

12 Gloucester Gate, 12 & 13
Gloucester Gate Mews
London, NW1 4AD

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 12466-04
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October 2016

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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 Gloucester Lodge (12 Gloucester Gate, 12 & 13 Gloucester Gate Mews), London NW1 4AD (planning reference 2016/4549/P). The basement is considered to fall within Category C 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 proposed development involves substantial renovation to a terraced residential property and two mews properties situated to the rear. The development includes a new basement construction beneath the rear courtyard and mews buildings, to link with the existing lower ground floor of the main house.
- 1.5. The BIA has been prepared by Techniker Ltd with a supporting Site Investigation report prepared by GRM Development Solutions Ltd. The authors' qualifications are in accordance with the requirements of CPG4.
- 1.6. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1. The updated BIA submissions confirm that searches for underground transport infrastructure and utility assets have been undertaken.
- 1.7. The BIA states that the site lies directly on a designated non-aquifer, the London Clay, and is within an area at very low risk of surface water flooding. It is accepted that there is a very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment. However, the neighbouring property reports historical basement flooding. The updated BIA submissions do not identify the potential causes of flooding to the adjacent property but do provide details of mitigation incorporated into the design of the proposed development, in accordance with best practice.
- 1.8. The updated BIA submission confirms that the impermeable area of the site will slightly decrease due to the proposed development's basement roof slab being covered by 1.0m of topsoil, within the courtyard, and that discharge flow will remain at or slightly below existing levels.

- 1.9. The site is located within a Critical Drainage Area. As such, and in line with CPG4 (Section 3.51), a drainage solution would be expected incorporating attenuation SUDS to reduce peak discharge rates. Aside from incorporating 1.0m of topsoil above the basement roof slab in the courtyard, further attenuation schemes have not been proposed, and it is understood this is due to Heritage restrictions imposed on the site preventing SUDS to be incorporated at the front of the property.
- 1.10. A site investigation is presented. The exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying shallow Made Ground. Updated information provided within the revised BIA submissions presents an appropriate bearing capacity for the London Clay which will be confirmed, along with other geotechnical parameters, by additional site investigation at the rear of the property prior to construction. The updated BIA submissions present an appropriate conceptual site model.
- 1.11. Limited groundwater monitoring has been presented and the updated BIA submissions confirm that longer term groundwater monitoring will be undertaken.
- 1.12. The BIA includes a GMA which assesses that ground movements will be minimal and that Damage Impact in accordance with the Burland Scale will be Category 1 (Very Slight). The revised BIA submissions provide additional details, including defining a zone of influence and methodology of the assessment, which are considered appropriate.
- 1.13. Control of construction activities to mitigate ground movements, including an outline monitoring proposal, is presented in the BIA. The revised BIA submissions provide additional structural engineering assessments to demonstrate the feasibility of the basement proposals.
- 1.14. It is accepted that there are no potential impacts in relation to slope stability.
- 1.15. As proposed in the BIA, it is recommended that the ground and groundwater conditions are confirmed by the contractor further ground investigation and monitoring prior to construction. This may be closed out as part of the party wall negotiations.
- 1.16. Queries and matters requiring further information or clarification are summarised in Appendix 2. Subject to the confirmation of the assessments and design assumptions by long term groundwater monitoring and the additional site investigation, the criteria contained in CPG4 and DP27 have been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 31 August 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Gloucester Lodge (12 Gloucester Gate, 12 & 13 Gloucester Gate Mews), London NW1 4AD, Camden Reference 2016/4549/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: "*Erection of single storey extension connecting 12 Gloucester Gate to mews building; insertion of rooflight; excavation of basement to extend below rear courtyard and mews properties; remodelling of mews properties with sash windows at upper ground floor (facing courtyard), parapet height raised, and erection of hipped, pitched roof to 12 Gloucester Gate Mews following demolition of 12 and 13 Gloucester Gate Mews behind retained elevation facing Gloucester Gate Mews*".

