CampbellReith
consulting engineers

13 Kemplay Road, London NW3 1TA

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-66
Revision: D1

July 2022

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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 13 Kemplay Road, NW3 1TA (planning reference 2022/1137/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 individuals who hold suitable qualifications.

1.5. The basement is to be founded within the Claygate Member beneath the monitored water levels. Temporary and permanent groundwater control measures are proposed. A kitchen extension at lower ground floor level is proposed and confirmation on what the founding stratum and proposed foundation solution should be provided.

1.6. Hydrological screening and scoping have not been undertaken.

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

1.8. Further consideration of the impact on the hydrogeology of the area is required. Mitigation measures during construction are provided however further consideration of the impact of these measures on ground movements is required.

1.9. An assessment of the impact of one tree to be removed on any nearby shallow foundations and the proposed development is required.

1.10. Utility data should be provided.

1.11. The proposed construction methodology is provided and includes temporary propping alongside illustrative figures to indicate the construction sequence. An outline construction program should be provided.

1.12. Underpinning will be undertaken in two lifts beneath the party wall with 15 Kemplay Road and a piled retaining wall will form the remainder of the basement. The type of piled retaining wall should be confirmed.

1.13. The depth and nature of the neighbouring property (No 15) foundations have not been determined. The Ground Movement Assessment (GMA) identifies the maximum differential depth to be assumed in detailed design.

1.14. The GMA should be updated to include consideration of ground movements during underpin construction/installation and ground movements relating to the construction of the pile retaining wall. Impacts to all surrounding structures, the Grade II listed building, utilities and highways should be considered.

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

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15/06/2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 13 Kemplay Road, NW3 1TA (Camden Planning reference 2022/1137/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 *"Erection of a replacement two storey dwelling with basement following demolition of existing house."*

2.6. The Audit Instruction also confirmed 13 Kemplay Road is not listed, and is a neighbour to a Grade II listed building Rosslyn Hill Chapel.

2.7. CampbellReith accessed LBC's Planning Portal on 30/06/2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment and Structural Method Statement (BIA) by Constant Structural Design Limited, March 2022
- Hydrogeological and Geotechnical Aspects BIA by H Fraser Ltd, ref 31451R2.1, rev 4 dated 21 March 2022
- Basement Impact Assessment – Land Stability by Ground and Project Consultants Ltd, ref 60498, rev 4, dated 18 March 2022.
- Factual report for Ground Investigation by LMB Geosolutions Ltd, rev 1, dated 09 November 2015.
- Design and Access Statement by Charlton Brown Architecture and Interiors dated February 2022.
- Tree Survey Report by Tretec, dated February 2022.
- Planning Application Drawings, provided by Charlton Brown Architecture & Interiors consisting of:

  Demolition Plan

  Location Plan

  Existing Plans

  Proposed Plans

  Existing elevations and sections

  Proposed elevations and sections
- Planning consultation responses.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Constant BIA, Section 1.
Is data required by Cl.233 of the GSD presented?	No	Utility data and a provisional outline construction programme should be provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Constant BIA, Section 4.
Are suitable plan/maps included?	Yes	Constant BIA, Section 3.
Do the plans/maps show the whole of the relevant area of study, and do they show it in sufficient detail?	No	'T2' Sycamore tree, to be removed is missing from the Constant BIA and the impact of its removal should be assessed prior to construction.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Ground and Project Consultants BIA Section 3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	H Fraser BIA Section 3.1. Note where a response is entered as 'unknown' this should be carried forward to scoping and mitigation identified.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Hydrology screening not provided though some of the plans are referenced in the Constant BIA, Section 3.4.
Is a conceptual model presented?	Yes	Ground Project Consultants BIA Section 4.2. H Fraser Consulting BIA Section 5.1.3 and Section 6.1.
Land Stability Scoping Provided?	Yes	Ground Project Consultants BIA Section 3.

