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Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-06
Revision: D1

February 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 152 Royal College Street (planning reference 2015/4396/P). On the basis of the BIA, the basement was considered to fall within Category A as defined by the Terms of Reference, however, a review of the proposals identified potential impacts on surrounding structures and infrastructure.

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 Basement impact Assessment (BIA) was undertaken by Michael Hadl Associates and the individuals involved are all Chartered Structural Engineers. Whilst there was no input from a Chartered Geologist with respect to the appraisal of groundwater flow as required by CPG4, hydrogeological issues are considered to be addressed appropriately.

1.5. A separate Ground Investigation, Geotechnical Analysis and Contamination Assessment Report was prepared by Soil Consultants and the individuals involved have suitable credentials.

1.6. The BIA has confirmed that the proposed basement will be founded in the London Clay and that the surrounding slopes are stable.

1.7. The basement is to be constructed by underpinning the party wall with no 154 Royal College Street with a bored pile wall forming the remainder of the site perimeter. Clarification is requested on whether this is a secant or contiguous wall.

1.8. 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. It is accepted that the BIA has shown that the development will have little detrimental effect on surface water discharges to the network drainage system.

1.9. It is accepted that any groundwater encountered is likely to be perched and pumping is anticipated to be sufficient to deal with this.

1.10. Clarification is requested on the presence of a semi-mature deciduous tree close to the north western corner which is indicated on the site plans and the Soil Consultants report but not on the BIA.

1.11. The impact on a sewer in the north eastern area has not been considered and this is requested.

1.12. Supporting analysis for the ground movement assessment has not been provided and this is requested. Predicted vertical and horizontal movements for the surrounding infrastructure and a damage category for the neighbouring building are also required.

1.13. A construction management plan has not been provided and this is requested.

1.14. A detailed monitoring programme together with trigger values should be agreed as part of the Party Wall Awards.

1.15. A works programme as required by cl.233 of the Arup GSD has not been provided and this is requested.

1.16. One of the residents' comments notes a construction management plan has not been provided and the limited ground movement analysis presented and this has been included in the queries. The remaining comments have not been addressed as they do not relate to the BIA.

1.17. Queries and requests for additional information are summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15 January 2016 to carry out a Category A Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 152 Royal College Street, London NW1 0TA, Camden Reference 2015/4396/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 five-storey building including excavation of basement to provide 1 x 4 bed maisonette (Class C3) and retail and office at ground and basement level. Demolish two storey building and erection of 2 x 3 bedroom, four storey dwellings including a new basement floor."* It should be noted that the description on the BIA states three above ground floors and a single storey basement.

The Audit Instruction also confirmed the proposal does not involve a listed building nor is it neighbour to a listed building.

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

- Basement Impact Assessment (BIA) - Michael Hadl Associates (MHA), dated July 2015 which includes as part of the appendices an interpretative Ground Investigation, Geotechnical Analysis and Contamination Assessment Report by Soil Consultants dated July 2015
- Design and Access Statement – Henning Stummel Architects Ltd
- Architects – Henning Stummel Architects Ltd drawings:

  Location Plan (101_PA_010)

  Existing Plans (101_PA_020)

  Existing Elevations (101_EX_200)

  Proposed Floor Plans (101_PA_100)

  Proposed Elevations (101_PA_200)

  Proposed Front Elevation (101_PA_210)

  Window and Roof detail (101_PA_310)

  South West Corner Detail (101_PA_410
- 17 No Consultation Responses

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	No	A works programme has not been provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Michael Hadl Associates (MHA) BIA report and appendices.
Are suitable plan/maps included?	Yes	MHA report appendices and Henning Stummel Architects Ltd drawings.
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	Discrepancy in the trees identified and an incorrect response to Q14 (see Audit paragraph 4.7 and 4.8).
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	MHA report Section 7.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	MHA report Section 7.
Is a conceptual model presented?	Yes	Soil Consultants Ground Investigation, Geotechnical Analysis and Contamination Assessment Report and MHA report Section 3.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Soil Consultants Report indicates the presence of a sewer in the north eastern area of the site which was not considered in the BIA (see Audit paragraph 4.9).
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	MHA report Section 7.1 states scoping not required as no concerns were raised in the screening.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	MHA report Section 7.1 states scoping not required as no concerns were raised in the screening.
Is factual ground investigation data provided?	Yes	Soil Consultants report.
Is monitoring data presented?	Yes	Soil Consultants report Section 5.3 and MHA report Sections 2.0 to 4.0.
Is the ground investigation informed by a desk study?	Yes	Included in Soil Consultants report and MHA report Section 2.0.
Has a site walkover been undertaken?	Yes	Soil Consultants report Section 3.2.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	154 Royal College Street, the immediate neighbouring property is indicated to contain a single storey basement.
Is a geotechnical interpretation presented?	Yes	Soil Consultants Report Section 6.0.
Does the geotechnical interpretation include information on retaining wall design?	Incomplete	Provided but considered incomplete (see Audit paragraph 4.10).
Are reports on other investigations required by screening and scoping presented?	Yes	

