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5 The Grove, London, N6 6JU

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-30
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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 5 The Grove, London, N6 6JU (planning reference 2021/4153/P & 2021/4931/L). 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 carried out by individuals who possess suitable qualifications as per CPG: Basements 2021. The Structural Engineering Report (SER) has been carried out by Constructure Ltd.

1.5. The proposed basement will extend the existing basement to the front of the property, below part of the existing front garden that comprises paving.

1.6. Desk study information and a screening assessment are presented.

1.7. It is accepted that the development will not have a significant impact on the hydrological or hydrogeological environment.

1.8. The revised BIA recommends that further groundwater monitoring and a trial excavation be undertaken to confirm design and temporary works parameters.

1.9. The basement will be built using a contiguous piled wall as well as reinforced concrete lined walls and slabs.

1.10. A ground movement assessment (GMA) has been undertaken and the damage assessment indicates Category 0 (Negligible) damage to neighbouring properties.

1.11. The SER recommends a movement monitoring strategy as part of the Party Wall agreement.

1.12. It is accepted that the surrounding slopes to the development site are stable.

1.13. Based on the revised submission it can be confirmed that the BIA complies with the requirements of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 7th December 2021 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 5 The Grove, London N6 6JU and Planning References 2021/4153/P & 2021/4931/L.

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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance (CPG): Basements. January 2021.
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Highgate Neighbourhood

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 *"Excavation of basement under front garden."*

The Audit Instruction confirmed 5 The Grove involved, and is a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 22/12/2021 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) by GEA Ltd, Revision 1, dated August 2021 (ref: J21179).
- Structural Engineering Report (SER) by Constructure Ltd, Revision P1, dated September 2021.

- Architects General Arrangement Plans & Sections existing by 31/44 Architects, dated August 2021.

  Location Plan.

  Existing Plans.

  Demolition Plans.

  Proposed Plans.

- Front Garden - Landscape Design Statement by Tom Stuart-Smith, Revision P01, dated August 2021, (ref: 381-L-X-911).
- Flood Risk Assessment by Hull Raiser Ltd, dated September 2021 (ref: 230821).
- Consultation Responses.

2.7. The following additional documents were provided to CampbellReith in response to the queries raised in the D1 audit and summarised in Appendix 2:

- Basement Impact Assessment Report (BIA) by GEA Ltd, Revision 2, dated February 2022 (ref: J21179).
- Structural Engineering Report (SER) by Constructure Ltd, Revision P2, dated February 2022.
- Utility Data.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Section 1.3.2 of BIA.
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	Depth of piling and presence or absence of adjacent basement to be confirmed.
Are suitable plan/maps included?	Yes	Enviro-check maps.
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	Section 3.1.2 of BIA. Presence of basements and shallow foundations for neighbouring properties clarified.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1.1 of BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1.3 of BIA.
Is a conceptual model presented?	Yes	Section 7.1 of BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.1 of BIA. Presence of basements and shallow foundations for neighbouring properties clarified.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.1 of BIA and discussed further in Section 10.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	Section 7.0 of BIA.
Is monitoring data presented?	No	Groundwater monitoring recommended in BIA.
Is the ground investigation informed by a desk study?	Yes	Section 2.0 of BIA.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Planning portal search indicate a lower ground floor/ basement.
Is a geotechnical interpretation presented?	Yes	Section 8.0 of BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 8.1.2 of BIA.
Are reports on other investigations required by screening and scoping presented?	No	The revised submission provides appropriate assessment to impermeable area.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Planning portal search indicate a lower ground floor/ basement.
Is an Impact Assessment provided?	Yes	Section 10.0 of BIA.
Are estimates of ground movement and structural impact presented?	Yes	Section 9.0 of BIA.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	The revised submission provides appropriate assessment.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	
Has the need for monitoring during construction been considered?	Yes	Considered in Section 5.1.1 of SER.
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	Geotechnical parameters, pile length and neighbouring foundation depths are confirmed.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Impermeable site area confirmed.
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	Section 9.5.1 of BIA.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by individuals who possess suitable qualifications as per CPG: Basements 2021.

4.2. The Structural Strategy Report (SER) has been carried out by Constructure Ltd.

4.3. The LBC Instruction to proceed with the audit identified that the basement proposal involved a listed building and was adjacent to listed buildings. The Design & Access Statement identified that 5 The Grove is located in the Highgate Conservation Area.

4.4. The proposed basement consists of extending the existing basement level beneath the front garden. The basement will extend to a depth of 4.00m below the ground level and excavation will be supported by a contiguous bored pile wall.

4.5. Desk study information and a screening assessment are presented.

4.6. The screening assessment states that the proposed basement extends below the existing front garden, which currently comprises impermeable paving. The proposed basement will therefore not result in an increase in impermeable surfacing. It is accepted that the development will not significantly impact the hydrological environment.

4.7. Section 2.3 of the revised BIA provides evidence as to the presence of basements/ lower ground floor within No.s 4 and 6 The Grove. A depth of 2.45m bgl has been considered in the damage assessment for both properties and is considered appropriate.

