CampbellReith
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51 Lancaster Grove, London NW3 4HB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12727-53
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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 51 Lancaster Grove, London, NW3 4HB (planning reference 2017/6836/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 Basement Impact Assessment (BIA) and supplementary information has been produced by those holding suitable qualifications.

1.5. The proposed development involves the extension of the part basement to occupy the Western footprint of the existing building plus front and rear light wells.

1.6. The proposed basement structure is to be constructed from reinforced concrete retaining walls and basement slab using common basement construction methods.

1.7. A site specific ground investigation has been conducted including recording ground water levels, along with relevant analysis of the soil properties.

1.8. The geology consists of previously worked ground overlaying Clay.

1.9. The basement is not anticipated to be located below the ground water level.

1.10. It has been concluded that the wider ground water environment will not be significantly impacted by the proposed basement.

1.11. Outline structural calculations have been produced for the basement structure.

1.12. An outline draft construction programme has been provided..

1.13. Volumetric change of the soil has been considered in the proposal.

1.14. It has been demonstrated that the proposal will limit damage to the neighbouring properties to no greater than Burland Category 1.

1.15. Camden Hydrogeological and Hydrological Study information provided confirms the property is at a low risk of surface flooding.

1.16. Sump pumps to the light wells are proposed as part of the surface water management.

1.17. Information regarding the location of public transportation assets is provided.

1.18. An outline movement monitoring strategy of the neighbouring buildings has been provided.

1.19. It has been demonstrated that the proposal adheres to the requirements of CPG4 and other Camden Planning Policy.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 22nd February 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 51 Lancaster Grove, NW3 4HB, reference 2017/6836/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.
- Local Plan 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;

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 *"Formation of an enlarged basement together with lightwells to the front and rear elevations"*

The Audit Instruction also confirmed that 51 Lancaster Grove was not, or was not a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 15th December 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment
- Construction Management Plan (Redacted)
- Design & access statement
- Floor plans and elevations
- Ground Investigation and Basement Impact Assessment - Part 1 (Redacted)
- Ground investigation and basement impact assessment -Hydro Part 2
- Ground investigation and basement impact assessment -Hydro Part 3
- Ground investigation and basement impact assessment -Hydro Part 4
- Ground investigation and basement impact assessment -Hydro Part 5 (Redacted)
- Site location plan and Existing Floor plans and Elevations

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3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Refer first page of BIA and Ground Investigation Report.
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 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	A justification statement is generally provided for 'no' answers
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A justification statement is generally provided for 'no' answers
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A justification statement is generally provided for 'no' answers
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Ground Investigation and Basement Impact assessment prepared by ground&water.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Ground Investigation and Basement Impact assessment prepared by ground&water.

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Croft BIA and Ground Investigation and Basement Impact assessment prepared by ground&water.
Is factual ground investigation data provided?	Yes	Ground&water BIA and appendices C and D
Is monitoring data presented?	Yes	Two repeat monitoring visit were carried out
Is the ground investigation informed by a desk study?	Yes	Ground Investigation and Basement Impact assessment prepared by ground&water.
Has a site walkover been undertaken?	Yes	Croft BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Croft BIA states that a search of Camden Council's website showed no basements to 49 and 53 Lancaster Grove.
Is a geotechnical interpretation presented?	Yes	Ground Investigation and Basement Impact assessment prepared by ground&water.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Retaining wall specific geotechnical properties are provided.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Movement Assessment. Site in Zone 1 flood risk.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Croft search conducted on Camden Council website show basement extensions are not present to either neighbouring property. Ground&water BIA assume part basements to neighbouring properties.
Is an Impact Assessment provided?	Yes	Croft BIA and section 7.0 of the Ground Investigation and Basement Impact assessment prepared by ground&water.
Are estimates of ground movement and structural impact presented?	Yes	Ground Investigation and Basement Impact assessment prepared by ground&water.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	

Item	Yes/No/NA	Comment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Heave protection, Party wall movement monitoring and temporary propping.
Has the need for monitoring during construction been considered?	Yes	Movement monitoring of the neighbouring property has been proposed.
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	Construction method, Ground movement assessment, and party wall monitoring.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Drainage design yet to be finalised.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Drainage design yet to be finalised.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Ground Investigation and Basement Impact assessment prepared by ground&water.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of Geotechnical consultants, ground&water, and the individuals concerned in its production have suitable qualifications.

4.2. Consulting Structural engineers, Croft, have produced supplementary information to support the structural design and construction of the basement proposal.

4.3. The existing property is a detached residential four-storey building with a single storey part basement, with the superstructure constructed from timber framing and masonry cladding. The part basement is constructed from reinforced concrete.

4.4. The proposed development involves the extension of the existing basement under the Western half of the building plus front and rear light wells.

4.5. The basement structure is proposed to be approximately 3.7m deep and constructed from L shaped cantilever RC retaining walls. A RC basement slab provides lateral support to the base of the retaining walls in the permanent case. The walls are designed to be stable without the requirement for propping at the top of the walls in the permanent case. However the ground floor steel beams to the basement underpins and concrete beams to the light well underpins are utilised as propping in the permanent case in order to mitigate wall movement and attain a suitable Burland category.

4.6. A site specific ground investigation was conducted, comprising two boreholes to a depth of 6.6mbgl BH1 and 3.5mbgl WS1. A trial pit was dug on a return visit. Recording of ground water in BH1 was conducted during the initial visit and during two repeat monitoring visits.

4.7. The ground model consists of a layer of Made Ground to depths between 0.75mbgl and 1.5mbgl, overlaying London Clay to depths of between 2.0mbgl to 5.7mbgl. The borehole and probe refused on a layer of Claystone encountered at depths of 6.5mbgl and 6.9mbgl.

