

75 Bayham Street (2),  
London, NW1 0AA

Basement Impact Assessment  
Audit

For

London Borough of Camden

Project Number: 12466-14

Revision: D1

Date: November 2016

Campbell Reith Hill LLP  
Friars Bridge Court  
41-45 Blackfriars Road  
London  
SE1 8NZ

T: +44 (0)20 7340 1700  
F: +44 (0)20 7340 1777  
E: [london@campbellreith.com](mailto:london@campbellreith.com)  
W: [www.campbellreith.com](http://www.campbellreith.com)

### Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	November 2016	Comment	FDav-12466-14-081116-75 Bayham Street(2)-D1.doc	F Drammeh	A J Marlow	G Kite

This document has been prepared in accordance with the scope of Campbell Reith Hill LLP’s (CampbellReith) appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of CampbellReith’s client. CampbellReith accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of Campbell Reith Hill LLP. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

© Campbell Reith Hill LLP 2015

### Document Details

Last saved	08/11/2016 16:24
Path	FDav-12466-14-081116-75 Bayham Street(2)-D1.doc
Author	F Drammeh, MEng (Hons)
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12466-14
Project Name	75 Bayham Street (2)
Planning Reference	2016/4482/P

## Contents

1.0	Non-technical summary .....	1
2.0	Introduction .....	3
3.0	Basement Impact Assessment Audit Check List .....	5
4.0	Discussion .....	8
5.0	Conclusions .....	12

## Appendix

- Appendix 1: Residents' Consultation Comments
- Appendix 2: Audit Query Tracker
- Appendix 3: Supplementary Supporting Documents

## **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 75 Bayham Street (Camden Planning Reference 2016/4482/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 BIA is an update to a previously approved scheme which was audited at the time (Camden Planning Reference 2015/6036/P).
- 1.5. The BIA was undertaken by Michael Alexander Consulting Engineers and the reviewers which include an individual from LBH Wembley have suitable qualifications.
- 1.6. The proposal includes the construction of a single storey basement to a depth of 4.25m, beneath an existing building by underpinning.
- 1.7. The scheme drawings do not include existing plans, sections and elevations and these are requested.
- 1.8. A basement plan with temporary propping indicated and an underpinning bay sequence are requested.
- 1.9. The groundwater level was not established and the BIA recommends trial pitting prior to construction. Temporary dewatering measures as well as basement waterproofing in the permanent case are also recommended.
- 1.10. The presence or absence of basements beneath the neighbouring properties was not fully established. The BIA however, states this information will be obtained through the Party Wall process.
- 1.11. The retaining wall parameters given in LBH Wembley's report are considered incomplete as discussed in Audit paragraph 4.11.

- 1.12. Maximum Category 2 damage is predicted for the neighbouring properties, however, the ground movement assessment should be reconsidered as discussed in Audit paragraph 4.15. Further details on the mitigation measures to limit damage are requested.
- 1.13. The impact of the construction on the roadway and utilities beneath is considered with mitigation proposed.
- 1.14. A drainage strategy, which considers implementation of attenuation SUDS, should be presented. Alternately, if considered impracticable, a statement indicating why attenuation SUDS cannot be implemented should be presented.
- 1.15. Outline movement monitoring proposals are requested. Details and trigger levels are to be agreed as part of the Party Wall award.
- 1.16. An outline works programme is included. Details should be provided by the Contractor at a later date.
- 1.17. It is accepted there are no slope stability or wider hydrogeological issues and the site is not an area prone to flooding.
- 1.18. Requests for further information are discussed in Section 4 and summarised in Appendix 2.

