CampbellReith
consulting engineers

21 Mornington Crescent, London, NW1 7RG

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
13693-31

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	March 2023	Draft	AAKB-13693-31-220323-21 Mornington Crescent-D1.docx	AA	NS	KB
D2	August 2023	Draft	MEemb-13693-31-180823 - 21 Mornington Crescent D2.docx	ME	EMB	EMB
D3	September 2023	For Comment	KBemb13693-31-250923 - 21 Mornington Crescent D3.docx	KB	EMB	EMB
F1	March 2024	For Planning	KBemb13693-31-080324 - 21 Mornington Crescent F1.docx	KB	EMB	EMB

Document Details

Last Saved	08/03/2024 17:06
Author	K Barker MSci CGeol FGS UK RoGEP
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	13693-31
Project Name	21 Mornington Crescent, London, NW1 7RG
Revision	F1
Planning Reference	2023/0439/P
File Ref	KBemb13693-31-08032024 - 21 Mornington Crescent F1.docx

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 21 Mornington Crescent, London, NW1 7RG (planning reference 2023/0439/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 proposed development comprises the demolition of the existing walkway into the garden and the extension of the existing single storey basement and ground floor approximately 5m to the rear yard.

1.5 The qualifications of the BIA authors are in accordance with LBC guidance.

1.6 Screening and scoping exercises are presented and have been revised to reflect current guidance. A desktop study and non-technical summaries are provided, as well as confirmation that a site walkover has been undertaken.

1.7 It is accepted that the development will not impact the hydrogeology of the area.

1.8 Drainage proposals have been presented to demonstrate that there will be no adverse impacts to the hydrological environment due to the increase in impermeable surfaces and the location of the site within a Critical Drainage Area.

1.9 A ground investigation was undertaken and groundwater monitoring data is now presented and considered in the assessment.

1.10 A construction method statement and outline structural calculations are presented as well as details of the structural scheme, underpinning sequence and temporary works proposals. Clarification regarding the bearing capacity given for the founding stratum and the anticipated loading from the new development is presented in Revision 2 of the BIA.

1.11 The Ground Movement Assessment has been re-evaluated and states that damage may be limited to no worse than Burland Category 1. The walls assessed in the BIA are described in the text.

1.12 The BIA indicated that a movement monitoring scheme will be adopted to ensure that the movements generated are maintained within predicted limits. This will form part of the party wall agreement.

1.13 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) on 01 August 2023 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 21 Mornington Crescent, London, NW1 7RG and planning reference 2023/0439/P.

2.2 An initial audit report had been previously produced in relation to a basement at this property (planning application 2021/2654/P). The application was withdrawn, due to a modification in the proposed scheme. This audit report examines the information presented under the planning application 2023/0439/P.

2.3 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.

2.4 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.

2.5 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.

2.6 LBC's Audit Instruction described the planning proposal as *"Construction of a rear extension at ground level and lower ground floor level and reconfiguration of internal layout at lower ground and ground floor level".*

2.7 The Audit Instruction confirmed 21 Mornington Crescent is a listed structure. The terrace of 12 houses of which it forms a part have a grade II listing.

2.8 CampbellReith accessed LBC's Planning Portal on 11 August 2023 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Key GeoSolutions Ltd, Ref.: 21-102-R-001, dated May 2021

