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10A Oakhill Avenue, London, NW3 7RE

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12066-40
Revision: D1

September 2015

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	September 2015	Comment	TAMjw12066-40-250915-D1.doc	T Marsland	E Brown	E Brown

Document Details

Last saved	25/09/2015 09:01
Path	TAMjw12066-40-250915-D1.doc
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Project Number	12066-40
Project Name	10A Oakhill Avenue, London, NW3 7RE
Planning Reference	2015/1628/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 10A Oakhill Avenue, London, NW3 7RE (planning reference 2015/1628/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. There is no overarching BIA report nor is there a construction method statement from a Consulting Engineer. The information submitted comprised the following separate reports:-

- Interim Basement Impact Assessment Screening Report: 'Land Stability' report by Soil Consultants.
- 'Factual Report on Ground Investigation' by Soil Consultants.
- 'Slope Stability and Ground Movement Assessment' by KEY GS.
- BIA (Surface Water and Groundwater) by esi.

The authors of these documents have suitable credentials.

1.5. No construction methodology has been provided. The proposed basement (approximately 6.5m bgl/89.16m OD) will be constructed using a secant piled wall with top down construction techniques, and will be founded close to the boundary of the Claygate Member and the London Clay. The proposed secant piled retaining wall will extend significantly into the London Clay Formation below. It is vital that the construction methodology is confirmed, and the above listed reports will need to be reviewed by the authors to determine if the construction technique requires any of their conclusions to be amended.

1.6. It is likely that the groundwater table will be encountered during basement foundation excavation and proposals for excluding water in the permanent and temporary cases are required.

1.7. Analysis has been undertaken of estimated horizontal and vertical ground movements based on the above construction technique. Vertical heave during excavations of the first and second basements are predicted to be 25mm and 50mm respectively. Output from a software analysis

of predicted total displacements is provided and it is stated that the effect on neighbouring properties will be negligible (<10mm). This corresponds to categories 0 or 1 after Burland 1995. However, no supporting evidence for this conclusion is provided.

1.8. No proposals are provided for a movement monitoring strategy during excavation and construction. For a double basement excavation we consider this is necessary, together with condition surveys of potentially affected properties.

1.9. There will be a net increase in impermeable surface on site of around 13% and a sustainable drainage system will need to be designed at the next stage of the project. The area is not known to experience flooding. The BIA (Surface Water and Groundwater) concludes there will be no adverse impact on surface flows from the proposed basement.

1.10. The proposed basement development will have an impact on the wider hydrogeology of the area and is predicted to result in an increase in the water level adjacent to the neighbouring property of around 0.4m. The esi report concluded that this is within seasonal fluctuations of groundwater level and ground water levels are not expected to exceed ground level. Further work is recommended to compare the worst case groundwater level increase relative to the neighbouring properties, with particular focus on any neighbouring properties that have basements. The reports are silent on this which is presumably an unknown at this stage.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 09/07/2015 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 10A Oakhill Avenue, London, NW3 7RE (2015/1628/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 a 3 storey building with lower ground and basement levels to accommodate 2 x 4-beds and 3 x 3-bed units (Class C3)……."*

2.6. CampbellReith accessed LBC's Planning Portal on 21st September 2015 and gained access to the following relevant documents for audit purposes:

- 'Land Stability' report by Soil Consultants.
- 'Factual Report on Ground Investigation' By Soil Consultants.
- 'Slope Stability and Ground Movement Assessment' by KEY GS.
- BIA (Surface Water and Groundwater) by esi.
- Planning Application Drawings consisting of:-

- Location Plan

- Proposed Plans, Sections and Elevations.

