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Basement Impact Assessment Audit

12a Church Row, London NW3 6UU

For
London Borough of Camden

Project No.
14006-87

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APPENDICES

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 12a Church Row, London NW3 6UU (planning reference 2024/2872/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 BIA has been produced by Symmetris and is supported by a Ground Investigation and Assessment report produced by LMB Geosolutions. The authors involved possess suitable qualifications.

1.5 The proposed redevelopment involves partial demolition of the existing building, the construction of a basement using a secant embedded pile retaining wall and construction of a new dwelling with an increased footprint.

1.6 Updated screening and scoping assessments are presented in both in the Symmetrys BIA and the Ground Investigation report by LMB Geosolutions, both supported by desk study information.

1.7 Ground investigations revealed that the basement would be founded on Claygate Member of the London Clay Formation.

1.8 The presence of groundwater is anticipated during construction, and suitable mitigation measures are considered. It is accepted that the proposed basement development will not impact the hydrogeology of the area.

1.9 The revised submission considers the impact of removing the swimming pool and trees. It is accepted that the proposed basement will not have a significant impact on the land stability of the area.

1.10 The site lies within a critical drainage area and a Flood Risk Assessment has been undertaken. It can be confirmed that, with the inclusion of appropriate mitigation, the proposed development will not have a significant impact on the hydrology of the area. The new drainage proposals are likely to require approval by the LLFA and Thames Water

1.11 Ground movement assessment carried out to predict damage to neighbouring buildings indicates that the damage will not exceed Burland Category 1 (very slight).

1.12 The BIA recommends that ground movement monitoring be carried out on adjacent properties.

1.13 Based on the additional information provided, it can be confirmed that the BIA complies with the requirements of CPG: Basements and the Principles for Audit set out in the Basement Impact Assessment (BIA) Audit Service Terms of Reference & Audit Process.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 18 July 2024 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 12a Church Row, London, NW3 6UU (Planning Reference: 2024/2872/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.
- Church Row and Perrins Walk 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 to the east facade at ground floor and to the north and west facades at ground and first floor, as well as a roof extension, single storey basement, reconstructed garden room and relocated garage".

2.6 The Audit Instruction confirmed 12a Church Row neither involves, nor is a neighbour to, listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 26 July 2024 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Symmetrys, ref. 23100-SYM-XX-XX-RPT-S-0001-rev B, dated 1 July 2024
- Flood Risk Assessment by Symmetrys, ref. 23100-SYM-RPT-C-001 rev. P03, dated July 2024

- Ground Investigation and Assessment by LMB Geosolutions Ltd, dated 1 July 2024
- Existing Plans by KSR Architects and Interior Designers, dated 25 June 2024
- Proposed Plans by KSR Architects and Interior Designers, dated 25 June 2024
- Planning statement by Boyer, ref. IMS-F-18 revision 2, dated 8 July 2024
- Arboricultural Report by Crown Tree Consultancy, ref. 10999, dated 4 July 2024

2.8 Following the initial D1 audit report the following additional information was provided to CampbellReith:

- Basement Impact Assessment by Symmetrys, ref. 23100-SYM-XX-XX-RPT-S-0001. rev E, dated 27 September 2024.
- Initial Structural Scheme drawings by Symmetrys, ref. 23100-SYM-ZZ-ZZ-PL-S-0001, rev B, dated 27 September 2024. Presented in Appendix A of the BIA.
- Suggested Sequence of Works drawings by Symmetrys, ref. 23100-SYM-ZZ-ZZ-PL-S-0001, rev B, dated 27 September 2024. Presented in Appendix A of the BIA.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Section 2.3 of the BIA.
Is data required by Cl.233 of the GSD presented?	Yes	
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	Section 4.2 of the BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.1 of the BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the BIA.
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.2 of the BIA.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.1 of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.3 of the BIA.
Is factual ground investigation data provided?	Yes	Appendix C of the BIA.
Is monitoring data presented?	Yes	Table 2 of the BIA.
Is the ground investigation informed by a desk study?	Yes	Section 3 of the BIA.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	
Is a geotechnical interpretation presented?	Yes	Appendix C of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Appendix C of the BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	A Flood Risk Assessment has been undertaken.
Are the baseline conditions described, based on the GSD?	Yes	Presence of basements in neighbouring buildings confirmed.
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	Ground movement assessment provided.

