Independent Review
of
Basement Impact Assessment for planning application 2015/0369/P
at

44 Dartmouth Park Road
London
NW5 1SN

for
London Borough of Camden

LBH 4322

March 2015

LBH WEMBLEY

Geotechnical & Environmental

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Foreword-Guidance Notes

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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.

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 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 a single storey basement underneath the most of the rear footprint of this detached property.

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

1.3 Information Provided

The information studied comprises the following:

1. Basement Impact Assessment Screening Stage 1 by Card Geotechnics Limited, dated January 2015, Ref: CG/18249 Revision 0
2. Flood Risk Assessment by VKHP-consulting, dated January 2015, Ref: 113715/FRA/01
3. Design and Access Statement by Peter Stern, dated 22nd January 2015, unreferenced
4. Survey drawings of Existing by E.L.S Land Consultants, dated January 2015, Ref: Z079
5. Drawings of Proposed by Peter Stern, dated January 2015, Ref: 370/02 pl, 370/03 pl and 370/08 pl to 370/12 pl
6. Site Survey by Peter Stern, dated January 2015, Ref: 370/01 pl

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).

This identifies the following potential issues of concern:

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

3.1.1.2 Stability

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

This identifies the following potential issues of concern:

- **London Clay is the shallowest strata at the site.**
- **There is a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site.**
- **The site is within 5m of a highway or pedestrian right of way.**
- **The proposed basement will significantly increase the differential depth of foundations relative to the neighbouring properties.**

3.1.1.3 Surface Flow and Flooding

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

This identifies the following potential issues of concern:

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

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).

The submission does not proceed to a scoping stage.

Nevertheless, the potential issues identified from the screening checklists as being of concern have been assigned bold text in the previous sections and are as follows:

- **The proposed development will result in a change in the proportion of hard-surfaced/paved areas.**
  The guidance advises that the sealing off of the ground surface by pavements and buildings to rainfall will result in decreased recharge to the underlying ground. In areas underlain by an aquifer, this may impact upon the groundwater flow or levels. In areas of non-aquifer (i.e. on the London Clay), this may mean changes in the degree of wetness which in turn may affect stability.
  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 strata at 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 a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site.**
  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 site is within 5m of a highway or pedestrian right of way.**
  The guidance advises that excavation for a basement may result in damage to the road, pathway or any underground services buried in trenches beneath the road or pathway.

- **The proposed basement will significantly increase the differential depth of foundations relative to the 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).

No site investigation appears to have yet 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 submission does not proceed to an impact assessment stage. There have, however, been several statements made in Document 1 as follows.

- **The proposed development will result in a change in the area of hard-surfaced/paved areas.**
  "*A minor increase in the proportion of hard-standing is proposed to the rear of the property where an infill extension is to be constructed, which will not extend beyond the rear wall of the existing extension. This minor increase in hardstanding is not considered to significantly affect run-off/surface attenuation characteristics.*"

- **London Clay is the shallowest strata at the site.**
  "*The site is directly underlain by the London Clay Formation; however, the basement will not share a party wall and heave/settlement will be negligible assuming good workmanship and a well-constructed scheme are carried out.*"

- **There is a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site.**
  "*The London Clay is shallow so there may be shrink/swell, however the basement will not be affected by or be influenced by this.*"

- **The site is within 5m of a highway or pedestrian right of way.**
  "*Dartmouth Park Road and York Rise are present immediately to the south-east and south-west of the site; however construction works are unlikely to impact the highway assuming good workmanship and well-constructed scheme are carried out.*"

- **The proposed basement will significantly increase the differential depth of foundations relative to the neighbouring properties.**
  "*The construction of the basement will significantly increase the differential depth of foundations between No. 46 and No. 44, however it is noted that the foundations of No. 46 are offset by approximately 1m and therefore will not be directly underpinned. Given the depth of the new basement (approximately 3m) and the thickness of the underpin walls (typically 300mm to 600mm), deflections of the underpin walls are likely to be negligible and would not contribute to ground movements adjacent to the construction. Similarly, heave displacements over the short and long term would be expected not to exceed between 2mm to 5mm around the basement perimeter and would therefore not affect the structure of No. 46.*"

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):

