

21 Boscastle Road
London, NW5 1EE

Basement Impact Assessment
Audit

For
London Borough of Camden

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May 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
W: www.campbellreith.com

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Author	F Drammeh, MEng
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 21 Boscastle Road, NW5 1EE (Camden Planning reference 2016/0953/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) has been carried out by Fairhurst Consulting Engineers with a Structural Engineering Report & Subterranean Construction Method Statement (SER&SCMS) was prepared by Elliot Wood Partnership LLP. The individuals concerned in the production of both documents have suitable qualifications.
- 1.5. The existing building comprises a cellar and the proposal involves the extension of this lower ground floor both in depth and in plan. The proposed construction method is to underpin the existing building and party wall foundations.
- 1.6. The basement is to be founded within the London Clay and sump pumping is proposed to deal with the anticipated perched water inflows.
- 1.7. Although a detailed construction sequence description is given, sketches to better indicate this are requested.
- 1.8. The depth and nature of the neighbouring property foundations have not been established and unless this information is forthcoming or an investigation undertaken to determine these, the maximum differential depth should be assumed.
- 1.9. Input and output from the Oasys Pdisp programme used to predict heave movements have not been provided and this is requested for completeness.
- 1.10. Category 0 (Negligible) to 1 (Very Slight) damage is predicted for Nos 19, 21 (the property itself) and 23 Boscastle Road and it is accepted that provided the works are properly controlled and the affected structures are in sound condition, it should be possible to limit damage to Category 1.

- 1.11. Outline movement monitoring proposals are provided and such a mitigation measure should be adopted. Condition surveys are recommended.
- 1.12. A works duration has been provided within the Construction Management Plan.
- 1.13. It is accepted that the proposals are unlikely to affect the hydrogeology of the area and there are no slope stability or flooding concerns regarding the proposed development.
- 1.14. 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 11 April 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 21 Boscastle Road, NW5 1EE (Camden Planning Reference 2016/0953/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 *"Enlargement of existing basement and creation of lightwell at front of building"*.
- 2.6. The Audit Instruction also confirmed 21 Boscastle Road is not listed, nor is it a neighbour to listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 6 May 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA): Fairhurst Consulting Engineers, dated February 2016
- Factual Ground Investigation report: LMB Geosolutions Limited, dated February 2016
- Structural Engineering Report and Subterranean Construction Management: Elliot Wood Partnership LLP, dated February 2016
- Design and Access Statement: Finkernagel Ross Architects, dated February 2016
- Construction Management Plan: Finkernagel Ross Architects, undated
- Finkernagel Ross Architects and Fairhurst Consulting Engineers Planning Application Drawings consisting of
 - Existing Plans
 - Proposed Plans
- 1 No. Planning Comment/ Response

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Qualifications of all individuals concerned meet requirements of CPG4 (see Audit paragraph 4.1).
Is data required by Cl.233 of the GSD presented?	Yes	Fairhurst BIA, Structural Engineering Report & Subterranean Construction Method Statement (SER & SCMS) and appendices.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Fairhurst BIA and SER & SCMS.
Are suitable plan/maps included?	Yes	BIA figures, Elliot Wood sketches and Finkernagel Ross Architects drawings.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Detailed drawings mostly provided, however, not all the Arup GSD maps provided (see Audit paragraph 4.4).
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Fairhurst BIA Section 3.9.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Fairhurst BIA Section 3.9.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Fairhurst BIA Section 3.9.
Is a conceptual model presented?	Yes	Fairhurst BIA Section 5.2 and 5.3 and Ground Investigation Report (GIR) although the thickness of the Made Ground indicated in the GIR contradicts the depths given in the BIA (see Audit paragraph 4.5).

