CampbellReith
consulting engineers

# Basement Impact Assessment Audit

## 20 Howitt Road, London, NW3 4LL

For
London Borough of Camden

Project No.
14006-16

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 | 20/07/2023 | For comment | EJPkb14006-16-200723-20 Howitt Road-D1 | EJP | KB | KB |
| D2 | 20/10/2023 | For comment | EJPkb14006-16-011123-20 Howitt Road-D2 | EJP | EMB | EMB |
| F1 | 11/03/2024 | For comment | EJPkb14006-16110324-20 Howitt Road-F1 | EJP | EMB | EMB |



### Document Details

| | |
|---|---|
| Last Saved | 10/03/2024 14:36 |
| Author | E Pike, MEng Hons (ACGI) CEng MICE RoGEP |
| Project Partner | E M Brown, BSc MSc CGeol FGS |
| Project Number | 14006-16 |
| Project Name | Basement Impact Assessment Audit |
| Revision | F1 |
| Planning Reference | 2023/0847/P |
| File Ref | EJPkb14006-16-110324-20 Howitt Road-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 (BIA) submitted as part of the Planning Submission documentation for 20 Howitt Road, London, NW3 4LL (planning reference 2023/0847/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 GEA BIA has been carried out by individuals who possess suitable qualifications in line with CPG: Basements.

1.5 The proposed development comprises the excavation of a single storey basement beneath the existing building footprint, incorporating the existing basement area, and extending to the front of the building to form a lightwell and to the rear below the garden area. The basement will be formed using underpinning techniques.

1.6 A screening and scoping assessment are presented, supported by desk study information.

1.7 The hydrology and hydrogeology screening and scoping have been updated to include the findings of the Flood Risk Assessment (FRA) undertaken.

1.8 The land stability scoping has been updated with regards to the proposed felling of trees and subsequent impact assessed as necessary.

1.9 A ground investigation has been carried out and groundwater monitoring undertaken. Any perched water encountered during construction is to be pumped from sumps.

1.10 The GEA BIA has confirmed that the proposed basement will be founded within the London Clay Formation.

1.11 The BIA has demonstrated that damage to neighbouring properties associated with the construction of the basement will not exceed Burland Category 1 (very slight) provided horizontal movements are strictly limited to 5mm.

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

1.13 The updated BIA complies with the requirements of CPG: Basements.

## 2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 22nd June 2023 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 20 Howitt Road, London, NW3 4LL, planning reference 2023/0847/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 "Change of use from a HMO (C4 use) and 2 bed flat into a single family dwelling, replacement of all existing windows with double glazed timber sash windows, extension to the existing basement to include a front lightwell, demolish the existing rear extension and replace with a full width single storey rear extension, installation of a rooflight within the front roofslope and two rooflights on the rear roofslope and external alternations."

2.6 The Audit Instruction confirmed 20 Howitt Road neither is, nor is a neighbour to, listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 29th June 2023 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Baxter Glaysher Consulting (BGC) Ltd., ref. 222162 Revision B – second issue dated February 2023.

- Flood Risk Assessment and SuDS Assessment (FRA) by Herrington Consulting Ltd, ref. 3601 – Issue 4, Revision 3 dated 27 February 2023.
- Location Plan.
- Planning Application Drawings by Ko Architects consisting of:
  - Existing Plans, Elevations and Sections (522-E01 to E05 dated October 2022, no revision).
  - Proposed Plans, Elevations and Sections (538-A01 to A06 dated February 2023, no revision).
  - Design & Access Statement dated February 2023.
- Planning Consultation Responses.

2.8 Subsequent to the initial audit report (Rev. D1 in July 2023), CampbellReith gained access to the following relevant documents to address the queries raised in Appendix 2:

- Basement Impact Assessment (BIA) by Baxter Glaysher Consulting Ltd., ref. 222162 Revision C – third issue dated August 2023.

2.9 After issuing Rev. D2 of the audit in November 2023, CampbellReith received the following relevant documents to address the queries raised in Appendix 2:

- 'Letter response to CR Queries' by Michael Barclay Projects (MBP) Ltd., ref. MBP-10215.MB, no date.
- Basement Impact Assessment (BIA) by Baxter Glaysher Consulting Ltd., ref. 222162, Revision D – fourth issue dated December 2023.
- Desk Study, Basement Impact Assessment & Ground Movement Analysis Report by GEA Ltd., ref. J23318, Revision 0 dated 22nd December 2023.

## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are BIA Author(s) credentials satisfactory? | Yes | Section 1.3.2 of GEA 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 | Appendix 1 of BGC BIA. For completeness, site location should be marked on applicable figures. |
| 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:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | Section 3.1.2 of GEA BIA. |
| Hydrogeology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | Section 3.1.1 of GEA BIA. |
| Hydrology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | Section 3.1.3 of GEA BIA. |
| Is a conceptual model presented? | Yes | Appendix 2 of BGC BIA. |
| Land Stability Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | Section 4.1 of GEA BIA. |
| Hydrogeology Scoping Provided? | Yes | Section 4.1 of GEA BIA. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Is scoping consistent with screening outcome? | | |
| Hydrology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | Section 4.1 of GEA BIA. |
| Is factual ground investigation data provided? | Yes | Appendix 2 of BGC BIA. |
| Is monitoring data presented? | Yes | Appendix 2 of BGC BIA. |
| Is the ground investigation informed by a desk study? | Yes | |
| Has a site walkover been undertaken? | Yes | Section 3 of BGC BIA. |
| Is the presence/absence of adjacent or nearby basements confirmed? | Yes | Section 2 of BGC BIA. |
| Is a geotechnical interpretation presented? | Yes | Section 2 of BGC BIA. |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | Section 2 of BGC BIA. |
| Are reports on other investigations required by screening and scoping presented? | Yes | Flood Risk Assessment and SuDS Assessment by Herrington Consulting Ltd. |
| 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 | Part 3 of GEA BIA. |
| Are estimates of ground movement and structural impact presented? | Yes | Section 8 and 9 of GEA BIA. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| 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 | |
| Has the need for monitoring during construction been considered? | Yes | Section 9.2 of GEA BIA. |
| Have the residual (after mitigation) impacts been clearly identified? | Yes | Section 11.1 of GEA BIA. |
| 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 | |
| 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 9 of GEA BIA states horizontal movements will need to be limited to 5mm to maintain damage within Category 1. |
| Are non-technical summaries provided? | Yes | Section 11.3.1 of GEA BIA. |

## 4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) by GEA has been prepared by individuals with qualifications in line with the requirements of CPG: Basements. This new BIA supersedes in part the BGC BIA as detailed in the MBP letter referred to in Section 2.9.

4.2 The site comprises a three-storey terraced house with a single storey rear extension, attached to adjacent property, number 22. The building has an existing approximately 2m deep basement cellar at the front left hand corner of the property which also shares a party wall with number 22. The adjoining properties (no. 18 and 22) are reported to be of similar design, with neither understood to have had works carried out to the existing basement cellar areas.

4.3 The proposed development comprises the excavation of a single storey height basement beneath the existing building footprint, incorporating the existing basement area, and extending to the front of the building to form a lightwell and to the rear below the garden area. The BGC BIA report now confirms the proposed formation level of the basement is 96.000m, resulting in a basement depth between 3.80m and 4.00m below existing ground level, with the existing cellar lowered by c. 1.40m. This is in agreement with the structural engineer's drawings.

4.4 Screening and scoping assessments are presented and are informed by desk study information. Whilst a standalone desk study has not been presented, the contents of the BGC BIA comprise the typical contents expected of a desk study.

4.5 The GEA BIA groundwater and surface water and flooding screening and scoping sections are complete, with appropriate reference to the Flood Risk Assessment and SUDS Assessment (FRA) prepared by Herrington Consulting Ltd.

4.6 The GEA BIA land stability screening and scoping sections are complete, which states two trees will be felled as part of the proposed development.

4.7 A ground investigation was carried out by Albury SI in December 2022 which revealed ground conditions to comprise concrete or Made Ground from surface to depths of between 0.90m and 1.30m below ground level (bgl) underlain by the London Clay Formation. Groundwater was struck at 1m bgl and one round of groundwater monitoring recorded water at 1.28m bgl, concluded to be perched in the Made Ground. The BGC BIA report concluded pumping from sumps is likely to be suitable to deal with any perched water. Foundation inspection pits revealed existing foundations to comprise corbelled brickwork extending to between 1.10m and 1.25m bgl.

4.8 Geotechnical interpretation is provided in the site investigation report which recommends a minimum founding depth of 3.50m bgl on the basis of potential desiccation of on-site soils. Appropriate conservative retaining wall parameters are provided in both the Albury SI report and GEA BIA. The retaining wall calculations contain soil parameters which broadly align with the Albury SI report and GEA BIA. The structural engineer's drawings in the updated BGC BIA indicate a proposed foundation depth of c. 3.85m, beyond the minimum foundation depth recommended in the site investigation report.

4.9 The BGC BIA states the basement will be formed using reinforced concrete cantilever retaining walls with structural loads transferred to the underside of the basement slab. The report states the basement walls will be constructed using traditional hit and miss underpinning techniques, propped in the temporary condition, allowing for hydrostatic pressures at ground level. Whilst the structural drawings do not illustrate hit and miss underpinning around the entire perimeter, notably not to the front lightwell and rear extension, the MBP letter states that hit and miss underpinning applies to all walls and that this is referred to in the drawing note on 222162/01. Section BB of drawing 222162/02 indicates the proposed basement will be deeper than the neighbour's basement cellar level.

