

London Borough of Camden

**9 Ellerdale Road
London, NW3 6BA**

**ASSESSMENT OF DOCUMENTATION SUBMITTED
TO SUPPORT PLANNING APPLICATION 2014/4617/P**

August 2014

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London Borough of Camden.**9 Ellerdale Road, NW3 6BA****Assessment of documentation submitted to support planning application
2014/4617/P****August 2014****TABLE OF CONTENT**

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London Borough of Camden.

9 Ellerdale Road, NW3 6BA

Independent assessment of documentation submitted to support planning application 2014/4617/P

August 2014

1. Introduction

A planning application has been submitted to London Borough of Camden for the enlargement of the existing basement at 9 Ellerdale Road, London NW3 6BA, with a sub-height existing basement to be expanded to full height, and the basement to be extended in plan. Supporting documentation has been submitted with the application, including a Basement Impact Assessment (BIA) report.

London Borough of Camden (LBC) has commissioned Geotechnical Consulting Group LLP (GCG) to undertake a review of the documentation submitted in support of the planning application to confirm whether it meets the requirements of the planning process.

All information and documentation has been provided by LBC, either directly, or by reference to LBC documentation and application details available from the Council's website.

2. Documentation

The principal documentation submitted as part of the planning application and subject to review includes the following:

- Ground Investigation and Basement Impact Assessment Report, 9 Ellerdale Road, London, NW3 6BA. Report number J14075. By Geotechnical & Environmental Associates. Dated July 2014.
- 9 Ellerdale Road, London NW3 6BA. Construction Method Statement. By Price & Myers. Dated May 2014.

The full list of documents supporting the BIA submission reviewed is provided in the reference list at the end of this report.

The following LBC documents were referred to, to form the basis of the review of the planning submission documents:

- Camden geological, hydrogeological and hydrological study; Guidance for subterranean development, Issue 01, November 2010 ('The Arup report').
- Camden Planning Guidance, basements and lightwells, CPG4, 2013.

- Camden Development Policy DP27: Basements and lightwells.

3. Review Requirements

The review requirements were defined in the instruction issued by LBC as to determine whether:

1. the submission contains a Basement Impact Assessment, which has been prepared in accordance with the processes and procedures set out in CPG4.
2. the methodologies have been appropriate to the scale of the proposals and the nature of the site;
3. 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 conservative engineering values/estimates;
4. 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 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 in the local area.

4. Basement Impact Assessment (BIA)

The requirements of a BIA are set out in CPG4 and fully detailed in Section 6 of the Arup Report. A BIA requires five Stages, as follows:

- Stage 1 – Screening
- Stage 2 – Scoping
- Stage 3 – Site Investigation and study
- Stage 4 – Impact assessment
- Stage 5 – Review and decision making (undertaken by LBC).

Stage 1 of the BIA methodology is screening, where matters of concern are investigated and the requirement for a full BIA is established. Three main issues are required to be considered: surface flow and flooding, slope stability, and subterranean flow. Each of these issues is covered by a separate screening flowchart (included as Figures 1 to 3 in

CPG4), to assist the screening process, whereby a series of questions are posed regarding the site and the proposed development.

The GEA 'Ground investigation and BIA report' includes the three screening flowcharts from CPG4. These are used to identify those areas that require further investigation. The subterranean (groundwater) flow assessment identifies 1 issue of concern, in response to question 1, this being that the site is located over an aquifer (the Claygate Member). In response to question 1b, whether the proposed basement will extend beneath the water table surface, it is noted that this is unlikely, but suggests that minor seepages may occur and that monitoring should be undertaken prior to construction.

In the Stability Screening Assessment, five issues of concern are identified: that the London Clay is the shallowest strata, that trees are to be felled, that there is a history of shrink/swell behaviour, that the site is within an aquifer and that the site is within 5m of a highway.

