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61 Redington Road London, NW3 7RP

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
13693-73

Date
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APPENDICES

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 61 Redington Road (planning reference 2022/1962/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 (BIA) 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 qualifications of the individuals involved in the production of the BIA are in accordance with LBC guidance.

1.5 The proposal includes the extension of the existing lower ground floor level beneath the majority of the footprint of the house, as part of significant alterations to the house.

1.6 Screening and scoping assessments are presented, supported by desk study information.

1.7 An assessment on the potential for local groundwater raise due to the proposed development has been presented in the BIA indicating no adverse impact. However groundwater monitoring as part of the basement construction is recommended.

1.8 A site investigation has been undertaken indicating the basement will be founded in the London Clay. Geotechnical parameters to inform design have been provided and accepted.

1.9 The basement is to be formed using mass concrete underpinning and will founded within the London Clay

1.10 A Ground Movement Assessment (GMA) has been presented and now demonstrates that damage to neighbouring properties will be within the limits set by the CPG.

1.11 Clarifications regarding arboricultural assessment and tree removal have been presented, indicating no adverse impact on neighbouring foundations.

1.12 Queries and requests for information are summarised in Appendix 2. Considering the additional information presented, the BIA meets the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on the 4th of August 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 61 Redington Road, London, NW3 7RP, planning reference 2022/1962/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:

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance (CPG): Basements. January 2021.
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Red Frog Sub-surface Water Features Mapping. Arup report. Revision A, 1 April 2016.
- Redington Frognal Neighbourhood Plan. March 2021.

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 "Conversion of 3x flats (2B4P) to 2x flats (1B2P and 5B10P). Erection of four storey rear extension at lower ground to 2nd floor including excavation at lower ground and front lightwells. Roof extension. Erection of rear ground floor terrace. Installation of 2x ASHP and 1 air con unit in rear garden and landscaping alterations".

2.6 CampbellReith accessed LBC's Planning Portal on the 19th of August 2022 and gained access to the following relevant documents for audit purposes:

- Ground Investigation Report and Basement Impact Assessment by Ground & Water Limited, ref: GWPR4656/BIA&GIR, dated April 2022.
- Arboricultural Impact Assessment Report by Landmark Trees, ref: HGH/61RDR/AIA/01b, dated May 2022.

- Surface Flow and Flooding Basement Impact Assessment by Water Environment Ltd, ref: 2210419, dated April 2022.
- Structural Design, Construction Sequence and Temporary Works by Vincent and Rymill Consulting Engineers, ref: unknown, issue 1, dated April 2022.
- Existing Site Plan, Floor Levels and Elevation and Sections by Mija Survey Ltd.
- Proposed Architectural Drawings by Griggs Architects:
  - Proposed Site Plan (Lower Ground Floor), ref: 1571 – PL02 Rev -, dated March 2022;
  - Proposed Site Plan (Ground Floor), ref: 1571 – PL03 Rev -, dated March 2022;
  - Proposed Floor Plans, ref: 1571 – PL10 Rev -, dated March 2022;
  - Proposed Elevations, ref: 1571 – PL11 Rev -, dated February 2022; and
  - Proposed Sections, ref: 1571 – PL12 Rev -, dated March 2022.
  - Consultation responses.

2.7 After CampbellReith submitted the D1 revision of this report, additional information has been obtained by the applicant/planning officer in relation to the queries raised in the D1:

- Updated Ground Investigation Report and Basement Impact Assessment by Ground & Water Limited, ref: GWPR4656_V1.08, dated August 2023.
- Updated Structural Design, Construction Sequence and Temporary Works by Vincent and Rymill Consulting Engineers, ref: unknown, issue 2, dated May 2023.
- Updated Surface Flow and Flooding Basement Impact Assessment by Water Environment Ltd, ref: 2210419, C03 dated May 2023.
- Updated Proposed Architectural Drawings by Ashby Design, dated April 2023:
  - Proposed Plans and Sections
  - Floors Comparative Plans, Comparative Elevations and Comparative Sections
  - Visual Illustrations

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Qualifications for land stability impact assessment are now met.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Section 2 of the BIA.
Are suitable plan/maps included?	Yes	All maps to support screening are included in the BIA.
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	Section 3.1 of the BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1 of the BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4 of the Surface Flow and Flooding BIA.
Is a conceptual model presented?	Yes	Sections 5.0 of the BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 3.2 of the BIA. However, Question 6 should be brought to scoping as per above.

