CampbellReith
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Flat 1, 99 Priory Road, London, NW3 3NL

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-44
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 Flat 1, 99 Priory Road, London, NW6 3NL (planning reference 2016/6710/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) has been carried out by Barrett Mahony Consulting Engineers (BMCE) although no evidence is provided that the BIA was assessed by an appropriately qualified Hydrologist or Hydrogeologist.

1.5. It is proposed to form the basement structure by constructing reinforced concrete L-shaped underpins to the perimeter masonry walls. Outline structural calculations for the basement retaining wall, basement slab and foundations are required to demonstrate the viability of the proposals, including soil properties and assumed water levels. Temporary propping details are required based on the structural designs requested.

1.6. An outline construction programme should be provided.

1.7. The BIA has confirmed that the proposed basement will be founded within London Clay. An indicative assessment of the likely heave pressures is required, including any associated mitigation measures.

1.8. Perched groundwater is likely to be encountered during basement foundation excavation. Mitigation measures are proposed for the permanent case. Groundwater control measures to be utilised during construction should be proposed.

1.9. Measures are proposed to offset the impacts of the increase in impermeable area, and these are considered acceptable. Specific discharge flow rates should be agreed with LBC and Thames Water.

1.10. A quantitative Ground Movement Assessment (GMA) is required to satisfy the requirements of CPG4. Mitigation measures are required where predicted damage is Burland Category 1 or greater, and the impact should then be reassessed, if applicable.

1.11. The presence of utility infrastructure within the development's zone of influence should be confirmed and damage impacts assessed, as applicable.

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

1.13. It is accepted that the development will not impact the wider hydrogeology of the area.

1.14. The proposed mitigation recommendations within the flood risk strategy appear appropriate. However, considering the site location is within a Local Flood Risk Zone, these should be confirmed by an appropriately qualified Hydrologist / Engineer.

1.15. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2. Until the additional information required is presented, the BIA does not meet the criteria of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 13 January 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Flat 1, 99 Priory Road, London, NW6 3NL.

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;

d) 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 extension. Erection of single storey rear extension. Erection of entrance porch".

2.6. The Audit Instruction also confirmed that the basement proposal does not involve a listed building nor does the site neighbour any listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 26 January 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) dated 2 December 2016 by Barrett Mahony Consulting Engineers,
- Design and Access Statement dated November 2016 by JAA Studio Architects,
- Planning application drawings by JAA Studio Architects consisting of:

  Existing Plans (dated 24 November 2016)

  Proposed Plans (dated 30 November 2016)

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	CEng, no Hydrogeologist / Hydrologist credentials/ experience provided.
Is data required by Cl.233 of the GSD presented?	No	Outline construction programme to be provided. Utility infrastructure within the zone of influence to be confirmed.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	BIA.
Are suitable plan/maps included?	Yes	BIA Appendices.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	BIA Appendix III.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Summarised in BIA Section 2.3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Summarised in BIA Section 2.2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Summarised in BIA Section 2.1.
Is a conceptual model presented?	Yes	BIA Section 4.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 3.3.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 3.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 3.1, 5.6.
Is factual ground investigation data provided?	Yes	BIA Section 4.
Is monitoring data presented?	Yes	BIA Section 4.
Is the ground investigation informed by a desk study?	Yes	BIA Section 4.4 – 4.6.
Has a site walkover been undertaken?	Yes	BIA Section 4.7.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Section 4.
Is a geotechnical interpretation presented?	Yes	BIA Section 4.8. Geotechnical parameters as per GSD Appendix G3 required.
Does the geotechnical interpretation include information on retaining wall design?	No	No retaining wall design presented, including soil stiffness or shear strength parameters provided.
Are reports on other investigations required by screening and scoping presented?	Yes	Site investigation, included within BIA.
Are the baseline conditions described, based on the GSD?	No	No, soil parameters not presented.
Do the base line conditions consider adjacent or nearby basements?	No	As per above. To be addressed in the Ground Movement Assessment (GMA). Refer to CIRIA C580.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA Section 5. Although this should be confirmed following the GMA.
Are estimates of ground movement and structural impact presented?	No	GMA not quantitative.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	As per above.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Mitigation measures are considered, although the appropriateness cannot be determined until the GMA has been completed.
Has the need for monitoring during construction been considered?	Yes	BIA Section 5.4, 5.7 and 5.8.
Have the residual (after mitigation) impacts been clearly identified?	No	GMA required before this can be properly assessed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA required.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	BIA Sections 5.9.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	GMA required.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	GMA required.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Barrett Mahony Consulting Engineers (BMCE) comprising Chartered Civil and Structural Engineers. No evidence is provided that the BIA was assessed by an appropriately qualified Hydrologist or Hydrogeologist and that adequate consideration of the surface and groundwater flows has been conducted.