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	H Fraser BIA Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Hydrology scoping not provided.
Is factual ground investigation data provided?	Yes	LMB Geosolutions factual report.
Is monitoring data presented?	Yes	LMB Geosolutions factual report.
Is the ground investigation informed by a desk study?	Yes	H Fraser Consulting BIA, Section 2.
Has a site walkover been undertaken?	Yes	LMB Geosolutions factual report.
Is the presence/absence of adjacent or nearby basements confirmed?	No	Ground Project Consultants BIA Section 3 has assumed adjacent basement to be absent which is conservative.
Is a geotechnical interpretation presented?	Yes	Ground Project Consultants BIA Section 4.2.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Ground Project Consultants BIA Section 4.2. Determination of any imposed loads to the underpins should be provided.
Are reports on other investigations required by screening and scoping presented?	Yes	Tretec Arboricultural Report.
Are the baseline conditions described, based on the GSD?	Yes	Constant BIA
Do the base line conditions consider adjacent or nearby basements?	Yes	Ground Project Consultants BIA, Section 5.2.
Is an Impact Assessment provided?	Yes	H Fraser Consulting Ltd BIA Section 5.3.

Item	Yes/No/NA	Comment
		Queries remain relating to 'T2' Sycamore tree, to be removed. Hydrology screening and scoping is missing and should be provided. GMA queries remain as described below.
Are estimates of ground movement and structural impact presented?	Yes	GMA provided in Ground Project Consultants BIA Section 6 and referenced in H Fraser Consulting Ltd BIA Section 5.2. Ground movement assessment does not account for movements during underpin installation/construction. Ground movements relating to piled retaining wall should also be assessed.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	H Fraser BIA Section 6.3 indicates a negligible risk of groundwater flooding at surface. The screening and scoping relating to groundwater flooding is missing and should be included before this can be concluded.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Ground and Project Consultants Section 5.
Has the need for monitoring during construction been considered?	Yes	H Fraser Consulting BIA Section 1.5.3. Constant BIA Section 6.4 identifies trigger values, but these should be checked once the GMA has been finalised.
Have the residual (after mitigation) impacts been clearly identified?	No	Ground and Project Consultants Section 7.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Ground movements during construction should be included in the GMA. Consideration of ground movements associated with piling is required. All adjacent structures, highways and utilities should be assessed.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Hydrology Screening and Scoping required.
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, the GMA should be updated.
Are non-technical summaries provided?	Yes	Constant BIA Section 1

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Constant Structural Design Ltd and they reference two other BIAs carried out by H Fraser Consulting Ltd and Ground and Project Consultants Ltd. The individuals concerned in their production have suitable qualifications.

4.2. The LBC Instruction to proceed with the audit identified that 13 Kemplay Road is not listed but is neighbour to Rosslyn Hill Chapel, a Grade II listed building. The Constant BIA identifies that the site lies within a Conservation Area.

4.3. The site is an end of terrace, two storey house and shares a party wall with 15 Kemplay Road. It is proposed to fully demolish the existing structure back to the party wall. A new three storey semi-detached house will be constructed with a full plan basement and an additional light well on the south-eastern side to the same depth. A single storey kitchen extension will be constructed to the east and will have a sunken floor level between the external ground and basement level.

4.4. The Fraser BIA indicates the basement and lightwell will have floor levels 2.90m below ground level (bgl) and that the kitchen extension will have a floor level at 0.99m bgl. The plans showing the existing site sections indicate ground level to be at 89.37m OD and the proposed sections drawings show the basement floor level to be at 85.445m OD. External ground levels at the front of the property are shown to be lowered by c. 1m as part of the development.

4.5. No basement has been identified at the adjacent 15 Kemplay Road.

4.6. An outline construction program and utility data should be provided.

4.7. A ground investigation has been undertaken at the site and identified Made Ground up to 1.45m bgl over the Claygate Member, which was recorded to a maximum depth of 6m bgl, over the London Clay. Groundwater monitoring undertaken in October to November recorded a ground water level of c.1.85m bgl. The Ground model in the BIAs use Made Ground to a depth 1.20m bgl.

