

109 King Henry's Road ,  
London NW3 3QX

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12336-60  
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Campbell Reith Hill LLP  
Friars Bridge Court  
41-45 Blackfriars Road  
London  
SE1 8NZ

T: +44 (0)20 7340 1700  
F: +44 (0)20 7340 1777  
E: [london@campbellreith.com](mailto:london@campbellreith.com)  
W: [www.campbellreith.com](http://www.campbellreith.com)

## Document History and Status

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## Document Details

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Author	F G Acheson BSc (Hons) MStructE AMICE
Project Partner	E M Brown, BSc MSc CGeol FGS
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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 109 King Henry's Road, London NW3 3QX (planning reference 2015/7091/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 review it against an agreed audit check list.
- 1.4. The Basement Impact Assessment (BIA) has been carried out by Soiltechnics with a review of the hydrology and hydrogeology by Chord Environmental Ltd. The individuals concerned in the production of these documents have suitable qualifications.
- 1.5. The proposed basement development consists of a single storey construction formed by lowering the existing ground floor by around 3.10m and extending it to the rear of the development site by around 6.00metres. It is also extended to the side towards no 111. It is proposed to underpin the existing walls where necessary and create a reinforced concrete box to form the basement. The basement will be founded in the London Clay.
- 1.6. In regard to the Slope Stability screening flowchart the responses to Q 6, 7 and 13 require further clarification as the Arboricultural Statement notes that there are trees to be removed (Q6), London Clay exhibits shrink / swell characteristics and requires consideration (Q7), and the basement is likely to increase the differential depth of foundations relative to adjacent properties (Q13).
- 1.7. The Subterranean (Groundwater) flow screening identified that the proportion of hard surface will increase as a result of the development and requires further consideration (Q4) .
- 1.8. The Surface Flow and Flood screening identified that the basement development will increase the extent of hard cover (Q3). Refer to 1.7 above.
- 1.9. Ground movements have been considered and calculations provided to assess the possible extent of damage. The calculations suggest that the damage, if realised, could fall into Category 2 of the Burland scale and mitigation measures have therefore been proposed. These comprise monitoring of the ground movements and adjusting the props should the movement measurements exceed 2 - 4 mm. It is noted that the extent of damage under the Burland Scale

is related to buildings in a sound condition. Condition surveys and monitoring should be agreed as part of the Party Wall award.

- 1.10. A Structural Design and Construction Statement has been prepared by Sinclair Johnston, Consulting Engineers, which provides information on the underpinning proposals and sequencing and the permanent basement construction. Regarding the construction sequence, the works to the rear bay window do not appear to be practical and more information is requested on how support to the bay window is maintained during the basement construction.
- 1.11. It is noted that the basement layout contains a bathroom and the basement drainage system will therefore require protection against surcharging of the public sewers.
- 1.12. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2.

## 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 11<sup>th</sup> May 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 109 King Henry's Road , London NW3 3QX , planning reference 2015/7091/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 '*Erection of a proposed side and rear extension and excavation of a basement level.*'
- 2.6. CampbellReith accessed LBC's Planning Portal on 23<sup>rd</sup> May 2016 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment Report (BIA)
  - Structural Design and Construction Statement (SDCS )

- Planning Application Drawings consisting of
  - Location Plan
  - Existing Plans
  - Proposed Plans, Elevations and Sections
- Design & Access Statement
- Arboricultural Statement
- CAAC Response

### 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?	Yes	Indicative construction programme is required.
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 plan/maps included?	Yes	Arup GSD maps with site location noted have been provided.
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	Responses to Q7,12 and 13 require further consideration although they have been answered as 'No'.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	The justification response reference for Q4 appears to be incorrect.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	The justification response references for Q4 and 5 appear to be incorrect. Clarification is required.
Is a conceptual model presented	Yes	BIA section 4.2.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Further information is required.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA section 13.1. Offsite surface water flows are to be restricted to the current level.
Is factual ground investigation data provided?	Yes	2 boreholes were sunk and 4 trial pits excavated.
Is monitoring data presented?	Yes	Monitoring has taken place.
Is the ground investigation informed by a desk study?	Yes	BIA section 3.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	It is noted in section 5.2.6 that it is understood that there are no adjacent basements but it is not confirmed.
Is a geotechnical interpretation presented?	No	Whilst the ground sequence is noted, no soil parameters for foundation or retaining wall design have been determined.
Does the geotechnical interpretation include information on retaining wall design	No	Refer to comments above
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural report provided.
Are the baseline conditions described, based on the GSD?	Yes	Generally the baseline conditions have been described. However there is no detailed information on the neighbouring properties.
Do the base line conditions consider adjacent or nearby basements?	No	It is stated that there are no adjacent basements but this is not confirmed.
Is an Impact Assessment provided?	Yes	Sections 11, 12 and 13 review the screening questions and provide commentary on the impacts.
Are estimates of ground movement and structural impact presented?	Yes	Some concerns on initial methodology indicated in the Sinclair Johnston Structural Design and Construction Statement.