4.2. The existing property is located at 99 Priory Road and consists of a detached four-storey structure including an existing basement. The existing basement is a partial basement, occupying about one-third of the building footprint. The building is currently divided into five separate apartments.

4.3. It is proposed to deepen the existing basement level to provide a floor-to-ceiling height of circa 2.70m. This involves excavation to a depth of circa 3.15m below external ground level. Existing floor-to-ceiling heights in the basement are circa 2.20m. It is further proposed to construct front and rear lightwells to the property. A rear extension is also proposed, together with internal alterations involving the demolition of load-bearing walls.

4.4. The BIA has identified that on site ground conditions comprise a variable depth of Made Ground (0.6m to 1.3m bgl) underlain by firm to stiff London Clay.

4.5. It is proposed to form the basement structure by constructing reinforced concrete L-shaped underpins to the perimeter masonry walls. It is proposed to execute all underpinning works in a standard underpinning sequence, in bay widths not exceeding 1.00m. The proposed underpinning will act as foundations to the external walls, distributing the superstructure loads to the subsoil under the basement. The proposed underpinning will also act as retaining structures, retaining the soil outside the basement. The proposed underpinning will be designed to resist lateral earth pressures, lateral water pressure due to a head of water, and surcharge pressures. This is an acceptable methodology using established techniques.

4.6. Structural designs are not presented in the BIA. Outline structural calculations for the basement retaining walls, basement slab and foundations are required to demonstrate the viability of the proposals, including soil properties and assumed water levels.

4.7. A proposed temporary works strategy is presented in Section 5.3 of the BIA, although temporary propping details are required based on the structural designs requested. Perched water is identified within the Made Ground. The temporary works plan should include suitable groundwater control methodologies, considering the likely volume and flow rates expected. The contractor should confirm groundwater conditions prior to starting works.

4.8. It is accepted that the basement will be founded in London Clay. Given the high volume change potential of the underlying London Clay, the provision of proprietary heave board protection under the proposed basement slab is acknowledged. An indicative assessment of the likely heave pressures is required, to supplement the mitigation measures proposed within the BIA, and to inform a Ground Movement Assessment (GMA).

4.9. A quantitative GMA is required. The engineering interpretation requires calculations of predicted ground movements and structural impacts to be provided. A Damage Category Assessment as per CIRIA C580 is required to assess the effects that the construction of the proposed basement will have on both Priory Road and adjacent properties, within an identified zone of influence. Furthermore, CPG4 requires mitigation measures to be considered where predicted damage exceeds Burland Category 1 and for the impact to be reassessed considering the proposed mitigation, if applicable.

4.10. It is agreed that condition surveys of the neighbouring properties should be commissioned and a programme of monitoring the adjoining structures should be established before the work starts. The monitoring strategy should adopt appropriate trigger values from the GMA and propose contingency plans.

4.11. The proposed basement will result in an increase in impermeable area due to the formation of the lightwell in the front garden and an extension of the rear patio. As a result, measures are proposed to offset the impacts of the development and these are considered acceptable. Specific discharge flow rates should be agreed with LBC and Thames Water.

