Appendix 5

# Independent Assessment
# of
# Basement Impact Assessment for planning application 2014/1016/P
# at

# 38 Heath Drive
# London
# NW3 7SD

# for
# London Borough of Camden

LBH 4239

June 2014

LBH WEMBLEY

Geotechnical & Environmental

Project No: LBH 4239

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# Contents

# 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 demolish the existing three storey detached house and garages at No. 38 Heath Drive and construct an apartment block with a single level basement containing three apartments and a swimming pool. It is understood that the basement will extend to approximately 3m depth below the new building and will extend to a depth of approximately 4.5m beneath the rear garden and to approximately 6.5m depth to form the swimming pool.

## 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.
6. Specific details of considerations in respect of the structural integrity or condition of the neighbouring properties which would benefit from particular conditions being placed upon a planning approval.

## 1.3 Information Provided

The information studied comprises the following:

1. Basement Impact Assessment Report, Stage 1 – Screening, by Soiltechnics, Ref: STK2604A-BIA, dated 7th November 2013
2. Review of Subterranean Flow section by Chord Environmental Ref: 1127/LJE220414 dated 23rd April 2014

3. Basement Excavation drawing, by Jampel Davison & Bell, Ref: 1768 Drawing No: 1, dated October 2013
4. Arboricultural Report: Arboricultural Impact Assessment and Arboricultural Method Statement, by David Clarke Chartered Landscape Architect and Consultant Arboriculturalist, unreferenced, dated November 2013
5. Tree Protection Plan, by David Clarke Chartered Landscape Architect and Consultant Arboriculturalist, Ref: TPP/38HDHL/010 A, dated November 2013
6. Planning Application Design & Access Statement, by MR Partnership, Ref: project 2979, dated November 2013
7. Structural Stability Report, by Jampel Davison & Bell, Ref: 1768/GP/KMS, dated 22nd October 2013
8. Proposed Site Elevations, by MR Partnership, Refs: 2979-021, 2979-061, 2979-062, all dated November 2013
9. Existing Site Elevations, by MR Partnership, Ref: 2979-002, dated November 2013
10. Proposed Site Sections, by MR Partnership, Refs: 2979-020, 2979-060, both dated November 2013
11. Site Location Plans (Proposed and Existing), by MR Partnership, Refs: 2979-001, 2979-010, both dated November 2013
12. Floor Plans, by MR Partnership, Refs: 2979-050, 2979-051, 2979-052, all dated November 2013
13. Heritage Statement by Montagu Evans, unreferenced, dated November 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 basement impact assessment (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 subterranean (groundwater) flow is included in Document 1. The questions have not been answered yes or no. Nevertheless, the intended answer is reasonably clear from the responses provided.

The report does not identify any potential issues.

##### 3.1.1.2 Slope Stability

A screening checklist for the impact of the proposed basement on land stability is included in Document 1. The questions have not been answered yes or no. Nevertheless, the intended answer is reasonably clear from the responses provided.

The report states that:

- **London Clay is the shallowest stratum at the site.**
- **A number of trees will be felled as part of the development.**
- **Works are proposed within the Root Protection Zone of a number of trees.**
- **There could be differences in ground / basement level floors between the new build and adjacent properties**

##### 3.1.1.3 Surface Flow and Flooding

A screening checklist for the impact of the proposed basement on surface flow and flooding is included in Document 1. The questions have not been answered yes or no. Nevertheless, the intended answer is reasonably clear from the responses provided.

The report does not identify any potential 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).

No scoping section is presented within the BIA. However the issues identified by the submission as being of concern are reasonably clear. These issues have been assigned bold text in the previous sections and are as follows

- **London Clay is the shallowest stratum 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).*

- **A number of trees will be felled as part of the development**
- **Works are proposed within the Root Protection Zone of a number of trees.**

  *The guidance advises that the soil moisture deficit associated with a felled tree will gradually recover. In high plasticity clay soils (such as London Clay) this will lead to gradual swelling of the ground until it reaches a new value. This may reduce the soil strength which could affect the slope stability. Additionally the binding effect of tree roots can have a beneficial effect on stability and the loss of a tree may cause loss of stability.*

- **There could be differences in ground / basement level floors between the new build and adjacent 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 desk study or site investigation information has been submitted. The assessment has relied upon BGS information.

### 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).

No Impact Assessment of the identified issues of concern has been presented other than some comments provided as responses to the screening questions in Document 1. Document 7 identifies that the building is to be supported on piled foundations with due provision made for heave and shrinkage caused by the action of tree roots. Document 7 also indicates that the swelling potential of the main basement area due to basement heave is in the order of 25mm, that some ground movement beyond the boundary should be expected but that the potential for damage to adjoining buildings is slight. Document 1 indicates that a contiguous piled wall will be installed around the perimeter of the proposed basement to act as a retaining structure both in the temporary and permanent conditions.

Document 7 concludes that the basement excavation should not give rise to significant ground movements beneath the buildings on the adjacent sites.

### 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:<br>• The "CEng" (Chartered Engineer) qualification from the Engineering Council; or a Member of the Institution of Civil Engineers ("MICE"); or<br>• 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<br>A Member of the Institution of Civil Engineers ("MICE") and a Geotechnical Specialist as defined by the Site Investigation Steering Group.<br>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 does **NOT** 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 the following additional issues are considered to be of concern.

