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Basement Impact Assessment Audit

340 Gray's Inn Road, London, WC1X 8BG

For
London Borough of Camden

Project No.
13693-90

Revision
D1

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CONTENTS

APPENDICES

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 Address (planning reference 2022/4469/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 qualifications of the individuals involved in the production of the BIA have not been demonstrated to be in accordance with LBC guidance.

1.5 The proposed development comprises a two-storey above ground extension of the existing building with the extension of the basement space. It also includes a localised lowering of the existing basement to create a greater headroom.

1.6 Screening and scoping assessments are presented, supported by desk study information. However, the screening and scoping assessments require further consideration as detailed in Section 4.

1.7 A site investigation has been undertaken; only draft logs were provided. Groundwater monitoring data has not been provided and is required.

1.8 Further consideration for the hydrogeological and hydrological environment is required.

1.9 Geotechnical parameters are not provided and are requested.

1.10 Clarification regarding basement depth, type of retaining wall adopted and propping arrangement is requested.

1.11 Structural Method Statement is not provided and is requested.

1.12 The Ground Movement Assessment (GMA) and Building Damage Assessment should be reviewed and further information provided as described in Section 4.

1.13 No tree works, including pruning or felling, will be undertaken in connection with the development.

1.14 Queries and requests for information are summarised in Appendix 2. Until clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 8 December 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Project Name, Address and Reference.

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 *"Change of use of first floor commercial floorspace to residential use and erection of a two storey (plus basement) extension along Britannia Street comprising commercial floorspace at basement and ground floors and 5 residential units at first floor; public realm works."*

2.6 The Audit Instruction confirmed 340 Gray's Inn Road neither comprises, nor is a neighbour to, listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 19 December 2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Ed Moseley, ref: 1560, dated 12 September 2022.
- Arboricultural Method Statement by David Archer Associates dated September 2022.
- Surface Water Drainage Strategy by London Structures Lab, ref: 1560-LSL-XX-XX-RP-C-SWS Rev 0, dated September 2022.

- Flood Risk Assessment by London Structures Lab, ref: 1560-LSL-XX-XX-RP-C_FRE Rev 0, dated September 2022.
- Architectural drawings by RUFFA Architects:
  - Existing First Floor & Roof Plan, ref: 22001-RA-XX-00-DR-A-00_101 rev PL01, dated 29 September 2022.
  - Existing Basement & Ground Floor Plan, ref: 22001-RA-XX-00-DR-A-00_100 rev PL01, dated 29 September 2022.
  - Proposed Basement & Ground Floor Plan, ref: 22001-RA-XX-00-DR-A-00_150 rev PL01, dated 29 September 2022.
  - Proposed First Floor & Roof Plan, ref: 22001-RA-XX-00-DR-A-00_151 rev PL01, dated 29 September 2022.
  - Site Location Plan, ref: 22001-RA-XX-00-DR-A-00_001 rev PL01, dated 29 September 2022.
  - Existing Site Layout Plan, ref: 22001-RA-XX-00-DR-A-00_010 rev PL01, dated 29 September 2022.
  - Proposed Site Layout Plan, ref: 22001-RA-XX-00-DR-A-00_050 rev PL01, dated 29 September 2022.
  - Existing North & East Elevations, ref: 22001-RA-XX-00-DR-A-00_200 rev PL01, dated 29 September 2022.
  - Existing South & West Elevations, ref: 22001-RA-XX-00-DR-A-00_201 rev PL01, dated 29 September 2022.
  - Proposed North & East Elevations, ref: 22001-RA-XX-00-DR-A-00_250 rev PL01, dated 29 September 2022.
  - Proposed South & West Elevations, ref: 22001-RA-XX-00-DR-A-00_251 rev PL01, dated 29 September 2022.
  - Existing Sections, ref: 22001-RA-XX-00-DR-A-00_300 rev PL01, dated 29 September 2022.
  - Proposed Sections, ref: 22001-RA-XX-00-DR-A-00_350 rev PL01, dated 29 September 2022.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	Section 2.1 of the BIA. It should be demonstrated that the authors of the BIA have the required qualifications as CPG Basements.
Is data required by Cl.233 of the GSD presented?	No	Structural method statement is not provided.
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	Embedded in the BIA report. However, the site location should be identified on each of the figures to support the conclusions of 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?	No	Section 4.2 of the BIA. Re- query increase in differential depth of foundations relative to neighbouring buildings. The metropolitan line seems to be running under the site. Questions 13 & 14 of the Land Stability screening to be updated to consider the above, and scoping assessment updated as necessary.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 4.1 of the BIA. However, according to London Lost Rivers (2013) a lost river is crossing the site.