## 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 10 October 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 75 Bayham Street, London NW1 0AA (Camden Planning Reference 2016/4482/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
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
  - Camden Planning Guidance (CPG) 4: Basements and Lightwells.
  - Camden Development Policy (DP) 27: Basements and Lightwells.
  - Camden Development Policy (DP) 23: Water
- 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; and,
  - 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 '*Variation of condition 3 (Plans) of planning permission ref: 2015/6036/P for the Conversion of B8 to B1, extension at rear at first floor level, extension of roof to create an additional floor space at second floor level to the rear of building and excavation of basement. Replacement of front doors and windows on the west elevation dated 26/04/2016. Namely the; Removal of proposed rear extension, alteration of roof to existing rear-end building, removal roof terrace screening and installation of roof plant with associated riser all at second floor level; Alterations to the glazing at the entrance and new rooflights at ground, first and second floor levels and; new timber sash windows to first and*

*second floor rear elevation. Minor increase in depth below ground for basement by 500mm. Removal of condition 5 (roof terrace screening)'.*

- 2.6. The Audit instruction also confirmed 75 Bayham Street is not listed nor is it a neighbour to listed buildings. The site is located however in the Camden Town Conservation Area.
- 2.7. CampbellReith accessed LBC's Planning Portal on 20 October 2016 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment (BIA) Issue 2.0: Michael Alexander Consulting Engineers, September 2016.
  - Geotechnical, Hydrogeological & Ground Movement Assessment: LBH Wembley, September 2016
  - Innes Associates Planning Application Drawings consisting of
    - Proposed basement plan: 1030\_23\_P5\_[MMA] [Proposed Basement Plan](2)
    - Proposed sections: 1030\_15\_P3\_[MMA] [Proposed Section AA](2), 1030\_16\_P4\_[MMA] [Proposed Section BB](2), 1030\_17\_P6\_[MMA] [Proposed Section CC](2) and 1030\_18\_P4\_[MMA] [Proposed Section DD](2)
    - Proposed western elevation: 1030\_14\_P6\_[MMA] [Proposed West Elevation](2)
    - Current scheme basement depth: 1030\_17\_P6: Section CC (proposed) dated August 2016
    - Previous scheme basement depth: 1030\_17\_P6: Section CC (proposed) dated April 2016

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	Yes	Michael Alexander BIA and LBH Wembley Geotechnical, Hydrogeological & Ground Movement Assessment (GHGMA).
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	See BIA and GHGMA.
Are suitable plan/maps included?	No	Although the BIA includes the relevant map extracts and proposed drawings are provided, existing drawings are not included.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	As above.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	The 'No' response to Q1b is considered incorrect as no groundwater monitoring was undertaken (see Audit paragraph 4.8), however, this issue was subsequently addressed.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 5.0.
Is a conceptual model presented?	No	Not strictly a conceptual model but ground conditions are presented in Section 4 of the GHGMA.



Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 4.02.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No issues identified from screening although Q1b should have been carried forward. This was subsequently addressed in Section 3.04 and Appendix E of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No issues identified.
Is factual ground investigation data provided?	Yes	GHGMA Report.
Is monitoring data presented?	No	Groundwater monitoring not undertaken.
Is the ground investigation informed by a desk study?	Yes	GHGMA Sections 2 and 3.
Has a site walkover been undertaken?	-	Not explicitly stated although this is assumed from the descriptions in both reports and the site photographs included in the BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	No	Not confirmed (See Audit paragraph 4.12).
Is a geotechnical interpretation presented?	Yes	GHGMA Section 6.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Although stiffness values are not included.
Are reports on other investigations required by screening and scoping presented?	Yes	GIR.
Are the baseline conditions described, based on the GSD?	Yes	See BIA and GHGMA.
Do the base line conditions consider adjacent or nearby basements?	Yes	See BIA 4.01.13 and Section 7.2 of the GHGMA but not confirmed.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA Sections 3.04 and 4.04.
Are estimates of ground movement and structural impact presented?	Yes	Section 4.04.6 of the BIA based on assessment given in the GHGMA.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	See BIA Sections 3.04 and 4.04.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	BIA and GHGMA.
Has the need for monitoring during construction been considered?	Yes	LBH Wembley GHGMA Section 9.13 and BIA Section 4.04.10 to 4.04.12 although outline proposals are not included.
Have the residual (after mitigation) impacts been clearly identified?	N/A	None identified.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Ground movement assessment considered inadequate (see Audit paragraph 4.15)
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	BIA, however, no attenuation SUDS proposed to mitigate surface water discharge flow.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Structural stability not demonstrated.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	GHGMA Sections 7.3 and 8.
Are non-technical summaries provided?	No	However, the BIA has generally been written in a way that is easy to understand.

