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Basement Impact Assessment Audit

12-13 Primrose Hill Studios, Fitzroy Road, London, NW1 8TR

For
London Borough of Camden

Project No.
14006-07

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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 12-13 Primrose Hill Studios (planning reference 2022/3694/P & 2022/4547/L). 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 prepared by individuals who possess suitable qualifications.

1.5 The BIA has confirmed that the proposed basement will be founded within the London Clay and minor groundwater management may be required during the excavation as recommended in the BIA.

1.6 It is accepted the site is at very low or low risk of flooding from all the sources. A Flood Risk Assessment and Drainage Strategy has been presented which concludes the development will not increase the flood risk.

1.7 The basement will be constructed using underpinning techniques. A Structural Engineer Statement is presented within the BIA detailing construction sequence and temporary works.

1.8 Geotechnical parameters including for retaining walls are presented and are appropriately conservative. Values for the bearing capacity adopted in the retaining wall design are accepted.

1.9 A Ground Movement Assessment has been undertaken and although the approach followed is accepted in principle, there are a number of queries that should be addressed as detailed in Section 4.

1.10 Outline proposals are provided for a movement monitoring strategy during construction. However, it needs to be revised after the GMA revision. A detailed monitoring strategy will need to be produced as part of the Party Wall negotiations.

1.11 It is accepted that the surrounding slopes to the development site are stable.

1.12 It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding.

1.13 It cannot be confirmed that the BIA complies with the requirements of CPG: Basements until the queries raised in Section 4 and summarised in Appendix 2 are addressed.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 14/04/2023 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 12-13 Primrose Hill Studios, Fitzroy Road, London, NW1 8TR and Planning Reference No. 2022/3694/P & 2022/4547/L.

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 "*Internal remodelling of both No.12 and No.13 Primrose Hill Studios, new basement studio linked to No.12, external modifications to No.13, new windows and remodelling of amenity area to form a shared space.*"

2.6 The Audit Instruction confirmed 12-13 Primrose Hill Studios and all the neighbouring properties are Grade II listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 18/05/2023 and gained access to the following relevant documents for audit purposes:

- Stage 2 – Planning Report and Basement Impact Assessment with Subterranean Construction Method Statement by Elliot Wood Ltd, Ref No. 2210445, Rev. P1, dated August 2022.
- Ground Investigation Report by Soiltechnics (in Appendix C of the Elliot Wood report), ref STU5616-R01, Rev C, dated July 2022.

- Basement Impact Assessment Report by Soiltechnics (in Appendix D of the Elliot Wood report), ref STU5616-R02, Rev A, dated April 2022.
- Planning Application Drawings by Jamie Fobert Architects:
  - Location Plan, dated 26th May 2022, Rev 1, Drg No. – 352_1_001
  - Existing Plans and Sections and Proposed Plans, Elevations and Sections dated 24th August 2022, Rev.

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	Desktop Study and ground investigation are undertaken.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Within the Screening/Scoping sections. Construction methodology statement presented.
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	Section 4.3 of (Soiltechnics) BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Question 1b should be answered as Yes, as groundwater was monitored above basement level as part of the SI. However, the potential presence of groundwater during basement construction has been considered in the impact assessment.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.4 of BIA.
Is a conceptual model presented?	Yes	Section 6 of BIA.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5 of BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Although Question 1b is not brought forward to scoping, it has been considered in the impact assessment.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	NA	No items brought forward to scoping.
Is factual ground investigation data provided?	Yes	Appendix C of Elliott Wood BIA.
Is monitoring data presented?	Yes	Appendix C of Elliott Wood BIA.
Is the ground investigation informed by a desk study?	Yes	Section 3 of Soiltechnics BIA.
Has a site walkover been undertaken?	Yes	In Soiltechnics BIA
Is the presence/absence of adjacent or nearby basements confirmed?	No	However, assumptions on this regard in the BIA are considered conservative.
Is a geotechnical interpretation presented?	Yes	Section 7 of Soiltechnics BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7 of Soiltechnics BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation, SER, FRA.
Are the baseline conditions described, based on the GSD?	Yes	

