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50 Maresfield Gardens, London NW3 5RX

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
14006-32

Date
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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 50 Maresfield Gardens (planning reference 2023/3017/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 proposed development comprises the extension of the existing basement across the whole building footprint. The basement will extend to a depth of 4.5m bgl (at the formation level of the slab) and 7.6m bgl at the pool area.

1.5 The BIA has confirmed that the proposed basement will be founded within the Claygate Member and London Clay.

1.6 Additional baseline data to inform the assessment is requested, as detailed in Section 4.

1.7 A number of queries are raised in regard to the Screening assessment, as detailed in Section 4. Once responses have been clarified, additional assessment and mitigation should be provided, as required.

1.8 The hydrogeological assessment should be reviewed by authors with the required qualifications as per CPG Basements.

1.9 It is indicated that more surface water will be discharged to ground than the existing conditions, which should be clarified, with additional assessment and mitigation provided, as required.

1.10 The basement will be constructed using underpinning and piling techniques. Structural drawings and outline construction methodology should be provided for review, including any required groundwater control techniques.

1.11 A Ground Movement Assessment has been presented, which indicates neighbouring structures will sustain a maximum of Burland Category 1 damage (Very Slight) due to the proposed construction works. However, a Consultation Response indicates existing structural damage to neighbouring 48 Maresfield Gardens, a Listed property. The neighbouring structural condition should be considered, and the assessment confirmed, with appropriate mitigation, as required.

1.12 Once the GMA has been confirmed, an outline methodology and guidance for monitoring structural movements during construction with proposed trigger values and contingency actions should be provided.

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

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 30/08/2023 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 50 Maresfield Gardens, London NW3 5RX and Planning Reference No. 2023/3017/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 "Replacement side extension behind new brick wall, basement extension, new fenestration and roof form, soft and hard landscaping."

2.6 The Audit Instruction confirmed the subject site is not a listed building but the adjacent buildings at No.47 St Mary's Convent School (to the rear) and 48 Maresfield Gardens (neighbouring building to the south) are Grade II* listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 21 September 2023 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment including Site Investigation, Construction Methodology and Ground Movement Assessment by A-squared Studio Engineers Ltd, Ref 2588-A2S-XX-XX-RP-Y-0002-02, Revision 02, dated 4 July 2023.
- Design and Access Statement by Marek Wojciechowski Architects Ltd, Ref 22022, dated 29 June 2023.

- Report regarding the impact on trees of proposals for development at 50 Maresfield Gardens, London, NW3 5RX by John Cromar's Arboricultural Company Ltd, Ref S940-J2-R-3, dated 30 June 2023.
- Flood Risk Assessment and Drainage Strategy, Ref J5106-C-RP-0001, Revision 00. Status S9 by Webb Yates Engineers Ltd, dated 3 July 2023.
- Heritage Appraisal by The Heritage Practice dated June 2023.
- Planning consultation comments.

2.8 Following discussion with the BIA's authors, CampbellReith were provided with the following relevant document for audit purposes on 27 September 2023:

- Phase 1 Desk Study by A2 Site Investigation Ltd, Ref 26822-A2SI-XX-XX-RP-Y-0001-00, Revision 00, dated 25 January 2023.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The authors' qualifications for the Subterranean Flow (groundwater) assessment do not meet the requirements of CPG Basements.
Is data required by Cl.233 of the GSD presented?	No	Outline construction methodology / structural information and programme should be presented.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Outline construction methodology / structural information should be presented.
Are suitable plan/maps included?	Yes	Appendix A of the BIA and architectural drawings.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Utility infrastructure maps to be provided.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 4.2 of BIA. Incorrectly answered or requires further clarification / assessment: 8, 10, 12 and 13.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 4.1 of BIA. Incorrectly answered or requires further clarification / assessment: 1a, 1b, 2 and 5.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 4.3 of BIA. Incorrectly answered or requires further clarification / assessment: 1 and 3. Note also that the site lies within Critical Drainage Area 3_005.

