CampbellReith
consulting engineers

Basement and Ground Floor
323 Gray's Inn Road,
LONDON, WC1X 8PX

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12727-58
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 (BIA) submitted as part of the Planning Submission documentation for 3 Trinity Close (planning reference 2017/6513/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 Basement Impact Assessment (BIA) has been carried out by an established firm of engineering consultants. The individuals concerned did not hold suitable qualifications for the hydrogeological assessment, however the hydrogeological assessment that has been produced is accepted.

1.5. The proposal consists of extending an existing basement level beneath the full plan area of an existing rear extension.

1.6. A site specific ground investigation has been carried out, however this did not included a borehole.

1.7. The site geology has not been fully established, however it has been demonstrated that the proposed basement will found within the London Clay.

1.8. The proposed basement structure is proposed to be formed using commonly adopted basement construction techniques, with appropriate construction details provided to indicate that stability can be maintained at all times during construction.

1.9. Outline structural calculations have been provided to demonstrate the feasibility of the proposal.

1.10. A ground movement assessment has been produced which indicates the potential damage category to the neighbouring properties of 0, which is within the maximum permitted damage category of 1.

1.11. It is accepted that the proposal does not significantly impact on the surface water drainage.

1.12. It is accepted that the basement is unlikely to impact on ground water flows.

1.13. An outline works programme has been provided.

1.14. A Thames Water public sewer has been identified beneath the proposed basement. Evidence of consultation with Thames Water has been provided demonstrating Thames Water's interest in safeguarding the proposal.

1.15. It is accepted that the site is at low risk of flooding and there are no slope stability concerns.

1.16. Given the above it can be confirmed that the proposal confirms to the requirements of CPG Basement. A number of queries summarised in appendix 2 have been closed.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) in February 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for the basement and ground floors of 323 Gray's Inn Road, London WC1X 8PX (Reference: 2017/6513/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;

2.5. 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.

2.6. LBC's Audit Instruction described the planning proposal as *"Rear basement extension; installation of plant and extraction system; replacement shop front."*

2.7. The Audit Instruction also confirmed that the proposal does not involve any listed building.

2.8. CampbellReith accessed LBC's Planning Portal on 19/03/2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) report by Soiltechnics, Ref: STP4083R-BIA_rev: 01, dated 29th January 2018.
- Architect's existing and proposed General Arrangement Plans & Sections.
- Design and Access Statement.
- Construction Management Framework statement by Penoyre & Prasad, dated December 2017.
- Camden BIA Audit Form ABCD.

2.9. CampbellReith received additional information requested in the rev. D1 via LBC's Planning Portal on 21/05/18:

- Basement Impact Assessment (BIA) report by Soiltechnics, Ref: STP4083R-BIA_rev: 03, dated 16th May 2018.
- BIA Appendix H (Redacted)

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	CGeol is not held, but the hydrology assessment complies with the CPG4.
Is data required by Cl.233 of the GSD presented?	Yes	Works programme attached to BIA revision 3
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Structural drawing and calculations have been provided.
Are suitable plan/maps included?	Yes	
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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	No	The depth of made ground has not been determined
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	While a formal scoping statement is not provided some scoping is carried out in the screening section and summary.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	While a formal scoping statement is not provided some scoping is carried out in the screening section and summary.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No items from hydrology screening carried through from screening

Item	Yes/No/NA	Comment
Is factual ground investigation data provided?	Yes	Trial pit log
Is monitoring data presented?	No	
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Unclear	No specific mention of a walkover is mentioned however it is apparent that the designer is appropriately familiar with the site.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	It is mentioned that the neighbouring buildings contain basements
Is a geotechnical interpretation presented?	No	
Does the geotechnical interpretation include information on retaining wall design?	No	
Are reports on other investigations required by screening and scoping presented?	Yes	Sewer flooding search, GMA, some TFL consultation
Are the baseline conditions described, based on the GSD?	No	
Do the base line conditions consider adjacent or nearby basements?	Yes	Neighbouring basements have been considered in the GMA
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	GMA
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?	No	
Has the need for monitoring during construction been considered?	No	
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Structural drawings and structural calculations have been submitted.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
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?	Yes	Damage to be limited to a maximum of Category 0
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by an established firm of engineering consultants, Soiltechnics Ltd. The individuals concerned in its production have suitable qualifications for the assessment of the hydrological and stability aspects of the assessment. Those required for the hydrogeological assessment aspects of the proposal are not held, however it is considered that the hydrogeological assessment has been carried out appropriately.

4.2. The site is located in a mixed residential and commercial area along the LBC's Gray's Inn Road. The existing building is a 4-storey plus basement level, with a single storey rear extension. The LBC instruction to proceed with the audit identified that the basement proposal does not involve, nor is neighbour to, a listed building.

4.3. The proposed development comprises the extension of the existing basement level beneath the full plan area of the rear extension.

4.4. A site specific ground investigation has been carried out consisting of a trial pit at the front of the existing basement with testing of soil samples using a pocket penetrometer. A borehole has not been carried out due to the continued tenancy and use of the property, however this is intended to be carried out prior to the construction of the basement. No ground water was identified during the trial pit investigation.

