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

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-04
Revision: D1

September 2016

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	September 2016	Comment	GKemb12466-04-280916-12 Gloucester Lodge-D1.docx	GK	PIL/CC	EMB

Document Details

Last saved	04/10/2016 16:33
Path	GKemb12466-04-280916-12 Gloucester Lodge-D1.docx
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Project Number	12466-04
Project Name	Gloucester Lodge (12 Gloucester Gate, 12 & 13 Gloucester Gate Mews)
Planning Reference	2016/4549/P

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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 incudes 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. A search of utility companies' underground assets / tunnels should be performed and appended to the Desk Study, and the impact assessment updated if applicable.

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, and further assessment is therefore considered necessary.

1.8. The BIA identifies that the impermeable area of the site will remain the same, or slightly decrease due to the basement roof slab in the courtyard being covered by 0.6m of topsoil. The BIA indicates that peak run-off flows will remain at existing levels. However, it should be noted that CPG4 indicates that basement roof slabs should be designed with 1m of soil above to attenuate surface water.

1.9. The site is located within a Critical Drainage Area. As such, and in line with CPG4 (Section 3.51), a drainage solution should be presented incorporating attenuation SUDS to reduce peak discharge rates.

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. Interpretative geotechnical information in accordance with the GSD Appendix G3 is not presented. The stiffness / strength of the London Clay should be clarified, as should the calculated bearing capacities, within an interpretative geotechnical discussion. Limited groundwater monitoring has been undertaken and more long term monitoring is required.

1.11. A conceptual site model should be presented for review which clearly indicates levels / elevations of the existing buildings / foundations, adjacent structures' foundations, ground and groundwater conditions and the proposed development's foundation elevations.

1.12. Further drawings, sketches and outline calculations are required to confirm the structural feasibility of the proposals and allow the Ground Movement Assessment (GMA) to be verified.

1.13. 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 geotechnical parameters adopted for the GMA should be presented to validate the land stability / damage impact assessment. The GMA should include a zone of influence and damage impact assessments should be prepared for each structure within that zone. It must also reflect the finally adopted form of construction.

1.14. Control of construction activities to mitigate ground movements, including an outline monitoring proposal, is presented in the BIA.

1.15. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the missing information is provided, it is not possible to conclude that 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.

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 should be checked.
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 should be provided, if applicable.
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 should be provided, if applicable.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	However, underground utility assets to be checked.
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	

Item	Yes/No/NA	Comment
Is a conceptual model presented?	No	Ground conditions encountered during the SI are presented. Site elevations, proposed development elevations, adjacent structures information, ground and groundwater conditions should be presented as a conceptual model.
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	Drainage plan incorporating attenuation SUDS should be presented.
Is factual ground investigation data provided?	Yes	
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	
Is a geotechnical interpretation presented?	No	Bearing capacities presented; however, these should be justified as they do not appear consistent with SI data. Geotechnical parameters in line with the GSD Appendix G3 should be presented.
Does the geotechnical interpretation include information on retaining wall design?	No	Outline permanent retaining wall / underpin methodology presented, but no retaining wall design information.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	No	None identified.
Are baseline conditions described, based on the GSD?	No	Geotechnical parameters, conceptual site model, GMA methodology, drainage strategy. design calculations – to be updated.
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	Geotechnical and structural parameters adopted should be presented; zone of influence of ground movement should be provided.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Additional assessments required.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Temporary propping and monitoring are discussed in outline, however, further structural engineering information required to fully determine impacts. A drainage strategy requires consideration.
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	No	A drainage strategy requires consideration.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Geotechnical and structural parameters adopted for outline design and GMA should be presented.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	A drainage strategy should be presented. CPG4 (Section 2.16) indicates minimum 1m soil above basement roof slabs in gardens; proposed development indicates 0.6m soil above slab (BIA Appendix J).
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Geotechnical and structural parameters adopted for GMA should be presented. A drainage strategy should be presented.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Geotechnical and structural parameters adopted for GMA should be presented.
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. Whilst searches have been presented for underground transport infrastructure assets, a search of utility companies' underground assets / tunnels should also be performed and appended to the Desk Study. The impact assessment should be updated if applicable.

4.4. 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 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.

4.5. The site 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. The neighbouring property (14 / 15 Gloucester Gate Mews) reports historical basement flooding. Further assessment should be carried out to determine the potential causes of the reported flooding and any impact to or from the basement proposals.

4.6. The BIA identifies that the impermeable area of the site will remain the same, or slightly decrease due to the proposed development's basement roof slab being covered by 0.6m 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 existing levels. However, it should be noted that CPG4 (Section 2.16) indicates that basement roof slabs should be designed with a minimum of 1m of soil above to allow mature vegetation development and to attenuate surface water.

