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Land at Lidlington Place, London NW1 1NH

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13398-07
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 the Land at Lidlington Place, London NW1 1NH (planning reference 2020/0571/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 (BIA) 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 LMB Geosolutions Limited and has been prepared by individuals who possess suitable qualifications.

1.5. The BIA has confirmed that the proposed basement will be founded on London Clay at 4.35m depth. The basement will be constructed using traditional underpinning techniques and formed in one lift. Limited perched water was noted.

1.6. The screening and scoping have been updated and it is accepted that significant slopes are not present on site or near the development.

1.7. It is also accepted that the development will not have a significant impact on the hydrogeology and hydrology of the area.

1.8. Details of the temporary works arrangement and construction sequence are provided. The finalised underpinning sequence should ensure no two opposite bays are excavated at the same time.

1.9. The Ground Movement Assessment indicates the development will result in movement no higher than Damage Category 1 (very slight) for neighbouring properties. The impact of the predicted ground movements on adjacent infrastructure and utilities is considered to be negligible. The BIA recommends structural monitoring during construction to safeguard surrounding properties.

1.10. Based on the revised submission, the BIA meets the criteria of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 17 February 2020 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for the Land at Lidlington Place, London NW1 1NH.

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: Basements. March 2018
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

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 *"Erection of new single-family dwellinghouse with ground and basement levels."*

2.6. CampbellReith accessed LBC's Planning Portal on 5 March 2020 and gained access to the following relevant documents for audit purposes:

- Ground Investigation and Basement Impact Assessment Report, by LMB Geosolutions Ltd, Issue 1, dated 16 January 2020.
- Basement Method Statement, Space Basements Ltd, no reference given, no date given.
- Design and Access Statement, Unagru Limited, no reference given, no date given.

- Planning Application Drawings by Unagru Limited, consisting of Existing and Proposed Plans and Sections.
- Arboricultural Impact Assessment, Tamla Trees, ref. 02992Rv2, dated January 2020.

2.7. Revised submissions were provided to CampbellReith in June and July 2020 and comprised the following:

- Ground Investigation and Basement Impact Assessment Report, by LMB Geosolutions Ltd, Issue 4, dated 1 July 2020.
- Basement Method Statement - E, Space Basements Ltd, no reference given, no date given.
- Build Design Drawings 02 rev C and 03 rev C.

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	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Construction methodology clarified in updated documents.
Are suitable plan/maps included?	Yes	The Arup GSD maps are referenced but not included.
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	Screening presented correctly in revised BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Extent of hard paving confirmed.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Extent of hard paving confirmed.
Is a conceptual model presented?	Yes	Basic data is provided.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See revised BIA.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Extent of hard surfacing confirmed.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Extent of hard surfacing confirmed.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	One groundwater monitoring visit carried out.
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	Lower ground floor levels observed during site walkover.
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?	Yes	Arboricultural Impact Assessment report is provided. Correspondence with TfL and Thames Water is provided.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	Updated to address comments in initial audit report.
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	Updated to address comments in initial audit report.
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	A need for monitoring has been identified.
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	Revised GMA presented.
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	Revised GMA presented.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Revised GMA presented.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by LMB Geosolutions Limited and has been prepared by individuals who possess suitable qualifications. Structural engineering information has been provided by Space Basements Limited and Build Design.

4.2. The proposed development comprises the construction of a new dwelling with one basement level and one above-ground storey. The site, which is surrounded by rear gardens/hardstanding on three sides and Lidlington Place on the other, is currently vacant.

4.3. Pages 11 to 13 of the BIA present the findings of a ground investigation carried out at the site. The ground conditions encountered comprise Made Ground to a maximum depth of 0.85m, below which London Clay was encountered to a maximum depth of 10m. One borehole was installed with a monitoring standpipe and recorded a standing water level of 2.89m below ground level approximately three weeks after being installed. This groundwater was interpreted as being representative of discrete units present within fissures and local mudstone horizons in the London Clay.

4.4. The BIA includes correspondence with utilities and underground asset owners and confirms the presence of two assets of interest near the site; London Underground Northern Line tunnels along Eversholt Street to the northeast, and a Thames Water combined sewer along Lidlington Place. Correspondence with TfL confirms the basement work will be outside the zone of interest for the tunnels. The Thames Water assets are considered further in the BIA.

4.5. The site is underlain by London Clay, which is designated an unproductive aquifer. Measures for mitigating the ingress of water during construction are presented on page 17 of the BIA. The site currently comprises hardstanding and the BIA states that the extent of impermeable areas will reduce slightly due to the inclusion of a rear garden comprising grass, which will allow surface water to infiltrate to the ground. It is accepted that the development will have no adverse impact on the hydrology and hydrogeology of the area. The BIA indicates that a final drainage design will be agreed in consultation with Thames Water and LBC.