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	Assumptions in this regard in the BIA are considered conservative.
Is an Impact Assessment provided?	Yes	Section 8 of Soiltechnics BIA.
Are estimates of ground movement and structural impact presented?	Yes	Section 7.3 of Soiltechnics BIA. However, clarification on the GMA is required.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	However, GMA to be revised.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	The BIA and GMA assumes the basement will be propped at all time. Temporary works deign will be responsibility of the appointed contractor.
Has the need for monitoring during construction been considered?	Yes	Section 9 of Elliott Wood BIA. However, trigger values will need to be revised after GMA revision.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Residual impact considered to be negligible. However, GMA to be revised.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Revision of the GMA is required.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	See FRA and Drainage Strategy (Appendix F).
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Clarification on the GMA is required. Applicant's building should also be included in the analysis.
Are non-technical summaries provided?	Yes	Only in Soiltechnics BIA

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been carried out by Soiltechnics Ltd and the individuals concerned in its production have suitable qualifications. The BIA is summarised in the Elliott Wood Stage 2 Planning Report.

4.2 The LBC Instruction to proceed with the audit identified that both the applicant's and neighbouring buildings are Grade II listed.

4.3 The site consists of two two-storey semi-detached masonry residential dwellings and associated garages to the southeast of the site. A hard surfaced courtyard is present between the two houses. The site is flat at a level of approximately 33m above Ordnance Datum (AOD). Land use in the immediate area consists mainly of residential properties of masonry construction. No. 12 and No. 13 are attached to No. 11 and No. 1 Primrose Hill respectively.

4.4 The proposed development comprises internal alterations to both properties and connecting them together. A single storey basement is proposed under the existing No.12 and the line of garages. The basement excavation will be up to c. 5.00m bgl.

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

4.6 A site walkover was undertaken as part of the Soiltechnics Ground Investigation, which forms Appendix C of the EW BIA. Non-technical summaries are presented in the Soiltechnics BIA.

4.7 A ground investigation was undertaken in March 2022 and identified the site to be underlain by Made Ground to a maximum depth in excess of 1.4m bgl but typically to c. 1.00m bgl. Below the Made Ground, London Clay was found to the bottom of the exploratory holes (to a maximum depth of 10m bgl). It is accepted the basement will be founded within the London Clay.

4.8 Groundwater was encountered during drilling in only one of the exploratory hole locations. Groundwater monitoring was undertaken on one occasion in March 2022 recording a groundwater depth of 2.96m bgl. Given the London Clay is classified as unproductive stratum, it is accepted the proposed development will not adversely affect the wider hydrogeological environment. However, there is the potential for groundwater ingress during the excavation and the BIA recommends the use of sump pumping to collect any water infiltration.

4.9 It is accepted the site is at very low or low risk of flooding from all the sources. No change in hardstanding areas is proposed. The Camden SFRA indicates the site to be within a Critical Drainage Area. A Flood Risk Assessment and Drainage Statement has been presented which concludes the development will not increase the risk of flooding from any source. It is noted that a sewer will need to be diverted to suit the extent of the new basement and that the final drainage proposal will need to be approved by the Local Authority and owner of the public sewer network.

4.10 A Construction Method Statement is provided detailing water control, waterproofing strategy, party wall matters, outline sequence of works and temporary works. The scheme will use underpinning techniques to construct reinforced concrete L shaped retaining walls around the perimeter of the basement. A reinforced suspended concrete slab will then be constructed between the toes of the L shaped retaining wall sections.

4.11 The BIA indicates that the underpins will be installed in two 'lifts'. Temporary works design will be the responsibility of the specialist contractor, however the BIA recommends the use of waling beams and stiff props to ensure the stability of the retaining walls and reduce ground movements magnitude.

4.12 Geotechnical parameters including those for retaining walls are presented and are considered to be appropriately conservative engineering values. Values for the bearing capacity to be adopted in the retaining wall design have been presented in Soiltechnics BIA. Although those values are considered to not be a cautious estimate, the values used in the outline retaining wall calculations are accepted.

4.13 A Ground Movement Assessment (GMA) has been undertaken by Soiltechnics Ltd using PDisp and XDisp software. Ground movements due to the following activities have been included in the analysis:

1. Construction of underpins.
2. Excavation of the basement.
3. Long term settlement of the soil due to loads acting on the underpins.

4.14 The PDisp assessment was undertaken to determine ground movements due to point 2 and 3. The analysis has estimated short- and long-term settlement due to basement excavation. Clarification is required regarding how the consolidation parameters have been selected or derived. In addition, the PDisp assessment considers all loading and unloading due to the development acting at the same time. For the GMA purposes it is recommended a single analysis for each stage is also undertaken to identify the stage at which the largest movements occur. Full input, output and contour plots should be provided.

