CampbellReith
consulting engineers

13a Pond Street
London
NW3 2PN

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12727-46
Revision: D1

March 2018

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

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 2018	Comment	RMam-12727-46-210318-BIA Audit 13a Pond Street-Rev D1.Doc	R Morley	A Morocs	A Morocs

Document Details

Last saved	21/03/2018 17:25
Path	RMam-12727-46-210318-BIA Audit 13a Pond Street-Rev D1.doc
Author	Robert Morley MEng
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12727-46
Project Name	13a Pond Street, London NW3 2PN
Planning Reference	2017/6907/P

Contents

Appendix

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 13a Pond Street NW3 2PN (planning reference 2017/6907/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 Basement Impact Assessment (BIA) and structural report has been carried out by those holding appropriate qualifications.

1.5. It has been identified that the entire terrace of adjacent properties located on Pond Street are Grade 2 listed.

1.6. It is proposed to demolish the existing building with the retention of the single storey extension only, with a new four storey property including single basement level proposed alongside the retained single storey.

1.7. The basement walls are proposed to be formed using piling methods, with concrete floors and liner walls. This is accepted as an appropriate structural form for the proposed basement in respect of the identified ground conditions.

1.8. An appropriate site investigation has been carried out, including investigation of ground water levels.

1.9. The ground conditions have been identified as a moderate depth of made ground overlaying London Clay. Ground water was observed at a relatively shallow depth below ground level.

1.10. The basement is to found below the anticipated ground water level. However an appropriate construction method has been proposed to account for this, and the impact on ground water flows is accepted as being negligible.

1.11. Further details of the soil properties are required, along with an outline structural design for the basement walls.

1.12. Clarification is required as to the impact on the surface water drainage system.

1.13. Confirmation of the intention to monitor the surrounding properties is required.

1.14. Clarification as to how movements of the soil due to excavation is to be accommodated is required.

1.15. A ground movement assessment has been produced that predicts damage category 1 for the immediate neighbouring structures. However it has been requested that this incorporates all surrounding buildings that fall within the zone of influence of the basement excavation, as well as a query as to the parameters used in the ground movement assessment.

1.16. It is accepted that nearby rail assets are outside of the zone of influence of the proposed site.

1.17. It is accepted that there are no slope stability concerns regarding the proposed development.

1.18. It is confirmed that the site is in an area that has been identified as having a low risk of flooding.

1.19. An outline works programme is required

1.20. Given the above a number of queries have been raised and are summarised in appendix 2 of this audit. The proposal cannot currently be confirmed to confirm to the requirements of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 12/02/18 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 13a Pond Street, NW3 2PN, planning ref: 2017/6907/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.
- Local Plan 2017, Policy A5 Basements.

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 "Demolition of the two-storey former stable and cottage. Replacement with a 3-storey extension, plus the formation of a new single storey basement. Alterations to existing 1969 extension. Refurbishment of existing roof terrace, and associated landscaping."

The Audit Instruction also confirmed 13a Pond street involved, or was a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 5/03/18 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment, Revision 3 – Chelmer Global Ltd
- Structural Report and Basement Impact Assessment, Rev 7 - Entuitive
- Planning Application Drawings, 25/05/16 – Gianni Botsford Architects
  consisting of;
  - Location Plan
  - Existing plans, elevations, and sections
  - Proposed plans, elevations, and sections
- Design & Access Statement, 27/11/17 - Gianni Botsford Architects
- Heritage Assessment, October 2017 - HeritageCollective
- Planning comments – Where pertinent to scope of audit

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Those involved with the production the BIA and Structural Report hold CGeol and MIStructE accreditation respectively
Is data required by Cl.233 of the GSD presented?	No	An outline works programme is not provided
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	An appropriate statement of justification has generally been provided for all 'no' answers
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	An appropriate statement of justification has generally been provided for all 'no' answers
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	An appropriate statement of justification has generally been provided for all 'no' answers
Is a conceptual model presented?	Yes	Section 4 of the basement impact assessment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	While a formal scoping discussion is not present, some scoping is provided within the responses to the screening questions
Hydrogeology Scoping Provided?	Yes	While a formal scoping discussion is not present, some scoping is

