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77 Lawn Road
London, NW3 2XB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12336-62

Revision: D1

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Appendix

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 77 Lawn Road, London NW3 2XB (planning reference 2016/1737/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 is a new single storey basement across the full footprint of the existing two storey semi-detached house. Additional works include an extension to the side and rear of the property.

1.5. The BIA has been prepared by Momentum Structural Engineers with a supporting Site Investigation report prepared by Southern Testing. The authors' qualifications do not meet the criteria outlined in CPG4.

1.6. A desk study in accordance with the GSD Appendix G1 has not been presented. A completed desk study, including data sources / mapping, should be made available for review.

1.7. A conceptual site model, geotechnical parameters and retaining wall information have not been presented, in line with the GSD Appendix G3. These should be prepared and submitted as part of a revised BIA.

1.8. The BIA indicates the site to be at very low risk of surface water flooding or impacting the wider surface water flow environment, which is likely to be accepted pending review of a comprehensive desk study including full appendices and providing that the design advice submitted as part of the site specific drainage assessment, incorporating attenuation SUDS, is followed.

1.9. It is accepted that the site is at very low risk from groundwater flooding and will not impact the wider hydrogeological environment. Perched water within the Made Ground has been identified and the Site Investigation report recommends long term monitoring to inform dewatering mitigation measures during construction and design criteria in the permanent case.

1.10. The BIA identifies slopes in excess of 7° on site and states that the basement design will need to take account of the slope. Limited discussion on design and mitigation is presented. Sufficient assessment, design detail and mitigation recommendations should be prepared and submitted as part of a revised BIA.

1.11. The BIA does not include a Ground Movement Assessment (GMA) or indicate land stability impacts caused by the proposed development. A GMA should be presented for review, including a predicted zone of influence. Damage impact assessments should be prepared for structures within the zone of influence, in line with CPG4 guidelines, which should include mitigation measures to further reduce those impacts where practicable.

1.12. The BIA does not contain sufficient design or structural information, and design drawings referenced to be within Appendix B are not presented. Sufficient detail and drawings should be prepared and presented within a revised BIA.

1.13. The BIA does not indicate survey and monitoring requirements to be implemented to monitor and control potential ground movement impacts during construction. These should be assessed and presented within a revised BIA.

1.14. Queries and matters requiring further information or clarification are summarised in Appendix 2.

1.15. The BIA is substantially incomplete. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 17 May 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 77 Lawn Road, London NW3 2XB, Camden Reference 2016/1737/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:

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

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; and,

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: "Creation of basement to form additional living accommodation for existing dwelling and 1x self-contained 1-bed flat at lower ground floor level; creation of sunken garage to side with green roof above; alterations to driveway and erection of new boundary fencing; erection of part two storey and part single storey side and rear extension; alterations to fenestration; and associated works".

2.6. CampbellReith accessed LBC's Planning Portal on 23 August 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (ref 2716) dated 10 March 2016 by Momentum Structural Engineers.
- Site Location Plan, Existing Plans and Elevations, Proposed Plans and Elevations (Rev P1 to P4, Planning) dated March to June 2016.
- Report to demonstrate Compliance with Code for Sustainable Homes SUR1 Surface Water Run-off dated March 2016 by Michael Ward.
- Site Investigation Report (ref J12507) dated March 2016 by Southern Testing Laboratories Ltd.
- Design and Access Statement dated March 2015. No author is identified.
- Comments and objections to the proposed development from local residents.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The author's qualifications are not in accordance with CPG4 guidelines e.g. CEng MICE, CGeol FGS.
Is data required by Cl.233 of the GSD presented?	No	Desk study information in accordance with GSD Appendix G1 has not been provided in full. e.g historical mapping, underground infrastructure / utility enquiry data, nearby basements / listed structures, historic spring lines, etc
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 plans/maps included?	No	Historical mapping and underground infrastructure / utility routes (if applicable) should be provided.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Historical mapping and underground infrastructure / utility routes (if applicable) should be provided.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Requires review of appropriate desk study information.
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?	No	Requires review of appropriate desk study information.

