

Maryon House, 115-119 Goldhurst Terrace  
London, NW6 3EY

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12336-89  
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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 Maryon House, 115-119 Goldhurst Terrace, London NW6 3EY (planning reference 2016/3545/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 a firm of engineering consultants, Site Analysis Services Ltd. The authors of the BIA possess suitable qualifications that comply with the requirements of CPG4. The qualifications of the authors of the Structural Engineering Report should be confirmed.
- 1.5. It has been confirmed that the development site does not involve a listed building, or is in close proximity to a listed building.
- 1.6. The proposal includes the demolition of an existing four storey building and the construction of a new four storey building with a basement to provide 10 residential flats. The proposal also includes relandscaping the areas to the front and rear of the site.
- 1.7. The BIA has stated that the proposed basement will be approximately 4.0m below ground level and will be within the London Clay, which is present between 1.5m below ground level and up to the full depth of investigation of 20.0m below ground level. The London Clay is overlaid by the Made Ground.
- 1.8. It is noted from the BIA that groundwater was not encountered within the boreholes and trial pits during the site investigation works. The subsequent monitoring indicates that ground water was not present within the monitoring standpipe installed in borehole. However, water was present in the window sample holes at about 1.05m below ground level. It is likely that the water encountered in the window sample holes is surface water run-off perched on top of the London Clay.
- 1.9. It is accepted that there are no hydrogeological or hydrological concerns with respect to the development proposals.

- 1.10. The BIA states that the basement walls below the party walls with no.'s 113 and 121 Goldhurst Terrace will be reinforced concrete underpins and sit on mass concrete footing. The footings and the walls will be installed in a hit and miss sequence. The reinforced concrete walls will be fixed to the basement raft slab. Underpinning will also be used to construct the basement wall to the west and the wall is connected to the basement raft slab. To the east, the basement wall will be formed by a contiguous piled wall with reinforced concrete lining wall, designed to resist hydrostatic water pressures. Calculations for the reinforced concrete walls have been provided. However, calculations for ground bearing pressure and basement raft slab under superstructure loads and uplift forces from hydrostatic pressure and heave are not included.
- 1.11. It is noted that a full ground movement analysis has been carried out to assess the effect on the surrounding properties. The predicted damage category of the adjoining properties is generally Very Slight (Burland Category 1) or less, with two walls being predicted to suffer possible Category 1/Category 2 damage. Appropriate mitigation measures, and a temporary and permanent works methodology have been provided. Queries are raised with respect to the soil parameters adopted and the effects of long term heave.
- 1.12. It is noted that there are two trees to the front of the site and they have been considered in the design and method of construction of the proposed basement to minimise disruption to the tree roots.
- 1.13. It is accepted that the new development and associated basement is at low risk of flooding and with the implementation of SUDS at the site, there will be no increase in flood risk elsewhere as a result of the development.
- 1.14. 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 25 July 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Maryon House, 115-119 Goldhurst Terrace, London NW6 3EY, Camden Reference 2016/3435/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; 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 Audit Instruction described the planning proposal as "Construction of four storey residential building with basement to provide 10 residential units (2 x 1 bed, 5 x 2 beds and 3 x 3 beds), associated landscaping and refuse store to the front of the site following demolition of existing four storey residential building." The Audit Instruction also confirmed the property did not involve a listed building nor was a neighbour to a listed building.

2.6. CampbellReith accessed LBC's Planning Portal on 03 August 2016 and gained access to the following relevant documents for audit purposes:

- Planning Statement dated June 2016 by Savills.
- Basement Impact Assessment dated May 2016 by Site Analytical Services Ltd.

This report includes the following documents in the appendices.

- Appendix A: Ground Investigation Report
- Appendix B: Ground Movement Assessment
- Report on Phase 1 Risk Assessment dated May 2016 by Site Analytical Services Ltd.
- Design & Access Statement dated June 2016 by KSR Architects.
- Demolition Drawings, Existing Plan/Elevation Drawings, and Proposed Plan/Section/Elevation Drawings dated June 2016 by KSR Architects.
- Structural Engineering Report and Subterranean Construction Method Statement dated June 2016 by ElliottWood.
- Construction Management Plan dated May 2016 by Motion Ltd.
- Surface Water and Flood Risk Assessment dated 09 June 2016 by Water Environment Ltd.
- SUDS Drainage Statement dated 07 June 2016 by ElliottWood.
- Landscape Design Proposal dated 22 June 2016 by John Davies Landscape.

