

195-199 Grays Inn Road, Camden
WC1X 8UL

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 12727-39
Revision: D1

February 2018

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	February 2018	Comment	AFLemb12727-39-230218-195-199 Grays Inn Road-D1.doc	AFL	EMB	EMB

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Document Details

Last saved	22/02/2018 17:28
Path	AFLemb12727-39-230218-195-199 Grays Inn Road-D1.doc
Author	A Laurie
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Project Number	12066-39
Project Name	195-199 Grays Inn Road
Planning Reference	2017/6230/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 195-199 Grays Inn Road, Camden WC1X 8UL (planning reference 2017/6230/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 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 Hardman Structural Engineers by a Chartered Engineer. Evidence of expertise ground engineering should be provided. Whilst the authors of the BIA did not provide evidence of suitable hydrology and hydrogeology expertise, the conclusions of the BIA are accepted.
- 1.5. Although not identified in the Audit instruction, the planning application has identified the presence of listed structures in close proximity to the subject site.
- 1.6. The BIA states that the proposed basement will be founded on piles within the London Clay formation. An adjacent party wall is to be underpinned. The BIA is based on historic boreholes located in the vicinity of the site. Information submitted to support the BIA assumptions shows the potential for Made Ground and Superficial Deposits to extend to depths beyond that proposed for the underpinning.
- 1.7. Site specific ground investigation is required to confirm the feasibility of the current methodology for forming the basement and to inform any necessary mitigation measures such as dewatering. Historic maps should be submitted.
- 1.8. The BIA outlines a basement construction proposal involving piles, retaining walls and a suspended floor slab with temporary propping arrangements. Underpinning of a basement structure at the neighbouring No. 4 Mecklenburgh Road is also proposed. The agreement of the owner should be confirmed or alternative measures proposed.
- 1.9. Further details of the proposed basement design in both permanent and temporary cases are required as described in Section 4.

- 1.10. No analysis has been undertaken of horizontal and vertical ground movements. A building damage assessment based on predicted ground movements and characterising the damage in accordance with Burland should be presented.
- 1.11. Outline proposals are provided for a movement monitoring strategy during excavation and construction. These will require to be further developed in due course.
- 1.12. Comment is required regarding consideration of an attenuation SUDS system.
- 1.13. It is accepted that the development is not in an area subject to flooding. It is also accepted that it is unlikely to impact on the wider hydrogeology of the area, however this should be confirmed following a ground and groundwater investigation.
- 1.14. Until the queries described in Section 4 and summarised in Appendix 2 are closed out, it is not possible to confirm that the BIA complies with the requirements of CPG4.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 24 January 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 195-199 Grays Inn Road, Camden WC1X 8UL, reference 2017/6230/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.
 - 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 "*Demolition of existing single storey structure. Erection of 3 storey (including a part sunken lower ground floor and a subterranean basement level) building for B1(a) office use (276m2).*"
- 2.6. The Audit Instruction noted that 195-199 Grays Inn Road is not a listed building and neither is it a neighbour to listed buildings. However, information submitted for the planning application has

shown that the building is adjacent to several Grade II listed features. This is discussed further in Section 4.

2.7. CampbellReith accessed LBC's Planning Portal on 05 February 2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) 195-199 Grays Inn Road, reference 2630, by Hardman Structural Engineers, dated 11 January 2018 (it is assumed this supersedes an earlier BIA dated November 2017);
- BIA Appendices 195-199 Grays Inn Road, by Hardman Structural Engineers, dated November 2013 and October 2017;
- Planning Application Drawings by European Urban Architecture (re-named Re Creo in 2016), dated October and November 2013, consisting of:
 - Location Plan AL(00)02;
 - Existing Plans and Sections, numbered AL(00)03-AL(00)10;
- Proposed Plans and Sections by Re Creo Architecture, date unknown, numbered AP. 06.01, AP.06.03-AP.06.05, AP.07.01-AP.07.04 and AP.08.01-AP.08.03;
- Design, Access and Heritage Statement Parts 1 and 2, by Re Creo Developments Limited, dated November 2017.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	Refer to Section 4.
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?	No	Further details of the design are required (refer to Section 4).
Are suitable plan/maps included?	No	Historic maps not presented.
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	Justification not presented for responses regarding water courses and worked ground.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	The groundwater level at the site has not been determined.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Local Camden SFRA maps have been consulted.
Is a conceptual model presented?	No	Conflicting information regarding ground conditions is presented and site specific conclusions not justified.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Scoping identified variable ground conditions in BGS logs and detailed SI is recommended, however this has not been carried out. A suitable bearing stratum has not been confirmed.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Not carried through to scoping.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	No potential impacts to carry through to scoping.
Is factual ground investigation data provided?	No	BIA states that this will be carried out at a later date due to current access constraints.
Is monitoring data presented?	No	
Is the ground investigation informed by a desk study?	Yes	Desk study information provided. Landmark Sitecheck report from 2013 included. Historic maps not included.
Has a site walkover been undertaken?	Yes	Not detailed.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Basements to adjacent properties are shown on drawings.
Is a geotechnical interpretation presented?	No	A site specific ground investigation is required with associated sampling, analysis and interpretative reporting.
Does the geotechnical interpretation include information on retaining wall design?	No	To be provided.
Are reports on other investigations required by screening and scoping presented?	No	Party wall agreements are referred to but not provided.
Are the baseline conditions described, based on the GSD?	No	No ground investigation has been carried out. There are inconsistencies in the information described in the BIA and the appended BGS logs. No water monitoring on site has been undertaken.

