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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 the construction of a basement beneath the existing property and extensions to the existing structure.

1.6 The BIA should be reviewed against the latest version of CPG Basements (January 2021).

1.7 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. Inconsistent and contradicting screening responses are presented in the two screening assessments.

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

1.9 The presence of groundwater is anticipated during construction, and suitable mitigation measures are considered. A construction methodology detailing temporary and permanent works is requested.

1.10 The impact of removal of the existing swimming pool on the groundwater regime requires further consideration.

1.11 Impact of tree removal on land stability on site and the neighbouring buildings requires further consideration.

1.12 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.

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

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

1.15 As described in Section 5, it cannot 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. Queries and comments on the BIA are described in Section 4 and Appendix 2.

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

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. Some screening responses are presented inconsistently between the BIA and the LMB report.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.1 of the BIA. Some screening responses are presented inconsistently between the BIA and the LMB report.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the BIA. Some screening responses are presented inconsistently between the BIA and the LMB report.
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?	No	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?	No	Inconsistent data, clarifications are requested.
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	FRA attached.
Are the baseline conditions described, based on the GSD?	No	Presence of basements in neighbouring buildings unclear.
Do the base line conditions consider adjacent or nearby basements?	No	Presence of basements in neighbouring buildings unclear.
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?	No	Consideration of the impact of discharging more surface water to the ground is requested.
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?	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 construction of a single storey basement beneath part of the central area of the existing building. 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 3.3m below ground level.

4.5 The BIA includes screening and scoping exercises supported by Desk Study data. It is noted that the BIA references the outdated CPG4. The BIA should be reviewed against the most recent CPG Basements (January 2021) and amended accordingly.

4.6 Ground investigations undertaken by LMB included a rotary percussive borehole progressed to a depth of 15m and trial pits. The sequence of strata beneath the site was identified to comprise of Made Ground 0.65m to 1.2m thick, overlying possible Head Deposits of thickness of 0.2m, 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 1.9m during drilling of the borehole, however it is mentioned that the water dried out, and the levels changed to approximately 4.28 m below ground level on completion of the borehole. Further monitoring was carried out using a shallow well installed to approximately 1.9m bgl and a deeper well installed to a depth of approximately 5m 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 provided 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 The justifications provided for question 3 of the surface water flow screening and question 4 of the groundwater screening exercise are inconsistent across the two screening assessments. It is mentioned that the development will not alter the proportion of hard surfaced areas, however it is understood that the removal of the existing swimming pool would result in a net decrease in the impermeable surface area on site.

4.10 Associated with the above, the responses provided for question 5 from the sub-terranean flow screening assessments by Symmetrys and LMB contradict each other. It is identified that the removal of the existing swimming pool would increase the rainwater infiltration into the ground. However, the impact of this increased infiltration on the subterranean flow needs to be considered.

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. Additional consideration of the increased infiltration as discussed in 4.10 is requested.

4.12 Contradicting responses are provided for question 6 of the land stability screening exercise. The BIA states that Category C trees on the site would be felled for the redevelopment. However, it is noted that the Symmetrys screening exercise provides a 'No' response to the question. The tree report drawings indicate that four trees near the existing building and three trees near the east boundary of the site are to be removed. Further consideration of the effects of tree removal on the stability of neighbouring structures is requested.

4.13 The response provided for land stability screening question 13, regarding neighbouring basements are conflicting. The BIA states that a neighbouring property has developed a basement, however the LMB report indicates that presence of basements in neighbouring properties are unknown. Clarifications is requested regarding the presence of neighbouring basement, and clarification of assumptions made in relation to their presence/absence.

4.14 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. The FRA incorporates a sustainable drainage strategy to ensure that the surface water run-off will be managed adequately.

4.15 The proposed development would be formed on the Claygate Member of the London Clay Formation, which is a high plasticity clay with a high-volume change potential.

4.16 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. However, it is unclear how the pile installation would take place, and an outline sequence of construction detailing the temporary and permanent works, and construction methodology is requested. It is also noted that the initial structural scheme plan drawing provided in the BIA uses the symbol typically associated with a contiguous pile wall to show the outline of the basement. However, it is noted that the drawing legend labels it as a secant pile wall.

4.17 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.

4.18 Section 7.5.2 of the BIA provides an appraisal of potential pile capacities for 10 and 15m piles. It is noted that the calculations of ground movements using CIRIA C760 curves used a pile length of 8m. Outline structural calculations to support assumptions regarding pile lengths are requested.

4.19 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.

4.20 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.

4.21 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 LBC guidelines.

5.2 The proposed redevelopment involves the construction of a basement beneath the existing property and extensions to the existing structure.

5.3 The BIA should be reviewed against the most recent version of CPG Basements.

5.4 Screening and scoping assessments are presented, supported by desk study information. However, screening assessments provided in the BIA and the Ground investigation report are found to provide inconsistent responses and clarifications are requested.

5.5 Ground conditions encountered on site mostly comprise Made Ground over Claygate Member of the London Clay Formation.

5.6 The proposed basement would extend below the groundwater levels established through monitoring, and secant pile walls are suggested for the basement walls. An outline sequence of construction detailing the temporary and permanent works, and construction methodology is requested.

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

5.8 The proposed development would alter the proportion of the hard surfaced areas on site through the removal of the existing swimming pool. The impact on surface water flow paths and the impact of increased infiltration on groundwater requires clarification.

5.9 The impact on land stability due to the removal of trees requires consideration.

5.10 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.

5.11 Outline structural calculations to support assumptions regarding pile length adopted for the GMA are requested.

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

5.13 It cannot 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, specifically:

- The methodologies and assumptions are not clearly stated.
- The conclusions of the various documents/details comprising the BIA are not consistent with each other. The conclusions are not sufficiently robust and accurate and are not accompanied by sufficiently detailed mitigation measures to support the grant of planning permission in accordance with Policy A5 of the Local Plan, in respect of:

- avoiding adversely affecting drainage and run-off or causing other damage to the water environment and
- avoiding cumulative impacts on ground and structural stability or the water environment in the local area.

5.14 Queries and comments on the BIA are described in Section 4 and Appendix 2.

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Appendix 1

Consultation Responses

None

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Appendix 2

Audit Query Tracker

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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.	Open- see section 4.5	
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.	Open- see section 4.9 to 4.11	
3	Land stability	Clarification regarding the impact on tree removal on neighbouring buildings is requested.	Open- see section 4.12	
4	Land stability	Clarification regarding the presence of basements in neighbouring buildings.	Open- see section 4.13	
5	BIA	An outline sequence of construction detailing the temporary and permanent works, and construction methodology is requested.	Open- see section 4.16	
6	BIA	Outline structural calculations to support assumed pile length are requested.	Open- see section 4.18	

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Appendix 3

Supplementary Supporting Documents

None

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