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22 Holmes Road
London, NW5 3AB

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12985-66
Revision: F1

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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 (BIA) submitted as part of the Planning Submission documentation for 22 Holmes Road (planning reference 2019/2823/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 audit instruction also confirmed that the proposal does not involve any listed buildings.

1.5. The Basement Impact Assessment (BIA) has been undertaken by appropriately qualified authors.

1.6. The proposed scheme comprises the demolition of the former studio building and the rear off-shoot extension and the construction of two storey houses, with one storey basements.

1.7. A site investigation including groundwater monitoring has been undertaken indicating the formation level may be below groundwater level. The updated BIA includes consideration for mitigation measures.

1.8. Outline permanent and temporary structural works proposals are presented.

1.9. The updated BIA presents geotechnical interpretation, including parameters for retaining wall and foundation design.

1.10. A Ground Movement Assessment (GMA) has been presented as part of the updated BIA that anticipates that damage to neighbouring structures from ground movements will be within the limits of CPG Basements. A movement monitoring proposal has been also included in the BIA.

1.11. It is accepted that the site is in an area currently at very low risk of flooding from rivers, seas, groundwater and surface water. It's noted that Thames Water have requested a Condition of Planning in order to agree surface water and waste water discharge arrangements.

1.12. It is accepted there will be no impact to the wider hydrogeological environment and that the proposed basements raise no concern in relation to slope stability.

1.13. Discussion and requests for information are presented in Section 4 and summarised in Appendix 2. Considering the additional information provided, the BIA meets the requirements of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 25 June 2019 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 22 Holmes Road, London NW5 3AB (Reference: 2019/2823/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: Basements, 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan 2017: Policy A5 Basements.

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 *"Demolition of former studio building and existing side and rear extensions to 22 Holmes Road. Erection of 2 storey (with basement), 2 bedroom dwelling between no.22 and no.24, and 2 x 2 storey (with basement) 2 bedroom dwellings to rear of site with associated private amenity space and refuse/cycle storage. Erection of new 2 storey extension to rear of no.22."*

2.6. The audit instruction confirmed that the proposal does not involve any listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 07 August 2019 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA, Rev.1) by Stantec UK Ltd and Key GeoSolutions Ltd (report ref.:67109 R1 and 19-088-R-001) dated May and April 2019 respectively.
- Basement Structural Methodology by Osborne Edwards Ltd (19088/JO), dated July 2019.
- Norton Mayfield Architects Planning Application drawings including proposed and existing plans and sections.

2.8. The following additional information was submitted by the applicant in September and November 2019 and in February and March 2020 following CampbellReith's previous audit report:

- Norton Mayfield Architects updated Proposed Basement, Lower Ground Floor, Ground Floor and Sections drawings.
- Updated Basement Impact Assessment (BIA, Rev.06) by Stantec UK Ltd and Key GeoSolutions Ltd.
- Cross Sections Through Proposed Basement by Key GeoSolutions Ltd (19-088-D-001, Rev. 01).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Authors' qualifications are satisfactory.
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	
Are suitable plan/maps included?	Yes	Maps and plans are provided in the BIA.
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	Data sources are presented in the BIA. Justification is provided for 'No' answers.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Scoping is consistent with screening outcome.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As above.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	A drainage and waste water design should be agreed with Thames Water.
Is factual ground investigation data provided?	Yes	Key GeoSolutions Ground Investigation Report.
Is monitoring data presented?	Yes	Section 3 of the Stantec BIA.
Is the ground investigation informed by a desk study?	Yes	Section 4, 5 and 6 of the BIA.
Has a site walkover been undertaken?	Unknown	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Supporting information confirming basement locations have been submitted.
Is a geotechnical interpretation presented?	Yes	Updated versions of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	As above.
Are reports on other investigations required by screening and scoping presented?	Yes	Osborne Edwards Basement Structural Methodology.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	As above.
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	A Ground Movement Assessment (GMA) has been presented.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	BIA and Structural Report.
Has the need for monitoring during construction been considered?	Yes	Both groundwater and ground movement monitoring are proposed.
Have the residual (after mitigation) impacts been clearly identified?	Yes	The BIA states residual impacts to be negligible.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	A GMA has been presented, demonstrating the structural stability of the building and neighbouring properties.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	A drainage and waste water design should be agreed with Thames Water.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	No	Future amendments to the BIA should include non-technical summaries.

4.0 DISCUSSION

4.1. The individuals concerned with the production of the Basement Impact Assessment (BIA) hold suitable qualifications.

4.2. The site currently contains a semi-detached three-bedroom house fronting on to Holmes Road that is distributed over three storeys with a lower ground, upper ground and first floor level. At the rear of the property there is a large single storey building that was a studio, which is connected to the house through a rear off-shoot that sits at a level between the lower and upper ground floors of the main house.

4.3. The proposed scheme comprises the demolition of the former studio building and the rear off-shoot extension, and the construction of three new two-storey houses in their place and on the remainder of the external areas. It is also proposed to build a one-storey basement roughly underneath the footprint of each of the three new houses. The erection of new 2 storey extension to the rear of No. 22 Holmes Road is also proposed.

