

**36-37 Great Russell Street,
London, WC1B 3PP**

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
14006-49

Date
March 2024

Campbell Reith Hill LLP
15 Bermondsey Square
London
SE1 3UN

T: +44 (0)20 7340 1700
E: london@campbellreith.com
W: www.campbellreith.com

DOCUMENT HISTORY AND STATUS

Revision	Date	Purpose/ Status	File Ref	Author	Check	Review
D1	07/02/2024	Draft	MEkb14006-49-010224 - 36-37 Great Russell Street D1.docx	ME	KB	KB
F1	26/03/2024	For planning	MEkb14006-49-260324 - 36-37 Great Russell Street F1.docx	ME	KB	KB

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Document Details

Last Saved	26/03/2024 09:29
Author	M Elias, BEng MSc GMICE Eng-OEA(LEB)
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	14006-49
Project Name	36-37 Great Russell Street, London, WC1B 3PP
Revision	F1
Planning Reference	2023/2864/P
File Ref	MEkb14006-49-260324 - 36-37 Great Russell Street F1.docx

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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 36-37 Great Russell Street, London, WC1B 3PP (planning reference 2023/2864/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 are in accordance with LBC guidance.
- 1.5 The proposed development comprises the demolition of the existing single-storey rear extension and construction of a new extension comprising a single-storey basement and two above ground storeys.
- 1.6 Screening and scoping assessments are presented and are informed by material that would typically be found in a desk study.
- 1.7 A site investigation has been undertaken indicating the basement will be founded in the Lynch Hill Gravel member. No groundwater monitoring has been undertaken.
- 1.8 Geotechnical parameters have been provided and are accepted. A number of historic boreholes have been used to inform the ground model. A plan showing the locations of these hole in relation to the site has been provided in the revised BIA.
- 1.9 The neighbouring properties all have basements that extend to the same depth as the proposed development, or deeper. The basement extension will use the existing walls and footings of the single-storey rear extension as temporary propping while the new reinforced concrete basement walls are constructed.
- 1.10 The revised BIA submission confirmed that the lift pit at basement level is no longer being installed and will now terminate at ground floor level.
- 1.11 A Ground Movement Assessment (GMA) has been undertaken and shows the impact to neighbouring properties will not exceed Burland Category 1 (Very slight).
- 1.12 Considering the additional information presented, it can be confirmed that the BIA meets the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) 14 August 2023 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 36-37 Great Russell Street, London, WC1B 3PP and Planning Reference 2023/2864/P. Although CampbellReith was instructed on 14 August 2023 to carry out the audit, the BIA was received on 4 January 2024.

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 "*Proposed conversion of rear ancillary storage area into Class E (office) space. Extension to existing basement at rear and conversion into Class E (office) space. Creation of new rear lightwell.*"

2.6 CampbellReith accessed LBC's Planning Portal on 22 January 2024 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Simpson TWS, Ref.: P23-224_V1.0, dated 12 December 2023.
- Land Stability and Building Damage Assessment by RSK Geosciences, Ref.: 372991-R01 (00), dated December 2023.

- Borehole Investigation Report by Risk Management, Ref.: RML 8604 Rev 1, dated 01 November 2023.
- FloodSmart BIA by GeoSmart Information Ltd, Ref.: 78973.00.01R1, dated 12 July 2023.
- Structural drawings and construction sequence by Buzhala Associates, dated March and September 2023.
- Existing and Proposed Architectural Drawings by Simpson TWS.
- Thames Water Consultation Responses

2.7 To address the queries raised in the D1 revision of this report, CampbellReith were provided the following additional relevant documents:

