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11-15 Kings Terrace, London, NW1 0JP

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13693-07
Revision: F1

June 2023

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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 11-15 Kings Terrace, London, NW1 0JP (planning reference 2021/3119/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 and have been prepared by Geotechnical and Environmental Associates (GEA) by individuals who possess suitable qualifications as per CPG: Basements. The BIA is supported with a Construction Method Statement (CMS) from Michael Barclay Partnership (MBP) and a Flood Risk Assessment by Evans Rivers and Coastal Ltd.

1.5. The BIA has confirmed that the proposed basement will be founded within London Clay. It is likely that the ground water table will not be encountered during basement foundation excavation.

1.6. The proposal is for a single storey basement to approximately 3m depth constructed using underpinning techniques. The CMS has been updated to ensure consistency with regards to the nature of the underpins, stages of underpinning and temporary props provided.

1.7. It is accepted that the development will not impact the hydrogeology of the area. The screening for an increase in hardstanding is updated and further clarification is provided within Section 13.0 of the BIA.

1.8. The BIA identifies the area is at risk to surface water flooding and a Flood Risk Assessment is presented. The final design should implement the appropriate flood risk mitigation, as indicated.

1.9. With respect to impacts to stability, a revised Ground Movement Assessment is provided in the BIA response letter dated march 2023, with predicted long and short term movements. The damage assessment identifies potential damage to neighbouring properties to be within Burland Category 1.

1.10. A monitoring strategy is presented and trigger levels are reviewed against the revised GMA to ensure that damage will be limited to Burland Category 1.

1.11. It can be confirmed that the BIA complies with the requirements of CPG: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 07/07/2021 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 11-15 Kings Terrace, London, NW1 0JP and Planning Reference No. 2021/3119/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 (CPG): Basements. January 2021.
- 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 *"Partial demolition and rebuilding of no.11-13 King's Terrace and demolition and rebuilding of no.15 King's Terrace, with the creation of a basement under both properties. Retention of office at basement and ground floor level and proposed 2 x residential units at first and second floor of no 11-13. Proposed residential mews house at no.15."*

The Audit Instruction confirmed 11-15 Kings Terrace did not involve, nor was a neighbour to, any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 16/07/2021 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) by GEA, Revision No. 0, dated June 2021
- Construction Method Statement (CMS) for Subterranean Development by Michael Barclay Partnership, dated June 2021.
- Planning Application Drawings consisting of:

  Planning Statement by RPS, dated June 2021

  Architects General Arrangement Plans & Sections Existing and Proposed by BB Partnership, dated June 2021

  Heritage Statement by BB Partnership, dated September 2020.

- Design & Access Statement by BB Partnership, dated June 2020
- Planning Consultation Responses

  Thames Water

  Conservation area advisory committee response

2.7. CampbellReith issued a D1 audit in August 2021 with request for additional information. The following updated documents were submitted by the applicant to answer CampbellReith's queries over the following dates:

- Updated Documents 09/11/2021
  - Basement Impact Assessment Report (BIA) by GEA, Revision No. 1, dated November 2021
  - Construction Method Statement (CMS) for Subterranean Development by Michael Barclay Partnership, dated October 2021 with Appendices B, C, D.
  - Flood Risk Assessment by Evans Rivers and Coastal, dated October 2021, Report Ref No. - 2818/RE/10-21/01
- Updated Documents 11/05/2022
  - Basement Impact Assessment Report (BIA) by GEA, Revision No. 2, dated May 2022
- Updated Document 14/11/2022
  - BIA Audit Response Letter by GEA, dated October 2022, Ref No. - J21098/ML/01
- Updated Document 12/06/2023
  - BIA Audit Response Letter by GEA, dated March 2023, Ref No. - J21098/ML/02

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Refer Section 1.3.2 of the 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	Outlined in the CMS
Are suitable plan/maps included?	Yes	Map extracts from the GSD are not included, however they are referenced in the screening.
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	Section 3.1.2 of the BIA and "No" answers are justified in Section 13.3
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1.1 of the BIA and "No" answers are justified in Section 13.3 Q 4 updated and further explanation provided in Section 13.3.1
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1.3 of the BIA and "No" answers are justified in Section 13.3. Q 3 updated and further explanation provided in Section 13.3.1
Is a conceptual model presented?	Yes	Section 7 of the BIA

