CampbellReith
consulting engineers

12A Platt's Lane,

London NW3 7NR

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-25

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 12A Platt's Lane, London NW3 7NR (planning reference 2016/4899/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 Soils Ltd accompanied by a Structural Methodology Statement prepared by Richard Tant. The input of a CGeol (Chartered Geologist) was required with respect to subterranean (groundwater) flow which has been included in the revised submissions.

1.5. The initial Basement Impact Assessment (BIA) raised a number of queries relating to BIA format, hydrology and stability of the proposed structure and neighbouring property. Further to the submission of CampbellReith's initial BIA audit report, supplementary information including a revised BIA was submitted in response to the queries raised. The current report takes account of that information and updates the BIA audit.

1.6. The existing site is a semi-detached three storey building which is to be redeveloped to include a new single storey basement within an excavation of 3.7m below existing ground level. The new basement extends to the rear of the building to form a patio and extends to the front and north-east side to provide light wells. The presence or absence of nearby basements or underground infrastructure has not been identified.

1.7. The ground investigation revealed Made Ground over the Claygate Member. Groundwater was recorded to depths ranging from 3.00m to 4.90m bgl.

1.8. The BIA has confirmed that the proposed basement will be founded within the Claygate Member and it will extend beneath the water table. The Claygate Member is classified as a Secondary 'A' aquifer and the underlying London clay is considered to be unproductive strata.

1.9. Relevant maps and justification for 'No' responses at the screening stage were required and have now been provided. The maps are included in Figures 12 to 22 of the BIA report.

1.10. The proposed construction method is reinforced concrete underpinned retaining walls with internal cavity drain system. Sketches to indicate the construction sequence and propping arrangements are provided.

1.11. Retaining wall parameters and stiffness (Young's Modulus) were required and have now been provided in Table 7.1 of the BIA.

1.12. Information was requested with respect to foundations at 10 Platt's Lane. It has now been confirmed that a basement is present but foundation depths are unknown. Therefore a maximum differential depth for the foundations has been assumed which is considered appropriately conservative.

1.13. The potential for shrink-swell subsidence is considered to be negligible and this is accepted. It has now been confirmed that no trees will be removed as part of the proposals and the proposed basement will fall outside of the area of influence of the trees. It is considered that no changes will be made in the moisture content of the soil if any mature trees are removed.

1.14. Drawings of existing and proposed permeable and impermeable areas have now been provided. It is accepted that the change in the proportion of impermeable area is to be negligible.

1.15. Based on the information provided, "the expected water seepage towards the basement excavation is expected to be at a very low rate or volume". The BIA recommends dewatering of the basement through the use of pumps in the temporary condition and the installation of suitable sumps and pumps in the permanent condition.

1.16. A damage impact Category 1 (very slight) is predicted by the GMA. The revised GMA identifies a zone of influence and assess subsequent impacts for all structures within the identified zone. Suitable mitigation measures are proposed to reduce ground movements / damage impacts.

1.17. An outline construction programme suitable for Planning assessment was requested and has now been provided.

1.18. It is accepted that the development will not impact on the wider hydrogeology of the area.

1.19. Queries and requests for clarification were raised in the initial audit report which have since been resolved as discussed in section 4 and summarised in Appendix 2. It is accepted that the BIA and supporting documents adequately identify the potential impacts arising out of the basement proposals and describe suitable mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 5th October 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 12A Platt's Lane, London NW3 7NR (planning reference 2016/4899/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.