4.8. The ground investigation report shows the site to lie within unproductive strata and just within the Outer Source Protection Zone. No groundwater was observed during the drilling process or subsequently in two follow up monitoring visits. The ground&water BIA makes a reasonable assessment that the basement is unlikely to be constructed below the ground water level.

4.9. The ground&water BIA does note that the made ground acts as a slightly porous medium for the migration of water while the London Clay Formation acts as a barrier to ground water migration. As a result of this soil profile the BIA notes that "significant" perched water is likely to be encountered during construction and additional drainage should be considered for the long term once the basement has been constructed.

4.10. The proposed scheme utilises RC retaining walls constructed in an underpin sequence with lateral restraint provided in both the temporary and permanent cases. Trench sheeting is used to stabilise the excavation and to mitigate the flow of ground water into the excavation in the temporary case with localised dewatering during excavation and construction of the basement.

4.11. An interpretive geotechnical report has been produced that provides geotechnical design parameters for retaining walls based on the site specific site investigations. A recommendation is made that retaining walls are designed for groundwater pressures in accordance with good design practise.

4.12. Outline structural calculations have been produced for the basement slab under heave loading. Retaining wall calculations are presented that indicate the feasibility of the solution to provide stability in the temporary and permanent case.

4.13. A Construction management plan outlining a draft programme of the proposed works covering key phases and approximate durations has been produced.

4.14. A Structural Methodology Statement has been produced. Structural drawings are included in the statement that clearly show the temporary and permanent propping required to mitigate lateral movement of the retaining walls.

4.15. It has been identified that as the London clay will experience unloading due to the excavation there is the potential for heave, and it is proposed that the ground bearing basement slab will be designed to resist heave forces which are to be transferred into the retaining walls which are supporting the super structure. This method of resisting heave forces is accepted as feasible.

4.16. A ground movement assessment has been produced to calculate a damage category for the neighbouring properties. This has been produced combining settlement as calculated following the method described in CIRIA C580, along with calculated heave values. The determined damage category is no greater than Burland category 1.

4.17. A flood risk assessment is not provided as part of the ground&water BIA. The BIA makes reference to Camden Hydrogeological and Hydrological Study (CHHS) maps to indicate that the property is located in flood risk zone 1 and is deemed to be at very low risk of flooding from surface water and Negligible/low risk of flooding from groundwater.

4.18. It is recognised that the proposed light wells will increase the volume of surface water drainage on the site. The BIA acknowledges the drainage design is yet to be finalised. Drainage is to be provided by use of sump pumps. The percentage of hardstanding increase is nominal compared to the area of existing hardstanding.

4.19. Reference is made to information within the Camden Hydrogeological and Hydrological Study which shows no evidence of public transportation assets located in the immediate vicinity of the site.

4.20. Monitoring of the neighbouring properties has been proposed during the basement works. A site-specific monitoring strategy has been proposed. It is accepted that monitoring will be carried out in accordance with good practise principles.

4.21. It can be confirmed that the proposal adheres to the requirements of CPG4.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) and supplementary report been carried out by a well-known firm of engineering consultants, and the individuals concerned in its production have suitable qualifications.

5.2. The proposed development involves the extension of the existing part basement to occupy the majority of the footprint of the existing building.

5.3. The basement structure is proposed to be RC retaining wall underpins with a RC basement slab. Ground floor steel beams provide permanent lateral support to the basement underpins. The light well retaining walls are laterally restrained by use of an RC header beam.

5.4. A site specific ground investigation was conducted, comprising boreholes and ground water monitoring.

5.5. The site geology consists of up to 1.5m of Made Ground, overlaying London Clay Formation.

5.6. Ground water was not recorded during the initial visit or the two return visits. It is unlikely the basement will be founded below the ground water level. Perched water is likely to be encountered and mitigation measures during construction are proposed.

5.7. Appropriate temporary works have been proposed with propping provided to the RC retaining walls during construction, local dewatering and trench sheeting to stabilise the excavation and control the flow of ground water in the temporary case.

5.8. An appropriate geotechnical interpretation has been produced with engineering properties of the soil for use in the design of the RC retaining walls and basement slab provided. Outline structural calculations have been provided for the basement slab and wall structure.

5.9. An outline draft construction programme has been produced for the proposal.

5.10. Heave pressures due to the unloading of the clay soil and are to be resisted by a ground bearing basement slab.

5.11. A ground movement assessment has been produced, it determines that the worst case damage will not exceed Burland category 1. This is accepted.

5.12. The site lies within flood zone 1 and is at low risk of flooding from surface water.

5.13. The developed area is increasing which will increase the volume of surface water drainage into the sewer system. It is indicated that SUDs will be provided by way of sump pumping the light wells.

5.14. Camden Hydrogeological and Hydrological Study maps are provided which show no public transportation asset within the immediate vicinity of the site.

5.15. A movement monitoring strategy of the neighbouring buildings has been proposed.

5.16. It has been demonstrated that the proposal adheres to the requirements of CPG4 and other Camden planning policy.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

No comments pertinent to the scope of the audit were received

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Hydrology	Outline details of SUDs strategy required due to potential increase in surface water area to demonstrate compliance with The London Plan.	Closed	30/04/2018
2	CMP	An outline programme of works indicating the main phases and approximate durations should be provided.	Closed	30/04/2018
3	Land stability	Long term high level prop assumed in GMA which does not reflect the proposed basement construction. GMA to be revised, or justification of values adopted to be provided.	Closed	30/04/2018

Appendix 3: Supplementary Supporting Documents

None

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