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45 Mount Pleasant, London WC1X 0AE

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13398-19
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Appendix

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 Apple Tree, 45 Mount Pleasant, London WC1X 0AE (planning reference 2020/0760/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 BIA has been carried out by individuals who possess suitable qualifications.

1.5. It is proposed to lower the existing lower ground floor and extend the basement to the rear to occupy the majority of the site footprint. The revised submission presents the excavation depth and founding stratum for the basement consistently in all assessments.

1.6. The site is a Grade II Listed building and is located within the Hatton Garden Conservation Area.

1.7. It is accepted that there are no slope stability concerns regarding the proposed development and that the development will not impact surface water flow.

1.8. It is accepted that the basement will not impact on groundwater flow.

1.9. The revised Ground Movement Assessment and Building Damage Assessment now consider the 'staged' construction sequence described in the Structural Report. The results indicate damage no higher than Burland Category 1 (very slight) is anticipated.

1.10. Updated trigger levels for monitoring have been provided based on the results of the updated ground movement assessment.

1.11. 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 23 April 2020 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 45 Mount Pleasant, London WC1X 0AE.

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 *"Demolition of existing rear outbuilding and erection of a courtyard garden room; reconstruction of the existing toilet block; installation of plant enclosure; enlargement of the existing basement; and various internal and external repair and refurbishment works."*

The Audit Instruction confirmed 45 Mount Pleasant is a Grade II listed building. The adjacent attached properties from 47 to 57 Mount Pleasant are also Grade II listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 23 April 2020 and gained access to the following relevant documents for audit purposes:

- Ground Investigation and Basement Impact Assessment Report (BIA) by GEA, reference J19092, Issue 3, dated 13 January 2020.
- Planning Application Drawings by Palmer Lunn Architects, consisting of a Location Plan, Existing and Proposed Plans and Sections.
- Design & Access Statement by Palmer Lunn Architects, rev PL01, dated 6 February 2020.
- Structural Engineering Planning Report by Price & Myers, ref. 27610, rev 0, dated February 2020.
- Planning statement by HGH Consulting, dated February 2020.
- Heritage Statement by Heritage Information Ltd, dated February 2020.

2.7. The following additional documents were provided to CampbellReith in July 2020 in response to the initial audit report and the queries summarised in Appendix 2:

- Ground Investigation and Basement Impact Assessment Report (BIA) by GEA, reference J19092, Issue 4, dated 3 July 2020.
- Structural Engineering Planning Report by Price & Myers, ref. 27610, rev 1, dated July 2020.

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	
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	
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?	Yes	
Is a conceptual model presented?	Yes	Clarification has been provided in the revised submission.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	Two rounds of groundwater monitoring undertaken.
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	Plan presented in Section 2.1.1 of BIA.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 8.1.2 and 10.2.
Are reports on other investigations required by screening and scoping presented?	N/A	
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	
Are estimates of ground movement and structural impact presented?	Yes	The revised submission addresses the previously raised queries.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
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	Updated trigger values have been provided in the revised submission.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Based on revised submission.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Based on revised submission.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Based on revised submission.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Based on revised submissions.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Geotechnical & Environmental Associates (GEA). Supporting structural information has been presented by Price and Myers. The individuals concerned in its production have suitable qualifications.

4.2. The Design and Access Statement identifies the existing development at the site as a Grade II listed building and the adjoining properties at 47 – 57 Mount Pleasant are also Grade II listed buildings. The site lies within the Hatton Garden Conservation Area.

4.3. The BIA identifies the neighbouring properties along Mount Pleasant to have basements, as detailed in Section 2.1.1 of the BIA.

4.4. The proposed basement consists of a single storey construction formed by lowering an existing lower ground floor area by 0.34m and extending the basement to the rear to occupy the majority of the site footprint. The revised submission indicates a maximum excavation depth for the basement extension of 3.50m. The retaining wall calculations given in the Structural Report indicate the retaining wall height to be 3.40m, and that consequently the ground floor level will be lowered slightly, by 100mm, where the basement extends beyond the building footprint.