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 single storey basement extension with new patio area, new lightwells to the front and rear elevation, installation of glazed balustrade with handrail at ground floor level for means of access/exit to the proposed basement, replacement of ground floor front window with a new door, erection of brick pier and metal railing front boundary treatment, replacement of windows throughout and associated external alterations all associated with existing ground floor flat".*

2.6. CampbellReith accessed LBC's Planning Portal on 7th November 2016 and gained access to the following relevant documents for audit purposes:

- (Revised) Basement Impact Assessment Report (BIA) by Soils Ltd dated October 2016, Reference: 15655/BIA/Rev1.05.
- Structural Methodology Statement by Richard Tant Associates dated 15th August 2016, Reference: RT/SMS/4387.
- Planning Application Drawings consisting of:
  - Location Plan.
  - Existing and Proposed Plans and Elevations drawings (e.g. LP-01 Rev 01, EX-01 Rev 04, EX-02 Rev 04, EX-03 Rev 03).
- Suggested Method of Works by Richard Tant Associates dated 10th August 2016 (4387-SM03 and 4387-SM04).
- Design & Access Statement by XUL Architecture dated 3rd June 2016, Reference: Rev 00.
- Construction Management Plan revised 15th August 2016.
- Planning Statement by Boyer dated September 2016.
- Tree Survey Report by Wassells on 9th June 2016.
- Planning Comments and Responses.

2.7. Subsequent to the initial audit, supplementary information was received by email on 13th December 2016 and this information is as follows:

- Cover Letter by Soils Limited
- (Revised) Basement Impact Assessment Report (BIA) by Soils Ltd dated December 2016, Reference: 15655/BIA/Rev1.06.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	Yes	An outline works programme has now been 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	BIA section 4. Groundwater monitoring conducted.
Are suitable plan/maps included?	Yes	Suitable maps to justify screening provided.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	As above.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Relevant maps provided. Responses to question 6 and 7 provided.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Relevant maps provided, justification for 'No' responses provided as per CPG4.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Relevant maps provided, justification for 'No' responses provided as per CPG4 (see Audit paragraph 4.11).
Is a conceptual model presented?	Yes	BIA section 4.1
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Table 3.5

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Table 3.4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Table 3.3 recommends mitigation measures in agreement with SFRA, Section 6.5.
Is factual ground investigation data provided?	Yes	BIA section 4.0.
Is monitoring data presented?	Yes	BIA section 4.1.4.
Is the ground investigation informed by a desk study?	Yes	BIA section 2.
Has a site walkover been undertaken?	Yes	Section 2.2 and 8.4 of the BIA report.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The presence of basement at 10 Platt's Lane has now been confirmed.
Is a geotechnical interpretation presented?	Yes	BIA section 5.0.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Refer to Appendix E of the BIA report. See Audit Paragraph 4.13.
Are reports on other investigations required by screening and scoping presented?	N/A	
Are the baseline conditions described, based on the GSD?	Yes	Refer to Soils Limited cover letter (Ref 15655/CL) paragraph 18.
Do the base line conditions consider adjacent or nearby basements?	Yes	See Audit Paragraph 4.16.
Is an Impact Assessment provided?	Yes	Provided in the Revised BIA report.
Are estimates of ground movement and structural impact presented?	Yes	GMA data provided in BCP report Appendices H & I.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Site identified to be at very low risk of surface water flow and mitigation measures considered in Table 3.6 of the BIA report.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	
Has the need for monitoring during construction been considered?	Yes	BIA section 8.2.
Have the residual (after mitigation) impacts been clearly identified?	Yes	BIA section 9.0.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	BCP section 8 and Appendices H & I.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The proportional change of impermeable area is considered to be negligible. See Audit paragraph 4.11.
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 2?	Yes	BCP section 8 and Appendices H & I.
Are non-technical summaries provided?	Yes	Refer to Soils Limited cover letter (Ref 15655/CL).

4.0 DISCUSSION

4.1. The BIA has been prepared by Soils Ltd accompanied by a Structural Methodology Statement prepared by Richard Tant Associates. The input of a CGeol (Chartered Geologist) was required with respect to subterranean (groundwater) flow and has now been included.

4.2. The exiting site is a semi-detached three storey building which is to be redeveloped to comprise a new basement with rear sunken patio area and light wells to the front and east side of the building.

4.3. The ground investigation revealed Made Ground up to 1.40m below ground level (bgl) and Claygate Member beneath the Made Ground comprising soft to firm Clay extending to a depth of 6m bgl. Groundwater was recorded to depths ranging from 3.00m to 4.90m bgl.

