CampbellReith
consulting engineers

10-11 King's Mews
London WC1N 2ES
Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12727-26

Revision: D1

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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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Author	K Zapaniotis, MEng CEng MICE
Project Partner	E M Brown, BSc MSc CGeol FGS
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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 10-11 Kings Mews (planning reference 2017/4543/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, together with supplementary information, and reviewed it against an agreed audit check list.

1.4. The BIA has been carried out by a well-known firm of engineering consultants who have provided information to show that their authors possess suitable qualifications and relevant experience.

1.5. The revised BIA has confirmed that the proposed basement floor level will be founded within Made Ground, and its foundations will extended to be deepened to a suitable bearing stratum.

1.6. An outline structural proposal has been described, however further details are required to demonstrate the constructability of the proposal.

1.7. An acceptable Ground Movement Analysis and Damage Assessment has been carried out which shows Very Slight (Burland Category 1) damage to 8-9 Kings Mews and Negligible (Burland Category 0) to 12-13 Kings Mews.

1.8. It is accepted that movement monitoring proposals will be developed and agreed during the Party Wall Act approval process.

1.9. It is accepted that below ground drainage will be developed should planning consent be approved. The current proposal does not increase the proportion of hard surfaces on site or increase the impact on the surface water drainage system.

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

1.11. 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.

1.12. A number of queries for additional information have been raised as summarised in appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) in December 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 10-11 Kings Mews, Camden Reference 2017/4543/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 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; 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 *"Erection of three storey plus basement building to provide 4x1 bed and 3x2 bed flats and associated works."*

The Audit Instruction also confirmed 10-11 Kings Mews involved, or was a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 03 January 2018 and gained access to the following relevant documents for audit purposes:

- Desk Study & Basement Impact Assessment Report (BIA) dated September 2017 by Geotechnical & Environmental Associates (GEA)
- Planning Statement dated July 2017 by Indigo
- Design and Access Statement dated August 2017 by MAA Architects (MAA)
- Planning Application Drawings consisting of

  Location Plan

  Existing Plans

  Proposed Plans

2.7. The proposed development takes similar form to that granted permission under Camden Planning Permission 2012/6315/P; approved on 17th June 2014.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
Is data required by Cl.233 of the GSD presented?	Yes	The required information is generally provided within the BIA, along with architect's plans, and a programme within the construction management plan.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	While the structural proposals are not presented in detail, description is provided of the structural proposals within the BIA.
Are suitable plan/maps included?	Yes	BIA.
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	BIA Section 4.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 4.
Is a conceptual model presented?	Yes	BIA Sections 2 and 3.
Land Stability Scoping Provided?	Yes	BIA Section 5.

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 5.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	Not required, consistent with screening outcome.
Is factual ground investigation data provided?	Yes	Previously carried out; in October 2012 and updated in June 2015. Also refer to BIA Section 6.0.
Is monitoring data presented?	Yes	BIA Section 6.0.
Is the ground investigation informed by a desk study?	Yes	Previously carried out; in October 2012 and updated in June 2015.
Has a site walkover been undertaken?	Yes	Previously carried out; in October 2012.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Section 9.0
Is a geotechnical interpretation presented?	Yes	BIA Section 5.0.
Does the geotechnical interpretation include information on retaining wall design?	No	Previously carried out; in June 2015.
Are reports on other investigations required by screening and scoping presented?	No	
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	BIA Section 5.0.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA Section 9.0.
Are estimates of ground movement and structural impact presented?	Yes	Refer to section 11.0.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Further information required with respect to temporary works, dewatering and ground movement monitoring.
Has the need for monitoring during construction been considered?	Yes	BIA Section 12.3. However outline details are not provided.
Have the residual (after mitigation) impacts been clearly identified?	No	Further information required with respect to temporary works and dewatering.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Further details regarding the temporary works and construction method are required.
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	Refer to Appendix of BIA. However, further information required with respect to temporary works, dewatering and ground movement monitoring.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	BIA Section 12.0.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of engineering consultants, Geotechnical & Environmental Associates (GEA) and the individuals concerned in its production have suitable qualifications.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal either involved a listed building or was adjacent to listed buildings but gave no details. The Design & Access Statement identified that 10-11 Kings Mews is located within the Bloomsbury Conservation Area and that John Street, to its rear, contains a majority of Grade II listed properties.

