

Garages to the South of 27a West End
Lane, NW6 4Q5

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13398-41
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Campbell Reith Hill LLP
15 Bermondsey Square
London
SE1 3UN

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

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Author	G Kite, BSc MSc DIC FGS MAPM
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 Garages to the South of 27a West End Land, NW6 4Q5 (planning reference 2020/2782/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 was prepared by Ridge and Partners LLP using chartered engineers to assess land stability and hydrology. The site investigation was prepared by a chartered geologist.
- 1.5. It is understood that a single storey basement is proposed and the BIA has confirmed that the proposed basement will be founded on London Clay. It is likely that perched water will be encountered during basement excavation.
- 1.6. It is understood that the excavation for the basement will be facilitated by a contiguous piled perimeter retaining wall, supported by temporary props. An outline retaining wall propping layout has been provided in the updated submission.
- 1.7. It was requested that the hydrogeological assessment be further clarified and approved by a suitably qualified individual. On the basis of the existing and proposed site conditions, the underlying unproductive strata and the concurring statements in the site investigation report and BIA, the hydrogeological assessment is accepted. There will be no impact to the wider hydrogeological environment.
- 1.8. In the updated submissions, the flood risk assessment has been amended. The site is at low risk of flooding. Attenuation SUDs will be implemented. There will be no impact to the wider hydrological environment.
- 1.9. Stability impacts are limited to excavation induced ground movements. Analysis has been undertaken of horizontal and vertical ground movements and predicts that damage to surrounding properties can be limited to Burland Category 0. Steps to control movements and outline mitigation measures are provided.
- 1.10. Requests for information are discussed in Section 4 and summarised in Appendix 2. Considering the updated submissions, the BIA meets the requirements of CPG: Basements.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 12th August 2020 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Garages to the South 27a West End Lane, NW6 4QJ (Planning reference: 2020/2782/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
- Camden Local Plan 2017 - Policy A5 Basements.
 - Camden Planning Guidance: Basements. March 2018
 - Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- 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 *"Demolition of existing garages and redevelopment of the site for residential use (Use Class C3) with associated amenity space, new landscaping, cycle store, bin store and other associated works."*
- 2.6. CampbellReith accessed LBC's Planning Portal on 3rd September 2020 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment prepared by Ridge and Partners LLP (dated June 2020), which includes the following reports:

- Site Investigation Report prepared by Soil Consultants (dated August 2017);
- Ground Movement Assessment prepared by Ridge and Partners LLP;
- Utility Records (dated August 2016);
- Flood Risk Assessment prepared by Create Consulting Engineers Ltd (dated September 2016).
- Design and Access statement prepared by Atomik Architecture (dated May 2020);
- SuDS Drainage Assessment with outline FRA prepared by Create Consulting Engineers (dated June 2020);
- Planning Application Drawings consisting of
 - Existing Plans: 0390(10)099, 0390(15)100;
 - Proposed Plans: 0390(20)105;
 - Proposed Elevation and Section: 0390(15)300 to 303, 0390(20)300G, 0390(20)301G, 0390(20)302E, 0390(20)303G, 0390(20)304, 0390(20)305, 0390(20)201H, 0390(20)202H, 0390(20)203F, 0390(20)204F.

2.7. CampbellReith were provided with the following relevant documents for audit purposes in November 2020:

- BIA Audit Responses prepared by Ridge and Partners LLP (dated 15 October 2020), which includes the following reports:
 - Flood Risk Assessment prepared by Create Consulting Engineers Ltd (dated June 2020).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Updated in current revision.
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 plan/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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	Section 1.6 and Section 8 of the BIA.
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	
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	Basements assumed to be absent for neighbouring properties.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	However, Young's Modulus (E) is absent.
Are reports on other investigations required by screening and scoping presented?	Yes	Site Investigation Report, Utility records. It is understood that a Condition Survey has been undertaken for nearby structures. The report has not been presented but a description of the properties is provided in the BIA.
Are the 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	

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	FRA presented in updated submission.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Section 7.4 of the BIA.
Has the need for monitoring during construction been considered?	Yes	Considered in Section 7.4 of the BIA.
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?	Yes	
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 1?	Yes	Predicted damage is limited to Burland Category 0.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Ridge and Partners LLP and the individuals concerned in its production have suitable qualifications to assess land stability and hydrology, but not hydrogeology as per the requirements of CPG.
- 4.2. In the updated submission, the BIA Audit Response states that the hydrogeological assessment should be reviewed by a Fellow of the Geological Society. CPG: Basements requires the review to be undertaken by a Chartered Hydrogeologist. It is noted that the site investigation report was prepared by a Chartered Geologist, which included a summary assessment on perched groundwater (as 4.10).
- 4.3. A Flood Risk Assessment report is included within the BIA, and has been carried out by Create Consulting Engineers Limited. This has been updated in the latest submission. The individuals concerned in its production have suitable qualifications.
- 4.4. It is proposed to demolish the existing block of garages and part of a paved car park area to facilitate the construction of a block of residential units, approximately 15m x 15m in area, comprising a basement and three storeys above.
- 4.5. The superstructure will be constructed from loadbearing masonry. The substructure will be embedded contiguous piled walls to 11m bgl around the perimeter, with their heads tied in by a capping beam at ground level. The basement slab will be suspended with a void former to accommodate heave. The maximum proposed excavation for the basement is 4m bgl. Temporary propping is also proposed to restrain movement of the perimeter walls during excavation.
- 4.6. The BIA has identified that the site is underlain by Made Ground to 2.20m bgl over London Clay proven to a depth of 15m bgl. Although groundwater was not encountered during drilling, subsequent monitoring of the standpipes recorded water levels to a shallowest depth of 0.58m bgl.
- 4.7. The BIA has identified that the site has perched groundwater in the Made Ground, is located 30m from an historic subterranean watercourse and that the lowest point of the basement may be close to/beneath mean water level of this historic watercourse. It is stated within the control of construction works that the removal of fines during dewatering will be minimised.
- 4.8. It is stated that the active '2 method' waterproofing system proposed for the basement, will help in mitigating the risk due to the subterranean watercourse. Dewatering during excavation is also proposed within the BIA. The updated submission confirms that the watercourse is no

longer in existence, having been culverted, and the proposed development will not impact any local watercourse.

