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1 St Mark's Crescent, London NW1 7TS

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12985-52

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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 (BIA) submitted as part of the Planning Submission documentation for 1 St Mark's Crescent, London NW1 7TS, Camden Reference 2018/6105/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 prepared by Chelmer Global Ltd and Alan Conisbee and Associates Ltd. The qualifications of the authors of the reports are in accordance with LBC Guidance.

1.5. The site currently comprises a mid-terraced residential property arranged over lower ground, ground, first and second floor levels. Regent's Canal runs along the boundary of the rear garden to the northeast. The proposed development involves the excavation of a basement beneath the full footprint of the house with associated light-wells to the front and rear of the property.

1.6. It is understood that adjoining No. 31 has planning approval for the construction of a basement. The BIA has been written prior to the adjacent basement being constructed.

1.7. The BIA includes the majority of the information required from a desk study in accordance with LBC guidance. As recommended in the BIA, a search of utilities and transport infrastructure should be undertaken.

1.8. An outline construction programme has been presented.

1.9. A site investigation at the adjacent property indicates the site to be underlain by varying thicknesses of Made Ground overlying the London Clay Formation. Groundwater has been recorded during monitoring visits above proposed basement level. There will be no impact to the wider hydrogeological environment.

1.10. Reasonably conservative interpretative geotechnical parameters are presented.

1.11. The basement will be formed by underpinning techniques. Outline temporary works and permanent structural calculations have been presented. The proposed underpinning methodology

is not presented consistently between the BIA documents; the methodology should be confirmed and documents updated.

1.12. A Ground Movement Assessment (GMA) is presented which considers the movements relating to the proposed basement construction and the impacts to neighbouring buildings. A maximum of Category 1 (Very Slight) damage is predicted in accordance with the Burland Scale. However, the GMA is not consistent with the proposed underpinning methodology. Further assessment is required.

1.13. Once a search of utilities / transport infrastructure has been carried out, the GMA should include assessment of impacts to assets within the zone of influence of the proposed basement.

1.14. The updated GMA should confirm that ground movements will not adversely impact the canal wall. It is noted that Planning Conditions are requested by the Canal & River Trust to ensure protection / repair of the canal, as required.

1.15. The site is within the Primrose Hill Local Flood Risk Zone, which is acknowledged in the BIA. The BIA assesses the flood risk as very low, based upon Environment Agency and LBC SFRA data, and provides flood risk mitigation advice. The flood risk assessment is accepted assuming that the mitigation measures proposed are adopted.

1.16. The site is within a critical drainage area. The proposed scheme will increase the proportion of impermeable site area. Outline drainage plans should be provided, including attenuation proposals, with sufficient assessment to demonstrate discharge flows will be in accordance with LBC's and Thames Water's requirements.

1.17. It is noted that Planning Conditions are requested by the Canal & River Trust to ensure surface waters are controlled and contaminated surface water cannot discharge to the canal.

1.18. Discussion and requests for further information are presented in Section 4 and summarised in Appendix 2. Until the information requested is presented, the BIA does not meet the criteria of CPG: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 7th March 2019 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 1 St Mark's Crescent, London NW1 7TS, Camden Reference 2018/6105/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): Basements.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The Local Plan (2017): 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 planning portal describes the proposal as: "*Excavation of basement with front and rear lightwells and alterations to existing rear conservatory to dwelling house*".

The planning portal also confirmed the site lies within the Primrose Hill Conservation Area. The site is not listed and neither are the adjacent buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 4th May 2019 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (ref BIA/9918) dated October 2018 by Chelmer Global Ltd.
- Structural Method Statement (ref 1780507/H Hawker) dated July 2018 by Alan Conisbee and Associates Ltd.
- Existing and Proposed Plans, Elevations and Section drawings (ref 1SMC-PL) December 2018 by Jonathan Freegard Architects.
- Design & Access Statement dated December 2018 by Jonathan Freegard Architects.
- Arboricultural Impact Assessment and Method Statement dated December 2018 by Arbor Cultural.
- Review of BIA by Ashton Bennett Ltd (as instructed by Mr and Mrs Scott of 2 St Mark's Crescent).
- A response from the Canal & River Trust (ref CRTR-PLAN-2019-26434) dated February 2019.
- Comments and objections to the proposed development from local residents and the Canal & River Trust.