- **The site is within 100m of a watercourse**
  *The guidance advises that 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.*

- **The basement will result in a change in the proportion of hardsurfaced/paved 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.*
  *The guidance also advises that sealing off of the ground surface by pavements and buildings to rainfall will result in decreased recharge to the underlying ground. 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 proposed basement may result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses**
  *Changes could result in decreased volume, which may affect ecosystems or reduce amenity, or increased flow which may additionally increase the risk of flooding.*

### 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?

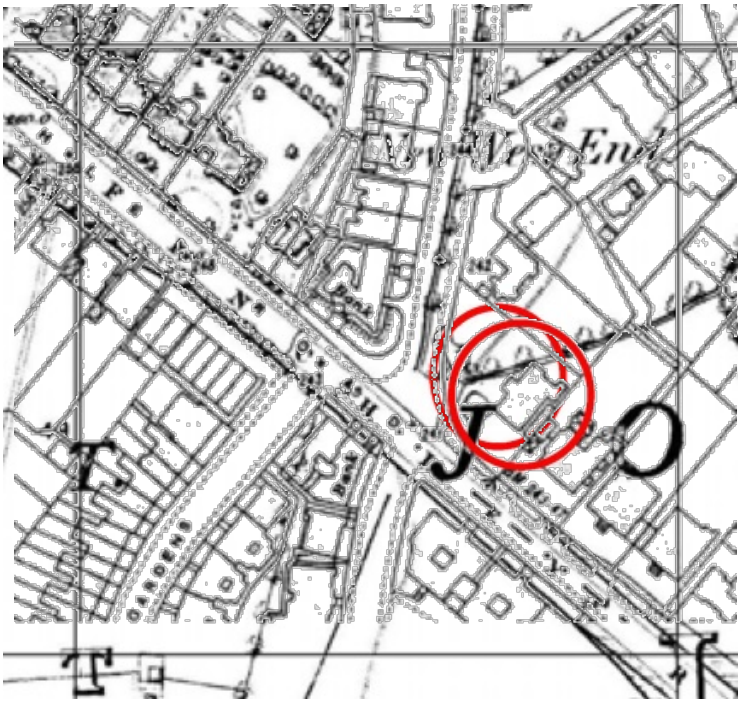
Document 1 indicates that a contiguous piled wall will be installed around the perimeter of the proposed basement to act as a retaining structure both in the temporary and permanent conditions. Document 7 envisages that this wall will not be propped other than possibly in the vicinity of the deep excavation for the pool.

### 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 site investigation has been carried out, and it would appear that no detailed desk study appraisal has been undertaken.

A study of the historical maps included in the Design & Access Statement, Document 6, appears to indicate that there was a former watercourse that crosses the site and that this may be truncated by the new basement. The mapping also indicates two ponds to have been present on the site.




**Overlay of mapping from Document 13 showing watercourse crossing 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?

It would be useful to examine large scale topographical mapping to assess identification of the existing site drainage and run-off.

### 3.2.6 Assessment Methodology

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

No site investigation has been undertaken.

No ground movement or wall movement analysis appears to have been undertaken.

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)

The project design has not progressed sufficiently for a definitive construction methodology and mitigation methods to be presented.

### 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 investigation or monitoring has been carried out.

No structural monitoring proposals have been made.

### 3.2.9 Residual Impacts after Mitigation

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

No. There may be issues of ground movement and surface flooding,

# 4. Assessment of Acceptability of Residual Impacts

### 4.1 Proposed Construction Methodology

Although some aspects of the intended construction methodology are set out in Document 7, the assessment has not really progressed sufficiently for a definitive construction methodology and mitigation methods to be presented.

### 4.2 Soundness of Evidence Presented

The information submitted appears sound but insufficient evidence has been submitted to properly conclude the BIA. There are some inconsistent statements made in regard to the amount of hard cover associated with the proposal.

### 4.3 Reasonableness of Assessments

No quantitative assessments have been provided.

### 4.4 Robustness of Conclusions and Proposed Mitigation Measures

The BIA must be considered only as a screening document rather than a complete Impact Assessment concluding with the setting out of mitigation measures. The document itself states that "*we are of the opinion, based on available information, that the impact assessment needs only to be taken to stage 1 – 'screening'.*"

It is not entirely clear why this conclusion was reached when a detailed desk study had not been completed and there were clearly some issues of potential concern identified by the screening process.

# 5. Conclusions

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

It is considered that in order for the submission to ensure accordance with DP27, this assessment must be progressed to include a site investigation based upon desk study researches, an assessment of the potential impacts of the issues of concern and the development of a more comprehensive reasoned construction methodology that, where necessary, demonstrates appropriate mitigation measures.

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
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 will be required as follows:

- A site investigation designed to address all the issues of potential concern.
- A quantitative Ground Movement Analysis.
- An assessment by appropriately qualified persons of all potential impacts, including any potential cumulative impacts.
- A reasoned Construction Methodology and details of any mitigation required.
- A monitoring and contingency plan.

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