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Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12336-44
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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 Whitestone House, London NW3 1EA (planning reference 2015/2645/P). The basement is considered to fall within Category C 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 the substantial demolition of the existing property, to be rebuilt with extensions to the existing footprint to the side and rear, and the construction of a single level of basement beneath an existing lower ground floor and beneath part of the rear garden. The basement will primarily be formed at 6.50m below ground level with a small section related to a new swimming pool extending to 8.00m bgl.

1.5. The proposed development lies within a Conservation Area and is adjacent to, and shares a Party Wall with, a Grade II listed building, Gangmoor.

1.6. The BIA has been prepared by Geotechnical and Environmental Associates Ltd. The authors' qualifications are in accordance with LBC's requirements.

1.7. A desk study broadly in accordance with the GSD Appendix G1 has been provided. In the revised submission, the appendices have been provided for review.

1.8. An adequate ground investigation has been undertaken and an interpretation provided. In the revised submission additional ground investigation data is presented and references to BH3 and BH4 have been clarified.

1.9. Outline structural proposals have been prepared, including construction sequence, temporary works requirements and recommendations for contractors in regards to dealing with perched groundwater. In the revised submission a preliminary ground movement assessment has been presented. The BIA states that temporary propping arrangements will be provided by the structural engineer prior to construction, and they have not been included in the BIA.

1.10. In the revised submission a ground movement assessment is presented, including an impact assessment in line with the Burland Scale, along with an identified zone of influence of the proposed development.

1.11. The BIA discusses the requirement for survey and monitoring of nearby structures during construction. For structures along the Party Wall, the monitoring should be agreed under the Party Wall Act.

1.12. Additional monitoring has been undertaken and presented in the revised BIA submission and it is considered unlikely that winter groundwater levels would create additional impacts. However longer term monitoring is recommended leading up to / during the construction period, in line with best practice.

1.13. It is accepted that the proposed development will have negligible impact on slope stability provided that the Contractor follows best practice and the recommendations of the Structural Engineer.

1.14. A surface flow and flooding assessment has been carried out, and the original BIA states that it should not be relied upon until assessed by an appropriately qualified engineer. This section appears to have been completed comprehensively and the author's qualifications appear adequate. This statement has been removed in the revised BIA submission.

1.15. It is accepted that the proposed development will not impact upon slope stability or land stability.

1.16. It is accepted that the proposed development will not impact upon the wider hydrological or hydrogeological environments.

1.17. Queries and matters that have been clarified in the revised BIA submission, and further recommendations, are summarised in Appendix 2.

1.18. The revised BIA submission meets the criteria contained in CPG4 and DP27.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 7th April 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Whitestone House, London NW3 1EA, Camden Reference 2015/2645/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: "*Substantial demolition and rebuild of existing four storey dwellinghouse and excavation of single storey basement for additional car parking and swimming pool. Erection of single storey enclosure to house car lift at ground floor level. Installation of three dormer windows to front roofslope*".

2.6. CampbellReith accessed LBC's Planning Portal on 22 April 2016 and gained access to the following relevant documents for audit purposes:

- Desk Study & Basement Impact Assessment (ref J14136, Issue 1) dated 20 October 2014 by Geotechnical & Environmental Associates Limited.
- Basement Impact Assessment Structural Proposals & Suggested Construction Sequence including Appendix A (Existing Engineering Drawings) and Appendix B (Proposed Structural Scheme Drawings and Outline Construction Sketches) (ref 140050/KH/TA, Revision P1) dated February 2015 by Alan Conisbee and Associates Limited.
- Location Plan, Site Layout Plan, Existing Plans and Elevations, Proposed Plans and Sections, Basement Car Park Sketch, Demolition Plans dated between 6 July 2013 and 26 November 2015 by Bentheim Design and Jonathan Freegard Architects.
- Design and Access Statement dated April 2015 by Bentheim Design and Jonathan Freegard Architects.
- Construction Management and Logistics Plan dated April 2015 by Jonathan Freegard Architects.
- Aboricultural Impact Assessment Report and Outline Method Statement (ref JFA/WSH/AIM/01) dated 15th July 2014 by Landmark Trees Ltd.
- Relevant correspondence with interested parties provided by LBC (as per Appendix 1).