4.7. As the site is located within a Critical Drainage Area, and in line with CPG4 (Section 3.51), a drainage solution should be presented incorporating attenuation SUDS to reduce peak discharge rates. Only where attenuation SUDS cannot be practically implemented will direct discharge to sewers be approved.

4.8. 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 in accordance with the GSD Appendix G3 is not presented. Bearing capacities have been presented, which whilst representative of generally accepted bearing capacities for London Clay, appear high compared to the site specific insitu test values presented. Limited groundwater monitoring has been undertaken and more long term monitoring is recommended. This is required to confirm the feasibility of constructing conventional underpins to a depth of 5m.

4.9. The site investigation data suggest soft to firm London Clay between ground level and 5m depth. However, the borehole log and BIA description of the London Clay state conditions are firm to stiff. The stiffness / strength of the London Clay should be clarified, as should the calculated bearing capacities, within an interpretative geotechnical discussion including parameters required for the GMA and in accordance with the GSD Appendix G3.

4.10. A conceptual site model has not been presented. A model should be presented for review which clearly indicates levels / elevations of the existing buildings / foundations, adjacent structures' foundations, ground and groundwater conditions and the proposed development's foundation elevations.

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. A structural engineering assessment is required to demonstrate the feasibility of the basement proposals. This should include drawing and sketches to illustrate the form of construction and sequencing of the temporary and permanent works and outline calculations to demonstrate the stability of the retaining walls and slab and adequacy of the bearing stratum. All assumptions are to be clearly set out.

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). It should be demonstrated that all potential affected structures have been assessed. Temporary propping arrangements and construction sequencing are discussed in outline. The geotechnical parameters adopted for the GMA should be presented to validate the land stability / damage impact assessment. The GMA should include a zone of influence and damage impact assessments should be prepared for each structure within that zone. The GMA should consider the proposed construction techniques. If they cannot be finalised at this stage (i.e. piling vs. underpinning), it should consider both options.

4.13. Control of construction activities to mitigate ground movements, including an outline monitoring proposal, are presented in the BIA.

4.14. It is accepted that there are no potential impacts in relation to slope stability.

4.15. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the missing information is provided, it is not possible to conclude that the criteria contained in CPG4 and DP27 have been met.

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. A search of utility companies' underground assets / tunnels should be performed and appended to the Desk Study, and the impact assessment updated if applicable.

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. An assessment of the potential causes is therefore considered necessary with consideration of any impact to the application site.

5.5. As the site is located within a Critical Drainage Area, and in line with CPG4 (Section 3.51), a drainage solution should be presented incorporating attenuation SUDS to reduce peak discharge rates. Only where attenuation SUDS cannot be practically implemented will direct discharge to sewers be approved. It is noted that part of the proposed development's basement roof slab is to be covered by 0.6m of topsoil. CPG4 (Section 2.16) indicates that basement roof slabs should be designed with 1m of soil above to allow mature vegetation development and to attenuate surface water.

5.6. The bearing formation for the proposed foundations comprises London Clay, underlying shallow Made Ground. The stiffness / strength of the London Clay should be clarified, as should the calculated bearing capacities. Limited groundwater monitoring has been undertaken and more long term monitoring is recommended to confirm the feasibility of constricting underpins to 5m depth.

5.7. A Conceptual Site Model should be presented for review which clearly indicates levels / elevations of the existing buildings / foundations, adjacent structures' foundations, ground and groundwater conditions and the proposed development's foundation elevations.

5.8. Only very basic structural information has been presented. Further details including confirmation of the form of construction, temporary and permanent works sequencing, and arrangements for propping are required together with outline retaining wall and slab calculations. All design assumptions should be clearly stated. This information is required to confirm the feasibility of the basement proposals and allow the ground movement/building damage assessment to be verified.

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 geotechnical parameters adopted for the GMA should be presented to validate the land stability / damage impact assessment. The GMA should include a zone of influence and damage impact assessments should be prepared for each structure within that zone. It should be reviewed to ensure it reflects the finally adopted construction methodology.

5.10. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the missing information is provided, it is not possible to conclude that 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).	Hydrogeological - BIA Addendum; surface water flow – further assessment required.

Appendix 2: Audit Query Tracker

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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).		
2	Land Stability	The BIA should present a conceptual site model indicating site elevations, proposed development elevations, adjacent structures information, ground and groundwater conditions.		
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.		
4	Groundwater	Long term groundwater monitoring should be undertaken.		
5	Surface Water Flow	Further flood risk assessment to be presented.		
6	Surface Water Flow	A drainage strategy, which considers implementation of SUDS, should be presented.		
7	Land Stability	Further structural engineering assessment and information required as described in Section 4.		

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.		

Appendix 3: Supplementary Supporting Documents

None

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