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?	No	The BIA states that clarity is required on the proximity of utilities / transport infrastructure.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plans/maps included?	No	The BIA states that clarity is required on the proximity of utilities / transport infrastructure.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	The BIA states that clarity is required on the proximity of utilities / transport infrastructure.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA report, Section 7.3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA report, Section 7.2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA report, Section 7.4.
Is a conceptual model presented?	No	Adequately presented in text and drawings, aside from utility / infrastructure locations.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA report, Section 8.3. The BIA recommends that a services search is undertaken to check there are no tunnels/services in the area and that the exact position of the HS2 Down Line tunnel is identified and the implications assessed.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA report, Section 8.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA report, Section 8.4. Two options of simple SuDS have been provided but a confirmed outline SuDs strategy should be presented.
Is factual ground investigation data provided?	Yes	BIA report, Appendix F.
Is monitoring data presented?	Yes	BIA report, Section 9.
Is the ground investigation informed by a desk study?	Yes	BIA report, Sections 2, 4, 5 and 6.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA report, Section 10.2.5 states that 'to our knowledge there are no existing basements beneath the adjoining No's 31 and 2 St Mark's Crescent. All properties along the terrace have original lower ground floors, similar to No. 1's, which are sometimes referred to as "basements"'. The adjoining No.31 St Mark's Crescent has planning approval for a single-storey full footprint basement, although at the time of the BIA site inspection construction had not begun.
Is a geotechnical interpretation presented?	Yes	BIA report, Section 10.4.103.3.

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA report, Section 10.4.3
Are reports on other investigations required by screening and scoping presented?	Yes	However, GMA and SUDs strategy to be updated.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	However, GMA and SUDs strategy to be updated.
Are estimates of ground movement and structural impact presented?	Yes	GMA inconsistent with structural proposals.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	GMA and SUDs strategy to be updated.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	However, GMA and SUDs strategy to be updated.
Has the need for monitoring during construction been considered?	Yes	BIA report, Section 10.7 and Structural Method Statement, Section 7.
Have the residual (after mitigation) impacts been clearly identified?	No	However, GMA and SUDs strategy to be updated.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA inconsistent with structural proposals.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	SUDs strategy to be confirmed.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	GMA and SUDs strategy to be updated.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	However, GMA inconsistent with structural proposals.
Are non-technical summaries provided?	Yes	Summaries provided.

4.0 DISCUSSION

4.1. The BIA has been prepared by Chelmer Global Ltd and Alan Conisbee and Associates Ltd. The qualifications of the authors of the reports are in accordance with LBC Guidance.

4.2. The site currently comprises a 19th century mid-terraced residential property arranged over lower ground, ground, first and second floor levels. The property is located on the northern side of St Mark's Crescent with the Regent's Canal running along the boundary of the rear garden to the northeast. The proposed development involves the excavation of a basement beneath the full footprint of the house with associated light-wells to the front and rear of the property. The new basement will be founded at approximately 4.00 metres below the existing lower ground floor level. The property is bounded by No. 2 (to the southwest) and No. 31 (to the northeast) which form part of the row of terrace housing in the same period of construction.

4.3. It is understood that adjoining No. 31 has planning approval for the construction of a basement. The BIA has been written prior to the adjacent basement being constructed.

4.4. It is noted that the Structural Method Statement references neighbouring buildings with different addresses, which should be corrected so that consistent information is presented.

