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37 Heath Drive, London NW3 7SD

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
14006-66

Date
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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 37 Heath Drive (planning reference 2023/5352/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 proposed development comprises the demolition of the existing structure and construction of a five-storey building with an extension to the existing basement to a depth of 2.8m below ground level.

1.5 The authors' qualifications do not meet the requirements of LBC guidance. It should be demonstrated that a chartered engineer (CEng MICE) has reviewed and approved the relevant assessments.

1.6 No site investigation or interpretative geotechnical information is provided and the potential for perched water above the London Clay has not been investigated. A site investigation along with groundwater level monitoring should be undertaken and data should be presented in an interpretative report including a conceptual site model.

1.7 The baseline conditions for the BIA should be provided based on the results from the site investigation, including outline structural drawings (sequencing, propping, permanent and temporary works), construction method statement and outline programme of works, including any required groundwater control techniques.

1.8 A number of queries are raised in regard to the Screening assessment, as detailed in Section 4. Once responses have been clarified, additional assessment and mitigation should be provided, as required.

1.9 The BIA does not include a Ground Movement Assessment (GMA) and therefore no conclusions can be made regarding land or structural stability issues relating to the proposed development. A GMA should therefore be provided along with an outline methodology and guidance for monitoring ground / structural movements during construction.

1.10 A Flood Risk Assessment and Drainage Strategy has been presented. SuDS in the form of attenuated drainage is proposed. Inconsistencies in the assessment should be clarified. Drainage proposals should be agreed with LBC and Thames Water.

1.11 Potential impacts to land stability, groundwater flow and surface water flow have not been adequately assessed.

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

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 29 March 2024 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 37 Heath Drive, London NW3 7SD (Planning Reference No. 2023/5352/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 "Demolition of existing building and erection of 5 storey building comprising 10 flats (2 x 2 bed, 6 x 3 bed, 2 x 4 bed) with one level of basement below comprising gym, yoga facilities, bicycle storage for 24 units, waste storage; 4 electric car parking spaces with charging points and landscaping in front."

2.6 The Audit Instruction confirmed the subject site is not a listed building but the site is located within the Redington Frognal Conservation Area.

2.7 CampbellReith accessed LBC's Planning Portal on 17 and 29 April 2024 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Jomas Associates, Ref P5381J2868/JRO, dated 30 August 2023.
- Flood Risk Assessment and Drainage Strategy by Jomas Associates Ltd, Ref P5381J2868, dated 14 September 2023.

- Arboricultural Impact Assessment and Method Statement by Abbots Agricultural Advice, Ref SAL/KMA/11656a – REVISION 1, dated 2 November 2023.
- Existing plans, sections and elevations by Icelabz, dated May 2023.
- Proposed plans, sections and elevations, Ref H-37 by AIP Designs India, dated September 2023.
- Heritage and Townscape Assessment by Squire Heritage Consulting, dated 29 October 2023.
- Design and Access Statement by Taishi, Ref 37HD/2023.
- 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 do not meet the requirements of CPG Basements. It should be demonstrated that a chartered engineer (CEng MICE) has reviewed and approved the relevant assessments.
Is data required by Cl.233 of the GSD presented?	No	Outline construction methodology / structural information and programme should be presented.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Outline construction methodology / structural information should be presented.
Are suitable plan/maps included?	No	Architectural drawings provided although appendices of BIA including historical maps and LBC map excerpts not provided.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Appendices of BIA including historical maps and LBC map excerpts not provided. Utility infrastructure maps to be provided (only Thames Water Asset location search included in Drainage Strategy).
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 5.1 of BIA. Requires further clarification / assessment: Q9 and Q13. Q6 contradicts the Arboricultural assessment.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 5.1 of BIA. Requires further clarification / assessment: Q2, Q3 and Q4. Q4 contradicts the Drainage Strategy.

Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 5.1 of BIA. Q3 contradicts the Drainage Strategy and Q6 contradicts sections 4.2.15 and 4.2.16 of the BIA.
Is a conceptual model presented?	No	A conceptual model of the development is not presented. Strata, groundwater, existing and proposed development levels, relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.2 of BIA. Requires site investigation and Ground Movement Assessment.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.2 of BIA. Requires site investigation to confirm the ground conditions and groundwater levels (if any) beneath the site. Review of local hydrogeological records required.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.2 of BIA. Flood risk assessment and drainage strategy provided.
Is factual ground investigation data provided?	No	
Is monitoring data presented?	No	
Is the ground investigation informed by a desk study?	N/A	Desk study provided in Sections 2, 3 and 4 of BIA.
Has a site walkover been undertaken?	Yes	As part of BIA by Jomas Associates on 22 August 2023.
Is the presence/absence of adjacent or nearby basements confirmed?	No	

