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91-93 Hillway, London N6 6AB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-51
Revision: D1

May 2022

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	May 2022	For Comment	KBemb-13693-51-310522-91-93 Hillway_D1.doc	KB	NS	EMB

Document Details

Last saved	31/05/2022 13:22
Path	KBemb-13693-51-310522-91-93 Hillway_D1.doc
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Project Number	13398-51
Project Name	91-93 Hillway, London N6 6AB
Planning Reference	2021/4545/P

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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 a retrospective planning application for 91-93 Hillway, London N6 6AB (planning reference 2021/4545/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. A previous basement development, submitted under planning reference 2013/4511/P, was granted planning permission in 2014. The works undertaken included additional basement excavation not included in the approved planning documents. As such, this Audit has been undertaken on a retrospective basis for the additional basement excavation.

1.3. 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.

1.4. 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.

1.5. Qualifications held by the authors of the BIA and Screening/Scoping reports are not provided. The author of the hydrogeology assessment is indicated to have the relevant qualifications.

1.6. The BIA has confirmed that the pool and plant room basements are founded within Claygate Member, which is identified as a Secondary Aquifer.

1.7. It is accepted that the development will not have a significant impact on the slope stability of hydrology of the area.

1.8. The impact assessment for hydrogeology should be updated to consider the implications of the deep plant room basement.

1.9. The basement was constructed using underpinning techniques in a hit and miss sequence and using temporary propping for stability.

1.10. No Ground Movement Assessment has been provided as part of the BIA, however, given the retrospective nature of this development it is assumed that any damage to neighbouring structures was dealt with through the party wall award process.

1.11. 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 11 April 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 91-93 Hillway, London N6 6AB.

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. As noted above, the audit is retrospective as much of the basement works are complete.

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.
- Highgate Neighbourhood Plan.

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 "*Extensions and alterations to nos. 91 and 93 Hillway including, removal of the chimney stack, erection of an outbuilding in the rear garden, excavation for a basement tank room, installation of terrace planter, ground floor corner window, installation of condenser units with enclosure, installation of first floor opaque boundary screen, removal of rear chimney, erection of horizontal timber screening and insertion of metal windows at first floor level. Part retrospective.*"

2.6. The Audit Instruction confirmed 91-93 Hillway neither involves, nor is a neighbour to, listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 29 April 2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Zussman Bear (ZB), ref. ZB/L/3921, undated.
- Basement Impact Assessment Screening/Scoping report by Southern Testing (ST), ref. J11891, dated August 2014, presented in Appendix C of the Zussman Bear BIA.
- Planning Application Drawings by Morden Architecture, consisting of:
- Site Location Plan, drawing no. 1900/PL00, dated July 2021,
    - Existing Rear Garden Set 1 drawings (plans and section), drawing no. 1900/EX01, rev A, dated 16 November 2021.
    - Proposed Rear Garden Set 1 drawings (plans and section), drawing no. 1900/PL01, rev A, dated 16 November 2021.
    - Proposed Rear Garden Elevation drawings, drawing no. 1900/PL01, rev C, dated 21 February 2021.
- Planning Statement by Boyer, ref. 21.5059, dated 22 July 2021, issue 01.
- Planning Consultation Responses.

2.8. In addition, CampbellReith reviewed the following relevant documents from the original planning application (2013/4511/P) for audit purposes:

- Basement Impact Assessment (BIA) by Zussman Bear, dated September 2014.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The author of the ZB BIA is CEng IStructE. No information is provided regarding the authors of the ST BIA.
Is data required by Cl.233 of the GSD presented?	No	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Revised impact assessments considering the additional, deep plant room basement have not been provided.
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	
Is a conceptual model presented?	No	However, the relevant information is presented in the ST Site Investigation Report

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	
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Unknown	
Has a site walkover been undertaken?	No	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Discussed on page 7 of the ZB BIA
Is a geotechnical interpretation presented?	No	Bulk density and angle of friction provided only.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 20 of SR's Site Investigation Report
Are reports on other investigations required by screening and scoping presented?	N/A	
Are the base line conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	No	No assessment for the deeper plant room basement is presented.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	No	No impact assessment has been provided in relation to the additional plant room basement.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	No impact assessment has been provided.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	However, the 2013 application information identifies the need to minimise disturbance to adjoining properties.
Has the need for monitoring during construction been considered?	No	No details have been provided of any monitoring undertaken during construction.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	However, as the basement is already constructed it is assumed that any damage to neighbouring structures was covered under any party wall agreements.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	No impact assessment for the deeper basement has been provided.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	No Ground Movement Assessment has been undertaken.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. This audit considers information provided to support a retrospective planning application for additional basement construction associated with planning application reference 2013/4511/P. Planning permission granted under the 2013 application included the construction of a pool, however during the works an additional, deeper basement was constructed to be used as a plant room.

4.2. The Basement Impact Assessment (BIA) has been carried out by Zussman Bear (ZB) and draws on the information provided in a BIA Screening and Scoping report by Southern Testing (ST). The ZB BIA is undated but appears to consider the plant room basement. The ST BIA has not been updated to consider the additional plant room basement. The authors of the ZB and ST BIAs are not given, therefore it is unknown if they hold the relevant qualifications.