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		provided within the responses to the screening questions
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	While a formal scoping discussion is not present, some scoping is provided within the responses to the screening questions
Is factual ground investigation data provided?	Yes	Factual ground investigations report
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Reference is made to a site walkover being undertaken in January 2017
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The GMA states that a number of the surrounding buildings contain existing basements.
Is a geotechnical interpretation presented?	No	
Does the geotechnical interpretation include information on retaining wall design?	No	
Are reports on other investigations required by screening and scoping presented?	Yes	A ground movement assessment has been produced
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	The conceptual model does not mention the presence of neighbouring basements
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	

Item	Yes/No/NA	Comment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	
Has the need for monitoring during construction been considered?	Unclear	Monitoring is recommended in the BIA, however this has not been mentioned in the method statement.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Queries have been raised regarding the GMA
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Unclear	Existing site drainage to be clarified to confirm discharge to surface water drainage.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Queries have been raised regarding the GMA
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Category 1 is predicted for the immediately neighbouring properties. However a query has been raised as to the calculation of this, as well as the number of properties included in the assessment.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Chelmer Global Ltd, who are a well known firm of Geotechnical & Environmental Associates. The individuals concerned in its production hold suitable qualifications.

4.2. The Structural Report has similarly been produced by Entuituve, an established firm of Structural engineering consultants, with the author holding the appropriate qualifications for assessment of stability.

4.3. The LBC Instruction to proceed with the audit identified that the basement proposal either involved a listed building. The Design & Access Statement identified that the entire terrace of adjacent properties located on Pond Street are Grade 2 listed.

4.4. The proposal consists of the partial demolition of the existing two storey building, with the retention of the large single storey extension. In place of the demolished property, a new four storey property is proposed which includes a single basement level.

4.5. The basement is proposed to be formed of a 350mm diameter secant piled wall with RC capping beam, with a 100mm RC liner wall. A ground bearing RC basement slab, and RC ground slab, are proposed to form a RC box within the piled wall. The general basement excavation is to be 4.1mbgl in depth, with localised deeper excavations to 4.5mbgl and 4.9mbgl for planting and mechanical plant.

4.6. Site investigations have were carried out in 2016, which consisted of two 10m boreholes, and a number of trial pits to investigates the foundations to the existing property and its extension. Two return ground water monitoring visits were undertaken in January 2017.

4.7. The ground conditions have been identified as up to 2m of made ground overlaying London Clay to depth. Ground water was not identified during drilling, however it was recorded during the two return monitoring visits at depths recorded of up to 4.90mbgl in BH1, and 0.97mbgl in BH2.

4.8. The basement is to found within the London Clay at a general depth of 4.1mbgl, with the basement foundation level is below that of the maximum recorded groundwater level by 3.5m. It is stated that the permeability of the London Clay is expected to be very low, and therefore the basement is not anticipated to significantly impact on ground water flows which would be present predominantly within the made ground.

4.9. It is accepted that the basement is unlikely to impact on the wider ground water flows, other than locally within the immediate vicinity of the basement, due to its detached nature, and shallow flows on top of the largely impermeable London clay. However due to the large variation in ground water levels recorded it is suggested that ground water monitoring continue in order to better understand the variation in local ground water levels.

4.10. The construction method is described as being carried out in a bottom up sequence, with excavation carried out inside of the piled wall and temporary propping provided as the ground level is reduced. The basement slab is then to be constructed to provide a permanent prop to the base of the piled wall, with the liner walls and internal RC walls constructed internally, with the ground slab constructed at the head of the piled wall providing a permanent prop. Ground water is described as being excluded in the temporary case by the secant piled wall. It is accepted that the provided description of the temporary works demonstrates the feasibility of providing stability at all times during construction.

