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15 Fitzroy Road, London, NW1 8TU

Basement Impact Assessment

Audit

For

London Borough of Camden

Project Number: 13693-82
Revision: D1

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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 15 Fitzroy Road, London, NW1 8TU (planning reference 2022/2941/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 gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.

1.4. The BIA has been carried out by individuals who possess the CEng qualification. Input from an individual holding the CGeol qualification is required.

1.5. The development comprises the lowering of the existing lower ground floor by 0.7m and the rebuilding of a 2-story outrigger building to the rear of the property. The basement will be formed using underpinning.

1.6. Groundwater levels should be clarified and presented consistently in all documents.

1.7. It is accepted that the development will not impact on the wider hydrology of the area and is not in an area subject to flooding.

1.8. Interpretive geotechnical soil parameters should be provided and the ground model requires clarification and should be presented consistently in all documents.

1.9. The Structural Engineering Report should be provided, detailing the outline construction sequence, temporary propping arrangements and outline structural calculations.

1.10. Input and output information for the Ground Movement Assessment should be provided, along with clarification of the worst case ground movements.

1.11. The Damage Assessment indicates that any movement will not cause damage to neighbouring properties in excess of Category 1 (Very Slight) on the Burland Scale.

1.12. The BIA recommends a structural monitoring strategy with trigger levels and an action-plan be developed and implemented during construction.

1.13. It cannot be confirmed that the BIA complies with the requirements of CPG: Basements until the queries raised in Section 4 and Appendix 2 are addressed.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 20th September 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 15 Fitzroy Road, London NW1 8TU, Camden planning reference 2022/2941/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 full width two-storey rear extension, following demolition of existing rear outrigger, internal excavation to lower down the lower ground floor level, like for like replacement of all windows with double glazed timber sash windows."*

2.6. The Audit Instruction confirmed 15 Fitzroy Road does not involve, or is not a neighbour to, listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 13th October 2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) – A2 Site Investigation, Ref: 22022-A2SI-XX-XX-RP-Y-0004-00, September 2022
- Building Damage Ground Movement Assessment (SSR) – A2 Site Investigation, Ref: 22022-A2SI-XX-XX-RP-Y-0005-00, September 2022
- Phase 1 Desk Study Report – A2 Site Investigation, Ref: 22022-A2SI-XX-XX-RP-Y-0001-00, September 2022
- Site Investigation Factual Report – A2 Site Investigation, Ref: 22022-A2SI-XX-XX-RP-Y-0002-00, September 2022
- Design and Access Statement – Box 9 Design Limited, July 2022
- Flood Risk Assessment – Studio AF Engineering, Ref: 1003-C-RP-001, September 2022
- Planning Application drawings by Box 9 Design Limited, consisting of:
    - Location and Site Plan, ref. 1809_LSP_100, dated June 2022;
    - LGF Existing, ref. 1809_EX_100, dated June 2022;
    - GF Existing, ref. 1809_EX_101, dated June 2022;
    - First Floor Existing, ref. 1809_EX_102, dated June 2022;
    - Existing Sections A&B, ref. 1809_S_240, dated May 2022;
    - Proposed Sections A&B, ref. 1809_S_250, rev A dated 05 July 2022;
    - LGF Proposed GA, ref. 1809_GA_100, rev A, dated 05 July 2022;
    - GF Proposed GA, ref. 1809_GA_101, rev A, dated 22 June 2022; and,
    - First Floor Proposed GA, ref. 1809_GA_102, dated June 2022.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	No CGeol qualified person identified.
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 7.0 of the BIA. However, the Structural Engineers Report should be provided.
Are suitable plan/maps included?	Yes	Plans only included in Desk Study Envirocheck Report included within Appendix A of the BIA.
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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	However the ground model in Section 6.1.6 of the BIA differs from that given in Section 3 of the GMA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Section 8 of the BIA states all elements will be founded on the London Clay. Reassessment required in relation to site investigation findings.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Responses should be presented consistently.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	For assessment purposes it has been assumed that the adjoining buildings are founded at ground level.
Is a geotechnical interpretation presented?	No	No interpretation or soil parameters are provided as per Section 4.25 of the CPG.
Does the geotechnical interpretation include information on retaining wall design?	No	No reference to retaining wall parameters within provided documents.
Are reports on other investigations required by screening and scoping presented?	Yes	
Are the baseline conditions described, based on the GSD?	Yes	However some contradictory information has been identified and requires clarification.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	Section 7.2 of the BIA.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	However, some clarifications are required.
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	However, clarification regarding the soil parameters, ground model and input and output data from the GMA area required.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Clarification regarding the hydrogeology is required.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However some additional information is required.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by engineering consultants A2 Site Investigation Limited (A2). The individuals concerned in its production have suitable CEng qualifications however input from an individual holding the CGeol qualification is required.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal does not involve and is not adjacent to a listed building.

4.3. The proposed development works comprise the deepening of the existing foundation by 700mm, and the demolition and reconstruction of a two-storey outrigger extension. The basement will be constructed using mass concrete underpins.

4.4. A ground investigation has been undertaken at the site. 4 no. hand-dug trial pits excavated to a maximum depth of 1.20m bgl recording Made Ground from 0.5m bgl to 1.2m bgl. The depth of this material was not proven in any of the hand-dug excavations. A single window sample (WS01) taken to a depth of 6.00m bgl recorded London Clay from 0.9m bgl to the base.

