a primarily residential area, located at 45 Elsworthy Road, London, NW3 3BS, and is occupied by a two-storeyed detached house. The site is roughly rectangular in shape and covers approximately 0.12ha. The existing building on site is a detached two-storey dwelling, built in 1897 and has had multiple alterations over the years, including a small basement that is approximately 8.00m in length, 8.00m in width and extends to approximately 2.00m below ground level (bgl).

4.4 The proposed development will include the extension of the single-storey basement along with several internal alterations to the main building. The proposed basement would involve a combination of underpins installed in a traditional 'hit and miss' sequence along the front and flank elevations, and a contiguous piled retaining wall along the rear elevation of the building. Updated information confirms the underpinning will be completed within a single lift.

4.5 The BIA states that an excavation approximately 4.00m deep would be required for the construction of the new basement, and locally deeper excavation of approximately 5.50m would be required to accommodate the proposed pool towards the south side of the building.

4.6 The BIA identifies that the neighbouring building at No. 47 Elsworthy Road has a basement beneath the full footprint of the building and No. 43 Elsworthy Road has an underground garage.

4.7 Screening assessments are presented and informed by desk study information. Relevant figures and maps from the ARUP GSD and other guidance documents have been referenced and provided within the BIA to support screening questions. The potential impacts identified from the screening exercise are scoped out and have been provided along with the screening responses.

4.8 Ground investigation undertaken by Chelmer Global comprising of 3 boreholes and 7 trial pits revealed a ground sequence of Made Ground approximately 3.20m thick overlying bedrock of London Clay Formation.

4.9 Groundwater was not encountered during the time of investigation, but a small seepage was observed in borehole BH1. Further groundwater monitoring identified groundwater at depths of between 1.80m to 3.00m below ground level. The BIA notes that any flows encountered during construction would be relatively minor and should be adequately controlled using conventional methods like sump pumping. The BIA states that the groundwater could represent perched groundwater within the Made Ground and the more permeable fractions of the London Clay Formation.

4.10 Historic maps from c. 1877, provided in Appendix B of the BIA indicate the presence of an unmarked water body on the southern part of the site. The BIA anticipates the infilled pond to lie outside of the basement area, and ground investigation reveals Made Ground 3.20m deep near this area.

4.11 The updated submissions indicate that trees will be removed as part of the development. The assessments indicate that, based on the proximity of the neighbouring property and the depth of foundations, there should be no significant impacts.

4.12 It is noted that the site either lies in close proximity to, or over, the lost river 'Tyburn', and identifies the possibility of its tributaries still existing near the site. It is understood that the river Tyburn has been incorporated into the sewer network as the King's Scholar Main Sewer. Figure 2 of the London Borough of Camden Strategic Flood Risk Assessment (SFRA) records the culverted water course, very close to the site. However, Thames Water asset records does not identify any culverts in the area.

4.13 The Utility Survey Report produced by Murphy Geospatial is provided in Appendix I of the BIA. A ground penetrating radar (GPR) survey was carried out to identify the presence of the culverted water course. The BIA and FRA states that the GPR survey was undertaken to a depth of 4.00m; however, section 3.3 of the Murphys report states that the low frequency ground penetrating radar (GPR) antennas could only reach approximately 3.00m below ground level. The Murphys report states that the presence of the watercourse in the area can neither be confirmed nor be negated. The BIA (Appendix G) indicates further survey will be required prior to construction which should be undertaken in liaison with Thames Water and asset protection measures agreed, if required.

4.14 The responses provided for surface water screening assessments indicate that the proposed basement extends beyond the footprint of the existing building and the proportion of hardstanding surfaces on site would increase. However, section 17 of the BIA states that the proposed development would result in a negligible change to the hardstanding surface area of the site. Despite the inconsistency, a site-specific Flood Risk Assessment (FRA) with mitigation measures has been provided.

4.15 The FRA identifies the site to be located within the Critical Drainage Area 'Group3_005' of the LBC. The site lies within Flood zone 1 and the FRA states that the site has a low to negligible risk of flooding from all sources. It is noted that the adjoining Elsworthy Road has a medium to high risk of surface water flooding. The FRA identifies that attenuation storage will be used to control off-site discharge of surface water to the existing sewer network. The proposed drainage strategy will require approval from Thames Water and the LLFA.

4.16 The BIA states that the proposed basement would not significantly affect the stability of the nearby slopes, as the property is situated in a relatively level area.

4.17 Thames Water Assets map provided within the Utilities Survey (Appendix H) of the BIA indicate the presence of a potential exclusion zone for a proposed sewer line along Elsworthy Road.

4.18 It is noted that responses from Cadent Gas indicates the presence of a gas line near the site. The site has also been identified to be within a High-Risk zone from National Grid Electricity Transmission plc's apparatus, which is shown to pass between No. 45 and No. 47. Potential impacts due to the proposed redevelopment on these existing utility assets requires further consideration. Asset protection agreements may be required with asset owners.