## 4.0 DISCUSSION

- 4.1. The BIA was undertaken by Michael Alexander Consulting Engineers, and the reviewer has CEng MStructE qualifications. It is stated that a further review was undertaken by a CGeol from LBH Wembley. The preparation of a BIA also requires the input of an individual with CEng MICE or CWEM qualifications with respect to the hydrological appraisal. The document control sheet of the Geotechnical, Hydrogeological Ground Movement Assessment (GHGMA) by LBH Wembley indicates the individual also possesses a CEng MICE qualification although it is not stated if the individual also reviewed the hydrological aspects. It is however noted that no adverse hydrological issues are identified.
- 4.2. The GHGMA also includes screening in the appendix, however, this was not audited.
- 4.3. The BIA is an update to a previously submitted and approved scheme (Camden Planning Reference 2015/6036/P) which was audited at the time. The main update to the previous scheme is the increase in depth of the proposed single storey basement.
- 4.4. The existing three storey building comprises of offices to the upper floors with a warehouse to the rear. The proposal is for the renovation, remodelling and extension of the existing buildings to create offices varying from two to four storeys above ground with a single storey basement. The basement is indicated to be 4.25m deep (previously 3.75m). Although proposed drawings are provided with the supporting documents, existing plans, sections and elevations are not included.
- 4.5. The basement is to be formed by underpinning the existing party walls. Preliminary construction sequence sketches which show two levels of underpinning together with temporary propping are included in the BIA. An underpinning bay sequence is however not provided. Structural calculations which are considered acceptable are included in the BIA Appendix.
- 4.6. The reinforced concrete underpins are considered 'special foundations' under the Party Wall act and are subject to the neighbours' agreement.
- 4.7. Relevant map extracts with the site location indicated have been included to support the responses to the screening questions.
- 4.8. A 'No' response is given to Question 1b of the hydrogeology screening which relates to whether or not the basement will extend beneath the water table. The justification states no groundwater was encountered during the site investigation. It should be noted that not encountering groundwater during drilling/excavation does not indicate its absence. It is likely equilibrium conditions had not been reached at the time and the groundwater level should have been established by a programme of monitoring. The possibility of encountering perched water

is however acknowledged in the impact assessment and it is stated in the construction method statement that a trial pit excavation will be undertaken by the Contractor prior to the commencement of site works. It further states that perched water, if encountered, is to be collected in sumps.