- Addendum to Basement Impact Assessment by Simpson TWS, Ref.: P23-224_CM-GB_ADDENDUM_BIA1.0, dated 04 March 2024.
- Land Stability and Building Damage Assessment by RSK Geosciences, Ref.: 372991-R01 (01), Rev 01, dated 01 March 2024.
- Proposed Basement & GF Plans, Proposed Front Elev. & Section AA by TAL ARC Ltd, Ref.: 36-37GRS-PP4-03 Rev. A, dated 15 March 2024.
- Proposed Basement Floor Plan (Appendix B of Addendum to Basement Impact Assessment) by Buzhala Associates, Ref.: GRS36-SK01E Rev. E, dated 20 March 2024.
- Proposed Ground Floor Plan (Appendix B of Addendum to Basement Impact Assessment) by Buzhala Associates, Ref.: GRS36-SK02D Rev. D, dated 20 March 2024.
- Proposed First Floor Plan (Appendix B of Addendum to Basement Impact Assessment) by Buzhala Associates, Ref.: GRS36-SK03D Rev. D, dated 20 March 2024.
- Section X-X (Appendix B of Addendum to Basement Impact Assessment) by Buzhala Associates, Ref.: GRS36-SK07B Rev. B, dated 16 February 2024.
- Details (Appendix B of Addendum to Basement Impact Assessment) by Buzhala Associates, Ref.: GRS36-SK08A Rev. A, dated 15 February 2024.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Section 2.2 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	
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 – Table 2 of the Land Stability and Building Damage Assessment report.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.3 of the BIA and Section 5 of the Floodsmart report.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.2 of the BIA and Section 5 of the Floodsmart report.
Is a conceptual model presented?	Yes	Section 2 of the Land Stability and Building Damage Assessment report.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.1 of the Land Stability and Building Damage Assessment report.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5 – Table 4 of the Floodsmart report.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	NA	None were carried over to scoping
Is factual ground investigation data provided?	Yes	Appendix C of the Land Stability and Building Damage Assessment report.
Is monitoring data presented?	No	No groundwater standpipes were installed as part of the ground investigation.
Is the ground investigation informed by a desk study?	No	A desk study has not been undertaken; however sufficient information has been provided as part of the BIA.
Has a site walkover been undertaken?	Unknown	It is unknown whether a site walkover has been undertaken by the BIA authors.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 2.4 of the BIA.
Is a geotechnical interpretation presented?	Yes	Section 7.1.1.1 of the Land Stability and Building Damage Assessment Report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7.1 of the Land Stability and Building Damage Assessment Report.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	NA	
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	Section 7.0 of the Land Stability and Building Damage Assessment Report.
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	Movement monitoring is suggested.
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	
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	

Item	Yes/No/NA	Comment
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	Section 7.0 of the Land Stability and Building Damage Assessment.
Are non-technical summaries provided?	Yes	Section 1 of the BIA.

4.0 DISCUSSION

- 4.1 The Basement Impact Assessment (BIA) has been carried out by Simpson TWS Consulting Engineers supported by RSK, who undertook the Land Stability and Building Damage Assessment. The individuals involved in producing the BIA possess qualifications in accordance with LBC guidance.
- 4.2 The Audit Instruction confirmed that the property neither contains, nor is a neighbour to, listed building. A Grade II listed building is present across the street from the site.
- 4.3 The site comprises two properties, no.s 36 and 37 Great Russell Street, which are of mixed use with retail at ground/first floor, commercial at second and residential above. The existing main buildings are both 4 stories with single level basements. Vaults extend beneath the pavement to the front of the properties on Great Russell Street. To the rear of the main buildings, no.s 36 and 37 both have a single-storey rear extensions occupying the full footprint of the site.
- 4.4 The proposed development comprises the demolition of the existing single-storey rear extension in the southern half of the site and the construction of a new two-storey extension with a single basement level. The revised BIA submission confirms that the lift pit at basement level is no longer being installed; the lift will terminate at ground floor level.
- 4.5 The new basement is anticipated to extend 3.00m below the existing ground floor level (bgl) across the southern half of the site. With a site level of approximately 27.00m above ordnance datum (AOD), the basement formation level is at approximately 24.00m AOD.
- 4.6 Screening and scoping assessments are presented and are informed by material that would typically be found in a desk study. Most relevant figures/maps and other guidance documents are referenced within the BIA to support screening questions.
- 4.7 A site investigation was conducted by Risk Management Limited (RML). The site works included the drilling of two boreholes, BH1 and BH2, reaching depths of 3.40m and 1.20m, respectively. Additionally, deep trial pits were excavated by others to approximate depths of 3.10m and 3.20m below ground level (bgl) along two boundary walls. These were inspected by RML but no details of the foundation depths and ground conditions are provided in the RML report.
- 4.8 Borehole BH1 terminated due to refusal in dense and very dense gravel, while BH2 terminated due to refusal within the Made Ground. The boreholes encountered a significant thickness of Made Ground down to 2.70m bgl, underlaid by the Lynch Hill Gravel Formation, which was proven to the terminal depth of 3.40m bgl. The interface with the underlying London Clay was not established during the site investigation.
- 4.9 Groundwater was not encountered within the boreholes during drilling and there were no groundwater monitoring standpipes installed to facilitate future monitoring. The report does not reference the presence of groundwater within the trial pits. In their report, RSK mentions that photographs of the trial pits indicate the absence of groundwater.

