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1 Guilford Street, London, WC1N 1DR

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-05
Revision: D1

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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 1 Guilford Street, London, WC1N 1DR (Camden Planning Reference 2016/4352/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 individuals involved have qualifications which are in accordance with CPG4 requirements.

1.5. The proposal includes the lateral extension of an existing single storey basement to the rear of the property. The proposed basement is to be formed using contiguous piled wall, details of which are not included and this is requested. The information provided should also include indicative structural calculations for the proposed basement, including retaining walls, slabs, box structure and foundations which clearly state the assumptions made.

1.6. The BIA indicates the groundwater level is beneath the depth of the basement and any shallow groundwater is likely to be perched water in the Made Ground. Temporary dewatering measures are proposed together with the need for basement waterproofing in the long term. The BIA recommends further groundwater monitoring.

1.7. The results of the site investigation would suggest the site to be located within a scour hollow, the extent of which needs to be investigated further as ground conditions can vary significantly over short distances.

1.8. The location of the Post Office Railway, identified as dismantled railway within the BIA needs further investigation as it is believed to be in the vicinity of the proposed basement.

1.9. Further investigation as to the presence of services and or cable tunnels is identified within land stability scoping but has not been included, this is requested.

1.10. Section 10.9 of the BIA discusses the need for further investigation of the foundations which support the cast iron portal column in northwest corner of basement, this needs to be identified within scoping and the results presented.

1.11. The ground movement assessment should be reconsidered using appropriate methodology for the strata type supporting the contiguous piled walls. Confirmation of the impact on 20 Brownlow Mews should also be included.

1.12. The full input and output data from the Pdisp analysis has not been included and this is requested.

1.13. Mitigation measures are discussed in the BIA, but no consideration of the residual risk or effects have been considered and this is required.

1.14. It is accepted that the surrounding slopes to the development site are stable.

1.15. Proposals for movement monitoring with trigger values are included. Details and trigger values should be agreed as part of the Party Wall awards, however, the trigger values may need revising based on the queries on the GMA as discussed in Section 4. The BIA recommends condition surveys.

1.16. A works programme has not been provided and this is requested.

1.17. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding.

1.18. 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 6 September 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 1 Guilford Street, London, WC1N 1DR (Camden Planning Reference 2016/4352/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;

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 rear extensions; erection of new part single storey, part 2 storey rear extension with roof terraces above; conversion of existing 4 bedroom dwelling into 1 x 2 bedroom maisonette and 1 x 3 bedroom maisonette; and extension of existing basement level."*

2.6. The Audit Instruction also confirmed 1 Guilford Street is not listed, nor is it a neighbour to a listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 26 September 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA): Chelmer Consultancy Services dated June 2016
- Haines Philips Architects Planning Application Drawings consisting of

  Location Plan

  Existing Plans

  Existing Sections

  Existing Elevations

  Proposed Plans

  Proposed Sections

  Proposed Elevations
- Design & Access Statement: Haines Philips Architects, dated August 2016
- Construction Method Statement: Price and Myers dated July 2016
- 1 No Consultation Response

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Section 1.2.
Is data required by Cl.233 of the GSD presented?	No	See Audit paragraph 4.2, 4.6 and 4.7. Works programme not included.
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 Sections 3 to 6.
Are suitable plan/maps included?	Yes	See BIA Sections 4 to 6.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	See BIA Sections 4 to 6.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	See Audit paragraph 4.6.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 7.2.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 7.4.
Is a conceptual model presented?	Yes	See BIA Section 10.1.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 8.3.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 8.2.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No scoping identified during screening process.
Is factual ground investigation data provided?	Yes	Yes included in BIA Appendix C and discussed in BIA Section 9.
Is monitoring data presented?	Yes	See BIA Section 9.8.
Is the ground investigation informed by a desk study?	Yes	See BIA Sections 2 to 6 (see Audit paragraph 4.4).
Has a site walkover been undertaken?	Yes	See BIA Section 1.3 and Appendix A.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	See BIA Section 2.8.
Is a geotechnical interpretation presented?	Yes	See BIA Section 10.4.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See BIA Sections 10.4 and 10.5.
Are reports on other investigations required by screening and scoping presented?	No	See Audit paragraphs 4.6 and 4.7.
Are the baseline conditions described, based on the GSD?	Yes	See BIA Sections 2 to 6.
Do the base line conditions consider adjacent or nearby basements?	Yes	See BIA Sections 2, 3, 10 and 11.
Is an Impact Assessment provided?	Yes	See BIA Sections 10 and 11.
Are estimates of ground movement and structural impact presented?	Yes	See BIA Sections 10 and 11. However there are comments on

