CampbellReith
consulting engineers

12/12A Park Village
West London
NW1 4AE

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-05

Revision: F1

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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
W:www.campbellreith.com

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Project Partner	E M Brown, BSc MSc CGeol FGS
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1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 12/12A Park Village West (planning reference 2015/7005/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 & SI have been carried out by well-known firms of engineering consultants using individuals who possess suitable qualifications. The authors of the CMS have also been clarified in the updated reports.

1.5. The BIA has confirmed that the proposed basement, which is approximately 4m deep and confined to the footprint of the coach house, will be founded within London Clay.

1.6. There was a discrepancy in the original BIA as to whether there is the potential for groundwater to be encountered in the basement excavation during construction. This has now been clarified and is no longer considered an issue. Proposals for temporary dewatering have been suggested.

1.7. The SI & BIA proposes two options dependent on ground conditions and recommends further ground investigation in order that the feasibility of underpinning can be confirmed. The CMS only considers underpinning. Piles are discounted due to the encroachment of useable space under the coach house.

1.8. Structural calculations are presented in the CMS. Hydrostatic pressures have been considered in the design of the retaining walls and basement slab. It is stated that the basement slab is to be designed for heave. The original BIA advised that heave calculations are carried out to allow the detailed design of the slab. These are included in the calculations carried out by the engineer and submitted subsequent to the initial audit report.

1.9. Analysis has been undertaken of likely horizontal and vertical ground movements and the predicted damage category is Burland Category 1, very slight. This is accepted provided there is good control of workmanship and the affected structures are in sound condition.

1.10. Proposals are provided for a movement monitoring strategy during excavation and construction.

1.11. It is accepted that the surrounding slopes to the development site are stable.

1.12. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding. The consideration of localised dewatering should be considered during the construction phase due to the possibility of interlinked deposits of water within the made ground.

1.13. Queries and requests for clarification are discussed within Section 4 and summarised in Appendix 2. These have subsequently been addressed in the updated BIA. It is accepted that the revised BIA and supporting documents adequately identify the potential impacts arising out of the basement proposals and describe suitable mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 14/01/2016 to carry out a Category B Audit on the Site Investigation (SI) & Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 12/12A Park Village West London NW1 4AE.

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 *"Extension at lower ground floor level involving excavation under former coach house, studio and courtyard including rear light well and insertion of 1st floor window to side elevation of coach house".*

2.6. The Audit instruction does not indicate any listed building status. The BIA makes reference to the 3 storey main house being a Grade II Listed building, but it is not clear if the adjoining coach house is subject to the same listed status.

2.7. CampbellReith accessed LBC's Planning Portal on 17/01/16 and gained access to the following relevant documents for audit purposes:

- Site Investigation (SI) & Basement Impact Assessment Report (BIA)
- Construction Method Statement (CMS)
- Arboricultural Impact Assessment Report & Outline Method Statement
- Planning Application Drawings consisting of

  Location Plan

  Existing Plans

  Proposed Plans
- Design & Access Statement
- Planning Comments and Response.

2.8. Subsequent to the issue of the initial audit report, additional and revised information was provided on 1 June 2016 to address the queries raised. This additional information, which has been considered in this updated audit report, comprised:

- Construction Method Statement
- Site Investigation & Basement Impact Assessment Report – Issue 4
- Response to CampbellReith BIA Audit 1.0.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Relevant qualifications and experience are outlined in the SI & BIA section 1.3.2. However the authors of the CMS are unknown – This has since been addressed in the updated BIA.
Is data required by Cl.233 of the GSD presented?	No	No works programme for construction, operation and commissioning has been presented.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	The SI & BIA identifies the potential requirement for a bored pile wall solution; this has not been considered in the CMS – This has since been addressed in the updated BIA. Piles shall not be considered, except for temporary works.
Are suitable plan/maps included?	Yes	Proposed and existing site plans from Collett Zarzycki Architects. Drawings were not included in the SI & BIA.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	SI & BIA appendix.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1.2 of SI & BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	Section 7.0 of SI & BIA.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	The report identifies the groundwater as negligibly permeable non aquifer and unproductive bedrock strata.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Hydrology is not considered in the scheme, however, from the screening it does not appear to be an issue which requires addressing.
Is factual ground investigation data provided?	Yes	This data is inconsistent with statements in the executive summary, some clarification is required.
Is monitoring data presented?	Yes	The data is presented in section 5.3 the data is limited and the monitoring period should be extended.
Is the ground investigation informed by a desk study?	Yes	Section 2.0.
Has a site walkover been undertaken?	Yes	Section 1.3 makes reference to site visits.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Adjoining property (No 12) is shown to have a lower ground floor.
Is a geotechnical interpretation presented?	Yes	Part 2 of SI & BIA section 6 onwards.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Some retaining wall designs are included, however alternative solution for bored piles is not included – No longer required.
Are reports on other investigations required by screening and scoping presented?	Yes	Additional Trial Pits and ground water monitoring are suggested in SI & BIA.
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?	No	However, no impacts to hydrogeology anticipated.
Is an Impact Assessment provided?	Yes	Section 8.
Are estimates of ground movement and structural impact presented?	Yes	A ground movement assessment was carried out in the revised BIA.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	The original ground movement assessment did not encapsulate the entire area proposed for the new basement. This has since been resolved.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	In the updated BIA and CMS, temporary stability and propping have been considered. However, a competent contractor will be required to carry out the works and more detail propping and temporary works scheme will need to be developed at the construction stage.
Has the need for monitoring during construction been considered?	Yes	Section 13.2.
Have the residual (after mitigation) impacts been clearly identified?	Yes	The BIA recommends modelling of predicted movements have been carried out and it is expected than any residual impacts shall be limited.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	In the updated CMS and BIA ground movement and structural stability have been considered.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	There is no significant change to impermeable areas. The site does not use soakaway drainage due to the presence of clay. The runoff rate remains unchanged. Section 3.1.3.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	The scheme will have an impact on the adjacent Grade II listed building, however, predicted damage is predicted to be no worse than Burland Category 1.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Section 13 states that the worst movement will be Category.
Are non-technical summaries provided?	Yes	See the executive summary.

4.0 DISCUSSION

4.1. The Site Investigation (SI) and Basement Impact Assessment (BIA) has been prepared by GEA (Geotechnical & Environmental Associates) a well-known firm of engineering consultants using individuals who possess suitable qualifications as identified in section 1.3.2 of the report.

4.2. The authors of the Construction Method Statement (CMS), Conisbee, are also a well-known and established firm of engineering consultants. The qualifications of the relevant parties have been identified in the updated BIA.

4.3. The original SI & BIA was written and published by June 2015, the CMS followed in August of 2015 and finally the Arboriculture impact assessment report in December 2015. The revised SI & BIA (revision 4) is dated May 2016.

4.4. The proposed basement consists of a single storey construction formed by excavating below an existing coach house to the west of the development site to around 4.0 metres depth. The proposed basement does not increase the impermeable area at the site.

4.5. The SI/BIA has identified that the site is overlain by made ground to depths between 0.3 and 1.7m under which London Clay can be found to between 3.8-5m. This was the maximum depth to which boreholes were taken to; no other strata were encountered.

4.6. The SI executive summary indicates that water was struck at 3m in BH1 and 1.2m in BH3. The borehole records do not reflect this and indicate water was only encountered in BH1. The summary also states water was found close to the base of the foundation in trial pit 5, this is not reflected in the trial pit log. The BIA variously states that groundwater ingress into the excavation may exceed that which can be dealt with by sump pumping, and that groundwater ingress is unlikely. This has now been clarified in the updated BIA; it is expected that only small pockets of perched water will be encountered.

4.7. The original SI & BIA discussed two alternative proposals to construct the basement. The preferred option was to underpin the existing structure using a traditional hit and miss pin installation sequence requiring approximately 4 metre deep underpins. The SI & BIA also made reference to an alternative construction method of a bored pile wall; it suggested that *"If trial excavations indicate that groundwater inflows cannot be suitably controlled or if sufficient space is not available to carry out trial pits, consideration may be given to the use of a bored pile retaining wall."* The report recommended that more trial excavations be carried out to the proposed depth of the basement to better establish the potential inflows. The initial audit considered that without further investigation of the ground conditions through additional trial pits as suggested in the SI & BIA or contingency planning for dealing with unfavourable inflows, the validity of the proposed design in the CMS had not been demonstrated. This has since been

clarified as per 4.6. A piled wall solution has been discounted due to the encroachment of useable space into the proposed basement.

4.8. The CMS only considers one option of basement construction and does not acknowledge the potential need for a bored pile wall. The construction method outlined indicates the need for temporary propping to support internal load bearing walls via Pynford Beams and the perimeter walls on concrete pins which will be formed in 2 stages, firstly down to 1.5m, then down to the final formation level of 4m.

