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111 Canfield Gardens, London NW6 3DY

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-23
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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 (BIA) submitted as part of the Planning Submission documentation for 111 Canfield Gardens, London NW6 3DY (planning reference 2021/4585/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the 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 installation of a basement car lift within the front driveway and conversion of an existing basement bedroom to a garage.

1.5. The BIA has been carried out by Site Analytical Services Ltd and the individuals concerned in its production have suitable qualifications.

1.6. An outline construction programme is provided.

1.7. The site investigation identifies the site to be underlain by Made Ground over the London Clay Formation.

1.8. Consultation responses from neighbours detailing the presence of a cellar under 109 Canfield Gardens and local flooding to gardens experienced in August 2021 have been considered within the updated assessments.

1.9. The BIA demonstrates that there will be a reduction in impermeable area as a result of the proposed development. However, the drainage design will be subject to approval by LBC, as detailed in Section 4.

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

1.11. A ground movement assessment is presented, and damage is limited to be within Category 1 of the Burland Scale.

1.12. The BIA recommends the inclusion of a monitoring strategy, which should be agreed as part of the Party Wall agreement.

1.13. It can be confirmed that the proposal adheres to the requirements of the CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 04 November 2021 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 111 Canfield Gardens, London NW6 3DY.

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 *"Formation of car lift system on paved forecourt to give access to 2 basement car parking spaces. Amended soft garden landscaping to part of frontage, relocated bin stores, alterations to the existing boundary walls and piers with new mild-steel gates and railings. Works to the ground floor elevation to re-instate the historic elevation of the house."*

2.6. The new planning application is a follow-up to the planning application 2019/4089/P, which was refused in 2020. The Audit Instruction confirmed the property is not a listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 18 November 2021 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) by Site Analytical Services Ltd, ref 19/31225-2, dated January 2020 and revised September 2021.
- Ground Movement Assessment (GMA) by Fairhurst, ref 136072/R1, dated 17 January 2020 and revised September 2021. This report is presented in Appendix B of the BIA.
- Structural Drawings, Calculations and Temporary Works Sequence by Martin Redston Associates, ref 19-558, dated January 2020.
- Planning Application Drawings by Willingale Associates, consisting of Location Plan, Existing Plans and Proposed Plans.
- Design and Access Statement by Willingale Associates dated July 2021.
- Planning consultation comments.

2.8. CampbellReith were provided with the following relevant documents for audit purposes between July and October 2022:

- Basement Impact Assessment Report (BIA) by Site Analytical Services Ltd, ref 19/31225-2, dated January 2020 and revised March 2022.
- Flood Risk Assessment by WtFR Ltd, dated 11th October 2022, Rev C, ref WTFR-FRA 2022/05/Q05 Rev C
- Car Lift Construction Details Drawings by Total Lifting Solutions, dated 9th June 2021, ref - C-XXX7 M1 WR 30

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Presented in Table A of the BIA
Is data required by Cl.233 of the GSD presented?	Yes	Outline construction programme provided in updated submissions.
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	Utility data 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	Question 13 updated and considers the presence of basements to neighbouring property.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Question 3 from the CGHHS Screening Flow Chart is missing. However, the same question forms part of the Hydrology screening and is answered satisfactorily. Questions 4 updated to consider proposed change to impermeable site area.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Question 4 updated to consider the proposed change to impermeable site area.
Is a conceptual model presented?	Yes	

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	Appendix A of the BIA
Is monitoring data presented?	Yes	Two rounds of groundwater monitoring have been undertaken.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Mentioned in the Phase 1 Desk Study
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	109 and 113 Canfield Gardens basement are taken into consideration.
Is a geotechnical interpretation presented?	Yes	Presented in the Fairhurst report – Appendix B of the BIA
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 6.8 of BIA and Section 4.3 of the Fairhurst report.
Are reports on other investigations required by screening and scoping presented?	Yes	FRA presented within the BIA in Section 3.5.2.2
Are the baseline conditions described, based on the GSD	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	It is assumed the neighbouring properties do not have basements. Neighbouring 109 Canfield Gardens is reported to have a cellar, which is discussed in the BIA.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Final drainage design to be approved by LLFA / LBC.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	As above
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	
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The proposals reduce impermeable site area. However, drainage design subject to LLFA / LBC approval.
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	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Site Analytical Services Ltd and the individuals concerned in its production have suitable qualifications. A Ground Movement Assessment (GMA) is included in Appendix B of the BIA.

4.2. The site and adjacent properties are not classified as listed buildings. The site is located within the South Hampstead Conservation Area.

4.3. The proposed development comprises deepening an existing light well and extending the excavation to the north to allow installation of a car lift system. Part of the existing basement will be converted from a bedroom to a garage. The maximum excavation depth for the basement extension is given as 3.30m and the existing light well will be deepened by 1.40m.

4.4. An outline construction programme has been presented in the updated submissions.

4.5. A screening assessment is presented. Queries in regards to inconsistencies in the responses provided in the screening assessment compared to the development information and desk study data presented within the BIA have been addressed by the updated submissions.

4.6. An historic watercourse is identified as being in close proximity to the site; responses to screening questions (land stability, groundwater) do acknowledge this and historic maps indicate the river to be approximately 200m east of the east and subsequent maps indicate that it has been culverted.

