

Flat A, 5 Mornington Terrace,  
London, NW1 7RR

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12466-41

Revision: D1

February 2017

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### Document Details

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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 Flat A, 5 Mornington Terrace, London NW1 7RR (planning reference 2016/5846/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 proposed development includes the extension of the existing basement to the rear of the property and erection of an upper ground floor rear extension.
- 1.5. The BIA has been prepared by Blue Engineering with supporting documents prepared by ZCD Architects. The author's qualifications for the BIA are not in accordance with CPG4 guidelines.
- 1.6. There are several omissions in the BIA: the Scoping process is absent and the Screening has not been informed by a desk study in line with GSD Appendix G1; no site investigation or interpretative geotechnical information is provided; outline design information is not provided.
- 1.7. The BIA states that the site lies directly on a designated non-aquifer, the London Clay. However, the Arup GSD Figure 16 indicates the site to be within an area of previously worked ground.
- 1.8. A site investigation appropriate to the scale of the proposed development should be undertaken to confirm ground and groundwater conditions. Sufficient insitu strength / density data should be provided to confirm bearing capacity for foundation design and stiffness parameters for ground movement assessments. Groundwater conditions should be considered in regards to both temporary and permanent works designs.
- 1.9. It is stated that there will be no change in impermeable site area, although this is unclear from the drawings presented. It is accepted that the scale of development is small, and any changes in impermeable site area will be small. However, an outline drainage plan should be provided demonstrating that discharge flows will be attenuated in line with LBC's and Thames Water's criteria.

- 1.10. Outline retaining wall design information should be presented. An outline temporary works scheme has been provided including sequencing and propping arrangements. Following site investigation, this should be updated, if required, to reflect the actual site ground and groundwater conditions.
- 1.11. Reference is made to lower ground floors on both sides of 5 Mornington Terrace, including assumed foundation depths. Adjacent foundation depths should be confirmed during the site investigation.
- 1.12. Damage impact to adjacent structures is stated to be Burland Category 0 to 1 (Negligible to Very Slight). The ground movement assessment should be provided indicating the effects of the excavation and the construction methodology, the zone of influence and the damage impact to structures within that zone.
- 1.13. An outline methodology and guidance for monitoring structural movements during construction is presented. This should be revised to reflect the actual ground / structural movements predicted in order to limit damage impact to the stated maximum of Category 1.
- 1.14. It is accepted that the site is at very low risk of surface water flooding.
- 1.15. It is accepted that the proposed development will not impact upon slope stability.
- 1.16. Assessments should be reviewed once the additional information required has been presented, and the impact assessment and mitigation proposals updated, as required.
- 1.17. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. Until the additional information requested has been provided it is not possible to assess whether the requirements of CPG4 have been met.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 11 January 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Flat A, 5 Mornington Terrace, London NW1 7RR, Camden Reference 2016/5846/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; and,
- 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: "Extension of existing basement to rear and excavation of 2 storey upper ground and lower ground floor rear extension. Alterations to lower ground floor front windows and reconfiguration of external front staircase".

The Audit Instruction also confirmed the proposal did not involve a listed building nor was it a neighbour of a listed building. The site is within Camden Town Conservation Area.

2.6. CampbellReith accessed LBC's Planning Portal on 20 January 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (reference 3134, Revision C) including drawings 3134-200 and 3134-201 dated 2 December 2016 by Blue Engineering.
- Design and Access Statement (project 1656) dated 25 October 2016 by ZCD Architects.
- Existing and proposed drawings dated 25 October 2016 by ZCD Architects.
- Comments and objections to the proposed development from local residents.

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	In accordance with CPG4 guidelines the authors should demonstrate relevant qualifications and experience in hydrology, hydrogeology and engineering geology.
Is data required by Cl.233 of the GSD presented?	No	Insufficient desk study information is provided as required in line with GSD Appendix G1 and data required by Cl.233 of the GSD has not been presented. Utility companies have not been approached with regards to underground infrastructure.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	The BIA is based on assumptions. Outline designs, movement and damage assessments, etc, required.
Are suitable plans/maps included?	No	A site location plan along with existing and proposed plans have been provided. However no further plans such as historical maps or geological maps are provided.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Insufficient plans and maps included.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	BIA report – section 3.3. No consultation of historical maps or geological maps, that indicate the site lies within an area of 'worked ground'.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	BIA report – section 3.2. No reference of appropriate mapping. The Screening process makes assumptions about the drainage design.

Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	BIA report – section 1.6 and 3.4. No reference of appropriate mapping. However, it is accepted the site has a very low risk of surface water flooding. The Screening process makes assumptions about the drainage design and discharge flow which require further assessment.
Is a conceptual model presented?	No	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Scoping not provided given that all responses to screening were 'No'. However, screening had not been informed by a desk study. Additional investigation is required to confirm the site ground conditions.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Scoping not provided given that all responses to screening were 'No'. However, screening had not been informed by a desk study. Additional investigation is required to confirm the site ground conditions.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Scoping not provided given that all responses to screening were 'No'. However, screening had not been informed by a desk study. Attenuation drainage references need further detailing to assess.
Is factual ground investigation data provided?	No	Within section 3 of the BIA, a reference is made relating to a BGS borehole log 150m from the site on Arlington Road. Site specific data should be provided.
Is monitoring data presented?	No	
Is the ground investigation informed by a desk study?	N/A	
Has a site walkover been undertaken?	Yes	

Item	Yes/No/NA	Comment
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 1.3 states that there are existing lower ground floors to both sides of 5 Mornington Terrace. Adjacent foundations / basement depths should be confirmed.
Is a geotechnical interpretation presented?	No	No site investigation provided or geotechnical data presented. Assumptions made on foundation bearing pressures.
Does the geotechnical interpretation include information on retaining wall design?	No	Retaining wall design referred to in section 4.3 and section 6 of BIA but no calculations provided.
Are reports on other investigations required by screening and scoping presented?	No	No site investigation provided.
Are baseline conditions described, based on the GSD?	No	No site investigation provided.
Do the base line conditions consider adjacent or nearby basements?	Yes	Adjacent foundations / basement depths should be confirmed.
Is an Impact Assessment provided?	No	
Are estimates of ground movement and structural impact presented?	Yes	Assessment calculations should be presented.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	No impact assessment submitted.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	A temporary works sequence indicating propping is presented, although without movement / damage assessments no conclusion can be reached as to adequacy. Groundwater and drainage have not been addressed.
Has the need for monitoring during construction been considered?	No	More information is required on the proposed construction including a construction programme in line with CPG4.

Item	Yes/No/NA	Comment
Have the residual (after mitigation) impacts been clearly identified?	No	Additional assessments required, as indicated.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	No structural calculations provided. Site investigation, ground movement assessment, damage impact assessments required.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Not proven. No proposed drainage plans have been provided. Attenuation in line with CPG4 3.51 should be proposed.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Further consideration of site conditions required. A ground movement assessment is required which should assess the impact on all of the structures within the zone of influence.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	However, no ground movement assessment has been provided with the report.
Are non-technical summaries provided?	No	However, the BIA is written so as to be understandable.

## 4.0 DISCUSSION

- 4.1. The BIA has been prepared by Blue Engineering with supporting documents prepared by ZCD Architects. The author's qualifications for the BIA are not in accordance with CPG4 guidelines. Evidence of appropriate qualifications and experience in hydrology, hydrogeology and engineering geology are required.
- 4.2. There is no development description within the BIA although the Design & Access statement and supporting plans show the proposed development to include the extension of the existing basement to the rear of the property and erection of an upper ground floor rear extension.
- 4.3. There are several omissions in the BIA: the Scoping process is absent and the Screening has not been informed by a desk study in line with GSD Appendix G1; no site investigation or interpretative geotechnical information is provided; outline design information is not provided. A Desk Study should provide all the relevant background information, including the site's history, the presence or absence of underground utilities or infrastructure, the presence or absence of listed buildings within the development's zone of influence, and details of slopes, geology, hydrogeological and hydrological conditions.
- 4.4. The BIA states that the site lies directly on a designated non-aquifer, the London Clay. However, the Arup GSD Figure 16 indicates the site to be within an area of previously worked ground. A site investigation in accordance with the GSD Appendix G2 and appropriate to the scale of the proposed development should be undertaken to confirm ground and groundwater conditions. The thickness of any worked ground and the presence of any perched groundwater should be assessed in terms of stability and hydrogeological impacts.
- 4.5. A site investigation should provide sufficient insitu strength / density data to confirm bearing capacity for foundation design and stiffness parameters for ground movement assessments. Groundwater conditions should be considered in regards to both temporary and permanent works designs. Groundwater monitoring should be undertaken as required to inform temporary works contingency planning and control of construction, and waterproofing design.
- 4.6. Geotechnical data should be presented in an interpretative report in accordance with GSD Appendix G3, including a conceptual site model.
- 4.7. It is stated that there will be no change in impermeable site area, although this is unclear from the drawings presented. It is accepted that the scale of development is small, and any changes in impermeable site area will be small. However, an outline drainage plan should be provided demonstrating that discharge flows will be attenuated in line with LBC's and Thames Water's criteria, in accordance with CPG4 Section 3.51.

