CampbellReith
consulting engineers

117 Canfield Gardens, NW6 3DY

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13398-56
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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 117 Canfield Gardens, NW6 3DY (planning reference 2020/3945/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The initial 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. This audit report considers the updated documents and information forwarded to CampbellReith as previously requested.

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 Basement Impact Assessment (BIA) has been carried out by H Fraser Consulting Limited. The individuals concerned in its production have suitable qualifications as required by LBC.

1.5. The Design and Access Statement acknowledges that Canfield Gardens falls within the South Hampstead Conservation Area.

1.6. It is proposed to demolish an existing conservatory and construct a basement across the full width to the rear of the existing building utilising underpinning methodologies.

1.7. A ground investigation indicates that the site is underlain by Made Ground over Head Deposits and London Clay with groundwater monitored below the level of the proposed basement. A factual summary of the ground investigation is provided; interpretative geotechnical information has also been provided.

1.8. It is stated that there are no potential impacts to surface water and subterranean flows other than local flooding and altered surface water flows. A flood risk assessment has been undertaken and mitigation to reduce surface water flows off site is presented to demonstrate that impacts are acceptable.

1.9. It is noted that the site does not include slopes greater than 7 degrees. The proposed development is not within 5m of a highway or pedestrian right of way. It has been confirmed that the basement will not impact any trees on site.

1.10. Outline structural information has been presented, including proposed underpinning methodology, sequencing and propping arrangements. The proposal will lead to an increase in differential depth with respect to neighbouring foundations. The proposed basement will be founded within London Clay.

1.11. A ground movement assessment has been undertaken indicating Category 0 (Negligible) damage to neighbouring properties in accordance with the Burland scale. Further clarifications were sought in the previous audit report and adequate responses have been received.

1.12. Outline proposals for a movement monitoring strategy are included in the BIA.

1.13. An outline construction programme is available.

1.14. Queries and requests for information have been adequately addressed. The BIA meets the requirements of CPG: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 9th October 2020 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 117 Canfield Gardens, NW6 3DY (Planning reference: 2020/3945/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 *"Erection of two storey rear extension incorporating basement floor following demolition of existing extension."*

2.6. CampbellReith accessed LBC's Planning Portal on 03rd November 2020 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment prepared by H Fraser Consulting Limited, dated August 2020;
- Structural Method Statement prepared by Constant Structural Design Limited, dated August 2020;

- Tree Protection Plan prepared by Andrew Day Arboricultural Consultancy Ltd, dated October 2020;
- Design and Access Statement;
- Planning Application Drawings consisting of

  Existing Drawings: Drawings 1 to 5, dated August 2020;

  Preliminary Structural Mark-up: Drawings 1 to 8, dated July 2020;

  Proposed Drawings: Drawings 1 to 10, dated August 2020.

- Consultation Responses.

2.7. Further information was forwarded to CampbellReith via email in December 2020 and comprised the following;

- Basement Impact Assessment prepared by H Fraser Consulting Limited, dated December 2020.

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	Refer Appendix J.
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	
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	Screening recommends flood risk and drainage assessments.
Is a conceptual model presented?	Yes	Section 5 of the BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Scoping recommends flood risk and drainage assessments.
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?	Yes	Section 1.5.1 of the BIA.
Is a geotechnical interpretation presented?	Yes	Table 5.2 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	Yes	Flood risk assessment and outline drainage assessment, ground movement assessment
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Appendix I of the BIA.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	
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	
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?	Yes	
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 H Fraser Consulting Limited and the individuals concerned in its production have suitable qualifications.

4.2. The Design and Access Statement acknowledges that Canfield Gardens falls within the South Hampstead Conservation Area.

4.3. The proposal involves a ground floor flat founded on shallow foundation, with an existing conservatory which extends from the south-western corner of the flat into the garden and an existing small basement (2.2m deep) underlying the middle/western part of the property. It is noted that the external areas of the property are predominantly hardstanding.

4.4. It is proposed to demolish the existing conservatory, followed by construction of a basement with founding depth varying from c. 1.4m below ground level (bgl) to 2.0m bgl along the full width to the rear of the existing structure.

4.5. A Desk Study broadly in accordance with the recommendations of the LBC guidance has been provided for review.

4.6. It is stated that the adjacent No.115 and No.119 Canfield Gardens have no basements.

4.7. It is stated that the site is situated outside the catchment of Hempstead Heath pond chains and that there are no surface water features or spring points within 500m of the site. A tributary of the 'lost' River Westbourne passes c.40m east of the site.

4.8. It is noted that the site does not include slopes greater than 7 degrees.

4.9. The proposed development is not within 5m of a highway or pedestrian right of way.

4.10. Based on the Screening and Scoping assessment responses within the previous BIA, further clarification was sought regarding the following issues. The responses provided were found to be adequate and are summarised alongside:

- Whilst it was stated in the BIA that there are no recorded incidences of shrink-swell subsidence in the local area, this was contradicted by consultation responses. The BIA also stated that it is unknown whether any trees will be removed as part of the works. An arboriculturalist has confirmed that no trees will be affected by the basement excavation. It is also noted that a tree protection plan is provided.

