CampbellReith
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13 Kemplay Road, London NW3 1TA

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-66
Revision: D2

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

1.6. The proposed basements are to be founded within the Claygate Member beneath the monitored water levels. Temporary and permanent groundwater control measures are proposed.

1.7. The revised submission confirms that the proposed basement will not have a significant impact on the hydrology of the area.

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

1.9. Mitigation measures for groundwater ingress and potential fines loss should be provided.

1.10. Further consideration of the impact on the land stability of the area is required in relation to the proposed additional loading on the underpinned party wall and in regard to the GMA.

1.11. Utility data is provided. Consultation with asset owners in relation to the proposed excavation and removal of a tree will be required.

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

1.13. Underpinning will be undertaken in two lifts beneath the party wall with 15 Kemplay Road and a contiguous piled retaining wall will form the remainder of the basement.

1.14. The GMA should be updated based on the comments on Section 4. The damage category assessment should be revised based on the updated GMA.

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 Trite, 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.

2.8. The following additional information was provided in response to queries raised in the D1 issue of Campbellreith's audit:

- Basement Impact Assessment by H Fraser Consulting Ltd, ref 30451R2.3, rev 6, dated 21 November 2022.
- BIA Audit Query Tracker Responses, ref 3161/JF/NT20221024.
- Outline Programme of Works by Constant Structural Design, dated 14 July 2022.
- Utility Search by Premier Energy, ref 609297, Rev 1, dated 02 August 2022.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Constant BIA, Section 1 & H Fraser revised BIA Section 1.3.
Is data required by Cl.233 of the GSD presented?	Yes	Constant Outline Programme of Works & Premier Energy Utility Search.
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?	Yes	
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. 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?	Yes	H Fraser revised BIA Section 3.
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? Is scoping consistent with screening outcome?	Yes	Ground Project Consultants BIA Section 3.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	H Fraser BIA Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	H Fraser revised BIA Section 4.
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 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	H Fraser revised BIA Section 5 has assumed adjacent basement to be absent which is conservative for the GMA but is not conservative for the Hydrogeological assessment.
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 BIA Section 5.3.

Item	Yes/No/NA	Comment
		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 updated in H Fraser revised BIA Section 5.3. Ground movement assessment does not account for movements during underpin installation/construction and piling associated with the proposed new loading of the underpinned party wall.
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?	No	H Fraser revised BIA Section 6.
Has the need for monitoring during construction been considered?	Yes	H Fraser 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	H Fraser revised BIA Section 6.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA to be updated. All adjacent structures, highways and utilities should be assessed.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	H Fraser revised BIA Section 6.3.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.

Item	Yes/No/NA	Comment
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. A revised BIA was submitted by H Fraser Consulting Ltd to address the comments raised by CRH. 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 85.45m OD. External ground levels at the front of the property are shown to be lowered by c. 1.00m 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 report have been provided. Services have been identified within 5m of the proposed excavation.

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 6.00m bgl, over the London Clay. Groundwater monitoring undertaken 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 shallow and deeper basements are to be founded within the Claygate Member and the revised Fraser BIA provides characteristic soil parameters which are accepted.

4.10. The basement retaining walls will typically be piled with a contiguous pile wall 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 permanent 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. Surface water flow and flooding, subterranean (groundwater) flow screening and slope stability screening are provided in the revised Fraser BIA, and the responses are accepted.

4.13. 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.

4.14. 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.

4.15. Section 5.5.4 of the revised Fraser BIA discusses the potential impact to groundwater flows below the site and identifies mitigation for groundwater flows. A drainage assessment undertaken by Amber Planning is provided in Appendix E and includes mitigation, SuDs options and a micordrainage calculation.

4.16. Section 5.5.4 of the revised Fraser BIA discusses the control of groundwater ingress during construction. The construction of a secant pile wall, instead of a contiguous pile wall, is suggested as a means of controlling water ingress. If a secant pile wall is to be adopted the Ground Movement Assessment will require revision.