4.11. No outline structural calculations have been provided for piled retaining wall, outline calculations should be provided to demonstrate the feasibility of the proposal.

4.12. No soil properties relating to retaining wall design have been provided. These should be provided based on the factual site investigation information in order to be utilised in the outline retaining wall design.

4.13. The basement is to extend outside of the footprint of the existing building by a small amount at the front and the rear. It is stated that this will not affect the surface water drainage as the existing site consists of hardstanding in these areas. However clarification is required as to the existing drainage routes, as should these existing hardstanding areas not be draining to the surface water system then the discharge from the site to the surface water drainage system may increase. Should the surface water discharge be found to be increasing the provision of SUDs is to be investigated.

4.14. A recommendation is made for ground movement monitoring within the BIA, however no proposal to adopt monitoring is confirmed within the structural report or method statement. Confirmation should be provided as to the intention to provide movement monitoring, with an outline monitoring strategy presented that demonstrates an effective strategy for restricting ground movements to those predicted by the GMA, and therefore category 1 damage.

4.15. Short and long term heave displacements are provided in the BIA for the differing basement depths and areas of the proposed basement. It is stated that the basement slab will need to be designed to resist these heave pressures, however no mention of heave protection has been provided within the structural report. The method for mitigating/resisting heave pressures should be confirmed.

4.16. A ground movement assessment has been produced which has calculated vertical movements using PDISP software, and horizontal movements using the tables as provided in CIRIA580. Consideration has been given to the presence of neighbouring basements, with only single storey structures to number 13 and 15 Pond Street considered for damage category determination, both of which were found to fall within category 1. Due to the listed status of

the building on Pond Street, this approach is not considered conservative, with the main building to number 15 falling some 11.1m from the proposed basement, well within the four times excavation depth influence zone of an excavation, and therefore should be considered for damage category determination.

4.17. The movements have utilised the values associated with contiguous piled wall construction, rather than those associated with secant piled wall construction which are more onerous. The GMA should be revised and resubmitted utilising appropriate displacement values for the construction type proposed.

4.18. A works programme is not provided. An outline works programme should be provided that indicates that main phases of work and durations.

4.19. It is stated that a railway tunnel runs 52m north of the site, and a Northern Line tunnel runs 114m south west of the site. While no evidence of consultation has been provided with these asset owners, it is accepted that the site is not likely to fall within safeguarding or influence zones of these public assets.

4.20. It is accepted that there are no slope stability concerns regarding the proposed development.

4.21. It is confirmed that the site is in an area that has been identified as having a low risk of flooding. This is accepted.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of Geotechnical & Environmental Associates. The individuals concerned in its production hold suitable qualifications.

5.2. The Structural Report has similarly been produced by an established firm of Structural engineering consultants, with the author holding the appropriate qualifications for assessment of stability.

5.3. It has been identified that the entire terrace of adjacent properties located on Pond Street are Grade 2 listed.

5.4. It is proposed to demolition the existing building with the retention of the single storey extension only, with a new four storey property including single basement level proposed alongside the retained single storey.

5.5. The basement is proposed to be formed of a secant piled wall, with internal RC box, with the basement slab ground bearing. The general basement excavation is to be 4.1mbgl in depth, increasing up to 4.9mbgl locally.

5.6. A site specific SI has been carried out consisting of two boreholes and trial pits. A brief period of ground water monitoring was undertaken.

5.7. The ground conditions have been identified as a moderate depth of made ground overlaying London Clay. Ground water was observed as at a maximum level of 0.97mbgl during a brief period of monitoring.

5.8. The basement is to found below the anticipated ground water level. It has been concluded that ground water flows are not significant and would occur primarily above the Clay within the made ground, which has been deemed as having a low permeability. This conclusion is agreed with and it is accepted that wider ground water flows are unlikely to be impacted.

