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16 Rosecroft Avenue, London, NW3 7QB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12727-99

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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 Rosecroft Avenue, London NW3 7QB (planning reference 2018/3211/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 site comprises a three-storey semi-detached residential property set in a slope with a lower ground floor garage. The proposed development comprises the excavation of a basement beneath the entire footprint of the ground floor including the construction of lightwells.

1.5. The BIA has been prepared by Ground & Water with supporting documents prepared by Vincent & Rymill. The authors qualifications are in accordance with LBC guidance.

1.6. A desk study broadly in accordance with LBC guidance is presented. Considering the level changes across the site, a conceptual model clearly indicating anticipated ground and groundwater conditions in relation to the proposed development should be presented.

1.7. The site investigation identified varying thickness of Made Ground underlain by the Bagshot Formation overlying the Claygate Member of the London Clay Formation.

1.8. The monitoring data suggests that the basement will encounter groundwater. Groundwater control measures are recommended by the BIA to ensure stability during construction. It is accepted that the proposed development will not impact the wider hydrogeological environment.

1.9. The proposed basement will be constructed at the same depth as the basement recently formed at the adjoining property, 14 Rosecroft Avenue. Structural calculations and retaining wall design are provided for review along with sequencing and propping information.

1.10. A Ground Movement Assessment (GMA) is presented that considers the movements relating to the proposed basement construction and the impacts to neighbouring structures. The assessment requires clarification, as detailed in Section 4.

1.11. The arboricultural report notes that the proposals require the removal of a tree. This requires assessment.

1.12. It is accepted that the site is at very low risk of flooding.

1.13. The development will increase the impermeable site area by approximately 34m^2 and the BIA indicates a SUDS strategy should be adopted. This strategy should be presented, to demonstrate that off-site discharge flows will be attenuated in accordance with LBC guidance.

1.14. An outline construction programme should be presented.

1.15. Non-technical summaries to be presented.

1.16. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. Until the additional information required has been presented, the BIA does not meet the criteria of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 13 August 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 16 Rosecroft Avenue, London NW3 7QB, Camden Reference 2018/3211/P. Existing and proposed drawings were uploaded on to Camden's website on 24 September 2018.

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
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The 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; 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 planning portal describes the proposal as: *"Excavation for a basement extension under the footprint of the building with front and rear light-wells, erection of a rear ground floor extension and minor alterations to the external façade all associated with the use as a residential dwelling (Class C3)."*

The site lies within Redington Frognal Conservation Area but the building is not a listed building. The property adjacent to the north of the site (18 Rosecroft Avenue) is a Grade II listed building.

2.6. CampbellReith accessed LBC's Planning Portal on 3 and 24 September 2018 and gained access to the following relevant documents for audit purposes:

- Ground Investigation and Basement Impact Assessment Report (ref GWPR2630 16 Rosecroft Avenue) dated July 2018 by Ground & Water Ltd.
- Structural design, Construction Sequence and Temporary Works (ref Issue 1) dated June 2018 by Vincent & Rymill.
- Drawings by 5D Architects Ltd dated June 2018: Plans for existing lower ground floor, ground floor, first floor, second floor and roof, sections and elevations and a site location plan
- Drawings by 5D Architects Ltd dated June and September 2018: Plans for proposed lower ground floor, ground floor, first floor, second floor, roof plan, sections and elevations.
- Tree survey, Arboricultural Impact Assessment and Tree protection plan (ref K71) dated 11th June 2018 by Martin Dobson Associates.
- Design and Access Statement, Rev A, dated 21 September 2018 (no author details).
- Construction Management Plan (ref Rev A) dated June 2018 by G&S Construction Engineering Limited.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
Is data required by Cl.233 of the GSD presented?	No	Outline construction programme to be presented. Exploratory hole locations and levels to be provided.
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	
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 Report, Section 3.1.1. Arboricultural report says a tree to be removed.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 3.1.1.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 3.1.1.