2.7. Subsequent to the issue of the initial audit report, CampbellReith was provided the following document on 27 July 2016 for audit purposes:

- Desk Study & Basement Impact Assessment (ref J14136, Issue 3, Final (Revised)) dated 22 July 2016 by Geotechnical & Environmental Associates Limited.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The author's qualifications are in accordance with CPG4 guidelines for all sections.
Is data required by Cl.233 of the GSD presented?	Yes	A desk study broadly in line with the GSD Appendix G1 has been provided. In the revised BIA submission the appendices have been provided for review.
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	Provided in the revised BIA submission.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Provided in the revised BIA submission.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Updated in the revised BIA submission.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Updated in the revised BIA submission.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Updated in the revised BIA submission.
Is a conceptual model presented?	Yes	

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Updated in the revised BIA submission.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Updated in the revised BIA submission.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Updated in the revised BIA submission.
Is factual ground investigation data provided?	Yes	Updated in the revised BIA submission.
Is monitoring data presented?	Yes	However, the monitoring was undertaken in summer and longer term monitoring over the winter months should be undertaken. References to BH3 and BH4 are clarified in the revised BIA submission.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	A single level basement is indicated to be present in the nearby property Bell Moor. Lower ground floors are indicated in the adjoining Gangmoor and The Cottage.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	Indicative 350 – 400mm diameter retaining wall contiguous piles are assumed in the BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	Provided in the revised BIA submission.

Item	Yes/No/NA	Comment
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Single level basements / lower ground floors indicated in adjacent properties.
Is an Impact Assessment provided?	Yes	It should be noted that if long term groundwater monitoring indicates interaction with the basement then the impact assessment will need to be revised, although this is considered unlikely.
Are estimates of ground movement and structural impact presented?	Yes	Provided in the revised BIA submission.
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?	Yes	Updated in the revised BIA submission.
Has the need for monitoring during construction been considered?	Yes	Movement monitoring is discussed and recommended.
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	Provided in the revised BIA submission.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The proposed basement is largely beneath current areas of hardstanding and additional run-off should not be expected. SUDS including attenuation tanks are proposed.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Updated in the revised BIA submission.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Provided in the revised BIA submission.
Are non-technical summaries provided?	Yes	Not specifically titled as such, but sufficient summary information is provided.

4.0 DISCUSSION

4.1. The BIA has been prepared by Geotechnical and Environmental Associates Ltd. The authors' qualifications are in accordance with LBC's requirements.

4.2. A desk study broadly in accordance with the GSD Appendix G1 has been provided for the proposed development. In the revised BIA submission, the appendices have been presented.

4.3. An adequate ground investigation has been undertaken. In the revised BIA submission additional ground investigation is presented and references to BH3 and BH4 are clarified. A geotechnical interpretation and a conceptual model are presented.

4.4. The BIA indicates that the proposed basement construction will utilise bored pile retaining walls and localised traditional underpinning techniques. In the revised BIA submission a ground movement assessment is presented. The BIA states that temporary propping arrangements will be provided by the structural engineer prior to construction, and they have not been included in the BIA.

4.5. The proposed development is sited below what is currently developed or covered by hardstanding. As such the impermeable site area is unlikely to significantly change and consequently surface flow and flooding impacts will be negligible. The BIA recommends attenuation tanks and SUDS in line with current guidance to further mitigate potential impacts.

4.6. The proposed development is on the crest of an approximately 26° slope down to Hampstead Heath and the Vale of Health beyond. The excavation / construction will not alter the slope profile, nor will it impact existing tree and vegetation cover along the crest of the slope. The building loads will be transferred to deeper foundations, including piles, which should reduce any surcharge / lateral load on the slope itself and improve long-term stability of the slope.

4.7. The proposed development is within the catchment area of the pond chains on Hampstead Heath, and the closest pond, Whitestone Pond, is within 60m of the site. The groundwater level has been monitored during summer months at below the proposed basement slab level. Additional groundwater monitoring data is presented in the revised BIA, again during summer months.

4.8. Perched water was identified in one of the boreholes. In the revised BIA submission, additional monitoring confirms this perched water is no longer present and has been attributed to a leaking utility that has now been repaired. The BIA provides recommendations for longer term groundwater monitoring and that the contractor undertakes trial excavations and plans for contingency sump pumping as part of the temporary works. It is currently stated that the basement will not impact the wider hydrogeological environment and it is accepted that winter

groundwater levels are unlikely to cause additional impacts. However, should longer term groundwater monitoring indicate interaction with the proposed basement then the impact assessment will need to be revised.

4.9. A surface flow and flooding assessment has been carried out, but the BIA states that it should not be relied upon until assessed by an appropriately qualified engineer. This section appears to have been completed comprehensively and the author's qualifications appear adequate. This statement has been removed in the revised BIA submission and the assessment is considered acceptable.

4.10. The original BIA did not present a ground movement assessment (GMA). In the revised submission a ground movement assessment is presented, including an impact assessment in line with the Burland Scale, along with an identified zone of influence of the proposed development. Damage impact to surrounding structures is assessed as Category 0 – 1 (Negligible to Very Slight). Within the subject property, the damage impact is assessed for various parts of the structure as Category 0 – 2 (Negligible to Slight).

