CampbellReith
consulting engineers

Flat 1, 154 Iverson Road
London NW6 2HH

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-92
Revision: F1

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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 Flat 1, 154 Iverson Road, London NW6 2HH (Camden Planning Reference 2016/2033/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 has been carried out by individuals who possess the necessary and suitable qualifications.

1.5. The BIA has confirmed that the proposed basement will be underlain by the London Clay.

1.6. It is likely that the groundwater table would be encountered during the basement excavation. Temporary dewatering measures should be considered as discussed in Section 4.

1.7. The proposed basement consists of a single storey construction formed by lowering the full footprint of the existing lower ground floor and providing new front and rear lightwells. Level differences between the front and the back of the property were identified.

1.8. A reinforced concrete retaining wall system is indicated as a structural solution to form the proposed structure. At this stage, the proposed reinforced concrete underpins are subject to the neighbours' agreement to special foundations as defined by the Party Wall Act.

1.9. Category 0 (Negligible) damage is indicated for the neighbouring properties.

1.10. Subsequent to the issue of the initial audit report, further investigation was undertaken with respect to unexploded ordnance as discussed in Section 4. It is to be established whether any gas or electrical services run under site. It is understood that the below ground drainage will be developed should planning consent be granted.

1.11. It is accepted that the Contractor will develop a Construction Traffic Management Planning Report prior to construction.

1.12. There is one tree in the front garden which is to be retained. It is indicated that the new basement footprint will be kept outside the root area in order to avoid any damage to the tree.

1.13. Proposals for a movement monitoring strategy during excavation and construction have been provided. Details and trigger levels should be agreed as part of the Party Wall award.

1.14. The proposals will not increase the extent of the existing impermeable hard-standing and thus the total amount of water entering into the sewer system.

1.15. The surrounding slopes to the development are stable and the site is within an area that is not prone to flooding. The site does not fall within any of Camden's Local Flood Risk Zones (LFRZ), but it is close to several and within a Critical Drainage Area.

1.16. It is accepted that the BIA and supplementary documents adequately identify the potential impacts of the proposed basement and subject to agreement of the Party Wall award, describe suitable mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Flat 1, 154 Iverson Road, London NW6 2HH (Camden Planning Reference 2016/2033/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 "*Formation of basement extension with front and rear lightwells*".

2.6. The Audit instruction also confirmed that neither the existing building nor any adjacent buildings to it are listed.

2.7. CampbellReith accessed LBC's Planning Portal on 18.08.16 and gained access to the following relevant documents for audit purposes:

- Design and Access Statement by Shape Architecture (undated)
- Basement Impact Assessment (BIA) report (Croft Structural Engineers, job number: 160606, July 2016) incorporating BIA land stability report by Ground and Project Consultants Ltd (June 2016), BIA groundwater report by H. Fraser Consulting Ltd (June 2016)
- Ground Investigation Report (Ground and Water Ltd, report ref:GWPR1660, June 2016)
- Shape Architecture Planning Application Drawings consisting of

