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166 Regent's Park Road
London, NW1 8XN

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12466-06
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 166 Regent's Park Road, London NW1 8XN (planning reference 2016/2670/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 proposed development is a two storey extension across the full footprint of the rear garden/yard. The extension will be formed at Lower Ground Floor and Ground Floor Levels.

1.5. The BIA has been prepared by Packman Lucas Engineering LLP with a supporting Desk Study and Site Investigation report prepared by Albury SI Ltd. The authors' qualifications are not in accordance with the requirements of CPG4. The BIA and supporting documents should be reviewed and approved by both a CEng MICE and CGeol FGS.

1.6. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1. A search of utility companies' underground assets / tunnels should be performed and appended to the Desk Study / BIA, and the impact assessment updated if applicable.

1.7. The Desk Study and BIA states that the site is not within an area at risk of flooding. However, the site is located within the Primrose Hill Local Flood Risk Zone and as such a site specific Flood Risk Assessment is required, in line with CPG4 (Section 3.48).

1.8. A site investigation is presented. It does not follow guidelines within CPG4 or the GSD Section 7. However, the exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying shallow Made Ground. The interpretative geotechnical information is broadly in accordance with the GSD Appendix G3.

1.9. A conceptual site model has not been presented. The levels/elevation of the existing buildings/foundations, adjacent structures' foundations, ground and groundwater conditions and the proposed development's foundation elevations should be clearly described.

1.10. The BIA assesses that ground movements will be minimal and that Damage Impact in accordance with the Burland Scale will be Category 0 (Negligible). However, temporary propping arrangements, construction sequencing and a Ground Movement Assessment (GMA)

should be presented to validate the land stability / damage impact assessment. The GMA should include a zone of influence and damage impact assessments should be prepared for each structure within that zone. Control of construction activities, incorporating an outline monitoring proposal, should be discussed.

1.11. Outline calculations to demonstrate the stability of the slab foundations, and retaining walls are required with all assumptions clearly stated.

1.12. The site investigation indicates perched water within the Made Ground, which will need to be controlled during excavation and construction. Limited groundwater monitoring has been undertaken and more long term monitoring is recommended.

1.13. The BIA identifies that the impermeable area of the site will remain the same, or slightly decrease due to the proposed development's green roof, and that peak run-off flows will remain at existing levels.

1.14. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 24 August 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 166 Regent's Park Road, London NW1 8XN, Camden Reference 2016/2670/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; and,

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: "Excavation of the rear garden, erection of a two storey rear extension & rear terrace".

2.6. CampbellReith accessed LBC's Planning Portal on 19 September 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment and Structural Feasibility Study (ref 5576 12 160706, Rev P3) dated 16 September 2016 by Packman Lucas Engineering LLP.

- Phase 1 Desk Study and Phase 2 Site Investigation Report (ref 16/10774/GO) dated September 2016 by Albury SI Ltd.
- Site Location Plan, Existing Plans and Elevations, Proposed Plans and Elevations (Rev Planning) dated May 2016 by Brian O'Reilly Architects.
- Design and Access Statement by Brian O'Reilly Architects.
- Comments and objections to the proposed development from local residents.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The author's qualifications are not in accordance with CPG4 guidelines e.g. CEng MICE, CGeol FGS.
Is data required by Cl.233 of the GSD presented?	Yes	The information is provided broadly in accordance with the guidelines. The presence of underground utility company assets should be checked.
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 plans/maps included?	Yes	Underground utility infrastructure mapping should be provided, if applicable.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Underground utility infrastructure mapping should be provided, if applicable.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Major underground utility assets to be checked.
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?	No	The site is within the Primrose Hill Local Flood Risk Zone and a site specific FRA is required.

