

Branch Hill House, Hampstead Heath,  
London  
NW3 7LS

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12985-95

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March 2020

Campbell Reith Hill LLP  
12-15 Bermondsey Square  
London  
SE1 3UN

T: +44 (0)20 7340 1700  
E: london@campbellreith.com  
W: www.campbellreith.com

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Author	G Kite, BSc MSc DIC FGS
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 (BIA) submitted as part of the Planning Submission documentation for Branch Hill House, Hampstead Heath, London NW3 7LS, Camden Reference 2019/6354/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 Ridge & Partners LLP with supporting documents prepared by Stanhope Gate Architecture. In the revised BIA, the authors' qualifications have been demonstrated to be in accordance with LBC guidance in regards to land stability and hydrological assessments. Whilst the hydrogeological assessment has not been undertaken by a chartered geologist, considering the proposed development and monitored groundwater level, the assessment has been accepted.
- 1.5. The site currently comprises a three-storey manor house with a single storey basement and an abutting two-storey residential block constructed in the 1960s. The proposed development comprises the demolition of the 1960s structure and the construction of a new three to five storey block of residential dwellings with a single storey basement.
- 1.6. The site investigation and BIA have been informed by a desk study broadly in accordance with LBC guidance.
- 1.7. A site investigation indicates the ground conditions to comprise Made Ground underlain by the Bagshot Formation and Claygate Member. Groundwater was encountered during the investigation at significant depth.
- 1.8. The single storey basement to 3.50m bgl is to be formed with contiguous piled walls forming the retaining walls. Where the basement abuts Branch Hill House, the basement wall is to be formed by reinforced concrete underpinning. Interpretative geotechnical information and temporary works information are provided, including sequencing, propping and structural calculations.
- 1.9. A Ground Movement Assessment (GMA) is presented that considers the movements relating to the proposed basement construction and the impacts upon Branch Hill House (the manor house). A maximum of Category 0 (Negligible) damage is predicted, in accordance with the Burland Scale.

The GMA does not consider the impact from the proposed underpinning which could be significant. However, with the exception of the manor house, the surrounding buildings lie beyond the zone of influence of the basement.

- 1.10. The BIA provides a proposal for monitoring structural movements to ensure construction is controlled and impacts are limited to those predicted. This should be reviewed once an Engineer and Contractor are appointed.
- 1.11. A tributary of the lost River Westbourne runs to the south of the site in close proximity to the proposed development with a further tributary to the north. However, no evidence of these was found on site. The BIA concludes the basement will not encounter groundwater and contiguous piles will not significantly impede groundwater flow. The BIA concludes there will be no impact to the wider hydrogeological environment.
- 1.12. The site is identified as being at 'very low' risk of flooding.
- 1.13. The proposed scheme will increase the proportion of impermeable site areas. The BIA indicates that SUDS will be adopted to mitigate any impact to the hydrological environment and a drainage strategy is provided. Final proposed drainage design will require approval from LBC and Thames Water.
- 1.14. Discussion and requests for further information are presented in Section 4 and summarised in Appendix 2. Considering the revised submission, the BIA meets the criteria of CPG: Basements.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 23<sup>rd</sup> December 2019 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Branch Hill House, London NW3 7LS, Camden Reference 2019/6354/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.
- 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: "*Change of use of Branch Hill House from care home (Use Class C2) to residential (Use Class C3) to provide 34 residential units and associated external alterations, demolition of the 1960s care home extension and erection of replacement*

*building, including basement, comprising residential accommodation (Use Class C3), ancillary plant, access and servicing and car parking."*

- 2.6. The planning portal also confirmed the site lies within the Hampstead Conservation Area. The building on site is not listed but the Grade II listed Lodge House is located to the southeast of the site and the Grade II listed Branch Hill Estate (Spedan Close), a 1970s housing development, is located west of the subject building.
- 2.7. CampbellReith accessed LBC's Planning Portal on 10<sup>th</sup> January 2020 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment (version 2.0, project number 5008338) dated 5 December 2019 by Ridge & Partners LLP.
  - Ground Investigation Report (ref 5008338-RDG-XX-ST-DOC-C-00-GCA-01) dated July 2019 by Ridge & Partners LLP.
  - Existing and Proposed Plans, Elevations and Section drawings and Site Location Plan dated July and December 2019 by Stanhope Gate Architecture.
  - Ground Movement and Damage Impact Assessment by Ridge & Partners LLP.
  - Structural Engineer's Statement and Calculations by Ridge & Partners LLP.
  - Level 2 Flood Risk Assessment Report (ref 5008338-RDG-XX-ST-DOC-C-00-GCA-01) dated December 2019 by Ridge & Partners LLP.
  - Surface and Foul Water Drainage Strategy (ref 5008338-RDG-XX-XX-DOC-C-0001) dated December 2019 by Ridge & Partners LLP.
  - Utility and Infrastructure Consultations Report (ref 181044) dated January 2019 by Milieu Consult.
  - Design & Access Statement dated December 2019 by Stanhope Gate Architecture.
  - Arboricultural Impact Assessment Report (ref SHA 681) dated 6 December 2019 by Sharon Hosegood Associates.
  - Historic Environment Assessment (ref P18-263) dated 17 December 2019 by Museum of London Archaeology.