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	Nearby basements are shown on drawings, including a basement to No. 4 Mecklenburgh Street beneath part of the existing floor slab at 195-199 Grays Inn Road.
Is an Impact Assessment provided?	No	A preliminary impact assessment is provided which requires updating with ground investigation information.
Are estimates of ground movement and structural impact presented?	No	Estimated ground movements from the excavation and underpinning/pile installation are required. Impact on the surrounding roadways and Grade II listed buildings should be indicated.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Refer to Section 4.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	The need for mitigation has been considered however measures proposed do not address all potential impacts.
Has the need for monitoring during construction been considered?	Yes	This has been considered and requires to be further developed in due course.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The BIA details utilising the existing drainage system. There is no planned increase to the footprint of the existing building.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	More detail is required regarding stability of the adjacent buildings, in particular the basement of No. 4 Mecklenburgh Street which is to be underpinned.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	Burland damage categories are not mentioned in the BIA or accompanying documents.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

- 4.1. The BIA has been prepared by Hardman Structural Engineers. The author is a Chartered Engineer. Evidence of expertise in ground engineering should be provided. The author does not hold the qualifications required for the assessment of impacts on groundwater flow and evidence of expertise in flood risk assessment and surface water drainage are not provided. However, the conclusions that there is no significant impact on the hydrology and hydrogeology are accepted, subject to confirmation by ground investigation.
- 4.2. The LBC Instruction to proceed with the audit identified that the basement proposal did not either involve a listed building or was adjacent to listed buildings. However, the Design, Access and Heritage Statement submitted with the BIA identified that 1-8 Mecklenburgh Street, to its rear, are Grade II listed properties. The gardens of these houses are adjacent to the western (rear) site boundary. The Heritage Statement also mentions that the Eastman Dental Hospital, which is opposite the site on Grays Inn Road, is a Grade II listed building.
- 4.3. The BIA states that an intrusive site investigation will be carried out at a later date, and preliminary ground conditions are based on historic boreholes located some 85-100m from the site. Site specific ground investigation of the below ground soils and neighbouring foundations is required, together with groundwater monitoring to demonstrate the feasibility of the proposed construction methodology in accordance with GSD 7.2 for the reasons stated below. It should be noted that a suitable Desk Study has been undertaken, as per GSD 7.2.1, although the historic maps should be presented.
- 4.4. The BIA states that the proposed basement will be founded on piles within the London Clay formation with the basement excavated to 3.70m bgl (also shown as 3.90m bgl on some drawings). BGS borehole logs submitted from nearby sites detail Made Ground to 3.60 and 5.70m bgl, locally underlain by Superficial Deposits to depths of 4.50 and 9.90m bgl. Such inconsistencies should be clarified.
- 4.5. The BIA outlines a basement construction proposal involving piles, retaining walls and a suspended floor slab with temporary propping arrangements. Underpinning of a basement structure at the neighbouring No. 4 Mecklenburgh Road is also proposed. Further details of the proposed basement design in both permanent and temporary cases are required. This includes confirmation of the nature of the soils in which underpinning will be carried out and the verification of an adequate bearing stratum; justification for the proposal to adopt a contiguous piled wall in the temporary case; confirmation of any requirements for dewatering.
- 4.6. Drawings included with the BIA show 2.80m deep basements to the rear of the properties 4-7 Mecklenburgh Street. The basement to the neighbouring 4 Mecklenburgh Street currently extends beneath the existing floor slab of the office building at 195-199 Grays Inn Road. It is

proposed to underpin the party wall in this area. In addition to the information required above, the agreement of the owner of 4 Mecklenburgh Street should be confirmed, or an alternative solution proposed.