Item	Yes/No/NA	Comment
Is a conceptual model presented?	No	Section 8.1.1 of BIA. A ground model is described in text. The conceptual model of the development is not presented. Strata, groundwater, existing and proposed development levels, relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.2 and 5.3 of BIA. Requires further clarification in response to requested Screening review / updates.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.1 of BIA. Requires further clarification in response to requested Screening review / updates.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Q2 brought forward to scoping within Section 5.1 of BIA (Hydrogeology scoping). Q5 not brought forward to scoping but investigated within a Flood Risk Assessment. Requires further clarification in response to requested Screening review / updates.
Is factual ground investigation data provided?	Yes	Interpretive Report by A2 Site Investigation Limited.
Is monitoring data presented?	Yes	Appendix C 6 of BIA.
Is the ground investigation informed by a desk study?	Yes	A Phase I Desk Study report for the site has been produced by A2 Site Investigation Limited.
Has a site walkover been undertaken?	Yes	As part of Interpretive Report by A2 Site Investigation Limited in December 2022 and January 2023.

Item	Yes/No/NA	Comment
Is the presence/absence of adjacent or nearby basements confirmed?	No	Consultation Response indicates that 48 Maresfield Gardens has a lower ground floor, as do architectural drawings.
Is a geotechnical interpretation presented?	Yes	Section 5 and 6 of Interpretive Report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 5 and 6 of Interpretive Report provides design parameters. Noted that BIA (7.2.3) relies upon assumed pile lengths of 10m. Existing piles indicated to be 19m long, therefore further justification for proposed pile lengths to be provided.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Assessment Report, Flood Risk Assessment and Ground Movement Assessment.
Are the baseline conditions described, based on the GSD?	No	Inconsistency between reports and assumptions made in regard to proposed development and surrounding structures.
Do the base line conditions consider adjacent or nearby basements?	No	Assumptions have been made on the absence of adjacent basements.
Is an Impact Assessment provided?	Yes	Section 8 of BIA. However, not all potential impacts considered.
Are estimates of ground movement and structural impact presented?	Yes	GMA includes estimates of ground movement. To be updated following review of requested clarifications and consideration to reported structural damage to 48 Maresfield Gardens.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Further clarification / assessment required.

Item	Yes/No/NA	Comment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Section 7.2.6 of BIA. Further clarification / assessment required.
Has the need for monitoring during construction been considered?	Yes	Section 7.2.6 of the BIA. To be reviewed and updated as required once clarifications / assessment provided.
Have the residual (after mitigation) impacts been clearly identified?	No	To be reviewed and updated as required once clarifications / assessment provided.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	To be reviewed and updated as required once clarifications / assessment provided.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Contradictory Screening responses in regards to additional discharge to ground to be reviewed, including potential impacts on underlying Secondary A Aquifer. Consideration of SUDS in relation to the Critical Drainage Area to be addressed.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	To be addressed with reference to local basements and groundwater flow.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Assessment to address reported structural damage to neighbouring 48 Maresfield Gardens, structural proposals and pile lengths.
Are non-technical summaries provided?	No	Provided for Screening process only.

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been prepared by A-squared Studio Engineers Ltd with supporting documents provided by A2 Site Investigation Limited, Marek Wojciechowski Architects Ltd and Webb Yates Engineers Ltd. The qualifications of the authors of the BIA for the Surface Water and Flooding and Land stability are in accordance with LBC guidance. However, the qualifications of the authors for groundwater flow (hydrogeological) assessment have not been proven.

4.2 The site comprises a three-storey detached residential property with a basement over a small area of the building footprint, a soft-landscaped garden to the east, and a paved area and Maresfield Gardens highway to the west. The site is generally flat with an existing ground level of approximately 80.9m OD. The subject site is not a listed building but the adjacent buildings at No.47 St Mary's Convent School (to the rear) and 48 Maresfield Gardens (neighbouring property to the south) are Grade II* listed buildings.

4.3 The proposed development comprises the demolition of selected internal superstructure elements, the lateral extension of the superstructure, and extension of the basement across the whole building footprint. The proposed basement will be retained by a contiguous piled wall and underpinning the existing ground beams. The basement will extend to a depth of 4.5m bgl (at the formation level of the basement slab, and 5.1m bgl to the formation level of the ground beams), and 7.6m bgl at the pool area.

