

Comments on CRH Independent Review of Basement Impact Assessment

of proposed development at

4 The Hexagon

Fitzroy Park

Camden

London

N6 6HR

for

Ms Lorraine Asbourne

LBH4391c Ver 1.0

September 2016



LBH
WEMBLEY



**Geotechnical &
Environmental**

Site: 4 The Hexagon, Fitzroy Park, Camden, London, N6 6HR
Client: Ms Lorraine Ashbourne

LBH4391c
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Foreword-Guidance Notes

GENERAL

This report has been prepared for a specific client and to meet a specific brief. The preparation of this report may have been affected by limitations of scope, resources or time scale required by the client. Should any part of this report be relied on by a third party, that party does so wholly at its own risk and LBH WEMBLEY Geotechnical & Environmental disclaims any liability to such parties.

The observations and conclusions described in this report are based solely upon the agreed scope of work. LBH WEMBLEY Geotechnical & Environmental has not performed any observations, investigations, studies or testing not specifically set out in the agreed scope of work and cannot accept any liability for the existence of any condition, the discovery of which would require performance of services beyond the agreed scope of work.

VALIDITY

Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should therefore not be relied upon in the future.

THIRD PARTY INFORMATION

The report may present an opinion on the disposition, configuration and composition of soils, strata and any contamination within or near the site based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

DRAWINGS

Any plans or drawings provided in this report are not meant to be an accurate base plan, but are used to present the general relative locations of features on, and surrounding, the site.

1. Introduction

1.1 Background

Following demolition of the existing building which has a partial lower ground floor, it is proposed to redevelop the site by construction of a three storey dwelling on approximately the same footprint with a lower ground floor area that will extend into the hillside beneath the full footprint.

LBH WEMBLEY Geotechnical & Environmental were appointed to prepare a Basement Impact Assessment (BIA) for submission to London Borough of Camden in order to satisfy the specific requirements of Camden Planning Policy DP27 on Basements and Lightwells and Supplementary Planning Guidance CPG4 (2015) on Basements and Lightwells. The BIA (Ref: LBH4391BIA Ver: 1.1 dated: 9th June 2016) was duly submitted and has been subject to an independent review for the council by Campbell Reith (CRH), who have provided their review in an audit report (Ref: 12066-85 Rev: D1 dated: 12th August 2016)

1.2 Report Rationale /Structure

This report has been prepared as a detailed response to the CRH audit. The report firstly sets out the planning policy and the auditing procedure / terms of reference for the audit and then consider each of the comments that have been made by CRH against these requirements.

1.3 Relevant Planning Policy

The CPG4 Planning Guidance on Basements and Lightwells refers primarily to Planning Policy DP27 on Basements and Lightwells.

The DP27 Policy reads as follows:

In determining proposals for basement and other underground development, the Council will require an assessment of the scheme's impact on drainage, flooding, groundwater conditions and structural stability, where appropriate. The Council will only permit basement and other underground development that does not cause harm to the built and natural environment and local amenity and does not result in flooding or ground instability. We will require developers to demonstrate by methodologies appropriate to the site 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 we will consider whether schemes:

- d) harm the amenity of neighbours;*
- e) lead to the loss of open space or trees of townscape or amenity value;*
- f) provide satisfactory landscaping, including adequate soil depth;*
- g) harm the appearance or setting of the property or the established character of the surrounding area; and*
- h) protect important archaeological remains.*

The Council will not permit basement schemes which include habitable rooms and other sensitive uses in areas prone to flooding. In determining applications for lightwells, the Council will consider whether:

- i) the architectural character of the building is protected;*
- j) the character and appearance of the surrounding area is harmed; and*
- k) the development results in the loss of more than 50% of the front garden or amenity area.*

In addition to DP27, the CPG4 Guidance on Basements and Lightwells also supports the following Local Development Framework policies:

Core Strategies:

- CS5 Managing the impact of growth and development
- CS14 Promoting high quality places and conserving our heritage
- CS15 Protecting and improving our parks and open spaces & encouraging biodiversity
- CS17 Making Camden a safer place
- CS18 Dealing with our waste and encouraging recycling

Development Policies:

- DP23 Water
- DP24 Securing high quality design
- DP25 Conserving Camden's heritage
- DP26 Managing the impact of development on occupiers and neighbours

This report makes some specific further reference to these policies but relies essentially upon the technical guidance provided by the Council in November 2010 to assist developers to ensure that they are meeting the requirements of DP27, which is known as the Camden Geological, Hydrogeological and Hydrological Study, Guidance for Subterranean Development (CGHHS), and was prepared by Arup.