4.6. In the revised BIA submission the screening exercise for Land Stability has been updated in line with queries raised in the initial audit report.

4.7. The site and surrounding area are generally flat. It is accepted that the basement development will not significantly increase the slopes on site, and that significant slopes in excess of 7 degrees are not present in the immediate vicinity.

4.8. A table of soil parameters derived from the site investigation is presented on page 13 of the BIA and further parameters which may be used for the design of the basement retaining walls are

presented in a table on page 16 of the BIA. The soil parameters presented in the BIA are broadly similar to those used in the slope stability assessment in Appendix H of the BIA.

4.9. The maximum excavation depth of the basement excavation is given consistently as 4.35m in the revised BIA. The ground model and soil parameters used in the structural retaining wall design are broadly consistent with the parameters given in the BIA.

4.10. The Basement Method Statement and drawings 02 and 03 have been updated and indicate excavations will take place in bays not exceeding 1200mm width. The Underpinning Specification, presented as part of the Structures Method Statement, has not been updated and still refers to these bays not exceeding 1000mm. The revised drawings are assumed to supersede this, as the documents are all compiled by the same company, Build Design.

4.11. The revised BIA and Basement Method Statement indicate the underpinning will be undertaken in one lift. Drawing 02C presents an updated proposed underpinning sequence for the work. The drawing currently shows two opposite bays labelled '02' in the construction sequence. This should be revised at detailed design stage to ensure that no two opposite bays are excavated at the same time.

4.12. It is now proposed to partially excavate the site before commencing construction of the underpin bays. The bays along the sides of the development will be excavated approximately half the width of the development with sloped sides, to allow the retaining wall and basement floor to be cast. The revised Basement Method Statement indicates each excavated bay will be propped against the central soil mass, or against the base of the opposite retaining wall. Drawing 03C presents details of the temporary propping arrangements and indicates that propping when the opposite bay has been constructed may also span the full width of the development.

4.13. The GMA considers ground movements and building damage resulting from an underpinning sequence. The assessment correctly identifies that there is no specific guidance for underpinning and uses CIRIA C760 to estimate ground movements. It is accepted that this methodology can result in estimates of ground movement that are appropriate to underpinning. On page 28 of the revised BIA submission it is identified that the typical range of ground movement resulting from underpinning works is between 5mm and 10mm for a single lift. The summary of results presented on page 29 of the revised BIA indicates a maximum Damage Category 1 for the properties either side of the development.

4.14. Page 30 and 31 of the revised BIA submission consider the impact of the predicted ground movements on adjacent infrastructure and utilities, and indicate a negligible impact.

4.15. Page 30 of the revised BIA discusses heave resulting from the basement excavation. The revised submission presents an unloading pressure and excavation depth consistent with the structural drawings. The BIA notes 30%-50% of heave would be expected to occur prior to construction of the basement slab, and the remaining 50%-70% occurring following construction. Considering the proposals and the position of the basement in relation to surrounding structures and infrastructure, the assertion that heave *'is unlikely to exceed a few millimetres'* is accepted.

4.16. The need for monitoring before and during construction has been identified on page 31 of the revised BIA. The monitoring strategy should be agreed with interested parties during detailed design.

5.0 CONCLUSIONS

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

5.2. The BIA has confirmed that the proposed basement will be founded on London Clay at 4.35m depth. The basement will be constructed using traditional underpinning techniques and formed in one lift. Limited perched water was noted.

5.3. The screening and scoping have been updated and it is accepted that significant slopes are not present on site or near the development.

5.4. It is also accepted that the development will not have a significant impact on the hydrogeology and hydrology of the area.

5.5. Soil parameters are presented and are broadly consistent within all documents and assessments.

5.6. Details of the temporary works arrangement and construction sequence are provided. The finalised underpinning sequence should ensure no two opposite bays are excavated at the same time.

5.7. The Ground Movement Assessment indicates the development will result in movement no higher than Damage Category 1 (very slight) for neighbouring properties. The impact of the predicted ground movements on adjacent infrastructure and utilities is considered to be negligible.

5.8. The BIA recommends structural monitoring during construction to safeguard surrounding properties.

5.9. Based on the revised submission, the BIA meets the criteria of CPG Basements.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Hydrology and Hydrogeology	Confirm external surfacing for rear garden and update screening/scoping accordingly.	Closed	8 June 2020
2	Land Stability	Screening to be updated as identified in Section 4 and scoping to be revised accordingly.	Closed	8 June 2020
3	Land Stability	Basement excavation depth to be confirmed. Basement construction method to be defined – underpinning details, proposals for open cut etc (see Section 4).	Closed	10 July 2020
4	Land Stability	Ground movement assessment to be updated in accordance with Section 4.	Closed	8 June 2020

Appendix 3: Supplementary Supporting Documents

None

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