CampbellReith
consulting engineers

18 Grove Terrace
London NW5 1PH

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-68

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 submitted as part of the Planning Submission documentation for 18 Grove Terrace, London NW5 1PH (planning reference 2017/1726/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. This information did not include a Basement Impact Assessment (BIA). Following communication with Camden Borough Council a BIA was provided by email on 20th April 2017.

1.4. The proposed development includes lowering and making habitable of the basement level beneath the front garden by 0.45m from existing basement level and a circular stairwell at the rear of the property providing access to the basement. The property is grade II* listed and within the Dartmouth Park Conservation Area.

1.5. A BIA Report has been provided for review. The BIA prepared by Lyons O'Neill Structural Engineers includes a previous BIA and Site Investigation Report prepared by Southern Testing. The authors' / reviewers' qualifications are in accordance with LBC guidance.

1.6. Desk study information within the BIA is broadly in line with aspects recommended in the LBC guidance. The information presented is accepted as sufficient.

1.7. Geotechnical investigation and monitoring information has been provided at the rear of the site, indicating Made Ground overlying London Clay and a perched water table in the Made Ground at 1.35m depth. Ground conditions at the front of the property have also been provided.

1.8. It is proposed to construct the development using underpinning methods, typically of less than 1.5m in depth at the front of the property. Two foundation inspection pit logs confirm the depth of the Party Walls on both sides at the front of the property.

1.9. It is stated that all foundations will be placed within stiff London Clay. Outline geotechnical parameters and a construction methodology, including temporary propping arrangements, have been presented. Outline retaining wall calculations have been provided.

1.10. It is accepted that ground movements generated by shallow underpinning should be minimal, assuming a good standard of workmanship. A ground movement and damage impact

assessment have been presented. It is accepted that the proposed works should cause damage of a maximum of Burland Category 1 to the existing structure and neighbouring structures.

1.11. It is accepted there is no change to the impermeable site area

1.12. Due to the extent of the proposed works in the rear garden, it is accepted that the fruit trees are unlikely to be affected by the proposed works. The presence of vegetation is therefore unlikely to generate ground movements within the proposed development.

1.13. A conceptual site model has been presented.

1.14. An outline construction programme has been provided.

1.15. It is accepted that there are no land stability impacts caused by slopes.

1.16. It is accepted that the proposed development will not impact the wider hydrogeological environment.

1.17. It is accepted that the proposed development is at a low risk of flooding.

1.18. Non-technical summaries have been provided with any updates to the BIA.

1.19. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. The BIA meets the criteria of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 21st March 2016 to carry out a Category B Audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 18 Grove Terrace, London, NW5 1PH, Camden Reference 2017/1726/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.

The BIA should demonstrate that schemes:

- maintain the structural stability of the building and neighbouring properties;
- avoid adversely affecting drainage and run off or causing other damage to the water environment;
- 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.

LBC's Audit Instruction described the planning proposal as: "*Reduce floor and make habitable existing 2no. front vaults; formation of an enlarged light well and new access stair from basement and ground floor levels; vaulting of roof void to 3rd floor rooms; install 2no. conservation rooflights to rear elevation roof; enlarge existing opening at first floor between front and rear room; installation of new kitchen and bathroom/shower rooms; refurbishment of historic features*."

2.4. CampbellReith were provided the following documents in an email from Camden Borough Council on 20th April 2017 for audit purposes:

- Basement Impact Assessment and Site Investigation Report – Project Reference: J11987, dated 28th October 2014 by Southern Testing.
- Basement Impact Assessment REV A – Job No. 15168, dated October 2016 by Lyons O'Neill Structural Engineers.
- Plans, Elevations and Sections dated September 2016 by Ian Adam-Smith Chartered Architects.
- Basement Condition Survey dated October 2014 by Archetype.
- Consultation response dated 6th April 2017.

2.5. CampbellReith received additional information from Camden Borough Council on 26th May 2017 in response to the D1 revision of this audit, as follows:

- Basement Wall Retaining Wall Calculation dated September 2016 by Lyons O'Neill Structural Engineers.
- 18 Grove Terrace Basement Impact Assessment Non-technical summaries dated May 2017 by Lyons O'Neill Structural Engineers.
- 18 Grove Terrace BIA Comments undated by unknown.

2.6. CampbellReith received additional information from Camden Borough Council on 23rd June 2017 in response to email queries from CampbellReith, as follows:

- 18 Grove Terrace Basement Impact Assessment Non-technical summaries REV A dated June 2017 by Lyons O'Neill Structural Engineers.

2.7. CampbellReith received additional information from Camden Borough Council on 10th August 2017 in response to email queries from CampbellReith, as follows:

- 18 Grove Terrace Basement Impact Assessment Trial Pits 1 and 2 dated August 2017 by Lyons O'Neill Structural Engineers.

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?	Yes	Contractor to finalise construction sequence during detailed design.
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	
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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	
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 foundation inspection pits confirm the foundation conditions beneath the Party Walls in the front and rear garden.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	NA	
Are the baseline conditions described, based on the GSD	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	See above, to be confirmed at the front.
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Impact Assessment for Grove Terrace should be undertaken at detailed design.
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	
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	
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?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. A BIA Report has been provided for review. The BIA prepared by Lyons O'Neill Structural Engineers includes a previous BIA and Site Investigation Report prepared by Southern Testing. The qualifications of the BIA authors / reviewers are in accordance with CPG4 Section 3.6.