- 4.7. The preliminary Ground Movement Assessment states that differential settlement of the neighbouring properties is not considered to be an issue. The BIA also states that the movement of the basement retaining wall will be limited to 10mm. However more detail of the assumptions that led to this conclusion are required.
- 4.8. No assessment has been made of horizontal and vertical ground movements associated with the installation of the underpinning and piling, and basement excavation, and this should be carried out using either analytical or empirical means. Anticipated building damage associated with predicted ground movements should be classified in accordance with the Burland scale, together with confirmation of impacts on the highway.
- 4.9. An indicative construction sequence for the piled basement construction is presented. The same should be provided for the proposed underpinning. Consideration should be given to the need for temporary dewatering.
- 4.10. Outline proposals are provided for a movement monitoring strategy during excavation and construction. This will require to be further developed in due course with the derivation of trigger levels and mitigation measures to ensure the surrounding properties are safeguarded.
- 4.11. Screening and scoping section of the BIA states that there will be no increase in surface water discharge into the ground and rainwater and run-off will be transferred to surface water drains as per the existing system. Comment is required regarding consideration of SUDS as per CPG4 section 3.51.
- 4.12. It is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding. It is also accepted that there are unlikely to be significant impacts to groundwater flow, although this should be confirmed once a ground investigation has been carried out.

5.0 CONCLUSIONS

- 5.1. The BIA has been prepared by Hardman Structural Engineers. Evidence of expertise ground engineering should be provided. Whilst the authors of the BIA did not provide evidence of suitable hydrology and hydrogeology expertise, the conclusions of the BIA are accepted.
- 5.2. The BIA states that the proposed basement will be founded on piles within the London Clay formation with the basement excavated to 3.70m bgl. An adjacent party wall is to be underpinned. Information submitted to support the BIA assumptions shows the potential for Made Ground and Superficial Deposits to depths beyond that proposed for the underpinning.
- 5.3. The BIA states that an intrusive site investigation will be carried out at a later date, and preliminary ground conditions are based on historic boreholes located in the vicinity of the site. However, site specific ground investigation is required to confirm the feasibility of the current methodology for forming the basement and to inform any necessary mitigation measures such as dewatering. Although a Desk Study has been undertaken, historic maps should be submitted.
- 5.4. The soils investigation should also confirm the absence of any impacts affecting the local hydrogeology.
- 5.5. The BIA outlines a basement construction proposal involving piles, retaining walls and a suspended floor slab with temporary propping arrangements. Underpinning of a basement structure at the neighbouring No. 4 Mecklenburgh Road is also proposed; the agreement of the building owner should be confirmed. Further details of the proposed basement design in both permanent and temporary cases are required as described in Section 4.
- 5.6. No analysis has been undertaken of horizontal and vertical ground movements and this should be carried out once a decision on methodology has been taken. A building damage assessment based on predicted ground movements and characterising the damage in accordance with Burland should be presented.
- 5.7. Outline proposals are provided for a movement monitoring strategy during excavation and construction. These will require to be further developed in due course.
- 5.8. Comment is required regarding consideration of SUDS.
- 5.9. It is accepted that the development is not in an area subject to flooding. It is also accepted that it is unlikely to impact on the wider hydrogeology of the area, however this should be confirmed following a ground and groundwater investigation.
- 5.10. Until the queries described in Section 4 and summarised in Apendix 2 are closed out, it is not possible to confirm that the BIA complies with the requirements of CPG4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Author's expertise in ground engineering to be confirmed.	Open	
2	BIA	Historic maps to be presented to confirm absence of worked ground.	Open	
3	Land Stability/Hydrogeology	Intrusive site investigation with associated sampling, monitoring and reporting required.	Open	
4	Hydrogeology	Confirmation of absence of impact on groundwater flow to be provided once ground and groundwater conditions determined.	Open	
5	Land Stability	Confirmation of feasibility of basement construction methodology with outline calculations required once ground and groundwater conditions determined.	Open	
6	Land Stability	Confirmation of any necessary mitigation measures required to ensure stability to be provided once ground and groundwater conditions determined.	Open	
7	Land Stability	Construction sequence to be extended to include underpinning.		
8	Land Stability	Mitigation measures include underpinning a neighbouring property. The agreement of the owner should be confirmed.		
9	Land Stability	Ground movement and building damage assessment to be provided.	Open	
10	Hydrology	Drainage scheme to be clarified and potential hydrogeological impacts updated following water monitoring.	Open	

Appendix 3: Supplementary Supporting Documents

None

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