

52 Aberdare Gardens,
London, NW6 3QD

Basement Impact Assessment
Audit

For
London Borough of Camden

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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 a swimming pool at 52 Aberdare Gardens, London, NW6 3QD (planning reference 2021/6286/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 carried out by individuals who possess suitable qualifications as per CPG: Basements 2021.
- 1.5. The proposal includes the extension of an existing below ground crawl space to form a single storey basement beneath the building footprint with lightwells to the front and rear, formed by reinforced concrete underpins.
- 1.6. The basement will extend to a depth of c.3.50m bgl and be founded within the London Clay Formation.
- 1.7. Screening questions for hydrology and hydrogeology should be reviewed and presented consistently. Some of the screening questions for Land stability also require further consideration.
- 1.8. The site is within a Critical Drainage Area and the Goldhurst Flood Risk Zone. A sustainable drainage strategy has been provided but clarifications are required.
- 1.9. Outline temporary works plan and structural load takedowns are provided. However, there are discrepancies in the drawings regarding the maximum width of underpin sections and the number of underpinning lifts, which require clarification.
- 1.10. Ground Movement Assessment (GMA) has been undertaken. However, it must be reviewed to account for damage to No. 50 as well as 54. The pedestrian footpath should also be considered in the damage assessment.
- 1.11. Until the queries summarised in Appendix 2 are addressed it cannot be confirmed that the BIA complies with the requirements of CPG Basements.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 9th May 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 52 Aberdare Gardens London NW6 3QD and Planning References 2021/6286/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 *"Amalgamation of 3 dwellings to 2 dwellings; creation of basement extension; alterations to existing single storey rear extension to include new roof terrace above, alterations to fenestration, alterations to front boundary treatment, removal and replacement of trees, installation of condenser in rear garden, and installation of solar panels to the roof."*
- 2.6. The Audit Instruction confirmed 52 Aberdare Gardens neither involves, nor is a neighbour to, listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 20/05/2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) by PJCE, Revision 1, dated December 2021 (ref: J2630).
- Basement Impact Assessment Report by Paddock geo engineering, Issue 1, dated 19th November 2011, (ref: P21 - 302bia)
- Basement construction methodology and temporary works by Flood Engineering dated 22nd November 2021 (ref:211119).
- Basement Construction Sequence drawings by Flood Engineering:
 - Sheet 1, drawing no. 100, rev P01, dated 07 December 2021.
 - Sheet 3, drawing no. 102, rev P01, dated 07 December 2021.
 - Sheet 3, drawing no. 103, rev P01, dated 07 December 2021
- Proposed Plans by Hudson+Madigan, dated 6th September 2021. (ref:HM120)
- Existing Plans by lime green associates, dated 27th July 2021
- Arboricultural Survey & Impact Assessment by Marcus Foster, dated December 2021. (ref: AIA/MF/0153/21)
- Design & Access Statement by Hudson+Madigan, dated 23rd December 2021.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
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?	No	
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?	No	Section 3.3 of Paddock BIA. Question 6 and 8 to be reviewed.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.2 of Paddock BIA. To be reviewed, see section 4.0.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1 of Paddock BIA. To be reviewed, see section 4.0.
Is a conceptual model presented?	No	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.1 of Paddock BIA
Hydrogeology Scoping Provided?	Yes	Section 4.1 of Paddock BIA.

