Independent Assessment
of
Basement Impact Assessment for planning application 2014/0241/P
at
22 Ferncroft Avenue
London
NW3 7PH

for
London Borough of Camden

LBH 4218

April 2014

LBH WEMBLEY

Geotechnical & Environmental

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Foreword-Guidance Notes

GENERAL

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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.

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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 and any such reliance on the report in the future shall again be at the client's own and sole risk.

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.

1. Introduction

It is proposed to construct extended the existing basement at this property to match the footprint of the whole house, including an area of new extension and to provide a front lightwell and a rear basement area.

1.1 Brief

LBH WEMBLEY Geotechnical & Environmental have been commissioned to provide an Independent assessment of information submitted against the requirements of LDF policy DP27 (but also including CS5, CS14, CS15, CS17, CS18, DP23, DP24, DP25 and DP26 – as stated at paragraphs 1.5 and 1.6 of CPG4) and with reference to the procedures, processes and recommendations of the Arup Report and CPG4 2013.

1.2 Report Structure

This report commences with a description of the LDF policy requirements, and then considers and comments on the submission made and details any concerns in regards to:

1. The level of information provided (including the completeness of the submission and the technical sufficiency of the work carried out)
2. The proposed methodologies in the context of the site and the development proposals
3. The soundness of the evidence presented and the reasonableness of the assessments made.
4. The robustness of the conclusions drawn and the mitigation measures proposed in regard to:
    a. maintaining the structural stability of the building and any neighbouring properties
    b. avoiding adversely affecting drainage and run-off or causing other damage to the water environment and
    c. avoiding cumulative impacts on structural stability or the water environment in the local area
5. Specific details of any further information that is required to enable an assessment to be satisfactorily concluded.

1.3 Information Provided

The information studied comprises the following:

1. Basement Impact Assessment (BIA) Report – by Soarbond Limited, Ref: 1250, dated 10th December 2013.
2. Scheme Drawings - by 21st Architecture, Ref: 174_S_01, _02, _03, 174_GA_00, _01, _02, _03, _RF, _LG, 174_GE_01, _02,_03, 174_GS_01, _02, _03, 174_LA_00 dated December 2013

2. Policy DP27 – Basements and Lightwells

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.

3. Assessment of Adequacy of Information Provided

3.1 Basement Impact Assessment Stages

The methodology described for assessing the impact of a proposed basement with regard to the matters described in DP27 takes the form of a staged approach.

3.1.1 Stage 1: Screening

Screening uses checklists to identify whether there are matters of concern (with regard to hydrogeology, hydrology or ground stability) which should be investigated using a BIA (Section 6.2 and Appendix E of the CGHSS) and is the process for determining whether or not a BIA is required. There are three checklists as follows:

- subterranean (groundwater) flow
- slope stability
- surface flow and flooding

3.1.1.1 Subterranean (Groundwater) Flow

A screening checklist for the impact of the proposed basement on groundwater is included in the BIA (Document 1).

The report states that

- **The proposed basement development will result in a change in the proportion of hard surfaced / paved external areas** (by 63%)

3.1.1.2 Slope Stability

A screening checklist for the impact of the proposed basement on land stability is included in the BIA (Document 1).

The report states that

- **London Clay is the shallowest stratum on the site**
- **There is evidence of a history of shrink-swell subsidence**
- **The proposed basement will significantly increase the differential depth of foundations relative to neighbouring properties**

3.1.1.3 Surface Flow and Flooding

A partial screening checklist for the impact of the proposed basement on surface water flow and flooding is included in the BIA (Document 1).

The report states that

- **the proposed basement development will result in a change in the proportion of hard surfaced / paved external areas**

Question 6 (surface water flooding) has not been addressed in the screening checklist but the BIA states that the site is not in a location that is subject to flooding.

3.1.2 Stage 2: Scoping

Where the checklist is answered with a "yes" or "unknown" to any of the questions posed in the flowcharts, these matters are carried forward to the scoping stage of the BIA process.

