

314-320 Acorn House, Gray's Inn
Road, WC1X 8DP

Basement Impact Assessment
Audit

For
London Borough of Camden

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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 314-320 Acorn House, Grays' Inn Road, WC1X 8DP (planning reference 2020/3880/P). The basement is considered to fall within Category C 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 prepared by AKT II Consulting Structural Engineers. Authors and/or reviewers possess suitable qualifications.
- 1.5. It is proposed to demolish the existing building, redevelop the existing basement by providing temporary propping to the retaining wall, and to excavate and construct a second basement within a sheet piling arrangement.
- 1.6. A ground investigation was undertaken, and a report dated July 2020 is available.
- 1.7. The BIA has confirmed that the proposed basement will be constructed within London Clay. Based on the proposed installation of a sheet pile wall, it is unlikely that water will be encountered during excavation for the lower basement.
- 1.8. It is accepted that the proposed development will not impact the hydrogeology of the area.
- 1.9. The BIA notes there will be no change in the impermeable surface area/hard paving as a result of the development and that the site is in an area with a low risk of surface water flooding. It is accepted that the development will not adversely impact the hydrology of the area.
- 1.10. The BIA indicates that the only stability impacts are related to ground movement around the excavation. A Ground Movement Assessment, and Building and Utility Damage Assessments, have been undertaken indicating Category 0 to Category 1 damage to neighbouring buildings and no impact to infrastructure.
- 1.11. A movement monitoring strategy during excavation and construction has been considered.

- 1.12. An outline design of the proposed concrete retaining wall for the new basement is presented.
Outline details of the temporary propping arrangement to the existing basement retaining wall and proposed sheet pile wall during construction and excavation are presented.
- 1.13. The BIA meets the requirements of CPG: Basements.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15th September 2020 to carry out a Category C audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 314-320 Acorn House, Gray's Inn Road, WC1X 8DP (Planning Reference: 2020/3880/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
- 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 *"Redevelopment of Acorn House as a part 6, part 10 storey mixed-use storey with 33 affordable homes (with external playspace at level 6, a community room and terrace at level 9), affordable office space and retail unit at ground and basement level; together with cycle parking facilities and associated ancillary uses."*

The Audit Instruction confirmed the adjoining terrace on Swinton Street is a Grade II listed building and that the site is in a Bloomsbury Conservation Area.

2.6. CampbellReith accessed LBC's Planning Portal on 30th September 2020 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) prepared by AKT II Consulting Structural and Civil Engineers, dated August 2020 (Reference 4259A);
- Design & Access Statement prepared by Allford Hall Monaghan Morris, dated August 2020 (Reference: 18102 (P1))
- Planning Application Drawings consisting of
Site Location Plan: Drawing Reference 18102(00)_001(P1);

Existing Plans, Elevation and Section: Drawing reference 18102_(01)_099(P2), (01)_100, (01)_201(P1), 201(P2), 301(P1);

Basement Demolition Plan: Drawing Reference 18102(01)_099(P1);

Proposed Basement Plans, Elevation and Section: Drawing Reference 18102(00)_098(P1), 099(P1), (00)_201(P1) to 204(P1), 301(P1), 302(P1).
- Comments from TWUL

2.7. Updated documents were forwarded to CampbellReith on 30th November 2020 and included the following:

- Basement Impact Assessment Report (BIA) (Rev02) prepared by AKT II Consulting Structural and Civil Engineers, dated November 2020 (Reference 4259A).

2.8. Further updated documents were forwarded CampbellReith from 8th January 2021 and 14th January 2021 and included the following:

- Software Analysis output and input details for XDisp and PDisp, for excavation in undrained condition.
- Basement Impact Assessment Report (BIA) (Rev03) prepared by AKT II Consulting Structural and Civil Engineers, dated December 2020 (Reference 4259A).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Page 3 of BIA
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	Section 11 of the BIA.
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?	NA	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	
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?	No	However, GMA has conservatively assumed that no basements are present beneath the surrounding properties.
Is a geotechnical interpretation presented?	Yes	Section 10 of the BIA and soil parameters presented as Appendix 2 of the updated documents.
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural report, Topographical Survey, Utility Survey.
Are the baseline conditions described, based on the GSD?	No	The presence of nearby basements is not confirmed.
Do the base line conditions consider adjacent or nearby basements?	No	As above. However, GMA has conservatively assumed that no basements are present beneath the surrounding properties.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Category 0 and Category 1 damage indicated for neighbouring properties.
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	Blue Roof Strategy provided, Drainage Strategy provided, temporary propping proposed for the retaining walls, movement monitoring proposed during works.
Has the need for monitoring during construction been considered?	Yes	Section 10.4 of the BIA
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	
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	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by AKT II Consulting Structural and Civil Engineers, and the individuals concerned in its production and review have suitable qualifications.
- 4.2. The LBC Instruction to proceed with the audit identified that the adjoining Terrace on 55-67 Swinton Street to the north is a Grade II listed building and that the site is within the Bloomsbury Conservation Area.
- 4.3. It is proposed to demolish the existing building which has a single storey basement car-park, to facilitate the construction of a part six storey, part nine storey building, with a two-storey basement. The upper basement will be developed within the existing retaining wall. The lower (new) basement has a smaller footprint beneath the centre of the building and will be constructed following excavation to a formation level at 11.90m OD (c.4.5m excavation). It is stated that the existing retaining wall will be propped during demolition and construction and it is intended to form a new basement wall inside the existing. The BIA notes that sheet piles will be employed to form the excavation for the lower basement, propped at high level in the temporary case and supported further by a reinforced concrete liner wall and lower ground floor slab in the permanent case.
- 4.4. A ground investigation has been undertaken which included boreholes sunk from existing basement level. The ground investigation identified that the reinforced concrete basement slab is underlain by Made Ground to a depth of 1.20 metres below which lies the London Clay Formation. It is noted that no groundwater was observed during drilling, but perched water was recorded at 0.68m below basement slab level during monitoring. Due to the intention to install the sheet pile wall, it is unlikely that water will be encountered during excavation for the lower basement.
- 4.5. The ground investigation report with updated soil parameters are included in Appendix 2 of the updated documents forwarded in November 2020. The BIA has been updated to include soil parameters derived from site specific investigation as requested in the initial audit report.
- 4.6. It is stated in the ground investigation report that the existing retaining wall comprises reinforced concrete. It is conjectured that there maybe a contiguous pile wall behind the concrete wall.
- 4.7. The BIA identifies that the London Clay on site is an unproductive stratum, there is no water source within 100m of the site, and that the lost River Fleet is more than 100m to east of the site. It is stated that the proposed basement development will not result in any changes in the proportion of hard surfaced/paved areas. It is also stated that there is very low risk of