1.4 Audit Policy

The technical procedure for the council to assess the information submitted in a BIA was set out in Section 8 of the CGHHS and is essentially a process of auditing the submission against the criteria given in Section 6 of the CGHHS.

The CGHHS audit process *should include the following:*

- *Check qualifications / credentials of author*
- *Check BIA scope against flowcharts (Section 6.2.2 [of CGHHS])*
- *Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?*
- *Have the appropriate issues been investigated? This includes assessment of impacts with respect to DP27 including land stability, hydrology, hydrogeology.*
- *Is the scale of any included maps appropriate? That is, does the map show the whole of the relevant area of study and does it show sufficient detail?*
- *Have the issues been investigated using appropriate assessment methodology? (Section 7.2 [of CGHHS])*
- *Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? (Section 5 [of CGHHS])*
- *Has the need for monitoring been addressed and is the proposed monitoring sufficient and adequate? (Section 7.2.3 [of CGHHS])*
- *Have the residual (after mitigation) impacts been clearly identified?"*

Further to the above CRH are understood to have agreed the following principles with the council:

“The audit should provide conclusions on the following principles:

Whether:

- a. *The person(s) undertaking the BIA hold qualifications relevant to the matters being considered, in accordance with the requirements set out in CPG4.*
- b. *The Basement Impact Assessment has been prepared in accordance with the processes and procedures set out in Camden Planning Guidance 4.*
- c. *The methodologies and assumptions are clearly stated and are appropriate to the scale of the proposals and the nature of the site.*
- d. *The conclusions have been arrived at based on all necessary and reasonable evidence and considerations, in a reliable, transparent manner, by suitably qualified professionals, with sufficient attention paid to risk assessment and use of cautious or moderately conservative engineering values/estimates.*
- e. *The conclusions of the various documents/details comprising the BIA are consistent with each other. The conclusions are sufficiently robust and accurate and are accompanied by sufficiently detailed amelioration/mitigation measures to ensure that the grant of planning permission would accord with policy DP27 (Basements and Lightwells) and DP23 (Water), in respect of:*
 - *maintaining the structural stability of the building and any neighbouring properties to within limits set out in the policy/guidance*
 - *avoiding adversely affecting drainage and run-off or causing other damage to the water environment and*
 - *avoiding cumulative impacts on structural stability or the water environment in the local area.”*

In addition CRH are understood to have agreed the following checklist of details with the council:

“The audit shall comment in detail on the following matters, where relevant to the proposals:

The soundness of :

- a) *the conceptual model with regards to ground and groundwater conditions*
- b) *the consideration given to structural condition of neighbouring properties*
- c) *identification of the likely impact on land stability and the structural integrity of the neighbouring properties*
- d) *identification of the likely impact on hydrogeology*
- e) *identification of the likely impact on hydrology*
- f) *the scope of completed ground investigations with the presumption that invasive ground investigation should take place in all instances*
- g) *appropriately conservative modelling used in reaching the BIA assumptions including anticipated structural damage categorised according to the Burland Scale, and conclusions (mindful that Campbell Reith shall use professional judgement in respect of calculations in the audit material and are not required to carry out any detailed calculations or checking of specific figures)*
- h) *proposals for ongoing monitoring of groundwater levels*
- i) *measures to ensure the on-going maintenance and upkeep of the basement and ground water management measures*
- j) *temporary works methodologies, requirements and recommendations for construction contractors*

- k) the inter-compatibility of the assessments, findings and conclusions of all BIA components;*
- l) an outline methodology for monitoring and responding to ground water levels and structural movement*
- m) Identification of relevant cumulative impacts on land stability and local ground and surface water conditions arising from the basement development”*

2. Issues identified by CRH Review

2.1 BIA format Issues

2.1.1 Question 3 of the hydrogeology screening has not been answered (CRH Query #1)

BIA not undertaken in accordance with ARUP GSD and CPG4 requirements.