- 4.9. It is stated that removal of Made Ground as part of the proposed works will mitigate localised risk and residual impact of the subterranean groundwater on the surrounding environment. This is further clarified in the updated submission, which states that: existing foundations surrounding the site already penetrate Made Ground, preventing flow of perched water and therefore the proposed development represents very little change to the existing situation; removal of Made Ground reduces the risk of any contaminants present leaching into soils and groundwater; and, the introduction of appropriate drainage (SUDs) will mitigate risk to both the hydrogeological and hydrogeological environments.
- 4.10. It was noted in the previous audit that the hydrogeological assessment had not been carried out/approved by a suitably qualified individual as per CPG requirements. On the basis of the existing and proposed site conditions, the underlying unproductive strata and the concurring statements in the site investigation report and BIA, the hydrogeological assessment is accepted. There will be no impact to the wider hydrogeological environment.
- 4.11. The original BIA had included a flood risk assessment that was not site specific. In the updated submissions, the flood risk assessment has been amended and is specific to the proposed development site. The site is at low risk of flooding. Attenuation SUDs will be implemented and an outline scheme is discussed, reducing off-site drainage flows in accordance with best practice, considering climate change. There will be no impact to the wider hydrological environment.
- 4.12. It is stated that there is a history of seasonal shrink-swell subsidence in the local area, the site is located within an area of previously worked ground, and that the development will significantly increase differential depth of foundations relative to neighbouring properties. It is also understood that the site is within 5m of highway/pedestrian right of way. These potential impacts have been assessed and mitigated, as required.
- 4.13. It is understood that no trees are proposed to be felled as part of the works. The BIA acknowledges presence of trees in adjoining gardens and describes measures to protect their roots. An arboricultural survey may be required during detailed design to confirm root protection measures.
- 4.14. It is accepted that there are no impacts to slope stability as the site does not include slopes, natural or manmade, greater than 7 degrees.
- 4.15. An outline design for steel sheet piling analysis and design is included in the BIA. However, it is understood that contiguous piled retaining wall is proposed. The ground and groundwater

assumptions made in the design of the wall are conservative. A development specific outline design of retaining wall was requested in the previous audit. An outline retaining wall propping layout has been provided in the updated submission which is sufficient to confirm assessment criteria.

- 4.16. It is stated that the proposed foundation and basement floor structures will incorporate void forming materials to accommodate any potential heave in the long term due to excavation.
- 4.17. A Ground Movement Assessment has been carried out for the installation stage and excavation stage of construction. Analysis has been undertaken of horizontal and vertical ground movements. Category 0 damage has been predicted based on the Burland scale and the methodology adopted for the assessment is accepted.
- 4.18. Section 7.4 of the BIA lists methods for 'Control of Construction Works' including condition survey before and after works. It is stated that Condition Surveys were undertaken for neighbouring structures. The report was not presented although the condition of the party walls is described in the BIA.
- 4.19. It is accepted that the proposed development will not affect land stability in the area, provided the control measures listed are adopted.

5.0 CONCLUSIONS

- 5.1. The BIA was prepared by Ridge and Partners LLP using chartered engineers to assess land stability and hydrology. The site investigation was prepared by a chartered geologist.
- 5.2. The BIA has confirmed that the proposed basement will be founded within London Clay. Perched water is present on site.
- 5.3. It is proposed to undertake the basement excavation following construction of contiguous pile perimeter retaining wall, supported with temporary props. An outline retaining wall propping layout has been provided in the updated submission.
- 5.4. On the basis of the existing and proposed site conditions, the underlying unproductive strata and the concurring statements in the site investigation report and BIA, the hydrogeological assessment is accepted. There will be no impact to the wider hydrogeological environment.
- 5.5. In the updated submissions, the flood risk assessment has been amended. The site is at low risk of flooding. Attenuation SUDs will be implemented. There will be no impact to the wider hydrological environment.
- 5.6. It is understood that no trees are proposed to be felled as part of the works and that appropriate root protection measures will be adopted during construction.
- 5.7. A ground movement assessment has been presented and was found to be appropriate for the development. Control measures are suggested to reduce ground movement during construction.
- 5.8. Requests for information are summarised in Appendix 2. Considering the updated submissions, the BIA meets the requirements of CPG: Basements.

Appendix 1: Residents' Consultation Comments

No relevant comments

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Hydrogeology assessment to be authored/ approved by a suitably qualified individual as required by CPG.	Closed	May 2021
2	Hydrogeology	Impact of development on the nearby water course to be assessed.	Closed	May 2021
3	Hydrogeology	Clarification sought on the statement: <i>"removal of Made Ground as part of the proposed works will mitigate localised risk and residual impact of the subterranean groundwater on the surrounding structure"</i>	Closed	May 2021
4	Hydrology	Confirmation required on whether the FRA is site specific and whether further mitigation measures are required.	Closed	May 2021
5	Stability	Outline design of contiguous pile retaining wall is requested.	Closed	May 2021

Appendix 3: Supplementary Supporting Documents

None

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