Item	Yes/No/NA	Comment
Is a conceptual model presented?	No	Ground conditions encountered during the SI are presented.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Requires review of appropriate desk study information, GMA and damage assessments to be completed.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	The impermeable area of the site will increase post-development. An assessment of surface water run-off and outline drainage design to mitigate discharge is presented. Requires review of appropriate desk study information.
Is factual ground investigation data provided?	Yes	Limited ground investigation has been undertaken.
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Yes	A limited desk study is presented.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	The Design and Access Statement indicates local building alterations but the presence of basements has not been identified.
Is a geotechnical interpretation presented?	No	Interpretation in line with the GSD Appendix G3 has not been presented.
Does the geotechnical interpretation include information on retaining wall design?	No	Structural drawings are referenced in Appendix B of the BIA but not presented. Retaining wall design is not presented.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	N/A	
Are baseline conditions described, based on the GSD?	No	Desk study and geotechnical information incomplete.
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	It should be updated once complete desk study, geotechnical interpretation and GMA are presented.
Are estimates of ground movement and structural impact presented?	No	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	It should be updated once complete desk study, geotechnical interpretation and GMA are presented.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Structural / land stability information and assessment is incomplete and mitigation measures are not presented. Surface flow mitigation via attenuation SUDs is presented.
Has the need for monitoring during construction been considered?	No	Monitoring is briefly discussed but not in sufficient detail.
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	Structural / land stability information and assessment is incomplete and mitigation measures are not presented. Slopes are identified in excess of 7° but no mitigation is discussed.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	It is likely that the development will not materially change run-off from the current site arrangements, on the basis that attenuation SUDS is implemented as described. However, pending review of complete desk study.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	No cumulative impact to the wider hydrogeological or hydrological environments likely. Structural / land stability impacts have not been considered.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	No damage impacts have been presented.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. A desk study has been presented. However, it does not consider all the aspects recommended in the GSD Appendix G1, such as: making enquiries with relevant transport and utility companies to identify potential for underground infrastructure beneath the site; identifying current and historical wells, springs and water courses; identifying basements and listed buildings within the proposed development's zone of influence; or providing historical mapping.

4.2. For example, the BIA states that the closest water course to the site is the River Thames, 6,500m away, in answer to the screening question: "Is the site within 100m of a watercourse, well (used/disused) or potential spring line?" Historic wells, rivers and spring lines are known to be closer to the site than the River Thames. The desk study should include adequate review of historic mapping and historic river routes / springs / wells to provide this information accurately.

4.3. Full appendices, including historical map extracts, should be presented with the Desk Study.

4.4. A site investigation has been presented which is limited in extent and does not follow guidelines within CPG4 or the GSD Section 7. The interpretative report is not in accordance with the GSD Appendix G3. Geotechnical parameters and a Conceptual Site Model have not been provided, nor has sufficient assessment or design detail e.g retaining wall design.

4.5. The BIA identifies slopes in excess of 7° on site and states that the basement design will need to take account of the slope. Limited discussion on mitigation is presented, which does not include sufficient design detail.

4.6. The BIA identifies that the impermeable area of the site will increase due to the proposed development and that peak run-off flows will also increase. An assessment of surface water flow and drainage design is presented and it is likely that, pending review of a comprehensive desk study and providing suitable attenuation SUDS is incorporated into the design, there should be no significant impact to the wider hydrological environment.

4.7. Very limited structural information is presented, and the structural drawings have not been included within the BIA's Appendix B. The BIA states that 'no adverse impacts are anticipated to the neighbouring structures' but insufficient information has been presented to assess this. A GMA should be presented for review, including a predicted zone of influence. Damage impact assessments should be prepared for structures within the zone of influence, in line with CPG4 guidelines, which should include mitigation measure to further reduce those impacts where practicable.

4.8. The BIA should also provide structural information for both the temporary and permanent cases, including proposed construction sequencing and propping arrangements, and retaining wall design parameters.

4.9. Perched groundwater has been identified within the Made Ground and the BIA identifies that seepage along fissures or sandy partings within the London Clay is a possibility. Outline advice is provided to contractors, that longer term monitoring in advance of construction is recommended and that sump pumping is likely to be effective for low flow seepages during construction. The BIA states that waterproofing and permanent design elements, such as designing for potential hydrostatic uplift, should be informed by the recommended long term monitoring.

4.10. The BIA is substantially incomplete and refers to future assessments to provide design information, ground movement assessments and mitigation measures to reduce the impacts on the surrounding environment. Whilst it is accepted that some further assessment and confirmation of site conditions can be undertaken in advance of construction and presented in a Basement Construction Plan (BCP), the CPG4 guidelines and supporting guidance require more detailed information, assessment, outline design and potential mitigation measures to be presented as part of the BIA.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by Momentum Structural Engineers with supporting Site Investigation report prepared by Southern Testing. The authors' qualifications do not meet the criteria outlined in CPG4. A revised BIA submission should include evidence of review and approval by appropriately qualified professionals.

5.2. A desk study in accordance with the GSD Appendix G1 has not been presented. A completed desk study, including data sources / mapping, should be made available for review.

5.3. A conceptual site model, geotechnical parameters and retaining wall information have not been presented, in line with the GSD Appendix G3. These should be prepared and submitted as part of a revised BIA.