- 4.8. Retaining wall design has been referred to in the BIA but no structural calculations have been provided. Outline retaining wall design information should be presented.
- 4.9. An outline temporary works scheme has been provided including underpinning sequencing and propping arrangements. Following site investigation, this should be updated, if required, to reflect the actual site ground and groundwater conditions. The potential for perched water above the London Clay should be considered, both in terms of permanent waterproofing grade and in the temporary case, for control of construction.
- 4.10. An outline construction programme should be provided.
- 4.11. Reference is made to lower ground floors on both sides of 5 Mornington Terrace, including assumed foundation depths. Adjacent foundation depths should be confirmed during the site investigation.
- 4.12. Damage impact to adjacent structures is stated to be Burland Category 0 to 1 (Negligible to Very Slight). However, no ground movement analysis (GMA) or damage impact assessment calculations has been presented for review and therefore there is no information on the indicative zone of influence of the development. The presence or absence of other nearby basements, underground structures or listed buildings within that zone should be confirmed.
- 4.13. A GMA should therefore be provided which should address both the excavation and construction methodology effects and assess the damage impact on all of the structures within the zone of influence (including the applicant's property, as a separate flat is indicated on the floor above the proposed development). In line with CPG4, where Category 1 or a higher damage category is identified, the BIA should provide mitigation measures to address ground movement.
- 4.14. An outline methodology and guidance for monitoring structural movements during construction is presented. This should be revised to reflect the actual ground / structural movements predicted to limit damage impact to the stated maximum of Category 1.
- 4.15. It is accepted that the site is at very low risk of surface water flooding.
- 4.16. It is accepted that proposed development will not impact upon slope stability.
- 4.17. Assessments should be reviewed once the additional information required has been presented, and the impact assessment and mitigation proposals updated, as required.
- 4.18. Non-technical summaries should be provided within any revisions to the BIA submitted.
- 4.19. Queries and matters requiring further information or clarification are summarised in Appendix 2.

## 5.0 CONCLUSIONS

- 5.1. The author's qualifications for the BIA are not in accordance with CPG4 guidelines. Evidence of appropriate qualifications and experience in hydrology, hydrogeology and engineering geology are required
- 5.2. The BIA should be informed by a desk study in line with the GSD Appendix G1 and a site investigation in line with Appendix G2. This should confirm foundation depths to adjacent properties.
- 5.3. Interpretative geotechnical information should be provided in accordance with the GSD Appendix G3, including a conceptual site model. Outline retaining wall design information should be provided.
- 5.4. An outline temporary works scheme has been provided. Following site investigation, this should be updated, if required, to reflect the actual site ground and groundwater conditions.
- 5.5. It is accepted that the site is at a very low risk of surface water flooding. An outline drainage plan incorporating attenuation proposals in accordance with CPG4 Section 3.51 should be presented.
- 5.6. Damage impact to adjacent structures is stated to be Burland Category 0 to 1 (Negligible to Very Slight). A ground movement assessment should be provided indicating the effects of the excavation and the construction methodology, the zone of influence and the damage impact to structures within that zone.
- 5.7. An outline methodology and guidance for monitoring structural movements during construction is presented. This should be revised to reflect the actual ground / structural movements predicted to limit damage impact to the stated maximum of Category 1.
- 5.8. It is accepted that the proposed development will not impact upon slope stability.
- 5.9. Assessments should be reviewed once the additional information required has been presented, and the impact assessment and mitigation proposals updated, as required.
- 5.10. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the additional information requested has been provided it is not possible to assess whether the requirements of CPG4 have been met.

## Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Richardson	Chairman of the Camden Town CAAC	13 <sup>th</sup> January 2017	Objection – the extension is too large.	N/A

## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Author's qualifications	The author's qualifications for the BIA are not in accordance with CPG4 guidelines.	Open – to be provided as 4.1	
2	Desk Study	Relevant information be provided in accordance with CPG4 / GSD G1	Open – to be provided as 4.2 to 4.4	
3	Site investigation	No site investigation or interpretative geotechnical information, no groundwater monitoring, in line with GSD G2 / G3	Open – to be provided as 4.4 to 4.6, 4.11	
4	Stability	Retaining wall designs, temporary works update, groundwater control, construction programme	Open – to be provided as 4.5, 4.8 to 4.11	
5	Surface Water Flow	Attenuation SUDS assessment	Open - to be provided as 4.7	
6	Stability	Ground Movement Assessment and Damage Assessment	Open – to be provided as 4.12 and 4.13	
7	BIA Format	Impact assessment should be presented for issues carried through scoping.	Open – to be provided	
8	BIA Format	Impact mitigation measures (e.g. GMA / damage impacts, drainage, groundwater control etc)	Open – to be provided	
9	BIA Format	Non-technical summaries	Open – to be provided	

## Appendix 3: Supplementary Supporting Documents

None

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