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18 Grove Terrace
London NW5 1PH

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-68

Revision: D1

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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 have not been demonstrated to be in full 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, except that the presence of underground utility infrastructures within the zone of influence should be identified.

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 and geotechnical parameters at the front of the property should be confirmed prior to construction.

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. Four foundation inspection pit logs confirm the depth of the Party Walls on both sides to the rear of the property, although the presence of adjacent basements has not been confirmed.

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 should be provided.

1.10. Whilst it is accepted that ground movements generated by shallow underpinning should be within usual tolerances, a ground movement and damage impact assessment should be presented including all structures within the zone of influence. This would include the highway and any utility infrastructure identified. The structural monitoring strategy should be updated to reflect these assessments.

1.11. The proposed development increases the impermeable area of the site. In accordance with LBC guidance, a drainage assessment is required that considers utilising attenuation SUDS to reduce off site discharge flows.

1.12. Confirmation of any trees to be removed should be provided in relation to potential for shrink swell movements at the rear of the property.

1.13. A conceptual site model should be presented.

1.14. An outline construction programme should be 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 should be 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. Until the additional information requested has been provided, it is not possible to assess whether the criteria of CPG4 have been met

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.

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.

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.*"

2.5. 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.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The author's qualifications should be demonstrably in accordance with CPG4 Section 3.6.
Is data required by Cl.233 of the GSD presented?	No	Outline construction programme 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 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	However, utility infrastructure should be located and assessed if applicable.
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?	No	An annotated site plan and section indicating potential risks and impacts should be provided.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	However, ground movement assessments are required for the Party Walls and Grove. Clarification on the presence and removal of any trees should be provided at the rear of the property.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	There is a change in the impermeable site area stated in the 2014 report that is not mentioned in the 2016 report. This inconsistency may be due to a change in the proposed development between the 2014 and 2016 reports. However, the drawings provided dated September 2016 also indicate a change in impermeable area.
Is factual ground investigation data provided?	Yes	Ground conditions should be confirmed at the front of the property prior to construction.
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 presence of basements at both Party Walls in the rear garden. No comment is made with regard to neighbouring basements in the front.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	Drained and undrained strength parameters are provided. An allowable bearing capacity is provided.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	No	If applicable, aboricultural report regarding trees in the vicinity of the rear of the site.
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?	No	Settlement and ground movement assessment for the basement is presented but not for the adjoining structures. Further assessment is required.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	However, drainage assessment should be provided for the increased impermeable surface area. Ground Movement Assessments for the Party Walls and Grove Terrace should be provided.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Drainage assessment should be provided in line with CPG4 3.51. The Party Walls and Grove Terrace will require GMA and Damage Category Classification.
Has the need for monitoring during construction been considered?	Yes	To be updated based on GMA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Long term settlement has been assessed for the basement but not for the Party Walls or Grove Terrace.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA for the Party Walls and Grove Terrace required.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Drainage assessment should be provided in line with CPG4 3.51.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Pending outcomes from GMA and drainage assessment.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	An example calculation is provided but this will require updating following the GMA for the Party Walls.
Are non-technical summaries provided?	No	However, the BIA is written so as to be understandable.

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 not demonstrably 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 is accepted as sufficient, except that the presence of underground utility infrastructures within the zone of influence should be identified. Utility records should be obtained and presented, including an impact assessment and mitigation proposals, if required.

4.4. A site investigation has been undertaken comprising two window sampler holes (to 6m depth), with groundwater monitoring standpipes installed, and four 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. It is noted that no exploratory holes have been undertaken at the front of the property. In advance of construction, ground and groundwater conditions, and geotechnical parameters, should be confirmed at this location. If conditions vary, the BIA should be updated, as required.

4.6. 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.

4.7. Comments are made within the BIA is regard to fruit trees in the rear garden that are not shown on the proposed or existing plans. Confirmation of the presence of these trees should be provided and an assessment of any impact to foundations should be provided.