2.8. CampbellReith were provided the following relevant document for audit purposes on 21<sup>st</sup> February 2020:

- Basement Impact Assessment (version 1.1, project number 5008338) dated 21 February 2020 by Ridge & Partners LLP.



### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The land stability and hydrological assessments have been authored or reviewed by CEng MICE. Whilst the hydrogeological assessment has not been undertaken by a CGeol FGS, it is accepted.
Is data required by Cl.233 of the GSD presented?	Yes	
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	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 4.2.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 4.1.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Report, Section 4.3.
Is a conceptual model presented?	Yes	Described within the BIA text in sufficient detail.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 5.2 and 5.3.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 5.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Although not referred to in the Scoping section, the Surface and Foul Water Drainage Strategy states that a below ground attenuation tank will be included as part of the proposed development. A Flood Risk Assessment has been provided for review.
Is factual ground investigation data provided?	Yes	Ground Investigation Report dated July 2019 by Ridge & Partners LLP.
Is monitoring data presented?	Yes	Ground Investigation Report, Section 6.3 and Appendix 6.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Site walkover 14 <sup>th</sup> March 2019.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The adjacent manor house includes a single storey basement.
Is a geotechnical interpretation presented?	Yes	BIA Report, Section 7 and Ground Investigation Report, Section 8.
Does the geotechnical interpretation include information on retaining wall design?	Yes	

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Movement and Damage Impact Assessment, Structural Engineer's Statement and Calculations, Utility and Infrastructure Consultations Report, Flood Risk Assessment Report, Surface and Foul Water Drainage Strategy.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	BIA Report, Section 8.
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement and Damage Impact Assessment Report (BIA Report, Appendix 4). No assessment of underpinning presented.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	FRA and Drainage Strategy noted (not referenced at Scoping).
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Structural sequencing and propping; structural monitoring; SUDS strategy.
Has the need for monitoring during construction been considered?	Yes	BIA Report, Section 1.8 and 7.4.
Have the residual (after mitigation) impacts been clearly identified?	Yes	No impacts identified to surrounding environments or structures. GMA does not consider effects of underpinning on adjacent manor house, although this is owned by Applicant and is to be refurbished.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	No impacts identified to surrounding environments or structures. GMA does not consider effects of underpinning on adjacent manor house, although this is owned by Applicant and is to be refurbished.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	SUDS Strategy.
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 1?	Yes	GMA does not consider impacts from underpinning to adjacent manor house, although this is owned by the Applicant and will be refurbished.
Are non-technical summaries provided?	Yes	

## 4.0 DISCUSSION

- 4.1. The BIA has been prepared by Ridge & Partners LLP with supporting documents prepared by Stanhope Gate Architecture. In the revised BIA, the authors' qualifications have been demonstrated to be in accordance with LBC guidance in regards to land stability and hydrological Assessments. Whilst the hydrogeological assessment has not been undertaken by a chartered geologist, considering the proposed development and monitored groundwater level, the assessment has been accepted.
- 4.2. The site currently comprises a three-storey residential manor house with a single storey basement constructed in the 1860s and an abutting two-storey residential block constructed in the 1960s. At the rear of the plot (southwestern end) a car park basement is present below the garden. The proposed development comprises the demolition of the 1960s structure and the construction of a new three to five storey block of residential dwellings with a single storey basement beneath. The original Branch Hill House (manor house) will be preserved and renovated. The proposed development will be founded at around 3.50m below ground level (bgl).
- 4.3. The site investigation and BIA have been informed by a desk study broadly in accordance with the GSD Appendix G1. A Utility and Infrastructure Consultations Report has been prepared by Milieu Consult with regards to underground infrastructure.
- 4.4. Screening and scoping assessments have been undertaken. In the revised BIA, the scoping assessment has not considered the tributary of the lost River Westbourne to the south of the site, in close proximity to the proposed development, and the further tributary further to the north, both of which were identified by screening. However, it is accepted there is no evidence of these features in the site investigation.
- 4.5. An increase in impermeable site area, which is identified within the Drainage Strategy, has been referenced in the revised screening assessment although not further discussed. However, it is noted that mitigation in the form of SUDS is described within the drainage strategy.
- 4.6. A site investigation was undertaken in April 2019 comprising three cable percussive boreholes drilled to a depth of 30m bgl. The investigation identified varying thicknesses of Made Ground underlain by the Bagshot Formation (described as clayey, silty fine and medium sand interbedded with thinly bedded sandy clay) and the Claygate Member. Groundwater was encountered during the investigation at depths between 10.00m and 26.10m bgl. Subsequent monitoring identified groundwater at 8.20m bgl in BH03.
- 4.7. Interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented.