There appears to be a degree of contradiction in this assessment, in that the Claygate Member is generally deemed to be a separate stratum to the London Clay. Therefore, the answer of 'yes' to "is the London Clay the shallowest strata at the site" appears to be incorrect (the geological maps and the site specific intrusive investigation confirm that the Claygate Member is present at ground level at this site); the 'Arup report' distinguishes between reference to 'The Claygate Member (of the London Clay Formation)' and 'the London Clay'. It is though correctly noted within the BIA that "the Claygate Member forms the youngest part of the London Clay Formation", so this appears to be an issue of terminology rather than fact.

The answer regarding shrink/swelling also appears to be overly conservative, since the question asks if there is a history/evidence of such behaviour at the site, while the answer is to generalise that the Claygate Member is shrinkable. In fact, the Claygate Member is typically very sandy, and is not especially prone to shrink/swell behaviour. The logs from the intrusive investigation confirm that the soil to 10m bgl is mostly sand, with some bands of very sandy clay of intermediate plasticity, and hence shrink/swelling behaviour would not be expected to be a significant issue at this site.

All the questions within the surface flow and flooding screening assessment are answered in the negative, and hence there are no issues of concern identified for further consideration.

It is hence concluded that the screening Stage of the BIA is present, and notwithstanding the evident errors as detailed above, that it has been undertaken in a comprehensive and conservative manner.

Stage 2 requires that the potential impacts of each of the matters of concern from Stage 1 be identified.

This Stage is included within the BIA, with potential impacts identified for the issues identified in Stage 1, these being:

- The site is located above a Secondary 'A' Aquifer
- London Clay the shallowest stratum on site

- Trees will be felled
- Seasonal shrink-swell can result in foundation movements
- Site is within 5m of a highway.

As noted above, the identification of London Clay as the shallowest stratum on site appears to be in error, and the identification of possible shrink-swell behaviour is based on a general potential for it to occur, not site specific history/evidence.

CPG4 suggests that a conceptual ground model be established as part of Stage 2; the BIA includes a conceptual model, but it is provided in the interpretation section.

The results of the Stage 2 assessment are supposed to be used to inform the requirements of the Stage 3 site investigation (see below); however, since the report includes the factual and interpretive reporting of the intrusive ground investigations, it appears that the site investigation works were completed prior to Stage 2 of the BIA being undertaken.

Thus, while the BIA does not conform precisely to the recommended format, each of the issues identified in Stage 1 for further assessment are addressed in Stage 2 of the BIA; hence the Stage is present and meets the requirements of CPG4.

Stage 3 of the BIA process requires site investigation and study. The 'Arup report' provides guidelines on the scope of the site investigation, with the recommendation that it follows a multi-stage approach of Desk Study, intrusive investigation, monitoring, reporting and interpretation.

Since the screening stage (Stage 1) of the BIA is presented in the same report as details of the intrusive ground investigation, it is implied that the site investigation was to a certain degree undertaken prior to the commencement of the BIA.

However, the BIA does feature an element of desk study. There has been a site specific intrusive investigation, and this is reported in the BIA, both factually and with interpretation of the likely engineering behaviour of the ground. The intrusive works included four boreholes undertaken using open drive and window sampler techniques, of which three had ground water monitoring instruments installed. Two post fieldworks monitoring visits of groundwater were undertaken. The borings were made in March 2014, and the post fieldworks monitoring undertaken in April 2014, the second visit being about 6 weeks after the instruments were installed.

The 'Arup report' provides guidance on monitoring, stating that "...if the matter of concern is the potential for groundwater flooding, measurements should be taken during the period of the year when groundwater levels are naturally at their highest (March or April)". The potential for ground water issues in the Claygate Member is well known, so groundwater levels are reasonably 'a matter of concern', and the identification in the subterranean flow screening assessment of an aquifer on the site means that they were identified as such within the BIA. As noted, the date of the groundwater monitoring correspondences to the period of the year when the 'Arup report' indicates groundwater should be expected to be at its highest.