Item	Yes/No/NA	Comment
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	Monitoring of ground movements is proposed.
Has the need for monitoring during construction been considered?	Yes	Details of typical monitoring regime are included in Sinclair Johnston's SDCS. There are differences between this document and the BIA section 5.2.6.
Have the residual (after mitigation) impacts been clearly identified?	NA	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Ground movement assessment has been provided. Stability of bay window to the rear of the property during basement construction requires clarification.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Statement in section 13.1.1 notes that flows offsite will be restricted. No details provided.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Ground movement assessment has been provided.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	GMA indicates that the damage will be no worse than Category 2 and mitigation measures including monitoring are proposed to restrict damage to no worse than Category 1.
Are non-technical summaries provided?	Yes	Refer to section 14 of the BIA

## 4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Soiltechnics with a review of the hydrology and hydrogeology by Chord Environmental Ltd. The individuals concerned in the production of these documents have suitable qualifications.
- 4.2. The LBC Instruction to proceed with the audit identified that the basement proposal did not border any listed buildings, although the BIA noted that the site is within the Elsworthy conservation area.
- 4.3. The proposed basement development consists of a single storey construction formed by lowering the existing ground floor by around 3.10m and extending it to the rear of the development site by around 6.00m. It is also extended to the side towards no 111. Existing walls are to be underpinned where necessary and a reinforced concrete box will be constructed to form the basement. No programme has been provided.
- 4.4. The BIA has identified that the site is underlain by Made Ground to a depth of 1.50m below which lies the London Clay Formation. Two boreholes were sunk which reached a depth of 7m and the London Clay was proved to the base of the boreholes.
- 4.5. Four foundation inspection pits were excavated, 3 of which related to the existing building and 1 along the boundary wall with no 111. The building foundations were between 0.23 – 0.55m below ground level and appear to be founded on Made Ground whilst the boundary wall foundation extended to 0.7m below ground level and again was indicated as being founded on Made Ground. The basement will be founded in the London Clay.
- 4.6. No groundwater was encountered in any of the inspection pits or boreholes and it is noted in the BIA (section 4.2.1) that no groundwater was observed in the standpipes on a return visit, although there are no further details provided to verify this.
- 4.7. Although physical works have been undertaken to determine the soil succession at the site, there has been no geotechnical interpretation undertaken to provide retaining wall design parameters or allowable bearing pressures. Some in-situ testing in the form of SPT / pocket penetrometer has been carried out. Given the nature of the soil encountered and the well known characteristics of the London Clay, it is considered that at this stage there is sufficient information for the BIA; however the final design of the structural elements may require more detailed works to be carried out.
- 4.8. Screening has been undertaken in accordance with the requirements of the GSD and written justification has been provided where the responses are 'No ' with reference to the relevant

maps included in the GSD. In addition some of these maps have been reproduced within the BIA with the site location marked on.

- 4.9. In regard to the Slope Stability screening flowchart, the responses to Q 6, 7 and 13 require further clarification as the Arboricultural Statement notes that there are trees to be removed (Q6), London Clay exhibits shrink / swell characteristics and requires consideration (Q7), and the basement is likely to increase the differential depth of foundations relative to adjacent properties (Q13).
- 4.10. The Subterranean (Groundwater) flow screening identified that the proportion of hard surface will increase as a result of the development and requires further consideration (Q4) although the BIA acknowledges that a flow restriction will be incorporated into the drainage.
- 4.11. The Surface Flow and Flood screening identified that the basement development will increase the extent of hard cover (Q3).
- 4.12. An arboricultural statement has been provided which noted that the impact of the proposed basement on the landscaping is limited and that the removal of a single tree in the rear garden – an ornamental pear – would not be significant. The effects of the removal of this tree on the development and neighbouring properties should be reviewed and any mitigation measures carried out.
- 4.13. Where the screening process has identified potential impacts, these have been reviewed in sections 11 - 13 of the BIA. However the queries noted in 4.10 – 4.12 above have not been addressed and require further clarification.
- 4.14. Ground movements have been considered and calculations provided to assess the possible extent of damage. The calculations are hand worked, and provide an assessment of the ground movements based on typical values in industry standard references. It is considered that the methodology gives conservative answers for the proposals although there appear to be some arithmetic errors in the calculations. The calculations suggest that the damage, if realised, could fall into Category 2 of the Burland scale and mitigation measures have therefore been proposed. These comprise monitoring of the ground movements and adjusting the props should be measurements exceed 2-4 mm. It is noted that the extent of damage under the Burland Scale is related to buildings in a sound condition. Condition surveys and monitoring should be agreed as part of the Party Wall award.
- 4.15. A Structural Design and Construction Statement has been prepared by Sinclair Johnston, Consulting Engineers, which provides information on the underpinning proposals and sequencing and the permanent basement construction. High and low level propping (both temporary and permanent) is identified and will need to be incorporated into the site works.