Item	Yes/No/NA	Comment
		Question 2 of the hydrogeology screening to be updated to assess the presence of a lost river on/near the site, and scoping assessment updated as necessary.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the BIA. According to Figure 15 Flood Map – Camden Geological Hydrogeological and Hydrological study. The site falls in an area with the potential to be at risk of surface water flooding. Question 6 of the Hydrology screening should be answered as "Yes" and carried over to scoping. However, a Flood Risk Assessment has been undertaken and the risk of Flooding on site has been determined as low.
Is a conceptual model presented?	No	Ground model not provided and is required.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	To be updated subject to screening assessment revision and to include the two items where 'yes' answers were given.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	To be updated subject to screening assessment revision.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	To be updated subject to screening assessment revision.
Is factual ground investigation data provided?	Yes	Appendix 2 of the BIA. Draft Ground Investigation data provided. Final issue data should be provided.

Item	Yes/No/NA	Comment
Is monitoring data presented?	No	Monitoring data has not been provided and is requested.
Is the ground investigation informed by a desk study?	Yes	Section 3 of the BIA.
Has a site walkover been undertaken?	Yes	Site walkover undertaken on 18/08/2022.
Is the presence/absence of adjacent or nearby basements confirmed?	No	Section 2.3.4 of the BIA. The BIA states that 46 Britannia Street has a basement. However, no information has been provided about the other neighbouring properties.
Is a geotechnical interpretation presented?	No	Geotechnical parameters are not presented and are required.
Does the geotechnical interpretation include information on retaining wall design?	No	As above.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Method Statement, SuDs proforma, Surface Water Drainage Strategy and Flood Risk Assessment.
Are the baseline conditions described, based on the GSD?	No	The presence/absence of adjacent or nearby basements not confirmed. Groundwater level not determined or proven.
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	Section 7 of the BIA. However, hydrological, hydrogeological and land stability assessments require revision.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	No	Section 6.3 of the BIA. GMA provided for the pile wall only. Clarifications are requested.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Section 7 of the BIA. Hydrological, hydrogeological and land stability assessments require revision.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Movement monitoring recommended. Further mitigation measures may be required as part of the revised impact assessment.
Has the need for monitoring during construction been considered?	Yes	Section 6.4 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	However, subject to further revision.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA provided; clarifications requested.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	A range of SuDS techniques has been considered for inclusion within the scheme with the aim of providing a reduction of runoff rates from the site.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Section of the BIA. However, subject to GMA revision.

Item	Yes/No/NA	Comment
Are non-technical summaries provided?	Yes	However, non-technical summary of the Screening process should be updated to summarise the issues brought forward to scoping.

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been carried out by Ed Moseley and Cham Ariyaratne. The individuals concerned in its production do not have suitable qualifications that meet the qualifications of CPG Basements. Evidence of input from an individual holding the CGeol qualification is requested.

4.2 The Audit Instruction confirmed the property neither contains, nor is a neighbour to, listed buildings.

4.3 The site is bounded by Gray's Inn Road to the West, Britannia Street to the south and existing multi-storey developments to the north and east. The existing development comprises a 6-storey building, with commercial spaces at ground and first floor level, residential units at levels 2-6 and an electrical substation at basement level.

