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48 Shoot-up Hill
London NW2 3QB

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-53
Revision: D1

May 2016

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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 48 Shoot-up Hill (planning reference 2016/1089/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 Lyons O'Neill using individuals who possess suitable qualifications.

1.5. The BIA has confirmed that the proposed basement will be founded within Made Ground and its foundations will need to be deepened to encounter the London Clay below.

1.6. The proposed construction methodology and structural solution, which includes underpinning of the existing party and internal load-bearing walls, and concrete walls in combination with a contiguous piled wall elsewhere, is suitable for this scheme.

1.7. A comprehensive Structural Strategy Report has not been included in the BIA. Design calculations, to show the adequacy of the proposed structural solutions, have not been presented in the BIA. These should be prepared and submitted for review.

1.8. It is possible that ground water will be encountered during basement foundation excavation. The dewatering measures recommended in the BIA should be considered.

1.9. A detailed Ground Movement Assessment, to establish likely structural movements that may occur during the construction of the basement, has not been undertaken. Justification of the assumptions is required and confirmation that the predicted category of damage will not be exceeded.

1.10. Proposals for a movement monitoring strategy, during and post basement construction, have been included in the BIA and these should be implemented.

1.11. It is accepted that the surrounding slopes to the development site are stable.

1.12. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding. However, anti-flood measures associated with sewer flooding, should be described.

1.13. Queries and requests for further information are discussed in Section 5 and summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 20 April 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for no. 48 Shoot-up Hill, Camden Reference 2016/1089/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 *"excavation of basement with front and rear lightwells; alteration of the residential mix to comprise 4x1-bed and 3x2-bed units and associated works"* and confirmed that the basement proposals do not involve a listed building nor does the property neighbour any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 27 April 2016 and gained access to the following relevant documents for audit purposes:

· Basement Impact Assessment Report (BIA)

- Planning Application Drawings consisting of

  Location Plan

  Existing Plans and Elevations

  Proposed Plans and Elevations

- Design & Access Statement

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA Page 4.
Is data required by Cl.233 of the GSD presented?	Yes	Justification of assumed values for Ground Movement Assessment (GMA) required.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	BIA and drawings.
Are suitable plan/maps included?	No	BIA Appendices Surface and Groundwater flood risk maps have not been presented.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Applicable to the maps presented only.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Paragraphs 3.3, 4.2.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	CAMDEN SFRA 2014 has not been consulted.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	No flood risk maps presented. Updated Flood Maps for Surface Water Flooding (CAMDEN SFRA 2014) have not been presented.
Is a conceptual model presented?	Yes	BIA Section 5.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Paragraph 3.3.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Paragraph 3.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Paragraph 3.4.
Is factual ground investigation data provided?	Yes	BIA Sections 5 and 6.
Is monitoring data presented?	Yes	BIA Paragraph 6.1.
Is the ground investigation informed by a desk study?	Yes	BIA Section 5.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	It is to be confirmed whether or not 46 Shoot-up Hill has a basement.
Is a geotechnical interpretation presented?	Yes	BIA Appendix G.
Does the geotechnical interpretation include information on retaining wall design?	No	
Are reports on other investigations required by screening and scoping presented?	No	Arboricultural Report.
Are the baseline conditions described, based on the GSD?	Yes	BIA Section 3.
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	BIA Section 4.
Are estimates of ground movement and structural impact presented?	Yes	A preliminary calculation based on assumed movement has been prepared (BIA Appendix F). A detailed GMA needs to be undertaken and submitted for review.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Justification of building damage assessment required and outline calculations for retaining walls and slabs.
Has the need for monitoring during construction been considered?	Yes	BIA Section 8.
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?	No	Neither a GMA nor structural design calculations have been presented.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	BIA Sections 3 & 4.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	BIA Sections 3 & 4.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Conclusion based on assumed movement. A detailed GMA has not been presented.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Lyons O'Neill and the individuals concerned in its production have suitable qualifications.

4.2. Neither a Structural Strategy Report (SSR) nor structural design calculations have been included in the BIA. Annotated sketches outlining the construction methodology have been presented in BIA Appendix C. In addition, BIA Section 10 briefly describes the sequence of the proposed basement construction works. It is worth noting that the BIA indicates that the Contractor is "to submit an overall Method Statement" prior to commencement of site works together with "detailed drawings and calculations" which would include a ground movement assessment due to excavation, underpinning and piling.

4.3. The Design and Access Statement identified that the property "is not listed and is not located within a Conservation Area". This has also been confirmed by LBC in the BIA Audit Instruction.

4.4. The proposed basement consists of a single storey construction formed by "enlarging the existing basement to provide two additional units" according to the Design and Access Statement. The construction of the basement is proposed to comprise underpinning, using traditional "hit and miss" methodology, of the party wall and internal load-bearing walls. Concrete liner walls in combination with a contiguous piled wall are proposed elsewhere. The construction techniques are well established and suitable for the scheme.