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Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 3.2 of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5 of the Surface Flow and Flooding BIA.
Is factual ground investigation data provided?	Yes	Appendix D of the BIA.
Is monitoring data presented?	Yes	Section 5.4 of the BIA. Single monitoring visit was undertaken, further monitoring visits may be required.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Sections 2.2 of the BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Sections 7.4.3 of the BIA. Presence of lightwells within neighbouring properties were noted during the site walkover.
Is a geotechnical interpretation presented?	Yes	Section 7 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7 of the BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	Desk Study and Ground Investigation Report; Arboricultural Survey & Impact Assessment; Suggested Sequence of work; Proposed structural calculations and drawings; Sustainable Drainage Strategy.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Sections 7.4.3 of the BIA. Presence of lightwells within neighbouring properties were noted during the site walkover.

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Is an Impact Assessment provided?	Yes	Section 7 of the BIA.
Are estimates of ground movement and structural impact presented?	Yes	Sections 7 and Appendix I of the BIA.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Sections 7 of the BIA and Section 6 and 7 of the Surface Flow and Flooding BIA. GMA provided.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Sections 7 of the BIA and Section 6 of the Surface Flow and Flooding BIA.
Has the need for monitoring during construction been considered?	Yes	Section 7.5 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Negligible.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Impact due to tree removal has been assessed. GMA provided.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	See Surface Flow and Flooding BIA.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Section 7.4.3 of the BIA.
Are non-technical summaries provided	Yes	Executive Summary of the BIA.

4.0 DISCUSSION

4.1 The BIA has been carried out by Ground and Water Limited with contributions from Water Environment Limited on the surface water flow assessment. The qualifications of the individuals concerned with the production of the report have been demonstrated to meet the requirements of CPG Basements.

4.2 The site is occupied a three-storey residential detached brick building with a front and rear garden. The structure contains an existing lower ground floor extending beneath the entire footprint of the house and at an elevation of between 97.03m and 96.14m AOD. The property fronts onto Redington Road to the northeast and is bounded by No. 59 and No. 63 Redington Road to the south-east and north-west respectively. The presence of lightwell was noted during the site walkover within neighbouring properties, suggesting the presence of similar lower ground floors.

4.3 The proposals include the deepening of most of the existing lower ground floor level and the construction of one lightwell at the front of the structure. Formation level for the proposed lower ground floor level will be at c. 94.7-95.0m AOD which will require an excavation of approximately 2.00m at its deepest.

4.4 Screening and scoping assessments are presented and informed by desk study information. Most relevant figures/maps from the ARUP GSD and other guidance documents are referenced within the BIA to support responses to screening questions. Question 6 of the land stability assessment has now been brought forward to scoping and the impact assessed.

4.5 The BIA states that the site is at very low probability of flooding from all sources. However, the proposed development will increase the overall proportion of hardstanding areas and the site is within a critical drainage area. A SuDS assessment has been therefore presented as part of the BIA, which indicates that through provision of suitable SuDS strategy and adequate mitigation measures, the development will not increase peak runoff rates and will not result in increased pressure on the wider area drainage infrastructure and consequent increase in surface water flooding risk.

4.6 A site investigation was undertaken by Ground and Water. Site works comprised three boreholes undertaken at ground level to a depth of 8.45m and three foundation inspection trial pits to depths between 1.00m and 1.30m below ground level (bgl). Made Ground was encountered to a maximum depth of 1.20m bgl above the London Clay Formation which was proved to full depth of the investigation. The new basement will extend to a depth of c. 3.50m bgl and will be founded within the London Clay.

4.7 Groundwater was not generally encountered during the investigation, but perched water was encountered within the Made Ground and London Clay in two of the exploratory holes. Two (WS01 and WS02) of the three boreholes were installed with piezometers. The BIA reports a single monitoring visit occurred at WS01 where groundwater was found to be at 3.80m bgl which is just below proposed basement level.

4.8 The BIA states that due to the cohesive nature of the London Clay, the rate of any inflow will be relatively slow such that any potential inflows are unlikely to be significant and should be dealt with through sump pumping. An outline method statement for groundwater management during construction is presented within the submitted structural information. It is recommended that additional groundwater monitoring is undertaken before construction to inform the detailed temporary works design and dewatering strategy.

4.9 It is accepted that although groundwater may be close to basement level, the London Clay Formation is an unproductive stratum and as such there will not be any impact to the wider hydrogeological environment. In addition, as the site is located downhill of a spring line, the BIA demonstrated that underground streams or spring lines are not diverted in accordance with Redington Frognal Neighbourhood Plan.

4.10 The geotechnical parameters to be adopted in retaining wall and settlement calculations are presented. The BIA indicates a friction angle, φ, of 24o for the London Clay, which has been adopted in the structural calculations. Similarly, the value used for the allowable bearing capacity used in the structural calculations are in line with those presented in the BIA and this is accepted.