4.8. Section 5.1.2 of the Groundwater and Land Stability BIA, and the strategy in the LMB Geosolutions Ltd factual Ground Investigation Report (GIR), state that two trial pits (TP1 and TP2) were undertaken adjacent to the walls of No. 13, which revealed concrete foundations bearing onto the Claygate Member at depths of 1.35m and 1.45m bgl respectively.

4.9. The deeper basement is to be founded within the Claygate Member and the Ground and Project Consultants BIA provides characteristic soil parameters which are accepted. The shallow basement founding strata has not been identified.

4.10. The basement retaining walls will typically be piled and the piled wall will be designed to cantilever in the temporary condition. The party wall will be extended down by mass concrete underpinning in two lifts, with waling beams and props installed as the basement is excavated. A reinforced concrete basement box will form the retaining structure in the permeant condition, with the ground floor acting as a lateral prop.

4.11. Piles will be installed below the basement box to resist against buoyancy, and heave protection below the basement raft will allow for overburden relief. The party wall loads will be directed into the ground through underpinning. The new build house loads will be directed onto the new piled raft foundation. A vertical movement joint between the underpinning and the basement retaining wall is proposed to minimise the risk of damage to the neighbouring structure during construction.

4.12. Characteristic bearing resistances designed to accommodate the new loads should be provided. It is not clear what the foundation solution is for the shallower kitchen construction is, nor is it clear what the underpin retaining wall loads are. A suitable founding stratum should be identified and bearing resistance calculations should be provided for both structures.

4.13. Subterranean (groundwater) flow screening and slope stability screening are provided, and the responses are accepted.

4.14. Surface water flow and flooding screening and scoping is missing and should be provided before the BIA can be accepted.

4.15. Section 3.4 of the Constant BIA identifies, with reference to Camden's Strategic Flood Risk Assessment, that the site lies in an area at risk of internal and external sewer flooding. It is requested that the issue be identified through the hydrology screening process and carried forward to a scoping assessment and mitigation measures proposed as necessary.

4.16. Section 5.4 of the Ground and Project Consultants BIA identifies that groundwater was monitored at depths between 1.87 and 2.52m bgl. The BIA notes that groundwater ingress is expected within the basement up to 1.5m in depth. Further consideration of the impact on the wider hydrogeological regime due to the proposed development is required.

4.17. The Fraser BIA identifies possible methods to control groundwater ingress. The construction of a secant pile wall instead of a contiguous pile wall is suggested as a means of controlling water ingress, however the Constant BIA indicates a contiguous pile wall will be used. The Fraser BIA indicates that dewatering by sump pumps would be able to manage seepages and surface water run-off during construction.

4.18. The Fraser BIA identifies a requirement for groundwater management to avoid significant changes in water pressure or ground loss due to washout of fines. The likelihood and

consequent impact of any loss of fines through groundwater ingress should be considered as part of the Ground Movement Assessment (GMA). Appropriate mitigation measures should be provided in the BIA.

4.19. A tree survey report by Tretec identifies several trees located at the site. One of the trees is identified as to be removed via a Section 211 notice and a tree management method statement is provided. The Constant BIA identifies the impact of the retained trees and the impact assessment indicated that the proposed basement would extend to well below the potential root action in accordance with guidance from Chapter 4.2 of the NHBC Standards. It is noted that the Fraser BIA states that no trees are proposed to be removed. The reports and assessments should be consistent in this regard. No consideration of the impact of the removed tree on the proposed development is provided, and this is required. Consideration of the impact on nearby shallow foundations is also requested.

4.20. A Ground Movement Assessment (GMA) is provided in Ground Project Consultants BIA, Section 6 and is referenced in the Fraser BIA, Section 5.2. The assessment only considers ground movement associated with the underpinning of the party wall with No. 15.

