

**106 King Henry's Road
London NW3 3SL**

**Basement Impact Assessment
Audit**

For

London Borough of Camden

Project Number: 12727-13

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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 106 King Henry's Road, London NW3 3SL (planning references 2017/5122/P and 2017/6307/P). The applications are both current and the submissions for both have been considered within this audit. 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 difference between the 2no. current planning applications relates to the proposed construction methodologies: whilst both applications allow for retaining walls to be formed via underpinning, application 2017/6307/P requires partial demolition of the existing structure, namely the front and rear walls.
- 1.5. The BIA and Structural Strategy Report (SSR) have been prepared by engineering consultants Solid Geometry, supported by environmental and geotechnical consultants Soiltechnics Ltd. The individuals involved in the preparation or review of the documentation possess qualifications broadly in accordance with the requirements of CPG4.
- 1.6. The BIA has confirmed that the proposed basement will be founded within London Clay which was encountered beneath a layer of Made Ground. It is unlikely that significant quantities of ground water will be encountered during basement foundation excavation.
- 1.7. The basement is to be formed using underpinning techniques to construct the perimeter retaining walls. Suitable permanent and temporary propping arrangements are described. Outline calculations for retaining walls, slabs and foundations are required, with all assumptions clearly stated.
- 1.8. The GIR contains a geotechnical interpretation. Justification of the soil strength is required.
- 1.9. It is accepted that there are no potential impacts on subterranean flows and that surrounding slopes are stable. Potential impacts on and from surface water remain to be confirmed.
- 1.10. It is predicted that damage to neighbouring properties should not exceed Burland category 1 (very slight).

- 1.11. A draft construction programme should be presented.
- 1.12. Until the queries described in Section 4, and summarised in Appendix 2, have been addressed, it cannot be confirmed that the basement proposals comply with the requirements of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 10 November 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 106 King Henry's Road, London NW3 3SL. The 2no. current planning application (reference 2017/5122/P and 2017/6307/P) follow on from an earlier pre-application consultation (reference 2016/7024/Pre).

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.
- 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;
- 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 "*Excavation of single storey basement under existing house and rear courtyard; erection of first floor extension to infill rear and side roof terrace; replacement of all rear and side windows and doors; insertion of 3 x new rooflights to flat roof.*"

- 2.6. The Audit Instruction confirmed that the property is not a listed building; nor is it a neighbour to any listed buildings.
- 2.7. CampbellReith accessed LBC's Planning Portal on 9 January 2018 and gained access to the documents listed below for audit purposes. It should be noted that the documents were filed both under the pre-application consultation and current planning references.
- Basement Impact Assessment Report (BIA) by consulting engineers Solid Geometry Rev A, dated 30 August 2017 and Rev B, dated 4 October 2017, containing:
 - BIA screening, scoping and assessments by Soiltechnics Ltd (Rev 1)
 - structural proposals (description and sketches)
 - construction sequence (description and sketches)
 - underpinning principles
 - Ground Investigation Report (GIR) by Soiltechnics Ltd Rev 01, dated August 2017
 - Planning Application Drawings prepared by Johanna Molineus Architects consisting of:
 - location plan
 - existing plans and sections
 - proposed plans and sections
 - Design & Access Statement and Planning Statement by Johanna Molineus Architects.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	No evidence of involvement of chartered geologist, however hydrogeology screening completed satisfactorily and no impacts identified.
Is data required by Cl.233 of the GSD presented?	No	No programme provided. Screening with respect to flooding not completed so potential need for mitigation not closed out.
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?	No	Screening opinion incorrectly states basement proposals will not significantly increase differential depth of foundations relative to neighbouring properties. Nevertheless a ground movement and building damage assessment has been carried out.
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?	No	Screening assessment not complete (Q6 not addressed). No reference to SFRA.
Is a conceptual model presented?	Yes	