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Section 1.
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	See BIA and Structural Engineering Report.
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	See BIA Table 2.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Table 2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Table 2.
Is a conceptual model presented?	Yes	See Phase 1 Risk Assessment Report Section 9.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.



Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4. It is noted the BIA by Site Analytical Services Ltd does not include a scope for the item 3 identified in the screening section. However, a scope is included the Surface Water and Flooding Impact Assessment Section 2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4 and Surface Water and Flooding Impact Assessment Section 2.
Is factual ground investigation data provided?	Yes	See BIA Appendix A.
Is monitoring data presented?	Yes	See BIA Section 5.3 and Ground Investigation Report Appendix B.
Is the ground investigation informed by a desk study?	Yes	It is noted that the Ground Investigation was undertaken at about the same time as the Desk Study.
Has a site walkover been undertaken?	Yes	See Phase 1 Risk Assessment.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	See Planning Statement Section 2 and Ground Movement Assessment Section 1.
Is a geotechnical interpretation presented?	Yes	See BIA Sections 5 and 6, and Ground Investigation Report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See BIA Section 6.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation Report.
Are baseline conditions described, based on the GSD?	No	No reference to the GSD. However, Arup report has been mentioned in the BIA, Surface Water and Flood Risk Assessment, and Structural Engineering Report.

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	See BIA Section 7.
Are estimates of ground movement and structural impact presented?	Yes	See Ground Movement Assessment Report.
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	See Structural Engineering Report Section 8.
Has the need for monitoring during construction been considered?	Yes	See Structural Engineering Report Section 8.
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	See Structural Engineering Report and Ground Movement Assessment Report.
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	See BIA and Structural Engineering.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	See Ground Movement Assessment Report.
Are non-technical summaries provided?	Yes	See BIA Sections 3.9, 4.2, 5.6, 6.0, 7.0, and Structural Engineering Report 'Non-Technical Summary' Section.

## 4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been prepared by Site Analysis Services Ltd. The Structural Engineering Report has been prepared by structural and civil engineering consultants, ElliotWood. The authors of the BIA report have suitable engineering qualifications. However the details of qualifications of the individuals involved in the preparation of the Structural Engineering Report are unclear.
- 4.2. The proposal includes the demolition of an existing four storey building and the construction of a new four storey building with a basement to provide 10 residential flats. The proposal also includes re-landscaping the areas to the front and rear of the site. The adjacent buildings to the north-west and south-east of the proposed site are three storeys. It is understood that none of the adjacent buildings is known to have a basement.
- 4.3. A ground investigation has been undertaken to identify that the geology at the site consists of Made Ground up to 1.5m below ground level, underlain by London Clay up to the depth of investigation of 20m. The proposed basement will be founded within the London Clay Formation, which typically comprises stiff and very stiff silty sandy clay with an allowable bearing pressure of 165kN/m<sup>2</sup> at 3.0m depth. The BIA does not include an estimation of loading or check of the adequacy of the bearing stratum.
- 4.4. It is noted from the BIA that groundwater was not encountered within the boreholes and trial pits during the site investigation works. The subsequent monitoring, approximately 6 weeks after, indicates that groundwater was not present within the monitoring standpipe installed in borehole. However, water was present in the window sample holes at about 1.05m below ground level. It is likely that the water encountered in the window sample holes is surface water run-off perched on top of the London Clay. Perched groundwater could be encountered during basement excavation and the contractor should have a plan in place to deal with any perched groundwater inflows.
- 4.5. It is accepted that there are no hydrogeological or hydrological concerns with respect to the development proposals.
- 4.6. The BIA states that the basement walls below the party walls with no.'s 113 and 121 Goldhurst Terrace will be reinforced concrete underpins and sit on mass concrete footings. The footings and the walls will be installed in a hit and miss sequence. The reinforced concrete walls will be fixed to the basement raft slab. This type of construction should be agreed as part of the Party Wall award. Underpinning will also be used to construct the basement wall to the west and the wall is connected to the basement raft slab. To the east, the basement wall will be formed by a contiguous piled wall with reinforced concrete lining wall, designed to resist hydrostatic water pressures. Calculations for the reinforced concrete walls have been provided. However,

calculations for ground bearing pressure and basement raft slab under superstructure loads and uplift forces from hydrostatic pressure and heave are not included.

