

58 Hillway,
London N6 6EP

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13398-98

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June 2021

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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 58 Hillway, London N6 6EP (planning reference 2020/5695/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 Soils Limited with supporting documents by The Basement Design Studio. The authors' qualifications are in accordance with the requirements of CPG guidelines.
- 1.5. The site is occupied by a three-storey detached property. The proposed development involves the construction of a full basement to an estimated 3.50m below ground level (bgl) under the footprint of the existing building plus lightwells extending beyond the existing external walls.
- 1.6. The BIA includes the majority of the information required from a desk study in line with LBC guidance. The presence of underground infrastructure within the development's zone of influence should be confirmed and impacts assessed, if required. A conceptual site model should be provided.
- 1.7. Screening responses should be clarified, as Section 4.
- 1.8. A site investigation was undertaken by Soils Limited in November 2020. The ground conditions comprise shallow Made Ground over the Claygate Member.
- 1.9. Groundwater was monitored at a depth of 2.17m bgl within the Claygate Member, based on only one groundwater monitoring visit. The BIA recommends additional groundwater monitoring, which should be undertaken.
- 1.10. The proposed basement development will be below the standing groundwater level. The presence and depth of surrounding basements has not been established. Groundwater control will be required during construction. Further assessment of the impacts to the hydrogeological environment is required.

- 1.11. Interpretative geotechnical information is presented. However, the final formation level should be confirmed to ensure a suitable foundation solution is proposed, noting the change in geotechnical parameters with depth in the Claygate Member.
- 1.12. Outline permanent and temporary structural proposals should be presented, including confirmation of formation levels, construction methods, sequencing and propping. Structural loads should be confirmed.
- 1.13. A Ground Movement Assessment (GMA) is presented which predicts a maximum of Category 1 (Very Slight) damage in accordance with the Burland Scale to the neighbouring property. This should be confirmed once the structural information requested has been provided, noting the queries in Section 4.
- 1.14. Hillway is within a Critical Drainage Area (Group 3-001). The BIA indicates that the impermeable site area will not increase as a result of the proposed development. The final drainage design should be approved by LBC and Thames Water.
- 1.15. 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. Standard flood risk mitigation measures should be adopted, such as non-return valves and raised above the external levels (lightwells).
- 1.16. 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 19th May 2021 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 58 Hillway, London N6 6EP, Camden Reference 2020/5695/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. January 2021.
- 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: *"Excavation of basement extension below footprint of building with front, rear and side lightwells, and associated alterations including external side access stair and new side entrance doors at basement level."*

The planning portal also confirmed the site lies within the Holly Lodge Estate Conservation Area but that the building is not listed.

2.6. CampbellReith accessed LBC's Planning Portal on 10th June 2021 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment and Ground Investigation (Ref 18781/BIA_R38) dated November 2020 by Soils Limited.
- Existing and proposed elevations, plans and sections dated October 202 by The Basement Design Studio.
- Design & Access Statement dated December 2020 by The Basement Design Studio.
- Construction Management Plan dated 7 December 2020 by Alex Painting and Amol Pisal.
- Comments and objections to the proposed development from local residents and the Holly Lodge Estate Conservation Area Advisory Committee.

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	Utilities and underground infrastructure in the vicinity of the site should be identified. A conceptual site model should be provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Outline structural information including retaining wall design and temporary works information have not been provided.
Are suitable plans/maps included?	No	Utilities and underground infrastructure in the vicinity of the site should be identified.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Maps and plans to describe the environmental setting are provided in the BIA. Utilities and underground infrastructure in the vicinity of the site should be identified.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 3.4, Table 3.3 of the BIA. The screening states that the site is not within a wider hillside setting in which the general slope is greater than 7°; however, the area immediately to the north of the site includes slopes of 7° to 10° and slopes of over 10°. No arboricultural assessment has been undertaken on site and therefore it is not known if any trees are to be felled as part of the proposed development. The presence of basements within the vicinity of the proposed development is unknown.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3., Table 3.2 of the BIA.

Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.2, Table 3.1 of the BIA.
Is a conceptual model presented?	No	A ground model is described in text. The conceptual model of the development is not presented. Strata, groundwater, existing and proposed development levels, relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Section 4.2, Table 4.1 of the BIA. Screening responses to be considered; further assessment to be presented, as required.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.2, Table 4.1 of the BIA. Further monitoring and assessment required.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.2, Table 4.1 of the BIA.
Is factual ground investigation data provided?	Yes	Section 5 of the BIA.
Is monitoring data presented?	Yes	Groundwater monitoring data is presented in Section 5.5 of the BIA. Further monitoring is recommended by the BIA and should be undertaken.
Is the ground investigation informed by a desk study?	Yes	No historical information provided as part of a desk study.
Has a site walkover been undertaken?	Yes	In conjunction with the site investigation.
Is the presence/absence of adjacent or nearby basements confirmed?	No	BIA assumes no basements are located beneath the neighbouring buildings. This may be conservative for ground movement assessment but is not conservative for hydrogeological assessment.

Item	Yes/No/NA	Comment
Is a geotechnical interpretation presented?	Yes	Section 5.6, 6 and 7 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Parameters provided for design. However, retaining wall proposals and formation levels not confirmed.
Are reports on other investigations required by screening and scoping presented?	No	An Arboricultural Assessment (or confirmation about whether trees are being felled) and a Construction Method Statement should be provided.
Are baseline conditions described, based on the GSD?	No	Hydrogeological conditions require further assessment. Formation levels and construction methodology to be confirmed.
Do the baseline conditions consider adjacent or nearby basements?	No	BIA assumes no basements are located beneath the neighbouring buildings. This may be conservative for ground movement assessment but is not conservative for hydrogeological assessment.
Is an Impact Assessment provided?	Yes	Section 8 of the BIA. However, not all potential impacts considered.
Are estimates of ground movement and structural impact presented?	Yes	Sections 9 and 10 of the BIA. Queries in Section 4.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Further information to be provided to allow assessments to be confirmed.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Further information to be provided to allow assessments to be confirmed.
Has the need for monitoring during construction been considered?	Yes	Monitoring is referred to in Section 8.2 of the BIA. This may require updating following updated assessments.
Have the residual (after mitigation) impacts been clearly identified?	No	Further information to be provided to allow assessments to be confirmed.

Item	Yes/No/NA	Comment
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Further information to be provided to allow assessments to be confirmed.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Hydrogeological assessment to be confirmed.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Hydrogeological assessment not accepted.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Further information to be provided to allow assessments to be confirmed.
Are non-technical summaries provided?	Yes	Section 11.2 of the BIA.