4.4 Screening assessments are presented and informed by desk study information. However, the following queries are raised, and responses should be reviewed and updated as required, with appropriate changes to Scoping, investigation, assessment and mitigation:

- Land Stability Q8: answer contradicts the Desk Study (section 3.3). Historic tributary located within 100m.
- Land Stability Q10: answer contradicts the Desk Study (section 3.3). The site is located on the Claygate Member designated a Secondary A Aquifer.
- Land Stability Q12: answer contradicts the assumptions of the BIA (that neighbouring structures have shallow foundations) and the development proposals.
- Land Stability Q13: answer references transport infrastructure mapping within the Desk Study; no mapping data for utility infrastructure (power / water tunnels) is referenced.
- Groundwater Flow Q1a: answer contradicts the Desk Study (section 3.3). The site is located on the Claygate Member designated a Secondary A Aquifer.
- Groundwater Flow 1b: answer contradicts the Desk Study (section 3.3). The site is located on the Claygate Member designated a Secondary A Aquifer. Where water levels are unknown, further investigation and assessment are appropriate.
- Groundwater Flow Q2 and Q5: answer contradicts the Desk Study (section 3.3, historic tributary located within 100m) and is located within ~100m of the boundary with outcropping London Clay, a likely spring line, and mapped springs / ponds.

- Surface Water Q1 and Q3: answer contradicts answers provided in Groundwater Flow Screening and Drainage Strategy.

4.5 The baseline conditions for the BIA should be updated based on outline structural drawings (sequencing, propping, permanent and temporary works), construction method statement and outline programme of works. The existing assessments are based on architectural drawings with assumptions as to the depth of the foundations and pile walls (which are notably shallower than the indicated existing pile depths, which should be justified).

4.6 Whilst the architectural drawings indicate the adjacent 48 Maresfield Gardens contains a lower ground floor / basement, the BIA does not identify local basements in proximity to the proposed development nor consider potential impacts / cumulative impacts (i.e. to groundwater flow, if applicable).

4.7 A conceptual model indicating ground and groundwater conditions, the existing and proposed development levels, and the relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation and assessment of impacts.

4.8 A ground investigation was undertaken in December 2022 and January 2023 by A2 Site Investigation Limited which identified the site to be underlain by Made Ground (maximum depth of 2.5m bgl) overlying the Claygate Member (maximum depth of 9.0m bgl) and the London Clay Formation (to the base of the exploratory holes to a maximum depth of 30.5m bgl). It is assumed that all new substructure elements will be founded in the Claygate Member and London Clay Formation.

4.9 Interpretative geotechnical information has been provided in accordance with the GSD Appendix G3.

4.10 The investigation indicated that the existing buildings is supported on piles with a toe level of 19.0m bgl.

4.11 Groundwater monitoring indicates that water is present at levels between 1.2m and 3.8m bgl and therefore within the Made Ground and the Claygate Member. Groundwater strikes are noted during the investigation within the Claygate Member. The proposed basement will therefore be constructed below standing groundwater level. The Interpretive Report states that ”it is recommended that a provision is made for finite sumping or pumping in order to facilitate the removal of any perched water that may be encountered during the works”.

4.12 The construction method statement should outline further how groundwater control will be employed to maintain stability during construction. Additionally, it should be assessed whether any temporary groundwater control utilised will impact upon surrounding structures.

4.13 Reference to appropriate long term basement waterproofing and flood risk mitigation to be adopted should be provided.

4.14 Following the updates to the Screening assessment, and with reference to the Consultation Responses, impact to groundwater flow should be confirmed, including any cumulative impacts.

4.15 A Flood Risk Assessment and Drainage Strategy have been presented. SuDS in the form of permeable paving and an increase in the soft landscaping is incorporated into the development to increase the area of the site drained by infiltration. The proposed discharge to ground should be considered via Screening (as 4.4) with any further investigation, assessment and mitigation presented, as required (noting also 4.14 and Consultation Response indicating groundwater inundation to neighbouring basement).

4.16 Drainage proposals should be agreed with LBC and Thames Water.

4.17 A Ground Movement Assessment (GMA) is presented in Appendix C of the BIA. In total, 18 façades of the two neighbouring buildings at 48 Maresfield Gardens and 52 Maresfield Gardens were considered in addition to an assessment of the impact that the proposed development will have on the adjacent highway of Maresfield Gardens. The results of the assessment indicate that a maximum of Burland Category 1 damage (Very Slight) will be sustained.