  Location Plan – drawing no. 1226.PL001

  Existing Block Plan – drawing no. 1226.PL002

  Proposed Block Plan – drawing no. 1226.PL003

  Existing and Proposed Lower Ground Floor Plan – drawing no. 1226.PL004, rev: B

  Existing and Proposed Ground Floor Plan – drawing no. 1226.PL005

  Existing and Proposed Front Elevation – drawing no. 1226.PL006

  Existing and Proposed Rear Elevation – drawing no. 1226.PL007

  Existing and Proposed Cross Section AA – drawing no. 1226.PL008

  Existing Longitudinal Section BB – drawing no. 1226.PL009

  Proposed Longitudinal Section BB – drawing no. 1226.PL010

  Existing and Proposed Section CC – drawing no. 1226.PL011

2.8. Subsequent to the issue of the initial audit, Croft's BIA report was revised and received on 28 September 2016 although this has not been included in the Appendix due to file size.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	Yes	BIA and supporting documents.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Refer to all BIA reports.
Are suitable plan/maps included?	Yes	Refer to all BIA reports and SI.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Refer to Shape Architecture drawings and Croft Structural Engineer's BIA.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Ground and Project Consultants Land Stability BIA report; section 3.0.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to H Fraser Consulting BIA report; Section 3.0.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Croft Structural Engineer's BIA report; p. 8 – 10.
Is a conceptual model presented?	Yes	Refer to all BIA reports.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to Ground and Project Consultants BIA report; section 7.0.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to H Fraser Consulting BIA report; Section 4.0.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to Croft Structural Engineer's BIA report; Section 2.0.
Is factual ground investigation data provided?	Yes	Refer to Ground and Water Site Investigation Report.
Is monitoring data presented?	Yes	Refer to Ground and Water Site Investigation Report, Section 4.4.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Refer to Croft Structural Engineers BIA (p.16).
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Refer to Croft BIA, p. 17 & 18.
Is a geotechnical interpretation presented?	Yes	Refer to Ground and Water Site Investigation Report, Section 6.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Refer to Ground and Water Site Investigation Report, Section 6.
Are reports on other investigations required by screening and scoping presented?	Yes	UXO information provided within Rev.01 of BIA.
Are the baseline conditions described, based on the GSD?	Yes	Refer to Croft Structural Engineer's BIA report.
Do the base line conditions consider adjacent or nearby basements?	Yes	Refer to H Fraser Consulting BIA Report, p.3. This is contradicted by the information submitted in Croft Structural Engineer's BIA report, p. 17 & 18.
Is an Impact Assessment provided?	Yes	Refer to Ground and Water Site Investigation Report; Section 6.5.
Are estimates of ground movement and structural impact presented?	Yes	Refer to Ground and Water Site Investigation Report; Section 6.5.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Refer to Ground and Water Site Investigation Report; Section 6.5.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Refer to Ground and Water Site Investigation Report; Section 6.5.
Has the need for monitoring during construction been considered?	Yes	Refer to Croft Structural Engineer's BIA report; Appendix D (Structural Monitoring Statement).
Have the residual (after mitigation) impacts been clearly identified?	Yes	Refer to Ground and Water Site Investigation Report and Croft Structural Engineer's BIA report.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Refer to Croft Structural Engineer's BIA report.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Refer to Croft Structural Engineer's BIA report. It is expected that the below ground drainage will be developed should planning consent is granted.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Refer to Croft Structural Engineer's BIA report.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Refer to Ground and Water Site Investigation Report; section 6.5
Are non-technical summaries provided?	Yes	Provided in all BIA reports.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Croft Structural Engineers, Ground and Project Consultants and H. Fraser Consulting. The individuals concerned in its production have suitable qualifications in accordance with the requirements of CPG4.

4.2. The Site Investigation (SI) was undertaken by Ground and Water Ltd.

4.3. The LBC Instruction to proceed with the audit identified that the basement proposal did not involve or was not in close proximity to a listed building.

4.4. The existing property is a three storey mid-terrace building with additional roof accommodation and basement. Difference in site levels between the front and the back of the property were identified, which are in the region of 1m. The proposed development involves the deepening of the existing shallow basement (currently at approx. 2.50mbgl) to 3.50mbgl and the construction of new front and rear lightwells in order to create a new habitable space.

4.5. The ground investigation has identified that the existing basement slab is underlain by Made Ground (to a maximum depth of 1.60mbgl) below which lies London Clay (to a maximum depth of 5.00mbgl). 2 No. window sample boreholes (to 5.0m depth), 1 No. trial pit (to expose existing front elevation foundations) and a Heavy Dynamic Probe (to 10.0m depth) were carried out with sampling and laboratory testing to confirm the geology and soil parameters required for the design of the new foundations. Probing indicated London Clay to 10.00 mbgl.

4.6. Groundwater was not observed during the site investigation. However, subsequent readings from a standpipe piezometer indicate a level of c.1.55mbgl, at the top of the London Clay. As per Ground and Project Consultants BIA report (p. 15), proposals to construct the new basement below the existing groundwater table should be managed carefully and recommendations for ongoing monitoring of groundwater levels should be carried out during and up to the end of the works. As a result, the main contractor should provide details of how they intend to control groundwater and maintain the stability of excavations. Should any dewatering be carried out for the main works, care must be taken not to allow settlement of the neighbouring structures. The monitoring of the water for fines will be necessary.

4.7. In the updated submissions, Croft Structural Engineers mention within the Basement Method Statement Section (p. 4) of their BIA report that pumps should be available during the construction works to cater for any potential water seepages. It is accepted that further details will be provided by the appointed Contractor at a later date.

4.8. The H. Fraser Consulting BIA report (p. 3) indicates that a planning application for the extension of 156a Iverson Road included a basement (with 2 bedrooms and a bathroom). There

is no mention of a basement for 152 Iverson Road. This is contradicted by the information given in pages 17 & 18 of the Croft Structural Engineer's report.

4.9. Given the proximity of the neighbouring properties, the demolition, excavation and associated traffic for the proposed development can be also identified as a particularly sensitive activity. Temporary works in Croft Structural Engineer's BIA report have been developed such that the effect of the works on neighbours is minimised. Proposals for a movement monitoring strategy during excavation and construction were provided and these are acceptable. However, it is recommended that a preliminary Construction Traffic Management Planning Report is developed to be used to highlight the general measures that the contractor will be expected to undertake so as to minimise the impact of his site operations. It is also proposed that all demolition works are carefully sequenced and carried out in accordance with the relevant British Standards by appropriately skilled and experienced contractors.

4.10. It is accepted that should planning consent be granted, a Construction Traffic Management Planning Report will be developed and this will not be required for the BIA.