4.5. It is accepted that there are no slope stability concerns regarding the proposed development.

4.6. The BIA identifies no increase in impermeable surfaces as part of the development. The site is indicated to be within an area with a potential risk of surface water flooding however the risk is identified as being low. It is accepted that the development will not impact surface water flow.

4.7. The BIA has shown that the development is close to a tributary of the “lost” River Fleet, which passes the east side of site in culvert. The shallowest stratum underlying the site is indicated to be London Clay, however superficial deposits were identified in close proximity to the site.

4.8. A site investigation has been undertaken, comprising one borehole and 10 no. trial pits. The results of the investigation indicate ground conditions comprise Made Ground to a maximum depth of 3.20 metres, below which superficial deposits, identified as reworked London Clay, were encountered to 3.60m, followed by London Clay Formation to a maximum proven depth of 8.50m.

4.9. The London Clay Formation was wet and had poor recovery to 8m depth. This was indicated as potentially being a result of the soils being disturbed due to the proximity of the former channel of the Fleet. Superficial deposits were not anticipated based on the desk study data, however, following the site investigation it is confirmed that these deposits are likely to extend across the full footprint of the basement and surrounding area. It is noted that the construction sequence

described in the structural report includes the installation of sacrificial metal sheeting against the earth face of underpin excavations to maintain stability.

4.10. During the site investigation, groundwater was encountered at 3.00m depth in the borehole and a standpipe was installed to allow future groundwater monitoring. Subsequent monitoring recorded water levels at 2.50m depth and 2.30m below ground level. This groundwater was considered to be perched water held within the Made Ground. Inflows during construction were indicated to be minor in nature.

4.11. The site description presented in Section 2.1 of the BIA notes cracks in the basement walls and water seeping through. This was noted in a location where it is intended to construct the basement extension, and where Trial Pit TP4 was carried out. Groundwater was not encountered in TP4 during the site investigation.

4.12. It is accepted that the basement will not impact on groundwater flows as water was typically recorded close to or below the basement level and appears to be impersistent. However the BIA refers to the potential need for pumping during the construction of the basement and this is now reflected in the construction sequence described in the revised submission of the structural report.

4.13. The revised BIA submission has been updated such that the ground conditions listed in Section 7 to characterise the site are reflected in the Conceptual Site Model (CSM) and correspond with those used in the ground movement assessment.

4.14. The revised BIA submission presents a consistent CSM and confirms that the formation level for the basement will be 10.50m OD, which, on average, will be within the superficial deposits. The revised BIA indicates a bearing capacity of 70kPa should be assumed for the soils anticipated at the basement founding level of 10.50m OD, and that this may increase to 100kPa for foundation extended to bear on the underlying London Clay. The revised structural calculations have adopted an allowable bearing pressure of 70kPa at the base of the retaining wall.

4.15. Section 6 of the Structural Report provides a proposed construction sequence for the basement. It indicates the use of a two-stage underpinning sequence. The west half of the basement extension is shown to be fully formed before excavation of the east side commences.

4.16. Section 9.1.3 of the revised BIA indicates a reinforced concrete floor slab will be adopted and that heave protection is to be installed beneath the basement slab. This is further discussed in Section 10.4.1 of the revised BIA. Section 5 of the Structural Report indicates that the floor slab will be designed to withstand heave pressures and will be ground bearing.

4.17. A Ground Movement Assessment (GMA) has been undertaken using PDisp software to assess the vertical ground movements arising from construction of the basement. The revised GMA

submission has been carried out in stages to reflect the proposed construction sequence detailed in the Structural Report.

4.18. The revised GMA submission has been updated to include a component of vertical and horizontal movement for the underpinning of the existing basement.