4.10 A Ground Movement Assessment (GMA) has been undertaken as part of the GEA BIA to demonstrate that ground movements arising from the basement construction and associated impact on neighbouring properties will be within LBC's policy requirements, namely 18 and 22 Howitt Road, as well as the adjacent highway. Ground movements due to underpinning and excavation have been modelled using OASYS PDisp and XDisp software. Whilst XDisp is intended for use with embedded retaining walls, it is accepted that, in certain circumstances, it may predict ground movements in the order of those anticipated for underpinning.

4.11 The results of the Building Damage Assessment in the GEA BIA indicate that damage to neighbouring properties can be limited to no worse than Burland Category 1 (very slight) as long as horizontal movements are limited to 5mm.

4.12 The GEA BIA contains recommendations for monitoring of ground movements, with trigger limits and contingency measures to be developed within a future monitoring specification for the works.

4.13 A separate Flood Risk Assessment and SuDS assessment (FRA) has been prepared by Herrington Consulting Ltd. The report assesses the risk of flooding from all sources to be low. The report stipulates a proposed increase in impermeable area for which the increased surface water runoff will be managed via the use of a green roof on the rear extension and by installing an 800mm deep attenuation tank beneath the basement with a pumping station, restricting the discharge rate to the existing combined sewer beneath Howitt Road. Non-return valves are also recommended to prevent backflow from the public sewer. The report concludes the proposed development will not result in an increased risk of flooding to the site and surrounding area. The updated structural engineers' drawings in the BGC BIA include the attenuation tank.

## 5.0 CONCLUSIONS

5.1 The GEA BIA has been carried out by individuals who possess suitable qualifications in line with CPG: Basements.

5.2 The proposed development comprises the excavation of a single storey basement beneath the existing building footprint, incorporating the existing basement area, and extending to the front of the building to form a lightwell and to the rear below the garden area. The basement will be formed using underpinning techniques.

5.3 A screening and scoping assessment are presented, supported by desk study information.

5.4 The hydrology and hydrogeology screening and scoping have been updated to include the findings of the Flood Risk Assessment (FRA) undertaken. The proposed structural drawings have been updated to include the proposed attenuation tank referred to in the FRA.

5.5 The land stability scoping requires has been updated with regards to the proposed felling of trees and subsequent impact assessed as necessary.

5.6 A ground investigation has been carried out and groundwater monitoring undertaken. Any perched water encountered during construction is to be pumped from sumps.

5.7 The GEA BIA has confirmed that the proposed basement will be founded within the London Clay Formation.

5.8 The results of the Building Damage Assessment demonstrate that damage to neighbouring properties will not exceed Burland Category 1 (very slight) provided horizontal movements are strictly limited to 5mm.

5.9 A monitoring strategy is to be developed at design stage with appropriate trigger levels to be defined and agreed with owners of the adjacent properties.

5.10 It is accepted that the development will not impact slope stability or the wider hydrogeology of the area and is not in an area subject to flooding.

5.11 The updated BIA complies with the requirements of CPG: Basements.

CampbellReith
consulting engineers

# Appendix 1

## Consultation Responses

None relevant to the BIA

CampbellReith
consulting engineers

# Appendix 2

# Audit Query Tracker

CampbellReith consulting engineers

Audit Query Tracker

| Query No | Subject | Query | Status | Date closed out |
|---|---|---|---|---|
| 1 | BIA | The BIA should include authors with the required qualifications as per CPG: Basements. | Closed – Section 4.1. | 01/03/24 |
| 2 | BIA | Proposed basement depth to be confirmed in report and on drawings. | Closed – Section 4.3. | 01/03/24 |
| 3 | Hydrology and hydrogeology | Hydrology and hydrogeology screening and scoping to be updated to include findings of FRA. | Closed – Section 4.5. | 01/03/24 |
| 4 | Land stability | Land stability screening and scoping to be updated to include reference to proposed felling of trees, taking into consideration the observations of potential desiccation recorded during the ground investigation. | Closed – Section 4.6. | 01/03/24 |
| 5 | Land stability | Further evidence to be provided of geotechnical parameters selected in retaining wall design and whether minimum foundation depth of 3.50m recommended in SI has been adopted. | Closed – Section 4.8. | 01/03/24 |
| 6 | Land stability | Conflict to be resolved between hit and miss underpinning referred to in BIA with the localised hit and miss underpinning shown on structural drawings as well as depth of the neighbouring basement on Section BB of drawing 222162/02. | Closed – Section 4.9. | 01/03/24 |
| 7 | Land stability | Building Damage Assessment to be revised to show damage to neighbouring structures will not exceed Category 1 (Very Slight). | Closed – Section 4.10 - 4.12. | 01/03/24 |
| 8 | Land stability | BIA, drawings and retaining wall design to be updated to include attenuation tank referred to in FRA. | Closed – Section 4.13. | 20/10/23 |

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