4.11. Based on the results of the project's soil investigation, it is considered unlikely that a piled foundations scheme would be required at this site. The Ground and Water's BIA report proposes that retaining walls are utilised to form the new basement. These will be approx. 3.50m high around the proposed lightwell areas and approx. 1m high under the party walls. Croft Structural Engineer's proposed method of construction adopts an underpinning process to all party walls and front and rear lightwells. It is proposed at this stage (and this is subject to the neighbours' agreement to special foundations as defined by the Party Wall Act) that underpinning under the party walls will be reinforced. A mass concrete underpin proposal with internal RC liner walls may be adopted, should there be no Adjoining Owners' consent to the current proposal.

4.12. From the updated BIA submissions presented, it is now understood that a special foundation solution will be adopted.

4.13. A ground movement analysis has been undertaken by Ground and Water Ltd (refer to section 6.5 of their BIA report). Anticipated movements have been calculated and used to assign damage categories in accordance with the CIRIA report C580. The findings of the analysis are that given good workmanship and other key points (as highlighted in p. 19 of their report), the basement to 154 Iverson Road can be constructed with Category 0, 'Negligible' damage to the adjacent properties.

4.14. There is one tree in the front garden which is to be retained. The new basement footprint will be kept outside the root area in order to avoid any damage to this tree.

4.15. Evidence that the site and the area within its vicinity have not suffered from ordnance in WWII should be provided. It is to be established whether any gas or electrical services run under the site.

4.16. Within the updated submissions presented, UXO information has been now provided. It is to be established whether any gas or electrical services run under the site. If so these will be need to be diverted.

4.17. It is understood that the below ground drainage design will be developed should planning consent be granted. Croft Structural Engineer's BIA report identifies that it is expected that the proposals will not increase the area of existing impermeable hard-standing. On this basis, the total amount of water entering into the sewer system as a result of the development will not increase.

4.18. It is accepted that there are no slope stability concerns regarding the proposed development and this is not in an area prone to flooding. The site does not fall within any of Camden's Local Flood Risk Zones (LFRZ), but it is close to several and within a Critical Drainage Area. Prior to commencement of works, the project team is to inform LBC with respect to the proposed re-development of the site and demonstrate that the impact of flooding from any source will be managed. Any report/assessment should draw the following conclusions and confirm that the proposals are safe and appropriate. These are that the proposed development (and any internal water efficiency and water recycling equipment and measures: a) will pose no additional strain on adjoining sites or the existing drainage infrastructure and b) has been designed to cope with potential flooding.

5.0 CONCLUSIONS

5.1. The BIA and SI have been carried out by engineering consultants using individuals who possess the necessary and suitable qualifications.

5.2. The ground investigation has confirmed that the existing basement is underlain by Made Ground and the London Clay Formation.

5.3. It is likely that groundwater will be encountered during the basement foundation excavation. Temporary groundwater control measures should be considered as discussed in Section 4.

5.4. One of the existing adjacent properties (No. 156a) has a basement whereas the other (No. 152) does not. This is contradicted by the information given in pages 17 & 18 of the Croft Structural Engineer's report.

5.5. Given the proximity of the neighbouring properties, it is recommended that a Construction Traffic Management Planning report is in place prior to tender and that all demolition works are carefully sequenced and carried out by skilled and experienced contractors.

5.6. The proposed method of construction is subject to the neighbours' agreement to special foundations as defined by the Party Walls Act as discussed in Section 4.

5.7. The ground movement assessment indicates Negligible damage to the neighbouring properties.

5.8. Subsequent to the issue of the initial CampbellReith audit, evidence has been provided showing that the site and the area within its vicinity have not suffered from ordnance in WWII. Information regarding gas and electricity services under the site is outstanding. It is understood that the below ground drainage design will be developed should planning consent be granted.

5.9. Proposals were provided for a movement monitoring strategy during excavation and construction which are acceptable.

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

5.11. 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. The site does not fall within any of Camden's Local Flood Risk Zones (LFRZ), but it is close to several and within a Critical Drainage Area as discussed in Section 4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Groundwater	Details of how the groundwater will be controlled and stability will be maintained during construction need to be submitted.	Closed – see Audit paragraph 4.6	26/10/2016
2	Stability	Special foundation solution proposed. Mass concrete underpin proposal with internal RC liner walls may be adopted, should there be no party wall consent to the current proposal. Alternative solution to be considered.	Special foundation solution adopted (see Audit paragraph 4.9). To be agreed as part of the Party Wall award.	N/A
3	BIA	Evidence that the site and surrounding area has not suffered from ordnance in WWII.	Closed – UXO information provided. See Audit paragraph 4.12.	26/10/2016
4	BIA	Construction Traffic Management Planning Report to be developed.	Not required for the BIA. To be provided at a later date to the Council.	N/A

Appendix 3: Supplementary Supporting Documents

None

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