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138-140 Highgate Road
London, NW5 1PB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12985-06
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 138-140 Highgate Road, NW5 1PB (planning reference 2018/1528/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 Basement Impact Assessment (BIA) has been carried out by individuals who possess suitable qualifications.

1.5. The desk study/screening & scoping report was prepared in accordance with Camden Planning Guidance (CPG) Basements.

1.6. The ground movement analysis indicated 'negligible' to 'very slight' damage to the adjacent existing buildings across College Lane. Low risk of damage is anticipated for the adjacent highways and the associated infrastructure. Allowance for making good minor surface defects, if required, during construction, is proposed for adjacent pavements and highways.

1.7. The Flood Risk Assessment report concluded that the proposed scheme will increase the permeable areas and recommended that a sustainable drainage system (SuDS) be incorporated to the scheme.

1.8. A construction methodology and proposed sequence of works are presented in the BIA. Suitable tree protection measures during construction in accordance with the arborist's report are suggested. Outline sheet pile calculations and construction sequence drawings are presented.

1.9. An outline monitoring strategy is presented.

1.10. An outline works programme for the final design and construction stages is provided.

1.11. It is accepted that the proposed development will have negligible impact to land stability, the surface water and the hydrogeology of the site.

1.12. A non-technical summary is presented.

1.13. The revised BIA documents meet the requirements of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 20 August 2018 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 138-140 Highgate Road, NW5 1PB (Camden planning reference 2018/1528/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 (March 2018);
- 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;

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 petrol station and MOT centre at 138-140 Highgate Road and erection of a three storey terrace building to provide 6 x 4 bedroomed dwelling houses with gardens at lower ground, ground and upper ground levels together with associated landscaping".

The Audit Instruction also confirmed that the basement proposal does not involve or is neighbour to, any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 10 September 2018 and gained access to the following relevant documents for audit purposes:

- "Planning policy statement", dated March 2018, issued by Washington Young LLP Chartered Town Planners;
- "140 Highgate Road, design and access statement", dated March 2018, issued by D*Haus Company Ltd;
- "Desk study basement impact assessment (screening & scoping) report", dated 19 February 2018, job ref.no. P1323J1303/SL, version final v1.0, issued by Jomas Associates Ltd;
- "Geo-environmental & geotechnical assessment (ground investigation) & basement impact assessment report", dated 8 August 2018, job ref.no. P1323J1303/SL, version final v2.0, issued by Jomas Associates Ltd;
- "Ground Movement Assessment", dated 15 August 2018, job ref.no. P1323J1303, version v1.0, issued by Jomas Associates Ltd;
- "Arboricultural impact assessment, arboricultural method statement, tree constraints plan and tree protection plan", dated February 2018, job ref.no. P1323J303, version final v1.0, issued by Jomas Associates Ltd;
- A planning application drawing titled "Site location plan and block plan", drawing no. 0067_PL_000, dated 12 March 2018, issued by D*Haus Company Ltd.
- Planning application drawings dated 15 August 2018, issued by D*Haus Company Ltd, consisting of:
    - "Existing roof plan", drawing no. 0067_PL_001, revision A;
    - "Existing ground floor plan", drawing no. 0067_PL_002, revision A;
    - "Existing elevations sheet 1 of 2", drawing no. 0067_PL_003, revision A;
    - "Existing elevations sheet 2 of 2", drawing no. 0067_PL_004, revision A;
    - "Existing sections", drawing no. 0067_PL_005, revision A;
    - "Proposed roof plan", drawing no. 0067_PL_006, revision A;
    - "Proposed upper ground floor plan", drawing no. 0067_PL_007, revision A;
    - "Proposed ground floor plan", drawing no. 0067_PL_008, revision A;
    - "Proposed lower ground floor plan", drawing no. 0067_PL_009, revision A;
    - "Proposed elevations sheet 1 of 2", drawing no. 0067_PL_010, revision A;

- "Proposed elevations sheet 2 of 2", drawing no. 0067_PL_011, revision A;
- "Proposed sections (cross sections)", drawing no. 0067_PL_012, revision A;
- "Proposed sections (longitudinal sections)", drawing no. 0067_PL_013, revision A;
- "Longitudinal elevations existing vs proposed", drawing no. 0067_PL_014.

- Planning comments and responses.