4.3. The LBC Instruction to proceed with the audit identified that the basement proposal neither involved a listed building nor was adjacent to listed buildings. The site lies within the Holly Lodge Conservation Area.

4.4. The basement consists of a single level plant room adjacent to an existing pool at the site. The ZB BIA indicates that the pool excavation extended to approximately 3.10m depth and the plant room excavation extended to approximately 4.20m depth.

4.5. The ST BIA was written in 2014 and does not consider the current as-built scheme or the impacts from the additional deeper plant room excavation. The ZB BIA appears to consider the current scheme and deeper excavations, however it only considers the screening questions from the ST BIA where a 'yes' response was given, and provides comment on these answers in the context of the deeper plant room basement. However, a full updated screening and scoping is not presented. Similarly an additional impact assessment is not provided.

4.6. Ground investigation undertaken at the site comprises two boreholes to 6.00m depth, one borehole to 2.70m depth and four foundation inspection pits. The ground conditions were identified as comprising silty sand with bands of clay. The two boreholes recorded water seepage at 3.90m and 5.00m depth.

4.7. The ST BIA identifies that the site is underlain by a Secondary A Aquifer, which comprises the Claygate Member. Monitoring standpipes were installed as part of the site investigation and monitored on two occasions after the site investigation works, in July and August 2014. Groundwater level was recorded at 4.88-4.90m in BH1 and 4.36-4.39m in BH2. Section 15 of the ST BIA identifies the need for an assessment of the potential impact of the new pool on groundwater levels. The subsequent Site Investigation Report by ST includes a discussion of groundwater with respect to the original pool scheme. The hydrogeological assessment

indicates no impact from the pool based on the proposed depth of the pool relative to the monitored groundwater levels. No further assessment based on the depth of the plant room has been undertaken, and this is requested to ascertain the impact of the additional deep basement.

4.8. Based on the considerations in the ST BIA it is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.

4.9. The ST BIA identifies that there will be an increase in hardstanding and that the water run-off from the extension will be discharged to the ground using soakaway drainage. The soakaway location and as built drainage are shown in Figure 23 of the ZB BIA. As such, it is accepted that the development will not significantly impact the hydrology of the surrounding area.

4.10. The ZB BIA discusses the construction sequence used to form the pool and plant room. Page 21 of the ZB BIA indicates that the basements were formed using underpinning in a hit-and-miss sequence, with the pins formed in bays not exceeding 1m wide and a minimum of 2 bays between working pins (Figure 24 of the ZB BIA). This methodology is consistent with current good working practice for underpin construction.

4.11. The ZB BIA indicates that no groundwater was encountered throughout the construction process. The pool excavation is indicated to have extended to 3.10m depth and the plant room excavation is indicated to have extended to 4.20m depth. Despite the dry conditions indicated in the ZB BIA, a full assessment of the impact that the deeper basement will have on the hydrogeology of the area should be undertaken. As mentioned in 4.7. above, the need for an impact assessment relating to hydrogeology for the deeper plant room basement is required.

4.12. The site investigation report indicates an allowable bearing capacity of 150kPa for the pool however the retaining wall design has used a value of 240kPa. As the development has already been built and appears to be performing adequately, it is assumed that the final detailed structural design was carried out appropriately.

4.13. No Ground Movement Assessment has been undertaken and it is not clear whether any movement monitoring of adjacent structures during construction was undertaken. However, as the additional plant room basement has already been constructed it is assumed that the neighbouring properties were safeguarded by party wall agreements.

5.0 CONCLUSIONS

5.1. The qualification of the authors involved in the preparation of the BIAs are not provided. The author of the hydrogeology assessment undertaken for the original scheme holds the required CGeol qualification.

5.2. The BIA has confirmed that the pool and plant room basements are founded within Claygate Member, which is identified as a Secondary Aquifer.

5.3. It is accepted that the development does not have a significant impact on the slope stability of hydrology of the area.

5.4. Groundwater monitoring identified groundwater to be as shallow as 4.36m bgl. The additional plant room basement extends to a depth of 4.20m bgl. The impact assessment for hydrogeology should be updated to consider the impact of the deep plant room basement on the wider hydrogeological environment.

5.5. The basement was constructed using underpinning techniques in a hit and miss sequence, and using temporary propping for stability.

5.6. A ground movement assessment has not been undertaken and it is not clear whether any movement monitoring of adjacent structures was undertaken as part of the works. As the development is now complete, it is assumed that any damage to neighbouring properties was covered under an associated party wall agreement.

5.7. 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: Consultation Responses

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Gatenby	Unknown	23/11/2021	Basement development may impact groundwater and groundwater flow in the area.	This has been queried as part of this audit.
Holmes	Unknown	23/11/2021		

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The qualifications held by the authors of the ZB and ST BIAs should be provided.	Open	
2	Hydrogeology	Additional assessment of the impact of the deep plant room basement on the hydrogeology of the area is required.	Open	

Appendix 3: Supplementary Supporting Documents

None

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