4.4 The proposed development comprises a two-storey above ground extension of the existing building with the extension of the basement space. It also includes a localised lowering of the existing basement to create a greater headroom. The ground floor will contain a new commercial space with a new residential space located at the first-floor level.

4.5 Screening and scoping assessments are presented and informed by desk study information. Most relevant figures/maps and other guidance documents are reference within the BIA to support responses to screening questions.

- Question 13 of the Land Stability screening mentions that there will be no increase in differential depth of the foundations relative to neighbouring buildings. However, the BIA states that the basement will be slightly deepened. Information has been only provided regarding the foundations of 46 Britannia Street; no other information has been provided regarding the other neighbouring buildings.
- Question 14 of the Land Stability screening states that there are no underground utilities or tunnels running close to the site. However, it seems that the metropolitan line is running under the site.
- Question 2 of the Hydrology screening assessments state that there is no nearby watercourse. However, according to London Lost Rivers (2013) it seems that there is a lost river at the location of the site.
- According to Figure 15 Flood Map – Camden Geological Hydrogeological and Hydrological study. The site falls in an area with the potential to be at risk of surface water flooding. Question 6 of the Hydrology screening should be answered as "Yes" and carried over to scoping. However, a Flood Risk Assessment has been undertaken and the risk of Flooding on site has been determined as low.
- Following revision of the screening assessment based on the above points, the scoping exercise should be revised accordingly, and the impact assessment updated to consider all identified items.

4.6 A site investigation was undertaken by London Structures Lab. Site works comprised two boreholes, BH01 to 25m depth and BH02 to 2.5m, and five trial holes. Only draft borehole logs have been provided. No conceptual ground model was presented in the BIA and is required. However, it has been stated that Made Ground is encountered at surface level, with clay at 3.4m down to depth of existing basement.

4.7 Groundwater monitoring data has not been provided and is required. An assumed groundwater level of 1m below top of excavation has been adopted in the ground movement assessment. Clarification and supporting data are requested to support the assumption adopted. If groundwater might be encountered during the excavation, mitigation measured to control the groundwater flow into the excavation should be identified.

4.8 The BIA did not assess the impacts on the wider hydrogeological environment. Clarification on the groundwater regime is required, as well as the consideration of the presence of neighbouring basements and the potential for cumulative impacts to the hydrogeology of the area.

4.9 The site is likely located in a Critical Drainage Area. The flood risk assessment (FRA) has identified that the site is at a low risk from flooding from all sources, with no mitigation required from a flood risk perspective.

4.10 The proposal will not increase the proportion of hardstanding across the site. However, a range of SuDS techniques has been considered for inclusion within the scheme with the aim of providing a reduction of runoff rates from the site. The proposed site will discharge the surface water from the development via existing Thames Water sewer. In addition, an attenuation tank will provide the required storage for the extension.

4.11 Geotechnical interpretation of the ground conditions and geotechnical parameters have not been provided and are required.

4.12 The construction of the basement extension will use a contiguous piled wall, with a permanent concrete liner wall. New columns will have piled foundations and the new basement slab will be designed as a suspended slab. In section 1.1.2 of the BIA deepening the basement is proposed to create more headroom. Construction methods for this area of the basement development should be clearly identified. Clarification is requested regarding the final proposed depth of the basement, and this should be presented consistently in the screening and scoping exercises.

4.13 The construction sequence has been summarised in Section 6.2.1 of the BIA. Additional information regarding the sequencing for the underpinning of the area where the basement floor is to be lowered is requested. Structural Method Statement is not provided and is required.

4.14 A ground movement assessment has been carried out by GEO5 2022. The following points require further revision or clarifications:

- Outline calculations are required to support the assumptions regarding embedded retaining wall pile length.