- 4.7. It is noted that a full ground movement analysis has been carried out to assess the effect on the surrounding properties. Whilst the selection of the soil stiffness is not considered appropriate to the excavation of a shallow basement in weathered London Clay, it is accepted that immediate heave outside the basement is likely to be small. Confirmation of the impact of any long term heave within and around the basement should be confirmed.
- 4.8. It is also noted that the predicted damage category of the adjoining properties is generally Very Slight (Burland Category 1) or less, although, for the rear walls of 111, 113 and 121-125 it is predicted as being on the boundary of Slight to Very Slight. Appropriate mitigation measures, and a temporary and permanent works methodology have been provided. The assessment recommends that consideration is given to the pre-loading of temporary props.
- 4.9. It is noted that there are two trees to the front of the site, which should be protected. They have been considered in the design and method of construction of the proposed basement to minimise disruption to the tree roots. It has been proposed that the underpins to the western perimeter will be excavated using hand tools to prevent excessive damage to the tree roots.
- 4.10. The Environment Agency flood zone maps indicate that the site is located in Flood Zone 1. It is accepted that the new development and associated basement is at low risk of flooding and with the implementation of SUDS at the site, there will be no increase in flood risk elsewhere as a result of the development.

## 5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) has been prepared by Site Analysis Services Ltd. The Structural Engineering Report has been prepared by a well-known firm of structural and civil engineering consultants, ElliotWood. The authors of the BIA report have suitable engineering qualifications. It is to be confirmed whether the qualifications of the individuals who prepared the Structural Engineering Report meet LBC requirements.
- 5.2. The proposal includes the demolition of an existing four storey building and the construction of a new four storey building with a basement to provide 10 residential flats. The proposal also includes relandscaping the areas to the front and rear of the site.
- 5.3. Ground investigation have been undertaken to identify that the geology at the site consists of Made Ground up to 1.5m below ground level, underlain by London Clay up to the depth of investigation of 20m. The proposed basement will be founded within the London Clay Formation.
- 5.4. Although, groundwater was not encountered within the boreholes and trial pits during the site investigation works, perched water was recorded on top of the London Clay.
- 5.5. It is accepted that there are no hydrogeological or hydrological concerns with respect to the development proposals.
- 5.6. The basement walls below the party walls with no.'s 113 and 121 Goldhurst Terrace will be reinforced concrete underpins on mass concrete footing installed in a hit and miss sequence. The reinforced concrete walls will be fixed to the basement raft slab. This type of construction should be agreed as part of the Party Wall award. Underpinning will also be used to construct the basement wall to the west, and a contiguous piled wall with reinforced concrete lining wall to the east. The walls are designed to resist hydrostatic water pressures. The BIA does not include an estimation of loading or check of the adequacy of the bearing stratum. Calculations for ground bearing pressure and basement raft slab under superstructure loads and uplift forces from hydrostatic pressure and heave are not included.
- 5.7. A ground movement analysis has predicted a damage category of typically Very Slight (Burland Category 1) or less to adjoining properties, with Slight damage being predicted to two walls. Appropriate mitigation measures and a temporary and permanent works methodology have been provided. Queries are raised with respect to the soil parameters adopted and the impact of heave.
- 5.8. It is accepted there are no slope stability concerns with respect to the development proposals.
- 5.9. It is noted that there are two trees to the front of the site. They will be protected and have been considered in the design and method of construction of the proposed basement.

- 5.10. It is accepted that the new development and associated basement is at low risk of flooding and with the implementation of SUDS at the site, there will be no increase in flood risk elsewhere as a result of the development.

## Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Caiden	Flat 2, 121 Goldhurst Terrace NW6 3EX	28/07/2016	Effects of basement excavation on the stability of the adjoining properties.	See 4.6-4.8
O'Hegarty	48 Canfield Gardens, NW6 3EB	26/07/2016	Effects on surface water and drainage.	See 4.5 & 4.9
Spencer	Charmondel Services Ltd, 23 King Street, SW1Y 6QY  Representation of the owner of Flat 1, 121 Goldhurst Terrace NW6 3EX	01/08/2016	Effects of basement excavation on the stability of the adjoining properties.	See 4.6-4.8



## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA Content	Confirmation that qualifications of authors/ reviewers of the Structural Engineering Report comply with requirements of CPG 4	Open, See 4.1	
2	Stability	Checking the adequacy of the bearing stratum and calculations of basement raft slab.	Open, See 4.6	
3	Stability	Soil stiffness parameters not considered appropriate. Long term heave to be confirmed.	Open, See 4.7 and 4.8	

## Appendix 3: Supplementary Supporting Documents

None

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