- Design and Access Statement by KAS Architects Ltd, dated January 2023.
- Existing Architectural drawings by KAS Architects Ltd
  - Existing Lower Ground Floor, Ref.: 101-EX-LG-DR-001 P2
  - Existing Ground Floor, Ref.: 101-RX-GR-DR-002 P2
  - Existing First Floor, Ref.: 101-EX-01-DR-003 P2
  - Existing Second Floor, Ref.: 101-EX-01-DR-004 P2
  - Existing Third Floor, Ref.: 101-EX-01-DR-005 P2
  - Existing Roof Plan, Ref.: 101-EX-01-RF-009 P2
  - Existing Section AA, Ref.: 101-EX-AA-DR-006 P2
  - Existing Section BB, Ref.: 101-EX-BB-DR-010 P2
  - Existing Front Elevation, Ref.: 101-EX-EAST-ELE-DR-007 P2
  - Existing Rear Elevation, Ref.: 101-EX-WEST-ELE-DR-008 P2
- Proposed Architectural Drawings by KAS Architects Ltd, dated 19/01/2023
  - Site location, Ref.: 101-00-DR-001
  - Proposed Lower Ground Floor, Ref.: 101-LG-DR-001 P1
  - Proposed Ground Floor, Ref.: 101-GF-DR-002 P1
  - Proposed First Floor Plan, Ref.: 101-01-DR-003 P1
  - Proposed Second Floor Plan, Ref.: 101-02-DR-004 P1
  - Proposed Third Floor, Ref.: 101-03-DR-005 P1
  - Roof Plan, Ref.: 101-RF-DR-009 P1
  - Proposed Section AA, Ref.: 101-AA-DR-006 P1
  - Proposed North Elevation, Ref.: 101-N-ELE-DR-010 P1
  - Section CC, Ref.: 101-BB-DR-009
  - Proposed Section BB, Ref.: 101-BB-DR-007 P1
  - Proposed West Elevation, Ref.: 101-WEST-ELE-DR-008 P1
  - Proposed Front Elevation, Ref.: 101-00-DR-020 P1
- Demolition Drawings by KAS Architects Ltd, dated 04/11/21
  - Lower Ground Demolition, Ref.: 101-EX-BB-DR-301
  - Ground Floor Demolition, Ref.: 101-EX-BB-DR-302
  - First Floor Demolition, Ref.: 101-EX-BB-DR-303
  - Second Floor Demolition, Ref.: 101-EX-BB-DR-304
  - Second BB Demolition, Ref.: 101-EX-BB-DR-306

2.9 Following the D1 and D2 audits, the following additional documents were provided to address the queries raised:

- Basement Impact Assessment (BIA) by Key GeoSolutions Ltd, Ref.: BIA 9710-001-R-01, dated July 2023.

- Structural Construction Method Statement by Structural Design Studio, ref 223164, rev P2, dated July 2023.

2.10 Following the issue of the D3 audit, the following additional documents were provided to address the queries raised:

- Belowground Drainage Strategy and Maintenance by Rystech Ltd, Rev P02, January 2024
- Basement Impact Assessment (BIA) by Key GeoSolutions Ltd, Ref.: BIA 9710-001-R-02, dated February 2024.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Section 2.1 of the revised BIA.
Is data required by Cl.233 of the GSD presented?	Yes	Revised and additional documents contain the required information.
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	Arup maps are used for reference.
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 4.2 of the revised BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.1 of the revised BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the BIA.
Is a conceptual model presented?	Yes	

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Sections 5.0 of the revised BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.0 of the revised BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.0 of the revised BIA.
Is factual ground investigation data provided?	Yes	Appendix 2 of the revised BIA.
Is monitoring data presented?	Yes	Appendix 2 of the revised BIA.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Section 2.2 of the revised BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 6.2 of the BIA. Properties No 20-22 have existing basements.
Is a geotechnical interpretation presented?	Yes	Section 7 of the revised BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7.1 of the revised BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	
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	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Section 7.3 and Appendix 4 of the revised BIA.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	The drainage strategy confirms the Impact Assessment for hydrology. The revised building damage assessment is reasonably conservative.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Drainage strategy.
Has the need for monitoring during construction been considered?	Yes	Section 7.4 of the revised BIA. Trigger levels to form part of the party wall agreement.
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	Drainage strategy presented.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	Yes	Section 1 of the revised BIA.

4.0 DISCUSSION

4.1 The BIA has been carried out by Key GeoSolutions Ltd. The revised BIA shows that the individuals concerned in its production hold suitable qualifications that meet the requirements of CPG Basements.

4.2 The Design & Access statement confirmed that 21 Mornington Crescent is a listed structure. The crescent of 12 terraced houses has a Grade II listing.

