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42 Elsworthy Road
London, NW3 3DL

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-68
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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 42 Elsworthy Road, London NW3 3DL (planning reference 2022/1537/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 proposed development comprises the construction of a single-level basement beneath the western part of the house, using traditional underpinning techniques.

1.5. The qualifications of the individuals involved in the production of the BIA are in line with Camden's guidance.

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

1.7. It is accepted that the proposed basement will not impact the hydrology or hydrogeology of the area.

1.8. Additional consideration of the impact of the proposed tree removal is requested.

1.9. The site investigation confirmed that the basement will be founded into Weathered London Clay, which is considered a suitable founding stratum. Any groundwater ingress during the excavation will be managed via traditional sump pumping.

1.10. A Flood Risk Assessment has been undertaken which concludes that the site is at low risk of flooding from all the sources and that the proposed development will not increase groundwater and surface flooding risk in the surrounding area.

1.11. Geotechnical parameters are presented, however, clarification is required for some of the parameters and they should be used consistently in all calculations.

1.12. Some clarifications relating to the underpinning construction sequence are requested.

1.13. A ground movement assessment and damage assessment are provided to demonstrate that ground movements and consequential damage to neighbouring properties will be within the LBC's policy requirements. The result of the preliminary damage assessment confirms that

damage to neighbouring properties will not exceed Category 1 (Very Slight) on the Burland scale.

1.14. An outline ground movement monitoring proposal has been presented in the BIA, however the trigger level values require updating to reflect the results of the ground movement assessment.

1.15. Queries and requests for information are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on the 28th of May 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 42 Elsworthy, London, NW3 3DL, planning reference 2022/1537/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:

- 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 "*Erection of two-storey west side extension following demolition of existing structure, demolition and rebuilt of existing east side extension; basement excavation with front, rear ligthwells; extension of front, side dormers; repositioning of rooflights; increase the doors height at lower ground floor rear; increase height of vehicular gates and piers to front; replacement of all single glazed timber sash windows with new double glazed timber sash windows; new landscaping; provision of bin and cycle storage to front garden; new plant equipment in rear garden, all to reconfigure the existing three flats*".

2.6. The audit instruction confirmed that the development neither involves, nor is a neighbour to, listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on the 25th of July 2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Create Consulting Engineers Ltd, ref: CB/CS/P17-1308/01/Rev B, dated 08 June 2022.
- Appendices D to J from previous revision of the BIA by Create Consulting Engineers Ltd, ref: CB/CS/P17-1308/01/Rev A DRAFT, dated 25 May 2022.
- Structural Engineers Statement by Axiom Structures Limited, ref.: 21142, rev P2, dated 14 February 2022.
- Architectural Drawings by Wolff Architects including demolition, existing and proposed plans and sections, dated 28th March 2022, Rev. 0.
- Arboricultural Impact Assessment by John Cromar's Arboricultural Company Ltd (ref.: S87-J3-IA-3), dated March 2022.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
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	Section 3 of the BIA.
Are suitable plan/maps included?	Yes	Section 3 and 4 of the BIA and architect's drawings.
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 5 of the BIA. However, Question 6 should be answered as 'Yes' as trees are going to be removed. See Section 9.4 of the arboricultural report.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 5 of the BIA. However, Question 1b should be answered as 'Yes' with respect to the basement extending below groundwater levels.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 5 of the BIA.
Is a conceptual model presented?	Yes	Section 7 of the BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Question 6 should be brought forward to scoping.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No items identified in the screening process.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No items identified in the screening process.
Is factual ground investigation data provided?	Yes	Appendix F of the BIA.
Is monitoring data presented?	Yes	Appendix J of the BIA and Section 7 of the BIA.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	On May 2017 and April 2022.
Is the presence/absence of adjacent or nearby basements confirmed?	No	However, assumptions made in the assessment are considered conservative.
Is a geotechnical interpretation presented?	Yes	Section 8 of the BIA. However, parameters for the Weathered London Clay should be amended.
Does the geotechnical interpretation include information on retaining wall design?	No	These are required.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation report and FRA provided.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Assumptions are considered conservative.
Is an Impact Assessment provided?	Yes	Section 9 of the BIA.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement Assessment (GMA) and outline structural proposal provided.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	However, some items should be brought forward to scoping and the impact assessment updated.
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 2.4 of the SES. Monitoring trigger levels should be revised to reflect the results of the GMA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Residual impacts are considered to be negligible.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Impacts of tree removals on neighbouring properties should be presented.
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?	No	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Create Consulting Engineers. The qualifications of the individuals involved in the production of the BIA meet the requirements of CPG Basements.

4.2. The site is occupied by a three-storey detached house which includes a minor two storey structure to the west with internal garages. The property has a lower ground floor covering the whole footprint of the building. To the rear and side (west) there are gardens with many mature trees and shrubs. The property is not listed and there are no listed buildings close by.

4.3. The proposed development comprises an extension to the existing lower ground floor and the construction of a new basement below the eastern part of the building. It is understood that the basement formation level will be at c. 4.60m bgl.

4.4. Screening and scoping assessments are presented and are informed by desk study information.

4.5. Question 6 of the land stability screening should be brought forward to the scoping stage, as the Arboricultural Impact Assessment recommends a number of trees to be removed as part of the development. The BIA should consider the impact to neighbouring properties due to tree removal.

4.6. A site investigation was undertaken by Create in July 2017. Site works included four boreholes undertaken from existing ground level to a maximum depth of 15.00m bgl. Made Ground of thickness up to 1.50m was found on top of the Weathered London Clay and London Clay which was encountered to final depth of the borehole.

