

**57 Cotleigh Road
London NW6 2NN**

**Basement Impact Assessment
Audit**

For

London Borough of Camden

Project Number: 12066-04

May 2015

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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 No. 57 Cotleigh Road (planning reference 2014/6309/P). The basement is considered to fall into 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 review it against an agreed audit check list.
- 1.4. It has not been possible to conclude whether the proposed basement will damage neighbours' properties or not because the Addendum to the Basement Impact Assessment does not consider the additional total and differential settlement of the underpinning panels due to the sequence of construction and the loading from the existing structure.
- 1.5. Section 1.1.1 of the Addendum to the Basement Impact Assessment states *"These preliminary analyses have not modelled the horizontal forces on the retaining walls, so have simplified the stress regime significantly."* Horizontal ground movements resulting from the excavation may induce damaging tensile strains within the neighbouring walls with differential horizontal ground movements between the corners of the proposed basement and the centre line. Consequently it has not been possible to conclude whether the proposed basement will damage neighbours' properties or not.
- 1.6. A revised Addendum document is required to complete this audit and to allow an assessment of the current ground movement predictions and building damage assessments. Until its receipt, it is not possible to accept the BIA statement that potential damage to adjoining properties will be Damage Category 1 – Very Slight. It is recommended that ground movement assessment also makes reference to any anticipated impact on 97 to 103 Kingsgate Road.
- 1.7. The BIA states that there are existing basements in the vicinity of No 57 Cotleigh Road but does not describe their impact, if any, on the conclusions regarding increased surface water run-off and modified groundwater flow.
- 1.8. The BIA states that the cellars upslope of No 57 Cotleigh Road will prevent the new basement from increasing the overall obstruction to the flow of perched groundwater. No information on these basements is presented to confirm whether the proposed basement will increase the

obstruction to groundwater flow or not. However as the site is underlain by 'Unproductive Strata', any such flows are likely to be of limited volume.

- 1.9. No 57 Cotleigh Road is situated close to Kingsgate Road, which is considered at high risk of flooding from surface water, and indeed flooded in 1975, and the BIA recommends non-return valves or a ground loop system should be fitted. Such a mitigation measure should be undertaken.
- 1.10. The BIA recommends that either the kitchen extension is built or that an upstand to the rear lightwell is provided. The BIA also recommends that a raised threshold to the patio doors is provided. These mitigation measures should be undertaken.
- 1.11. The BIA offers a pre-condition survey of No 55 Cotleigh Road together with monitoring. Dependent on the outcome of the revised ground movement assessment, it may be advisable to extend these to No 97-103 Kingsgate Road.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 20 May 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for No. 57 Cotleigh Road, Camden Reference 2014/6309/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 the "*Excavation to existing basement and excavation of rear lightwell*" and confirmed that the basement proposals did not involve a listed building nor did the site neighbour any listed buildings.
- 2.6. CampbellReith accessed LBC's Planning Portal on 22nd May 2015 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment Main Report
 - Basement Impact Assessment Addendum

- Basement Impact Assessment Geo-environmental Report
- Site location plan
- Elevation and Section drawing.

2.7. CampbellReith accessed LBC's Planning Portal on 22nd May 2015 and identified one resident's consultation comment as being pertinent to the audit of the BIA. The comment reviewed is summarised in Appendix A.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA page 3
Is data required by Cl.233 of the GSD presented?	Yes	BIA Sections 2 and 3, and Appendices A to F.
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 Sections 3 and 10.
Are suitable plan/maps included?	Yes	BIA Appendices D to F.
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	BIA Appendices B, D to F.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Sections 5 and 6, and Appendix E.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Sections 5 and 6, and Appendix E.
Is a conceptual model presented?	Yes	BIA Section 10
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	BIA Appendix C
Is monitoring data presented?	Yes	Standpipes monitored twice, see BIA section 9.8.
Is the ground investigation informed by a desk study?	Yes	BIA Appendices B, D, E, F
Has a site walkover been undertaken?	Yes	BIA section 1.3
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA section 2.9
Is a geotechnical interpretation presented?	Yes	BIA sections 9.4 to 9.13
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA section 10.4.10
Are reports on other investigations required by screening and scoping presented?	n/a	
Are baseline conditions described, based on the GSD?	No	
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	BIA Addendum
Are estimates of ground movement and structural impact presented?	Yes	But not deemed to be complete