4.3 The existing property is a mid-terrace four storey house; it has a basement approximately 2.60m deep and a sunken courtyard at basement level.

4.4 The proposed development comprises the demolition of the existing walkway into the garden and the extension of the existing single storey basement and ground floor approximately 5m into the rear yard. The founding level of the basement extension will be the same as the existing basement at a depth of 3.10m below ground level (bgl). The intended approach for constructing the extension to the basement and ground floor involves deepening and reinforcing portions of the foundations to the garden walls through underpinning.

4.5 The current BIA identifies that a site walkover was undertaken on 08 April 2021 and 21 June 2023.

4.6 The current BIA includes screening and scoping assessments that reflect the current CPG for Basements (2021) and the screening responses relating to hydrology, hydrogeology neighbouring foundation depth are now addressed.

4.7 The hydrogeology and hydrology screening processes have identified that the site lies within Flood Zone 1 with very low risk of flooding. However, the proposed development will result in an increase in hard surfaced area. The BIA states that the proposed basement development will not cause significant change of the hard surfaced areas as the footprint of the proposed basement has an area of c. 35m^2 that is currently partially hard surfaced and partially garden.

4.8 The current BIA now includes the use of permeable paving to reduce the overall increase in impermeable surface to 10m^2. The BIA now identifies the site to be within a Critical Drainage Area (CDA). Drainage proposals have been presented as a separate report, which describes mitigation measures and states that the additional flows off site have been accepted by Thames Water. The drainage strategy states there will be no adverse impacts to the hydrological environment.

4.9 A ground investigation was undertaken and comprised two window samples (WS01 and WS02) to a depth of 5.45m below ground level (bgl). WS01 was undertaken within the existing rear garden at an elevation of 33.30m OD while, WS02 within the rear courtyard of the existing basement at an elevation of 31.00m OD. Two foundation inspection pits (FP01-FP02) along the neighbouring boundary walls at the existing basement level.

4.10 The revised BIA indicates the ground conditions comprise Made Ground to c.1.20m bgl, followed by soils interpreted as London Clay to depth. Below the Made Ground in WS01 soils described as sandy gravelly clay and sandy clay were encountered to 3.00m bgl. The revised BIA provides soil parameters for 'ground above basement foundation level' and 'ground below basement foundation level' to account for the atypical soil descriptions given in the borehole logs

4.11 The Ground Investigation Report in Appendix 2 of the current BIA states that shallow spread foundations should be taken down to a minimum firm clay, and that foundations should be designed with an allowable bearing pressure of 100kN/m^2.

4.12 Groundwater was encountered at 0.70m bgl in TP02, while the other exploratory holes were found to be dry. Monitoring standpipes were installed within both the window samples and monitoring data is provided in Appendix 2 of the current BIA.

4.13 The current BIA presents a discussion of the groundwater conditions at the site in Section 5.5. The groundwater recorded during monitoring is identified to have come from the Made Ground or upper weathered London Clay. The BIA states that groundwater ingress will be of limited volume due to the low permeability of the London Clay and that standard groundwater control measures will be able to adequately manage any ingress. It is accepted that the wider hydrogeological environment will not be impacted.

4.14 The Construction Method Statement (CMS) provides a structural scheme in Appendix A, outline retaining wall calculations in Appendix B and a construction method statement in section 12 and Appendix A. An underpinning construction sequence and temporary propping details are provided. The drawings in Appendix A indicate each underpin bay will be a maximum of 1m wide and installed in a 'hit and miss' sequence. The outline retaining wall calculations use the soil parameters identified in the BIA, however the bearing pressure identified to be from the proposed loads is estimated to be 174kN/m^2, which exceeds the 100kN/m^2 allowable bearing pressure identified for the founding stratum. The current BIA notes that the allowable bearing capacity increases with depth such that it exceeds the anticipated bearing pressure at the proposed founding level.

4.15 A Ground Movement Assessment (GMA) has been undertaken to allow potential building damage to be assessed. From the GMA it is understood that ground movements due to underpinning and consequent excavation have been obtained by applying CIRIA C760 curves. Whilst the CIRIA approach is intended for embedded retaining walls, it is accepted that in some circumstances the CIRIA curves can predict ground movements within the range typically anticipated for underpinning techniques carried out with good control of workmanship.