4.12. Seepage was not encountered during the site investigation, although some shallow groundwater was observed in the Made Ground in subsequent monitoring. Mitigation measures are proposed in the event of water being encountered. It is therefore accepted that there are no significant groundwater flows to be affected by this development. However, temporary groundwater controls should be considered, as 4.7.

4.13. The BIA has shown that the surrounding slopes to the development are stable.

4.14. A structural design and basement construction methodology is requested to offset any impacts on surrounding roads or pedestrian walkways. No known tunnels or railway lines are located within the vicinity of the site. The BIA should identify any utilities infrastructure within the zone of influence of the development.

4.15. It is acknowledged that small shrubs and trees of height less than 3.00m will be removed from the from garden as a result of the development, and it is accepted that it is unlikely that proposed tree removal will result in any ground movement.

4.16. It is accepted that the site is not located within the catchment area of the Hampstead Heath pond chain.

4.17. It is accepted that the site is located within the Goldhurst Local Flood Risk Zone, and the proposed recommendations within the flood risk strategy appear appropriate. However, this should be confirmed by an appropriately qualified Hydrologist / engineer as defined in CPG4.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by Barrett Mahony Consulting Engineers (BMCE). Evidence should be provided that the BIA was assessed by an appropriately qualified Hydrologist and Hydrogeologist.

5.2. It is proposed to form the basement structure by constructing reinforced concrete L-shaped underpins to the perimeter masonry walls. The proposed underpinning will be designed to resist lateral earth pressures, lateral water pressure due to a head of water, and surcharge pressures. This is an acceptable methodology using established techniques.

5.3. Structural designs are not presented in the BIA. Outline structural calculations for the basement retaining wall, basement slab and foundations are required to demonstrate the viability of the proposals, including soil properties and assumed water levels.

5.4. Temporary propping details are required based on the structural designs requested.

5.5. An outline construction programme should be provided.

5.6. It is accepted that the basement will be founded in London Clay. An indicative assessment of the likely heave pressures is required.

5.7. A quantitative Ground Movement Assessment (GMA) is required. CPG4 requires mitigation measures to be considered where predicted damage exceeds Burland Category 1 and for the impact to be reassessed.

5.8. The presence of utility infrastructure within the development's zone of influence should be confirmed and damage impacts assessed, as applicable.

5.9. Perched groundwater is likely to be encountered during basement foundation excavation. Mitigation measures are proposed for the permanent case. Groundwater control measures to be utilised during construction should be proposed.

5.10. Measures are proposed to offset the impacts of the increase in impermeable area, and these are considered acceptable. Specific discharge flow rates should be agreed with LBC and Thames Water.

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

5.12. It is accepted that the site is not located within the catchment area of the Hampstead Heath pond chain.

5.13. It is accepted that the development will not impact on the wider hydrogeology.

5.14. The proposed mitigation recommendations within the flood risk strategy appear appropriate. However, considering the site location is within a Local Flood Risk Zone, these should be confirmed by an appropriately qualified Hydrologist / Engineer.

5.15. Queries and requests for further information are summarised in Appendix 2. Until the additional information required is presented, the BIA does not meet the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	BIA Author qualifications.	Open	
2	Stability	Outline structural calculations for the basement retaining wall, basement slab and foundations are required to demonstrate the viability of the proposals, including soil properties and assumed water levels. Geotechnical parameters as GSD Appendix G3 to be provided.	Open	
3	Stability	Assessment required, and mitigation of, likely heave pressures. This would inform the floor slab design.	Open	
4	Stability	Indicative temporary works propping scheme to be provided. Groundwater control measures to be provided.	Open	
5	Stability	Ground Movement Assessment and Structural Impact Assessment to be justified. Appropriate mitigation measures to be considered as required.	Open	
6	Hydrology	Flood risk assessment and proposed protection measures should be confirmed by an appropriately qualified Hydrologist.	Open	
7	BIA	An outline construction programme is to be provided.	Open	
8	Stability	The presence of utility infrastructure within the zone of influence should be confirmed. Damage impact should be assessed, if applicable.	Open	

Appendix 3: Supplementary Supporting Documents

None

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