4.18 The GMA can only be confirmed once the requested structural and utility information has been provided.

4.19 Additionally, a Consultation Response indicates existing structural damage to neighbouring 48 Maresfield Gardens, a Listed property. The GMA currently assumes all neighbouring structures are in good condition. The neighbouring structural condition should be considered and the assessment confirmed, with appropriate mitigation, as required.

4.20 Whilst the requirement for structural monitoring during construction is stated in the BIA, no outline proposals are provided. Following the confirmation of the GMA, outline monitoring proposals should be provided to ensure the assessed damage criteria are not exceeded.

4.21 Non-technical summaries should be provided within any revisions to the BIA submitted.

5.0 CONCLUSIONS

5.1 The proposed development comprises the extension of the existing basement across the whole building footprint.

5.2 The BIA has confirmed that the proposed basement will be founded within the Claygate Member and London Clay.

5.3 Additional baseline data to inform the assessment is requested, as detailed in Section 4.

5.4 A number of queries are raised in regard to the Screening assessment, as detailed in Section 4.

5.5 The hydrogeological assessment should be reviewed by authors with the required qualifications as per CPG Basements.

5.6 It is indicated that more surface water will be discharged to ground than the existing conditions, which should be clarified, with additional assessment and mitigation provided, as required.

5.7 Structural drawings and outline construction methodology should be provided for review, including any required groundwater control techniques.

5.8 A Ground Movement Assessment has been presented. The neighbouring structural condition should be considered, and the assessment confirmed, with appropriate mitigation, as required.

5.9 Once the GMA has been confirmed, an outline methodology and guidance for monitoring structural movements during construction with proposed trigger values and contingency actions should be provided.

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

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Appendix 1

Consultation Responses

Residents' Consultation Comments

The following comments highlight those pertinent to the BIA

Surname	Address	Date	Issue raised	Response
Sims	48 Maresfield Gardens	3 September 2023	"There has been a history of subsidence resulting in structural damage to the north side of our house due to the excavation of the existing basement to provide a gym on the south side of No. 50 Maresfield Gardens – this development was granted planning permission on 10th September 2001 under application reference PWX0103437. This work disrupted the foundations of our house, the soil conditions, and lateral loadings. This has resulted in structural cracking and settlement along the north of our house – all since the 2001 basement was constructed next door at No. 50 – with for example the rear balcony slab dropping by 40mm and many of the door openings by over 30mm. Additionally, the retaining garden wall which is 2.3 metres tall, now leans towards our garden. It is holding up all of the soil from No. 50 Maresfield Gardens and the top of this wall now overhangs the base by 150mm. Furthermore, the excavation of the existing basement at No. 50 Maresfield Gardens has had a significant effect on the ground hydrology in that the lower ground floor to our house now floods when there is heavy rain with water coming up through the walls and floor. This occurred in July 2021 and most recently in August 2023."	Section 4 and Appendix 2 (further responses required)

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Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA Format	BIA authors' qualifications.	Open – 4.1	
2	BIA Format	Non-technical summaries.	Open – 4.21	
3	BIA Format	Additional baseline information for assessment and Conceptual Model to be provided.	Open – 4.4 – 4.7	
4	Screening	Assessments to be clarified and updated, with consequential investigation / assessment / mitigation etc provided, as required.	Open – 4.4	
5	Groundwater	Noting clarifications to Screening process; aquifer status; groundwater flow and cumulative impacts; additional discharge to ground; Consultation Responses; groundwater control during construction.	Open – 4.4, 4.11 – 4.15	
6	Land Stability	Noting clarifications to Screening process; construction methodology; structural information; foundation depths; Consultation Responses; GMA; monitoring proposals.	Open – 4.4, 4.11 – 4.13, 4.17 – 4.20	
7	Surface Water	Noting clarifications to Screening process; downstream impacts; drainage proposals to be subsequently agreed with LBC and Thames Water.	Open 4.4, 4.15, 4.16	

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Appendix 3

Supplementary Supporting Documents

None

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