- 4.10 In their report, RSK states that, despite no groundwater being recorded in the ground investigation, references to their nearby projects indicate the presence of a perched groundwater table within the superficial deposits of the Lynch Hill Gravel Member at 18m to 19m AOD. They anticipate that a perched groundwater table is present within the Lynch Gravel Member a few meters below the proposed basement depth. A selection of borehole logs from the area are provided in Appendix C of the RSK report, and a hole location plan showing the proximity of these boreholes to the site has been provided in the revised RSK report.
- 4.11 The RSK report states that the presence of existing basements at the same levels or slightly deeper on all sides of the proposed basement suggests that the proposed basement extension in the centre would not adversely affect the groundwater regime. Clarification on lift pit excavation was requested in the D1 audit report, but since the lift pit will now terminate at ground level and will no longer extend deeper than the existing basement, further clarification is deemed unnecessary. It is accepted that the basement will not impact the hydrogeology of the area.
- 4.12 The Floodsmart Basement Impact Assessment report on the impact of the development to groundwater states that the site is located within a Critical Drainage Area but is at a very low risk of surface water flooding, the effect of the development is unlikely to increase the groundwater or surface water flood risk to neighbouring properties. It is accepted that the basement will not impact the hydrology of the wider area.
- 4.13 The geotechnical parameters, including a bearing capacity of 250kPa for standard strip or pad footings, were outlined in the RML report. Friction angles and supporting outline calculations for the lift pit retaining walls were not initially provided and were queried in the D1 audit report. However, given that the scheme has been updated and the lift pit will now terminate at ground floor level, this requirement is no longer applicable, and the geotechnical parameters are accepted.
- 4.14 The construction sequence of the proposed works is envisaged to include the following:
- demolition of the existing single-storey extension,
 - excavation within the existing foundation walls and adjacent basement walls while installing temporary propping as required,
 - casting reinforced concrete lining walls on western and southern elevations, constructing the basement raft to form the basement,
 - and finally, constructing the ground floor slab followed by the removal of temporary propping.
- 4.15 The existing walls and footings of the single-storey rear extension will be retained to provide stability and support in both temporary and permanent cases. A new reinforced concrete basement wall will be constructed on the western and southern sides of the basement, abutting the existing neighbouring retaining walls. These new basement walls will be founded on strip footings approximately 1.00m wide and 1.00m below the proposed basement level. The development includes a ground-bearing basement raft slab.