- Planning Consultation Responses.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are Individual report (from Section 1.4) Author(s) credentials satisfactory?	Yes	Chartered Geologists, Chartered Engineers, and Chartered Institute of Water and Environmental Management members.
Is data required by Cl.233 of the GSD presented?	No	Construction methodology and programme not 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	See accompanying report documents mentioned in section 1.4 above.
Are suitable plan/maps included?	Yes	See accompanying report documents mentioned in section 1.4 above.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	See accompanying report documents mentioned in section 1.4 above.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See accompanying report documents mentioned in section 1.4 above.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See accompanying report documents mentioned in section 1.4 above.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See accompanying report documents mentioned in section 1.4 above.

Item	Yes/No/NA	Comment
Is a conceptual model presented?	Yes	See accompanying report documents mentioned in section 1.4 above.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See accompanying report documents mentioned in section 1.4 above.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See accompanying report documents mentioned in section 1.4 above.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See accompanying report documents mentioned in section 1.4 above.
Is factual ground investigation data provided?	Yes	See accompanying report documents mentioned in section 1.4 above.
Is monitoring data presented?	Yes	See accompanying report documents mentioned in section 1.4 above.
Is the ground investigation informed by a desk study?	No	No desk study provided.
Has a site walkover been undertaken?	Unknown	Not mentioned in any of the reports. Level of detail in reports suggests that a site walkover is likely to have occurred.
Is the presence/absence of adjacent or nearby basements confirmed?	No	Not mentioned in any of the reports. Needs to be confirmed by further investigative work.
Is a geotechnical interpretation presented?	No	

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	No	
Are reports on other investigations required by screening and scoping presented?	No	Not required.
Are baseline conditions described, based on the GSD?	Yes	To extent commensurate with scale of basement proposals.
Do the base line conditions consider adjacent or nearby basements?	No	Not mentioned in ant of the reports. Needs to be confirmed by further investigative work
Is an Impact Assessment provided?	Yes	See accompanying report documents mentioned in section 1.4 above.
Are estimates of ground movement and structural impact presented?	Yes	But no construction methodology or evidence to support conclusions.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	See accompanying report documents mentioned in section 1.4 above.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	No construction methodology provided.
Has the need for monitoring during construction been considered?	No	CampbellReith do not agree with this and have made recommendations that ground movement monitoring is used with this proposed double basement.

Item	Yes/No/NA	Comment
Have the residual (after mitigation) impacts been clearly identified?	No	Ground movement assessment/building damage assessment to be revised. Implications of impact on hydrogeology to be considered in more detail.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	In a scheme design way the piled retaining wall and top down construction is likely to be an appropriate construction method. Construction methodology describing permanent and temporary works and proposal for monitoring are required.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Surface water run-off will be increased. Recommendations are made for a proposed sustainable drainage system.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Not proven.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	However, no supporting evidence provided.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment is an amalgamation of various reports listed in section 1.4 of this report. The report authors appear to have suitable qualifications. Not all information required for a BIA has been provided. There is a no construction methodology, programme or details of mitigation measures.

4.2. The BIA indicates that the proposed basement (approximately 6.5m bgl) will be constructed using a secant piled wall and top down construction techniques, and will be founded at the boundary of the Claygate Member and the London Clay. The proposed secant piled walling will extend significantly into the London Clay Formation below. The exploratory holes extended to a maximum depth of 7m. No desk study, geotechnical interpretation or design information for retaining walls have been provided.

4.3. The site investigation report identifies that the basement will be formed close to boundary between is the Claygate Member (Secondary Aquifer A) and the London Clay (Non-productive Aquifer).

4.4. None of the reports discuss the neighbouring properties construction i.e. whether they have existing basements.

4.5. The conclusions reached in the Surface and Groundwater report is that the proposed basement will have a damming effect and could cause the water level to adjacent properties to rise by approximately 0.4m, which is stated as below ground level and within the seasonal fluctuation of the existing groundwater level. It is not known what groundwater level was assumed for the baseline condition. There is no discussion of how a rise in the water table could affect nearby basements. This could be a significant increase if neighbouring properties have basements and the rise in groundwater level could compromise existing waterproofing measures and cause water ingress. Further work needs to be undertaken to ascertain if this is a likely scenario, starting with a survey to determine any existing basements local to the proposed development and confirmation of the worst case baseline groundwater conditions.