4.4. The BIA has confirmed that the proposed basement will be founded within the Claygate Member and it will extend beneath the water table. The Claygate Member is classified as a Secondary 'A' aquifer and the underlying London clay is considered to be unproductive strata.

4.5. Relevant maps for the screening stage have been provided in Figures 12 to 22 of the BIA report.

4.6. The existing building comprises timber floors and load bearing masonry walls. The proposal is to construct a new single storey basement with an excavation of 3.7m below existing ground level. The new basement extends to the rear of the building to form a patio and extends to the front and north-east side to provide light wells.

4.7. The BIA confirmed that no trees will be removed as part of the proposals and the proposed basement will fall outside of the area of influence of the trees. The Tree Survey Report provided in Appendix J of the BIA, recommends removing two elderly trees and one Cherry tree. It is considered that no changes will be made in the moisture content of the soil if these trees are decided to be removed.

4.8. It has now been confirmed that the new basement will be outside the zone of the shrink/swell influence. A 'No' response to Question 7 of the Stability Screening is therefore acceptable.

4.9. The response to Question 10 of the Stability Screening has now been revised in the subsequent BIA report stating that due to "the low permeability of the Claygate Member, the expected water seepage towards the basement excavation is expected to be at a very low rate or volume". The BIA recommends dewatering of the basement through the use of pumps in the temporary condition and the installation of suitable sumps and pumps in the permanent condition.

4.10. Drawings of existing and proposed permeable and impermeable areas have now been provided in Appendix F of the BIA. It is acceptable that the change in the proportion of impermeable area is to be negligible.

4.11. The proposed construction method is reinforced concrete underpinned retaining walls with an internal cavity drain system. A number of internal load bearing ground floor walls are to be removed and replaced with a steel frame. Sketches to indicate the construction sequence and propping arrangements are provided.

4.12. Structural calculations on retaining wall design were requested and have now been provided in Appendix E of the BIA report. The calculations correspond to the recommended allowable bearing pressure of 95 kN/m^3 provided in section 6.1 of the BIA report.

4.13. Stiffness (Young's Modulus) values were requested and have now been provided in Table 7.1 of the BIA report. The Ground Movement Assessment considers the settlement due to underpinning on soils described as soft based on the parameters provided in Table 7.1.

4.14. Three trial pits were undertaken to investigate the existing building foundations. The trial pits indicated brick foundations to depths ranging from 0.28m and 0.57m bgl, overlying mass concrete. No foundation was observed in one of the trial pits at the front of the building.

4.15. Information was requested with respect to foundations at 10 Platt's Lane. It has now been confirmed that a basement is present but foundation depths are unknown. Therefore a maximum differential depth for the foundations has been assumed which is considered appropriately conservative.

4.16. Section 7 of the BIA indicate short term heave movements up to 4mm, long term movements up to 16mm and the settlement due to workmanship expected to be no more than 5mm using Oasys Pdisp. P-disp information is presented in Appendix H in order to verify the ground movements. These heave movements represent the maximum movements in the centre of the excavation, reducing to smaller values along the basement boundary. These movements were carried through to the damage impact assessment described in Section 8 of the BIA report.

4.17. The proposed basement is indicated to have a bathroom and therefore protection is required for the basement drainage system against flooding of the public sewers as stated in section 5.11 of the CPG4. Mitigation measures including the use of positively pumping devices (PPDs) and anti-flood valves will be fitted to contrast the risk of flooding as presented Section 2.3 of the BIA report

4.18. A damage impact Category 1 (very slight) is predicted in the GMA. Suitable mitigation measures to reduce ground movements/damage impacts are presented in Section 8.3 of the BIA report.

4.19. Following the revised GMA, the category of damage was reassessed and mitigation measures proposed in Section 8.3 were fed back into the GMA. The resultant predicted damage is not more than Category 0 based on the mitigation measures proposed.

4.20. It is accepted that the development will not impact on the wider hydrogeology of the area. The site is identified to be at a very low risk of surface water flooding. The BIA takes into account the use of temporary/permanent mitigation measures which are discussed in Table 3.6 in the BIA report.