4.7. No groundwater was encountered during the ground investigations. All four boreholes were installed with monitoring standpipes and four return monitoring visits were carried out between July and September 2017, and in April 2022. Groundwater was recorded between c. 1.20 and 11.15m bgl, with a trend of water level increasing over time. The BIA states that, as groundwater was not encountered during the site investigation, the water recorded in the boreholes is likely to be from perched groundwater held in fissures and/or Made Ground, which is accumulating over time. The Structural Engineer Statement (SES) indicates any groundwater ingress during the excavation will be managed via traditional sump pumping. It is accepted that the basement will not impact the hydrogeology of the area.

4.8. The site has a low risk of flooding from surface water and no increase in hardstanding areas is proposed. A Flood Risk Assessment (FRA) has been undertaken, which concludes that the site is at low risk of flooding from all the identified sources and that the proposed development will

not increase groundwater or surface flooding risk in the surrounding area. It is accepted that the basement will not have a significant impact on the hydrology of the area.

4.9. Geotechnical parameters to be adopted in the basement design and ground movement calculations are presented. However, the undrained shear strength assumed for the Weathered London Clay is considered overly generous based on the results from the ground investigation. This value should be revised be present a 'cautious or moderately conservative estimate' as required by LBC guidance. The value for the bearing capacity should be consequently amended.

4.10. Parameters for retaining walls (Young's Modulus and angle of shearing resistance) are not presented in the BIA and are required. The soil density used in the preliminary retaining wall calculations in Appendix 2 of the SES are not consistent with those given in Table 8.1 of the BIA.

4.11. An outline structural proposal and associated drawings are included in the BIA. Underpinning below the existing perimeter walls is proposed to form the new basement. The underpinning is to be carried out following a traditional 'hit and miss' sequence. The underpins will be propped in the temporary condition and supported by the basement and ground floor slab in the long term. Allowance for minor dewatering during the excavation has also been made.

4.12. Within appendix 1 of the SES, temporary works drawing ref. 21142-ASL-SK-TW-040, rev P01 shows the underpinning sequence for the basement. It is noted that two opposite and adjoining bays are both marked as being undertaken at the same stage (stage 1) of the underpin construction sequence. Confirmation of the additional temporary works measures in this location, or a revised underpinning sequence should be provided. Confirmation that the full 5.20m height of underpinning will take place in one lift is also requested.

4.13. A GMA and damage assessment are provided to demonstrate that ground movements and consequential damage to neighbouring properties will be within the LBC's policy requirements. The analysis was carried out following the CIRIA C760 guidance for embedded retaining wall. While not strictly intended for use with underpinning, it is accepted that, with good control of the works and experienced workmanship, the C760 methodology can predict the typical range of movements generated by underpinning.

4.14. The result of the preliminary damage assessment confirms that damage to neighbouring properties will be within Category 1 of the Burland Scale. An assessment has been also undertaken for the adjacent road and negligible damage is anticipated for the road and any services running along it.

4.15. The SES recommends the construction works should be carried out by a competent and experienced in similar works contractor. An outline structural monitoring strategy has been developed to control construction works and maintain movements/damage impacts within the

predicted limits. The proposed monitoring trigger levels of amber = 5mm and red = 10mm should be updated to reflect the ground movement values calculated in the GMA.

5.0 CONCLUSIONS

5.1. The qualifications of the individuals involved in the production of the BIA are in line with Camden's guidance.

5.2. Screening and scoping assessments are presented and informed by desk study information. However, Question 6 of the land stability screening should be brought forward to scoping as the Arboricultural Impact Assessment recommends a number of trees to be removed as part of the development. The BIA should present an impact assessment on neighbouring properties due to tree removal.

5.3. The site investigation confirmed that the basement will be founded in the Weathered London Clay.

5.4. Any groundwater ingress during the excavation will be managed via traditional sump pumping.

5.5. A Flood Risk Assessment has been undertaken, which concludes that the site is at low risk of flooding from all the sources and that the proposed development will not increase groundwater and surface flooding risk in the surrounding area.

5.6. It is accepted that the basement will not impact the hydrology or hydrogeology of the surrounding area.

5.7. Geotechnical parameters are presented, however, clarification is required for some parameters as discussed in Section 4. Soil parameters should be used consistently in all calculations.

5.8. Some clarifications relating to the underpinning construction sequence are requested.

5.9. A ground movement assessment (GMA) and damage assessment are provided to demonstrate that ground movements and consequential damage to neighbouring properties will be within the LBC's policy requirements.

5.10. The result of the damage assessment confirms that damage to neighbouring properties will be within Category 1 (Very Slight) of the Burland Scale.

5.11. An outline ground movement monitoring proposal has been presented in the BIA, however the proposed trigger levels should be revised in line with the predicted ground movements presented in the GMA.

5.12. Queries and requests for information are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

Appendix 1: Residents' Consultation Comment

None relevant to this audit.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Land Stability	Question 6 of the land stability screening should be brought to scoping as the Arboricultural Impact Assessment recommends a number of trees to be removed as part of the development. The BIA should consider the impact on neighbouring properties due to tree removal.	Open – See Section 4.5.	
2	Geotechnical Interpretation	The undrained shear strength for the Weathered London Clay and associated bearing capacity should be amended. Parameters for retaining walls (Young's Modulus and angle of shearing resistance) are not presented and are required. The outline retaining wall calculations should use parameters consistent with those presented in the BIA.	Open – See Section 4.9. Open – See Section 4.10.	
3	Construction	Confirmation of the underpinning sequence and number of lifts is requested	Open – See Section 4.12.	
4	Construction	The trigger levels proposed for the movement monitoring should be revised to reflect the values calculated in the ground movement assessment.	Open – See Section 4.15.	

Appendix 3: Supplementary Supporting Documents

None

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