

45 Highgate West Hill,  
London N6 6DB

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12985-78

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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 45 Highgate West Hill, London N6 6DB (planning reference 2019/4092/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 (BIA) 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 Geotechnical & Environmental Associates with supporting structural information provided by Momentum Engineering. The qualifications of the authors of the report prepared by GEA are in accordance with LBC guidance.
- 1.5. The site is occupied by a semi-detached four-storey Grade II listed house with two storey and single storey extensions. The proposal is to demolish the existing single storey side extension and construct a two-storey extension with single level basement.
- 1.6. The BIA includes the majority of the information required for a desk study in line with LBC guidance.
- 1.7. A site investigation has identified Made Ground over the Bagshot Formation and Claygate Member. No groundwater was encountered during the investigation nor during the one return monitoring visit. Further groundwater monitoring is recommended in the BIA. There will be no impact to the wider hydrogeological environment.
- 1.8. Geotechnical interpretation, including retaining wall design parameters, and outline temporary works information is provided.
- 1.9. Although a Ground Movement Assessment (GMA) concludes that a maximum of Category 1 damage (Very Slight) will be sustained by the Listed 45 Highgate West original structure, the impact assessment indicates potential for Category 2 damage (Slight) to be sustained. The GMA should be updated to include recommendations on limiting movements, as outlined in Section 4.
- 1.10. Further to 1.9, an outline methodology and guidance for monitoring structural movements during construction should be provided, including contingency response actions to mitigate movements / damage.

- 1.11. Highgate West Hill is within a Critical Drainage Area (Group 3-001) but the site is not located within a Local Flood Risk Zone. The site is at 'low' risk of flooding from surface water run-off. Standard flood risk mitigation measures should be adopted.
- 1.12. The proposed scheme will not increase the proportion of impermeable area at the site. There is no risk to the wider hydrological environment.
- 1.13. An outline construction programme should be provided.
- 1.14. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of CPG Basements.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 17<sup>th</sup> September 2019 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 45 Highgate West Hill, London N6 6DB, Camden Reference 2019/4092/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): Basements. March 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The Local Plan (2017): 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; 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 planning portal describes the proposal as: "*The erection of two storey brick side extension with basement and lightwells, part brick part glazed link to main house, creation of doors from windows and associated alterations, part demolition of existing extension.*"

The planning portal also confirmed the site lies within Highgate Village Conservation Area and the site is a Grade II listed building (understood to have been built c. 1729).

2.6. CampbellReith accessed LBC's Planning Portal on 20<sup>th</sup> September 2019 and gained access to the following relevant documents for audit purposes:

- Ground Investigation and Basement Impact Assessment Report (ref J19183, Issue no. 3) dated 6 September 2019 by Geotechnical & Environmental Associates Ltd (GEA).
- Existing and proposed elevations, plans and sections dated July 2019 by Chris Dyson Architects.
- Structural Stability Report dated 6 August 2019 by Momentum Engineering.
- Design and Access Statement (ref Rev 01) dated August 2019 by Chris Dyson Architects.
- Arboricultural Survey and Impact Assessment (ref AIA/MF/07719) dated 5 August 2019 by Marcus Foster Arboricultural Design & Consultancy.
- Consultation Responses 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?	Yes	
Is data required by Cl.233 of the GSD presented?	No	Outline construction programme to be presented.
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 plans/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	Existing and proposed elevations and plans.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA, Stability Screening Assessment, Section 3.1.2:
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA, Subterranean (groundwater) Screening Assessment, Section 3.1.1.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA, Surface Flow and Flooding Screening Assessment, Section 3.1.3.
Is a conceptual model presented?	Yes	Section 7.1 of BIA.



Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 4.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	The BIA has not identified that the site is within a Critical Drainage Area Group (as defined by LBC). The development will not result in an increase of hardstanding areas at the site.
Is factual ground investigation data provided?	Yes	BIA Report, Section 4.
Is monitoring data presented?	Yes	BIA Report, Section 5 and borehole logs. The BIA recommends further groundwater monitoring.
Is the ground investigation informed by a desk study?	Yes	BIA Report, Section 2.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	BIA Report, Section 2.3. However, conservative assumptions for stability assessment have been made. No groundwater impacts.
Is a geotechnical interpretation presented?	Yes	BIA Report, Section 10.
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA Report, Section 8.1.2.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Movement Analysis (Section 10 of BIA report) and Arboricultural survey and impact assessment.
Are baseline conditions described, based on the GSD?	Yes	

Item	Yes/No/NA	Comment
Do the baseline conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	BIA Report, Section 9.
Are estimates of ground movement and structural impact presented?	Yes	A Ground Movement Analysis has been provided within the BIA which includes the assessment of the subject site, 46 Highgate West Hill and 1 to 5 The Grove.
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?	Yes	A temporary works sequence indicating underpinning and propping is presented.
Has the need for monitoring during construction been considered?	No	Outline strategy including contingency actions to limit movement / damage to be provided.
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	See Section 4 – potential Burland Category 2 impacts.
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	See Section 4 – potential Category 2 impacts.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However, see Section 4 – potential Burland Category 2 impacts.

Item	Yes/No/NA	Comment
Are non-technical summaries provided?	Yes	

## 4.0 DISCUSSION

- 4.1. The BIA has been prepared by Geotechnical & Environmental Associates with supporting structural information provided by Momentum Engineering. The qualifications of the authors of the report prepared by GEA are in accordance with CPG guidelines.
- 4.2. The site is occupied by a semi-detached four-storey Grade II listed house with two storey and single storey extensions in the south and an associated garden in the north and west of the site. The proposed development is to demolish the existing single storey side extension to the main building and subsequently construct a two-storey extension with a single level basement. The new basement section will have a finished floor level approximately 2.80m below existing ground level (bgl) resulting in an excavation of approximately 3.20m bgl with formation level at approximately 125.30m OD.
- 4.3. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1. The BIA confirms that a search of all the local utilities and buried services was carried out prior to the site investigation.
- 4.4. There is a Thames Water covered reservoir adjacent to the south of the property. Momentum have contacted Thames Water to 'determine the approval process and are awaiting a response.'
- 4.5. Consultation of the 'Lost Rivers of London' map has confirmed that there are no rivers within the vicinity of the site nor any current surface water bodies.
- 4.6. A site investigation was undertaken by GEA in July 2019 comprising one borehole to a depth of 15.00m bgl and two windowless sampler boreholes to a depth of 5.00m bgl. The ground conditions comprise Made Ground (to a maximum depth of 2.40m) over the Bagshot Formation (to 13.40m) overlying the Claygate Member ( to 15.00m). No groundwater was encountered during the investigation nor during the one return monitoring visit.
- 4.7. The BIA report discusses the variable nature of the ground conditions and the potential for perched water to be present in the more permeable layers of the Bagshot Formation. The BIA recommends that a number of trial excavations are undertaken to depths as close to the full basement depth as possible, to provide an indication of the likely groundwater conditions. The BIA concludes that the monitoring of the standpipes also be continued. However, based on the dry conditions during the investigation and monitoring visit, it is accepted that there is no significant groundwater flow that would be impacted by the proposed works.
- 4.8. The basement will be single storey and will be formed within contiguous bored piled walls which will also be used to support the loads of the building.