The scoping produces a statement which defines further the matters of concern identified in the screening stage. This defining should be in terms of ground processes, in order that a site specific BIA can be designed and executed (Section 6.3 of the CGHSS).

There is no scoping stage described in the BIA.

However, issues that can be reasonably identified from the submission as being of concern have been assigned bold text in the previous sections and are as follows

- **The proposed basement development will result in a change in the proportion of hard surfaced / paved external areas**
  The guidance advises that a change in the in proportion of hard surfaced or paved areas of a property will affect the way in which rainfall and surface water are transmitted away from a property. This includes changes to the surface water received by the underlying aquifers, adjacent properties and nearby watercourses. Changes could result in decreased flow, which may affect ecosystems or reduce amenity, or increased flow which may additionally increase the risk of flooding.

- **London Clay is the shallowest stratum on the site**
  The guidance advises that of the at-surface soil strata present in LB Camden, the London Clay is the most prone to seasonal shrink-swell (subsidence and heave).

- **There is evidence of a history of shrink-swell subsidence**
  The guidance advises that there are multiple potential impacts depending on the specific setting of the basement development. For example, in terraced properties, the implications of a deepened basement/foundation system on neighbouring properties should be considered.

- **The proposed basement will significantly increase the differential depth of foundations relative to neighbouring properties**
  The guidance advises that excavation for a basement may result in structural damage to neighbouring properties if there is a significant differential depth between adjacent foundations.

3.1.3 Stage 3: Site Investigation and Study

Site investigation and study is undertaken to establish the baseline conditions. This can be done by utilising existing information and/or by collecting new information (Section 6.4 of the CGHSS).

The report of a shallow hand auger investigation undertaken at No.18 Ferncroft Avenue has been provided, but it is evident that an extensive desk study has not been undertaken.

It appears that no site specific investigation has been undertaken.

3.1.4 Stage 4: Impact Assessment

Impact assessment is undertaken to determine the impact of the proposed basement on the baseline conditions, taking into account any mitigation measures proposed (Section 6.5 of the CGHSS).

The submitted BIA (Document 1) does not include any Impact Assessment stage, and does not really reach any conclusion other than to state that the basement construction would have been simpler if undertaken at the same time as the house construction.

3.2 The Audit Process

The audit process is based on reviewing the BIA against the criteria set out in Section 6 of the CGHSS and requires consideration of specific issues:

3.2.1 Qualifications / Credentials of authors

Check qualifications / credentials of author(s):

Surface flow and flooding: The report will meet the requirements **IF** evidence can be provided that the assessor is specialised in flood risk management and surface water drainage.

Subterranean (groundwater) flow: The report does **NOT** meet the requirements.

Land stability: The assessor does not appear to be a specialist in ground engineering and there does not appear to be demonstrable evidence that the assessments have been made in conjunction with a suitably qualified engineering geologist. The report hence does **NOT** appear to meet the requirements.

3.2.2 BIA Scope

Check BIA scope against flowcharts (Section 6.2.2 of the CGHSS). The scope of issues of concern has been checked against the flowcharts and it is considered that they have been identified in section 3.1.2 above.

However, the validity of the screening assessments is questioned since a specialist desk study does appear to have been undertaken. For example reference to British Geological Survey mapping would have confirmed that **the site is underlain by Claygate Beds** and reference to Environment Agency information would have confirmed that these beds are classed as being **a Secondary A Aquifer** of high permeability.

As a result of the flawed screening, the following additional issue of concern has not been addressed.

- **the site is within an aquifer**
  The guidance advises that the basement may extend into the underlying aquifer and thus affect the groundwater flow regime.

3.2.3 Description of Works

Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?

Yes, conventional underpinning is envisaged.

3.2.4 Investigation of Issues

Have the appropriate issues been investigated? This includes assessment of impacts with respect to DP27 including land stability, hydrology, hydrogeology.