4.4. The BIA states that neighbouring buildings Nos.20 and 24-26 have existing lower ground floors at around 34.10m AOD. The proposed basement finished floor level is at 31.76m AOD.

4.5. A site investigation has been undertaken, proving Made Ground to a maximum depth of c. 0.90m bgl (c. 34.30m AOD). The London Clay Formation was intercepted underneath the Made Ground and proven to the bottom of the boreholes at 5.45m bgl. A foundation inspection pit was undertaken alongside the adjoining building, 24 Holmes Road, showing a concrete foundation at a depth of c. 0.90m bgl and bearing into London Clay.

4.6. Groundwater was not encountered during the site investigation. A rising head test was carried out and the water returned slowly, interpreted within the BIA to indicate low permeability and negligible flow potential.

4.7. During three monitoring visits after the investigation works, groundwater was monitored at depths of c. 0.85 and 4.55m bgl. A maximum excavation depth of 3.85m (31.35m OAD) is proposed. Both the structural report by Osborne Edwards Ltd and the updated version of the BIA suggest provision is made for the implementation of pumps to manage any groundwater ingress during the excavation in addition to groundwater monitoring.

4.8. The construction sequence proposed in the structural report indicates underpinning works will be undertaken after the demolition of the former studio and the off-shoot buildings. Underpinning is proposed along the western wall of the applicant's house, using a typical 'hit and miss' sequence. The remaining perimeter of the proposed basements will be constructed by installing contiguous piled retaining walls. It is understood that high level props will be installed

to provide support in the temporary case and that the basement slab will be supported by piled foundations.

4.9. A retaining wall is assumed to be present along the northern boundary, separating the site from Regis Road. The wall, believed to be located at the back of the studio, is approximately 1.00m high. A system of waling beams and props connected to thrust blocks is proposed to support the wall during construction. As the proposed finished floor level along the northern boundary will increase the difference in level with the road to c. 2.20m, the existing retaining wall will be removed in an underpinning sequence and a new, higher retaining wall will be installed. The wall will be a cantilever in the temporary condition.

4.10. The updated BIA presents a ground model and geotechnical parameters for all the strata intercepted during the ground investigation. Parameters for retaining wall and foundation design have been also presented.

4.11. A Ground Movement Assessment (GMA) has been presented as part of the updated BIA. The range of movements predicted are in line with expectations considering the scale, depth and construction methodologies to be adopted. A maximum of Category 1 damage (Very Slight), in accordance with the Burland Scale, is predicted for neighbouring structures.

4.12. A movement monitoring proposal has been included in Section 5.3 of Key GeoSolutions Ltd BIA describing target locations, frequency of monitoring and trigger levels. Monitoring should be implemented as proposed to control construction and ensure that damage impacts to do not exceed those predicted.

4.13. It is accepted the site is in an area currently at very low risk of flooding from rivers, seas, groundwater and surface water. The BIA states that there will not be any change in the hardstanding area proportion (100%) and that existing drainage arrangements will remain.

4.14. Thames Water has requested a Planning Condition in regard to surface water drainage, which they require to be attenuated in accordance with Policy, and waste water disposal. The drainage strategy and phasing strategy should be agreed with Thames Water.

4.15. It is accepted the proposed basement raises no concern in relation to slope stability.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been undertaken by appropriately qualified authors.

5.2. A site investigation including groundwater monitoring has been undertaken.

5.3. Outline permanent and temporary structural works proposals are presented.

5.4. The updated BIA presents a geotechnical interpretation, including parameters for retaining wall and foundation design.

5.5. A GMA has been presented. Damage impacts to neighbours are predicted to be a maximum of Category 1 (Very Slight).

5.6. A movement monitoring strategy is proposed. This should be implemented to ensure damage impacts do not exceed predicted limits.

5.7. It is accepted the site is in an area currently at very low risk of flooding from rivers, seas, groundwater and surface water.

5.8. It is noted that Thames Water have requested a Condition of Planning in order to agree surface water and waste water discharge arrangements.

5.9. It is accepted there will be no impact to the wider hydrogeological environment and that the proposed basement raises no concern in relation to slope stability.

5.10. Given the additional information requested provided, the BIA meets the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comment

Residents' Consultation Comments

Date	Name	Consultation Response	Comment
01/07/2019	Thames Water	- Insufficient existing combined waste water infrastructure to support development; - Drainage to be attenuated in line with the London Policy 5.13.	4.14

Appendix 2: Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Stability	Supporting information confirming neighbouring basements locations and dimensions should be provided.	Closed – see Section 4.4.	March 2020
2	Stability	The BIA should be updated including consideration for mitigation measures against groundwater ingress into the excavations, as described in the structural report.	Closed – see Section 4.7.	March 2020
3	Stability	The BIA should include a detailed ground model along with a geotechnical interpretation including geotechnical parameters for all the strata intercepted during the ground investigation.	Closed – see Section 4.10.	March 2020
4	Stability	A GMA should be presented in the BIA.	Closed – see Section 4.11.	March 2020

Appendix 3: Supplementary Supporting Documents

None

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