- 4.9. The response to Question 9 of the land stability screening states there is an area of worked ground beneath the other side of Bayham Street. However, the map extract provided with the site location indicated appears to show the worked ground beneath the site itself. This issue was however carried forward to scoping and ground investigation. It is stated in Section 4.03 of the BIA that no significant areas of backfill were encountered, however, this has not been demonstrated as discussed below in Audit paragraph 4.13.
- 4.10. A ground investigation was undertaken by LBH Wembley which comprised three window sample holes and trial pits to investigate the existing and neighbouring property foundations. The investigation encountered Made Ground to a maximum depth of 1.80m in the window sample holes underlain by London Clay. Groundwater was not encountered during the investigation and groundwater monitoring was not undertaken.
- 4.11. Trial pits undertaken adjacent to No 73 and 77 Bayham Street indicate brick foundations to 1.80 and 2m *'below floor level'* respectively. It is stated in Section 4.5 of the GHGMA that the remaining party walls appear to have shallow foundations at depths of 0.50 to 0.80m *'below floor level'*.
- 4.12. The presence or absence of basements beneath the neighbouring properties was not fully established. It is stated in the land stability screening that *'No 73 appears to have a lower ground floor. It is understood from drawings that the Pratt Mews properties do not have basements and it is unclear if any of the other adjoining properties have basements'*. Section 7.2 of LBH Wembley's report states that *'it is thought No. 77 has a basement to approx. 1.80m with 73 to approx. 1.50m'*. It is stated in Section 4.04.5 of the BIA that *'where the floor levels to the adjoining properties are not known, this information will be requested through the Party Wall process'*. It is stated further trial pitting adjacent to the street will be undertaken prior to the works to confirm these have similar depths and profiles to the adjoining walls.
- 4.13. Retaining wall parameters are included in Section 6 of the GHGMA although stiffness (Young's Modulus) values are not included. The ground investigation did not include any strength testing and the London Clay is described as *'soft to firm'* to 4.50m with indication that it is soft to at least 3.00m in one of the holes. Although the depth of excavation (4.85m) is likely to be within the soils described as *'stiff'*, further ground investigation to enable the derivation of geotechnical parameters should be undertaken for detailed design.

- 4.14. Heave movements using the modified Boussinesq's Elastic Theory are included in Section 7 of LBH Wembley report together with contour plots. Movements of up to 10mm are indicated around the edges of the excavation in the short term reducing to 5mm in the long term. Heave mitigation measures are recommended which includes a suspended basement slab with compressible material beneath and the underpins to be constructed with an enlarged toe.
- 4.15. Section 8 of LBH Wembley's report states that movement due to underpinning is dependent on good workmanship and temporary propping. It further states that if the above is achieved, horizontal movements can be adequately limited and hence the scale of damage. Although actual predicted movements are not given, it is stated that damage can be limited to Category 2 (Slight) if overall lateral movements can be limited to less than 10mm and Category 1 (Very Slight) if movements can be limited to 5mm. This is not considered to be adequate and actual horizontal and vertical movements should be predicted with a resulting damage category based on reasonably conservative assumptions. Potential additional settlement due to the first level of underpinning on soils described as soft should also be considered.
- 4.16. CPG4 requires mitigation measures where predicted damage is anticipated to be Category 1 or higher. Section 9 of the LBH Wembley report gives 'mitigation measures' which include appropriate temporary propping, monitoring and heave protection measures. These measures, especially monitoring, are not mitigation measures in themselves as they are what would be usually expected from any basement construction. Although it is acknowledged that underpinning is highly dependent on good workmanship and adequate temporary propping, the 'mitigation measures' proposed are not considered to strictly address the CPG4 requirement.
- 4.17. Section 4.04.3 of the BIA considers the impact of the proposals on the adjacent roadway and any utilities running beneath. It is stated that services will be located prior to excavation and temporary propping will be utilised to minimise the damage. Further trial pitting is also proposed as discussed on Audit paragraph 4.12 above.
- 4.18. The need for movement monitoring is highlighted in both LBH Wembley's report and the BIA however, no outline proposals are presented. Although it is accepted that details and trigger levels will be agreed as part of the Party Wall process, an outline proposal should be provided for completeness.
- 4.19. An outline works programme is provided as required by Cl. 233 of Arup GSD.
- 4.20. It is stated in the hydrology screening that there will be no increase in the paved areas and that the surface flows will be routed as existing into the combined sewer in Bayham Street. Attenuation SUDS options have not been proposed to reduce discharge flows and therefore flows to combined sewers will remain at current levels.

- 4.21. It is accepted that there are no slope stability concerns or wider hydrogeological issues as a result of the proposed development and that the site is not located in an area subject to flooding.

