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Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12727-32
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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 24 Lawn Road, London, NW3 2XR (planning reference 2017/5619/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 and supporting documents have been prepared firms of engineering consultants using individuals who possess suitable qualifications.

1.5. The proposal neither involved a listed building or was adjacent to listed buildings.

1.6. The proposed development consists extending and existing lower ground floor beneath an existing ground floor structure by lowering the existing floor void by approximately 1.7m. The current property is split level with a partial lower ground floor and garage to the rear of the property.

1.7. Site investigations to a shallow depth have been carried out to investigate the existing foundations and site geology, which is supported by publically available geotechnical data. This site investigation is accepted given the modest scale of the proposal, however further investigations may be required to facilitate the detailed design.

1.8. Significant ground water flows are not anticipated to be encountered during the basement construction.

1.9. It is accepted that the impermeable area is not changing.

1.10. An appropriate construction methodology has been proposed which indicates the basement is to be constructed in accordance with good practise construction principles using common techniques.

1.11. Confirmation of consultation with TFL and Network Rail is required due to the proximity of public assets.

1.12. Category 2 damage is predicted to the neighbouring properties. This is greater than the maximum permitted category of 1 allowed by LBC.

1.13. An outline movement monitoring strategy is provided.

1.14. Outline structural calculations for the basement retaining walls are required.

1.15. An outline works programme has been presented.

1.16. It is accepted that there are no slope stability concerns and the site has a very low flooding.

1.17. Given the above it cannot be confirmed that the proposal confirms to the requirements of CPG4. A number of queries have been summarised in appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 11th of January 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 24 Lawn Road, London, NW3 2XR (planning reference 2017/5619/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.
- 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 *"Excavation for a basement extension under the footprint of the existing building, erection of single storey rear extension following demolition of existing, replacement balustrading and alterations to rear elevation at lower ground floor level all associated with providing ancillary residential floorspace (Class C3)."*

2.6. The Audit Instruction also confirmed 24 Lawn Road, London, NW3 2XR neither involved, or was neighbour to, listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 9th of February 2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report prepared by Morph Structures, Max Freeman MEng and Dave Heeley MEng, CEng, MIStructE, December 2017 including:
  - Geotechnical Screening and Scoping Report by Card Geotechnics Limited (CGL), ref. No. CG/28395, dated December 2017
- Design and Access Statement prepared by con | form architects, October 2017
- Planning Application Drawings dated October 2017 of Existing by con | form architects consisting of:
  - 528_001 / P1 Site Location Plan
  - 528_101 / P1 Existing Ground Floor Plan
  - 528_102 / P1 Existing Lower Ground Floor Plan
  - 528_103 / P1 Existing Roof Plan
  - 528_110 / P1 Existing Section AA
  - 528_111 / P1 Existing Section BB
  - 528_120 / P1 Existing Elevations
- Planning Application Drawings October 2017 of Proposed by con | form architects consisting of:
  - 528_201 / P1 Proposed Ground Floor Plan
  - 528_202 / P1 Proposed Lower Ground Floor Plan
  - 528_203 / P1 Proposed Roof Plan
  - 528_210 / P1 Proposed Section AA
  - 528_211/ P1 Proposed Section BB
  - 528_220 / P1 Proposed Elevations
- Structural Strategy Report (SSR)
- Planning Comments by Conservation Area Advisory Committee, ref. No. 21111801

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	Outline works programme not required
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 plan/maps included?	Yes	Responded to screening question adequately.
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	Some justification is provided for 'no' answers.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Some justification is provided for 'no' answers.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Justification not provided for 'no' answers, however screening carried out satisfactorily.
Is a conceptual model presented?	Yes	Ground condition is presented however from desk study data for nearby Borehole. Trial pits were investigated, as site access is limited. Perched water was not present at the time of the investigation.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4 of the screening and scoping report provides some scoping of items raised by screening.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No items carried through from hydrogeological screening.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4 of the screening and scoping report provides some scoping of items raised by screening.
Is factual ground investigation data provided?	Yes	Trial pit investigation was carried out onsite.
Is monitoring data presented?	No	Ground water monitoring has not been carried out.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Unclear	CGL Screening and Scoping Report point 2.4 states Network Rail to confirm exact alignment of Belsize Tunnel and New Belsize Tunnel. Local planning history has been presented for number of applications stating application numbers but no location detail of similar development is given.
Is a geotechnical interpretation presented?	No	
Does the geotechnical interpretation include information on retaining wall design?	NA	No geotechnical interpretation provided.
Are reports on other investigations required by screening and scoping presented?	No	Scoping has indicated that an intrusive ground investigation might be required, however this has not been provided.