4.15 The PDdisp analysis also considers heave due to basement excavation. Although this can be helpful to inform basement slab design, heave is typically not considered to affect neighbouring buildings as it is confined within the basement perimeter. When included in the GMA, heave could off-set settlement and reduce the actual category of damage. The GMA should be amended to exclude heave as part of the worst-case scenario.

4.16 Movements obtained from the PDisp analysis have been imported into XDisp, which has been used to estimate ground movements due to underpin installation and ultimately damage categories for adjacent structures, in accordance with the Burland Scale. A total of 10mm in both the vertical and horizontal direction has been assumed for the installation. From the software input it is understood that those movements become zero at distance equal to the excavation depth. Clarification to support this assumption is required. It is noted Section 8.1.2 of the BIA indicates that the GMA has been undertaken in general accordance with CIRIA C760, in which movements dissipate over 1.5 to 4 times the wall or excavation depth depending on the stage of the construction sequence under consideration.

4.17 As described above, the ground movements imported from PDisp include total vertical movements (including heave). As ground movements due to underpin installations calculated in XDisp will take place in the short term, it is recommended that only short term movements from PDisp (excluding heave) are also considered in the XDisp analysis to ensure the assessment captures the worst case damage category.

4.18 The applicant properties are listed buildings. As per the CPG for basements, these buildings should be included in the analysis.

4.19 One of the walls analysed in the GMA appears to be in Burland Category 3 which is not accepted by the CPG. The BIA indicates this to be related to software limitations and geometry. It is recommended the analysis to be refined in line with the comments above to demonstrate all structures will be within Category 1.

4.20 The GMA indicates that the adjacent highway of Kingstown Street will experience a maximum 7mm movement, which is not considered to result in significant damage. This should be reviewed once the above amendments to the GMA are made.

4.21 A proposed monitoring regime has been included in the BIA including preliminary trigger values. These may need to be reviewed following GMA revision. A detailed monitoring strategy will need to be produced as part of the Party Wall negotiations.

5.0 CONCLUSIONS

5.1 The Basement Impact Assessment (BIA) has been carried out by engineering consultants Elliott Wood Ltd and Soiltechnics Ltd and the individuals concerned in its production have qualifications in accordance with CPG Basements.

5.2 The BIA has confirmed that the proposed basement will be founded within the London Clay. Groundwater was encountered during drilling and subsequent monitoring, groundwater management measures are considered in the BIA. No impact to the wider hydrogeological environment is expected.

5.3 It is accepted the site is at very low or low risk of flooding from all the sources. The Camden SFRA indicates the site to be within a Critical Drainage Area. A Flood Risk Assessment and Drainage Strategy has been presented which concludes the development will not increase the flood risk.

5.4 The basement will be formed mainly by mass reinforced concrete underpinning in a typical 'hit and miss' sequence. A Structural Engineer Statement is presented within the BIA.

5.5 Geotechnical parameters including for retaining walls are presented and are considered to be appropriately conservative engineering values. Values for the bearing capacity adopted in the retaining wall design are accepted.

5.6 A GMA is undertaken and although the approach followed is accepted in principle, there are a number of queries that the BIA should address as detailed in Section 4.

5.7 The analysis assumes a high support stiffness and subsequent damage assessment generally indicate damage to be limited within Category 1. However, one of the walls appears to be in Category 3 which cannot be accepted. Refinement of the analysis is recommended.

5.8 Outline proposals are provided for a movement monitoring strategy during construction. However, it may need to be revised after the GMA revision. A detailed monitoring strategy will need to be produced as part of the Party Wall negotiations.

5.9 It cannot be confirmed that the BIA complies with the requirements of CPG: Basements until the queries raised in Section 4 and summarised in Appendix 2 are addressed.

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Appendix 1

Consultation Responses

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Redacted			Land stability and hydrogeology	See Section 4.8 and 4.13 – 4.21
Henry	Unknown	10/11/22	Land stability and hydrogeology	
Seward	Unknown		Land stability and hydrogeology	

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Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Land stability	The GMA should be revised as indicated in Section 4.	Open – See Section 4.14 – 4.20	
2	Land stability	Outline monitoring proposal may need to be revised following GMA revision	Open – See Section 4.21	

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Appendix 3

Supplementary Supporting Documents

None

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