## 5.0 CONCLUSIONS

- 5.1. The BIA was undertaken by Michael Alexander Consulting Engineers and the reviewers which include an individual from LBH Wembley have suitable qualifications.
- 5.2. The proposal includes the construction of a single storey basement to a depth of 4.25m, beneath an existing building which is to be extended and renovated, by underpinning.
- 5.3. The scheme drawings do not include existing plans, sections and elevations and these are requested.
- 5.4. Although structural calculations and construction sequence sketches (sections) are included, a plan view of the basement showing the indicative temporary propping layout and an underpinning bay sequence are not included. These are requested for completeness.
- 5.5. The groundwater level was not established and the BIA recommends trial pitting prior to construction. Temporary dewatering measures as well as basement waterproofing in the permanent case are also recommended.
- 5.6. The presence or absence of basements beneath the neighbouring properties was not fully established. The BIA however states this information will be obtained through the Party Wall process.
- 5.7. The retaining wall parameters given in LBH Wembley's report are considered incomplete as discussed in Audit paragraph 4.13.
- 5.8. Heave movements are predicted together with mitigation measures proposed.
- 5.9. Maximum Category 2 damage is predicted for the neighbouring properties, however, the ground movement assessment should be reconsidered as discussed in Audit paragraph 4.15. Further details on the mitigation measures to limit damage are requested.
- 5.10. The impact of the construction on the roadway and utilities beneath is considered with mitigation proposed.
- 5.11. Although movement monitoring is considered, no outline proposals are included and this is requested. Details and trigger levels are to be agreed as part of the Party Wall award.
- 5.12. A drainage strategy, which considers implementation of attenuation SUDS, should be presented. Alternately, if considered impracticable, a statement indicating why attenuation SUDS cannot be implemented should be presented.

- 5.13. An outline works programme is included. Details should be provided by the Contractor at a later date.
- 5.14. It is accepted there are no slope stability or wider hydrogeological issues and the site is not an area prone to flooding.



## **Appendix 1: Resident's Consultation Comments**

None

## Appendix 2: Audit Query Tracker

Audit Query Tracker\*

Query No	Subject	Query	Status	Date closed out
1	BIA format	Incomplete scheme drawings. Existing plans, sections and elevations not provided	Open – to be provided	
2	Stability	Plan view showing layout of the proposed basement with indicative temporary propping not provided	Open – to be provided	
3	Stability	Underpinning bay sequence not provided	Open – to be provided	
4	Stability	GMA to be refined as discussed in Audit paragraph 4.15	Open – to be addressed	
5	Stability	Details of mitigation measures to limit damage not provided	Open – to be provided	
6	Stability	Movement monitoring outline proposals not provided	Open – to be provided	
7	Stability	Retaining wall parameters incomplete	Open – adequate investigation to enable the derivation of the required parameters to be undertaken prior to detailed design.	N/A
8	Stability/Hydrogeology	Groundwater level not established although mitigation proposed.	Open – Groundwater level to be investigated as indicated in the BIA prior to site works commencing.	N/A
9	Hydrology/Drainage	Drainage strategy considering the implementation of attenuation SUDS, should be presented or a statement indicating why this cannot be implemented should be presented if considered impracticable.	Open – to be provided	

\* Please provide clear and complete responses to the above queries. If the BIA and/or supporting documents are amended, please provide a covering email/letter to indicate the amended sections.

### **Appendix 3: Supplementary Supporting Documents**

None

---

## London

Friars Bridge Court  
41- 45 Blackfriars Road  
London, SE1 8NZ

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

## Surrey

Raven House  
29 Linkfield Lane, Redhill  
Surrey RH1 1SS

T: +44 (0)1737 784 500  
E: surrey@campbellreith.com

## Manchester

No. 1 Marsden Street  
Manchester  
M2 1HW

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

## Bristol

Wessex House  
Pixash Lane, Keynsham  
Bristol BS31 1TP

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

## UAE

Office 705, Warsan Building  
Hessa Street (East)  
PO Box 28064, Dubai, UAE

T: +971 4 453 4735  
E: uae@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: Friars Bridge Court, 41- 45 Blackfriars Road, London SE1 8NZ  
VAT No 974 8892 43