5.4. The BIA indicates the site to be at very low risk of surface water flooding or impacting the wider surface water flow environment, which is likely to be accepted pending review of a comprehensive desk study (as 5.2) including full appendices and providing that the design advice submitted as part of the site specific drainage assessment, incorporating attenuation SUDS, is followed.

5.5. It is accepted that the site is at very low risk from groundwater flooding and will not impact the wider hydrogeological environment.

5.6. Perched water within the Made Ground has been identified and the Site Investigation report recommends long term monitoring to inform dewatering mitigation measures during construction and design criteria in the permanent case.

5.7. The BIA identifies slopes in excess of 7° on site and states that the basement design will need to take account of the slope. Limited discussion on design and mitigation is presented. Sufficient assessment, design detail and mitigation recommendations should be prepared and submitted as part of a revised BIA.

5.8. The BIA does not include a Ground Movement Assessment (GMA) or indicate land stability impacts caused by the proposed development. A GMA should be presented for review, including a predicted zone of influence. Damage impact assessments should be prepared for structures within the zone of influence, in line with CPG4 guidelines, which should include mitigation measure to further reduce those impacts where practicable.

5.9. The BIA does not indicate survey and monitoring requirements to be implemented to monitor and control potential ground movement impacts during construction. These should be assessed and presented within a revised BIA.

5.10. The BIA does not contain sufficient design or structural information, and design drawing referenced to be within Appendix B are not presented. Sufficient detail and drawings should be prepared and presented within a revised BIA.

5.11. Queries and matters requiring further information or clarification are summarised in Appendix 2.

5.12. The BIA is substantially incomplete. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Summerfield	78 Lawn Road, NW3 2XB	21 April, 5 May, 9 May and 4 July 2016	Structural damage to adjoining building caused by construction; removal of tree causing structural damage and allowing overlooking; removal of tree (aesthetics); development is not in keeping with the street's character.	Not yet addressed in BIA.
Luger	5, 19 Lawn Road, NW3 2XR	15 April 2016	Structural damage to adjoining buildings.	Not yet addressed in BIA.
Solomon	76 Lawn Road, NW3 2XB	11 May 2016	Obstruction of access rights due to shared driveway entrance of 76 and 77 Lawn Road; restriction of natural light; overlooking due to removal of trees; development is not in keeping with the street's character.	-
Symes	79 Lawn Road, NW3 2XB	11 May and 14 July 2016	Obstruction of access rights due to shared driveway entrance; development is not in keeping with the street's character.	-
Tamir	82 Lawn Road, NW3	12 May 2016	Development is not in keeping with the street's character.	-
Noakes	79 Lawn Road, NW3 2XB	11 May 2016	Development is not in keeping with the street's character.	-
Kedourie	75 Lawn Road, NW3 2XB	11 May 2016	Obstruction of access rights due to shared driveway entrance; development is not in keeping with the street's character.	-
Poole / Tomlinson	74 Lawn Road, NW3 2XB	10 May 2016	Structural damage to adjoining building caused by construction; removal of tree causing structural damage and allowing overlooking.	Not yet addressed in BIA.
Herbert	16 Downside Crescent, NW3 2AP	2016	Security and disturbance.	-

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	A revised BIA submission should include evidence of review and approval by appropriately qualified professionals for the relevant sections e.g. CEng MICE, CGeol FGS.	Open, to be provided.	
2	Desk Study	A desk study in accordance with GSD Appendix G1 should be presented, to include full appendices. For example, it should include: enquiries with relevant transport and utility companies to identify potential for underground infrastructure beneath the site; identifying current and historical wells, springs and water courses; identifying basements and listed buildings within the proposed development's zone of influence; historical mapping; etc.	Open, to be provided.	
3	Land Stability	The BIA should present geotechnical interpretation in line with the GSD Appendix G3 e.g. a conceptual site model, geotechnical parameters, retaining wall design information, etc.	Open, to be provided.	
4	Groundwater	In line with the site investigation recommendations, long term groundwater monitoring should be undertaken.	Open, to be provided.	
5	Land Stability / Ground Movement Assessment	A GMA should be presented, to include a zone of influence, identified basements and listed buildings, damage impact assessments, methodology and calculations, etc.	Open, to be provided.	
6	Land Stability / Slope	Further assessment, design detail and mitigation advice should be presented in	Open, to be provided.	

	Stability	regards to the slopes on site.		
7	Land Stability / Structural Information	Sufficient design detail and drawings should be prepared and presented, including temporary and permanent works, construction sequencing, propping arrangements, etc.	Open, to be provided.	
8	Land Stability / Monitoring and Survey	Survey and monitoring requirements to be implemented to monitor and control potential ground movement impacts during construction should be assessed and presented.	Open, to be provided.	

Appendix 3: Supplementary Supporting Documents

None

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