2.7. CampbellReith issued a BIA audit report (rev. D1) on 24/09/2018 raising queries on the above relevant documents.

2.8. The following revised reports were received from LBC and Jomas Associates Ltd, on 15 October and 12 December 2018, and 9 January 2019, respectively, in response to the queries raised in the initial (rev. D1) BIA audit report:

- "Proposed demolition and construction of 6 terraced houses – Structural Engineering Report & Construction Method Statement", dated 5 October 2018, project no.18035, ref. AMA_REP_01, rev.00, issued by AMA Consulting Engineers (referred to as 'CMS' hereafter).
- "Desk study basement impact assessment (screening & scoping) report", dated 19 February 2018, job ref.no. P1323J1303/SL, version final v1.0, issued by Jomas Associates Ltd, appropriately reviewed and signed by individuals that possess suitable qualifications.
- "Ground investigation, basement impact assessment & GMA", dated 21 December 2018, job ref.no. P1323J1303/SL, final version v4.3, issued by Jomas Associates Ltd; (referred to as 'GI & GMA report' hereafter)

2.9. Also, CampbellReith accessed LBC's planning portal on 3 December 2018 and gained access to the following relevant documents for audit purposes:

- "140 Highgate Road_Design and Access Statement", rev. A, dated November 2018, issued by D*Haus Company Ltd;
- "140 Highgate Road, timeline forecast", dated October 2018, issued by D*Haus Company Ltd;
- "Flood Risk Assessment at 138-140 Highgate Road London NW5 1PB", dated October 2018, issued by Turner Jomas & Associates Ltd;
- Revised drawings, dated October 2018, issued by D*Haus Company Ltd.

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	A project timeline that includes construction works is provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Preliminary drawings showing the intended construction solution and sequence of works is provided.
Are suitable plan/maps included?	Yes	General site location and site-specific plans are included.
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	Reference has been made to Camden Planning Guidance; a Groundsure report and OS Maps data have been included in the screening & scoping report.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	As above.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A Groundsure report, OS Maps data, Environment Agency information and Camden SFRA data have been consulted and presented in the screening & scoping report, and the revised GI & GMA report.
Is a conceptual model presented?	Yes	In the revised GI & GMA report.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	In the screening & scoping report.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As above.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As above.
Is factual ground investigation data provided?	Yes	In the revised GI & GMA report.
Is monitoring data presented?	Yes	In the revised GI & GMA report.
Is the ground investigation informed by a desk study?	Yes	A full desk study report has been provided including a Groundsure report and OS maps.
Has a site walkover been undertaken?	Yes	The site walkover information is presented in section 2.2 of the screening & scoping report.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Existing buildings across College Lane have been assumed to have no basements in the GMA, which is a conservative assumption. Refer also to the revised GI & GMA report calculations.
Is a geotechnical interpretation presented?	Yes	In the revised GI & GMA report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	As above.
Are reports on other investigations required by screening and scoping presented?	Yes	A construction method statement is provided in the CMS report. A Flood Risk Assessment report is provided.
Are the baseline conditions described, based on the GSD?	Yes	
Do the baseline conditions consider adjacent or nearby basements?	Yes	

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	In the revised GI & GMA report.
Are estimates of ground movement and structural impact presented?	Yes	Refer to the revised GI & GMA report.
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	Assuming good workmanship during construction the proposed development is not anticipated to adversely affect the land stability, the surface water or the groundwater regime. Allowance for making good minor surface defects, if required, at adjacent pavements and highways during construction is proposed.
Has the need for monitoring during construction been considered?	Yes	The need for monitoring has been considered in the revised GI & GMA, and CMS reports.
Have the residual (after mitigation) impacts been clearly identified?	N/A	No residual impacts are anticipated.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Refer to the revised GI & GMA report.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The scheme is not expected to adversely affect drainage or run-off.
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 1?	Yes	Refer to the revised GI & GMA report.
Are non-technical summaries provided?	Yes	A non-technical summary is presented within the “Executive Summary” section of the revised GI & GMA report.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by engineering consultants Jomas Associates Ltd and AMA Consulting Engineers, by individuals who possess suitable qualifications in accordance with Camden Planning Guidance (CPG) Basements.

4.2. The proposed development involves demolition of the existing fuel station and MOT centre and erection of a three-storey terrace building to provide 6 x 4 bedroom dwelling houses with gardens at basement, lower and upper ground levels together with associated landscaping. The proposal involves excavations ranging between 5m and 8m below ground level (bgl). The greater excavation depth will be located towards the east-northeast of the site, adjacent to College Lane. Propped sheet piles along the perimeter of the site are proposed to provide earth support during construction. Permanent reinforced concrete retaining walls will be constructed in front of the sheet piles with the concrete floor slabs acting as props in the long term. A raft slab foundation solution is proposed.

4.3. The revised BIA reports consist of: (i) a desk study/screening & scoping report, (ii) a ground investigation, basement impact assessment & ground movement assessment report (GI & GMA report), and (iii) a structural engineering & construction method statement report (CMS). The (CPG) Basements document is referenced across all BIA reports as required.

4.4. The desk study/screening & scoping report was prepared in accordance with CPG Basements.

4.5. The revised GI & GMA report included geotechnical factual information, geotechnical interpretation and geotechnical parameters for retaining wall design. The ground investigation scope undertaken is considered appropriate for the proposed development. The ground conditions encountered comprised Made Ground up to 1.20m thick over London Clay formation at depth. No groundwater was encountered during drilling except for two locations where groundwater seeps were recorded at various depths. Subsequent groundwater monitoring indicated the presence of groundwater at various depths, which is suggested to be dealt with by conventional pumping with a sump, if required, during construction.