4.3. A previous planning application (2012/6315/P) was submitted in 2012 and approved in 2014 which proposed a development of similar scale including a basement level. A report by GEA geotechnical consultants was produced which contained details of a site specific ground investigation, which has been relied upon in the updated GEA report for the current application. A Structural Strategy Report was produced by Fluid Structural Engineers which contains details of the proposed structure and construction methodology. A comparable structural report has not been submitted to accompany the current planning application, and the currently proposed basement structure differs from that proposed at the time of the previous structural report which has therefore largely been disregarded for the purposes of this audit.

4.4. The existing site is covered by a two storey rear extension to 6 John Street, and primarily by a hardstanding car parking area.

4.5. The proposed development consists of a 3.0m deep basement under the full footprint of the site and three stories above ground, as shown in MAA Architect's (MAA) drawings. The site backs onto the rear of 6 John Street, fronts King's Mews and is bordered to the North and South by 12 and 9 King's Mews respectively. The basement is proposed to be formed by lowering the existing lower ground floor area at the rear of the development site by approximately 2.0 metres and excavating the front portion of the site, to the same level (18.105mOD), by approximately 3.0m.

4.6. The BIA has identified that the existing, 300mm thick, reinforced concrete ground slab is underlain by Made Ground to a depth of 4.80 metres (16.290mOD) below which lies Lynch Hill Gravel (14.990mOD), thickness 1.30 metres, below which lies the London Clay Formation.

4.7. Trial pits to 12 and 9 King's Mews indicate the base of the existing party wall foundations at 2.80m and 2.30m below existing ground level (bgl). Based on groundwater monitoring to date, groundwater is expected at depths of between 3.25mbgl (17.840mOD) and 3.60mbgl (17.490mOD).

4.8. The proposed construction of the basement is to underpin the perimeter walls with mass concrete underpinning to the depth of the gravel stratum (up to 4.8mbgl), with the basement slab, liner walls, and ground slab formed as a reinforced concrete box at a higher level within the made ground. No formal structural drawings have been provided, with only the proposed structure described within the basement impact assessment. Structural calculations should be provided to indicate the feasibility of the proposal.

4.9. An outline construction method has been provided in the BIA. While the mass concrete underpinning is described as being carried out in a 'hit and miss' sequence and constructed using a 'trench box, sheet lined, shored, and strutted' however this does not go into adequate detail as required for the formation of mass concrete underpinning to a significant depth (4.8mbgl), and beneath the ground water table, for which specialist techniques may be required. Further details of the construction method should be provided, along with outline temporary works, in order to demonstrate the feasibility of the construction method proposed.

4.10. A Ground Movement Analysis has been carried out by GEA using geotechnical modelling software and default values within CIRIA report C580 to represent the installation of the underpinned foundations as a planar embedded wall. XDISP and PDISP software suits have been utilised in order to calculate ground movements, the combined effect of the retaining wall installation and excavation generating between 10mm and 15mm maximum vertical settlements and horizontal movements. Whilst the CIRIA approach is intended for embedded retaining walls, we accept that the predicted ground movements are within the range typically anticipated for underpinning techniques carried out with good control of workmanship.

4.11. The results of a heave analysis carried out using the software has indicated a compressible layer may need to be incorporated beneath the basement floor slab, which will require designing to resist potential uplift forces generated by movement of up to 5mm. As no formal structural scheme has been presented it is not confirmed if this measure is to be adopted within the structural design.

4.12. A damage assessment has subsequently been carried out using the principles contained in CIRIA C580 which identified Very Slight (Burland Category 1) damage to 8-9 Kings Mews and Negligible (Burland Category 0) damage to 12-13 Kings Mews, which falls within the maximum damage category as permitted by LBC (category 1).