- 4.8. The single storey basement is to be formed with contiguous piled walls forming the retaining walls. Where the basement abuts Branch Hill House, the basement wall is to be formed by reinforced concrete underpinning. Temporary works information is provided, including sequencing, propping and structural calculations. It is noted that underpinning is proposed to be formed in three stages.
- 4.9. A Ground Movement Assessment (GMA) is presented that considers the movements relating to the proposed basement construction and the impacts upon nearby structures. Only the existing Branch Hill House is identified within the zone of influence of the works. A maximum of Category 0 (Negligible) damage is predicted, in accordance with the Burland Scale, although the GMA does not consider the impact from the proposed underpinning. Typically, expected vertical and horizontal movements from underpinning are in the region of 5mm to 10mm per stage, therefore the proposed three stages of underpinning may result in movements that will be significantly in excess of the current predictions. However, the building is owned by the Applicant, . It is not listed and it is understood that it will be entirely renovated.
- 4.10. The BIA provides a strategy for monitoring structural movements to ensure construction is controlled and impacts are limited to those predicted. This should be reviewed once the Engineer and Contractor are appointed.
- 4.11. It is accepted that the basement will not encounter groundwater and the contiguous piles will not significantly impede groundwater flow. The BIA concludes there will be no impact to the wider hydrogeological environment.
- 4.12. The site is not located within a Local Flood Risk Zone. The flood risk assessment (FRA) identifies the site as being at very low risk of flooding. The roads around Branch Hill House did not flood in 1975 or 2002.
- 4.13. The site is within a Critical Drainage Area (Group 3-010) and impermeable site area will increase, although this was not identified within the BIA scoping process. The BIA indicates that SUDS will be adopted to mitigate any impact to the hydrological environment and a drainage strategy is provided. Off-site drainage flow rates are indicated to be attenuated to a maximum of 2l/s. Final proposed drainage design will require approval from LBC and Thames Water. The BIA concludes the proposed development will not impact the wider hydrological environment.

## 5.0 CONCLUSIONS

- 5.1. In the revised submission, the qualifications of the authors for the land stability and hydrological assessments have been demonstrated to be in accordance with LBC guidance. The author of the hydrogeological assessment is not a chartered geologist. However, given the context of the proposals, the assessment is accepted.
- 5.2. A site investigation indicates the ground conditions to comprise Made Ground underlain by the Bagshot Formation and Claygate Member. The groundwater was monitored at 8.20m bgl, considerably below the proposed basement depth.
- 5.3. Geotechnical parameters for the design of the substructure and temporary works information are provided, including sequencing, propping and structural calculations.
- 5.4. A GMA is presented that predicts a maximum of Category 0 (Negligible) damage to the adjacent manor house. The GMA does not consider the impact from the proposed underpinning, which could be significant, but will not affect any other surrounding properties.
- 5.5. The structural monitoring strategy should be reviewed once the Engineer and Contractor are appointed.
- 5.6. The BIA concludes there will be no impact to the wider hydrogeological environment.
- 5.7. The site is identified as being at 'very low' risk of flooding.
- 5.8. The BIA indicates that SUDS will be adopted to mitigate any impact to the hydrological environment and a drainage strategy is provided. Final proposed drainage design will require approval from LBC and Thames Water.
- 5.9. Requests for further information are summarised in Appendix 2. Considering the revised submission, the BIA meets the criteria of CPG: Basements.

## Appendix 1: Residents' Consultation Comments

None



## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA Authors	Evidence of required qualifications and experience in ground engineering, engineering geology and hydrology.	Closed	March 2020

## Appendix 3: Supplementary Supporting Documents

None

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## London

15 Bermondsey Square  
London  
SE1 3UN

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

## Birmingham

Chantry House  
High Street, Coleshill  
Birmingham B46 3BP

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

## Surrey

Raven House  
29 Linkfield Lane, Redhill  
Surrey RH1 1SS

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

## Manchester

No. 1 Marsden Street  
Manchester  
M2 1HW

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

## Bristol

Wessex House  
Pixash Lane, Keynsham  
Bristol BS31 1TP

T: +44 (0)117 916 1066  
E: bristol@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: 15 Bermondsey Square, London, SE1 3UN  
VAT No 974 8892 43