Item	Yes/No/NA	Comment
Is a conceptual model presented?	No	A ground model is described in text. Exploratory hole locations and levels to be provided. The conceptual model should indicate strata, groundwater, existing and proposed development levels, relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 3.2. However, removal of tree to be considered.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 3.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 3.2. However, SUDS strategy is recommended but not presented.
Is factual ground investigation data provided?	Yes	BIA Report, Sections 4 and 5. Exploratory hole locations and levels to be provided.
Is monitoring data presented?	Yes	BIA Report, Section 5.4.
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	The adjoining property (14 Rosecroft Avenue) has a recently developed basement which is at the same depth as the proposed basement at 16 Rosecroft Avenue. No. 18 was noted to not have an existing basement. It is not known whether No. 12 has a basement (BIA Report, Section 7.1).
Is a geotechnical interpretation presented?	Yes	BIA Report, Section 6.

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA Report, Section 7.4. Retaining wall design has not been provided.
Are reports on other investigations required by screening and scoping presented?	Yes	An Arboricultural Assessment is provided.
Are baseline conditions described, based on the GSD?	Yes	Conceptual model required to clarify groundconditions.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	BIA Report, Section 7.10.
Are estimates of ground movement and structural impact presented?	Yes	BIA Report, Section 7.6. However, GMA not accepted (see Section 4).
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	GMA to be clarified; SUDS strategy to be presented. Tree removal not considered.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	GMA to be clarified; SUDS strategy to be presented. Tree removal not considered.
Has the need for monitoring during construction been considered?	Yes	Appendix 4 of the Vincent & Rymill report.
Have the residual (after mitigation) impacts been clearly identified?	No	GMA to be clarified; SUDS strategy to be presented. Tree removal to be considered.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA to be clarified. Tree removal requires discussion.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	SUDS strategy to be presented.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	GMA to be clarified; SUDS strategy to be presented.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	GMA to be clarified; a maximum Damage Impact of Category 2 (Slight) indicated.
Are non-technical summaries provided?	No	Non-technical summaries to be presented.

4.0 DISCUSSION

4.1. The BIA has been prepared by Ground & Water with supporting documents provided by Vincent & Rymill. The authors' qualifications are in accordance with CPG guidelines.

4.2. The site comprises a three-storey semi-detached residential property set in a slope with a lower ground floor garage beneath the front of the site with a sloping concrete driveway. The proposed development comprises the excavation of a basement beneath the entire footprint of the ground floor including the construction of lightwells and a single storey rear extension. The basement will be excavated approximately 3.40m below existing ground floor level. The retaining wall foundations of the basement are to be formed approximately 2.00m below driveway level (floor level of front garage) and 4.20m below patio level (at the rear).

4.3. The site investigation and BIA have been informed by a desk study broadly in accordance with the GSD Appendices G1 and G2. However, the location plan and levels for the exploratory holes should be provided, and a conceptual model presented. Considering the changes in level across the site, the conceptual site model is required to clarify the proposals in relation to the ground and groundwater conditions and neighbouring structures.

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

4.5. The site investigation identified varying thickness of Made Ground underlain by the Bagshot Formation overlying the Claygate Member of the London Clay Formation. Groundwater was monitored on two occasions during May and June 2018. The highest groundwater level recorded was 3.70m bgl in WS2, stated to be located at the rear of the property. The proposed basement development is indicated to be at a depth of 4.20m below ground level (bgl) at this location and is likely to encounter groundwater. The BIA states that the structural design will need to take into account the potential for the retaining walls at the rear to encounter groundwater, to consider dewatering to safely facilitate the construction and consider the potential buoyancy effects of groundwater in final design.

4.6. It is recommended that seasonal groundwater levels should be considered and further monitoring undertaken, as required.

4.7. The BIA has identified that the assumed course of the 'lost' River Westbourne runs adjacent to the east of the site. In addition, historical maps indicated a pond in the southwestern corner of the site prior to the site's development, and a well 90m northwest (incorrectly identified as northeast in the BIA) of the site. However, considering the nature of the underlying and surrounding ground conditions, groundwater flow below and around the proposed basement is possible and it is accepted there will be no impact to the wider hydrogeological environment.

4.8. It is understood that the proposed basement will be constructed at the same depth as the basement recently formed at the adjoining property, 14 Rosecroft Avenue, and that the Party Wall between the properties is already underpinned, which will form the basement wall on that side of the development. Structural calculations and retaining wall design are provided for review along with sequencing and propping information.