Item	Yes/No/NA	Comment
		approach used, see Audit paragraph 4.10 and 4.11.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	See Audit paragraph 4.9.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	See BIA Section 10.9 and Audit paragraph 4.12.
Has the need for monitoring during construction been considered?	Yes	See BIA Section 10.7.
Have the residual (after mitigation) impacts been clearly identified?	No	See Audit paragraph 4.12.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	There are queries on the approach (see Audit paragraph 4.10 and 4.11).
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	The BIA demonstrates there is no adverse effect on the drainage and run-off.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Structural stability not demonstrated.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	However, there are queries on the approach used (see Audit paragraphs 4.10 and 4.11).
Are non-technical summaries provided?	Yes	See BIA sections, 7, 8, 9 and 11.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been undertaken by Chelmer Consultancy Services and the individuals involved have CEng MICE, C.WEM FCIWEM and CGeol FGS qualifications.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal did not involve a listed building nor was it adjacent to a listed building. The instruction however identified that there are two Grade II listed bollards outside the property. The site is within the Bloomsbury Conservation Area.

4.3. It is stated the site comprises a four storey terraced house with a partial basement. The proposal includes a lateral extension of the existing basement to the rear of the property, to be formed by contiguous piled wall except where it adjoins the existing basement and basement beneath No 20 Brownlow Mews which is indicated to be under construction. The proposed extension lies beneath a garage extension at the rear of the property which is to be demolished along with the two storey rear projection and to be replaced with new two/three storey extension. An open lightwell at basement level, alongside the party wall with No 137 Gray's Inn Road is also included in the proposal.

4.4. The BIA identified the site is underlain by Made Ground over Hackney Gravel Member and London Clay. The site specific ground investigation did not prove the base of the Hackney Gravel, but the BIA identified nearby historic boreholes encountered the base of the gravels at up to 19.65m below ground level, within a scour hollow. On review of data available to CampbellReith and given the depth of River Terrace deposits encountered within the borehole, it is considered that the site is located within the scour hollow identified in the BIA to the north.

4.5. Groundwater was monitored at between 9.94 and 10.75m bgl. It is stated in the Chelmer BIA that '*the higher groundwater levels in BH1 are considered to reflect perched groundwater water in the Made Ground, supported on the underlying clays of the River Terrace Deposits*'. The BIA states temporary groundwater control by pumping from screened sumps should be adequate to deal with any inflows. It is however stated that that further groundwater monitoring should be undertaken. In the permanent case, basement waterproofing is recommended.

4.6. The BIA makes reference to a search for railways and tunnels map, undertaken by Groundsure on their behalf (included in BIA Appendix E). This map identifies a dismantled railway 79m to the southeast of the site which is believed to be the former Post Office Railway (Mail Rail). It is understood that this information may be based on open source data which may not be the most reliable. It is advised that Mail Rail is contacted directly to confirm the location of the tunnel, as other readily available information indicates it to be in the vicinity of the proposed development.

4.7. Land stability scoping identified the need for services search to check that no tunnels/services are in the vicinity of the proposed basement. The results of this search have not been presented, and further investigation with respect to tunnels is needed, as readily available information would suggest cable tunnels may run close to the proposed basement.

4.8. A separate Construction Method Statement is provided with the BIA, which proposes a construction sequence comprising demolition of existing superstructure to rear of building, installation of the contiguous piled wall, excavation to basement formation level with props as required and formation of the reinforced concrete liner walls and basement. Outline calculations are required with all design assumptions clearly stated to confirm feasibility of the proposals.

4.9. Section 10.9 of the BIA discusses the need for further investigation of the foundations which support the cast iron portal frame column close to the northwest corner of the basement, but this is not fully identified within the scoping.

4.10. The BIA presents a ground movement assessment which considers settlement/heave due to the excavation using the computer program Pdisp by Oasys and horizontal movements due to excavation and wall installation, based on the method in CIRIA C580 as modified by the technical paper, "Prediction of party wall movements using CIRIA C580" by Ball, Langdon and Creighton (2014) which concludes that movements can be controlled to less than those predicted in CIRIA C580. It is noted that this paper is based on a single case study for a contiguous piled wall embedded into London Clay on a large highly controlled construction site. It is considered that the results and conclusions for this case study are not relevant to a shallow basement supported by a contiguous piled wall embedded solely within granular deposits. Further review and modelling is required to assess the ground movements and impact.

