CampbellReith
consulting engineers

1 Centric Close, Oval Road
London, NW1 7EP

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12466-59
Revision: F1

March 2017

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	Gareth Harper, BEng (Hons)
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 1 Centric Close, London, NW1 7EP (planning reference 2016/6891/P). The basement is considered to fall within Category C 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 has been carried out by a well-known firm of consultants who possess relevant qualifications and experience.

1.5. The proposal includes demolition of the existing buildings at the site and construction of a detached four to seven storey block. A single-storey basement is proposed in the northern area of the site. The basement will be supported by a contiguous piled wall with building loads supported on piled foundations from basement level.

1.6. A soils investigation confirmed the presence of London Clay to the depth of the investigation below Made Ground at depths between 2.3m and 3.0m, underlain by soft Alluvium with a thickness between 0.4m and 1.3m. Perched groundwater was encountered between 2.8m and 3.0m bgl over two rounds of groundwater monitoring, although this is likely to be a limited quantity.

1.7. The results of the GMA assessment indicate that with good construction control, damage to surrounding properties will be Negligible (Category 0). Although no detailed temporary works plan is presented, 'low' support stiffness has been assumed in the analysis, and is accepted.

1.8. The BIA recognises that heave of the underlying clay material will occur, due to the excavation, and the proposals to alleviate the effect on the basement are accepted.

1.9. Correspondence with Network Rail should be conducted to ensure that they are satisfied with the proposal based on their own requirements.

1.10. It is accepted that there are no slope stability or hydrogeological concerns with regards to the proposed development.

1.11. The BIA meets the criteria of CPG4 and DP27.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28 February 2017 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 1 Centric Close, London, NW1 7EP (2016/6891/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;

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 existing buildings (Class B1(c) & B8) and the erection of a part 4, part 5, part 6 and part 7 storey building comprising 1,219 sqm of commercial floorspace (Use Class B1) at basement and ground floor levels and 76 residential units (28 x 1-bed; 35 x 2-bed and 13 x 3-bed) (Class C3) including disabled car parking, landscaped courtyard and communal amenity areas."*

The Audit Instruction also confirmed that the basement proposal does not involve a listed building nor does the site neighbour any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 22nd March 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment dated March 2017 by Card Geotechnics Ltd
- Existing and proposed architectural plans by Allford Hall Monaghan Morris:

  (P00)_001 – (P00)_010 Rev P01

  (P00)_100 – (P00)_108 Rev P01

  (P00)_150 – (P00)_152 Rev P01

  (P00)_210 – (P00)_223 Rev P01

  (P00)_300 – (P00)_312 Rev P01
- Refer to Fairview New Homes Ltd letter titled "Planning Application for Residential Development at Centric Close, Oval Road, Camden, NW1 7EP (Planning Portal Reference PP-05693831)" dated 14 December 2016 for details of other reports presented.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA Authors' qualifications include CEng and CGeol.
Is data required by Cl.233 of the GSD presented?	Yes	Information contained within BIA, Ground Investigation Report, Design Access Statement and 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	BIA Sections 7 and 8.
Are suitable plan/maps included?	Yes	Although Arup GSD map extracts are not presented, figures presented in the BIA and GIR (including Groundsure Report) contain suitable plan/maps.
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 3.3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 3.2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 3.4.
Is a conceptual model presented?	Yes	BIA Sections 5.5 and 5.6 and Figures 5a-d.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 3.5 and 4.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 3.5 and 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 3.5 and 4.
Is factual ground investigation data provided?	Yes	Ground Investigation Report by CGL.
Is monitoring data presented?	Yes	BIA Section 5.4 and GIR Appendix F.
Is the ground investigation informed by a desk study?	Yes	BIA Section 3.
Has a site walkover been undertaken?	Yes	BIA Section 2.3.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Section 3.3 and 8.2. Figures 5a-d.
Is a geotechnical interpretation presented?	Yes	BIA Section 5 and GIR Section 6
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA Section 5. Summarised in Table 7.
Are reports on other investigations required by screening and scoping presented?	Yes	Refer to Fairview New Homes Ltd letter titled "Planning Application for Residential Development at Centric Close, Oval Road, Camden, NW1 7EP (Planning Portal Reference PP-05693831)" dated 14 December 2016 for details of other reports presented.
Are the baseline conditions described, based on the GSD?	Yes	BIA and GIR.
Do the base line conditions consider adjacent or nearby basements?	Yes	

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA Section 6 and 7.
Are estimates of ground movement and structural impact presented?	Yes	BIA Section 7.
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?	Yes	BIA Section 7.
Has the need for monitoring during construction been considered?	Yes	BIA Section 7.7.
Have the residual (after mitigation) impacts been clearly identified?	Yes	BIA Section 8.2.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	A Ground Movement and Damage Impact Assessment was conducted in Section 7 of the BIA. Queries raised were addressed directly in consultation with CGL, with the GMA accepted.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	BIA Section 7.6.
Are non-technical summaries provided?	Yes	BIA Section 8.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been produced by a well-known firm of engineering consultants, Card Geotechnics Ltd (CGL) and the individuals concerned in its production have suitable qualifications and experience.

4.2. The proposed development comprises the demolition of the existing buildings at the site and construction of a detached four to seven-storey block comprising residential units over commercial (Class B1) floor space within the footprint of the existing warehouses. A single-storey basement is proposed in the northern area of the site, comprising commercial (Class B1) units and some limited storage space.

4.3. The development site covers a large area. For the avoidance of doubt, the audit is only concerned with the area of the proposed basement and the area within the proposed basement's zone of influence.