4.0 DISCUSSION

- 4.1. The BIA has been prepared by Soils Limited with supporting documents by The Basement Design Studio. The authors' qualifications are in accordance with the requirements of CPG guidelines.
- 4.2. The site is occupied by a three-storey detached property. The proposed development involves the construction of a full basement under the footprint of the existing building plus lightwells extending beyond the existing external walls to the south and east of the property. It is estimated that the proposed basement formation level depth will be no greater than 3.50m below ground level (bgl).
- 4.3. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1. The presence of underground infrastructure within the development's zone of influence should be confirmed and impacts assessed, if required.
- 4.4. A conceptual site model should be presented, annotated as required to indicate ground and groundwater conditions, existing and proposed development levels, relative levels of structures and utilities within the zone of influence, etc. Potential impacts and required mitigation
- 4.5. The Screening responses require the following clarifications:
- The BIA indicates that the site is within a 'wider hillside setting'. As such, any additional design requirements to mitigate potential impacts should be presented, as required.
 - The BIA states that it is 'unknown' whether any trees will be felled as part of the proposed development. This should be confirmed, and impacts assessed and mitigated, as required.
 - The BIA states that it is 'unknown' whether there is a history of shrink-swell subsidence in the area. Consultation responses allude to subsidence in neighbouring properties. Further assessment should be presented, and mitigation measures, if applicable.
 - Relevant mapping should be referenced in regard to the presence or absence of underground infrastructure.
 - The BIA assumes no basements are located beneath the neighbouring buildings. This may be conservative for ground movement assessment but is not conservative for hydrogeological assessment. The presence or absence of local basements should be confirmed.
- 4.6. A site investigation was undertaken by Soils Limited in November 2020, comprising two window sampler boreholes to a depth of 6.00m bgl, two dynamic probes (DPSH) to a maximum depth of 10.00m bgl and three trial pits for foundation inspection purposes. The ground conditions comprise shallow Made Ground (from ground level to depths ranging from between 0.65m and 1.30m bgl) over the Claygate Member to depth. It's noted that there is a discrepancy between the described soil strengths in the logs to the parameters presented in the ground model.

- 4.7. The BGS mapping data for the area indicates that the Claygate Member is designated a Secondary 'A' Aquifer. The monitoring data suggests that groundwater is present at a depth of 2.17m bgl within the Claygate Member. However, only one groundwater monitoring visit was undertaken (20 November 2020) when groundwater levels should be rising from their annual minimum (typically September). The proposed basement development will be at an estimated depth of 3.50m bgl and therefore below the standing groundwater level. The BIA recommends further groundwater monitoring and concludes that 'excavations beneath the groundwater table are likely to be unstable and dewatering of foundation trenches may be necessary'.
- 4.8. Further groundwater monitoring should be undertaken. Additionally, hydrogeological assessment should be presented that considers the potential impacts from both temporary (e.g. groundwater control during construction) and permanent works, including the presence or absence of neighbouring basements. It's noted that consultation responses refer to very shallow groundwater locally, observed on nearby developments, that should be considered.
- 4.9. Interpretative geotechnical information is presented. However, the final formation level should be confirmed to ensure a suitable foundation solution is proposed, noting the change in geotechnical parameters with depth in the Claygate Member. It's also noted that the presented allowable bearing capacities assume up to 25mm settlement will be allowable; however, settlement of this magnitude has not been considered in the stability assessment (ground movement assessment).
- 4.10. Outline permanent and temporary structural proposals should be presented, including confirmation of formation levels, construction methods, sequencing and propping. Structural loads should be confirmed. If groundwater control methods are to be implemented, these should be described, along with any potential impacts and mitigation measures. It's noted that the BIA makes reference to potential instability within the saturated Claygate Member during excavations.
- 4.11. A Ground Movement Assessment (GMA) is presented which predicts a maximum of Category 1 (Very Slight) damage in accordance with the Burland Scale to the neighbouring property. The following queries are raised:
- The GMA should be confirmed once the structural and construction methodology information requested has been provided.
 - The GMA methodology currently calculates lateral movements lower than currently anticipated for single storey basement construction. Noting the discussion within the BIA on potential instability of the saturated Claygate Member soils when excavating, a sensitivity analysis should be presented that indicates that reasonably conservative movements have been considered in any damage assessment.

- All structural walls within a 1mm ground movement contour line, the zone of influence of the proposed works, should be assessed. Any highways or underground structures within this zone should also be assessed.
 - For transparency, all GMA calculations should be provided for review.
- 4.12. An outline methodology and guidance for monitoring structural movements during construction should be provided. Outline discussion is already presented, but this may require further review once the GMA has been confirmed, sufficient to demonstrate works will be controlled to mitigate impacts in line with predictions.
- 4.13. Hillway is within a Critical Drainage Area (Group 3-001). The BIA indicates that the impermeable site area will not increase as a result of the proposed development. The final drainage design should be approved by LBC and Thames Water.
- 4.14. 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 with the road Hillway classified as 'low risk'. The site is not at risk from flooding from reservoirs. The site did not flood in 1975 or 2002. Standard flood risk mitigation measures should be adopted, such as non-return valves and raised above the external levels (lightwells).