Qualifications required for assessments

Surface flow and flooding	A Hydrologist or a Civil Engineer specialising in flood risk management and surface water drainage, with either: • The "CEng" (Chartered Engineer) qualification from the Engineering Council; or a Member of the Institution of Civil Engineers ("MICE"); or • The "C.WEM" (Chartered Water and Environmental Manager) qualification from the Chartered Institution of Water and Environmental Management.
Subterranean (groundwater) flow	A Hydrogeologist with the "CGeol" (Chartered Geologist) qualification from the Geological Society of London.
Land stability	A Civil Engineer with the "CEng" (Chartered Engineer) qualification from the Engineering Council and specialising in ground engineering; or A Member of the Institution of Civil Engineers ("MICE") and a Geotechnical Specialist as defined by the Site Investigation Steering Group. With demonstrable evidence that the assessments have been made by them in conjunction with an Engineering Geologist with the "CGeol" (Chartered Geologist) qualification from the Geological Society of London.

Surface flow and flooding: The report meets the requirements.

Subterranean (groundwater) flow: The report meets the requirements.

Land stability: The report meets the requirements.

3.2.2 BIA Scope

Check BIA scope against flowcharts (Section 6.2.2 of the CGHSS).

It is stated within Document 1 that the site is approximately 115m from the "River Fleet". However, there is evidence that the course is a lot closer, possibly running close to or even through part of the rear garden of the property itself.

- **The site is within 100m of a watercourse, well (used/disused) or potential spring line.**
  The guidance advises that flow from a spring, well or watercourse may increase or decrease if the groundwater flow regime which supports that water feature is affected by a proposed basement.
  If the flow is diverted, it may result in the groundwater flow finding another location to issue from with new springs forming or old springs being reactivated.
  A secondary impact is on the quality of the water issuing or abstracted from the spring or water well respectively.

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?

The scheme does not yet appear to have been developed to a stage where a detailed construction methodology has been prepared.

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 ground investigation appears to have yet been undertaken, and no ground movement assessment has yet been provided.

Given the possible proximity of the “Fleet River” the ground conditions will require careful investigation.

The conceptual site model (figure 3 of Document 1) would appear to be optimistic in that it suggests that the new basement excavation will not proceed deep enough to potentially impact the foundations to No. 46 Dartmouth Park Road.

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?

A detailed structural section indicating the configuration of the proposed basement in relation to the neighbouring foundations of No. 46 Dartmouth Park Road would be useful.

3.2.6 Assessment Methodology

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

No ground movement assessment has yet been undertaken.

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)

A detailed construction methodology does not yet appear to have been prepared and hence the appropriateness of any mitigation cannot yet be judged.

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 monitoring has yet been suggested.

3.2.9 Residual Impacts after Mitigation

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

A detailed construction methodology does not yet appear to have been prepared and hence any residual impacts cannot yet be identified.

4. Assessment of Acceptability of Residual Impacts

4.1 Proposed Construction Methodology

The scheme does not yet appear to have been developed to a stage where a detailed construction methodology has been prepared.

4.2 Soundness of Evidence Presented

A ground investigation does not appear to have yet been undertaken.

4.3 Reasonableness of Assessments

The assessments cannot yet be concluded.

4.4 Robustness of Conclusions and Proposed Mitigation Measures

The present submission does not really progress beyond a screening stage that has identified the potential issues of concern. These issues need to be investigated before conclusions can be drawn and any mitigation measures developed.

5. Conclusions

The submitted BIA does reflect the processes and procedures set out in DP27 and CPG4, but does not progress beyond a Stage 1 Screening.

As a consequence the submission is incomplete and does not meet the requirements of 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

5.1 Further Information Required

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

- Stage 2 Scoping
- Stage 3 Site Investigation
- Stage 4 Impact Assessment

With the benefit of this further information, the BIA should then be progressed accordingly to address the concerns about the present submission that have been raised in sections 3 and 4 of this document and to include an assessment of any impacts and a specific construction sequence and methodology indicating in detail how the host building and neighbouring structures are to be protected. The BIA should provide a detailed assessment of the extent of the possible movements and damage to be expected to both the host building and No. 46 Dartmouth Park Road during and after the works. A monitoring and contingency plan should also be presented that reflects the outcome of these assessments.