4.7. The hydrology screening exercise notes that Canfield Gardens flooded historically, and the scoping exercise states that a Flood Risk Assessment (FRA) is carried out in Section 3.5.2.2 of the BIA. The assessment determines that the site is in the Goldhurst Local Flood Risk Zone and that the provision of permeable paving and soft landscaping would allow surface water to infiltrate through the partially permeable Made Ground and into the London Clay, where it would dissipate over time, reducing the risk of flooding. This is further discussed in 4.11.

4.8. Within the land stability screening, the change in differential depths to neighbouring properties' foundations is acknowledged. The presence of basements in neighbouring properties has been discussed in the BIA and the GMA accounts for the presence of basements.

4.9. The site investigation identifies the site to be underlain by Made Ground to a maximum depth of 1.80m (41.40m OD), below which lies the London Clay Formation extending to at least 15.00m (28.20m OD) depth. Groundwater monitoring results indicate groundwater to be at a depth of c.6.67m (36.60m OD).

4.10. The owner of neighbouring 109 Canfield Gardens states that the property has a cellar which has suffered from water infiltration. Photos of flooding in the rear garden have also been provided, dated August 2021. The proposed development aims to reduce the impermeable surfaces onsite, replacing them with permeable surfaces.

4.11. It is proposed to address the potential for surface water flooding with a recommendation for permeable paving and preliminary depths for the subbase required for attenuation are proposed. The BIA demonstrates that there will be a reduction in impermeable area as a result of the proposed development. However, the drainage assessment is inconclusive as to whether the permeable paving and drainage strategy proposed will achieve acceptable offsite runoff rates during storm events in accordance with relevant policies and considering the local surface water flooding reported. This has been discussed with LBC and is understood the Lead Local Flood Authority (LLFA) will consider this in detail. Therefore, surface water drainage design will be subject to approval by LBC.

4.12. A GMA has been undertaken to consider potential impacts to land stability / neighbouring structures. Section 4.3 of the GMA presents the ground model used for the analysis and soil parameters are presented in Table 5.

4.13. The GMA includes an assessment of the development using PDisp software to estimate vertical ground movements within the development during and after construction. Section 4.4 of the GMA discusses the load cases used to inform the PDisp analysis and Section 4.5 references three stages used in the PDisp assessment. Output data from three stages of assessment are presented in Appendices C (Stage 1, Undrained Unloading), D (Stage 2, Undrained reloading) and E (Stage 3, Drained reloading).

4.14. Section 4.7 of the GMA states that 'a ground floor slab is also proposed' and discusses the use of a ground floor slab as a prop in the permanent case. Given the excavation will be supported by trench sheets and propping in the temporary case, and a RC basement slab will act as a permanent prop, a moderate stiffness approach is adopted. The XDisp utilises the ground movement curve for excavation in front of a low stiffness wall to simulate effects from the excavation on neighbouring structures. This approach is accepted to provide a moderately conservative approach.

4.15. The updated GMA predicts Category 1 (Very Slight) impact to a wall of No.113 resulting from the car lift excavation and no damage is predicted for No.109. A damage assessment undertaken for the highway indicate a low range of movements. Appendix C of the GMA report includes a utility plan that illustrates the presence of surface water drainage, gas, and water pipes in proximity to the site.

4.16. Section 7.3 of the BIA recommends the inclusion of a monitoring strategy before commencement, during construction and for a period after completion of the works. Trigger levels and corresponding actions should be agreed as part of the Party Wall agreement.

5.0 CONCLUSIONS

5.1. The BIA authors have suitable qualifications.

5.2. An outline construction programme is provided.

5.3. The site investigation identifies the site to be underlain by Made Ground over the London Clay Formation.

5.4. Consultation responses from neighbours detailing the presence of a cellar under 109 Canfield Gardens and local flooding to gardens experienced in August 2021 should be considered within the assessments.

5.5. The BIA demonstrates that there will be a reduction in impermeable area as a result of the proposed development. However, the drainage design will be subject to approval by LBC, as detailed in Section 4.

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

5.7. A ground movement assessment is presented and damage is limited to be within Category 1 of the Burland Scale.

5.8. The BIA recommends the inclusion of a monitoring strategy, which should be agreed as part of the Party Wall agreement.

5.9. It can be confirmed that the proposal adheres to the requirements of the CPG Basements. However, surface water drainage scheme is subject to approval by LBC.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

At the time of this audit a total of 11 responses had been submitted to the council regarding this development. Of the issues raised, those that are relevant to this audit have been separated into a number of distinct categories, which are discussed as follows:

Surname	Address	Date	Issue raised	Response
Numerous	N/A	November and December 2021	Subsidence and/or damage to neighbouring structures, particularly the adjoining property at No. 109.	Section 4
			Flooding and high groundwater levels	Surface Water Drainage Scheme proposed will be subject to approval by Lead Local Flood Authority
Deavall	109 Canfield Gardens	November 2021	Notes the presence of a cellar under 109 Canfield Gardens which is not considered in the BIA. Concerns regarding flooding and structural damage	Surface Water Drainage Scheme proposed will be subject to approval by Lead Local Flood Authority

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA Format	An outline construction programme should be provided.	Closed	July 2022
2	Hydrology / Hydrogeology / Land Stability	Screening assessment responses to be consistent with information provided throughout the BIA and additional assessment / mitigation to be presented, as required.	Closed	July 2022
3	Hydrology / Hydrogeology	Consultation responses to be addressed in regard to neighbouring cellar and reported local flooding.	Closed	November 2022
4	Land Stability	Queries to be addressed as Section 4	Closed	October 2022

Appendix 3: Supplementary Supporting Documents

None