2.6. CampbellReith accessed LBC's Planning Portal on 16 September and 21 September 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment, Screening and Scoping (ref 15060/01/04) dated 12 August 2016 by Techniker Ltd.
- Basement Impact Assessment, Addendum (ref 150600) dated 21 September 2016 by Techniker Ltd.
- Planning Statement dated August 2016 by Montagu Evans.
- Design and Access Statement dated August 2016 by Make Architects.
- Site Location Plan, Existing Plans and Elevations, Proposed Plans and Elevations, Demolition Plans and Sections dated July 2015 by Make Architects.
- Outline Construction Management Plan (ref 15060/05/02) dated 11 August 2016 by Techniker Ltd.
- Comments and objections to the proposed development from local residents.

2.7. CampbellReith were issued the documents listed below on 7 and 13 October 2016 for audit purposes. These are presented in Appendix 3 and considered in this revised audit report.

- Basement Impact Assessment, Addendum 02 (ref 15060) dated 4 October 2016 by Techniker Ltd.
- Basement Impact Assessment, Addendum 03 (ref 15060) dated 13 October 2016 by Techniker Ltd.

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?	Yes	The information is provided broadly in accordance with the guidelines. The presence of underground utility company assets has been provided in Addendum.
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	Underground utility infrastructure mapping has been provided in Addendum.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Underground utility infrastructure mapping has been provided in Addendum.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Underground utility infrastructure mapping has been provided in Addendum.
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	CSM has been provided in Addendum 03.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Updated information has been provided in Addendum.
Is factual ground investigation data provided?	Yes	Additional ground investigation is proposed in BIA Addendum to confirm geotechnical properties.
Is monitoring data presented?	Yes	One round of monitoring presented. Longer term monitoring is recommended.
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	Updated information has been provided in Addendum including relevant foundation / strata levels in CSM.
Is a geotechnical interpretation presented?	Yes	Updated information has been provided in Addendum including relevant foundation / strata levels in CSM.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Outline permanent retaining wall / underpin methodology presented and updated information has been provided in Addendum. The additional ground investigation proposed should inform the retaining wall parameters required.
Are reports on other investigations required by screening and scoping presented?	NA	None identified.

Item	Yes/No/NA	Comment
Are baseline conditions described, based on the GSD?	Yes	Updated information has been provided in Addendum.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Updated GMA has been provided in Addendum.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Updated information has been provided in Addendum.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Updated information has been provided in Addendum.
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	Yes	Updated information has been provided in Addendum.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Updated structural information has been provided in Addendum.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Addendum indicates minimum 1m soil above basement roof slab in courtyard.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Updated information has been provided in Addendum.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Updated GMA and damage impact methodology has been provided in Addendum.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment has been carried out by Techniker Ltd and the authors qualifications are shown as being suitable.
- 4.2. The proposals comprise the excavation of a single large basement beneath the rear garden and Nos 12 and 13 Gloucester Gate Mews. The basement will have a single storey approximately 5m deep. It is intended to form the basement using conventional underpinning techniques although mini piles are also considered for the new mews building.
- 4.3. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1. The updated BIA submissions confirm that searches for underground transport infrastructure and utility assets have been undertaken, and that there are no underground assets within the proposed development's zone of influence.
- 4.4. The BIA states that the site lies directly on a designated non-aquifer, the London Clay. In the absence of significant volumes of groundwater, it is accepted that there is very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment. Notwithstanding this, the updated BIA submissions confirm that longer term groundwater monitoring will be undertaken to confirm this assessment.
- 4.5. The site is within an area at very low risk of surface water flooding although it is situated within a Critical Drainage Area (CDA) and areas of low / medium surface water flood risk are indicated on the Environment Agency flood risk maps immediately adjacent to the development site at the Outer Circle and Gloucester Gate Mews. However, the site itself is not shown to be at risk.
- 4.6. The neighbouring property (14 / 15 Gloucester Gate Mews) reports historical basement flooding. The updated BIA submissions do not identify the potential causes of flooding to the adjacent property. However, the submissions confirm that the proposed development will be constructed to Grade 3 BS8102 waterproofing standard, with raised thresholds, perimeter drainage and sealed service penetrations. Assuming the works are undertaken in accordance with best practice then the risk of the proposed development being affected by surface water flooding is considered to be low.
- 4.7. The updated BIA submission confirms that the impermeable area of the site will slightly decrease due to the proposed development's basement roof slab being covered by 1.0m of topsoil, within the courtyard. The BIA indicates that peak run-off flows will be discharged to combined sewers, and discharge flow will remain at or slightly below existing levels, thereby avoiding any cumulative effects.