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	
Is factual ground investigation data provided?	Yes	Section 5.2 of Paddock BIA
Is monitoring data presented?	Yes	Section 5.3 of Paddock BIA
Is the ground investigation informed by a desk study?	Yes	Section 2.0 of Paddock BIA
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	
Is a geotechnical interpretation presented?	Yes	Section 5.6 of Paddock BIA
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 5.6.3 of Paddock BIA
Are reports on other investigations required by screening and scoping presented?	Yes	A SUDS strategy and Arboricultural Survey are provided
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	Section 6.0 of Paddock BIA. But to be reviewed with the screening and scoping for hydrology and hydrogeology.
Are estimates of ground movement and structural impact presented?	Yes	Section 4.0 of PJCE BIA report, however further assessment is required.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	As above.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Preliminary Temporary works plan provided.
Has the need for monitoring during construction been considered?	Yes	Outline Movement Monitoring plan provided in Appendix D of PJCE BIA.
Have the residual (after mitigation) impacts been clearly identified?	No	Screening exercises to be reviewed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	The GMA requires further consideration
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Clarification relating to the drainage strategy are required.
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	But GMA to be reviewed
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by individuals who possess suitable qualifications as per CPG: Basements 2021.
- 4.2. The Structural Assessment of the proposed basement is included within the PJCE BIA report.
- 4.3. The site is occupied by a three-storey residential building with an existing lower ground crawl space with a head height of c. 1.5m. The Design & Access Statement identified that 52 Aberdare Gardens is located in the South Hampstead Conservation Area and the property is neither listed, nor does it adjoin any listed buildings.
- 4.4. The proposed basement works comprise extending the existing below ground crawl space to form a single storey basement beneath the entire building footprint and the formation of lightwells at the rear and front of the property. The basement will be formed by a reinforced concrete underpins constructed in a traditional hit and miss underpinning sequence.
- 4.5. Desk study information and a screening assessment are presented in the Paddock BIA.
- 4.6. A ground investigation comprised 2no. Window Samples to 6m and 6no. trial pits. The investigation confirms that the ground conditions comprise Made Ground to c.1.50m below ground level (bgl), underlain by the London Clay Formation to depth. It is confirmed the basement will be founded within the London Clay Formation to a depth of 3.50m bgl.
- 4.7. Groundwater was not encountered during the investigation, but subsequent groundwater monitoring carried out, indicate shallow groundwater at c. 1.5m depth in WS1. The report concludes that this water is be due to perched water within the Made Ground and surface water infiltration into the monitoring well, and not representative of a ground water table within the unproductive London Clay Formation.
- 4.8. Screening Questions 3 and 4 for hydrology and hydrogeology, respectively need to be clarified with regards to change in hard surfaced/paved areas onsite. The BIA has shown that although the development is close to a lost River Fleet, it will not impact on the wider hydrogeology of the area. However, Question 4 should be reviewed to maintain consistency with hydrology screening.
- 4.9. Question 6 of the hydrology screening identifies the site to be within a Critical Drainage Area and the Goldhurst Local Flood Risk zone. Appropriate figures from the SFRA are consulted, indicating that the site is in a region with very low flood risk from surface waters, reservoirs, groundwater, and fluvial/tidal watercourses.

- 4.10. A Sustainable Drainage Systems Strategy (SDS) is presented in Appendix E of the PJCE BIA. Although permeable paving is indicated, the drawings in Appendix H of the SDS show an impermeable membrane used in the construction of the paving areas, rendering them effectively impermeable. Surface water run-off will be discharged into the combined sewer using a control chamber to limit outflows to 2L/s. The location of the proposed attenuation storage to control discharge should be shown. Drawing L2630-C-SK200 in Appendix I of the SDS requires revision, as the paved areas are currently shown as permeable. The garden path and shed are also show as being removed as part of the proposed works. This should be confirmed or the drawing updated to reflect no change in these areas.
- 4.11. The screening assessment for land stability identifies the site to be within a highway or pedestrian footpath and that the proposed development will result in differential foundation depths; these are taken forward to scoping. Trees will be felled as part of the proposed development, according to the arboricultural survey report, and Question 6 should be revised to reflect this and the impact assessed appropriately. Question 8 should be reviewed to acknowledge the presence of the lost river and the impact assessed appropriately.
- 4.12. The basement will be constructed as reinforced concrete underpins beneath the existing masonry walls, with the underpins running along the party wall with No. 52/54 bearing into mass concrete foundations of approximately the same width as the existing corbelled wall foundations. In the permanent case the underpinning will be supported by a reinforced concrete basement floor slab at the base and a metal ground floor deck at the top. Appendix B and C of the PJCE BIA contain an outline temporary propping scheme and structural load takedowns, respectively.
- 4.13. In the PJCE BIA the maximum width of the underpinnings is presented inconsistently between drawings Nos. L2630-S-20-0090 and L2630 S-08-010. The latter specifies a maximum excavation width of 1.2m whereas the former recommends excavating underpinnings to a maximum width of 1m. The underpinning construction sequence should be presented consistently between all documents and drawings. Clarification of whether the underpinning will be formed in one or two lifts is also required.
- 4.14. Ground Movement and Building Damage Assessment (GMA) is undertaken in Section 4.0 of the PJICE BIA report. The party wall shared by No. 52/54 is only assessed and no walls of No. 50 are assessed for damage. The assessment states that this is due to the foundation of No. 50 being beyond extent of a 45-degree line drawn from the assumed foundation depth to the basement formation level, and hence these foundations are unaffected. This is incorrect, as the 45 degree line represents the zone in which the load from the neighbouring foundation impacts on the basement retaining wall, as opposed to the impact that basement excavation will have on the ground. Therefore the impact to No. 50 should be included in the GMA.