No investigation of the groundwater table has been undertaken within the site. A water-bearing sand layer could potentially lie above or close to the intended basement level. Given sufficient head of water within such a layer, there may be concern that the base of excavations could become unstable.

No investigation of the ground has been undertaken within the site.

3.2.5 Mapping Detail

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? Yes.

3.2.6 Assessment Methodology

Have the issues been investigated using appropriate assessment methodology? (Section 7.2 of the CGHSS).

The BIA has not been prepared in accordance with the processes and procedures set out in Camden Planning Guidance (CPG4) and are inevitably inconclusive as a result of the absence of site specific ground investigation and groundwater monitoring.

There has been no assessment of possible cumulative effects.

3.2.7 Mitigation

Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? (Section 5 of the CGHSS)

As a result of the uncertainty surrounding the ground conditions in the proposed basement area, and in particular the groundwater conditions, the BIA cannot really be validated beyond the scoping stage.

There is insufficient evidence that the issues have been fully considered. There is uncertainty about whether the proposed works might adversely affect adjacent structures and what measures might be undertaken to mitigate any potential impacts.

The BIA does not contain sufficient detail to assess whether the proposed construction and mitigation methodology is robust enough to stand the test of DP27.

3.2.8 Monitoring

Has the need for monitoring been addressed and is the proposed monitoring sufficient and adequate? (Section 7.2.3 of the CGHSS)

No groundwater monitoring has been carried out. It will be necessary to locate and monitor the groundwater table beneath the site in order to conclude the assessment.

No structural monitoring has been proposed. Structural monitoring will be required.

3.2.9 Residual Impacts after Mitigation

Have the residual (after mitigation) impacts been clearly identified?

No. The BIA is based upon assumed (rather than actual) ground and groundwater conditions and is hence of a preliminary nature.

4. Assessment of Acceptability of Residual Impacts

4.1 Proposed Construction Methodology

Conventional underpinning techniques are envisaged.

4.2 Soundness of Evidence Presented

The submitted evidence is not site specific and sufficient detail is not presented to conclude the assessments.

4.3 Reasonableness of Assessments

It would be reasonable for the assessments to have included further consideration of

- the possible presence of groundwater
- the possible effects of any dewatering
- the potential damage category associated with the possible effects of the works upon neighbouring structures

4.4 Robustness of Conclusions and Proposed Mitigation Measures

There is little doubt that, given expert control and construction above the groundwater table, the proposed basement construction is entirely feasible. However, there remains uncertainty regarding the ground conditions and whether the excavation will extend below the water table and this will affect the mitigation measures that may be required. The assessment must unfortunately be therefore considered incomplete in regards to drainage, structural stability and cumulative effects.

5. Conclusions

The submitted BIA does not wholly reflect the processes and procedures set out in DP27 and CPG4.

It is considered that the present submission does not demonstrate sufficient detail and certainty to ensure accordance with DP27, in respect of

a. Maintaining the structural stability of the building and any neighbouring properties
b. Avoiding adverse impact on drainage and run-off or causing other damage to the water environment and
c. Avoiding cumulative impacts on structural stability or the water environment

It is suggested that the concerns about the submission that have been raised in sections 3 and 4 of this document can be addressed by the applicant by way of further submission.

5.1 Further Information Required

It is considered that in order to meet the requirements of DP27 further information is required as follows:

- Further information is required on the ground conditions including ascertaining the presence and location of water-bearing layers beneath the site.

With the benefit of this further information, the BIA should then be revised accordingly to include an updated assessment of any groundwater impact. The revised BIA should include a re-assessment of the extent of the possible movements and damage to be expected during and after the works. A detailed monitoring and contingency plan should also be presented that reflects the outcome of this further assessment. Each section of the BIA must be signed off by persons with the required credentials.

It is envisaged that, at the discretion of the council, this further information and assessment might reasonably be sought by condition that it should be approved by Camden prior to the commencement of any work.