CampbellReith
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Heath House
North End Way
London, NW3 7ET

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-18
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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 Heath House, North End Way, London NW3 7ET (planning reference 2015/6280/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 prepared by JNP Group Consulting Engineers and includes documents prepared by STATS Limited in 2008. It is to be confirmed whether or not the qualifications of the individuals who prepared the documents in 2008 meet the LBC requirements.

1.5. It has been confirmed that the development site involves a Grade 2 listed building.

1.6. The proposal includes the conversion of the Heath House from single family dwelling to six self-contained residential apartments, a double storey extension to the west, extension of the existing garage to the south and a single level basement below the existing lower ground of the existing building. The proposal utilises an implemented planning consent granted in 2008. The principal change includes the larger garage to the south.

1.7. It is noted that the Planning Statement by Indigo states a single storey west extension while the architectural drawings show double storey extension.

1.8. The BIA has stated that the proposed basement will be founded in the medium dense to dense sand and gravels of the Bagshot Formation.

1.9. The ground investigation and subsequent water monitoring indicate the groundwater level to be at around 8m below existing ground level. The BIA has indicated that basement construction will have a negligible effect on groundwater levels, although further groundwater monitoring is recommended to confirm this.

1.10. It is accepted that there are no hydrogeological or hydrological concerns with respect to the development proposals.

1.11. The BIA states that the basement wall will be either mass concrete underpinning or contiguous piled walling with indicative details included in the Appendix 6. The BIA also states that the

basement will be designed and specified by competent Chartered Civil or Structural Engineers and that the design will be submitted in due course. There is no structural information such as loading estimation, adequacy of the bearing stratum, retaining wall and basement slab analysis, and structural impact assessment.

1.12. The Construction Management Plan includes a generic construction sequence. Details of the construction methodology of the basement walls are not available.

1.13. The BIA states that there will be no significant impact on the stability of the existing Grade II listed building as a result of the development but there is no justification. A Ground Movement Assessment and Damage Assessment of the existing building are not available. The BIA does not mention any plan or strategy to be adopted for monitoring the existing Grade II Listed building.

1.14. 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 28 January 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Heath House, North End Way, London NW3 7ET, Camden Reference 2015/6280/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 *"Conversion of existing single dwelling house to 6 self-contained residential units; erection of new west side wing comprising basement, lower ground, ground and first floors; erection of rear conservatory extension; remodelling roofs of main house and east side wing; excavation of front forecourt to provide basement level carpark; various external alterations and associated landscaping."* The Audit Instruction also confirmed the property is a listed building.

2.6. CampbellReith accessed LBC's Planning Portal on 10 February 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment dated 02 November 2015 by JNP Group.
- Environmental Study dated October 2007 by STATS Limited (Included in Appendix 4 of the BIA).
- Geotechnical and Geoenvironmental Investigation dated July 2008 by STATS (included in Appendix 5 of the BIA).
- Architect's General Arrangement Plans and Cross-Sections Planning Issue dated October 2015, Existing and Proposed, by Charlton Brown Architects.
- Planning Statement dated November 2015 by Indigo.
- Construction Management Plan undated by Consero London.
- Flood Risk Assessment dated 7 August 2015 by Consero London.
- Indicative Underpinning and Contiguous Piling Details (Included in Appendix 6 of the BIA).
- Landscape Design Statement dated September 2015 by ACD Landscape Architects.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Executive Summary Section.
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?	Yes	See BIA and Planning Statement.
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?	Yes	BIA Section 3.2. In Q13, the justification does not consider the existing building on the site.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 3.1.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 3.3.
Is a conceptual model presented?	Yes	Geotechnical & Geoenvironmental Report.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 4.2.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 4.1.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 4.3.
Is factual ground investigation data provided?	Yes	Geotechnical & Geoenvironmental Report Sections 3,4 and 5.
Is monitoring data presented?	Yes	Groundwater monitoring in the Geotechnical & Geoenvironmental Report Sections 4.2.
Is the ground investigation informed by a desk study?	Yes	Geotechnical & Geoenvironmental Report Section 2.2 and Environmental Study Report.
Has a site walkover been undertaken?	Yes	Environmental Study Report.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Section 3.2. The property is detached and quite distant from any other properties.
Is a geotechnical interpretation presented?	Yes	Geotechnical & Geoenvironmental Report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA Section 7.4.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation report.
Are baseline conditions described, based on the GSD?	No	No reference to the GSD.
Do the base line conditions consider adjacent or nearby basements?	Yes	

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA Section 6.
Are estimates of ground movement and structural impact presented?	No	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Justification of structural movement to the existing building is not available.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	The BIA Section states that the indicative details of the underpinning and contiguous piled walling have been previously approved under the previous planning permission and full detailed structural proposal would be submitted in due course.
Has the need for monitoring during construction been considered?	No	
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	Justification is not provided to support the conclusion in the BIA Section 6.2 on the stability of the existing building is not available.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
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 2?	No	
Are non-technical summaries provided?	Yes	BIA Section 5.2.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been prepared by JNP Group Consulting Engineers and consists of the main assessment report, prepared in November 2015, the Environmental Study prepared by STATS Limited in 2007, and the Geotechnical and Geo-environmental Report which was also prepared by STATS Limited in July 2008. The authors of the main assessment report have suitable engineering qualifications. However the details of qualifications of the individuals involved in the preparation of the Environmental Study and the Ground Investigation Report are unclear.