4.5. The site investigation and BIA have been informed by a desk study broadly in accordance with the GSD Appendix G1. Groundsure data indicates that the nearest tunnel is located 95m north of the site (associated with the London Overground) but there is a closer tunnel 62m northeast of the site shown on the site location plan (consultation of TfL website shows no exclusion zones). Plans available for the HS2 route indicate that the HS2 Down Line will pass within a bored tunnel approximately 35m northeast of the site. As recommended in the BIA, a search of utilities and transport infrastructure should be undertaken, including confirmation of the HS2 route, and the impact assessments extended to all infrastructure assets within the zone of influence of the works.

4.6. An outline construction programme has been presented.

4.7. A site investigation was undertaken by Chelmer Global Ltd in June 2018 comprising two windowless sampler boreholes drilled to depth of 6.00m bgl and 12.00m bgl. Four trial pits were excavated in October 2005 by Conisbee and Associates as part of the previous modernisation at the site (replacement of existing lower ground floor rear conservatory). Some possible reworked material containing brick fragments was encountered in BH2 although no artificial materials were recorded in BH1 and the shear strength profiles were found to be typical of in-situ London Clay. The BIA identifies that the brick fragments may have been introduced to BH2 during the drilling process as no casing was used with the continuous flight auger method of drilling.

4.8. Groundwater was not encountered during the site investigation but monitoring was undertaken in both boreholes and recorded water at between 1.14 and 2.24m bgl. The highest recorded groundwater level at 1.14m bgl is equivalent to 6.36m ASD which is above the proposed basement formation level of 4.55m ASD. The Regent's Canal water level is estimated at 6.22m ASD. Section 10.2 of the BIA states that the proposed basement will need to be fully waterproofed as per BS8102:2009.

4.9. The BIA states that groundwater flow within the London Clay is likely to be limited to seepage through any silt/sand partings that are sufficiently interconnected. The BIA does not consider that the groundwater encountered is representative of a continuous groundwater body and it is accepted that there will be no impact to the wider hydrogeological environment.

4.10. The Regent's Canal is situated approximately 10.5m from the rear wall of the rear lightwell and the potential that the groundwater is in hydraulic continuity with the canal has been identified in the BIA. The temporary works strategy allows for sump pumping during construction to ensure stability.

4.11. Reasonably conservative interpretative geotechnical parameters, broadly in accordance with the GSD Appendix G3, is presented. Geotechnical parameters should be consistent between the BIA and the Structural Method Statement.

4.12. The basement will be constructed using underpinning techniques. The proposed development will be formed in reinforced concrete, underpinning the existing load-bearing walls as necessary with a new reinforced concrete ground floor slab propping the top of the retaining walls. A capping beam will transfer propping forces where the floor needs to be open at the top of the retaining wall (i.e. at lightwells and stairwells). Outline temporary works and structural calculations are provided within the Structural Method Statement and associated appendices prepared by Alan Conisbee and Associates Ltd.

4.13. The proposed underpinning methodology is not presented consistently between the BIA documents; the Structural Method Statement proposes a two-stage underpinning approach, which has not been adopted within the stability assessment which assumes a single-stage approach. The methodology should be confirmed and documents updated.

4.14. A Ground Movement Assessment (GMA) is presented which considers the movements relating to the proposed basement construction and the impacts to neighbouring buildings. A maximum of Category 1 (Very Slight) damage is predicted in accordance with the Burland Scale. However, the GMA is not consistent with the proposed underpinning methodology. The methodology should be confirmed and assessment revised, as required.

4.15. Once a search of utilities / transport infrastructure has been carried out, the GMA should include assessment of impacts to assets within the zone of influence of the proposed basement.

4.16. The updated GMA should confirm that ground movements will not adversely impact the canal wall. According to consultations with the Canal & River Trust (dated February 2019), the canal wall is the responsibility of the site owner and is not owned or managed by the Canal & River Trust. The C&RT recommend that a planning condition be attached to the decision requiring a waterway wall (canal wall) survey and appropriate repairs before and after construction works to ensure that there is no damage to the wall during construction or loss of water from the canal into the proposed basement. It is noted that previous correspondence with C&RT indicated that they considered damage would be unlikely to be sustained to the canal wall, but that all works within 3m of the wall should be undertaken in consultation with C&RT.