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4 of the BIA and further elaborated in Section 13.1
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	None taken forward to scoping.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Section 4 of the BIA and further elaborated in Section 13.1 Q 3 updated and further clarification provided in Section 13.3.1 regarding increase in hardstanding.
Is factual ground investigation data provided?	Yes	Section 5 of the BIA
Is monitoring data presented?	No	Although it is noted in Section 5.3 that a standpipe was found to be dry when monitored
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	Evidence is provided to the presence of single storey basements on Camden High Street.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 8.1.2 of the BIA
Are reports on other investigations required by screening and scoping presented?	Yes	Flood Risk Assessment is presented.
Are the baseline conditions described, based on the GSD?	Yes	
Do the baseline conditions consider adjacent or nearby basements?	Yes	Evidence is provided to the presence of single storey basements on Camden High Street.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	Section 13 of the BIA.
Are estimates of ground movement and structural impact presented?	Yes	Sections 9, 10, 11 and 12 of the BIA
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	Flood Risk Assessment is presented. Mitigation measures are provided in Section 6 of the CMS.
Has the need for monitoring during construction been considered?	Yes	Refer to BIA Audit response letter dated March 2023
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?	Yes	Section 11 and 12 of the BIA
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Flood Risk Assessment is presented.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Refer to updated GMA within BIA Audit response letter dated March 2023.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Geotechnical and Environmental Associates (GEA) and the individuals concerned in its production have suitable qualifications. A supporting Construction Method Statement has been prepared by the Michael Barclay Partnership (MBP) and a Flood Risk Assessment by Evans Rivers and Coastal Ltd.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal did not involve a listed building and was not adjacent to listed buildings (although it is noted the BIA incorrectly refers to the presence of Grade II Listed Buildings in Section 11.0). The Design & Access Statement identified that 11-15 Kings Terrace is located in the Camden Town Conservation Area and within Commercial Sub Area 1 with Camden High Street to its rear.

4.3. The terraced buildings is 2-storeys above ground and a wall divides 11-13 and 15 Kings Terrace. The proposed works include the construction of a new single storey basement beneath the existing footprint of the current buildings, which is to extend to a depth of 3.20m below the existing ground floor level. The basement is to be constructed using concrete underpinning techniques in a hit and miss sequence, supported by props in the temporary case. The CMS is contradictory about whether the underpins are mass or reinforced concrete.

4.4. The BIA has identified that the proposed basement will be founded on London Clay. The ground investigation has identified made ground to a depth of 1.10m below the existing ground floor, followed by London Clay to a depth of at least 3.70m. Groundwater was not encountered during the investigation and subsequent monitoring found a standpipe to be dry. The GI also indicates the surrounding walls to bear on foundations 0.73m in depth through a trial pit inspection.

4.5. With respect to surface water and flooding, Question 3 of the screening mentions there are no changes in impermeable surfaces above the ground surface. However, evidence provided in Section 13.3.1 clarifies the proposed scheme will not increase amount of hardstanding since the entire site is covered by hardstanding. The screening has identified King's Terrace is at risk from surface water flooding and a Flood Risk Assessment is undertaken by a qualified person. The final design should implement the recommended flood risk mitigation measures.

4.6. The subterranean screening identifies no issues concerned with the development and therefore a scoping is not carried out. Question 4 of the screening is clarified within Section 13.3.1. The presence of surrounding basements has not been proven and they are assumed to be absent. In the absence of an aquifer and significant subterranean flows, this is accepted.

4.7. Screening questions for Land Stability have identified potential impacts which are assessed in the scoping stages.

4.8. A structural load takedown along with retaining wall analysis is undertaken in Appendix C of the CMS. The assumed parameters for the retaining wall analysis are taken from Section 8.1.2 of the BIA. However, the made ground is not modelled in the analysis.