4.21. An outline construction programme was requested and has now been provided.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by Soils Ltd accompanied by a Structural Methodology Statement prepared by Richard Tant Associates. The input of a CGeol (Chartered Geologist) was required with respect to subterranean (groundwater) flow and has now been included.

5.2. Relevant maps and justification for 'No' responses at the screening stage were required and have now been provided. The maps are included in Figures 12 to 22 of the BIA report.

5.3. The revised GMA identifies a zone of influence and subsequent damage impacts for all structures within the identified zone. Suitable mitigation measures are proposed to reduce ground movements / damage impacts.

5.4. Drawings of existing and proposed permeable and impermeable areas have now been provided. It is acceptable that the change in the proportion of impermeable area is to be negligible.

5.5. The BIA recommends dewatering of the basement through the use of pumps in the temporary condition and the installation of suitable sumps and pumps in the permanent condition.

5.6. It has now been confirmed that no trees will be removed as part of the proposals and the proposed basement will fall outside of the area of influence of the trees. It is considered that no changes will be made in the moisture content of the soil if any mature trees are decided to be removed.

5.7. An outline construction programme was requested and has now been provided.

5.8. It is accepted that the development will not impact on the wider hydrogeology of the area. The site is identified to be at a very low risk of surface water flooding. The BIA takes into account the use of temporary/permanent mitigation measures which are discussed in Table 3.6 of the BIA report.

5.9. It is accepted that the development will not impact on the wider hydrogeology of the area. The site is identified to be at a very low risk of surface water flooding. The BIA takes into account the use of temporary/permanent mitigation measures which are discussed in Table 3.6 in the BIA report.

5.10. Queries and requests for clarification were raised in the initial audit report which have since been resolved as summarised in Appendix 2. It is accepted that the BIA and supporting documents adequately identify the potential impacts arising out of the basement proposals and describe suitable mitigation.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	Author's qualification not in compliance with CPG4. See Audit paragraph 4.1.	Closed- CGeol included	19.01.17
2	BIA format	Works programme not provided	Closed-Provided in Appendix K	19.01.17
3	BIA Hydrology	Change in permeable/impermeable site area to be stated. Drainage proposals to meet LBC /TW attenuation requirements to be presented.	Closed- Provided in Appendix F	19.01.17
4	BIA Stability	Risk of shrink-swell not investigated.	Closed- Provided in the BIA Table 3.2, Question 7	19.01.17
5	Bia Stability	Further information to be provided regarding dewatering method with relevant mitigation measures and impact assessment.	Closed- Provided in the BIA Table 3.2, Question 10	19.01.17
6	BIA Stability	Status of the existing trees to be provided together and impact assessed.	Closed – Provided in the BIA Table 3.2, Question 6	19.01.17
7	Stability	Absence or presence of nearby basement to be confirmed and impact assessment updated, if required.	Closed- Provided in Soils Limited cover letter (Ref15655/CL), paragraph 18.	19.01.17
8	Stability	Neighbouring property foundations to be described or maximum differential depth assumed to be stated in assessments.	Closed- Provided in Soils Limited cover letter (Ref15655/CL), paragraph 18.	19.01.17
9	Stability	Ground movement calculations and input and output data from GMA modelling to be provided.	Closed- Provided in BIA Section 8 and Appendices H and I	19.01.17
10	Stability	Retaining wall design calculations required.	Closed- Provided in Appendix E	19.01.17

11	Stability	Stiffness parameters not provided.	Closed- Provided in the Bia report Table 7.1	19.01.17
12	Stability	Damage category to be provided for all properties within the zone of influence. Mitigation to be presented, if applicable.	Closed- Provided in BIA report Section 8.3	19.01.17

Appendix 3: Supplementary Supporting Documents

Cover Letter by Soils Limited

(Revised) Basement Impact Assessment Report (BIA) by Soils Ltd dated December 2016, Reference: 15655/BIA/Rev1.06.

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