4.5. The BIA has identified that the new basement will be founded at approximately 3.2 m bgl in London Clay which underlies Made Ground. The depth of the Made Ground varies from 0.1m to 2.7m according to the soil investigation based on 1 no. borehole, 2 no. window samples and 5 no. hand-dug trial pits.

4.6. The BIA presents groundwater monitoring data which indicates the presence of a "shallow water table" potentially due to perched water or surface infiltration sources. The report acknowledges that allowance should be made for dewatering during the construction of the basement and proposes that "intermittent pumping" from collector sumps is considered. In addition, the BIA proposes that the basement design incorporates waterproofing measures in the permanent condition.

4.7. The BIA has determined that the clay soils encountered at the site are of high volume change potential. The same report goes to conclude that no specific precautions should be considered due to the distance between the existing trees and basement foundations. The BIA indicates that an Arboriculturalist Report, which will determine the tree root protection areas, is anticipated to be prepared. Confirmation of the absence of any impact is required.

4.8. The BIA has given consideration to the potential heave uplift that may occur upon basement excavation. Heave protective measures, in the form of compressible material placed beneath the ground bearing slab, are recommended in the BIA, however no details of the recommended measures have been indicated.

4.9. Brief calculations of the potential movement of the neighbouring property, that may occur during the excavation of the basement, have been included in the BIA. These have been prepared based on assumed vertical and horizontal deflections. The BIA states that "revised values for deflections may be used during the detailed design stage". A full Ground Movement Assessment (GMA) which would determine the category and extent of potential damage to neighbouring properties has not been included in the BIA. In addition, it is to be confirmed whether or not the neighbouring building has an existing basement. It is likely that there is a basement, of size similar to the existing at 48 Shoot-up Hill, at no. 46 Shoot-up Hill according to the BIA. Justification of the assumed ground movements is required and confirmation that any revised assessment prepared during detailed design will not result in any greater damage.

4.10. The BIA proposes that a movement monitoring strategy is adopted during both excavation and construction works. An outline of the strategy and mitigating measures, which are suitable for this scheme, are detailed in the BIA.

4.11. The BIA states that contaminated soil was encountered during the site investigation. It also recommends that "allowance should be made for experienced verification of the excavation/remedial works by a geo-environmental engineer". The report also advises that soil remediation may be required as well as the provision of a hydrocarbon resistance vapour membrane within the floor slab construction.

4.12. Despite the site not being located within risk areas of surface or ground water flooding, anti-flood measures, in the form of non-return valves fitted to the basement drainage scheme, may be required to protect the basement from flooding due to local sewers operating under surcharge.

4.13. It can be concluded that the site is not located within flood risk areas based on the maps found in Camden SFRA 2014, although the BIA has not shown any maps of surface water or ground water flood risk areas. The BIA states that the scheme will not have an adverse impact on the overall site hydrogeology due to the "local falls in the local topography, low to negligible hydraulic gradient and the very low/impermeable nature of the underlying clay materials".

4.14. It is accepted that there are no slope stability concerns regarding the proposed development

5.0 CONCLUSIONS

5.1. The BIA has been carried out by Lyons O'Neill using individuals who possess suitable qualifications. Queries and requests for further information are discussed in Section 5 and summarised in Appendix 2.

5.2. A comprehensive SSR has not been included in the BIA, although an outline of the construction sequence has been presented in the form of annotated sketches and brief explanatory text. No structural design calculations have been included in the BIA and these are required.

5.3. The BIA has confirmed that the property is not listed nor it is located within a Conservation Area.

5.4. The BIA has confirmed that the proposed basement will be founded within Made Ground and its foundations will be deepened to encounter the London Clay below.

5.5. It is possible that ground water may be encountered during basement foundation excavation and the BIA makes proposals for dewatering measures. The potential loss of fine soil particles will need to be taken into account should dewatering be employed.

5.6. The BIA concludes that no special precautions are required for foundation design although the London Clay found at the site is classed as high volume change Potential. It is recommended that the existing trees protection areas are identified and considered during basement excavation. The absence of any impact requires confirmation.

5.7. The proposed structural solutions and methodology for the construction of the basement are suitable for this scheme.

5.8. It is recommended that the party wall foundations are exposed prior to commencement of any basement construction works.

5.9. It is to be confirmed whether or not the neighbouring property has a basement. Justification of the GMA to show the anticipated structural movements and associated potential damage during basement construction is required, with confirmation that the detailed design will not result in a greater level of damage.

5.10. Proposals for a movement monitoring strategy, during and post basement construction, have been included in the BIA and these should be implemented.

5.11. Anti-flood measures incorporated into the basement drainage scheme to prevent potential flooding due to local sewers operating under surcharge should be described.

5.12. It is accepted that the surrounding slopes to the development site are stable.

5.13. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding.

5.14. Queries and requests for further information are discussed in Section 5 and summarised in Appendix 2.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Justification of GMA to be submitted for review	Open	
2	Stability	Design calculations to show adequacy of proposed structural solutions (concrete walls, ground bearing slab, capping beam etc.) to be prepared and submitted for review.	Open	
3	Stability	Arboricultural report to be finalised and submitted for review	Open	

Appendix 3: Supplementary Supporting Documents

None

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