

117 Canfield Gardens, NW6 3DY

Basement Impact Assessment  
Audit

For

London Borough of Camden

Project Number: 13398-56  
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November 2020

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### Document History and Status

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### Document Details

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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 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 Basement Impact Assessment (BIA) has been carried out by H Fraser Consulting Limited. The qualifications of the author of the land stability assessment are not in accordance with CPG guidance.
- 1.5. It is noted that some sections of the assessments reference superseded LBC guidance.
- 1.6. The Design and Access Statement acknowledges that Canfield Gardens falls within the South Hampstead Conservation Area.
- 1.7. 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.
- 1.8. It is stated that the adjacent No.115 and No.119 Canfield Gardens have no basements.
- 1.9. It is stated that the site is situated outside the catchment of the Hampstead 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.
- 1.10. 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. Further clarification is required related to the history of subsidence in the local area and any proposals to remove trees.
- 1.11. 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; however, sufficient interpretative geotechnical information has not been provided.

- 1.12. 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 are proposed. Whilst the BIA states infiltration SUDS are feasible, this has not been demonstrated. The final drainage design should be approved by LBC and Thames Water.
- 1.13. The Strategic Flood Risk Assessment indicates that the site is situated in the Goldhurst Local Flood Risk Zone, and is potentially at risk from flooding. A flood risk assessment has been undertaken. Whilst mitigation is proposed to protect the proposed development, the drainage arrangements to mitigate impacts to the wider hydrological environment should be clarified.
- 1.14. 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. The proposed basement will be founded within London Clay.
- 1.15. A ground movement assessment has been undertaken indicating Category 0 (Negligible) damage to neighbouring properties in accordance with the Burland scale. Further clarifications are sought, as discussed in Section 4.
- 1.16. Outline proposals for a movement monitoring strategy are included in the BIA.
- 1.17. An outline construction programme should be presented.
- 1.18. Queries are discussed in Section 4 and summarised in Appendix 2. Until the queries are addressed, the BIA does not meet the criteria of CPG: Basements.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 9<sup>th</sup> 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 03<sup>rd</sup> 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.

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	Land Stability assessment by CEng MICE required.
Is data required by Cl.233 of the GSD presented?	No	Outline construction programme required.
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?	No	Further clarification for responses on removal of trees and shrink-swell subsidence required, noting consultation responses.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Whilst it is indicated that no additional surface water will be discharged to ground this is contradicted in sections 6.5, 6.6 and 6.7.
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?	No	Further clarification for responses on removal of trees and shrink-swell subsidence required, noting consultation responses.



Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	As screening comments, clarification required volume of water discharged to ground and suitability of infiltration SUDS into the low permeability London Clay.
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?	No	Section 5.2 of the BIA states only factual data. Noted that no comment is made on the potential for shallow soils to be desiccated and the influence on shear strength / recommended bearing capacity.
Does the geotechnical interpretation include information on retaining wall design?	No	
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?	No	Insufficient geotechnical assessment.
Do the base line conditions consider adjacent or nearby basements?	Yes	

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Appendix I of the BIA; further clarifications required as Section 4.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Clarifications required in regards to land stability, hydrology and hydrogeology
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	GMA to be clarified; suitability of infiltration SUDS to be demonstrated; shrink-swell potential to be considered.
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	No	To be clarified following review and responses to queries.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Pending further geotechnical assessment and clarification of GMA.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Suitability of infiltration SUDS to be demonstrated.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However, further clarification of GMA required.
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. The qualifications of the author of the land stability assessment are not in accordance with CPG guidance. It should be demonstrated that appropriately qualified authors have contributed to each section of the assessments.
- 4.2. It is noted that some sections of the assessments reference superseded LBC guidance. All sections of the assessments should reference current LBC guidance.
- 4.3. The Design and Access Statement acknowledges that Canfield Gardens falls within the South Hampstead Conservation Area.
- 4.4. 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 hard-standing.
- 4.5. 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.
- 4.6. A Desk Study broadly in accordance with the recommendations of the LBC guidance has been provided for review.
- 4.7. It is stated that the adjacent No.115 and No.119 Canfield Gardens have no basements.
- 4.8. 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.
- 4.9. It is noted that the site does not include slopes greater than 7 degrees.
- 4.10. The proposed development is not within 5m of a highway or pedestrian right of way.
- 4.11. Based on the Screening and Scoping assessment responses, further clarification is required in regard to the following issues:
  - Whilst the BIA states that there are no recorded incidences of shrink-swell subsidence in the local area, this is contradicted by consultation responses.

