

**Independent Assessment
of
Basement Impact Assessment for
planning application 2014/2094/P
at**

**No. 7
St. Pancras Way
London
NW1 0PB**

**for
London Borough of Camden**

LBH 4241

June 2014

**LBH
WEMBLEY**



**Geotechnical &
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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 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 excavate a new single storey basement under part of the footprint of the existing western building at this site.

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 (BIA) Report - by Chelmer Consultancy Services, Ref: BIA3705, dated December 2013
2. Site sections and scheme drawings – by Wells Mackereth, Refs: PL001, PL091, PL101, PL102, PL121, PL122 all dated March 2014
3. Geo-environmental Desk Study for 7 St Pancras Way, London – by Jomas Associates Ltd, Ref: P8474J252 Final v1.0, dated March 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). This identifies that:

- **the site is within 100m of a watercourse**

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). This identifies that:

- **London Clay is the shallowest stratum on the site**
- **the site is within 100m of a watercourse**

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 has not identified any issues.

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).

A scoping stage is described in the BIA and the issues that have been identified as being of concern have been assigned bold text in the previous sections and are as follows

- **the site is within 100m of a watercourse, well or potential spring line**

The 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.

- **London Clay is the shallowest stratum on the site**

Of the at-surface soil strata present in LB Camden, the London Clay is the most prone to seasonal shrink-swell (subsidence and heave).

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).

A ground investigation is noted to have been undertaken at the site in April/May 2013, but has not been submitted. This investigation is reported to have comprised two boreholes to 15m depth and nine hand-dug trial pits, three of which were also extended by mechanical digging. Groundwater monitoring standpipes were reported to have been installed to 8m depth in both boreholes, but no details of these are provided.

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) includes an Impact Assessment.

- **London Clay is the shallowest stratum on the site and there is some potential for seasonal shrink-swell subsidence**

The BIA states no roots were encountered during the investigation, and that groundwater is present above the London Clay.

- **the site is within 100m of a watercourse**

The BIA recognises that the River Fleet flowed through or adjacent to the site, and that deposits of very soft silty alluvial clays are likely to be present in and adjacent to the former river channel.

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

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: <ul style="list-style-type: none">• 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.

Check qualifications / credentials of author(s):

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). The scope of issues of concern has been checked against the flowcharts it is considered that they have been identified in section 3.1.2 above. It should be noted that although the “No” responses provided to questions 1a and 1b for subterranean (groundwater) flow screening might be considered debatable, the report subsequently acknowledges the fact that groundwater is likely to be present within and adjacent to the former river channel.

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?

No construction methodology document has been provided, but it is clear that Document 1 recommends the construction of a secant/contiguous bored pile basement retaining wall in order to deal with the soft ground and water issues.

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.

At this site it is acknowledged that particular importance needs to be given to establishing the location and profile of the former river channel, the presence of groundwater and the nature of any flow.

The reported groundwater monitoring records appear to be possibly inconsistent. It is noted that a former basement on an adjacent site was reported to have been “waterlogged” and that there appear to be indications of a phreatic surface at around 1m to 1.5m depth beneath the building.

Confidence is required that either there is negligible groundwater flow across the site or that the new basement will not obstruct any flow of groundwater or that appropriate mitigation measures will be introduced to preserve any flow that is truncated by the new basement.

The investigation reportedly found the London Clay at 1.3m and 2.8m depth on this site, (although the location of these boreholes has not been provided), but it is also noted that Document 1 refers to what is possibly a 4m deep alluvial channel being found on the adjacent site to the south.

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).

It is not really possible to comment upon the appropriateness of the assessment methodology without having seen the investigation report. Rather surprisingly high hydraulic gradients appear to be implied by the presented data and it is acknowledged that the existing pattern of below ground water movements at this may be complicated by the presence of any historic culverts or drainage and by any continuity of permeability within the made ground.

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)

Although no specific construction methodology document has been submitted, it can be stated that the construction methodology recommended in Document 1 would, if implemented, be considered robust enough to stand the test of DP27 from the standpoint of surface flow and stability. If there were to be any as yet undetected significant groundwater flow beneath the building, this would require further assessment and mitigation.

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)

Yes.

3.2.9 Residual Impacts after Mitigation

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

The impacts associated with the construction methodology recommended in Document 1 would be considered minimal from the standpoint of surface flow and stability. However, if there were to be any as yet undetected significant groundwater flow beneath the building that was intercepted by the new basement piling, then this would require further assessment and mitigation. There may be particular sensitivity associated with the existing basement upstream of the development that might conceivably be impacted by an impounding of groundwater.

4. Assessment of Acceptability of Residual Impacts

4.1 Proposed Construction Methodology

Although Document 1 makes recommendations for a construction methodology it is noted that no specific construction methodology document has been supplied

4.2 Soundness of Evidence Presented

It is not possible to comment on the soundness of the evidence unless this can be studied first hand.

4.3 Reasonableness of Assessments

The submitted assessments appear to be reasonable.

4.4 Robustness of Conclusions and Proposed Mitigation Measures

The construction methodology recommended in Document 1 would be considered robust enough to stand the test of DP27 from the standpoint of surface flow and stability. If there were to be any as yet undetected significant groundwater flow beneath the building, this would require further assessment and possible mitigation.

5. Conclusions

The submitted BIA has followed the processes and procedures set out in DP27 and CPG4.

Moreover, If

1. It can be shown that the two ground investigation boreholes have been undertaken in the immediate area of the proposed basement excavation and
2. It can be shown that the response zones within the monitoring standpipes extended to a sufficiently high level to fully capture any groundwater presence above the London Clay

then it may be considered that the present submission does 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
- c. Avoiding cumulative impacts on structural stability or the water environment

It is recommended that as a condition of granting planning approval, a Construction Method Statement should be submitted and approved by Camden as a pre-commencement condition in order to be certain that the recommendations provided in the BIA are carried through to construction.

If the two ground investigation boreholes were not constructed in the immediate area of the proposed basement, then it is recommended that additional exploration be undertaken to check the ground conditions around that area and that the groundwater flow impacts be re-assessed also as a pre-commencement condition. This is considered necessary because of the potential for relatively rapid changes in conditions within the immediate vicinity of the River Fleet channel and the particular need for confidence in regard to the assumed negligible groundwater flow and the consequent justification for an absence of any groundwater flow mitigation.