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consulting engineers

8 Daleham Gardens
London
NW3 5DA

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 13398-76
Revision: F1

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Appendix

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 8 Daleham Gardens, NW3 5DA (planning reference 2020/0630/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 site layout and the proposed development are described in paragraph 4.2 – 4.3.

1.5. The qualifications of the individuals involved in the BIA are in accordance with LBC guidance.

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

1.7. The site investigation indicates the proposed basement will be founded in the London Clay, which is considered to be a suitable founding stratum.

1.8. The BIA confirmed that there will be no adverse impact on the hydrogeological environment.

1.9. A Flood Risk Assessment (FRA) has been presented in the BIA. The site is at very low risk from flooding from rivers, seas and reservoirs, moderate risk from flooding from groundwater and at high risk from surface water flooding.

1.10. The FRA includes various mitigation measures to deal with surface water flooding which should be adopted during construction.

1.11. The site is within a Critical Drainage Area. The BIA and the FRA confirmed that impermeable areas of the site will not be increased as a result of the proposed development. It is accepted that there is no impact on surface water flows.

1.12. Geotechnical parameters presented are considered reasonably conservative.

1.13. It is accepted that there are no slope stability concerns regarding the proposed development. A Ground Movement Assessment (GMA) has been undertaken. The analysis confirms that damage impacts from excavation for the basement are within LBC's policy criteria. The revised submissions confirm that appropriate mitigation actions will be implemented to prevent impacts to surrounding shallow foundations due to the removal of trees.

1.14. The BIA presented an outline monitoring strategy to ensure movements are limited to those predicted.

1.15. Queries and requests for information are summarised in Appendix 2. Considering the revised submissions, the BIA meets the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 31 December 2020 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 8 Daleham Gardens, London NW3 5DA, Camden Reference 2020/0630/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: Basements. March 2018.
- 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 part basement extension under existing property including installation of side lightwell*."

2.6. The Audit Instruction confirmed applicant's property and neighbouring properties are not listed.

2.7. CampbellReith accessed LBC's Planning Portal on 7th January 2021 and gained access to the following relevant documents for audit purposes:

- Ground Investigation Report and Basement Impact Assessment (ref.: 10409/JRCB), dated 11th October 2019, by Soil Consultants Ltd;
- Existing and proposed plans, elevations and sections by GL Studio Architecture Design Landscape Ltd, dated February 2020;
- Construction Method Statement for Subterranean Development (ref.: MBP-7770), dated November 2019, by Michael Barclay Partnership LLP;
- Hydrology and Sub-surface Flow Screening Basement Impact Assessment (ref.:2019-003-065-002), dated October 2019, by Stephen Buss Environmental Consulting Ltd (Appendix B of the BIA)
- Flood Risk Assessment (ref.: 2376/RE/10-19/01), dated October 2019, by Evans Rivers and

Coastal (Appendix C of the BIA);

- Ground Movement Analysis Report (ref.: 10409/JRCB) dated 19th November 2019, by Soil Consultants Ltd.

2.8. CampbellReith were provided with the following relevant documents for audit purposes in September and December 2021:

- Ground Investigation Report and Basement Impact Assessment (ref.: 10409/JRCB_Rev2), dated 27th September 2021, by Soil Consultants Ltd;
- Ground Investigation Report and Basement Impact Assessment (ref.: 10409/JRCB_Rev3), dated 7th December 2021, by Soil Consultants Ltd.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See document issue status of the BIA.
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	See Section 1.5 of the BIA.
Are suitable plan/maps included?	Yes	The assessment is supported by suitable drawings of existing and proposed development and by suitable maps to describe the environmental setting.
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 6.1 of the BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appendix B of the BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appendix C of the BIA.
Is a conceptual model presented?	Yes	Section 4 of the BIA.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 6.2 of the BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Appendix B of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Appendix B of the BIA.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	Section 4.4 of the BIA.
Is the ground investigation informed by a desk study?	Yes	Section 2 of Stephen Buss' report.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	However, assumptions made in the BIA on this regard are considered reasonably conservative.
Is a geotechnical interpretation presented?	Yes	Section 5 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	As above.
Are reports on other investigations required by screening and scoping presented?	Yes	Flood Risk assessment presented.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Updated in revised submissions.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	Section 11 of the GEA report and 1.5 of the BIA.
Are estimates of ground movement and structural impact presented?	Yes	See Ground Movements Analysis (GMA) Report.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Mitigation actions to be implemented to prevent impacts due to tree removal are presented in the revised submissions.
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 7 of the GMA and Appendix C of the CMS.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Mitigation actions to be implemented to prevent impacts due to tree removal are presented in the revised submissions.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Mitigation actions to be implemented to prevent impacts due to tree removal are presented in the revised submissions.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	See Stephen Buss Environmental Consulting Ltd's report.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	See GMA.
Are non-technical summaries provided?	No	However, the BIA is well written and easy to understand.

4.0 DISCUSSION

4.1. The BIA was undertaken by Soil Consultants Ltd with contributions from Stephen Buss Environmental Consultants Ltd, Evans Rivers and Coastal Ltd and Michael Barclay Partnership LLP. The qualifications of the authors are in line with those requested by LBC guidance.

4.2. The site is currently occupied by a large three-storey residential property which incorporates an existing undercroft over part of its footprint. For the purpose of the BIA, the existing ground floor level has been taken at 10.00m SD (Site Datum), while the undercroft is about 1.80 m below ground floor level (8.20m SD).

4.3. The proposed works comprise the lateral extension and deepening of the existing undercroft into the north western corner of the property, covering an area of c. 50m^2. The proposed lower ground floor level will be about 3.20m below ground floor level and about 1.40m below undercroft level. As such, a formation level of c. 6.40m SD is anticipated.

