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155 Regent's Park Road
London, NW1 8BB

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12985-77
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 (BIA) submitted as part of the Planning Submission documentation for 155 Regent's Park (planning reference 2019/3891/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 audit instruction also confirmed that the proposal does not involve listed buildings.

1.5. The Basement Impact Assessment (BIA) has been undertaken by appropriately qualified authors.

1.6. The proposals include the construction of a two-storey basement under the entire footprint of the new building.

1.7. Outline permanent and temporary structural works proposals are presented. This includes the installation of a contiguous bored piled wall and RC wall installed in an underpinned sequence to support the excavation.

1.8. Site investigation information and interpretative geotechnical parameters are provided. Clarification of geotechnical parameters is requested.

1.9. A Ground Movement Assessment has been presented in the BIA. However, it should be reviewed as detailed in Section 4 of this report.

1.10. It noted that London Underground infrastructure and utilities are located adjacent to the proposed development. Assessment of impacts to the London Underground infrastructure is provided, with predicted movements impacting the highway and underlying utilities presented. Asset protection criteria should be agreed with each asset owner.

1.11. A structural movement monitoring proposal has been included in the BIA. This should be adopted during the works and agreed under the Party Wall Act.

1.12. It is accepted there will be no impact to the wider hydrogeological environment and that the proposed basement raises no concern in relation to slope stability.

1.13. There will be no hydrological impacts as a result of the proposed basement. Attenuation SUDS are proposed in accordance with best practice.

1.14. It is accepted that there is a low risk of flooding.

1.15. Until the additional information requested is provided, the BIA does not meet the requirements of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 3rd September 2019 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 155 Regent's park Road, London NW1 8BB (Reference: 2019/3891/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: Basements, 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan 2017: 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 *"Erection of an eight storey building plus two basement levels comprising a retail unit at ground (Class A1), a hotel (Class C1) and single residential unit (Class C3) on the upper floors, with associated works."*

2.6. The audit instruction also confirmed that the proposal does not involve listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 10 September 2019 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (Version 1.0 – July 2019), Geotechnical Interpretative Report (Version 1.0 – July 2019), Asset Impact Assessment of TfL Northern Line (Version 1.0 - August 2019) and Flood Risk assessment & SuDS Strategy (Version 1.0 – July 2018) by LBH Wembley.
- Structural Engineering Report by Heyne Tillett Steel Ltd, which includes ST Consult SI report.
- Arboricultural Impact Assessment Report by Landmark Trees, dated July 2019.
- Piercy & Company Planning Application drawings including proposed and existing plans and sections.

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	
Are suitable plan/maps included?	Yes	Maps and plans are provided in the BIA.
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	Data sources are presented in Section 3 and 4 of the BIA. Justification is provided for 'No' answers.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Is a conceptual model presented?	Yes	See Section 2, 3, 4 and 5 of the BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.2 of the BIA. Scoping is consistent with screening outcome.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As above.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As above.
Is factual ground investigation data provided?	Yes	ST Consult Factual Site Investigation Report.
Is monitoring data presented?	No	Groundwater monitoring was not undertaken as part of the site investigation.
Is the ground investigation informed by a desk study?	Yes	Section 3 of the BIA.
Has a site walkover been undertaken?	Unknown	Not specified.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 2.3 of the BIA.
Is a geotechnical interpretation presented?	Yes	However, clarification of London Clay Cu design line and Made Ground parameters requested.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7.2 of the BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	Structural Engineering Report and Flood Risk Assessment.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	As above.
Is an Impact Assessment provided?	Yes	Section 9 of the BIA.
Are estimates of ground movement and structural impact presented?	Yes	Section 7 and 8 of the BIA.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	BIA, Structural Report and FRA.
Has the need for monitoring during construction been considered?	Yes	An outline structural monitoring plan is presented in Section 10 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	The BIA states there will be no unacceptable residual impacts. GMA should be clarified to confirm this.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	The GMA should be updated as discussed in Section 4 of this audit report.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	See FRA / SUDS assessment.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	The GMA should be updated as discussed in Section 4 of this audit report.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However, the GMA should be updated as discussed in Section 4 of this audit report.
Are non-technical summaries provided?	Yes	Section 9, BIA.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been undertaken by LBH Wembley and the individuals concerned in its production hold suitable qualifications.

4.2. The site currently contains a four-storey building, with a partial single level basement with reinforced concrete retaining walls to the perimeter. The building fronts Haverstock Hill and is set back from the main road by an area of public realm. The site comprises a mix of uses including retail, offices and residential units. The BIA confirms properties No. 151-153 Regent's Park Road do not have a basement, whereas properties No. 1-13 Adelaide Road are indicated to have single storey basements.

4.3. The development will comprise the demolition of the existing building and construction of an eight-storey building comprising a ground floor retail unit, a hotel and residential units. A two-storey basement covering the entire footprint of the building and containing a combination of plant and hotel rooms is also proposed.

4.4. A site investigation, comprising a borehole and a foundation inspection pit, was undertaken in July 2018 that proved Made Ground to a maximum depth of approximately 1.20m below ground level (bgl). The London Clay Formation was encountered beneath the Made Ground and proven to the base of the borehole at 30.00m bgl. The foundation inspection pit was undertaken adjacent to the northern wall of the existing basement, indicating a 300mm concrete foundation bearing into grey/orange sand and gravel, likely to represent engineered fill.