groundwater flooding on site. It is accepted that the development will have no adverse impact on the hydrogeological environment.

- 4.8. The BIA states that the site does not fall within the Hampstead Heath Surface Water Catchment area. The site is located within Critical Drainage Area Group 3_003 and it is stated in the BIA that the site is within a Zone 1 flood zone. A Flood Risk Assessment has been undertaken, which concludes that there is very low risk of surface water/sewer flooding. A SuDS design (including a blue roof strategy) is proposed for the betterment of the existing discharge system. Taking this into account together with the need to satisfy Thames Water, it is accepted that there will be no adverse impacts to the hydrological environment.
- 4.9. With respect to impacts to stability, the BIA states that the site does not include slopes, natural or man-made, greater than 7 degrees, except for a ramp which provides access to the existing lower basement. No re-profiling is proposed on the site. An Arboricultural Impact Assessment has been presented, no trees are proposed to be removed and no development is proposed within root protection zone of existing trees. It is also stated that there is no evidence of seasonal shrink or swell subsidence in the local area. The site is not within the exclusion zone of any tunnels.
- 4.10. Gray's Inn Road is present immediately to the south-west of the site and Swinton Street to the north-west. It is stated in the BIA that the distance to highway/footpath is approximately 1m from the centre line of the existing retaining wall. The illustrative output of the GMA indicates no significant movement to the highways.
- 4.11. The BIA notes that there are neighbouring buildings to the east and the south of the site, although no information is presented regarding the presence or absence of basements for these structures. A Ground Movement and Building Damage Assessment has been undertaken for the surrounding structures, which conservatively assumes buildings to have shallow foundations. The illustrative output of the assessment indicates Category 0 to Category 1 damage for the neighbouring properties. Detailed input and output data from the modelling has been provided to justify the conclusions presented.
- 4.12. A site constraints plan has been presented which identifies the presence and location of utility lines including Thames Water assets. A Utility Damage Assessment has been undertaken which indicates no significant impact on the surrounding assets due to the proposal.
- 4.13. An outline design for the concrete retaining wall for the second basement is presented and is accepted. Outline sketch details of the sheet pile wall and temporary propping arrangement for that and the existing retaining wall are presented. It is accepted that, assuming appropriate design and good control of workmanship, the proposal will not have an adverse impact on the stability of the surrounding buildings and infrastructure.

- 4.14. Consideration has been given to a movement monitoring strategy during excavation and construction in Section 10.4 of the BIA.

5.0 CONCLUSIONS

- 5.1. The BIA has been carried out by AKT II Consulting Structural and Civil Engineers using individuals who possess suitable qualifications.
- 5.2. The BIA has confirmed that the proposed basement will be founded within London Clay.
- 5.3. The BIA has been updated to reflect the findings of the final ground investigation report.
- 5.4. It is proposed to modify the existing basement while maintaining the existing retaining wall supported using temporary propping during construction. The excavation and construction of the lower basement will be facilitated by the installation of sheet pile retaining wall, propped at high level.
- 5.5. It is accepted that the proposal will not adversely impact the hydrology of the area nor, in light of the absence of an aquifer, the hydrogeology.
- 5.6. No information is provided regarding the foundation depths and the presence/absence of basements to neighbouring structures. However, the absence of basements has been conservatively assumed in the Ground Movement Assessment.
- 5.7. A Building Damage Assessment for the neighbouring properties indicates less than Category 1 damage.
- 5.8. Consideration has been given for a movement monitoring strategy during excavation and construction.
- 5.9. The outline proposal/design of the temporary propping arrangement for the existing retaining wall and the sheet pile retaining wall for the lower basement is presented.
- 5.10. The BIA meets the requirements of CPG: Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Thames Water Developer Services	Reading, RG1 8DB	0309.2020	Impact on assets	Utility Impact and Damage Assessment provided and indicates no damage due to proposed development. Further discussion is to be undertaken with TWUL and is beyond scope of this audit.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Land Stability	The BIA should be updated to reflect the findings of the final ground investigation report.	Closed	30.11.2020
2	Land Stability	Proposals and outline design for sheet pile wall and temporary propping arrangement for the existing retaining and proposed sheet pile retaining walls to be provided.	Closed	30.11.2020
3	Structural Stability	The input assumptions and output details of the ground movement and building damage assessment are to be presented.	Closed	14.01.2021

Appendix 3: Supplementary Supporting Documents

None

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