- Whilst it is indicated that no additional surface water will be discharged to ground this was contradicted in sections 6.5, 6.6 and 6.7 of the BIA. Clarification was sought regarding the

proposed drainage arrangement. The proposal for discharge has now been updated to include an attenuation tank rather than an infiltration drainage system. This is accepted.

4.11. A ground investigation has been undertaken indicating that the site is underlain by Made Ground to 0.5m bgl, over Head Deposits to 1.1m bgl, underlain by London Clay proven to at least 8.0m bgl. It is noted that groundwater is indicated to be present at 3.25m bgl based on monitoring. A factual summary of the ground investigation is provided. A geotechnical interpretation is provided. Whilst the recommended bearing capacity is not justified by the date, it is noted that limitations to soil strength during design have been adopted, and the approach is acceptable.

4.12. The site is within a Critical Drainage Area. It is understood that there will be a reduction in the impermeable site area since green roofs are proposed. However, off-site drainage flows are stated to increase unless mitigated, and infiltration SUDS were initially proposed. Considering the low permeability of the London Clay, as stated in the BIA, further clarity on the drainage proposals was requested. As noted above, he proposal has now been updated to include an attenuation tank, which is considered to be an acceptable proposal for the conditions on site. The final drainage design should be approved by LBC and Thames Water.

4.13. The Strategic Flood Risk Assessment indicates that the site is situated in the Goldhurst Local Flood Risk Zone. The BIA indicates the site and surrounding area is potentially at risk from groundwater, surface water and sewer flooding. A flood risk assessment has been undertaken and mitigation is proposed to protect the proposed development.

4.14. Outline structural information has been presented, including proposed underpinning methodology, sequencing and propping arrangements. The proposal will lead to an increase in differential depth with respect to neighbouring foundations.

4.15. A ground movement assessment has been undertaken on the basis of the methodology described within CIRIA C760. Whilst this is intended for use with embedded basement retaining walls, it is acknowledged that it can provide a basis for estimating the movements from retaining walls formed by underpinning. It was noted in the previous audit that typically movements from a single stage of underpinning constructed within suitable soils and appropriately stiffly propped would be anticipated to generate larger movements than those predicted in the GMA. The GMA was revised following the comment to include 5mm vertical movements during construction. A 2mm horizontal movement has also been included, which although small, considering the reduced retaining height is considered to be acceptable.

4.16. The GMA concludes that Category 0 (Negligible) damage in accordance with the Burland scale would impact neighbouring properties, including the subject property (flats above the ground floor flat).

4.17. Outline proposals for a movement monitoring strategy are included in the BIA.

4.18. An outline construction programme has been provided.

5.0 CONCLUSIONS

5.1. It is demonstrated that appropriately qualified authors have contributed to each section of the BIA.

5.2. All sections of the BIA now makes reference to current LBC guidance and justification is presented for the findings of the screening and scoping exercises

5.3. Sufficient interpretative geotechnical assessment is now provided in accordance with LBC guidance and the basement design is based on reasonably conservative assumptions.

5.4. The requested clarifications in regard to shrink-swell subsidence, the removal of trees and the discharge of surface water to ground has been provided and found to be satisfactory. The ground movement assessment is considered to be reasonably conservative and damage no worse than Burland Category 1 is predicted. No other stability impacts are predicted

5.5. The proposed drainage solution is considered adequate to mitigate the impacts to the wider hydrological and hydrogeological environments. It is accepted there are no other significant impacts to the water environment.

5.6. An outline construction programme is available.

5.7. The BIA meets the requirements of CPG: Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
The Combined Residents' Association of South Hampstead	-	-	Related to subsidence and hydrogeological impact.	Section 4
-	Flat 119 Canfield Gardens	-	Subsidence risk, structural stability of building, and hydrology related issues.	Section 4

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA Format	It should be demonstrated that appropriately qualified authors have contributed to each section of the assessments.	Closed	13.12.20
2	BIA Format	All sections of the assessments should reference current LBC guidance.	Closed	13.12.20
3	BIA Format	An outline construction programme should be provided.	Closed	13.12.20
4	Land Stability, Hydrology and Hydrogeology	The requested clarifications in regard to shrink-swell subsidence, the removal of trees and the discharge of surface water to ground should be provided and consistently presented throughout the BIA.	Closed	13.12.20
5	Land Stability	Sufficient interpretative geotechnical assessment should be provided in accordance with LBC guidance and comments in Section 4.	Closed	13.12.20
6	Hydrology / Hydrogeology	The feasibility of the proposed drainage solution should be demonstrated as adequate to mitigate the impacts to the wider hydrological and hydrogeological environments.	Closed	13.12.20
7	Land Stability	The ground movement assessment should be demonstrated to be reasonably conservative, once the geotechnical assessment has been confirmed.	Closed	13.12.20

Appendix 3: Supplementary Supporting Documents

None

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