4.19 The basement construction is proposed to be carried out using a combination of reinforced concrete underpinning and contiguous pile walls. The existing ground floor and lower ground floor walls to the north of the current building are intended to be constructed underpinning works in a hit-and-miss sequence. The updated submissions confirm this will be undertaken in a single lift. Contiguous piled retaining walls are proposed to form the basement retaining walls at the rear of the property.

4.20 The BIA recommends stiff temporary propping at high and low levels for the basement excavation, due to the sensitivity of nearby structures to anticipated ground movements, and the basement walls are modelled as high stiffness walls in the Ground Movement Assessment (GMA).

4.21 The GMA assesses the impact to neighbouring buildings at 47 Elsworthy Road and 43 Elsworthy Road. It considers heave and settlement and CIRIA C760 empirical curves to estimate the ground movements arising from the basement construction. While CIRIA C760 is intended for use with embedded retaining walls, it is acknowledged that it can also predict ground movements in the range of those excepted for a single lift of underpinning undertaken using good workmanship practises.

4.22 The GMA estimates that the proposed basement construction would not cause any damage greater than Burland Damage Category 1 (very slight).

4.23 The potential damage due to short term and long-term ground movements on the footpath and highway of Elsworthy Road has been considered in the GMA. Consideration of the impact to the access road has been included in the updated BIA.

4.24 The BIA indicates that a movement monitoring scheme with suitable action trigger levels and contingency measures is to be adopted to ensure that any ground movements generated with the construction are maintained within the predicted limits.

5.0 CONCLUSIONS

5.1 Considering the updated documents submitted, the authors' hold qualifications in accordance with CPG Basements.

5.2 Screening and scoping assessments are presented, supported by desk study information.

5.3 Clarification regarding tree removal has been provided in the updated submissions.

5.4 The BIA states that the ground conditions on site consists of Made Ground over London Clay.

5.5 There should be no impact to groundwater flows.

5.6 Geotechnical parameters to inform retaining wall design have been provided.

5.7 It is accepted that, with the inclusion of the proposed attenuated drainage scheme, the basement will not adversely impact off-site surface water flows.

5.8 The BIA indicates further survey will be required prior to construction in regard to a culvert which should be undertaken in liaison with Thames Water and asset protection measures agreed, if required.

5.9 Outline construction information including temporary works propping and sequencing has been provided.

5.10 A Ground Movement Assessment (GMA) has been carried out. Based on the updated submissions indicating a single lift of underpinning, the assessment is accepted.

5.11 It is understood that a ground movement monitoring scheme is to be adopted to ensure that movements generated are maintained within the predicted limits.

5.12 Considering the updated submissions, the BIA complies with the requirements of CPG: Basements.

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Appendix 1

Consultation Responses

None

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Appendix 2

Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Qualifications of the authors should be demonstrated to be in accordance with LBC guidelines.	Closed	March 2025
2	Land stability	Clarification of the removal of trees and associated impact is requested.	Closed	March 2025
3	Land stability	The BIA indicates further survey for a culvert will be required prior to construction which should be undertaken in liaison with Thames Water and asset protection measures agreed, if required. It's also noted that asset protection agreements with utility providers may be required.	Note Only	N/A
4	Land stability	Clarification is requested as to how the use of two lifts of underpinning has been incorporated into the GMA. Impacts to highways to be reviewed.	Closed	March 2025

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Appendix 3

Supplementary Supporting Documents

Technical Note by Green Structural Engineering ref. 20230188 dated 20 February 2025

Letter by Chelmer Global Ltd ref LTR/13535 (received 20 February 2025)

20/02/2025

Our Ref: 20230188
Campbell Reith Project No: 14006-90 Revision D2

FAO Graham Kite (GK)
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Dear Mr Graham Kite,

RE: 45 Elsworthy Road, London, NW3 3BS

Furthering discussion surrounding the ground movement assessment (Query 4) of the Basement Impact Assessment Audit, please accept this email as confirmation that all information showing a 2 Stages of underpinning during construction is to be superseded within a Single Stage Underpinning Construction Method with appropriately designed shoring, limiting the Damage Category assessed to 1 (Very Slight) for adjacent surrounding structures.

We believe the above is acceptable.

Yours Sincerely

Prepared By

Toffee Chen
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Approved by

Arash Aini
Director

FAO Graham Kite (GK)
Campbell Reith Hill LLP
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Our Ref: LTR/13535

FAO: Mr Graham Kite

Re: 45 Elsworthy Road, London, NW3 3BS

In regard to the ground movement assessment (Query 4) of the Basement Impact Assessment Audit associated with the above project, we have been informed by the Structural Engineer attached to the project (Green Structural Engineering) that they now wish to supersede all information currently showing 2 Stages of underpinning during construction with a Single Stage Underpinning Construction Method, limiting the Damage Category assessed to 1 (Very Slight) for adjacent surrounding structures.

We confirm that the above is acceptable.

Yours faithfully

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