4.17. 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 impact of any loss of fines through groundwater ingress alongside mitigation measures are identified in Section 5.3

and 5.5.4 of the revised Fraser BIA. Mitigation measures to prevent the identified ground loss and potential settlement resulting from the dewatering process should be provided.

4.19. A tree survey report by Tretec identifies several trees located at the site. One of the trees located to the south of the property, adjacent to Kemplay Road is identified as to be removed via a Section 211 notice and a tree management method statement is provided. The Constant BIA and the Fraser revised BIA in Section 5.5.3 identify the impact of the removed and retained trees and the assessments indicate that the foundations and proposed basement will extend to below the potential root action in accordance with guidance from Chapter 4.2 of the NHBC Standards.

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 has been undertaken using XDisp software.

4.21. The GMA follows the guidance provided in CIRIA C760 and acknowledges that this guidance is intended for use with embedded retaining wall, not underpinning. The revised assessment now indicates that ground movements associated with underpinning and piling are considered. The movements predicted are not considered appropriate for the two lifts of underpinning described. Typically for underpinning horizontal and vertical movements in the order of 5mm to 10mm per underpin lift are anticipated. The input data from the Xdisp analysis should be provided to demonstrate how the two different construction methodologies have been assessed.

4.22. In the assessment of ground movements associated with underpinning of the party wall, the revised BIA also does not account for movements associated with the new loading of the retaining wall. The ground movement assessments related to underpinning and the piled retaining walls should be updated once an assessment of the new loading movements has been made. All adjacent structures should be considered as part of the impact assessment, including highways, utilities, and the nearby Grade II listed building.

4.23. An assessment of utility damage has been undertaken as part of the H Fraser revised BIA and should be updated after the above comments have been addressed. It is noted that consultation with adjacent utility asset owners should be undertaken prior to any tree removal or construction activity.

4.24. Monitoring during construction is proposed in Section 6.4 of the Constant BIA. The proposed trigger levels should be 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 shallower and deeper basement are to be founded within the Claygate Member beneath the monitored water levels. Temporary and permanent groundwater control measures are proposed.

5.3. Hydrological, hydrogeological and land stability screening and scoping have been undertaken.

5.4. It is accepted that the proposed basement will not have a significant impact on the hydrology and hydrogeology of the area.

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

5.6. The BIA identifies that groundwater will be encountered during basement excavation and construction. Mitigation methods for dewatering during construction are provided however mitigation measures to prevent loss of fines require clarification.

5.7. Utility data has been provided. Consultation with asset owners will be required prior to construction.

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

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

5.10. The Ground Movement Assessment (GMA) should be updated to consider movements related to the new loading on the underpinned retaining wall.

5.11. The ground movements associated with the underpinning are not considered to reflect the proposed two lifts to be undertaken. The GMA should be updated.

5.12. If a secant pile wall is used to control groundwater ingress the GMA will require revision to consider this wall type.

5.13. 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 has raised a number of queries relating to the BIA.

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.	Closed Closed	03/11/2022 03/11/2022
2	Hydrology	Hydrological screening and scoping are not provided and is required.	Closed	03/11/2022
3	Hydrogeology	Further consideration of the impact of the proposed basement on the wider hydrogeological environment is required. Mitigation measures to prevent the loss of fines should be identified and any resultant impact on ground movements should be assessed.	Closed Open – Mitigation measures should be provided.	
4	Stability	The BIA should identify what the shallower basement founding stratum will be and characteristic bearing resistances should be provided.	Closed	03/11/2022
5	Stability	Clarity on what the underpin retaining wall will be founded on is requested. The proposed new loading on the underpins is requested. XDisp input data are requested	Closed Open Open	
6	Stability	A tree is to be removed; the impact of its removal on the proposed basement and foundations should be provided.	Closed	03/11/2022
7	Stability	The GMA does not account for movements during underpin installation/construction of the underpins. The GMA should consider two lifts of underpinning. If a secant pile wall is proposed to mitigate loss of fine, the GMA should also consider this.	Open Open 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.	Closed	03/11/2022

Appendix 3: Supplementary Supporting Documents

None

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