- 4.8. The site is located within a Critical Drainage Area, and in line with CPG4 (Section 3.51), a drainage solution incorporating attenuation SUDS to reduce peak discharge rates would be expected. CPG4 indicates that only where attenuation SUDS cannot be practically implemented will direct discharge to sewers be approved. Aside from incorporating 1.0m of topsoil above the basement roof slab in the courtyard, further attenuation schemes have not been proposed, and it is understood this is due to Heritage restrictions imposed on the site preventing SUDS to be incorporated at the front of the property.
- 4.9. Whilst it is not considered likely that surface water drainage from the site is directly attributing to any historical flooding encountered at the adjacent property, the incorporation of 1.0m of topsoil above the basement roof slab and replacement of existing drainage with new during the redevelopment should provide betterment to the existing situation.
- 4.10. A site investigation is presented. The exploratory works undertaken identify the London Clay as the bearing formation for the proposed foundations, underlying shallow Made Ground. Interpretative geotechnical information and a more comprehensive conceptual site model is presented in the updated BIA submissions. Considering the change in elevations between the front of the property, where the borehole was formed, and the rear of the property where the basement is to be constructed, the bearing capacity presented is reasonable for the rear of the property i.e. 4m to 5m bgl = +4.4 to +3.4m OD, with a bearing capacity of 110kN/m². The revised BIA submissions confirm that additional ground investigation and insitu testing will be taken at the rear of the property to confirm geotechnical parameters prior to construction.
- 4.11. As noted above, it is suggested that the majority of the new basement walls will be formed by underpinning techniques with piling also being considered for the mews building. The revised BIA submissions provide additional structural engineering assessment which outlines the sequencing and confirms the requirement for stiff propping and close monitoring of works during construction. Design loads, assumptions and sketches are presented to demonstrate the feasibility of the basement proposals.
- 4.12. The BIA includes a Ground Movement Assessment (GMA) which assesses that ground movements will be minimal and that Damage Impact in accordance with the Burland Scale will be Category 1 (Very Slight). The revised BIA submissions provides additional details, including defining a zone of influence, and methodology of the assessment, which are considered appropriate. Control of construction activities to mitigate ground movements, including an outline monitoring proposal, are presented in the BIA.
- 4.13. It is accepted that there are no potential impacts in relation to slope stability.