Item	Yes/No/NA	Comment
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Damage category 2 predicted, however this is not supported by a formal GMA.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Ground movement assessment not provided.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Heave protection, monitoring during construction
Has the need for monitoring during construction been considered?	Yes	The monitoring method is to be developed further during detailed design including levelling, geospatial surveying, crack width gauges, strain gauges, inclinometers, or extensometers or a combination of these methods. The monitoring will be undertaken prior to demolition and continue through to completion of the structure.
Have the residual (after mitigation) impacts been clearly identified?	No	Residual impacts have not been identified.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Structural calculations and formal GMA not provided.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	No change in hard landscaping as existing back garden is fully paved, however confirmation as to the impact on the drainage system to be clarified.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Formal GMA not carried out. BIA indicates damage category 2 predicted.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) and Site Investigation Report have been carried out by a firm of engineering consultants, Morph Structures in conjunction with Card Geotechnics Limited ('CGL') and the individuals concerned in its production have suitable qualifications as required by CPG4.

4.2. The Design and Access Statement identified that the basement proposal neither involved a listed building nor was adjacent to listed buildings.

4.3. The BIA submissions include land Stability, Hydrogeology and Hydrology screening and scoping, and impact assessment as defined and required in the LBC Planning Guidance document 'Basement and Lightwells (CPG4).

4.4. It identified that 24 Lawn Road is located in the Parkhill & Upper Park Conservation Area within the London Borough of Camden. The existing property comprises a three-storey terrace house including attic storey and split Ground and Lower Ground Floor level with reduced height. The later storey used as utility and garage space is accessible from the half a storey lower than entrance level shared back of house mews. The site is bounded to the North and South by mid terrace properties 23 and 25 Lawn Road which have similar Lower Ground Floor garages to the rear.

4.5. The proposed development consists of a single level basement construction formed by lowering an existing Lower Ground Floor area of the existing single storey rear projection to the property of the development site by up to 1.7 meters. The remaining single storey structure to the rear of the property is proposed to be demolished to facilitate the configured development.

4.6. Site investigations consisted of two foundation inspection pits by Morph Structures on 22 November 2017 within the existing Lower Ground Floor garage and utility room. The trial pits identified Made Ground with possible Head Deposits, over stiff London Clay. No ground water was identified within the trials pits, however it is not clear to what depth the trial pits extended. The site investigations are supported by a desk study which provides nearby borehole data from the British Geological Survey, which indicates approximately 2.9m of Made Ground above 1.85m of stiff brown clay with crystals and then 3.85m of stiff fissured brown silty clay with crystals. The data nearest borehole data being some 350 meters from the site.

4.7. While a borehole has not been carried out on site as part of the site specific investigations it is felt that the trial pit investigation in combination with the desktop study are appropriate in scale for the modest scale of the proposed basement. The CGL report indicates that further intrusive ground investigations may be required to support the detailed basement design and to derive specific geotechnical parameters.

4.8. Groundwater strikes were noted in historical records of bore holes No. TQ28NE77 to TQ28NE79 located between 240m and 270m to the north of the site as shallow as 1.5mbgl, however the BIA has concluded that any ground water encounter during construction would constitute perched water rather than wider strategic ground water flows. This conclusion is accepted, however care should be taken during construction should any ground water be identified with a dewatering plan in place should it be required.

4.9. It is stated that the impermeable area is not changing as the existing lower ground floor extends to the rear site boundary. This is accepted.

4.10. The site is confirmed to not be located within a groundwater Source Protection Zone (SPZ) or within 500m of one.

4.11. Construction methodology has been presented as part of the BIA and involves demolition of the existing rear extension down to lowest level and removal of existing slab, followed by forming concrete retaining wall parallel to Garnett Road. At the second stage retaining wall under rear wall of building is to be formed, followed by underpinning the existing internal and external party walls in 'hit and miss' sequence with 1 meter widths segments. The permanent retaining wall to be installed in front of underpins. Lower Ground Floor and Ground Floor slab plates, as well as Ground and First Floor transfer structure to be constructed to act as the permanent props.