4.6. The ground movement analysis presented in the GI & GMA report indicated ‘negligible’ impact (Burland damage category ‘0’) for the majority of the adjacent existing structures across College Lane, with the exception of two facades where ‘very slight’ damage (Burland damage category ‘1’) is expected. Low risk of damage is anticipated for the adjacent highways and the associated infrastructure, including Highgate Road and College Lane. Allowance for making good minor surface defects, if required, at adjacent pavements and highways during construction is proposed in the GI & GMA report.

4.7. The Flood Risk Assessment (FRA) report undertaken for the site concluded that the proposed scheme will increase the permeable/porous areas and recommended that a SuDS be incorporated and finlaised prior to construction.

4.8. A construction methodology and a proposed sequence of works are presented in the CMS report. The construction methodology includes sheet piles installation around the perimeter of the proposed excavation with temporary propping. Floor slabs are anticipated to act as permanent props during a staged construction. Permanent reinforced concrete walls are proposed in front of the sheet pile walls. The CMS report indicates that a detailed topographical survey has been undertaken for the scheme and reference is made to setting up suitable tree protection measures during construction in accordance with the arborist's report. Outline sheet pile calculations and construction sequence drawings are also presented in the CMS. The GI & GMA report should be consulted with regard to ground parameters for the final design calculations.

4.9. An outline monitoring strategy is discussed in Section 6 of the CMS report.

4.10. An outline works programme for the final design and construction stages is presented in "140 Highgate Road, timeline forecast" report, in accordance with GSD's paragraph 233.

4.11. It is accepted that the proposed development will have negligible impact to land stability, the surface water and the hydrogeology of the site.

4.12. A non-technical summary is presented within the "Executive Summary" section of the revised GI & GMA report.

4.13. In this context, all our previous queries have been closed out and the revised BIA documents meet the requirements of CPG Basements.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by individuals who possess suitable qualifications.

5.2. The desk study/screening & scoping report was prepared in accordance with CPG Basements.

5.3. The revised BIA documents included geotechnical factual and interpretative information.

5.4. Conventional pumping with a sump is recommended to deal with the presence of groundwater during construction, if required.

5.5. The ground movement analysis indicated 'negligible' to 'very slight' damage to the adjacent existing buildings across College Lane. Low risk of damage is anticipated for the adjacent highways and the associated infrastructure. Allowance for making good minor surface defects, if required, during construction, is proposed for adjacent pavements and highways.

5.6. The Flood Risk Assessment report concluded that the proposed scheme will increase the permeable areas and recommended that a SuDS be incorporated to the scheme.

5.7. A construction methodology and a proposed sequence of works are presented. Suitable tree protection measures during construction in accordance with the arborist's report are suggested. Outline sheet pile calculations and construction sequence drawings are presented.

5.8. The ground investigation report should be consulted with regard to ground parameters for the final design.

5.9. An outline monitoring strategy is presented.

5.10. An outline works programme for the final design and construction stages is provided.

5.11. It is accepted that the proposed development will have negligible impact to land stability, the surface water and the hydrogeology of the site.

5.12. A non-technical summary is presented.

5.13. The revised BIA documents meet the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Willmott	Unknown	Unknown	• Adjacent trees and root protection areas	• Setting up tree protection measures is addressed in section 6 of the CMS report.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The assessment of the land stability and surface flow and flooding, should be undertaken by individuals who possess suitable qualifications.	Closed	12/12/2018
2	BIA	Reference to CPG Basements (March 2018) document is required.	Closed	15/10/2018
3	BIA	The latest planning application drawings should be consistently referenced in the BIA.	Closed	15/10/2018
4	BIA	Update of scoping section is required according to screening section comments.	Closed	12/12/2018
5	BIA	Amendments of the GI report about excavation depth, proposed thickness of imported soil, “underpinning of walls”, geotechnical parameters for retaining wall design.	Closed	18/12/2018
6	BIA	Consistency of the proposed construction solution is required across all BIA documents.	Closed	15/10/2018
7	BIA	A detailed topographical survey is recommended to inform the BIA.	Closed	15/10/2018
8	BIA	A works programme for construction should be provided.	Closed	15/10/2018
9	BIA	The non-technical executive summary should be updated.	Closed	09/01/2019
10	Stability	In the land stability screening, justification should be provided for all ‘No’ answers, and review is required for answers no. 6, 12 and 13.	Closed	12/12/2018
11	Stability	The GMA should be revised.	Closed	09/01/2019
12	Stability	A construction method statement and a structural engineering report should be provided with outline calculations and sketches.	Closed	15/10/2018
13	Stability	A structural monitoring strategy is required.	Closed	15/10/2018
14	Hydrogeology	Reference to figure 11 of Arup GSD should be included.	Closed	03/12/2018
15	Hydrology	In the surface flow and flooding screening, justification shall be provided for all ‘No’ answers.	Closed	12/12/2018
16	Hydrology	A Flood Risk Assessment should be undertaken.	Closed	03/12/2018

Appendix 3: Supplementary Supporting Documents

None

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