4.19. A Building Damage Assessment (BDA) is presented in Section 11 of the BIA. The ground movements calculated in the PDisp analysis were imported to the XDisp analysis and horizontal and vertical displacements were calculated for adjacent sensitive structures. The revised XDisp analysis has been undertaken using the 'critical stage' of ground movement from the PDisp analysis. The geometry used in the PDisp and XDisp models now takes into account the 1m wide off-set shown around the party wall for 20-23 Rosebery Square in the Structural Report.

4.20. The results of the revised XDisp analysis, presented in Section 11.1 of the revised BIA, indicate damage no higher than Burland Category 1 (very slight) is anticipated. A sensitivity analysis of the XDisp assessment has also been carried out, where the stiffness of the basement wall was changed from a 'high stiffness' to a more conservative 'low stiffness' wall. The results indicate two areas, located at the re-entrant corner in the south of the site, where the damage category increases to Category 2.

4.21. The revised BIA goes on to show that a 20% reduction to the vertical and horizontal movements associated with the two Category 2 areas will return the anticipated ground movement to within Category 1 limits. It is generally not considered appropriate to apply a reduction to ground movements at re-entrant corners, as they are prone to more ground movement than a simple rectangular geometry. However, in this instance the reduction has been applied as part of a sensitivity check using a more conservative analysis for the site. It is therefore accepted that, with tight controls on workmanship, the development should result in damage no higher than Burland Category 1 (very slight).

4.22. The revised submission considers the ground movements that will affect the host building, and indicates that damage no greater than Burland Category 0 (negligible) will apply to No. 45 Mount Pleasant.

4.23. The BIA present utility records for the site and surrounding area and considers adjacent utilities and the Fleet Sewer in its analyses.

4.24. Section 7 of the revised Structural Report presents a monitoring strategy for the adjacent buildings before and during construction works. The proposed trigger values of 5mm (amber) and 8mm (red) now reflect the predicted movements given in the GMA.

5.0 CONCLUSIONS

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

5.2. It is proposed to lower the existing lower ground floor area by 0.34m and extend the basement to the rear to occupy the majority of the site footprint. The revised submission presents the excavation depth and founding stratum for the basement consistently in the Conceptual Site Model and in all assessments.

5.3. The site is a Grade II Listed building and is located within the Hatton Garden Conservation Area.

5.4. It is accepted that there are no slope stability concerns regarding the proposed development and that the development will not impact surface water flow.

5.5. It is accepted that the basement will not impact on groundwater flows and the construction sequence described in the revised Structural Report has been updated to reflect the potential need for pumping during basement construction.

5.6. The revised Ground Movement Assessment and Building Damage Assessment now take into account the 'staged' construction sequence described in the Structural Report.

5.7. The results of the revised XDisp analysis indicate damage no higher than Burland Category 1 (very slight) is anticipated.

5.8. Trigger levels for monitoring have been updated based on the results of the updated ground movement assessment.

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	Ground Model	The ground model presented for the site should be adopted consistently and presented clearly in the conceptual site model diagram.	Closed	17 July 2020
2	Stability	The excavation depth of the basement should be confirmed and associated assessments updated. The founding stratum should be confirmed and further justification provided for the assumed bearing pressure adopted for the London Clay.	Closed	17 July 2020
3	Stability	Construction sequence should refer to potential need for pumping.	Closed	17 July 2020
4	Stability	GMA does not reflect the staged construction sequence and should take into account the 1m off-set at 20-23 Rosebery Square and the ground movements arising from construction of the underpins, as well as the development.	Closed	17 July 2020
5	Stability	Further justification is required for method used to assess the re-entrant corner in XDisp, or an alternative approach should be adopted.	Closed	17 July 2020
6	Stability	A Building Damage Assessment for the listed host building should be carried out.	Closed	17 July 2020
7	Stability	Monitoring trigger levels should be updated to reflect the wall movements predicted in the BIA.	Closed	17 July 2020

Appendix 3: Supplementary Supporting Documents

None

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