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Screening opinion incorrectly states basement proposals will not significantly increase differential depth of foundations relative to neighbouring properties. Nevertheless a ground movement and building damage assessment has been carried out.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Screening assessment not complete (Q6 not addressed). No reference to SFRA.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	No	GIR states that a standpipe installed was dry on a return monitoring visit.
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?	Yes	Nearby basements listed in DAS.
Is a geotechnical interpretation presented?	Yes	However, justification for assumed soil strength is required.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Although stiffness values not provided.
Are reports on other investigations required by screening and scoping presented?	No	Cannot be confirmed until surface water screening exercise completed. GIR advises consultation with arboriculturalist.
Are the baseline conditions described, based on the GSD?	No	Flood risk to be confirmed.

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	However, need or otherwise for Flood Risk Assessment to be confirmed.
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Cannot be confirmed until surface water screening exercise completed.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Cannot be confirmed until surface water screening exercise completed.
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	No	Cannot be confirmed until surface water screening exercise completed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Outline calculations for retaining walls, bearing pressures and slab to be provided.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Cannot be confirmed until surface water screening exercise completed.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Cannot be confirmed until surface water screening exercise completed.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	
Are non-technical summaries provided?	Yes	BIA contains Summary and Conclusions.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by engineering consultants Solid Geometry, supported by Soiltechnics Ltd. Whilst it is not shown that a chartered geologist was involved in the preparation of the documents, it is accepted that the hydrogeology screening exercise has been completed correctly and no impacts identified. The BIA contains descriptions and sketches relating to the temporary and permanent works sequencing and form of construction.
- 4.2. The difference between the 2no. current planning applications relates to the proposed construction methodologies: whilst both applications allow for retaining walls to be formed via underpinning, application 2017/6307/P requires partial demolition of the existing structure, namely the front and rear walls, which are to be propped in the temporary case.
- 4.3. A basement is to be formed beneath the entire property. The perimeter of the basement is to be formed by underpinning techniques to a depth of approximately 3.50m. Underpins are to be 350mm thick reinforced concrete with 400mm deep bases tied into a 400mm deep slab designed to accommodate heave. With the exception of an area of sunken courtyard, the underpins will be propped at high level in the temporary and permanent cases.
- 4.4. The BIA has identified the site to be underlain by London Clay beneath around 1m of Made Ground. Groundwater was encountered during the sinking of one of the two 5m deep exploratory holes at 4.45m depth. A subsequent monitoring visit (date not specified) is reported to have found the standpipe to be dry. Inspection pits revealed the foundations to the property to comprise a thin concrete strip over brick and concrete to 1.15m depth. The foundation to a garden wall was similar with a total depth of 0.60m.
- 4.5. The GIR contains a geotechnical interpretation including parameters for the design of the foundations and retaining walls. An undrained shear strength (C_u) of 100kN/m^2 is suggested for the London Clay, with settlement of 7mm predicted from the anticipated loads. However, this does not appear to be supported by the results of in situ testing which show C_u between 20 and 75 kN/m^2 in one of the exploratory holes and SPT N values typically of 8 and 11.
- 4.6. The screening assessment has identified that there are no potentially adverse impacts on subterranean (groundwater) flow. The subject site is not underlain by an aquifer and there is no change to the extent of impermeable areas. The site does not lie within the catchment of Hampstead, or any other, ponds and there are no existing or lost rivers in close proximity.
- 4.7. The screening assessment for surface water impacts has not been completed; the final screening question, which relates to flooding, has not been completed. Whilst the BIA text notes that the site is not within an area noted by the Environment Agency as having a

significant risk of flooding, there is no reference to the Strategic FRA for Camden, nor to historic flooding. The remainder of the screening is accepted but until the final question has been addressed, it is not possible to confirm that there are no potentially significant impacts to, or from, surface water.