Q3 of the hydrogeological screening reads:

Is the site within the catchment of the pond chains on Hampstead Heath?

This question is the same as Q1 of the hydrological screening, which reads:

Is the site within the catchment of the pond chains on Hampstead Heath?

Although Q3 was inadvertently omitted from the table in section 4.2 of the BIA, the reviewer would have spotted that the question had in fact been answered as the relevant potential impacts had been carried forward into the section 5 scoping assessment as follows:

- ***The site is within the catchment area of the pond chains on Hampstead Heath.***
The guidance advises that with regard to the pond chains on Hampstead Heath, any reduction in the spring inflow to the ponds would reduce the overall flow through the ponds, which in turn could allow an increased build-up of contaminants. This may potentially lead to the bathing ponds not attaining the required Bathing Water Directive water quality standards.

CONCLUSION : CRH Query #1 can be closed out..

2.1.2 Full CMP details and programme not provided (CRH Query #2)

Works duration provided in outline CMP. Detailed programme to be provided by appointed Contractor at a later date. Details of CMP to be agreed with Council.

A works duration is indicated in the Construction Management Plan (CMP), however a detailed programme should be submitted by the appointed contractor at a later date. Details of the CMP should be agreed with the Council

CONCLUSION : CRH Query #2 can be closed out. (note: CRH have recognised this)

2.1.3 Stiffness parameters not given for retaining wall design (CRH Query #3)

Stiffness parameters for retaining wall design to be provided.

Young's Modulus values are not included in the retaining wall parameters and these are requested

The retaining wall parameters provided in Section 6.5 of the LBH Wembley Hydrogeological, Geotechnical & Ground Movement Assessment Report is considered incomplete as it does not include Young's Modulus, E, values.

Section 6.5 of the LBH Wembley Hydrogeological, Geotechnical & Ground Movement Assessment Report is complete. Ground Movement and Soil Stiffness are considered in the next section of that report Section 7, where Young's Modulus, E, values are provided.

CONCLUSION : CRH Query #3 can be closed out.

2.2 Hydrogeology Issues

2.2.1 Impact of increased hard standing area and discharge to groundwater (CRH Query #4)

Risk to be assessed and appropriately addressed.

LBH Wembley Hydrogeological, Geotechnical & Ground Movement Assessment Report Section 5.3.3 indicates there will be an increase in hard surfaced area that will be drained via SuDs however the BIA does not address this and propose how a SuDs system would be implemented to address the screening/scoping items relating to the increase in impermeable area of the development and the discharge of surface water and bypass drainage to the groundwater.

This is incorrect. Section 7.2 of the BIA specifically addresses the impacts relating to surface water infiltration and drainage as a result of the proposed increase in hard surfacing. The SuDs system design will be progressed by a drainage design engineer following a grant of planning permission.

CONCLUSION : CRH Query #4 can be closed out.

2.2.2 Bypass Drainage System (CRH Query #5)

Details of proposed system and permeability testing results to be provided.

Details of the proposed bypass drainage system should be provided along with a permeability investigation to justify its suitability.

The bypass drainage proposal does not provide any indication of the permeability of the proposed soakaway. No details of the system are provided.

This is incorrect. No soakaway has been proposed. Section 5.3.3 of the Geotechnical & Ground Movement Assessment Report explains that the increase in hard surfaced area will be drained via SuDs.

Section 7.2 of the BIA explains that a SuDs re-infiltration system is to be designed. The Bypass Drainage System, including the SuDs design will be progressed by the drainage design engineer following a grant of planning permission.

CONCLUSION : CRH Query #5 can be closed out.

2.3 Hydrology Issues

2.3.1 *Impact of increased hard standing area and discharge to groundwater (CRH Query #6)*

Risk to be assessed and appropriately addressed.

A 'No' response is given to Question 4 of the Hydrology screening which relates to whether there will be change in the profile of the inflows of surface water flows received by the neighbouring properties. As the impermeable area of the property has been indicated as increasing the response to this question should have been 'Yes' with the issue appropriately addressed in the scoping.