4.4. It is understood that the basement floor slab will be at a level of approximately 28.4mOD. The basement will be supported by a contiguous piled wall, and has been assumed that these will cantilever in the temporary condition (i.e. 'low' support stiffness) and will be propped by the basement and ground floor levels in the permanent condition. The basement and building loads will be supported on piled foundations from basement level.

4.5. An intrusive investigation was undertaken by CGL on 10th May 2016 comprising four window sampler (WS) boreholes to a maximum depth of 5.45m bgl and four hand-dug foundation inspection pits (FIPs). These generally encountered Made Ground at depths between 2.3m and 3.0m, underlain by soft Alluvium with a thickness between 0.4m and 1.3m, below which London Clay was encountered (29.1m to 30.0m OD). The basement would therefore be founded in London Clay, a suitable bearing stratum. A conceptual site model is presented in the Basement Impact Assessment.

4.6. Groundwater was encountered in boreholes WS02 and WS03 at 2.8m and 3.0m bgl respectively over two rounds of groundwater monitoring, although this was confirmed to be perched groundwater in the Made Ground. An additional four rounds of groundwater monitoring are proposed by CGL, and this is agreed. Control of groundwater by sump pumping or similar should be incorporated during construction as necessary.

4.7. The BIA recognises that heave of the underlying clay material will occur, due to the excavation, and the proposals to alleviate the effect on the basement are accepted.

4.8. Geotechnical design parameters are provided within the Geoenvironmental and Geotechnical Interpretive Report by CGL, and these have been assessed and are considered reasonably

conservative, and accepted. To date the ground investigation has been limited to 5.45m bgl or the top 2m of London Clay. Therefore, additional information is required to establish parameters for the deeper ground.

4.9. A Ground Movement Analysis (GMA) was undertaken by CGL based on the requirements of CIRIA C580 to assess the effects that the construction of the proposed basement will have on neighbouring buildings and the adjacent Network Rail railway tracks. Input parameters and assumptions used in the analysis were reviewed. Queries raised were addressed directly in consultation with CGL, with the GMA accepted.

4.10. The results of the GMA assessment indicate that with good construction control, damage to surrounding properties will be Negligible (Category 0). The GMA should be reviewed and updated once detailed design is conducted and construction methodologies are refined. It is noted that CPG4 requires that mitigation proposals be offered to reduce potential damage when in excess of Category 1 (Very Slight). These should be considered should the proposed scheme change and result in damage in excess of Category 1.

4.11. A formal monitoring strategy is recommended in the BIA and this is agreed. Contingency measures and trigger levels based on the outcome of the GMA are recommended.

4.12. A services/infrastructure search was conducted, and no sensitive assets were identified in the zone of influence of the basement, except the railway line that was assessed within the BIA.

4.13. Although the estimated maximum movements due to basement construction are not considered to pose a significant risk to Network Rail assets, this requires correspondence with Network Rail to ensure that they are satisfied.

4.14. The proposed development will not materially alter the proportion of hard standing across the site. It is accepted that the development will not contribute to any significant cumulative impact with regard to surface water flow or flooding.

4.15. It is accepted that the development will not affect the hydrogeological setting as no known ponds, springlines or wells are in close vicinity to the site and that the site is outside the Hampstead pond chain catchment area.

4.16. It is accepted that there are no slope stability concerns regarding the basement development.

5.0 CONCLUSIONS

5.1. The BIA was undertaken by Card Geotechnics Ltd. The author's qualifications are in accordance with CPG4 requirements.

5.2. The proposal includes demolition of the existing buildings at the site and construction of a detached four to seven storey block. A single-storey basement is proposed in the northern area of the site. The basement will be supported by a contiguous piled wall with building loads supported on piled foundations from basement level.

5.3. A soils investigation encountered Made Ground at depths between 2.3m and 3.0m, underlain by soft Alluvium with a thickness between 0.4m and 1.3m, below which London Clay was encountered (29.1m to 30.0m OD). The basement would therefore be founded in London Clay, a suitable bearing stratum.

5.4. Perched groundwater was encountered between 2.8m and 3.0m bgl over two rounds of groundwater monitoring. Further groundwater monitoring is proposed by CGL to confirm the presence of water along with appropriate mitigation measures, as required.

5.5. Following demolition, the basement will be constructed by the installation of a contiguous bored pile retaining wall, assumed to cantilever in the temporary condition. Although no detailed temporary works plan is presented, 'low' support stiffness has been assumed in the analysis, and is accepted.

5.6. The results of the GMA assessment indicate that with good construction control, damage to surrounding properties will be Negligible (Category 0). A formal monitoring strategy is recommended in the BIA and this is agreed. Contingency measures and trigger levels based on the outcome of the GMA are recommended.

5.7. The BIA recognises that heave of the underlying clay material will occur, due to the excavation, and the proposals to alleviate the effect on the basement are accepted.

5.8. Although the proposed development is not considered to pose a significant risk to Network Rail assets, this requires correspondence with Network Rail to ensure that they are satisfied with the proposal based on their own requirements.

5.9. It is accepted that there are no slope stability or hydrogeological concerns with regards to the proposed development.

5.10. The BIA meets the criteria of CPG4 and DP27.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Romans, P		20.01.17	Structural integrity of property.	See response in Section 4.7 and 4.9 to 4.11.
Boman-Behram	27 Oval Road, London, NW1 7EP	02.02.17	Stability and hydrogeological concerns.	See response in Section 4.6, 4.7 and 4.9 to 4.11.

Appendix 2: Audit Query Tracker

None

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