Item	Yes/No/NA	Comment
Is a geotechnical interpretation presented?	No	No site investigation provided or geotechnical data presented.
Does the geotechnical interpretation include information on retaining wall design?	No	No geotechnical interpretation presented.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Assessment Report and Flood Risk Assessment and Drainage Strategy however no site investigation or Ground Movement Assessment provided.
Are the baseline conditions described, based on the GSD?	No	No site investigation provided
Do the base line conditions consider adjacent or nearby basements?	No	No site investigation and no confirmation of adjacent or nearby basements.
Is an Impact Assessment provided?	Yes	Section 6 of BIA. Impact Assessment contradicts the Drainage Strategy with regards to the increase in impermeable area post development and a site investigation and Ground Movement Assessment are not provided.
Are estimates of ground movement and structural impact presented?	No	
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Further assessment required.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Further assessment required.
Has the need for monitoring during construction been considered?	No	

Item	Yes/No/NA	Comment
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Contradictory Screening responses with regards to increase in impermeable site area.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Further consideration of site conditions required. A ground movement assessment is required which should assess the impact on all of the structures within the zone of influence. To be addressed with reference to local basements and groundwater flow.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	No ground movement assessment provided.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been prepared by Jomas Associates Ltd with supporting documents by Icelabz Architects and AIP Designs India. The authors' qualifications do not meet the requirements of CPG Basements. It should be demonstrated that a chartered engineer (CEng MICE) has reviewed and approved the relevant assessments.

4.2 The site comprises a detached residential building arranged over three storeys with a lower ground floor. The property fronts onto Heath Drive, with associated hardstanding driveway in the northwest of the site and rear patio area and a large private garden in the southeast of the site. The site is generally flat with an existing ground level of approximately +73.8m OD at the front of the property and +74.3m OD at the rear of the property. The subject site is not a listed building.

4.3 The proposed development comprises the demolition of the existing structure and construction of a five-storey building with an extension to the existing basement. The basement will extend to a depth of 2.8m below ground level (bgl).

4.4 Screening assessments are presented and informed by desk study information. However, the following queries are raised, and responses should be reviewed and updated as required, with appropriate changes to Scoping, investigation, assessment and mitigation:

4.4.1 Land Stability Q6: answer contradicts the Arboricultural Assessment. Several trees will be removed to enable the development.

4.4.2 Land Stability Q9 and Q13: Site investigation and assessment required to confirm underlying ground conditions at the site. Worked ground identified adjacent to the south of the site and unknown neighbouring foundations. Water courses that (potentially) crossed the site may have deposited soft and / or organic deposits and impacts to design and stability of the proposed structures require assessment.

4.4.3 Groundwater Flow Q1b: Site investigation and assessment required to confirm hydrogeology beneath the site.

4.4.4 Groundwater Flow Q2 and Q3: Site investigation and assessment required with reference to the close proximity of a tributary of the lost river Kilburn (Westbourne). Ward specific hydrogeological studies and mapping are available which should be reviewed and refenced. Historic water course ran close to and (potentially) across the site.

4.4.5 Groundwater Flow Q4: answer contradicts the Drainage Strategy. The impermeable site area will increase from 61% to 66% post development.

4.4.6 Surface Water Q3: answer contradicts the Drainage Strategy. The impermeable site area will increase from 61% to 66% post development.

4.4.7 Surface water Q6: answer contradicts sections 4.2.15 and 4.2.16 of the BIA. The site is located within a Critical Drainage Area (Group 3_010) and adjacent to Cannon Hill Local Flood Risk Zone.

4.5 No site investigation has been undertaken on site to date. A Ground Investigation and BIA undertaken at the adjacent address (38 Heath Drive) is referenced; however, given the scale of the planned development, this data is not considered sufficient to confirm ground and groundwater conditions. It is noted that Redington and Frognal Neighbourhood Forum hydrogeological study has been published which provides data pertinent to the assessment of the subject site, and this should be reviewed and referenced. A site investigation should be undertaken broadly in accordance with the GSD Appendix G2. The data should be presented in an interpretative report in accordance with GSD Appendix G3.

4.6 The site is indicated to be underlain by the London Clay Formation, designated unproductive strata. However, as 4.5 above, local hydrogeological information should be reviewed. "The Lost Rivers of London" (Barton 1992) also indicates that the site is within close proximity to a tributary of the lost river Kilburn (Westbourne) which followed the line of Heath Drive. In addition, the site investigation, which was undertaken adjacent to the site (38 Heath Drive) in 2014, recorded perched groundwater levels between 2.05m and 2.40m bgl. A site investigation should be undertaken to establish the hydrogeological regime beneath the site. If required, groundwater monitoring should be undertaken in advance of excavation to inform temporary works contingency planning and control of construction.