4.11 Structural information including a proposed construction sequence for the basement is presented in the BIA. The underpinning of the existing perimeter walls will take place in a 'hit and miss' sequence. The BIA states that the new retaining walls will not be cantilevered at any stage during the construction process and adequate temporary propping, particularly at the top level, will occur at all times prior to the construction of the permanent concrete floor slabs.

4.12 A GMA and damage assessment are provided to demonstrate that ground movements and consequential damage to neighbouring properties will be within the LBC's policy requirements. Nearby sensitive structures comprise the adjoining No. 59 and 63 Redington Road.

4.13 A PDisp model has been produced to mainly estimate heave occurring due to basement excavation and to inform basement design. Poisson's ratio Values used in the analysis are now considered realistic.

4.14 An XDisp model has been produced to estimate ground movements due to basement construction by underpinning in accordance with CIRIA C760. Whilst the CIRIA approach is intended for embedded retaining walls, it is accepted that the predicted ground movements are within the range typically anticipated for underpinning techniques carried out with good control of workmanship. The BIA has been revised and it now anticipates ground movements of c. 5mm in both the horizontal and vertical direction. The results of the Building Impact Assessment currently indicate damage to neighbouring buildings will not exceed Category 0 (Very Slight).

4.15 The structural report presents an outline ground movement monitoring strategy including equipment recommended, survey control, frequency, trigger levels and monitoring procedure. It states that the final monitoring points shall be agreed between the party wall surveyor and consulting engineer. Trigger values have been updated and are now in line with those predicted in the GMA.

4.16 The Arboricultural Survey & Impact Assessment recommends one tree being removed as part of the development. As there is the potential for soils with shrink-swell potential to be present close to the surface, the BIA presented a qualitative analysis to demonstrate the neighbouring properties will not be impacted by the tree removal.

5.0 CONCLUSIONS

5.1 The qualifications of the individuals involved in the production of the BIA are in accordance with LBC guidance.

5.2 The proposal includes the extension of the existing lower ground floor level beneath the majority of the footprint of the house, as part of significant alterations to the house.

5.3 Screening and scoping assessments are presented, supported by desk study information. Question 6 of the land stability assessment has been updated and brought forward to scoping.

5.4 An assessment on the potential for local groundwater raise due to the proposed development has been presented in the BIA. No adverse impact on the wider hydrogeological environment is expected. However, groundwater monitoring should be undertaken to inform temporary works design.

5.5 A site investigation has been undertaken indicating the basement will be founded in London Clay.

5.6 Geotechnical parameters to inform design have been provided and accepted.

5.7 The basement is to be formed using mass concrete underpinning and it will be found in London Clay.

5.8 The Ground Movement Assessment (GMA) has been reviewed and demonstrates damages to neighbouring properties to not exceed Category 0 of the Burland Scale.

5.9 Impact assessment on tree removal has been presented and is not considered to affect neighbouring properties.

5.10 Queries and requests for information are summarised in Appendix 2. Considering the additional information presented, the BIA meets the requirements of Camden Planning Guidance: Basements.

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Appendix 1

Residents' Consultation Comment

Residents' Consultation Comments

Surname	Address	Date	Issue Raised	Response
Neil Kitchener	63e Redington Road	14/08/22	Structural stability	See Section 4.13., 4.14., 4.15.
Redacted	63A Redington Road	19/08/22	Structural Stability	See Section 4.13., 4.14., 4.15.
Karin Orlik	Unknown	22/08/22	Hydrogeology Impact Flooding	See Section 4.4., 4.9.

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Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date Closed Out
1	BIA format	Land stability impact assessment should be reviewed by a suitably qualified professional.	Closed – See Section 4.1.	October 2023
2	Land Stability	Q6 of the land stability screening should be brought forward to scoping.	Closed – See Section 4.4.	October 2023
3	Hydrogeology	An assessment on the potential for local groundwater raise due to the proposed basement should be presented.	Closed – See Sections 4.9.	October 2023
4	Land stability	The PDisp heave analysis should adopt a suitable value for the Poisson's Ratio in the long term scenario.	Closed – See Sections 4.13.	October 2023
5	Structural loads	The BIA should present anticipated proposed loads on the underpins. The GMA should be revised to include those loads in the analysis.	Closed – See Sections 4.14.	October 2023
6	Monitoring	Trigger values presented in the outline ground movement monitoring proposal should be revised according to the ground movements anticipated in the GMA.	Closed – See Section 4.15.	October 2023
7	Land Stability	The BIA should confirm whether trees are going to be removed as part of the development and if so, present an assessment on potential movements occurring to neighbouring foundations.	Closed – See Section 4.16.	October 2023
8	Hydrogeology	Ground water monitoring should be undertaken to inform temporary works design.	Note Only	October 2023

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Appendix 3

Supplementary Supporting Documents

None

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