5.0 CONCLUSIONS

- 5.1. The authors' qualifications are in accordance with the requirements of CPG guidelines.
- 5.2. The presence of underground infrastructure within the development's zone of influence should be confirmed and impacts assessed, if required. A conceptual site model should be provided.
- 5.3. Screening responses should be clarified, as Section 4.
- 5.4. A site investigation indicates the ground conditions to comprise Made Ground over the Claygate Member.
- 5.5. The BIA recommends additional groundwater monitoring, which should be undertaken. Further assessment of the impacts to the hydrogeological environment is required, as Section 4.
- 5.6. Interpretative geotechnical information is presented. However, clarifications are required, as Section 4.
- 5.7. Outline permanent and temporary structural proposals should be presented, including confirmation of formation levels, construction methods, sequencing and propping. Structural loads should be confirmed.
- 5.8. A Ground Movement Assessment (GMA) is presented. This should be confirmed, noting the queries in Section 4.
- 5.9. 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. Standard flood risk mitigation measures should be adopted.
- 5.10. Hillway is within a Critical Drainage Area (Group 3-001). The proposed development will not increase the impermeable area of the site. The final drainage design should be approved by LBC and Thames Water.
- 5.11. 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
Chaumeton	63 Hillway	24/01/21	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
Hendy	Not provided.	28/01/21	Concerns regarding hydrogeological impacts.	Queries raised in Section 4
Rogers	Not provided.	30/01/21	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
Sanders	54 Hillway	01/02/21	Reported subsidence of 54 Hillway. Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
Crowley	Not provided.	5/02/21	Reported subsidence risk. Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
Straker	Not provided.	06/02/21	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
Rattan	56 Hillway	08/02/21	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
Smith	Not provided.	11/02/21	Concerns regarding land stability.	Queries raised in Section 4
Elliot	Not provided.	13/02/21	Concerns regarding land stability.	Queries raised in Section 4
Rothenberg	Not provided.	14/02/21	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
M Narraway	Chair of Holly Lodge Estate Conservation Area Advisory Committee	Not provided.	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4

Fox	15 Makepeace Avenue	Not provided.	Concerns regarding land stability and hydrogeological impacts.	Queries raised in Section 4
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Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Desk Study	Underground utility and infrastructure information should be provided.	Open – to be provided as 4.3	
2	BIA Format	A conceptual model of the development should be presented. Strata, groundwater, existing and proposed development levels, relative levels of structures within the zone of influence should all be indicated in plan and section with relevant annotation.	Open – to be provided as 4.4	
3	Land Stability	Screening responses should be clarified, as Section 4.	Open – to be provided as 4.5	
4	Hydrogeology	The BIA recommends additional groundwater monitoring, which should be undertaken. Further assessment should be presented.	Open – to be provided as 4.8	
5	Land Stability	Interpretative geotechnical information is presented. However, the final formation level should be confirmed to ensure a suitable foundation solution is proposed, noting the change in geotechnical parameters with depth in the Claygate Member.	Open – to be provided as 4.9	
6	Land Stability	Permanent and temporary works information, including structural load, retaining wall construction methodology, temporary works sequencing and propping, planning for groundwater control etc.	Open – to be provided as 4.10	
7	Land Stability	GMA to be reviewed and updated	Open – to be provided as 4.11	
8	Land Stability	An outline methodology and guidance for monitoring structural movements during construction should be provided. Outline discussion is already presented, but this may require further review once the GMA has been confirmed, sufficient to demonstrate works will be controlled to mitigate impacts in line with predictions.	Open – to be provided as 4.12	

Appendix 3: Supplementary Supporting Documents

None

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