4.8. A site investigation confirms that the ground conditions comprise of Made Ground to c.0.80m below ground level (bgl), underlain by 14.20m of Bagshot Formation and followed by the Claygate Member to depth. Groundwater was encountered during the investigation within the Bagshot Formation at depths of 6.00m bgl at the rear of the site and 12.00m bgl at the front garden. It is confirmed the basement will be founded within the Bagshot formation.

4.9. The screening assessment for hydrogeology identifies the Bagshot Formation as a Secondary A Aquifer. Given the depth of groundwater encountered during the investigation, and the referenced depth of groundwater from nearby investigations, it is accepted that there should be no impact to the hydrogeological environment. However, the BIA recommends a trial excavation of the full basement excavation depth, as well as groundwater monitoring, to be carried out to confirm the depth of groundwater and inform the temporary works design, which should be implemented.

4.10. The SER includes proposed construction methodology and the sequence of construction. The proposed development will include the construction of a contiguous pile wall capable of sustaining vertical loads in the permanent condition and lateral loads in the temporary condition, as well as the casting of the capping beam and the installation of RC liner walls and slabs at basement and ground level to provide permanent props.

4.11. The length of the proposed piles is confirmed within the SER to be 11m. This pile length has been used in the ground movement assessment (GMA).

4.12. A GMA is undertaken in Section 9.0 of the revised BIA. The geotechnical parameters have been reviewed and the relationships for Young's modulus are now taken as E_u = 500cu and E' = 300cu for cohesive soils. This correlation is considered to meet the requirement of the BIA to use cautious or moderately conservative engineering values.

4.13. A revised PDisp assessment is undertaken to calculate heave in the short term and long term using the above revised Young's modulus values.

4.14. The GMA utilises XDisp and CIRIA C760 movement curves for excavation in front of stiff clay and installation of a contiguous bored pile in stiff clay, to predict ground movements due to excavation and installation of the retaining walls and excavation of the basement, resulting in vertical movement of 8mm and horizontal movement of 13mm.

4.15. The GMA predicts damage to the neighbouring properties to be Category 0 (Negligible) in accordance with the Burland scale.

4.16. A utility survey plan is provided as part of the revised submission and assessment of utilities are undertaken in Section 9.6 of the BIA. This audit considers the GMA for neighbouring buildings only and the owners of the utilities may require separate assessment to satisfy their requirements.

4.17. The SER suggests that movement monitoring targets be applied to No. 6 The Grove. As part of the Party wall agreement, a movement monitoring strategy will be confirmed.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by individuals who possess suitable qualifications.

5.2. The proposal is to extend the existing basement level beneath the front garden.

5.3. The front garden comprises of impermeable paving and no change is proposed, therefore it is accepted that there will be no significant impact to hydrological environment.

5.4. Desk Study and a utility plan survey is provided.

5.5. A site investigation confirms that the proposed basement would be built within the Bagshot Formation.

5.6. Groundwater monitoring is recommended in the revised BIA to confirm design and temporary works parameters. A trial excavation would be required to the proposed depth and additional groundwater monitoring undertaken. It is accepted that there should be no impact to the hydrogeological environment.

5.7. The basement will be built with a contiguous piled wall as well as reinforced concrete lined walls and slabs.

5.8. A ground movement assessment (GMA) has been undertaken. Damage assessments indicate damage to be within Category 0 (Negligible) of the Burland Scale.

5.9. Clarification has been provided on the assumed foundation depths of the neighbouring properties, the depth of piling and geotechnical parameters adopted in the analysis.

5.10. The SER recommends a movement monitoring strategy as part of the Party Wall agreement.

5.11. It is accepted that the surrounding slopes to the development site are stable.

5.12. Based on the revised submission it can be confirmed that the BIA complies with the requirements of CPG Basements.

Appendix 1: Consultation Responses

Residents' Consultation Comments

Issues relevant to the GMA are addressed below.

Surname	Address	Date	Issue raised	Response
Janet Jones	10A South Grove. Highgate	21/10/2021	Damage to neighbouring properties	Ground movement Assessment undertaken has proved the damage to neighbouring properties would be within Category 0 (Negligible) of the Burland Scale.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Description of proposed works location to be consistent with application documents / drawings.	Closed	12/03/22
2	Hydrology	Changes to impermeable site area to be confirmed with assessment provided, as required, to demonstrate there will be no impact to the hydrological environment.	Closed	12/03/22
3	Land Stability	Depth of neighbouring foundations to be confirmed and stated / adopted consistently through BIA. If neighbouring basements are present, comment on potential cumulative impacts should be made.	Closed	12/03/22
4	Land Stability	Review of geotechnical parameters is required, as discussed in Section 4.	Closed	12/03/22
5	Land Stability	Depth of proposed piling to be stated within SER and confirmed to be adopted within the GMA.	Closed	12/03/22
6	Land Stability	GMA to be updated considering comments on geotechnical parameters, length of piles and depth to neighbouring foundations, to include full input / output of calculations.	Closed	12/03/22

Appendix 3: Supplementary Supporting Documents

None

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