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16 Avenue Road
London, NW8 6BP

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-19
Revision: F1

January 2017

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	November 2016	Comment	GKajm12466-19-171116-16 Avenue Road-D1.docx	GK	CC	AJM
F1	January 2017	Planning	GKajm12466-19-030117-16 Avenue Road-F1.docx	GK	CC	AJM

Document Details

Last saved	03/01/2017 15:07
Path	GKajm12466-19-030117-16 Avenue Road-F1.docx
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Project Number	12466-19
Project Name	16 Avenue Road
Planning Reference	2016/5375/P

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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 16 Avenue Road, London NW8 6BP (planning reference 2016/5375/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 involves demolition of the existing structure, which includes a small basement, and construction of a residential house of three storeys with a basement across the full footprint of the house and extending beyond the house to the front and rear. A sub-basement level is also proposed, to accommodate the swimming pool and car lift system.

1.5. The BIA has been prepared by Fairhurst with supporting documents prepared by the Elliott Wood Partnership. The authors' qualifications are in accordance with the requirements of CPG4.

1.6. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.

1.7. The BIA states that the site lies directly on a designated non-aquifer, the London Clay and it is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.

1.8. The proposed development incorporates an attenuation SUDS scheme which reduces peak discharge flows by approximately 35% from existing levels. The scheme includes flood risk mitigation measures that benefit the development. The scheme offers benefit to the wider hydrological environment.

1.9. The adjacent street area of Avenue Road is classified as having a high surface water flood risk, although the site itself topographically higher and is classified as very low risk. Assuming the proposed waterproofing, attenuation SUDS and flood risk mitigation measures proposed are implemented, along with the recommendations given in the FRA, the proposed development is accepted as being of very low risk of flooding.

1.10. A site investigation is presented. The exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying a Made Ground and Head Deposits. Interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented.

1.11. Groundwater monitoring is presented and the BIA recommends more long term monitoring to be undertaken, combined with additional site investigation, prior to construction to assess potential perched water inflows during construction.

1.12. The BIA includes a GMA which assesses that ground movements will be minimal and that Damage Impact to structures within the proposed development's zone of influence will be Category 0 (Negligible) in accordance with the Burland Scale, with the exception of the existing garden wall on site where damage impact is assessed as Category 1 (Very Slight).

1.13. Control of construction activities to mitigate ground movements, including temporary works recommendations and an outline monitoring proposal, are presented in the BIA.

1.14. It is accepted that there are no land stability impacts related to slopes. It is accepted that there are no land or structural stability issues relating to the proposed development, assuming guidance presented within the BIA is followed, including provision of stiff propping and monitoring throughout the construction period, in accordance with best practise.

1.15. Queries and matters requiring further clarification are summarised in Appendix 2. Assuming that the works proceed in accordance with the recommendations presented 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 18 October 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 16 Avenue Road, London NW8 6BP, Camden Reference 2016/5375/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: "Erection of a two storey (plus basement and loft), 7 bed dwellinghouse (C3) and associated re-landscaping following the demolition of the existing house".

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

- Desk Study and Basement Impact Assessment (ref 116255/R1.1, Final) dated September 2016 by Fairhurst.

- Structural Engineering Report and Subterranean Construction Method Statement (ref 2160348, P3) dated September 2016 by the Elliott Wood Partnership.
- Flood Risk Assessment (ref 2160348, Rev P2) dated September 2016 by the Elliott Wood Partnership.
- Drainage Strategy and SUDS Statement (ref 2160348, Rev P2) dated September 2016 by the Elliott Wood Partnership.
- Site Location Plan, Existing Plans and Elevations, Proposed Plans and Elevations, Demolition Plans and Sections (ref 1611, Rev PL) dated September 2016 by Wolff Architects.
- 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?	Yes	BIA 2.4
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 plans/maps included?	Yes	BIA appendices
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 2.1, 3.0 and appendices
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA 2.1, 3.0 and appendices
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA 2.1, 3.0 and appendices
Is a conceptual model presented?	Yes	BIA 6.3.3 and Structural Engineering Report
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA 4.0

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA 4.0
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA 4.0, FRA. Attenuation SUDS proposed.
Is factual ground investigation data provided?	Yes	BIA 5.0, Appendix E
Is monitoring data presented?	Yes	BIA 5.3, Appendix E
Is the ground investigation informed by a desk study?	Yes	BIA 3.0, appendices
Has a site walkover been undertaken?	Yes	BIA 3.1
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA 3.1
Is a geotechnical interpretation presented?	Yes	BIA 6.3
Does the geotechnical interpretation include information on retaining wall design?	Yes	Structural Engineering Report
Are reports on other investigations required by screening and scoping presented?	Yes	FRA / SUDS
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	BIA 3.1
Is an Impact Assessment provided?	Yes	BIA 6.0

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	BIA 6.3
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	Temporary propping, monitoring, groundwater inflow assessments, Attenuation SUDS etc
Has the need for monitoring during construction been considered?	Yes	BIA 6.5
Have the residual (after mitigation) impacts been clearly identified?	Yes	BIA 6.1, 6.2, 6.5
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	BIA 6.4, Subject to confirmation of retaining wall design
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	BIA 6.1
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Subject to confirmation of retaining wall design
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	BIA 6.4
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The BIA has been prepared by Fairhurst with supporting documents prepared by the Elliott Wood Partnership. The authors' qualifications are in accordance with the requirements of CPG4.