- 4.9. The site investigation presents geotechnical interpretation including retaining wall design parameters. A conceptual model is discussed within the BIA text. Outline temporary works information is included in the Momentum Engineering Structural Stability Report.
- 4.10. The BIA assumes that neighbouring structures do not have basements. Whilst this has been disputed by neighbouring property owners, the assumption of no basement is considered conservative when considering potential stability issues.
- 4.11. The GMA considers the movements of the subject site, together with 46 Highgate West Hill and 1 to 5 The Grove. The damage impact assessment indicates potential for Burland Category 2 damage (Slight) to be sustained to the front façade of the original Listed section of no. 45. The BIA concludes that the wall will act as 'a more monolithic structure and the predicted differential movements are likely to be distributed across the entire length of the wall and therefore the predicted damage of Category 1 (Very Slight) will result.
- 4.12. Whilst the GMA concludes Category 1 damage will occur, the analysis indicating potential for Category 2 damage to the Listed structure should not be discounted. The GMA should include a statement on maximum allowable movements to maintain damage within Category 1. A monitoring strategy should be presented including trigger values and contingency response actions to ensure damage is limited to Category 1.
- 4.13. No impact assessment has been undertaken of the adjacent Thames Water covered reservoir. The Momentum Engineering report states that 'the proposed works will not affect the existing Thames Water reservoir structures' and that 'the works are carried out within the site footprint and predicted movements are minimal'. It is acknowledged that consultation with Thames Water is ongoing, and that assessment and asset protection criteria will be agreed.
- 4.14. Highgate West Hill is within a Critical Drainage Area (Group 3-001), although this was not identified within the BIA screening or scoping process. The site is not located within a Local Flood Risk Zone. The site is at 'very low' risk of flooding from surface water run-off and is not at risk from flooding from reservoirs. Highgate West Hill did not flood in 1975 or 2002. Standard flood risk mitigation measures should be adopted.
- 4.15. The proportion of impermeable site area will remain unchanged. There will be no impact to the hydrological environment. A final drainage design should be agreed with LBC and Thames Water.
- 4.16. Queries and matters requiring further information or clarification are summarised in Appendix 2.

## 5.0 CONCLUSIONS

- 5.1. The qualifications of the authors are in accordance with LBC guidance.
- 5.2. The ground conditions comprise Made Ground over the Bagshot Formation which is underlain by the Claygate Formation. Further groundwater monitoring is recommended in the BIA. It is accepted there will be no impact to the wider hydrogeological environment.
- 5.3. Geotechnical interpretation, including retaining wall design parameters and outline temporary works information is provided.
- 5.4. The GMA should be updated to include recommendations on limiting movements, as outlined in Section 4. Asset protection criteria should be agreed with Thames Water.
- 5.5. An outline methodology and guidance for monitoring structural movements during construction should be provided, including contingency response actions to mitigate movements / damage.
- 5.6. The site is at low risk of flooding from surface water run-off. Standard flood risk mitigation measures should be adopted.
- 5.7. The proposed scheme will not increase the proportion of impermeable area. It is accepted there is no risk to the wider hydrological environment.
- 5.8. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of CPG Basements.

## Appendix 1: Residents' Consultation Comments

Consultation Comments

Surname	Address	Date	Issue raised	Response
Trackman	Neighbour (address redacted)	30 <sup>th</sup> August 2019	<p>Mr and Mrs Trackman (address unknown as comment redacted) have confirmed that the rear of their property is close to the proposed works and that their property does include a basement although GEA have assumed that there is no basement at this address.</p> <p>The GEA report does state that 'Anecdotal evidence provided by the residents of Three Bells House indicates the property to have a single level basement beneath its entire footprint' which contradicts the GEA information provided in table on page 5 of the BIA but this does not appear to have been taken into account during the ground movement assessment.</p>	<p>Section 4 – conservative assumptions have been made in the stability assessment. There are no potential impacts with respect to subterranean flow.</p>



## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Land Stability	Ground Movement Assessment and Damage Assessment:  Whilst the GMA concludes Category 1 damage will occur, analysis indicates potential for Category 2 damage to the Listed original structure. The GMA should include a statement on maximum allowable movements to maintain damage within Category 1. A monitoring strategy should be presented including trigger values and contingency response actions to ensure damage is limited to Category 1.	Open	
2	BIA	An outline construction programme should be provided	Open	

## Appendix 3: Supplementary Supporting Documents

None

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