4.9. A Ground Movement Assessment (GMA) is presented that considers the movements relating to the proposed basement construction and the effect on nearby properties, 18 and 12 Rosecroft Avenue. The GMA presents a range of calculated movements, based on variations in ground conditions and what it states to be 'conservative' to 'realistic' assumptions. The assessment presented is therefore unclear and requires further review and assessment, considering that:

- LBC guidelines require the BIA and associated / supporting assessment to be 'reasonably conservative'.
- The 'conservative' GMA indicates potential for Category 2 (Slight) damage (in accordance with the Burland Scale) to no. 18.
- The GMA assumes that all retaining walls will be stiffly propped at high level in both the temporary and permanent conditions. The structural information indicates that this is not the case for some of the retaining walls, notably some of the walls closest to no. 18.
- The assessed vertical movements within the GMA do not take into account the settlement of the foundations. A range of settlements is presented in the geotechnical interpretation, typically in excess of 20mm which is twice the vertical movements adopted within the GMA.
- Contour plots and an indicative zone of influence are not provided.
- It is accepted that the existing basement at 14 Rosecroft Avenue and the existing underpinned Party Wall are likely to ensure damage to 14 and 12 Rosecroft Avenue is negligible. However, impacts to 18 Rosecroft Avenue and the highway (and any utilities therein) require further assessment.
- A single 'reasonably conservative' assessment should be presented.

4.10. It is noted that structural monitoring during the works is proposed, including trigger levels which should control construction works to maintain damage to neighbouring structures within Category 1 (Very Slight). However, until the GMA is reviewed as 4.9, the feasibility of maintaining movements within those trigger levels has not been proven.

4.11. The arboricultural report notes that the proposals require the removal of a tree from the rear garden. This contradicts the BIA which states that no trees will be removed, clarification is required and the potential impact to surrounding properties requires to be addressed and any necessary mitigation measures described.

4.12. The current Environment Agency and Camden SFRA data indicate that the site is at "very low" risk of flooding from surface water. Rosecroft Avenue did not flood in 1975 or 2002, is not located within a Critical Drainage Area and is not in a flood risk area for reservoir flooding.

4.13. The development will increase the impermeable site area by approximately 34m^2 as part of the development. Section 7.9 of the BIA outlines potential SUDS options. However, no assessment of the impact of the change is made and no specific SUDS strategy is proposed to mitigate off-site surface water discharge flow in accordance with policy requirements. This should be presented. The final, detailed drainage design will require approval from LBC and Thames Water.

4.14. An outline construction programme should be presented.

4.15. Outline retaining wall calculations should be provided.

4.16. Non-technical summaries should be provided, in accordance with CPG Basements and Policy A5 (Basements).

5.0 CONCLUSIONS

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

5.2. A conceptual site model should be presented.

5.3. A site investigation and interpretative geotechnical information is presented.

5.4. Groundwater has been encountered on site and the proposed basement development is likely to encounter groundwater. There will be no impact to the wider hydrogeological environment.

5.5. A construction methodology, structural scheme and temporary works sequences are presented. The proposed basement will be constructed at the same depth as the basement recently formed at the adjacent 14 Rosecroft Avenue.

5.6. A Ground Movement Assessment (GMA) is presented but require further clarification, as detailed in Section 4.

5.7. An outline for structural monitoring is presented, which should be reviewed following submission of the revised GMA.

5.8. The impact of the removal of a tree from the rear garden requires consideration. Any necessary mitigation measures should be described.

5.9. It is accepted that the site is at very low risk of flooding.

5.10. The development will increase the impermeable site area by approximately 34m^2. An assessment of impact and provision of SUDS strategy suitable to mitigate the impact should be provided.

5.11. An outline construction programme should be presented.

5.12. Non-technical summaries should be presented.

5.13. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the additional information requested has been provided, the requirements of CPG Basements have not been met.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	An outline construction programme should be presented.	Open	
2	BIA	A conceptual site model clearly indicating anticipated ground / groundwater conditions in relation to the proposed development to be presented. Levels of the exploratory holes and a location plan to be provided.	Open	
3	BIA	Non-technical summaries to be presented.	Open	
4	Land Stability	GMA to be reviewed and clarified in accordance with comments in Section 4.	Open	
5	Land Stability	Impact assessment to be extended to include tree removal	Open	
6	Land Stability	Retaining wall design to be provided.	Open	
7	Hydrology	SUDS strategy sufficient to demonstrate that off-site discharge flows will be attenuated in accordance with LBC guidance to be presented.	Open	

Appendix 3: Supplementary Supporting Documents

None

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