5.9. A bottom up construction sequence is proposed with temporary propping described as being provided to the secant piled walls at all times until the permanent RC box is constructed. This is accepted as an appropriate method of construction.

5.10. Soil engineering properties specific to retaining wall design, along with an outline retaining wall structural design are required.

5.11. The basement is to extend beyond the footprint of the existing building, beneath areas of hardstanding. Clarification is required as to the existing drainage of these hard standing areas in order to assess whether the discharge to the drainage system will increase.

5.12. Confirmation is required if monitoring of the surrounding properties during construction is to be provided, with an outline movement monitoring strategy that demonstrates limiting movement to those predicted in the GMA.

5.13. It is not clear how heave forces are to be designed for, clarification is required.

5.14. A GMA has been produced that predicts damage category 1 for the single storey rear structures to 13 and 15 Pond Street. However the values taken for ground movements are not appropriate for the construction type proposed, and the scope of the GMA should include all buildings within the influence zone of the excavation.

5.15. It is accepted that nearby rail assets are outside of the zone of influence of the proposed site.

5.16. It is accepted that there are no slope stability concerns regarding the proposed development.

5.17. An outline works programme should be provided that indicates that main phases of work and durations.

5.18. It is confirmed that the site is in an area that has been identified as having a low risk of flooding.

5.19. Given the above a number of queries have been raised and are summarised in appendix 2 of this audit. The proposal cannot currently be confirmed to confirm to the requirements of CPG4.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Paraphrased objections pertinent to the scope of this audit are presented.
Where the same or a similar objection has been raised more than once, it has only been listed in the first instance it was received.

Surname	Address	Date	Issue raised	Response
Davey	17a Pond Street	-	Unacceptable risk to stability and integrity of surrounding properties	The applicant has been asked to adequately demonstrate the damage category to the surrounding properties.
Othick	Flat 3, 33 Hill Gardens	-	Consideration of movement of ground water	The applicant has investigated ground water levels and identified that ground water flows are not strategic to the wider area and not likely to constitute a significant volume. Therefore the basement is not anticipated to cause significant disruption to flows, and rather will displace mostly perched water. This conclusion is accepted.
Harding	-	-	Inadequate ground water monitoring	It has been demonstrated that ground water flows are not likely to be significant due to the impermeability of the underlying clay soil and the identified geology, with the ground water monitoring undertaken during the winter months considered as appropriate to identify an snapshot of the characteristic ground water level at that time of year.
Harding	-	-	Disruption to ground water flows, and misinterpretation of permeability of clay soil.	It is felt that the applicant has adequately assessed the geological and hydrogeological conditions with respect to ground water flows, which are anticipated as being low. The description of the clay provided is consistent with a low permeability soil.

Appendix 2: Audit Query Tracker

CampbellReith
consulting engineers

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1		Further details of the existing site drainage are required in order to demonstrate that the discharge to the surface water system is not increasing. SUDs should be considered if the surface water discharge is found to be increasing.	Open	
2		Parameters associated with retaining wall design are required to enable design of the retaining wall	Open	
3		Outline structural design is required of the retaining wall in order to demonstrate the feasibility of the structural proposal	Open	
4		Confirmation that ground movement monitoring is to be adopted during the works, in order to effectively limit movements to those predicted with the GMA.	Open	
5		Confirmation as to how ground heave is to be structurally resisted or mitigated in line with recommendations made in BIA report.	Open	
6		Inclusion of listed buildings on Pond Street for damage category determination, and all surrounding buildings that fall within the zone of influence of the basement excavation.	Open	
7		GMA to be revised to use values associated with movements of secant piled walls in accordance with the proposed structural solution.	Open	
8		An outline works programme is required detailing the main phases of works and their durations.	Open	

Appendix 3: Supplementary Supporting Documents

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