4.5. The site geology has been identified as consisting of made ground underlain by The London Clay formation, with the existing basement formation located within The London Clay. A summary of ground conditions provided in the BIA, from BGS record data formed within 500m of the property, reports approx. thickness of 20m of London Clay below the existing basement level. A site plan illustrating locations of the above has been included.

4.6. The true depth of made ground is unknown due to the only site specific investigation being a trial pit against the existing foundation, where the depth of made ground would not be expected to be representative of the made ground thickness across the site.

4.7. It is described that the proposed basement is to be constructed of concrete underpinning, with a high level floor slab constructed in order to prop the top of the walls in the permanent case. Structural proposal has been provided in form of a structural drawing, indicating underpinned RC walls with a 150mm thick ground bearing slab RC slab.

4.8. Temporary works are described as 'a system of props will be installed at high level', however no construction methodology, or further details of temporary works is provided. A structural

drawing has been provided, which shows the underpinning sequence with sections of wall 1m wide.

4.9. Outline structural calculations for the basement wall have been provided. Heave to be considered in the calculations of the ground bearing slab during the detailed design stage.

4.10. The BIA concludes that ground water flows above the London Clay are likely to be minimal given the impermeability of the London Clay, reflecting perched water only. While the depth of made ground is not known, it is accepted that the existing terrace of basement containing properties are not causing any apparent significant raising of ground water levels, and that extending the basement to the rear is unlikely to provide a significant impact on ground water flows.

4.11. A ground movement assessment has been provided which is based on the methodology described in CIRIA C760 for embedded retaining walls. The damage category for the neighbouring properties has been calculated as category 0 (negligible), which is less than the permitted maximum damage category of 1. While the method as described in CIRIA 760 is not strictly intended for assessing ground movements of underpinning proposals, it can be accepted as a conservative analogy.

4.12. The BIA confirms that the areas of hard and permeable landscaping will not result in any significant change and thus the volume of surface water inflow from surface run-off will remain unchanged due to the proposed development. It is accepted that the proposal will not have a significantly adverse impact on the surface water drainage of the site.

4.13. An outline works programme which indicates the main phases and anticipated durations of work has been provided.

4.14. The applicant has confirmed the presence of a Thames Water Public sewer running beneath the existing rear extension and therefore in the location of the proposed basement. It has been confirmed that the level of the sewer is beneath that of the proposed basement slab level, and that a Thames Water Building Over application is being sought. Evidence of consultation with Thames Water has been provided.

4.15. The property is located within close proximity to a number of London Underground tunnels located. The applicant has provided evidence of consultation with TFL regarding the drilling of a borehole to the rear of the property which has been confirmed as not impacting TFL infrastructure. An evidence showing consultation with TFL regarding the basement construction has been provided. The proposal will not affect London Underground Infrastructure.

4.16. It is accepted that the site is at low risk of flooding and there are no slopes greater than 7° within the vicinity of the site.

4.17. Given the above it can be confirmed that the proposal confirms to the requirements of CPG Basements. A number of queries summarised in appendix 2 have been closed.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by an established firm of engineering consultants, Soiltechnics Ltd. The individuals concerned in its production have suitable qualifications other than for the hydrogeological assessment. However, the hydrology assessment complies with the CPG4.

5.2. The existing building contains a basement level beneath the main 4-storey property, with a single storey extension to the rear. The proposal consists of extending the existing basement level beneath the full plan area of the rear extension.

5.3. A site specific ground investigation consisting of a trial pit and a limited amount of soil testing has been carried out, with a borehole planned once access is able to be obtained.

5.4. The geology has been identified as made ground overlaying London Clay. The representative depth of made ground across the site has not been established. However the proposed basement is likely to found within the London Clay.

5.5. The proposed basement structure is underpinned RC walls to the existing extension walls with a ground bearing basement slab, with the underpinning carried out in a hit and miss sequence.

5.6. Outline structural calculations have been provided, which demonstrates the structural feasibility of the proposal.

5.7. A ground movement assessment has been produced which indicates damage category of 0 for the neighbouring properties.

5.8. It is accepted that the proposal does not impact on the impermeable areas or effect the site surface water drainage.

5.9. While the depth of made ground in unknown it is accepted that the basement is unlikely to impact on ground water flows.

5.10. An outline works programme has been provided.

5.11. A Thames Water public sewer has been identified beneath the proposed basement. An evidence of consultation with Thames Water has been provided.

5.12. Evidence of consultation with TFL has been provided. The basement construction will not affect LU Infrastructure.

5.13. It is accepted that the site is at low risk of flooding and there are no slope stability concerns.

5.14. Given the above it can be confirmed that the proposal confirms to the requirements of CPG Basements. A number of queries summarised in appendix 2 have been closed.

Appendix 1: Residents' Consultations Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Construction	An outline works programme indicating the main phases and durations of work is required.	Closed	21/05/2018
2	Statutory approvals	Thames Water building over approval to be obtained	To be dealt with by informative	N/A
3	Statutory approvals	Evidence of consultation with TFL/LU is required for the main basement construction works.	Closed	21/05/2018
4	Stability	Outline structural calculations are required for the proposed basement wall	Closed	21/05/2018
5	Stability	Details of the proposed structure by way of structural drawings is required.	Closed	21/05/2018
6	Stability	Further details of the construction method are required in relation to the confirmed basement structure	Closed	21/05/2018

Appendix 3: Supplementary Supporting Document

None

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