4.6. An assessment of vertical and horizontal ground movements has been produced which estimates that the effect on neighbouring properties will be negligible. However, this is based on an assumed construction methodology and no supporting evidence is provided for the conclusions of the assessment, such as assumed soil parameters. The full input and output data for the software analysis are required together with the assumptions and calculations used to derive the building damage assessment.

4.7. No ground movement monitoring has been proposed which CampbellReith considers a requirement for a basement of this size and depth. This should be carried out for both the

excavation and construction phases of the project. Condition surveys of potentially affected properties are also required.

4.8. The BIA (Surface and Groundwater) noted that the increase in impermeable surface areas is just around 13% and that, subject to an assessment of SUDs, this is unlikely to cause any detrimental impact.

4.9. It is accepted that there are no slope stability concerns regarding the proposed development and it is not in an area prone to flooding.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment has been carried out by well-known firms of engineering consultants using individuals who possess suitable qualifications.

5.2. Much of the information required by a BIA is not provided including construction methodology, programme and proposed mitigation measures. No desk study, geotechnical interpretation or design advice for retaining walls have been provided.

5.3. The proposed basement is to be founded close to the boundary between the Claygate Member and the London Clay with the proposed secant piled retaining wall extending into the London Clay Formation below. The exploratory holes extended only a short distance below the proposed basement level.

5.4. It is likely that the ground water table will be encountered during basement foundation excavation. No measures for temporary and permanent exclusion have been provided.

5.5. The BIA states proposed basement will be constructed using a secant piled wall with top down construction techniques. This forms the basis of assumptions made in the reports concerning ground movements etc. and needs to be confirmed with outline details for temporary and permanent works.

5.6. It is recommended that further investigation of the neighbouring properties construction is carried out to ascertain whether there are existing basements which could be affected by the predicted rise in ground water levels caused by the proposed basement construction.

5.7. Horizontal and vertical ground movement analysis predicts negligible impact on neighbouring properties provided the construction technique mentioned in 5.3 is adopted. No supporting evidence for the conclusions is provided. It is recommended that the assessment is reviewed against a Construction Method Statement and that all assumptions and input/output data for software analysis are clearly presented.

5.8. No proposals are provided for a movement monitoring strategy during excavation and construction. These are require together with proposals for condition surveys of potentially affected properties.

5.9. It is accepted that there are no adverse impacts on slope stability, surface water flows or flooding.

Appendix 1: Resident's Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Safit	Flat 4, 10 Oakhill Avenue	03/05/15	Groundwater flow Soil subsidence	Refer to 4.5, 4.6 and 4.7
Khadavi	Flat 5, 10 Oakhill Avenue	28/05/15	Groundwater flow	Refer to 4.5
Brafman	Flat 6, 10 Oakhill Avenue	28/04/15	Groundwater flow Soil subsidence	Refer to 4.5, 4.6 and 4.7
Oakhill RA	10 Oakhill Avenue	15/05/15	Surface run off Building damage	Refer to 4.8, 4.6 and 4.7

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Significant information required for the BIA has not been provided.	BIA to be updated and completed with reference to Camden guidance.	
2	Hydrogeology/Stability	No information is presented with respect to neighbouring basements.	Information to be provided with confirmation of impacts.	
3	Hydrogeology	Assumed baseline condition not stated and impact not assessed.	Confirm potential impact for nearby basement.	
4	Stability	No information provided for design of retaining walls and piles.	To be provided.	
5	Stability	No information presented to support conclusions with respect to predicted ground movement and building damage.	To be provided.	
6	Stability	No proposals for condition surveys, mitigation measures or monitoring.	To be provided.	

Appendix 3: Supplementary Supporting Documents

None

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