4.11. The revised BIA submission provides additional clarity on site development levels.

4.12. Outline structural information is provided and the BIA and GMA assumes basement retaining walls will be 350 – 400mm diameter. Prior to construction, sufficient bored pile wall information should be provided to confirm these assumptions are correct. Similarly, a preliminary methodology, sequence and temporary propping arrangement should be provided in relation to the proposed underpinning works.

4.13. There will be a requirement for survey and monitoring of nearby structures during construction. Monitoring during construction is discussed and recommended within the BIA. The revised BIA submission presents a GMA which includes contour plots indicating the zone of influence. During construction, structures within that zone should be monitored in line with recommendations of the Structural Engineer. For structures along the Party Wall, the monitoring should be agreed under the Party Wall Act.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by Geotechnical and Environmental Associates Ltd. The authors' qualifications are in accordance with LBC's requirements.

5.2. A desk study has been provided for the proposed development. In the revised submission, the appendices have been provided for review.

5.3. In the revised BIA submission, inconsistent references to BH3 and BH4 are clarified, and additional ground investigation data is presented. A geotechnical interpretation and a conceptual model are presented.

5.4. Longer term groundwater monitoring over winter months should be undertaken. Should this indicate interaction with the proposed basement then the impact assessment will need to be revised, although this is considered to be unlikely.

5.5. The BIA indicates that the proposed basement construction will utilise bored pile retaining walls and localised traditional underpinning techniques. Outline structural information is provided and the BIA and GMA assumes basement retaining walls will be 350 – 400mm diameter. Prior to construction, sufficient bored pile wall information should be provided to confirm these assumptions are correct. Similarly, a preliminary methodology, sequence and temporary propping arrangement should be provided in relation to the proposed underpinning works.

5.6. The proposed development is within a conservation area and shares a Party Wall with a Grade II listed property, Gangmoor. In the revised BIA submission, a GMA is presented and damage impact to surrounding structures is assessed as Category 0 – 1 (Negligible to Very Slight). Within the subject property, the damage impact is assessed for various parts of the structure as Category 0 – 2 (Negligible to Slight).

5.7. There will be a requirement for survey and monitoring of nearby structures during construction. For structures along the Party Wall, the monitoring should be agreed under the Party Wall Act.

5.8. Since receiving the revised BIA submission, it is accepted that the proposed development will not impact upon slope stability or land stability.

5.9. Since receiving the revised BIA submission, it is accepted that the proposed development will not impact the wider hydrological or hydrogeological environments.

5.10. Queries and matters that have been clarified in the revised BIA submission, and further recommendations, are summarised in Appendix 2.

5.11. The revised BIA submission meets the criteria contained in CPG4 and DP27.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Solomons	Vale of Health Society	12/01/2016	Objection – multiple concerns as to the impact of the basement on the adjacent slopes and wider hydrogeology / hydrology.	Refer to section 4 of audit report.
Permutt	Bell Moor Management Company, NW3, 1DY	07/01/2016	Objection – adjacent building suffered water / flood damage and concern is that basement will create increased flood risk and structural damage to their own basement garage.	Refer to paragraphs 4.7-4.9 of audit report.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	The desk study appendices should be provided for review, including all historical map, Envirocheck and ground investigation information.	Provided in revised submission.	August 2016
2	BIA	References to BH3 / BH4 to be clarified, especially in regards groundwater monitoring.	Provided in revised submission.	August 2016
3	Hydrogeology	Longer term groundwater monitoring to be carried out, including over the winter months. Revise impact assessment if groundwater interacts with proposed basement.	Open - Additional groundwater monitoring has been undertaken, and this should be continued through the winter months. However, it is accepted that groundwater levels are unlikely to intercept the basement.	August 2016
4	Land Stability / Hydrogeology	Site development elevations should be presented clearly, with levels in the BIA text and Structural Proposals in agreement with levels presented on the drawings / sketches.	Updated in revised submission.	August 2016
5	Land Stability	Structural methodology should provide additional retaining wall information, such as a likely range of pile diameters, lengths and spacings. Similarly, a preliminary methodology, sequence and temporary propping arrangement should be provided in relation to the proposed underpinning works.	The assessments of the BIA and GMA are based on assumed retaining wall piles of 350 – 400mm diameter, and that stiff propping in line with best practise is provided. More detailed structural information and temporary works arrangements will need to be provided in advance of construction to confirm these assumptions are correct.	

6	Land Stability	Ground movement calculations should be provided for review. Nearby basements should be identified. A zone of influence should be identified. The presence of nearby Listed structures should be identified.	Provided in revised submission.	August 2016
7	Hydrology	The BIA should confirm that the assessment has been carried out by sufficiently experienced engineers or provide additional review by a suitable author.	Updated in revised submission.	August 2016

Appendix 3: Supplementary Supporting Documents

None

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