4.11. The BIA includes plots and summary of predicted displacements. However, the BIA does not contain the full input and output from the software analysis. Predicted movements have been included in the damage assessment.

4.12. Mitigation measures are discussed in BIA Section 10.9 but are based on the results of further investigations. The results of these further investigations should be included within the BIA and appropriate mitigation measures identified. The author has not discussed the effects of the mitigation measures nor any residual risk if implemented. It is accepted that the results from the monitoring of 20 Brownlow Mews are not available at present due to the ongoing construction of the basement.

4.13. It is accepted that there are no slope stability concerns, wider hydrogeological concerns, or any surface water concerns regarding the proposed development.

4.14. Proposals are provided for monitoring with trigger levels defined and whilst such a mitigation measure should be adopted, the trigger levels may need to be revised following reconsideration of the approach to the GMA. The BIA recommends condition surveys.

4.15. A works programme as required by cl.233 of the Arup GSD has not been provided.

5.0 CONCLUSIONS

5.1. The BIA was undertaken by Chelmer Consultancy Services. The individuals involved have qualifications which are in accordance with CPG4 requirements.

5.2. The proposal includes the lateral extension of an existing single storey basement to the rear of the property. The proposed basement is to be formed using contiguous piled wall, full details of which are not included and this is requested. The information provided should also include indicative structural calculations for the proposed basement, including retaining walls, slabs, box structure and foundations which clearly state the assumptions made.

5.3. The BIA indicates the groundwater level is beneath the depth of the basement and any shallow groundwater is likely to be perched groundwater in the Made Ground. Temporary dewatering measures are proposed together with the need for basement waterproofing in the long term. The BIA recommends further groundwater monitoring.

5.4. The results of the site investigation would suggest the site to be located within a scour hollow, the extent of which needs to be investigated further as ground conditions can vary significantly over short distances.

5.5. The location of the Post Office Railway, identified as dismantled railway within the BIA needs further investigation as it is believed to be in the vicinity of the proposed basement.

5.6. Further investigation as to the presence of services and or cable tunnels is identified within land stability scoping but has not been included, this is requested.

5.7. Section 10.9 of the BIA discusses the need for further investigation of the foundations which support the cast iron portal column in northwest corner of basement, this needs to be identified within scoping and the results presented.

5.8. The ground movement assessment should be reconsidered using appropriate methodology for the strata supporting the contiguous piled walls. Confirmation of the impact on 20 Brownlow Mews should also be included.

5.9. The full input and output data from the Pdisp analysis has not been included and this is requested.

5.10. Mitigation measures are discussed in the BIA, but no consideration the residual risk or effects have been considered and this is needed.

5.11. It is accepted that the surrounding slopes to the development site are stable.

5.12. Proposals for movement monitoring with trigger values are included. Details and trigger values should be agreed as part of the Party Wall awards, however, the trigger values may need revising based on the queries on the GMA as discussed in Section 4. The BIA recommends condition surveys.

5.13. A works programme has not been provided and this is requested.

5.14. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Petalas (owner of 20 Brownlow Mews)	6 Laverton Mews, London SW5 0PB	08/09/2016	Impact on the stability of 20 Brownlow Mews following its own basement construction and the proposed basement at 1 Guilford Street.	GMA to be updated and BIA to include impact assessment on 20 Brownlow Mews.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	A works programme has not been submitted as required by cl.233 of the GSD	Open – outline programme to be provided.	
2	Stability	Retaining wall calculations not provided	Open – Outline structural calculations for retaining wall to be submitted.	
3	Stability	Site suspected to be located within scour hollow, extent of which unclear	Open – extent of scour hollow to be investigated and results to be discussed within BIA.	
4	Stability	Location of Post Office Railway and other tunnels unclear	Open – location of Post Office Railway and the presence of other tunnels to be confirmed and presented within BIA.	
5	Stability	Foundations of cast iron portal column unknown	Open – investigation of foundations to be completed and discussed in BIA along with the need for any mitigation measures.	
6	Stability	Inappropriate methodology used in GMA	Open – GMA to be revised using appropriate methodology for the ground strata encountered within piling. Full inputs and outputs from Pdisp analysis to be included.	
7	Stability	Confirmation of the impact on 20 Brownlow Mews	Open – to be provided.	
8	Stability	Outline monitoring proposals	Open - the trigger values may need revising based on the queries on the GMA as discussed above. Details and trigger values should be agreed as part of the Party Wall awards, however,	N/A

Appendix 3: Supplementary Supporting Documents

None

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