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Incomplete ground movement analysis and building damage assessment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	BIA section 10.8.1
Has the need for monitoring during construction been considered?	Yes	BIA section 10.6
Have the residual (after mitigation) impacts been clearly identified?	No	Incomplete ground movement analysis and building damage assessment
Has the scheme demonstrated that the structural stability of the building and neighbouring properties maintained?	No	Incomplete ground movement analysis and building damage assessment
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?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Yes but based upon an incomplete ground movement analysis and building damage assessment
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The current BIA, and its supporting documentation, appear to be thorough and undertaken by competent persons.
- 4.2. The BIA provides information in section 2.9 of nearby properties that have basements. No information concerning the level of these basements relative to the proposals for 57 Cotleigh Road has been provided to support the inferred conclusion of the BIA that these will have no impact on the proposed basement at No 57 Cotleigh Road, and that the proposed basement at No 57 Cotleigh Road will not impact on the existing basements. Hence it is not possible to conclude whether the proposed basement will have any impact or not. However, the site is underlain by London Clay which is an 'Unproductive Stratum'. Any groundwater flows are therefore likely to be restricted to limited and impersistent perched water bodies in the Made Ground.
- 4.3. No calculations for stability of underpins below load bearing walls to the existing property, or of new retaining walls, to form the new basement have been provided. No information on the excavation and construction sequence for the underpins have been provided. Sections 10.4.3 to 10.4.5 of the BIA give general statements about contractor workmanship and competence but provide no site specific detail. It is understood that a contractor may not yet have been appointed but, as described in 4.4 below, it will be important to consider the underpinning sequence in the final design.
- 4.4. Traditional underpinning comprises the excavation and construction in bays of a new deepened foundation.
 - There will be additional settlement of the underpinning panels due to loading from the existing structure
 - There will be additional settlement of the underpinning panels due to overloading whilst the adjacent underpinning panels are being excavated
 - The effect of the particular underpinning sequence may result in differential settlement between the underpins at the end of their construction.
- 4.5. Section 1.1.1 of the Addendum to the basement impact assessment states "These preliminary analyses have not modelled the horizontal forces on the retaining walls, so have simplified the stress regime significantly." Horizontal ground movements resulting from the excavation cannot be ignored as these may induce damaging tensile strains within the neighbouring walls. Also it is likely that there will be differential horizontal ground movements between the corners of the proposed basement and along the line of the basement walls in-between the corners. Consequently it has not been possible to conclude whether the proposed basement will damage neighbours' properties or not.

- 4.6. A ground movement analysis should provide estimates of horizontal movement and its impact on adjoining properties, which has not been carried out to date, in addition to the assessment of vertical settlement. This should then allow agreement to be reached on the potential category of damage to adjoining properties.
- 4.7. The Addendum to the basement impact assessment, contrary to Section 1.1.1, does not state that the status of this ground movement analysis and impact assessment is preliminary and that the items described in clauses 4.3 to 4.6 will subsequently be considered as part of the design process. A revised Addendum document is required to complete this audit and to overcome concerns with the current ground movement predictions and building damage assessments. Until its receipt, it is not possible to accept the BIA statement that potential damage to adjoining properties will be Damage Category 1 – Very Slight.
- 4.8. No 57 Cotleigh Road is situated close to Kingsgate Road, which is considered high risk of flooding from surface water, and indeed Cotleigh Road flooded in 1975, and consequently the BIA recommends non-return valves or a ground loop system should be fitted. Such a mitigation measure should be undertaken.
- 4.9. The BIA recommends that either the kitchen extension is built or that an upstand to the rear lightwell is provided. The BIA also recommends that a raised threshold to the patio doors is provided. These mitigation measures should be undertaken.
- 4.10. The BIA offers that a precondition survey and regular monitoring should be carried out on the neighbouring property No. 55 Cotleigh Road. These should be undertaken to act as an early warning system against the occurrence of unexpected movement. It is recommended that the revised ground movement assessment considers the impact of excavation on 97 to 103 Kingsgate Road. Dependent on the findings, monitoring and condition surveys could be advisable for these buildings.
- 4.11. Apart from the previous comments, the BIA provides a comprehensive overview of the impact of the proposed basement at No 57 Cotleigh Road.

5.0 CONCLUSIONS

- 5.1. Additional information needs to be provided to enable confirmation that the BIA is fully compliant with the requirements of the London Borough of Camden.
- 5.2. Although it has not been possible to conclude whether the proposed basement will impact on local groundwater movement, any impacts are considered to be minor.
- 5.3. The BIA ground movement analysis addendum is incomplete ignoring both horizontal ground movements and the settlements of the new underpinning. This revised document is required to complete this audit and to overcome concerns with current settlement predictions. Until its receipt, it is not possible to accept the BIA statement that potential damage to adjoining properties will be Damage Category 1 – Very Slight.
- 5.4. No 57 Cotleigh Road is situated close to Kingsgate Road, which is considered high risk of flooding from surface water, and indeed Cotleigh Road flooded in 1975, and consequently the BIA recommends non-return valves or a ground loop system should be fitted. Such a mitigation measure should be undertaken.
- 5.5. The BIA recommends that either the kitchen extension is built or that an upstand to the rear lightwell is provided. The BIA also recommends that a raised threshold to the patio doors is provided. These mitigation measures should be undertaken.
- 5.6. The BIA offers that a pre-condition survey be undertaken at No 55 Cotleigh Road. This should be carried out. Dependent on the results of the ground movement assessment, this could be extended to Nos 97-103 Kingsgate Road.
- 5.7. The BIA offers that a set of monitoring targets may be installed onto the external walls with No. 55 Cotleigh Road. These should be installed to act as an early warning system against the occurrence of unexpected movement. Again this could be extended to Nos 97-103 Kingsgate Road.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Ruparelia	103a Kingsgate Road, London NW6 2JE	Uploaded 8.4.15.	Requires an independent structural report Requires confirmation no damage to his property Requires insurance to be provided	See 4.10 and 5.7 See 4.6, 5.3, 5.6 and 5.7. No response

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	The Addendum to the basement impact assessment does not consider the settlement of the underpinning panels	Revised ground movement and building damage assessment to be provided	
2	Stability	Horizontal ground movements induced from the excavation cannot be ignored as these may induce damaging tensile strains within the neighbouring walls. Also it is likely that there will be differential horizontal ground movements between the corners of the proposed basement and along the line of the basement walls in-between the corners	Revised ground movement and building damage assessment to be provided	
3	Stability	BIA offers survey and monitoring of neighbouring properties	Extent of condition surveys and monitoring regimes and trigger levels to be agreed with Party Wall Surveyor	N/A

Appendix 3: Supplementary Supporting Documents

None

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