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Fairhurst BIA Section 4.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Fairhurst BIA Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Fairhurst BIA Section 4.
Is factual ground investigation data provided?	Yes	LMB Solutions GIR.
Is monitoring data presented?	Yes	Fairhurst BIA Section 5.
Is the ground investigation informed by a desk study?	Yes	Deskstudy information included in Fairhurst BIA which is assumed to have informed the ground investigation.
Has a site walkover been undertaken?	Yes	Fairhurst BIA Section 2.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Fairhurst BIA Section 7 states No 19 and 23 have existing lower ground floors.
Is a geotechnical interpretation presented?	Yes	Fairhurst BIA Section 6.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Fairhurst BIA Section 6.3.
Are reports on other investigations required by screening and scoping presented?	Yes	GIR presented.
Are the baseline conditions described, based on the GSD?	Yes	Fairhurst BIA Section 3.
Do the base line conditions consider adjacent or nearby basements?	Yes	Not considered in baseline conditions section but presence of lower ground floors discussed in BIA Section 7.1.2.

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA Section 7.
Are estimates of ground movement and structural impact presented?	Yes	BIA Section 7.1.5 to 7.1.7.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Impact of issues carried forward from screening and scoping addressed.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Fairhurst BIA Section 7 and SER & SCMS.
Has the need for monitoring during construction been considered?	Yes	Outline proposals in SER & SCMS.
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?	Yes	Fairhurst BIA Section 7 and SER & SCMS.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Fairhurst BIA.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Fairhurst BIA Section 7 and SER & SCMS.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Category 0 (Negligible) to Category 1 (Very Slight) damage predicted.
Are non-technical summaries provided?	Yes	Fairhurst BIA Sections 4.1, 5.6, 6.7 and 7.4.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Fairhurst Consulting Engineers and the qualifications of the individuals concerned are in accordance with the requirements of CPG4.
- 4.2. A Structural Engineering Report & Subterranean Construction Method Statement (SER & SCMS) was prepared by Elliot Wood Partnership LLP and the individuals involved have the necessary qualifications.
- 4.3. The site comprises a four storey terraced residential property including an existing lower ground floor/cellar and front and rear garden areas. The site slopes gently to the east with levels of 53.72m AOD measured in the garden area and 52.32m AOD measured in the front garden area. The existing lower ground floor has a level of around 51.21m AOD. The site is located within the Dartmouth Park Conservation Area in the London Borough of Camden.
- 4.4. Although it is evident that a thorough screening process has been undertaken with some of the Arup GSD map extracts included, it would be beneficial if the all the relevant map extracts from the Arup GSD and Camden Strategic Flood Risk Management Assessment identifying the site location on each map are included. These extracts would help to support statements made in the BIA screening process.
- 4.5. The ground investigation revealed Made Ground up to c.1.25m below ground level (m bgl) which was not proven in a number of trial pits over London Clay which was proven to 15m bgl. The depth of the Made Ground is indicated to a maximum depth of 0.90m bgl in the Ground Investigation Report, which does not appear to consider the thickness encountered in the trial pits. Groundwater was monitored to within 3.20m bgl. The BIA confirmed the basement is to be founded within the London Clay and that the water table is considered to be perched water reflective of high winter levels. Sump pumping is indicated to be likely to be able to deal with perched water inflows during construction, however, long term ground water monitoring is recommended.
- 4.6. Trial pits were undertaken to investigate the existing building foundations as well as the party wall foundations. The trial pits indicate that the main house is founded on corbelled brickwork strip foundations. The existing cellar walls are founded on mass concrete strip footings around its perimeter at existing cellar floor level. It is stated that along the party wall with No.19, the base of the footing was encountered at approximately 0.80m below existing ground floor level. Along the party wall with No.23, it is indicated the footings were observed down to a depth of approximately 1.10m below existing ground floor level, however, it is noted the trial pit records in the Ground Investigation Report state the base of the foundation could not be established.