Item	Yes/No/NA	Comment
Is a conceptual model presented?	No	Ground conditions encountered during the SI are presented. The relationship between existing and proposed ground/floor levels and ground and groundwater conditions should be clearly shown such as in a sketch with elevations and accompanying annotations.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Temporary propping, construction sequence, GMA and damage assessments to be presented.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	The site is within the Primrose Hill Local Flood Risk Zone and a site specific FRA is required.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	One round of monitoring presented. Longer term monitoring is recommended.
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	
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	Outline permanent retaining wall / underpin design presented. Temporary propping and sequencing to be presented.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	No	FRA required.
Are 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	It should be updated once updated desk study, FRA and GMA are presented.
Are estimates of ground movement and structural impact presented?	No	Movements and damage impacts to be updated following completion of GMA.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	It should be updated once updated desk study, FRA and GMA are presented.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Temporary works / land stability information and assessment is incomplete. Mitigation measures to be updated based on assessment.
Has the need for monitoring during construction been considered?	Yes	Monitoring is discussed but not in sufficient detail.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Structural / land stability information and assessment is incomplete.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Pending review of FRA. Areas of hardstanding remain as present, with slight betterment presented by the Green Roof. Attenuation SUDS plans are not presented.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Hydrological/land stability impacts to be assessed following FRA and GMA (with supporting information).
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	To be updated based on GMA.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The BIA has been prepared by Packman Lucas Engineering LLP with a supporting Desk Study and Site Investigation report prepared by Albury SI Ltd. The authors' qualifications are not in accordance with the requirements of CPG4. The BIA and supporting documents should be reviewed and approved by both a CEng MICE and CGeol FGS.

4.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1. The BIA identifies that there are no TFL underground assets, basements and listed buildings within the proposed development's zone of influence. A search of utility companies' underground assets/tunnels should be performed and, if appropriate, appended to the Desk Study/BIA, and the impact assessment updated if applicable.

4.3. The proposed development comprises the extension of a basement beyond the rear of the existing building with the construction of a single storey extension over and a green roof at first floor level. It is intended that the retaining walls are formed using underpinning techniques.

4.4. The Desk Study and BIA states that the site is not within an area at risk of flooding. However, the site is located within the Primrose Hill Local Flood Risk Zone and as such a site specific Flood Risk Assessment is required, in line with CPG4 (Section 3.48).

4.5. A site investigation is presented. It does not follow the guidelines within CPG4 or the GSD Section 7. However, the site footprint is limited and the exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying shallow Made Ground. The interpretative geotechnical information is broadly in accordance with the GSD Appendix G3.

4.6. The proposed foundations include mini-piles. Depending on the proposed pile lengths (not provided in BIA) additional SI for design purposes may be required.

4.7. The site investigation indicates that the proposed development will have foundations extending approximately 1.6m to 2.0m below the existing foundations of 4 Elgon Mews, and approximately 0.5m deeper than existing foundations on Regent's Park Road, on the assumption that adjoining structures on Regent's Park Road to the proposed development have similar foundation depths.

4.8. A conceptual site model has not been presented. The BIA should clearly indicate levels/elevations of the existing buildings/foundations, adjacent structures' foundations, ground and groundwater conditions and the proposed development's foundation elevations.

4.9. The BIA states "underpinning the perimeter Party Walls will remove the risk of the movements to the adjacent properties" but acknowledges "there is a risk of movement to the neighbours

during construction stages". The BIA assesses that ground movements will be minimal and that Damage Impact in accordance with the Burland Scale will be Category 0 (Negligible). The BIA indicates that "detailed structural proposals will be required to ensure stability to adjacent properties in both the temporary and permanent conditions" and discusses the requirement for survey and monitoring of ground/structural movements in accordance with the Party Wall Act.

4.10. Whilst permanent retaining wall design information is presented, structural details of the temporary propping and construction sequencing and a Ground Movement Assessment (GMA) should also be presented to validate the land stability/damage impact assessment. The GMA should include a zone of influence and damage impact assessments should be prepared for each structure within that zone. Control of construction activities, incorporating an outline monitoring proposal, should be discussed. Outline calculations to demonstrate the stability of the foundations basement slab and retaining walls are required. All design assumptions should be clearly stated.