5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment has been carried out by Techniker Ltd and the authors qualifications are shown as being suitable.
- 5.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1. The updated BIA submissions confirm that there are no underground assets within the proposed development's zone of influence.
- 5.3. The site lies directly on London Clay, and is within an area at very low risk of surface water flooding. It is accepted that there is very low risk of groundwater flooding at the site or impact to the wider hydrogeological environment.
- 5.4. Although the site itself is not identified as being at risk, neighbours have reported flooding. The updated BIA submissions do not identify the potential causes of flooding to the adjacent property. Whilst it is not considered likely that surface water drainage from the site is directly attributing to any historical flooding encountered at the adjacent property, the incorporation of 1.0m of topsoil above the basement roof slab and replacement of existing drainage with new during the redevelopment should provide betterment to the existing situation.
- 5.5. As the site is located within a Critical Drainage Area, and in line with CPG4 (Section 3.51), a drainage solution would be expected incorporating attenuation SUDS to reduce peak discharge rates. Aside from incorporating 1.0m of topsoil above the basement roof slab in the courtyard, further attenuation schemes have not been proposed, and it is understood this is due to Heritage restrictions imposed on the site preventing SUDS to be incorporated at the front of the property.
- 5.6. The bearing formation for the proposed foundations comprises London Clay, underlying shallow Made Ground. The revised BIA submissions clarify the Conceptual Site Model and the bearing capacity of the London Clay is considered acceptable at foundation level for outline assessment purposes. As proposed in the BIA Addendum, additional site investigation to confirm geotechnical parameters at the rear of the property should be undertaken prior to construction.
- 5.7. A suitable Conceptual Site Model has been presented for review in the revised BIA submissions.
- 5.8. The revised BIA submissions provide appropriate structural engineering assessment which outlines the sequencing and confirms the requirement for stiff propping and close monitoring of works during construction. Design loads, assumptions and sketches are presented to demonstrate the feasibility of the basement proposals.
- 5.9. A Ground Movement Assessment (GMA) indicates ground movements will be minimal and that Damage Impact in accordance with the Burland Scale will be Category 1 (Very Slight). The

revised BIA submissions provide additional details, including defining a zone of influence, and methodology of the assessment, which are considered appropriate. Control of construction activities to mitigate ground movements, including an outline monitoring proposal, are presented in the BIA.

- 5.10. Limited groundwater monitoring has been presented. The BIA addendum confirms that more long term monitoring will be provided, together with further intrusive investigation. This may be closed out as part of the party wall award negotiations.
- 5.11. Queries and matters requiring further information or clarification are summarised in Appendix 2. Subject to the confirmation of the assessments and design assumptions by long term groundwater monitoring and the additional site investigation, the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Novotny	14-15 Gloucester Gate	07/09/16	Wider hydrogeological and hydrological impacts caused by the development including flooding of adjacent properties (flooding reported on the property at basement level).	4.4 – 4.9

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Desk Study	Enquiries with relevant utility companies to identify potential for underground infrastructure beneath the site / within the zone of influence should be appended (and impact assessment updated, if applicable).	Closed – provided in BIA Addendum	October 2016
2	Land Stability	The BIA should present a conceptual site model indicating site elevations, proposed development elevations, adjacent structures information, ground and groundwater conditions.	Closed – provided in BIA Addendum	October 2016
3	Land Stability	Geotechnical Parameters in line with the GSD Appendix G3 should be presented. Stiffness / Strength of the London Clay should be discussed with reference to site specific insitu test results.	The geotechnical parameters presented in BIA Addendum 02 are not considered representative. However, the design bearing capacity assumed in Addendum 03 and for the GMA are considered appropriate. Geotechnical parameters to be confirmed by additional SI prior to construction.	October 2016
4	Groundwater	Long term groundwater monitoring should be undertaken.	-	To be closed out as part of party wall award
5	Surface Water Flow	Further flood risk assessment to be presented.	Closed – waterproofing and mitigation of flood risk provided in BIA Addendum.	October 2016
6	Surface Water Flow	A drainage strategy, which considers implementation of SUDS, should be presented.	Soil above basement roof slab to be provided in line with guidance. Heritage restrictions to be considered in order to implement additional attenuation SUDS at front of property.	October 2016
7	Land Stability	Further structural engineering assessment and information required as described in Section 4.	Closed – provided in BIA Addendum	October 2016

8	Land Stability / Ground Movement Assessment	The geotechnical parameters adopted in the GMA should be presented, which should also include a zone of influence and damage impact assessments for structures within the zone.	Closed – provided in BIA Addendum	October 2016
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Appendix 3: Supplementary Supporting Documents

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