- The deflection profile obtained from Geo5 resembles that of a cantilever wall instead of a high stiffness wall with props; even though it has been stated that the GMA is based on an assumed temporary works strategy which has props. Clarification is requested regarding the wall type adopted and propping arrangement.
- The assessment predicts movements due to the excavation; installation movements of a contiguous piled wall have not been considered and should be included.
- Ground movements associated with the construction to lower the floor of the existing basement floor should be included in the assessment.
- It is unclear whether the assessment in Geo5 has been undertaken according to Section 6.2.2 of CIRIA C760. Clarification is required to show how the calculated displacements in Geo5 have been used to validate the ground movements in the GMA.
- Input and output data from the Geo5 assessment is requested to confirm the model geometry, ground model and soil parameters used to carry out the assessment.
- The neighbouring property 46 Britannia Street has only been considered in the GMA. The existing property, all neighbouring properties and road pavements within the zone of influence should be included in the GMA and subsequently the damage assessment.

4.15 The results of the Building Impact Assessment currently indicated damage to 46 Britannia Street will not exceed Category 0 (Negligible); however, the GMA requires review, as outlined above. Calculations that demonstrate the damage category for each building are not provided and are required.

4.16 The BIA recommends a structural monitoring strategy to be implemented to control the works and impacts to neighbouring structures. Monitoring points and monitoring strategy to be reviewed subject to GMA revision.

4.17 The arboricultural method statement indicates that no tree works, including pruning or felling, will be undertaken in connection with the development.

5.0 CONCLUSION

5.1 The qualification of the individuals involved in the production of the BIA have not been demonstrated to be in accordance with LBC guidance.

5.2 The proposed development comprises a two-storey above ground extension of the existing building with the extension of the basement space. It also includes a localised lowering of the existing basement to create a greater headroom.

5.3 Screening and scoping assessments are presented, supported by desk study information. However, the screening and scoping assessments require further consideration as detailed in Section 4.

5.4 A site investigation has been undertaken; only draft logs were provided. Groundwater monitoring data has not been provided and is required.

5.5 Further consideration for the hydrogeological and hydrological environment is required.

5.6 Geotechnical parameters are not provided and are requested.

5.7 Clarification regarding basement depth, type of retaining wall adopted and propping arrangement is requested.

5.8 Additional information regarding the sequencing for the underpinning of the area where the basement floor is to be lowered is requested . Structural Method Statement is not provided and is requested.

5.9 The Ground Movement Assessment (GMA) and Building Damage Assessment should be reviewed, and further information provided as described in Section 4.

5.10 No tree works, including pruning or felling, will be undertaken in connection with the development.

5.11 Queries and requests for information are summarised in Appendix 2. Until clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

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Appendix 1 -
Consultation Responses

None

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Appendix 2 - Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The qualifications of the individuals involved in the production of the BIA are not in accordance with LBC guidance.	Open – See Section 4.1	
2	Land Stability/ Hydrology/ Hydrogeology	Screening and scoping assessments to be reviewed following the comments provided in Section 4.	Open – See Section 4.5	
3	Land Stability	Conceptual ground model not provided and is requested.	Open – See Section 4.6	
4	Hydrogeology	Groundwater monitoring data not provided and is required. Mitigation measured to control the groundwater flow into the excavation should be identified.	Open – See Section 4.7	
5	Hydrogeology	Impact to wider hydrogeological environment to be considered.	Open – See Section 4.8	
6	Land Stability	Geotechnical parameters not provided and are requested.	Open – See Section 4.11	
7	Land Stability	Clarification regarding basement depth is required.	Open – See Section 4.12	
8	Land Stability	Further detail of the construction sequence, including the method and sequence to be used in the area where the basement floor is to be lowered, is requested.	Open – See Section 4.13	
9	Land Stability	Structural Method Statement not provided and is required	Open – See Section 4.13	
10	Land Stability	Ground Movement Assessment to be reviewed following the comments provided in Section 4.	Open – See Section 4.14	
11	Land Stability	Damage assessment to be reviewed following the comments provided in Section 4.	Open – See Section 4.15	
12	Land Stability	Monitoring points and monitoring strategy to be reviewed subject to GMA revision	Open – See Section 4.16	

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Appendix 3 - Supplementary Supporting Documents

None

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