- 4.16 The D1 audit report requested the proposed construction sequence for the lift pit and further assessment of groundwater impact on excavation, along with proposed mitigation measures. However, these details are now unnecessary given the changes to the scheme and the termination of the lift at ground level.
- 4.17 A settlement / heave analysis has been completed using PDisp to assess the likely vertical ground movements to be expected from the proposed development during each stage of construction: demolition, basement excavation, construction (short term) and construction (long term). The PDisp calculated displacements were then imported into XDisp to carry out a building damage assessment.
- 4.18 Given the presence of existing basements on all sides of the proposed basement extension, RSK states that the horizontal movements will not be realised as there will be no soils retained by the new basement box.
- 4.19 The Poisson's ratios used in the different PDisp models were updated in the revised BIA submission and have been accepted.
- 4.20 Further consideration of the impact from the lift pit excavation in the ground movement assessment was requested in the D1 audit report. However, this is no longer necessary due to the change in the lift scheme.
- 4.21 The results of the revised Building Damage Assessment indicate that the damage to neighbouring properties will not exceed Burland Category 1 (Very Slight).
- 4.22 The Land Stability and Building Damage Assessment states that a monitoring strategy should be put in place prior to commencing any proposed work to ensure that the expected displacements are not exceeded. A scheme will be agreed as part of the Party Wall Agreements to install a movement monitoring system, it will include the location of monitoring nodes to be located on the retained walls and on adjacent property walls. Readings will be taken at regular intervals and additional readings undertaken when specific works are planned.
- 4.23 Thames Water's comments include an expectation for the developer to demonstrate measures that will be undertaken to minimize groundwater discharges into the public sewer. Groundwater discharges commonly result from construction site dewatering, deep excavations, basement infiltration, borehole installation, testing, and site remediation.

5.0 CONCLUSIONS

- 5.1 The qualifications of the individuals involved in the production of the BIA are in accordance with LBC guidance.
- 5.2 The proposed development comprises the demolition of the existing single-storey rear extension and construction of a new extension comprising a single-storey basement and two above ground storeys.
- 5.3 Screening and scoping assessments are presented and are informed by material that would typically be found in a desk study.
- 5.4 A site investigation has been undertaken indicating the basement will be founded in the Lynch Hill Gravel member. No groundwater monitoring has been undertaken.
- 5.5 Geotechnical parameters have been provided and are accepted. A number of historic boreholes have been used to inform the ground model. A plan showing the locations of these hole in relation to the site has been provided in the revised BIA.
- 5.6 The neighbouring properties all have basements that extend to the same depth as the proposed development, or deeper. The basement extension will use the existing walls and footings of the single-storey rear extension as temporary propping while the new reinforced concrete basement walls are constructed.
- 5.7 The revised BIA submission confirmed that the lift pit at basement level is no longer being installed and will now terminate at ground floor level.
- 5.8 A Ground Movement Assessment (GMA) has been undertaken and shows the impact to neighbouring properties will not exceed Burland Category 1 (Very slight).
- 5.9 Considering the additional information presented, it can be confirmed that the BIA meets the requirements of Camden Planning Guidance: Basements.

Appendix 1

Consultation Responses

None

36-37 Great Russell Street, London, WC1B 3PP
Basement Impact Assessment Audit

CampbellReith
consulting engineers

Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Hydrogeology	A location plan showing the borehole data used to inform the BIA should be provided.	Closed – See Sections 4.10	March 2024
2	Land Stability	Friction angles have not been included, supporting outline calculations for the lift pit retaining walls are requested.	Closed – See Section 4.13	March 2024
3	Land Stability	Further information regarding the construction sequence for the lift pit excavation is requested. Mitigation measures for dealing with any groundwater encountered are also requested.	Closed – See Section 4.16	March 2024
4	Land Stability	Clarification regarding the Poisson ratio adopted is requested.	Closed – See Section 4.19	March 2024
5	Land Stability	Further consideration of the land stability impact of the lift pit is requested, considering the anticipated gravel and groundwater.	Closed – See Section 4.20	March 2024

Appendix 3

Supplementary Supporting Documents

None

London

15 Bermondsey Square
London
SE1 3UN

T: +44 (0)20 7340 1700
E: london@campbellreith.com

Birmingham

Chantry House
High Street, Coleshill
Birmingham B46 3BP

T: +44 (0)1675 467 484
E: birmingham@campbellreith.com

Bristol

Unit 5.03,
HERE,
470 Bath Road,
Bristol BS4 3AP

T: +44 (0)117 916 1066
E: bristol@campbellreith.com

Manchester

No. 1 Marsden Street
Manchester
M2 1HW

T: +44 (0)161 819 3060
E: manchester@campbellreith.com

Campbell Reith Hill LLP. Registered in England & Wales. Limited Liability Partnership No OC300082
A list of Members is available at our Registered Office at: 15 Bermondsey Square, London, SE1 3UN
VAT No 974 8892 43