Item	Yes/No/NA	Comment
Are baseline conditions described, based on the GSD?	Yes	MHA and Soil Consultants reports.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Inadequate	MHA report Section 10 although this is considered inadequate (see Audit paragraphs 4.11 to 4.14).
Are estimates of ground movement and structural impact presented?	No	See Audit paragraph 4.12.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	This is considered inadequate (see Audit paragraphs 4.11 to 4.14).
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	MHA report Section 6.0.
Has the need for monitoring during construction been considered?	Inadequate	Briefly mentioned in Section 10 of the MHA report however no details given (see Audit paragraph 4.16).
Have the residual (after mitigation) impacts been clearly identified?	No	None identified.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Not demonstrated (see Audit paragraph 4.13).
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?	No	

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	Section 10 of the MHA report concludes risk to ground stability should be low (see Audit paragraph 4.13).
Are non-technical summaries provided?	Yes	MHA report Section 7.1, 8.1, 9.0 and 10.1.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) was prepared by Michael Hadl Associates (MHA) Ltd and the individuals concerned in its production are all Chartered Structural Engineers with one of the reviewers also a Fellow of the Institution of Civil Engineers (FICE). The preparation of a BIA also requires the involvement of a Chartered Geologist (C.Geol) with respect to appraisal of groundwater flow and whilst this does not appear to be the case, it is considered that groundwater issues have been appropriately appraised.

4.2. A separate Ground Investigation, Geotechnical Analysis and Contamination Assessment Report was prepared by Soil Consultants Ltd and the individuals involved have suitable qualifications.

4.3. The basement, with a formation level of c.3m below ground level (bgl) is to be constructed by underpinning the party wall with no 154 Royal College Street with a bored pile (secant or contiguous) wall forming the remainder of the site perimeter, however, Section 6.0 of the Soil Consultants report indicates a contiguous wall. An indicative construction sequence is presented in Appendix C of the MHA report.

4.4. The BIA indicates the neighbouring property 154 Royal College Street comprises a basement with relatively low headroom. A trial pit excavated against this property indicates a foundation level of 2.10m bgl.

4.5. The ground investigation encountered Made Ground noted to be infill from a historic basement to between 1.90 and 2.30m bgl over London Clay with groundwater monitored at c.2.90m bgl. It is stated in the MHA report that any perched water should be removed by sump pumping during construction and it is accepted that should be sufficient. Section 6.0 of the BIA states the basement slab and walls are to be designed for a maximum a water level of 1m bgl.

4.6. Whilst Regents Canal is indicated to be within 20m of the site, the BIA states that as this is a manmade 'tanked' structure in a non-aquifer therefore has little influence on groundwater. It is accepted that the BIA has shown that the development will have no significant effect on the hydrogeology of the surrounding area.

4.7. It is stated in the BIA that the site is not in a flood risk area and this is accepted.

4.8. The BIA noted the presence of trees along the Canal across Baynes Street, however, there is no mention of the semi-mature deciduous tree identified close to the southwestern corner in Section 2.0 of the Soil Consultants Report and indicated on the site plans.

4.9. A 'No' response is given to Q14 of the slope stability screening which relates to whether or not the site is over or within the exclusion zone of a tunnel. This is considered incorrect because

whilst it was confirmed there are no London Underground Assets in close proximity, the screening fails to identify a sewer running through the north eastern area of the site which was noted in the Soil Consultants Report and indicated on the site plans.

4.10. Retaining wall parameters are given on Section 6.1 of the Soil Consultants Report, however, this is considered incomplete as stiffness parameters are not given for the London Clay and Made Ground.

4.11. The BIA states subsidence of soil behind the basement retaining walls, particularly to neighbouring highways and structures is to be kept within acceptable limits by the formation of a rigid basement box stiffened by lateral supports. It is further stated that subsidence/heave from the basement construction will not be onerous and will not influence the neighbouring buildings. It is stated in Section 6.2 of the Soil Consultants that long term heave is expected to be in the order of 10 to 15mm although it is unclear how this was determined.