4.11. The site investigation indicates perched water within the Made Ground, which will need to be controlled during excavation and construction. Limited groundwater monitoring has been undertaken and more long term monitoring is recommended.

4.12. The BIA identifies that the impermeable area of the site will remain the same, or slightly decrease due to the proposed development's green roof, and that peak run-off flows will remain at existing levels. No attenuation SUDS is proposed, other than a green roof, to attenuate peak run-off flows. It should be demonstrated how this will achieve the required attenuation.

4.13. The BIA currently does not meet the criteria outlined in CPG4 and DP27. Additional supporting information and assessment is required, as described, and outlined in Appendix 2.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by Packman Lucas Engineering LLP with a supporting Desk Study and Site Investigation report prepared by Albury SI Ltd. The authors' qualifications are not in accordance with the requirements of CPG4. The BIA and supporting documents should be reviewed and approved by both a CEng MICE and CGeol FGS.

5.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1. A search of utility companies' underground assets / tunnels should be performed and appended to the Desk Study / BIA, and the impact assessment updated if applicable.

5.3. The Desk Study and BIA states that the site is not within an area at risk of flooding. However, the site is located within the Primrose Hill Local Flood Risk Zone and as such a site specific Flood Risk Assessment is required, in line with CPG4 (Section 3.48).

5.4. A site investigation is presented. It does not follow guidelines within CPG4 or the GSD Section 7. However, the exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying shallow Made Ground. The interpretative geotechnical information is broadly in accordance with the GSD Appendix G3.

5.5. A conceptual site model has not been presented. The levels/elevation of the existing buildings/foundations, adjacent structures' foundations, ground and groundwater conditions and the proposed development's foundation elevations should be clearly described.

5.6. The BIA assesses that ground movements will be minimal and that Damage Impact in accordance with the Burland Scale will be Category 0 (Negligible). However, temporary propping arrangements, construction sequencing and a Ground Movement Assessment (GMA) should be presented to validate the land stability / damage impact assessment. The GMA should include a zone of influence and damage impact assessments should be prepared for each structure within that zone. Control of construction activities, incorporating an outline monitoring proposal, should be discussed.

5.7. Outline calculations to demonstrate the stability of the slab, foundations and retaining walls are required with all assumptions clearly stated.

5.8. The site investigation indicates perched water within the Made Ground, which will need to be controlled during excavation and construction. Limited groundwater monitoring has been undertaken and more long term monitoring is recommended.

5.9. The BIA identifies that the impermeable area of the site will remain the same, or slightly decrease due to the proposed development's green roof, and that peak run-off flows will remain at existing levels.

5.10. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Simpson	Primrose Hill CAAC	30/06/16	No provision of SUDS assessment to meet the sustainability provisions of the NPPF.	See audit paragraph 4.12.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	A revised BIA submission should include evidence of review and approval by appropriately qualified professionals for the relevant sections e.g. CEng MICE, CGeol FGS.		
2	Desk Study	Enquiries with relevant utility companies to identify potential for underground infrastructure beneath the site/within the zone of influence should be made (and impact assessment updated, if applicable).		
3	Land Stability	The BIA should clearly show site elevations, proposed development elevations, adjacent structures information, ground and groundwater conditions etc e.g sketch with elevations / accompanying annotations.		
4	Groundwater	In line with the site investigation recommendations, long term groundwater monitoring should be undertaken.		
5	Surface Water Flow	The site is within the Primrose Hill Local Flood Risk Zone and a site specific FRA should be presented.		
6	Land Stability / Ground Movement Assessment	A GMA should be presented, to include a zone of influence, damage impact assessments, methodology and calculations, etc.		
7	Land Stability / Structural Information	Sufficient design detail, drawings and calculations should be prepared and presented, including temporary and permanent works, construction sequencing,		

		propping arrangements, etc.		
8	Land Stability / Monitoring and Survey	Survey and monitoring requirements to be implemented to monitor and control potential ground movement impacts during construction should be assessed and presented.		

Appendix 3: Supplementary Supporting Documents

None

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