4.2. The site investigation undertaken identifies the London Clay as the bearing formation for the proposed foundations, underlying Made Ground and Head Deposits.

4.3. The site investigation and BIA have been informed by a desk study broadly in accordance with the GSD Appendix G1.

4.4. Interpretative geotechnical information is presented, broadly in accordance with the GSD Appendix G3.

4.5. The site lies directly on a designated non-aquifer, the London Clay and it is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.

4.6. The proposed development results in an approximately 13% increase in impermeable area when compared to the existing site layout. However, the proposal incorporates an attenuation SUDS scheme which aims to meet targets set in the National Planning Policy Framework (NPPF). Current peak discharge rate from the site has been calculated as 7.36l/s and the scheme proposed reduces peak discharge flows by approximately 35% from existing levels to 4.86l/s, based on a 100 year + 40% (for climate change) return period storm event. The attenuation scheme will comprise underground modular storage units and a hydro-brake to restrict discharge flows.

4.7. In accordance with LB Camden's guidance, the basement roof slab extending beneath the rear garden will be covered by 1m of topsoil, to attenuate run-off and allow the development of mature vegetation. The scheme incorporates satisfactory pollution control measures and includes flood risk mitigation measures that benefit the development. The scheme offers benefit to the wider hydrological environment.

4.8. The adjacent street area of Avenue Road is classified as having a High surface water flood risk, due to periodic storm events surcharging the storm sewer network. The site itself is classified as very low risk. Taking into account that the topographic survey indicates the ground level to rise from road level to the front of the house by 500mm, and the waterproofing and attenuation SUDS flood risk mitigation measures proposed, the development is accepted as being of very low risk of flooding.

4.9. Groundwater monitoring is presented over a relatively short time period and the BIA recommends more long term monitoring to be undertaken prior to construction to assess

potential perched water inflows during construction. Mitigation in the form of dewatering is proposed in the temporary case. This is not detailed in the structural engineering report and the contractor should make suitable assessment and plans for contingency dewatering to control excavation / construction.

4.10. In the permanent case, RC liner walls will be constructed within the pile walls. Appropriate grade 3 waterproofing has been allowed for, including a drained cavity between the piled walls and the liner walls, and positive drainage from sumps.

4.11. The BIA confirms that full propping of the basement walls has been allowed for, both in the permanent and temporary conditions. Suitable analysis has been presented. The BIA includes a GMA which assesses that ground movements will be minimal and that Damage Impact to structures within the proposed development's zone of influence will be Category 0 (Negligible) in accordance with the Burland Scale.

4.12. Control of construction activities to mitigate ground movements, including temporary works recommendations and an outline monitoring proposal, are presented in the BIA.

4.13. It is accepted that there are no land stability impacts related to slopes. It is accepted that there are no land or structural stability issues relating to the proposed development, assuming guidance presented within the BIA is followed, including provision of stiff propping and monitoring throughout the construction period, in accordance with best practise.

5.0 CONCLUSIONS

5.1. The authors' qualifications are in accordance with the requirements of CPG4.

5.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.

5.3. It is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.

5.4. The proposed development incorporates an attenuation SUDS scheme which includes flood risk mitigation measures that benefit the development. The scheme offers benefit to the wider hydrological environment.

5.5. The proposed development is accepted as being of very low risk of flooding.

5.6. A site investigation and interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented.

5.7. Groundwater monitoring is presented and the BIA recommends more long term monitoring to be undertaken prior to construction to assess potential perched water inflows during construction. In the permanent case the development will incorporate grade 3 waterproofing systems.

5.8. The BIA includes a GMA which assesses that ground movements will be minimal and that Damage Impact to structures within the proposed development's zone of influence will be Category 0 (Negligible) in accordance with the Burland Scale, with the exception of the existing garden wall on site where damage impact is assessed as Category 1 (Very Slight).

5.9. Appropriate control of construction activities to mitigate ground movements, including temporary works recommendations and an outline monitoring proposal, are presented in the BIA.

5.10. It is accepted that there are no land stability impacts related to slopes. It is accepted that there are no land or structural stability issues relating to the proposed development, assuming guidance presented within the BIA is followed in accordance with best practise.

5.11. Queries and matters requiring further clarification are summarised in Appendix 2. Assuming that the works proceed in accordance with the recommendations presented the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Groundwater	In accordance with the BIA's own recommendations, long term groundwater monitoring should be undertaken to confirm inflow rates prior to construction.	Ongoing – to be reviewed by the Engineer prior to construction.	N/A
2	Land Stability	Prior to construction the Engineer should review and approve detailed contingency dewatering proposals to be implemented by the Contractor to control excavation / construction.	Ongoing – to be reviewed by the Engineer prior to construction.	N/A

Appendix 3: Supplementary Supporting Documents

None

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