4.21. The GMA follows the guidance provided in CIRIA C760 and acknowledges that this guidance is intended for use with imbedded retaining wall, not underpinning. Whilst the CIRIA approach is intended for embedded retaining walls, it is accepted that the predicted ground movements are within the range typically anticipated for underpinning techniques carried out with good control of workmanship. However, this only applies when the full C760 methodology is followed. The GMA only uses figure 6.15 from C760 to estimate ground movements associated with underpinning, and states that “we have not included for wall installation as the wall to adjacent properties is to be underpinned, therefore the ground movement will be limited to that caused by excavation”. This approach is not accepted or considered to be reasonably conservative, as required by LBC policy.

4.22. The GMA does not account for movements during installation/construction of the underpins. Typically for underpinning horizontal and vertical movements in the order of 5mm to 10mm per underpin lift are anticipated. The Constant BIA indicates underpinning will be undertaken in two lifts and the GMA should include ground movements per lift of underpinning.

4.23. In addition to the above, an assessment of ground movements associated with the piled basement wall should also be undertaken. All adjacent structures should be considered as part of the impact assessment, including highways, utilities, and the nearby Grade II listed building.

4.24. H Fraser Consulting indicates footpath is 4.5m from the basement. However, Charlton Brown Architecture & Interiors proposed site plan indicates a lightwell to be 3m from the public

footpath. This should be presented consistently in all reports and the impact to highways appropriately assessed.

4.25. Monitoring during construction is proposed in Section 6.4 of the Constant BIA. This should be assessed with the trigger levels updated once the GMA has been revised.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by Constant Structural Design Limited and the individuals involved have suitable qualifications.

5.2. The basement is to be founded within the Claygate Member beneath the monitored water levels. Temporary and permanent groundwater control measures are proposed. A kitchen extension at lower ground floor level is proposed and confirmation on what the founding stratum and proposed foundation solution should be provided.

5.3. Hydrological screening and scoping have not been undertaken.

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

5.5. The BIA identifies that groundwater will be encountered during basement excavation and construction. Further consideration of the impact on the hydrogeology of the area is required. Mitigation measures during construction are provided however further consideration of the impact of these measures on ground movements is required.

5.6. An assessment of the impact of one tree to be removed on any nearby shallow foundations and the proposed development is required.

5.7. Utility data should be provided.

5.8. The proposed construction methodology is provided and includes temporary propping alongside illustrative figures to indicate the construction sequence. An outline construction program should be provided.

5.9. Underpinning will be undertaken in two lifts beneath the party wall with 15 Kemplay Road and a piled retaining wall will form the remainder of the basement. The type of piled retaining wall should be confirmed.

5.10. The depth and nature of the neighbouring property (No 15) foundations have not been determined. The Ground Movement Assessment (GMA) identifies the maximum differential depth to be assumed in detailed design.

5.11. The GMA does not account for movements during underpin installation/construction and no analysis has been undertaken of horizontal and vertical ground movements associated with the piled retaining wall. The type of piled wall requires confirmation and the impacts to all surrounding structures, the Grade II listed building, utilities and highways should be considered.

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

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Hollins	Not provided	15/06/2022	Request the BIA undergoes 3rd party scrutiny, like the previously rejected application.	CRH BIA Audit.

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	Works programme not included. Utility data required.	Open Open	
2	Hydrology	Hydrological screening and scoping are not provided and is required.	Open	
3	Hydrogeology	Further consideration of the impact of the proposed basement on the wider hydrogeological environment is required. Mitigation measures should be identified and any resultant impact on ground movements should be assessed.	Open Open	
4	Stability	The BIA should identify what the shallower basement founding stratum will be and characteristic bearing resistances should be provided.	Open	
5	Stability	Clarity on what the underpin retaining wall will be founded on alongside the proposed new loading is requested.	Open	
6	Stability	A tree is to be removed; the impact of its removal on the proposed basement and foundations should be provided.	Open	
7	Stability	The GMA does not account for movements during underpin installation/construction of the underpins.	Open	
8	Stability	No analysis has been undertaken of horizontal and vertical ground movements associated with the piled retaining wall. This should be provided in line with the comments in Section 4.	Open	

Appendix 3: Supplementary Supporting Documents

N/A

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