- 4.8. With respect to stability, the BIA has identified and assessed a potential impact relating to the presence of London Clay. In the assessment, it notes that the basement lies outside the root zone of any nearby trees and vegetation and therefore it will have no impact. However, the GIR notes that an arboriculturalist should be consulted. The need for this should be clarified.
- 4.9. Whilst the BIA incorrectly states that the differential depth between the basement and adjacent foundations will not be significantly increased, the GIR does contain a ground movement and building damage assessment for 104 and 108 King Henry's Road. The construction sequence reflects that proposed by the engineer and the ground model is reasonable. It is predicted that damage can be limited to no worse than Burland category 1 by means of good workmanship and movement monitoring. The likelihood of heave within the excavation is noted and the structural engineer's description of the basement proposals includes the design of the basement slab to accommodate this.
- 4.10. It is accepted that there are no slope stability concerns regarding the proposed development.
- 4.11. Whilst sketches and text to show the construction of the temporary and permanent works are provided, there are no outline calculations to demonstrate the adequacy of the proposals such as retaining wall and slab calculations or the justification of the bearing resistance. These should be provided with all assumptions clearly stated.
- 4.12. The need for a movement monitoring strategy during excavation and construction is recognised and this should be developed for detailed design.
- 4.13. A draft construction programme should be provided.

5.0 CONCLUSIONS

- 5.1. The BIA, supporting GIR and assessments have been carried out by consulting engineers Solid Geometry, supported by Soiltechnics Ltd. The individuals concerned in their production possess qualifications broadly in accordance with the requirements of CPG4.
- 5.2. The difference between the 2no. current planning applications relates to the proposed construction methodologies: application 2017/6307/P requires partial demolition of the existing structure, namely the front and rear walls.
- 5.3. The BIA has confirmed that the proposed basement will be founded within the London Clay. It is to be confirmed whether an arboriculturalist is required as noted in the GIR. Significant quantities of groundwater are unlikely to be encountered during basement excavation.
- 5.4. The basement is to be formed using underpinning techniques to construct the perimeter retaining walls. Suitable permanent and temporary propping arrangements are described. The basement slab is to be designed to accommodate heave and it has been confirmed that there is sufficient resistance to buoyancy. Outline calculations for retaining walls, slabs and foundations are required, with all assumptions clearly stated.
- 5.5. The GIR contains a geotechnical interpretation. Justification of the soil strength is required.
- 5.6. It is accepted that there are no potential impacts on subterranean flows. Potential impacts on and from surface water remain to be confirmed.
- 5.7. An analysis has been undertaken of horizontal and vertical ground movements and it is predicted that damage to neighbouring properties should not exceed Burland category 1 (very slight).
- 5.8. No proposals are provided for a movement monitoring strategy during excavation and construction, nor is a programme presented. Whilst the former can be part of detailed design, a draft programme should be presented.
- 5.9. It is accepted that the surrounding slopes to the development site are stable.
- 5.10. Until the queries described in Section 4, and summarised in Appendix 2, have been addressed, it cannot be confirmed that the basement proposals comply with the requirements of CPG4.

Appendix 1: Residents' Consultation Comments

2017/5122/P: None

2017/6307/P: Over Page

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Kwok	104 King Henry's Road	December 2017	Concerned that demolition and construction will impact the party wall / neighbouring property.	Section 4 – structural calculations requested; damage controlled to within Category 1 feasible.
Berman	5 Lower Merton Rise	December 2017	Concerned that demolition and construction will impact the party wall / neighbouring property.	Section 4 – structural calculations requested; damage controlled to within Category 1 feasible.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Draft programme to be presented.		
2	Surface water	Screening to be completed and any necessary assessments and mitigation measures presented.		
3	Stability	Confirmation of requirement for arboriculturalist to be confirmed.		
4	Stability	Justification of soil strengths required.		
5	Stability	Outline calculations to justify retaining walls and slab design, and bearing resistance required.		

Appendix 3: Supplementary Supporting Documents

None

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