4.16 The movements predicted in Revision 1 of the BIA were lower than those typically anticipated from a single lift of underpinning using good workmanship. Vertical movements due to structural loading and construction effects are expected to be a minimum of 5mm to 10mm per lift. Table 3 in Appendix 4 of the current BIA shows that the horizontal predicted movements fall within this range (6.9mm) and vertical movements of up to 9mm are predicted on the line of the underpins. These movement are typical of those associated with underpinning and the BIA concludes that damage to adjacent structures can be limited to Burland Category 1 (Very Slight).

4.17 A plan showing the geometry of the proposed basement in relation to neighbouring properties and the walls assessed in the building damage assessment was requested. Whilst not provided, a description of the walls assessed for damage is presented in the BIA.

4.18 The BIA indicates that a movement monitoring scheme is to be adopted. The monitoring trigger levels proposed in the revised BIA are higher than the movements predicted in the GMA and are subject to agreement as part of any party wall negotiations.

5.0 CONCLUSIONS

5.1 The proposed development comprises the demolition of the existing walkway into the garden and the extension of the existing single storey basement and ground floor about 5m to the rear yard.

5.2 The qualifications of the BIA authors are in accordance with LBC guidance.

5.3 Screening and scoping exercises are presented and have been revised to reflect current guidance. A desktop study and non-technical summaries are also provided, as well as confirmation that a site walkover has been undertaken.

5.4 It is accepted that the development will not impact the hydrogeology of the area.

5.5 Drainage proposals have been presented to demonstrate that there will be no adverse impacts to the hydrological environment due to the increase in impermeable surfaces and the location of the site within a Critical Drainage Area.

5.6 A ground investigation was undertaken and groundwater monitoring data is now presented and considered in the assessment.

5.7 A construction method statement and outline structural calculations are presented and give details of the structural scheme, underpinning sequence and temporary works proposals. Clarification has been provided regarding the allowable bearing pressure given for the founding stratum and the proposed loading from the new development.

5.8 The Ground Movement Assessment has been re-evaluated as detailed in Section 4, and the Building Damage Assessment states that damage to neighbouring properties may be limited to Burland Category 1 (Very Slight). The geometry of the proposed basement in relation to neighbouring properties assessed in the building damage assessment is described in the text.

5.9 The BIA indicated that a movement monitoring scheme will be adopted to ensure that the movements generated are maintained within predicted limits. This will form part of the party wall agreement.

5.10 It can be confirmed that Revision 2 of the BIA and the supporting information meet the requirements of Camden Planning Guidance: Basements.

CampbellReith
consulting engineers

Appendix 1

Consultation Responses

None

CampbellReith
consulting engineers

Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA Format	BIA should refer to the latest Camden policy guidance.	Closed	11/08/2023
2	BIA Format	Desktop information and non-technical summaries to be included	Closed	11/08/2023
3	BIA Format	Clarification if a site walkover was undertaken is required.	Closed	11/08/2023
4	BIA Format	The qualifications of the authors are not in line with those requested by LBC guidance.	Closed	11/08/2023
5	Hydrogeology and Hydrology	Increase in hardstanding will need to be quantified. An outline drainage strategy and utilities information should be presented.	Closed	07/03/2024
6	Hydrogeology	Clarification on groundwater monitoring data and mitigation measures.	Closed	11/08/2023
7	Land Stability	The conceptual ground model and geotechnical parameters derived in the BIA require further consideration.	Closed	11/08/2023
8	Land Stability	Structural engineering information to be provided. Clarification is required regarding the allowable bearing pressure given for the founding stratum and the proposed loading from the new development.	Closed	07/03/2024
9	Land Stability	The GMA and building damage assessment to be reviewed and updated.	Closed	07/03/2024
10	Land Stability	Movement monitoring values to be revised following the GMA update.	Closed	11/08/2023

CampbellReith
consulting engineers

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