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	8.1.7 of the BIA.
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 prepared by Symmetrys Structural/Civil Engineers and is supported by LMB Geosolutions Ltd (LMB) through a Ground Investigation and Assessment Report. The authors involved have suitable qualifications.

4.2 The LBC Instruction to proceed with the audit identified that the basement proposal neither involved a listed building or nor was adjacent to listed buildings.

4.3 The site is located within a predominantly residential area on Church Row and is approximately 350m away from Hampstead station. The existing structure on site comprises a detached 2-storey house with load bearing masonry walls supporting floors and a timber roof structure. The property has a private garden and a swimming pool to the east side of the property.

4.4 The proposed redevelopment involves the partial demolition of the existing building and the construction of a single storey basement beneath part of the central area of the existing building's footprint. The proposed scheme also includes extensions of the facades on the east and west sides, roof extensions, relocated garage reconstructed garden room, and the removal of the existing swimming pool within the garden. The BIA assumes that the formation level of the basement will be approximately 3.30m below ground level (bgl).

4.5 The revised BIA submission now references the most recent CPG Basements (January 2021) and has been amended accordingly.

4.6 Ground investigations undertaken by LMB included a rotary percussive borehole progressed to a depth of 15.00m and trial pits. The sequence of strata beneath the site was identified to comprise of Made Ground 0.65m to 1.20m thick, overlying possible Head Deposits of thickness of 0.20m, and underlain by the Claygate Member which extended to a depth of 14.55m. London Clay Formation was identified beneath the Claygate Member.

4.7 Groundwater was encountered at a depth of 1.90m during drilling of the borehole, however it is mentioned that the water dried out, and the groundwater levels were measured at approximately 4.28m bgl on completion of the borehole. Further monitoring was carried out using a shallow well installed to approximately 1.90m bgl and a deeper well installed to a depth of approximately 5.00m bgl. Groundwater was identified at depths of 1.26m and 1.57m in the shallow installation and at depths of 1.38m and 1.64m in the deeper installation. The BIA states that the observed groundwater is typical and considers to be representative of the Secondary (A) aquifer of the Claygate Member.

4.8 Screening assessments are presented in both the BIA and the Ground Investigation and Assessment report by LMB, which is in Appendix C of the BIA. Most relevant maps and figures have been referenced within the BIA to support screening responses. Some screening responses presented inconsistently between the two screening exercises and are discussed below.

4.9 It is understood that the existing swimming pool would be removed and replaced with lawn/grass, resulting in a net decrease in the impermeable surface area on site.

4.10 Associated with the above, it is identified that the removal of the existing swimming pool would increase the rainwater infiltration into the ground. Symmetrys has confirmed that the predominant clay composition of the underlying geology at the site may limit infiltration into the ground. The revised submission confirms that a filter drain is proposed along the length of the garden area to intercept surface water infiltration through the topsoil.

4.11 The BIA states that the existing property is detached and the proposed basement would only extend a limited area beneath the footprint of the building, therefore any cumulative effects on existing groundwater flow would be low. It is accepted that the development will not have a significant impact on the hydrogeology of the area.

4.12 The response provided for land stability screening question 13, regarding neighbouring basements were conflicting. The revised basement impact assessment addresses the previously identified inconsistency and confirms the presence of a basement at 1 Frognal Gardens. The presence of basements in other neighbouring properties remains unknown.

4.13 It is noted that the site lies within a critical drainage area according to the Strategic Flood Risk Assessment (SFRA) maps. A Flood Risk Assessment (FRA) has been carried out states that the site lies within Flood Zone 1 and has a very low risk of flooding from all sources. The BIA identifies that the site lies on the boundary of the Frognal Lane Local Flood Risk Zone. It is also noted that the Frognal Gardens Road, towards the east of the site, flooded in 1975 and the Frognal Road, to the west of the site, flooded in 2002. The BIA states that sewer flooding within Frognal Gardens or Church Row carriageways would not pose a risk to the site due to the carriageway falling from the east to the west.

4.14 The FRA incorporates a sustainable drainage strategy to ensure that the surface water run-off will be managed adequately. It is accepted that, with the inclusion of appropriate mitigation, the basement will not impact the hydrology of the area. New drainage proposals are likely to require approval by the LLFA and Thames Water.