4.5. Groundwater was struck during the site investigation at 4.00m bgl in the borehole, and within the granular engineered fill below the existing basement slab during excavation of the hand trial pit. Further groundwater monitoring has not been undertaken. It is accepted that the London Clay does not support groundwater flow and that there will be no impact to the wider hydrogeological environment. Further groundwater monitoring is recommended to inform the temporary works strategy, especially in regards to local dewatering requirements of perched water (e.g. within granular fill) or seepage from claystone / sand partings.

4.6. The geotechnical parameters that have been provided in the BIA are considered to be incomplete. Geotechnical parameters for the Made Ground, an undrained shear strength line for the London Clay and the relationship used to derive the undrained Young's Modulus for the London Clay should be clarified.

4.7. The construction sequence (Section 4.0 of the structural report) proposed includes the installation of a contiguous piled retaining wall along most of the site boundary and the installation of bearing piles from ground level. A top-down basement construction is proposed, with casting of the new ground floor slab before the excavation to formation level. A double

level of temporary propping is proposed to control ground movements. As the proposed basement is immediately adjacent to the rear extension of No. 1-13 Adelaide Road, the contiguous wall will not be installed at this location and a reinforced concrete stem wall in 1m wide strips will be constructed instead, utilising a 'hit and miss' underpinning sequence in two lifts.

4.8. The second level basement slab has been designed as a suspended slab with incorporated heave protection measures and will provide, together with the first level basement slab, a permanent prop to the walls.

4.9. A Ground Movement Assessment (GMA) has been undertaken. The analysis includes consideration of ground movements due to basement excavation heave (both short and long term) occurring within the retaining wall perimeter, and occurring at behind the retaining wall, assuming a high stiffness wall support and estimated following CIRIA C760 guidance.

4.10. The BIA states that: 'Given the distance between the piling and the neighbouring buildings, the latter are not expected to be affected by the installation of the bored pile retaining wall'. This is not considered to be reasonably conservative as, in accordance with to CIRIA C760, ground movements caused by the installation of a contiguous piled wall can extend behind the wall to a distance up to twice the wall depth. The GMA should be updated to include ground movements (both horizontal and vertical) induced by the installation of the wall.

4.11. As CIRIA C760 guidance refers to ground movements occurring at surface, the GMA states that a reduction of those ground movements can be applied considering the foundation level of the neighbouring building. As such, a reduction of 15% and 50% has been applied to ground movements occurring at No. 151-153 Regent's Park Road and No. 1-13 Adelaide Road respectively (assuming foundation depth to be at 1.00 and 3.5m bgl). The rationale behind the reductions applied should be stated, noting also that where neighbouring foundation depths have been assumed, all assumptions and corresponding engineering judgements, should be reasonably conservative.

4.12. A section of the eastern basement wall will be constructed utilising a 'double lift' of underpinning. The GMA should discuss and include for ground movements caused by underpinning in two lifts.

4.13. In order to assess the GMA, the contour plots and calculations should be presented in the BIA for all properties within the zone of influence of the works.

4.14. A separate GMA (TfL GMA) has been issued to include ground movements impacting the London Underground infrastructure running adjacent to the site. Asset protection criteria will be agreed directly with TfL.

4.15. The GMA indicates movements at ground level impacting the highway. Asset protection criteria should be agreed with the underlying utility asset owners, as applicable.

4.16. An outline structural monitoring proposal has been included in Section 10 of the BIA report, with red trigger levels suggested to be at 5mm in both the horizontal and the vertical direction. This should be adopted during the works, with a final proposals to be agreed during the Party Wall Act negotiations.

4.17. The Arboricultural Report states that the cherry tree located in front of the site may be removed as part of the proposed development.

4.18. A Flood Risk Assessment has been undertaken as part of the BIA, indicating the site to be at very low to low risk of flooding. Attenuation SUDS is proposed to limit off-site discharge flows, in accordance with best practice.

4.19. It is accepted the proposed basement does not impact slope stability.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been undertaken by appropriately qualified authors.

5.2. The proposals include the construction of a two-storey basement covering the entire footprint of the site.

5.3. Outline permanent and temporary structural works proposals are presented.

5.4. Site investigation data is provided. Interpretative geotechnical parameters should be clarified, as detailed in Section 4.

5.5. The GMA should be reviewed, as detailed in Section 4.

5.6. A movement monitoring proposal has been included in the BIA. This should be adopted during the works and agreed under the Party Wall Act.

5.7. It is accepted there will be no impact to the wider hydrogeological environment and that the proposed basement raises no concern in relation to slope stability.

5.8. The site is at low risk of flooding.

5.9. There will be no impact to the wider hydrological environment.

5.10. Until the additional information requested is provided, the BIA does not meet the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comment

None

Appendix 2: Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Stability	The GMA should be updated to include ground movements induced by the installation of the contiguous piled retaining wall for the relevant areas. References used to estimate the decrease of ground movements with depth should be presented.	Open	
2	Stability	Ground movements due to a double level underpinning should be considered where relevant and any cumulative impact caused by two different techniques (underpinning + contiguous piled retaining wall) should be considered in the BIA. Full GMA calculations should be presented for all the neighbouring properties.	Open	
3	BIA format	Geotechnical parameters for the Made Ground, an undrained shear strength design line for the London Clay and the relationship used to derive the undrained Young's Modulus for the London Clay should be provided.	Open	

Appendix 3: Supplementary Supporting Documents

None

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