4.2. The development site consists of a Grade II Listed building. The proposal includes a double storey extension to the west, extension of the existing garage to the south and a single level basement below the existing lower ground of the existing building. The current scheme is an amendment to a previously consented scheme in 2008. The comparison drawings prepared by Charlton Brown Architects show that the primary changes, which may affect land stability, hydrogeology, and hydrology, are the extension of the car park to the south of the existing building and the change to the layout of the additional basement below the existing building.

4.3. Two phases of soils investigation have been undertaken to identify that the geology at the site consists of Made Ground, underlain by Bagshot Formation, underlain in turn by London Clay. The proposed basement is likely to be founded within the Bagshot Formation, which typically comprises medium dense to dense gravelly sand with safe bearing pressure of 150kN/m^2. The BIA does not include an estimation of loading or check of the adequacy of the bearing stratum.

4.4. It is accepted that the site is at the highest point on the cusp between Golders Green Pond Chain Catchment and Hampstead Pond Chain Catchment. It is noted that the site is in Flood Risk Zone 1, where land is assessed as having less than a 1 in 1000 annual probability of river or sea flooding, and is not identified as a street that flooded in either 1975 or 2002. Thus, flooding is highly unlikely.

4.5. It is noted that the proposal will not alter the existing proportion of hard surfaces and paved areas and, hence, the quantity of local rainfall entering the existing sewer system.

4.6. The BIA states that although the site is located directly above a Secondary A aquifer, the proposed basement will have no impact as the groundwater level is 18m below the existing ground levels. However, the groundwater monitoring results in the Geotechnical Report, Section 4.2, show that water, possibly perched water, was present at 8.42m but not at deeper level of borehole BH1. Water was also absent in boreholes BH3 and BH5 at the time of the monitoring visits. It is noted that the duration between the monitoring visits is short, the first one was on 23 April 2015 and the second one was on 30 April.

4.7. It is stated in the BIA that the retaining walls would be constructed by traditional hit and miss concrete underpinning or contiguous piled walling. There are indicative details in the Appendix 6 of the BIA but they are not clear. Structural proposals are not available. No design calculations, descriptive methodology of basement construction or indicative basement temporary works layout have been provided.

4.8. The Ground Movement Assessment and Damage Assessment of the existing Grade II Listed building are not available. There is no recommendation regarding a movement monitoring strategy.

4.9. The BIA Screening Stage identifies that trees are anticipated to be affected by the proposed development. The Scoping Stage refers to the Landscape Planning Strategy and Tree Protection Plan and states no further action is required. However, the Landscape Planning Strategy states that there are three Category "B" trees covered by a Tree Preservation Order and they are to be retained and protected during construction. This should be clarified.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by JNP Group Consulting Engineers. It is to be confirmed whether or not the BIA has benefited from the input of a charted geologist as required by CPG4.

5.2. The development site involves a Grade 2 listed building.

5.3. The proposed scheme is an amendment to a consented scheme in 2008. The primary changes are the extent of the lower ground to form a larger car park and the change to the layout of the proposed basement below the existing building.

5.4. The ground investigation and subsequent water monitoring indicates the groundwater level to be in excess of 18m below existing ground level and the BIA states that the proposed basement will have a negligible effect on groundwater levels. However, reference to the GI data shows that groundwater was recorded at around 8m below ground level. It is noted that the duration between groundwater monitoring visits was short. It is recommended that additional monitoring to be undertaken to confirm the groundwater level.

5.5. It is accepted that there are no hydrogeological or hydrological concerns with respect to the development proposals, although this should be confirmed once additional groundwater monitoring has been completed.

5.6. It is accepted that the risk of surface water flooding is low.

5.7. The BIA states that the basement wall will be either mass concrete underpinning or contiguous piled walling. There is no structural information such as loading estimation, adequacy of the bearing stratum, retaining wall and basement slab analysis, and structural impact assessment.

5.8. Details of the construction methodology of the basement walls are not available.

5.9. A Ground Movement and Damage Assessment of the existing building is not available. The BIA does not mention any plan or strategy to be adopted for monitoring the existing Grade II Listed building.

5.10. 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
Mayo	Redington Frognal Association		Effects of basement excavation on the Listed building.	See 4.7 – 4.8
Turner	Hampstead Hill Gardens		Underground excavation in unstable land	See 4.7 – 4.8
Harms		15 Dec 2015	Underground excavation in notoriously unstable Bagshot Sand and shifting gravel.	See 4.7 – 4.8
Hunger-Craig	Camden Town Hall, WC1 H9JE	11 Dec 2015	Effect of construction on protected trees.	See 4.9

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	Confirmation that qualifications of authors/ reviewers comply with requirements of CPG 4	Open, See 4.1	
2	Stability/hydrogeology	Confirmation of groundwater level and impact on hydrogeology	Open, See 4.6	
3	Stability	Structural Engineering Design Strategy and Construction Methodology	Open, See 4.7	
4	Stability	Ground Movement Analysis and Damage Assessment	Open, See 4.8	
5	Stability	Detailed movement monitoring scheme for the existing Listed building	Open, See 4.8	

Appendix 3: Supplementary Supporting Documents

None

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