4.4. The LBC Instruction to proceed with the audit confirmed applicant's property and neighbouring properties are not listed. The closest properties are No. 6 and No. 10 Daleham Gardens to the south and the north respectively. Daleham Gardens lies to the west of the property and runs in a N-S direction. The site is bounded by a terrace of properties facing Belsize Lane to the east. The depth and typology of the foundations of neighbouring properties have not been confirmed in the BIA. However, assumptions made on this regard are considered conservative.

4.5. Screening and scoping assessments are presented and informed by desktop study information. Most of the relevant figures/maps from the Arup GSD and other guidance documents are referenced within the BIA to support responses to the screening questions.

4.6. A site investigation was undertaken in September 2019 to inform the basement design. A total of two window sample boreholes were completed. The ground investigation encountered Made Ground to a maximum depth of 2.65m bgl. Superficial Deposits locally underlie the Made Ground to a depth of 2.45m bgl and, where present, are underlain by the London Clay which was proven to the base of the boreholes to a depth of 5.00m bgl.

4.7. Groundwater was not encountered during drilling. However, it was monitored between 1.59 and 3.06m bgl (8.21 – 6.74m SD) in the boreholes during three monitoring visits. The monitored groundwater levels are above the proposed formation level. The BIA states that groundwater control measures will be required and that localised sump pumping may be sufficient to deal with groundwater ingress into the excavation. The BIA also recommends trial excavations to be undertaken in advance of construction to confirm groundwater conditions and allow appropriate mitigation measures to be put in place.

4.8. The assessment presented in Appendix B of the BIA confirmed that there will not be any impact on the local and wider hydrogeological environment and this is accepted.

4.9. A Flood Risk Assessment (FRA) has been presented in the BIA. The site is at very low risk from flooding from rivers, seas and reservoirs, moderate risk from flooding from groundwater and at high risk from surface water flooding. The FRA recommends the basement be tanked as a precaution against groundwater flooding. The FRA states that the high surface water flooding risk is related to localised surface water ponding in the rear garden and not necessarily from major overland flow routes from other parts of the catchment. The report includes a warning and evacuation strategy and indicates various mitigation measures to deal with surface water flooding

which should be adopted during construction.

4.10. The site is within a Critical Drainage Area. The BIA and the FRA confirmed that impermeable areas of the site will not be increased as a result of the proposed development and that existing hardsurfacing at the front of the property could be retrofitted using SUDS permeable paving. It is accepted that there is no impact on surface water flows.

4.11. An outline construction sequence is presented in Section 8 of the Construction Method Statement (CMS). It is proposed to construct the new basement using traditional reinforced concrete underpinning following a typical 'hit and miss' sequence. The CMS confirmed that temporary propping is proposed in the short term and that the new retaining walls will not be cantilevered at any stage.

4.12. Geotechnical parameters to inform settlement, retaining wall calculations and foundation design have been presented in the BIA and are considered reasonable. The proposed value shave been adopted by the structural engineer in the outline structural calculations.

4.13. A Ground Movement Assessment (GMA) has been undertaken to demonstrate that ground movements and consequential damage to neighbouring properties will be within LBC's policy requirements.

4.14. From the GMA, it is understood that ground movements due to underpinning and consequent excavation have been modelled by applying CIRIA C760 curves for excavation and, as such, settlement due to underpin workmanship has been estimated by using the C760 curves for embedded retaining wall installation. Ground movements caused by the application of the new building loads at the new formation level have been also considered in the analysis.

4.15. Whilst the CIRIA approach is intended for embedded retaining walls, it is accepted that the predicted ground movements, which dictate the likely damage, can be within the range typically anticipated for underpinning techniques carried out with good control of workmanship. The GMA states that damage is predicted to fall into Category 0 for all the neighbouring properties.

4.16. It is confirmed in the GMA that a ground movements monitoring regime will be implemented throughout construction of the basement, in accordance with current guidance.

4.17. The Screening and Scoping section of the BIA indicates the area to be prone to seasonal shrink-swell which can result in foundation movements and that some trees are going to be removed as part of the development. The revised submissions confirm that appropriate mitigation actions will be implemented to prevent impacts to surrounding shallow foundations due to the removal of trees.

4.18. It is accepted that there are no slope stability concerns regarding the proposed development.

5.0 CONCLUSIONS

5.1. The qualifications of the individuals involved in the BIA are in accordance with LBC guidance.

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

5.3. The site investigation indicates the proposed basement will be founded in the London Clay.

5.4. The BIA confirmed that there will be no adverse impact on the hydrogeological environment.

5.5. A Flood Risk Assessment (FRA) has been presented in the BIA. It is accepted that there is no impact on surface water flows.

5.6. Geotechnical parameters presented are considered reasonably conservative.

5.7. It is accepted that there are no slope stability concerns regarding the proposed development. Ground Movement Assessment (GMA) has been undertaken. The analysis confirms that damage impacts from excavation for the basement are within LBC's policy criteria. Mitigation actions are proposed to prevent impacts to surrounding shallow foundations due to the removal of trees.

5.8. The BIA presented an outline monitoring strategy to ensure movements are limited to those predicted.

5.9. Queries and requests for information are summarised in Appendix 2. Considering the revised submissions, the BIA meets the requirements of Camden Planning Guidance: Basements.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Land stability	An outline check against NHBC guidelines to ensure that neighbouring foundations are not affected by any tree removal should be presented.	Closed	January 2022

Appendix 3: Supplementary Supporting Documents

None

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