4.9. A basic method statement and construction sequence has been provided for the basement structure, some of the key elements covered include the Pynford Beam RC design, a retaining wall design, and designs for the ground and basement slabs. Load bearing walls have also been indicated along with spread foundations and a RC column for which calculations have been received. It is accepted that the soil parameters assumed in the retaining wall calculations are appropriate. With respect to the ground bearing basement slab, it was noted that the original BIA recommended that heave calculations are carried out.

4.10. It is reported that the main house is listed; it is not known whether this applies to the coach house. There is an obligation on building owners to avoid damage to listed properties. A ground movement and building damage assessment is therefore required for No 12 Park Village West. It is accepted that there are no other properties within the likely zone of ground movement. A subsequent ground movement assessment has been carried out. Whilst the method adopted is more appropriate to piled retaining walls and the full input data have not been provided, it is accepted that ground movements will be small provided there is good control of workmanship.

4.11. The BIA has shown that although the development is close to the former Regents Canal, it was filled sometime between 1938 and 1946 reportedly with rubble from buildings destroyed during World War II. The site slopes towards this feature and it is not considered as a risk.

4.12. As the works are exclusively within the footprint of the existing coach house there will be no change to surface water discharge.

4.13. The impact on the hydrology and hydrogeology has been considered. The information presented indicates that the basement will not have any impact on groundwater or surface water, however during the construction phase some consideration should be given to the temporary dewatering of the made ground.

4.14. The BIA notes that there are slopes steeper than 7^{o} in the surrounding area but confirms that there will be no adverse impacts to stability from the basement proposals. It is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.

5.0 CONCLUSIONS

5.1. The BIA & SI have been carried out by well-known firms of engineering consultants using individuals who possess suitable qualifications. The authors of the CMS have also been clarified in the updated reports.

5.2. The BIA has confirmed that the proposed basement, which is approximately 4m deep and confined to the footprint of the coach house, will be founded within London Clay.

5.3. There was a discrepancy in the original BIA as to whether there is the potential for groundwater to be encountered in the basement excavation during construction. This has now been clarified and is no longer considered an issue. Proposals for temporary dewatering have been suggested.

5.4. The SI & BIA proposes two options dependent on ground conditions and recommends further ground investigation in order that the feasibility of underpinning can be confirmed. The CMS only considers underpinning. Piles are discounted due to the encroachment of useable space under the coach house.

5.5. Structural calculations are presented in the CMS. Hydrostatic pressures have been considered in the design of the retaining walls and basement slab. It is stated that the basement slab is to be designed for heave. The original BIA advised that heave calculations are carried out to allow the detailed design of the slab. These are included in the calculations carried out by the engineer and submitted subsequent to the initial audit report.

5.6. Analysis has been undertaken of likely horizontal and vertical ground movements and the predicted damage category is Burland Category 1, very slight. This is accepted provided there is good control of workmanship and the affected structures are in sound condition.

5.7. Proposals are provided for a movement monitoring strategy during excavation and construction.

5.8. It is accepted that the surrounding slopes to the development site are stable.

5.9. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding. The consideration of localised dewatering should be considered during the construction phase due to the possibility of interlinked deposits of water within the made ground.

5.10. Queries and requests for clarification are discussed within Section 4 and summarised in Appendix 2. These have subsequently been addressed in the updated BIA. It is accepted that the revised BIA and supporting documents adequately identify the potential impacts arising out of the basement proposals and describe suitable mitigation.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Redacted	13 Park Village West London NW1 4AE	5/01/2015	Windows overlooking the adjacent property and concerns over damage to existing established tree's roots during the excavation of the basement.	Case officer to respond on window issue. See Arboricultural impact assessment for potential impact on tree roots.
Simpson	Conservation area advisory committee - Address Redacted	28/01/2016	Issues with geology in relation to former canal. Concerns over the integrity of the footprint. Request that a construction management plan be written into the contracts.	Potential impact to/of former canal considered in BIA.

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA audit	Author(s) of CMS to be confirmed.	Updated CMS identifies Authors.	29/06/16
2	Hydrogeology	Conflicting groundwater levels reported in BIA/SI which recommends further monitoring. Groundwater levels to be clarified.	Clarified in updated BIA.	29/06/16
3	Stability	BIA states that further ground investigation is required to confirm feasibility of underpinning. CMS does not consider recommended alternative piled scheme.	Piles are not longer to be considered.	29/06/16
4	Stability	BIA has conflicting information regarding risk of grodundwater ingress into basement excavation during construction.	This will be dealt with onsite by the contractor, it is expected that only small pockets of groundwater will be encountered.	29/06/16
6	Stability	Ground movement and building damage assessment required for 12 Park Village West and 12A (if listed).	An assessment has been carried out and movements are within acceptable limits.	29/06/16

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