4.13. It is noted that the site is likely to have been bombed during World War II. A UXO risk assessment has not been submitted, the requirement for a preliminary or detailed UXO risk assessment should be considered by the applicant prior to construction.

4.14. The mass concrete underpinning will extend beneath the anticipated ground water level (3.25mbgl to 3.60mbgl), whereas the main basement excavation is anticipated to be just above the ground water level at around 3mbgl.

4.15. Groundwater monitoring and desktop study of the surrounding topography and geology has confirmed that direction of flow of groundwater is anticipated to be southeasterly/easterly. The depth of the surrounding properties ground floors are not anticipated to extend below the ground water level, and that none of the surrounding properties contain basement levels other than 7-8 Kings Mews that does contain a swimming pool, which at 2.5m depth is also not anticipated to extend beneath the ground water table. It has therefore been concluded that any ground water disrupted by the underpinning will be able to freely flow around and beneath the basement within the made ground and gravel, this conclusion is accepted, however it is recommended that ground water level monitoring continue until construction in order to better understand seasonal variations in ground water level and the impact this may have on construction and hydrogeological impact.

4.16. The BIA confirms that monitoring of the adjoining properties will be undertaken throughout the works at regular intervals, however a monitoring strategy is not provided. Proposals will be made and agreed with the owners of adjacent properties during the Party Wall Act approval process.

4.17. It is confirmed that the existing site is fully hardstanding and that the current proposals will not increase the proportion of hard surfaces therefore the volume of surface water inflow from surface run-off will remain unchanged due to the proposed development. It is accepted that below ground drainage will be developed should planning consent is granted.

4.18. The BIA has shown that although the development is close to a tributary of the "lost" River Fleet, it will not impact on the wider hydrogeology of the area, any other watercourses, springs or the Hampstead Heath Pond chain catchment area.

4.19. It is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.

4.20. Given the above a number of queries have been raised which are summarised in appendix 2.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by a well-known firm of engineering consultants who have provided information to show that their authors possess suitable qualifications and relevant experience.

5.2. The revised BIA has confirmed that the proposed basement level will be founded within Made Ground, with mass concrete underpinning foundations extending to the Lynch Hill Gravel below.

5.3. It has been confirmed that the ground water table will be encountered during basement excavation due to excavation for the mass concrete underpinning. Limited temporary works proposals or any details of sump pumping of groundwater during excavation have been provided.

5.4. An acceptable Ground Movement Analysis and Damage Assessment has been carried out which shows Very Slight (Burland Category 1) damage to 8-9 Kings Mews and Negligible (Burland Category 0) to 12- 13 Kings Mews.

5.5. No formal structural drawings or calculations have been submitted, however it is described that mass concrete underpinning is to be provided to the party walls, with reinforced concrete liner walls and basement and ground slab constructed within this.

5.6. Acceptable heave mitigation measures will be incorporated below the basement floor slab by the introduction of compressible void formers, however this has not been confirmed

5.7. Proposals to develop and agree the movement monitoring strategy during the Party Wall Act approval process have been deemed acceptable.

5.8. It is understood that the current proposals will not increase the proportion of hard surfaces on site. It is accepted that below ground drainage will be developed should planning consent is approved.

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

5.10. Submitted information on below ground basement structures has shown that the development is unlikely to have a significant local impact or cumulative impact on the local hydrogeology, as that there are no neighbouring basements.

5.11. A number of queries for additional information have been requested as summarised in appendix 2. At present it cannot be confirmed that the application complies with the requirements set out in CPG4.

Appendix 1: Resident's Consultation Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Construction method statement to be provided to indicate the feasibility of carrying out the construction while maintaining stability to the neighbouring properties. Details to consider the depth of underpinning, and excavation beneath the ground water table as anticipated, and outline temporary works required.	Open	
2	Stability	Outline structural calculations required to demonstrate the feasibility of the proposed basement structure.	Open	

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