4.15 The BIA proposes secant pile walls for inhibiting potential groundwater ingress and soil retention. A structural scheme showing the proposed drawings of pile wall installations are provided in Appendix A of the BIA. Additional information including an outline sequence of construction, temporary works and construction methodology are provided as part of the revised BIA submission.

4.16 The BIA identifies potential for differential settlements within neighbouring structures, and a Ground movement assessment (GMA) has been carried out by LMB. The ground movements resulting from the proposed construction are estimated using XDISP and following CIRIA C760 guidance. The ground movements due to retaining wall installation and the basement excavation estimated from CIRIA C760 curves are accepted.

4.17 Section 7.5.2 of the BIA provides an appraisal of pile capacities for 10m and 15m long piles. The calculations of ground movements in the GMA using CIRIA C760 curves use a pile length of 8m. It is clarified in the revised BIA that the 8m pile length is for the retaining wall only, not the bearing piles.

4.18 A damage assessment was carried out for the neighbouring buildings following CIRIA C760 guidelines. The damage assessment estimates a maximum damage category of Burland Category 1 (very slight) to the neighbouring buildings.

4.19 A utility infrastructure search revealed the presence of a water main and a combined sewer beneath Church Road, approximately 15m away from the proposed basement excavation. The GMA concludes that the basement development will have a negligible impact on the sewer and the water main.

4.20 The BIA states that, while the site is within 5m of Church Road, the basement excavation itself lies at a distance greater than 5m from the road. The GMA anticipates negligible damage to the pavements and estimates the maximum horizontal and vertical movements to be less than 2mm.

5.0 CONCLUSIONS

5.1 The qualifications of the individuals concerned with the production of the BIA are in accordance with CPG Basements.

5.2 The proposed redevelopment involves partial demolition of the existing building, the construction of a basement using a secant embedded pile retaining wall and construction of a new dwelling with an increased footprint.

5.3 Updated screening and scoping assessments are presented, supported by desk study information.

5.4 Ground conditions encountered on site mostly comprise Made Ground over Claygate Member of the London Clay Formation. It is accepted that the proposed basement development will not impact the hydrogeology of the area.

5.5 The proposed basement would extend below the groundwater levels established through monitoring, and secant pile walls are suggested for the basement walls.

5.6 Geotechnical parameters to inform retaining wall design have been provided.

5.7 The revised submission considers the impact of removing the swimming pool and trees. It is accepted that the proposed basement will not have a significant impact on the land stability of the area.

5.8 The site lies within a critical drainage area, however the flood risk assessment establishes that the proposed development poses minimal flood risk. Mitigation measures to control surface water drainage off-site are proposed. With the inclusion of appropriate mitigation measures it is accepted that the basement will not impact the hydrology of the area. The new drainage proposals are likely to require approval by the LLFA and Thames Water

5.9 Outline structural information and a construction sequence of works have been provided as part of the revised submission.

5.10 Ground movement assessment carried out using CIRIA curves and XDISP concludes that the neighbouring buildings will not suffer any damage greater than Burland Category 1 (very slight). A monitoring proposal for adjacent properties has been included.

5.11 Based on the revised BIA and supporting documents it can be confirmed that the BIA complies with the requirements of CPG: Basements and the Principles for Audit set out in the Basement Impact Assessment (BIA) Audit Service Terms of Reference & Audit Process.

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Appendix 1

Consultation Responses

None

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Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The BIA should be reviewed against the most recent CPG Basements (January 2021) and amended accordingly.	Closed	04/09/2024
2	Hydrology and Hydrogeology	Clarification is requested regarding the impact that removal of the swimming pool will have on the surface water flow paths and the hydrogeological environment.	Closed	04/09/2024
3	Land stability	Clarification regarding the impact on tree removal on neighbouring buildings is requested.	Closed	04/09/2024
4	Land stability	Clarification regarding the presence of basements in neighbouring buildings.	Closed	04/09/2024
5	BIA	An outline sequence of construction detailing the temporary and permanent works, and construction methodology is requested.	Closed	27/09/2024
6	BIA	Outline structural calculations to support assumed pile length are requested.	Closed	27/09/2024

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Appendix 3

Supplementary Supporting Documents

None

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