- 4.7. It is stated in the BIA that Nos 19 and 23 are constructed in a similar manner to No 21, being four storey terraced residential properties with existing lower ground floor/cellars and front and rear garden areas, however it is stated the foundation depths of these properties are unknown. Unless this information is forthcoming, the greatest differential depth should be assumed.
- 4.8. The proposals include a full width single storey basement extension beneath the footprint of the existing building and extending 1.50m into the rear garden. A lightwell is also proposed at the front of the building. The basement and lightwell are to extend to a maximum depth of approximately 3.00m bgl which is approximately 1.10m deeper than the existing basement.
- 4.9. The proposed construction method is underpinning. It is stated that *'L-shaped reinforced concrete underpins will be used to underpin the main house along the party wall with No.19 Boscastle Road around the perimeter of the basement. The reinforced concrete underpins will be designed to support the surcharge from the soil and neighbouring building. Mass concrete underpins will be used to underpin the main house along the party wall with No.23 Boscastle Road. A reinforced concrete lining wall will be constructed against the mass concrete underpins which will be designed to support the surcharge from the soil and neighbouring building. The basement retaining walls to the front and rear of the building will be formed from reinforced concrete cast in an underpin sequence to avoid undermining existing structures above'*.
- 4.10. A detailed construction method and sequence is described in the SER & SCMS with temporary propping indicated. An underpinning bay sequence is included together with indicative structural calculations. Sketches indicating each stage of the basement excavation, construction and temporary propping details to better indicate the construction sequence have not been included and this is requested.
- 4.11. Section 7.1.4 of the BIA indicate short term heave movements of 8mm within the excavation, 4mm adjacent to No 19 and 5mm adjacent to No 23 estimated using Oasys Pdisp. Although contour plots of the anticipated movements are included, the tabular input and output from the programme are not included. This is requested for completeness.
- 4.12. The BIA predicts vertical ground movements of approximately 2mm and 5mm horizontal movement. It is stated that provided good workmanship and the proposed construction sequence is followed together with temporary propping, Category 0 (Negligible) to 1 (very Slight) damage is predicted for Nos 19, 21 (the property itself) and 23 Boscastle Road. It is accepted that provided the works are properly controlled and the affected structures are in sound condition, it should be possible to limit damage to Category 1.
- 4.13. It is indicated that the site is within 5m of a pedestrian right of way and it is stated in the impact assessment that *'there is nothing unusual in the proposed development that will give rise to any concerns with regard to the stability of public highways'*. This is accepted.

- 4.14. It is accepted that the proposals are unlikely to affect the hydrogeology of the area and there are no slope stability or flooding concerns regarding the proposed development.
- 4.15. Outline movement monitoring proposals are included in the SER&SCMS. Details and trigger levels may be agreed as part of the Party Wall Awards. Condition surveys are recommended.
- 4.16. An indicative works duration is included in the Construction Management Plan. A detailed programme may be presented by the appointed Contractor.
- 4.17. It is clear that the requirements of CPG4 and the Arup GSD have been largely followed with the information required presented and the BIA and SER & CMS proposes appropriate mitigation with respect to the issues identified.

5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) has been carried out by Fairhurst Consulting Engineers with a Structural Engineering Report & Subterranean Construction Method Statement (SER & SCMS) was prepared by Elliot Wood Partnership LLP. The individuals concerned in the production of both documents have suitable qualifications.
- 5.2. The basement is to be founded within the London Clay and sump pumping is proposed to deal with the anticipated perched water inflows.
- 5.3. The existing building comprises a cellar and the proposal involves the extension of this lower ground floor both in depth and in plan. The proposed construction method is to underpin the existing building and party wall foundations.
- 5.4. Although a detailed construction sequence description is given, sketches to better indicate this are requested.
- 5.5. The depth and nature of the neighbouring property foundations have not been established and unless this information is forthcoming or an investigation undertaken to determine these, the maximum differential depth should be assumed.
- 5.6. Input and output from the Oasys Pdisp programme used to predict heave movements have not been provided and this requested for completeness.
- 5.7. Category 0 (Negligible) to 1 (very Slight) damage is predicted for Nos 19, 21 and 23 Boscastle Road and it is accepted that provided the works are properly controlled and the affected structures are in sound condition, it may be possible to limit damage to Category 1.
- 5.8. Outline movement monitoring proposals are provided and such a mitigation measure should be adopted. Condition surveys are recommended.
- 5.9. A works duration has been provided within the Construction Management Plan.
- 5.10. It is accepted that the proposals are unlikely to affect the hydrogeology of the area and there are no slope stability or flooding concerns regarding the proposed development.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Delew	235 Boscastle Road London NW5 1EE	28/03/16	Impact on neighbouring properties	See Audit paragraph 4.12

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Sketches to indicate each stage of the basement excavation and construction not provided	Open – to be provided	
2	Stability	Input and output from Pdisp not provided	Open – to be provided	

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