4.12. The screening and scoping report indicates that heave movements due to the unloading of clay are anticipated to be 'relatively low'. While no formal calculation of heave movements have been provided, heave protection by way of compressible material has been indicated within the structural design.

4.13. It is indicated that Network Rail and Transport for London (TfL) assets are located within the vicinity of the site, and that both have been contacted with regards to the requirement of their statutory approval. Confirmation of consultation with TFL and Network Rail is required.

4.14. It has been stated that ground movements are anticipated to be 'relatively low' and 'category 2' within the CGL report and Morph report respectively. However, no formal ground movement assessment calculation has been submitted to validate these claims. Due to the proximity to neighbouring properties and the identified likely change in relative foundation levels a formal Ground Movement Assessment is required. It should be noted that the maximum damage category permitted by LBC with respect to neighbouring properties is Burland category 1.

4.15. The BIA identifies that the movement monitoring method is to be developed further during detailed design and will include levelling, geospatial surveying, crack width gauges, strain

gauges, inclinometers, or extensometers or a combination of these methods. The monitoring will be undertaken prior to demolition and continue through to completion of the structure.

4.16. Outline structural calculations for the basement retaining walls have not been provided. These should be submitted to demonstrate the feasibility of the proposed basement structure.

4.17. An outline works programme covering key phases of work has been presented.

4.18. It is accepted that there are no slope stability concerns regarding the proposed development and the site has a very low flooding risk from surface water and sewers, reservoirs and fluvial/tidal watercourses.

4.19. Given the above it cannot be confirmed that the proposal confirms to the requirements of CPG4. A number of queries have been summarised in appendix 2.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) and Site Investigation Report have been carried out by a firm of engineering consultants, Morph Structures in conjunction with Card Geotechnics Limited ('CGL') using individuals who possess suitable qualifications.

5.2. The Design and Access Statement identified that the basement proposal neither involved a listed building or was adjacent to listed buildings.

5.3. The BIA submissions include land Stability, Hydrogeology and Hydrology screening and scoping, and impact assessment as defined and required in the LBC Planning Guidance document 'Basement and Lightwells (CPG4).

5.4. The proposed development consists extending and existing lower ground floor beneath an existing ground floor structure by lowering the existing floor void by approximately 1.7m. The current property is split level with a partial lower ground floor and garage to the rear of the property.

5.5. Site investigations consisted of trial pits to investigate existing foundations and geology, along with a desktop study to identify anticipated geology based on nearby boreholes. The geology has been identified as a moderate depth of made ground overlaying London Clay. The extent of the geotechnical investigations was felt to be proportional to the proposed scheme, however further SI may be required to facilitate the detailed design.

5.6. While site investigations to the proposed basement depth have not been undertaken, any ground water encountered is anticipated to be perched water only, with wider ground water flows uninterrupted.

5.7. It is accepted that the impermeable area is not changing.

5.8. An appropriate construction methodology has been proposed which indicates the existing below floor void lowered using mass concrete underpinning and reinforced concrete retaining walls constructed in a hit and miss sequence.

5.9. Heave protection is proposed by way of compressible material beneath the basement slab.

5.10. Confirmation of consultation with TFL and Network Rail is required due to the proximity of public assets.

5.11. Category 2 damage category has been predicted. However, this is not supported by a formal GMA which is required. The maximum permitted damage category is 1.

5.12. An outline movement monitoring strategy is provided.

5.13. Outline structural calculations for the basement retaining walls are required.

5.14. An outline works programme has been presented.

5.15. It is accepted that there are no slope stability concerns and the site has a very low flooding.

5.16. Given the above it cannot be confirmed that the proposal confirms to the requirements of CPG4. A number of queries have been summarised in appendix 2.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Outline structural calculations for retaining walls to be submitted to demonstrate feasibility of the proposed structure.	Open	
2	Stability	Ground movement assessment to be provided with supporting calculations.	Open	
3	Stability	Evidence of correspondence with Network Rail and TFL required, and confirmation if formal safeguarding approval need be obtained.	Open	

Appendix 3: Supplementary Supporting Documents

None

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