Regarding the construction sequence, the works to the rear bay window do not appear to be practical and more information is requested on how support to the bay window is maintained.

- 4.16. It is noted that the basement layout contains a bathroom and this means that the basement drainage system will require protection against surcharging of the public sewers. No information on how this is to be achieved has been provided and further details are required.
- 4.17. A non-technical summary has been provided in section 14.
- 4.18. It is accepted that there is no impact on slopes , nearby tunnels, hydrogeology and hydrology.

## 5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) has been carried out by Soiltechnics with a review of the hydrology and hydrogeology by Chord Environmental Ltd. The individuals concerned in the production of these documents have suitable qualifications.
- 5.2. The BIA has identified that the site is underlain by Made Ground to a depth of 1.50m below which lies the London Clay Formation.
- 5.3. No groundwater was encountered in any of the inspection pits or boreholes and it is noted in the BIA (section 4.2.1) that no groundwater was observed in the standpipes on a return visit.
- 5.4. In regard to the Slope Stability screening flowchart the responses to Q 6, 7 and 13 require further clarification as the Arboricultural Statement notes that there are trees to be removed (Q6), London Clay exhibits shrink / swell characteristics and requires consideration (Q7), and the basement is likely to increase the differential depth of foundations relative to adjacent properties (Q13).
- 5.5. The Subterranean (Groundwater) flow screening identified that the proportion of hard surface will increase as a result of the development and requires further consideration (Q4) although it is noted that there will be a flow restriction imposed on the drainage network.
- 5.6. The Surface Flow and Flood screening identified that the basement development will increase the extent of hard cover (Q3).
- 5.7. Ground movements have been considered and calculations provided to assess the possible extent of damage. It is considered that the methodology gives conservative answers for the proposals. The calculations suggest that the damage, if realised, could fall into Category 2 of the Burland Scale and mitigation measures have therefore been proposed comprising monitoring of the ground movements and adjusting props should the movement measurements exceed 2-4 mm.
- 5.8. Condition surveys and monitoring of the adjacent properties should be agreed as part of the Party Wall award.
- 5.9. A Structural Design and Construction Statement has been prepared by Sinclair Johnston, Consulting Engineers, which provides information on the underpinning proposals and sequencing and the permanent basement construction. High and low level propping (both temporary and permanent) is identified and will need to be incorporated into the site works. Regarding the construction sequence, the works to the rear bay window do not appear to be practical and more information is requested on how support to the bay window is maintained.

- 5.10. It is noted that the basement layout contains a bathroom and the basement drainage system will therefore require protection against surcharging of the public sewers. No information on how this is to be achieved has been provided and further details are required.

## Appendix 1: Residents' Consultation Comments

None

## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Indicative construction programme required	Open	
2	Stability	BIA states no trees to be removed but Arboricultural statement notes one tree removed . Clarification and assessment of potential impact required	Open	
3	Stability	London Clay is susceptible to shrink / swell . Clarify any impact	Open	
4	Stability	No information on adjacent properties foundations noted - clarify	Open	
5	Surface water / groundwater flow	Restriction of surface water runoff to existing rate – clarification required	Open	
6	Stability	What is sequence of works to ensure support – clarification required	Open	
7	Surface water	How will basement be protected from public sewer surcharging – clarification required	Open	

## Appendix 3: Supplementary Supporting Documents

None

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## London

Friars Bridge Court  
41- 45 Blackfriars Road  
London, SE1 8NZ

T: +44 (0)20 7340 1700  
E: [london@campbellreith.com](mailto:london@campbellreith.com)

## Birmingham

Chantry House  
High Street, Coleshill  
Birmingham B46 3BP

T: +44 (0)1675 467 484  
E: [birmingham@campbellreith.com](mailto:birmingham@campbellreith.com)

## Surrey

Raven House  
29 Linkfield Lane, Redhill  
Surrey RH1 1SS

T: +44 (0)1737 784 500  
E: [surrey@campbellreith.com](mailto:surrey@campbellreith.com)

## Manchester

No. 1 Marsden Street  
Manchester  
M2 1HW

T: +44 (0)161 819 3060  
E: [manchester@campbellreith.com](mailto:manchester@campbellreith.com)

## Bristol

Wessex House  
Pixash Lane, Keynsham  
Bristol BS31 1TP

T: +44 (0)117 916 1066  
E: [bristol@campbellreith.com](mailto:bristol@campbellreith.com)

## UAE

Office 705, Warsan Building  
Hessa Street (East)  
PO Box 28064, Dubai, UAE

T: +971 4 453 4735  
E: [uae@campbellreith.com](mailto:uae@campbellreith.com)

Campbell Reith Hill LLP. Registered in England & Wales. Limited Liability Partnership No OC300082  
A list of Members is available at our Registered Office at: Friars Bridge Court, 41- 45 Blackfriars Road, London SE1 8NZ  
VAT No 974 8892 43