4.5. Groundwater monitoring equipment was installed in the window sample hole, with the response zone placed within the Made Ground. The installation was monitored on two occasions and was recorded as dry.

4.6. The BIA presents contradictory information relating to the hydrogeology of the site. Section 1.1.11 states the excavation “will extend below the water table”. Question 1b of the screening in Section 4.1 states has a response of ‘N/A’, however the response to a similar question (Question 10) in Section 4.2 states “dewatering will likely not be required… to be confirmed by additional site-specific ground investigation”. It is also stated that localised pumping can be utilised should perched groundwater be encountered during excavation works. The hydrogeological assessment should be presented consistently.

4.7. Geotechnical parameters for the soils recorded during the site investigation are not provided. Table 3.1 of the Building Damage Ground Movement Assessment (GMA) presents Young’s Modulus values but does not identify how these have been derived. Soil parameters, including retaining wall parameters, should be presented.

4.8. The ground model for the site should be confirmed. In the BIA the Made Ground is 1m thick with London Clay below, whereas in the GMA the Made Ground is taken as 3m thick. Clarification of the thickness of Made Ground, the assumptions made when compiling the ground model, and the soil parameters used for the strata is required. Confirmation of the founding stratum for the basement is also required.

4.9. It is accepted that there are no hydrological concerns regarding the proposed development and the site is not in an area prone to flooding.

4.10. Section 2.5.1 indicates that the neighbouring properties are of a similar construction to no. 15, with four above ground storeys and a lower ground floor level. Section 7.2.3 of the BIA states that the adjacent buildings are assumed to be founded at ground level for the purposes of the ground movement assessment.

4.11. The BIA indicates that temporary propping and shoring will be used to mitigate any potential movement associated with the development. Appendix B of the BIA should present a Structural Engineers Report however no such report was available in the BIA. This document should be provided and should confirm the construction sequence, temporary propping arrangement and outline retaining wall calculations.

4.12. The GMA considers a series of construction stages comprising: the demolition of an existing outrigger at the rear of the property; the installation of underpins; bulk excavation to deepen the lower ground floor and the construction of a new outrigger.

4.13. PDisp software has been used to evaluate the effects of unloading/overburden removal during demolition of the outrigger and the subsequent construction of the new extension. XDisp software has been used to evaluate the ground movements associated with installing the underpins and bulk excavation.

4.14. XDisp uses ground displacement curves presented in CIRIA C760. Whilst the CIRIA approach is intended for embedded retaining walls, we accept that the predicted ground movements are within the range typically anticipated for underpinning techniques carried out with good control of workmanship.

4.15. Input and output data from the PDisp and XDisp analysis should be provided to confirm the model geometry and ground model used. Further clarification of how the two assessment methods have been combined is requested.

4.16. Table 4.2 of the GMA presents the maximum cumulative ground movements from the assessments, however it is unclear whether these are for the 'worst case' stage of the development or a summation of the movements (i.e. allowing heave to off-set settlement). This should be clarified.

4.17. The GMA estimated that the maximum damage category is Category 1 (Very Slight) on the Burland scale.

4.18. Section 5 of the GMA and Section 7 of the BIA recommend that a project specific monitoring regime and action-plan be implemented, with trigger levels for mitigation defined in accordance with the results of the GMA.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by individuals who possess the CEng qualification. Input from an individual holding the CGeol qualification is required.

5.2. The development comprises the lowering of the existing lower ground floor by 0.7m and the rebuilding of a 2-story outrigger building to the rear of the property. The basement will be formed using underpinning.

5.3. Groundwater levels should be clarified and presented consistently in all documents, with mitigation measures proposed if a risk to the hydrogeology of the area is identified.

5.4. It is accepted that the development will not impact on the wider hydrology of the area and is not in an area subject to flooding.

5.5. Interpretive geotechnical soil parameters should be provided.

5.6. The BIA has stated that the proposed basement will be founded within the London Clay however the ground model requires clarification and should be presented consistently in all documents.

5.7. The Structural Engineering Report should be provided, detailing the outline construction sequence, temporary propping arrangements and outline structural calculations.

5.8. A Ground Movement Assessment has been undertaken. Input and output information for the analyses undertaken should be provided. Clarification of the worst case ground movements should be provided.

5.9. The Damage Assessment indicates that any movement induced by the development will not cause damage to neighbouring properties in excess of Category 1 (Very Slight) on the Burland Scale.

5.10. The BIA recommends a structural monitoring strategy with trigger levels and an action-plan be developed and implemented during construction.

5.11. It cannot be confirmed that the BIA complies with the requirements of CPG: Basements until the queries raised in Section 4 and Appendix 2 are addressed.

Appendix 1: Consultation Responses

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Qualifications	Input from an individual holding the CGeol qualification is required.	Open – See 4.1	
2	Hydrogeology	Groundwater levels should be clarified and presented consistently in all documents.	Open – See 4.6	
3	Land Stability	Interpretive geotechnical soil parameters are required.	Open – See 4.7	
4	Ground Model	The ground model requires clarification and should be presented consistently in all documents.	Open – See 4.8	
5	Land Stability	The Structural Engineering Report should be provided, detailing the outline construction sequence, temporary propping arrangements and outline structural calculations.	Open – See 4.11	
6	Land Stability	PDisp and XDisp input and output information is required. Further clarification of how the PDisp and XDisp data have been combined is requested. Clarification of the worst case ground movements should be provided.	Open – See 4.15 Open – See 4.15 Open – See 4.16	

Appendix 3: Supplementary Supporting Documents

None

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