4.9. A construction methodology is presented in Section 8 of the CMS and further expanded with drawings illustrating the hit and miss sequence along with a comprehensive construction sequence in the appendices. Drawing MBP 8292 / 101 is updated to indicate a single stage underpinning and is consistent with Section 8 of the CMS and GMA.

4.10. A Ground Movement Assessment (GMA) is undertaken and presented in Part 3 (Section 9, 10, 11 and 12) of the BIA. The methodology assumes the neighbouring buildings to have foundation depths of 1.00m deep and no basements present. Foundation inspection pits revealed foundations at c 0.73m depth, but this is accepted. The GMA includes both lateral and vertical movements on the basis that the basement retaining walls are propped in the temporary and permanent case. Section 5 of the CMS and sketch in Appendix is updated to indicate the temporary props will be installed above ground level to maintain stability once construction works commence.

4.11. The GMA is updated to consider ground movement due to the structural loads on the new foundations as well as settlement resulting from the construction of the underpins. The BIA Audit Response Letter dated March 2023 is updated to consider a minimum of 5mm vertical and horizontal ground movement curves in XDisp. The updated assessment predicts that the damage to neighbouring properties can generally be limited to Very Slight (Category 1), the predicted damage to Wall 1 & Wall 2 of 28-30 Camden High Street and Wall 1 of 26 Camden High Street, is updated to be within Very Slight (Category 1).

4.12. BIA Audit Response Letter dated March 2023 specifies a monitoring regime with a amber trigger level for 5 mm movements and red trigger level for 8 mm.

5.0 CONCLUSIONS

5.1. The authors of the BIA possess suitable qualifications set out by CPG Basements. The BIA is supported by a Construction Method Statement and a Flood Risk Assessment.

5.2. The BIA has confirmed that the proposed basement will be single storey, built within London Clay and overlain by a thin layer of Made Ground.

5.3. It is likely that significant volumes of ground water will not be encountered during basement foundation excavation. The excavation is to a depth of 3.20 m bgl.

5.4. Concrete underpinning will be undertaken to form the basement along with the construction of retaining walls. The construction methodology in the CMS is updated to include consistent information on type, stages of underpinning undertaken, and the placement of temporary props.

5.5. Screening sections for hydrogeology, hydrology and land stability are included in the BIA. Evidence is provided for "No" answers in Section 13.3.1. The screening questions for hydrogeology and hydrology are updated to indicate there will be no change in hardstanding onsite and further clarified within Section 13.3.1.

5.6. Additionally, the area is at risk from surface water flooding and a Flood Risk Assessment is presented. The recommended flood risk mitigation measures should be implemented.

5.7. The presence of a single storey basement on Camden High Street is proven but not on adjacent neighbouring properties. In view of the potential impacts identified, this is accepted.

5.8. The stability screening and scoping identified potential damage to neighbouring properties. The GMA is updated to consider ground movements caused by structural loads on the new underpins.

5.9. The revised GMA uses a ground movement curve of minimum 5mm of horizontal and vertical movement. The resultant damage for the walls are within Category 1 of the Burland Scale.

5.10. A monitoring strategy is presented, and trigger levels should are updated against the revised GMA to ensure that damage will be limited to Burland Category 1.

5.11. It can be confirmed that the BIA complies with the requirements 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	Question 3 of Screening should be reviewed to match evidence provided.	Closed	June 2023
2	Hydrology	Flood Risk Assessment required.	Closed	June 2023
3	Hydrogeology	Question 4 of Screening should be reviewed to match evidence provided.	Closed	June 2023
4	Stability	Further explanation is required to justify the estimated ground movements and reduction to predicted damage categories, as described in Section 4.	Closed	June 2023
5	Stability	CMS contains numerous contradictions, such as • referring to both one and two stage underpinning • mass concrete and RC underpinning • temporary propping levels. These should be reviewed to ensure consistency within the report and between the CMS and GMA.	Closed	June 2023
6	Stability	Movement monitoring strategy should be reviewed against GMA to ensure damage limited to Burland Category 1	Closed	June 2023

Appendix 3: Supplementary Supporting Documents

None

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