This is incorrect. The issue has been both assessed and appropriately addressed. The answer to Question 4 of the Hydrology screening is not a simple follow on from the previous Question 3 which asks whether the impermeable area of the property will increase.

It is stated that the development is to include appropriate SuDs to maintain the existing flow profile and Section 7.2 of the BIA specifically states that the system is to be designed to safely deal with any peak flows without flooding of the adjacent property downslope.

The SuDs system design will be progressed by the drainage design engineer following a grant of planning permission.

CONCLUSION : CRH Query #6 can be closed out.

2.3.2 *Screening did not identify that the site is located in an area at risk from surface water flooding (CRH Query #7)*

Risk to be considered and addressed as necessary.

The screening exercise did not identify that the site is in an area at risk from surface water flooding. The BIA should be updated to consider this potential impact.

A 'No' response was given to Question 6 of the Hydrology screening which relates to whether or not the site is in an area at risk from flooding. Figure 3iii of the Camden SFRA indicates the site is in area at risk from surface water flooding.

It is correct that Figure 3iii of the Camden SFRA indicates that, while there is no evidence of any past flooding, the site includes an area thought to be associated with a possible 1 in 1000 year risk from surface water flooding. However, Figure 3viii of the Camden SFRA indicates that for a 1 in 1000 year flood event there is no elevated flood hazard at this site.

In practice the only route for surface water to enter the site is via the existing driveway, and any surface water entering by this route is collected by the existing surface water drainage system.

A Flood Risk Assessment will nevertheless be provided as required by CPG4 procedure.

CONCLUSION : CRH Query #7 is valid.

2.4 Stability Issues

2.4.1 **Presence or absence of basement beneath neighbouring properties not discussed in BIA and foundations depths not determined (CRH Query #8)**

Presence or absence of basements to be beneath adjacent properties to be confirmed. Foundation depths investigated or maximum differential depth assumed.

The BIA does not confirm if there are any adjacent basements to the site and the neighbouring foundations are likely to be similar to the foundations to 6 The Hexagon. Unless further information is forthcoming or an investigation undertaken to determine these, the maximum differential depth should be assumed.

The answer to Question 11 of the stability screening issue was given as follows

The proposed basement will be approximately 2m lower than the foundations to No. 3 The Hexagon."

This is the maximum differential depth and has been assumed on the basis that the adjacent properties do not include basements.

CONCLUSION : CRH Query #8 can be closed out.

2.4.2 **No construction sequence sketches and no temporary works proposal (CRH Query #9)**

Construction sequence sketches with temporary works indicated if required to be provided.

Sketches to illustrate the construction sequence with any temporary propping indicated and an underpinning bay sequence are not provided and this is requested. The information provided should also include structural details of the proposed basement.

Structural details of the proposed basement are not provided. Although a construction sequence is provided in the text, sketches to illustrate this are not provided. An underpinning bay sequence is also not provided

The construction sequence has been described and illustrated, and the Structural Engineer has submitted a structural report. This report will be updated in more detail as requested and reissued.

CONCLUSION : CRH Query #9 can be closed out.

2.4.3 **Full input and output from the SAPPER programme not included (CRH Query #10)**

Full input and output from the SAPPER programme to be provided for completeness.

The full tabular input and output from the SAPPER programme is not included and this is requested for completeness.

Although contour plots of the heave and settlement are included, the full tabular input and output from the programme is not provided.

All the information used to input the Sapper programme is provided in the ground movement assessment report, to the extent that CRH may if they wish duplicate the analysis in full. A tabular output is not provided.

CONCLUSION : CRH Query #9 can be closed out.

2.4.4 Monitoring proposals (CRH Query #10)

Outline proposal provided. Details and trigger levels to be agreed as part of Party Wall award.

An outline monitoring proposal is included in the Structural and Civil Engineering Planning Report with trigger levels included. Details and trigger levels should be agreed as part of the Party Wall award.

CONCLUSION : CRH Query #10 can be closed out. (note: CRH have recognised this)

3. CONCLUSION

Of ten issues that have been raised by CRH, only one is considered to be a reasonably valid obstruction to a planning determination and this will require the preparation of a flood risk assessment.