4.8. An outline construction methodology and work programme is to be provided.

4.9. It is proposed to construct the development using underpinning methods, typically of less than 1.5m in depth at the front of the property. Four foundation inspection pit logs confirm the depth of the Party Walls on both sides to the rear of the property, although the presence of adjacent basements should be confirmed at the front of the property.

4.10. 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 should be provided.

4.11. Ground movements generated by shallow underpinning within stiff London Clay should be within usual tolerances. However, only a 'demonstration' calculation of ground movement has been presented. A ground movement and damage impact assessment should be presented including all structures within the zone of influence. This would include the highway and any utility infrastructure identified. As a listed structure, walls within 18 Grove Terrace itself should also be assessed for movement and damage impacts.

4.12. The discussion on structural monitoring presented should be updated following review of the updated ground movement assessment. An outline monitoring strategy indicating trigger levels and contingency actions should be provided.

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

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

4.15. There is inconsistency in the assessment of impermeable site area due to the proposed development between and within the provided BIA documents. A review of the drawings provided indicates that there will be an impact to surface water drainage and flow. A drainage assessment is required and attenuation SUDS options should be considered, as required in CPG4, Section 3.51, to reduce peak discharge flows. Alternately, if considered impracticable, a statement indicating why SUDS cannot be implemented should be presented within the drainage strategy.

4.16. A conceptual site model should be presented which clearly indicates all impacts and risk associated with the proposed development.

4.17. Non-technical summaries should be provided within any revisions to the BIA submitted.

4.18. Queries and matters requiring further information or clarification are summarised in Appendix 2.

5.0 CONCLUSIONS

5.1. The qualifications of the BIA authors / reviewers should be demonstrated to be in accordance with requirements.

5.2. The presence of underground utility infrastructures within the zone of influence should be identified.

5.3. Neighbouring basement structures at the front of the property should be identified, if present, and the impact assessments updated, if applicable.

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

5.5. The presence of trees at the rear of the development should be confirmed and any impact assessed (ie potential for generating shrink swell movement of foundations).

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

5.7. A ground movement and damage impact assessment should be provided, including all structures within the zone of influence. The structural monitoring strategy should be updated to reflect this.

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

5.9. The proposed development increases the impermeable area. A drainage assessment as per CPG4 Section 3.51 is required.

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 should be presented, clearly identifying any risks and impacts related to the proposed development.

5.13. Non-technical summaries should be provided within any revisions to the BIA submitted.

5.14. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the additional information requested has been provided it is not possible to assess whether the requirements of CPG4 have been met.

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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	Open - to be demonstrably in accordance with CPG4 Section 3.6.	
2	Stability	Underground infrastructure	Open – underground utility infrastructure information should be provided. The impact assessment should be updated, if required.	
3	Stability	Neighbouring basements structures	Open – to be confirmed and impact assessment updated, if required.	
4	Stability	Ground conditions / geotechnical parameters at the basement location	To be confirmed in advance of the construction works by trial excavation	N/A
5	Hydrology	Change in impermeable site area and assumptions made on drainage design (inconsistencies in drawings and text)	Open – outline drainage assessment in accordance with CPG4 Section 3.51 to be provided.	
6	Stability	Outline retaining wall calculations	Open – to be provided.	
7	Stability	Ground Movement and Damage Impact Assessments for Party Walls and Grove Terrace	Open – to be provided.	
8	Stability	Monitoring Strategy	Open – to be updated based on ground movement assessment, including trigger levels and contingency actions.	
9	Stability	Confirmation of presence, size and location of trees	Open – to be provided, including any impact assessment (if required).	
10	BIA	Outline construction programme	Open – to be provided.	
11	BIA	Conceptual Site Model	Open – to be provided.	
12	BIA	Non-technical summaries	Open – to be provided.	

Appendix 3: Supplementary Supporting Documents

None

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