4.7 The baseline conditions for the BIA should be provided based on the results from the site investigation, outline structural drawings (sequencing, propping, permanent and temporary works), construction method statement and outline programme of works. The requirements of the GSD clause 233 should be provided.

4.8 The BIA does not identify local basements in proximity to the proposed development nor consider potential impacts / cumulative impacts (i.e. to groundwater flow, if applicable).

4.9 A conceptual model indicating ground and groundwater conditions, the existing and proposed development levels, and the relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation and assessment of impacts.

4.10 It is accepted that the site is at low risk of surface water flooding (although the carriageway of Heath Drive is at medium risk of surface water flooding). The development will result in an increase in impermeable site area. A Flood Risk Assessment and Drainage Strategy has been presented. SuDS in the form of attenuated drainage with restricted off-site flows to sewers is proposed. Drainage proposals should be agreed with LBC and Thames Water. Information provided within the BIA and Flood Risk Assessment and Drainage Strategy is not consistent and should be updated. The assessment of surface water flow impacts should be reviewed once the information provided is consistent between reports.

4.11 No ground movement analysis (GMA) has been presented for review and therefore there is no information on the indicative zone of influence of the development. The presence or absence of other nearby basements and underground structures within that zone should be confirmed. A GMA should therefore be provided which should address both the excavation and construction methodology effects and assess the damage impact on all of the structures within the zone of influence. In line with CPG Basements, where Category 1 or a higher damage category is identified in a ground movement assessment, the BIA should provide mitigation measures to address ground movement. It should also provide an outline methodology and guidance for monitoring ground / structural movements during construction.

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

5.0 CONCLUSIONS

5.1 It should be demonstrated that a chartered engineer (CEng MICE) has reviewed and approved the relevant assessments.

5.2 Baseline information fundamental to the BIA has not been presented and is required, as detailed in Section 4.

5.3 A number of queries are raised in regard to the Screening assessment, as detailed in Section 4. Once responses have been clarified, additional assessment and mitigation should be provided, as required.

5.4 Potential impacts to land stability, groundwater flow and surface water flow have not been adequately assessed. Once the necessary baseline data has been provided, assessment and mitigation proposals in accordance with LBC guidance should be provided.

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

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Appendix 1

Consultation Responses

Residents' Consultation Comments

The following comments highlight those pertinent to the BIA:

Surname	Address	Date	Issue raised	Response
Ajay	Not provided	28 March 2024	"the addition of a substantial basement as outlined in the proposed plan raises concerns about increased flood risks and building hazards to neighbouring properties. The cumulative effect of numerous large basements in the vicinity has already been observed to contribute to significant subsidence issues, as evidenced by the challenges faced by Avenue Mansions. It is crucial to note that previous instances of major flooding in Hampstead and Highgate were attributed to the proliferation of large basements and the reduction of green spaces in the area. Therefore, approving another basement construction would only exacerbate these risks and compromise the safety and quality of life for residents".	Section 4 and Appendix 2 (further responses required)
Redington Frognal Neighbourhood Forum	N/A	9 April 2024	"Excavation of a basement beneath this steeply sloping land would have a negative impact on slope stability, potentially causing a London clay landslip, as occurred to the rear of 264 Finchley Road. The proposed basement is in close proximity to the underground River Cannon / Westbourne and tributaries, where properties regularly flood with water and effluent. The topography, the presence of aquifers and clay subsoil all militate against any basement excavation".	Section 4 and Appendix 2 (further responses required)

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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 Format	It should be demonstrated that a chartered engineer (CEng MICE) has reviewed and approved the relevant assessments.	Open – 4.1	
2	BIA Format	Non-technical summaries.	Open – 4.12	
3	BIA Format	Additional baseline information for assessment and Conceptual Model to be provided.	Open – 4.7 and 4.9	
4	Screening	Assessments to be clarified and updated, with consequential investigation / assessment / mitigation etc provided, as required.	Open – 4.4	
5	Site investigation	Site investigation data and geotechnical interpretation required.	Open – 4.5 and 4.6	
6	Groundwater	Noting clarifications to Screening process; aquifer status; groundwater flow and cumulative impacts; groundwater control during construction; local hydrogeological studies to be referenced and investigated further, as required.	Open – 4.4 to 4.6	
7	Land Stability	Noting clarifications to Screening process; a ground movement assessment and damage assessment addressing both the excavation and construction methodology effects and identifying a zone of influence and assessment of all structures within the zone; construction methodology; structural information; foundation depths; monitoring proposals.	Open – 4.4 to 4.11	
8	Surface Water	Noting clarifications to Screening process; drainage proposals to be subsequently agreed with LBC and Thames Water.	Open 4.4, 4.10	

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Appendix 3

Supplementary Supporting Documents

None

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