- The BIA states that it is unknown whether any trees will be removed as part of the works. This should be clarified, noting the consultation responses, and impacts assessed and mitigated, as required. It is noted that a tree protection plan is provided.
  - Whilst it is indicated that no additional surface water will be discharged to ground this is contradicted in sections 6.5, 6.6 and 6.7 of the BIA.
- 4.12. 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; however, sufficient interpretative geotechnical information has not been provided in accordance with the GSD Appendix G3. It is noted that the shallow soils sampled are potentially desiccated and the influence on the insitu shear strength and bearing capacity should be assessed, along with any potential requirements to mitigate shrink-swell movements.
- 4.13. 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 are proposed. Whilst the BIA states infiltration SUDS are feasible, based on an extract from the Strategic Flood Risk Assessment that indicates there are 'opportunities for bespoke infiltration SUDS', this has not been demonstrated. Considering the low permeability of the London Clay, as stated in the BIA, further clarity on the drainage proposals should be presented, including how infiltration SUDS (if feasible) would impact the wider hydrological environment, noting the groundwater flooding risks stated in the BIA and discussed in 4.14. The final drainage design should be approved by LBC and Thames Water.
- 4.14. 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 whilst mitigation is proposed to protect the proposed development, the drainage arrangements to mitigate impacts to the wider hydrological environment should be clarified.
- 4.15. 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.
- 4.16. An outline construction programme should be provided.
- 4.17. 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. 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 contour plots should be presented and it should be clarified whether any allowance for shrinkage of the dry pack beneath the rear wall of 117 Canfield Gardens is included within the calculations.

- 4.18. 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). However, as 4.17, it should be demonstrated that the assessment is reasonably conservative. Additionally, conclusions to the GMA cannot be substantiated until sufficient geotechnical information is provided (as 4.12).
- 4.19. Outline proposals for a movement monitoring strategy are included in the BIA.

## 5.0 CONCLUSIONS

- 5.1. It should be demonstrated that appropriately qualified authors have contributed to each section of the BIA.
- 5.2. All sections of the assessments should reference current LBC guidance.
- 5.3. The requested clarifications in regard to shrink-swell subsidence, the removal of trees and the discharge of surface water to ground should be provided.
- 5.4. Sufficient interpretative geotechnical assessment should be provided in accordance with LBC guidance.
- 5.5. The feasibility of the proposed drainage solution should be demonstrated as adequate to mitigate the impacts to the wider hydrological and hydrogeological environments.
- 5.6. The ground movement assessment should be demonstrated to be reasonably conservative, once the geotechnical assessment has been confirmed.
- 5.7. An outline construction programme should be provided.
- 5.8. Until the queries raised are addressed, the BIA does not meet the criteria 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.	Open	
2	BIA Format	All sections of the assessments should reference current LBC guidance.	Open	
3	BIA Format	An outline construction programme should be provided.	Open	
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.	Open	
5	Land Stability	Sufficient interpretative geotechnical assessment should be provided in accordance with LBC guidance and comments in Section 4.	Open	
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.	Open	
7	Land Stability	The ground movement assessment should be demonstrated to be reasonably conservative, once the geotechnical assessment has been confirmed.	Open	

## Appendix 3: Supplementary Supporting Documents

None

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