4.12. The BIA does not give predicted vertical and horizontal movements from the underpinning, wall installation and excavation nor does it give an anticipated damage category for 154 Royal College Street, the immediate neighbouring property. It is noted in BIA that this property is in poor condition and cracking is evident on the front elevation.

4.13. The BIA concludes the risk to ground stability should be low and ground movements should be kept within tolerable limits although no supporting analysis has been presented.

4.14. As noted on paragraph 4.9, a sewer is present in the north eastern area and the impact of the proposed development on this has not been considered.

4.15. Given the site is bound on two sides by roadways, a construction management plan is requested. This should be regarded as a Building Regulation approval item and not a Planning issue.

4.16. The BIA briefly mentions all adjacent buildings will be monitored under the Party Wall procedures, however, no further details are provided.

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

4.18. One of the residents' comments relates to the failure to provide a construction management plan and the limited ground movement analysis presented. This has been included in the queries. None of the other residents' comments have been addressed as they do not relate to the BIA.

5.0 CONCLUSIONS

5.1. The BIA report authors and reviewers are Chartered Structural Engineers and whilst CPG4 requires the input of a Chartered Geologist with respect to the appraisal of groundwater flow, it is considered the BIA appropriately addressed this issue.

5.2. The individuals involved in the preparation of the Soil Consultants Ground Investigation, Geotechnical Analysis and Contamination Assessment Report have suitable qualifications.

5.3. The basement is to be constructed by underpinning the party wall with no 154 Royal College Street with a bored pile forming the remainder of the site perimeter. Clarification is requested on whether this is a secant or contiguous wall.

5.4. The BIA has confirmed that the proposed basement will be founded in the London Clay and that the surrounding slopes are stable.

5.5. 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. It is accepted that the BIA has shown that the development will have little detrimental effect on surface water discharges to the network drainage system.

5.6. It is accepted that any groundwater encountered is likely to be perched and pumping is likely to be sufficient to deal with this.

5.7. The BIA did not identify the presence of a semi-mature tree close to the north western corner although this is indicated on the site plans and the Soil Consultants report. Clarification is requested.

5.8. The BIA does not identify the presence nor consider the impact of the developer on a sewer in the north eastern area although this is noted in the Soil Consultants Reports and indicated on the site plans.

5.9. Stiffness parameters are not given as part of the retaining wall parameters and this is requested.

5.10. Supporting analysis for the ground movement assessment has not been provided and this is requested.

5.11. It is not clear how the predicted heave as a result of excavation was analysed and clarification is requested together with the full input and output if soil displacement software was used.

5.12. It is requested the impact of heave as a result of excavation, vertical and horizontal movements as a result of the underpinning, pile installation and excavation on the neighbouring property,

the roadways and any utilities running beneath them is considered. Predicted vertical and horizontal movements and a damage category are also required.

5.13. A construction management plan has not been provided and this is requested.

5.14. Proposals for a movement monitoring strategy have not been provided and this is requested. .A detailed monitoring programme together with trigger values should be agreed as part of the Party Wall Awards.

5.15. A works programme as required by cl.233 of the Arup GSD has not been provided and this is requested.

5.16. One of the residents' comments notes a construction management plan has not been provided and the limited ground movement analysis presented and this has been included in the queries. The remaining comments have not been addressed as they do not relate to the BIA.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Nedin (Nathaniel Lichfield and Partners)	On behalf of the owner of Bruges Place, Baynes Street	30th September 2015	Failure to provide a construction management plan Limited ground movement assessment, no indication of anticipated damage category and impacts not appropriately considered	see Audit paragraph 4.15 see Audit paragraph 4.13

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 – To be provided	
2	Stability	Clarification is requested on whether a contiguous or secant wall is proposed	Open – To be provided in updated document	
3	Stability	Clarification is requested on the presence of a semi-mature tree on the northwestern corner	Open – To be provided in updated document	
4	Stability	Stiffness parameters not provided for retaining wall design	Open – To be provided	
5	Stability	Unclear how predicted heave movements were determined	Open – Clarification requested and full input and output from any software used to be provided	
6	Stability	Supporting analysis for ground movement assessment and predicted damage category not provided	Open – To be provided	
7	Stability	Presence of a sewer in north eastern area not considered	Open – To be considered and impact assessed	
8	Stability	Movement monitoring details not provided	Open – Proposals to be provided in updated document. Detailed monitoring regime and trigger levels to be agreed with Party Wall Surveyor.	N/A
9	BIA format	Constructed management plan not provided	Open – To be provided and agreed with the owners of the roadways and the council	N/A

Appendix 3: Supplementary Supporting Documents

None

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