4.17. A movement monitoring specification has been provided within the BIA which should be agreed under the Party Wall Act and revised, as required, once the GMA has been updated.

4.18. The BIA notes that St Mark's Crescent was not subject to surface water flooding in 1975 and 2002 but that the site is located within the Primrose Hill Local Flood Risk Zone and within Critical Drainage Area (Group 3_003), as defined by LBC. The Environment Agency indicates the site to be at a 'Very Low' risk of surface water flooding. Flood risk mitigation measures are proposed, such as providing upstands to the retaining wall around the rear lightwell and installing raised thresholds to the external doors in the lightwells. The flood risk assessment is accepted assuming that the mitigation measures proposed are adopted.

4.19. The site is within a critical drainage area. The proposed scheme will increase the proportion of impermeable site area. Two options of SUDS have been discussed within the BIA. A confirmed drainage scheme should be provided in outline, including attenuation proposals, with sufficient assessment to demonstrate discharge flows will be in accordance with LBC's and Thames Water's requirements.

4.20. It is noted that Planning Conditions are requested by the Canal & River Trust to ensure surface waters are controlled and contaminated surface water cannot discharge to the canal.

5.0 CONCLUSIONS

5.1. The qualifications of the authors of the BIA report are in accordance with LBC guidance.

5.2. As recommended in the BIA, a search of utilities and transport infrastructure should be undertaken.

5.3. A site investigation and interpretative geotechnical information is presented.

5.4. Groundwater has been encountered on site and the proposed basement development will be below standing groundwater level. There will be no impact to the wider hydrogeological environment.

5.5. The proposed underpinning methodology is not presented consistently between the BIA documents; the methodology should be confirmed and documents updated.

5.6. A Ground Movement Assessment (GMA) is presented. However, the GMA is not consistent with the proposed underpinning methodology. Further assessment is required, as detailed in Section 4.

5.7. The site is within the Primrose Hill Local Flood Risk Zone, which is acknowledged in the BIA. The flood risk assessment is accepted assuming that the mitigation measures proposed are adopted.

5.8. The site is within a critical drainage area. Outline drainage plans should be provided, including attenuation proposals, with sufficient assessment to demonstrate discharge flows will be in accordance with LBC's and Thames Water's requirements.

5.9. It is noted that the Canal & River Trust request planning conditions in respect of stability / damage protection of the canal wall and surface water discharge.

5.10. Requests for further information are summarised in Appendix 2. Until the information requested is presented, the BIA does not meet the criteria of CPG Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
All details redacted			Concerns in regard to groundwater and flooding.	Section 4
Scott*	2 St Mark's Crescent	February 2019	Objection: Concerns about groundwater, ground conditions, flood risk, drainage and construction methodology	Section 4
Canal & River Trust		04/02/2019	Requests planning conditions imposed: - Survey of canal walls pre / post construction - Repair works to be undertaken to the wall if required - Measure imposed to prevent contamination of the canal from surface waters	Section 4
*In addition Mr and Mrs Scott instructed Ashton Bennett Ltd to undertake a review of the BIA prepared by Chelmer Global Ltd. This has been made available for review and taken into consideration in the preparation of this report.				

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	Underground infrastructure information should be provided (utility / transport).	Open	
2	Land Stability	Construction methodology to be consistently presented in all documents (i.e. single or double lift underpinning)	Open	
3	Land Stability	GMA to be updated to be consistent with proposed construction methodology.	Open	
4	Land Stability	GMA to be updated to include utility / transport infrastructure within the zone of influence. The updated GMA should confirm that ground movements will not adversely impact the canal wall.	Open	
5	Hydrology	Outline drainage strategy should be confirmed, including appropriate attenuation proposals to mitigate changes in impermeable site area.	Open	

Appendix 3: Supplementary Supporting Documents

None

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