- 4.15. The GMA uses the methodology presented in CIRIA C580 (now CIRIA C760) to predict the magnitude of ground movements arising from the basement development. Whilst the CIRIA approach is intended for embedded retaining walls, it is accepted that the ground movements predicted using this method are within the range typically anticipated for underpinning techniques carried out with good control of workmanship.
- 4.16. The GMA only considers ground movements due to excavation of the basement and does not include any component to represent movements arising from construction of the underpins (i.e. 'Installation of the Wall' in CIRIA C760). The GMA must be reviewed and updated to include installation movements, dry pack settlement, and structural loads. Wall perpendicular to the excavations are considered to be the critical sections, and damage assessments should be undertaken for No. 50 walls and the pedestrian pathway.
- 4.17. The maximum excavation depth considered in the GMA is 2m, which reflects the presence of the crawl space below ground. Proposals indicate that the existing foundation of the wall adjacent to No. 50 will be demolished to allow the retaining wall to be cast as a single, full height structure. The demolition of the foundations will remove support from the upper 1.6m of ground in the temporary case, therefore the impact of this, and its contribution to ground movements impacting No. 50, should be included in the revised GMA.
- 4.18. Proposals are provided for a movement monitoring strategy during construction in Appendix D of PJCE Report. The threshold values provided are to be reviewed along with an updated GMA.

5.0 CONCLUSIONS

- 5.1. The BIA has been carried out by individuals who possess suitable qualifications.
- 5.2. The proposal includes extending the existing below ground crawl space to form a single storey basement beneath the building footprint with lightwells to the front and rear, formed by reinforced concrete underpins.
- 5.3. The basement will extend to a depth of c.3.50m bgl and be founded within the London Clay Formation.
- 5.4. Groundwater monitoring has been undertaken and shallow groundwater was recorded at the front of property due to perched water.
- 5.5. Screening questions in hydrology and hydrogeology regarding hard surfaced areas should be reviewed to maintain consistency.
- 5.6. Land Stability screening Question 8 will need to be reviewed to account for the lost river, and Question 6 will need to account for trees being felled as part of the development.
- 5.7. The site is within a Critical Drainage Area and the Goldhurst Flood Risk Zone. Clarification on some aspects of the drainage strategy is required.
- 5.8. Outline temporary works plan and structural load takedowns are provided. However, there are discrepancies in the drawings regarding the width of underpin sections and number of stages of underpinning.
- 5.9. Ground Movement Assessment (GMA) has been undertaken. However, it must be reviewed to consider Nos. 54 and 50. The pedestrian footpath will also need to be considered in the damage assessment.
- 5.10. Until the queries summarised in Appendix 2 are addressed it cannot be confirmed that the BIA complies with the requirements of CPG Basements.

Appendix 1: Consultation Responses

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Hydrogeology and Hydrology	Screening assessments to be updated regarding paved/hard surfaces	Open – Section 4.8	
2	Hydrology	Clarification is required for some elements of the drainage and surface water mitigation proposals.	Open – Section 4.10	
3	Land Stability	Question 6 and 8 of the screening should be updated and the impacts assessed appropriately.	Open – Section 4.11	
4	Structural Drawings	The underpinning construction sequence should be presented consistently between all documents and drawings. Clarification of whether the underpinning will be formed in one or two lifts is also required.	Open – Section 4.13	
5	GMA	GMA to be updated with comments in Section 4.0 and a damage assessment to be carried out for No. 50 and pedestrian footpath.	Open – Section 4.14 to 4.17	
6	Land Stability	Monitoring proposals to be updated along with GMA	Open	

Appendix 3: Supplementary Supporting Documents

None