4.2. The proposed development includes excavations in the existing basement and rear garden of the existing development. The rear garden excavation is adjacent to an existing lightwell to permit construction of a circular staircase providing access to the basement level and may be up to 2m depth. The excavation in the existing basement is to be underpinned on all four sides with localised excavation up to approximately 1.5m depth with a final floor lowering of 0.45m; the base of the underpins are likely to be approximately 5m below the level of Grove Terrace. The site is listed as Grade II and located in the Dartmouth Park Conservation Area. Comment is not provided on the listed status of neighbouring buildings that share Party Walls.

4.3. Desk study information within the BIA is broadly in line with aspects recommended in the GSD Appendix G1 and is accepted as sufficient. Existing basements have been identified in the front and rear of adjacent properties to No 19.

4.4. A site investigation has been undertaken comprising two window sampler holes (to 6m depth), with groundwater monitoring standpipes installed, and six foundation inspection pits. The ground model is based on these investigations. The ground conditions comprise Made Ground underlain by London Clay (firm to stiff clay). An interpretative geotechnical report is provided within the available documents. Groundwater monitoring indicated a perched water table within the Made Ground that was recorded at 1.35m bgl at the worst case.

4.5. The site overlies London Clay which is designated Unproductive Strata. The current foundations at the rear of the property are on Made Ground with the rest of the footings on London Clay. Due to the localised nature of the foundations at the rear of the property, relative to the current basement, it is considered that increasing the foundation depth into the London Clay will have no adverse effects on the wider hydrogeological environment. Where foundations are already within the London Clay, increasing their depth into the same strata is considered to have negligible hydrogeological impact.

4.6. Comments are made within the BIA regarding fruit trees in the rear garden that are not shown on the proposed or existing plans. Due to the extent of the proposed works in the rear garden it is accepted that they are unlikely to be affect by the proposed works. The presence of vegetation is therefore unlikely to generate ground movements within the proposed development.

4.7. An outline construction methodology and works programme has been provided.

4.8. It is proposed to construct the development using underpinning methods, typically of less than 1.5m in depth at the front of the property. Six foundation inspection pit logs confirm the depth of the Party Walls on both sides to the rear and front of the property.

4.9. It is stated that all foundations will be placed within stiff London Clay. Outline geotechnical parameters and a construction methodology have been presented. The temporary works propping and sequencing proposed appear to be appropriate. Outline retaining wall calculations have been provided.

4.10. Ground movements generated by shallow underpinning within stiff London Clay should be within usual tolerances. A ground movement and damage impact assessment has been provided.

4.11. A discussion on structural monitoring is presented, along with an outline monitoring strategy.

4.12. It is accepted that the site is not in a Flood Risk Zone and is at low risk of flooding.

4.13. It is accepted that there are no land stability impacts caused by slopes.

4.14. It has been confirmed that there is no change in impermeable site area due to the proposed development.

4.15. A conceptual site model has been presented which clearly indicates all impacts and risk associated with the proposed development.

4.16. Non-technical summaries have been provided.

5.0 CONCLUSIONS

5.1. The qualifications of the BIA authors / reviewers are in accordance with requirements.

5.2. The presence of underground utility infrastructures within the zone of influence has been identified.

5.3. Neighbouring basement structures at the front of the property have been identified, and impact assessments have been updated.

5.4. The ground and groundwater conditions, and geotechnical parameters, identified from the investigation at the rear of the property have been confirmed as applicable to the basement construction at the front of the property.

5.5. The presence of trees at the rear of the development has been confirmed and it is accepted that they will not affect the proposed development.

5.6. The construction methodology and temporary works are assessed as appropriate. Outline retaining wall calculations have been provided. An outline construction programme has been provided.

5.7. A ground movement and damage impact assessment have been provided, which is accepted.

5.8. It is accepted that the proposed development will not impact the wider hydrogeological environment.

5.9. The proposed development does not increase the impermeable area.

5.10. It is accepted that there are no land stability impacts caused by slopes.

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

5.12. A conceptual site model has been presented.

5.13. Non-technical summaries have been provided.

5.14. Queries and matters requiring further information or clarification are summarised in Appendix 2. The BIA meets the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Author qualifications	Closed	23/06/17
2	Stability	Underground infrastructure	Closed	23/06/17
3	Stability	Neighbouring basements structures	Closed	23/06/17
4	Stability	Ground conditions / geotechnical parameters at the basement location	Closed	10/08/17
5	Hydrology	Change in impermeable site area and assumptions made on drainage design (inconsistencies in drawings and text)	Closed	23/06/17
6	Stability	Outline retaining wall calculations	Closed	23/06/17
7	Stability	Ground Movement and Damage Impact Assessments for Party Walls and Grove Terrace	Closed	23/06/17
8	Stability	Monitoring Strategy	Closed	23/06/17
9	Stability	Confirmation of presence, size and location of trees	Closed	23/06/17
10	BIA	Outline construction programme	Closed	23/06/17
11	BIA	Conceptual Site Model	Closed	23/06/17
12	BIA	Non-technical summaries	Closed	23/06/17

Appendix 3: Supplementary Supporting Documents

RC wall at rear – Calculation by Lyons O'Neill Engineers, dated September 2016

15168 18 Grove Terrace LON Summary by Lyons O'Neill Structural Engineers, dated May 2017

18 Grove Terrace – BIA Comments by Lyons O'Neill Structural Engineers, undated

15168 18 Grove Terrace LON Summary – Rev A by Lyons O'Neill Structural Engineers, dated June 2017

18 Grove Terrace Trial Hole Information by Lyons O'Neill Structural Engineers (including photographs), dated 10th August 2017

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