The 'Arup report' also states that "data should be referenced to a common geographic co-ordinate system" and that "Elevation data...should be quoted with reference to a common datum, which should be Ordnance Datum". The intrusive ground investigations do not appear to have been surveyed to establish co-ordinates, but ground level is given as an elevation to Ordnance Datum, though the report makes it clear that these values are approximated from topographic survey data. The GEA report does include a site location plan, so the lack of Ordnance Survey co-ordinates for the investigation locations is not a significant deficiency. Overall, the intrusive ground investigations appear to be sufficient in scope and quality for the proposed works.

The BIA does contain a Stage 3 – Site investigation and study stage; it is considered that this is comprehensive and meets the requirements of CPG4.

Stage 4 of the BIA process requires an impact assessment, whereby the direct and indirect implications of the proposed project are evaluated. This is intended to address those issues identified in the scoping stage.

The BIA does include a Stage 4 impact assessment, in which each of the issues that were identified in Stage 1 of the assessment are specifically addressed. A separate construction methodology statement accompanies the BIA (the BIA is in fact an appendix to the CMS document), and within this it is identified that the adjoining neighbouring house recently had a new basement constructed, which included underpinning of the party wall.

It is stated that water encountered during the site investigations consisted of perched water, and that the ground water is below the depth of the proposed works, and hence it is implied that there is no impact on the hydrogeological environment (individually or cumulatively).

It is stated in the BIA that the proposed development is unlikely to result in any specific land or slope stability issues, but it is noted that "a detailed analysis of movements may be required in due course." There is no assessment of ground movements or potential damage assessment of the neighbouring structure within the submitted documentation.

It is considered that a BIA Stage 4 is present, which address the issues identified in the earlier stages of the process.

Each of the required Stages of the BIA is present, and addresses the relevant issues, though some discrepancies within the details have been noted. It is hence considered that the submission does contain a Basement Impact Assessment which has been prepared in accordance with the processes and procedures set out in CPG4.

5. Assessment of methodology

The proposed works involve the formation of the new basement through the installation of a sheet piled retaining wall around the perimeter of the proposed basement footprint, other than along the existing party wall which has already been underpinned.

The existing structure will then be supported temporarily on needle beams passing through the walls supported by pad footings, while the permanent works, in the form of a reinforced concrete structure, are completed.

It is considered that the methodology is appropriate to the form and scale of the proposed development and the nature of the ground conditions.

6. Basis of BIA conclusions

The conclusions of the BIA are based on a consideration of the ground investigation (including a desk top study, the factual report on the intrusive investigation and interpretation of the data).

The interpretation of the data from the investigation appears to have been undertaken sensibly, such that the conclusions are generally reliable, and the assessment has been undertaken with an appropriate degree of conservatism; in some instances, the BIA appears to have unnecessarily identified issues of concern (for example, incorrectly stating that London Clay is the shallowest strata on site).

The BIA has been jointly authored by staff from GEA Limited, with the individual authors identified, and between them, having all the professional qualifications required by CPG4.

7. Requirements of DP27

Camden Development Policy DP27 refers to “larger schemes, where the basement development extends beyond the footprint of the original building or is deeper than one full storey below ground level (approximately 3 metres in depth)”. Since the proposal extends beyond the footprint of the existing structure, the requirements of ‘larger schemes’ apply.

The requirement of DP27 for “larger schemes” is that evidence is provided that the development will “not harm the built and natural environment or local amenity”. The information to be provided is not fixed, but may be in scale with the nature and size of the development. However, it is clear that evidence must be provided to address points (a) to (h) of policy DP27. Points (a) to (c) are specifically relevant; the developer is required 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;”

Since the party wall between 9 Ellerdale and the neighbouring building (18 Prince Arthur Road) is already underpinned, it seems unlikely that the neighbouring building will be subject to significant ground movements or impairment of its structural stability. However, excavation does cause ground movements, and there is therefore the potential for movement of the underpins as the new excavation is undertaken adjacent to them, for example. Since this scheme constitutes a “larger scheme”, the applicant must provide the evidence to demonstrate that structural stability will be maintained.

It is considered that the application is not compliant with the requirements of DP27, in that there is no assessment of the predicted ground movements and resulting damage category for the neighbouring 18 Prince Arthur Road.

The BIA includes details of ground water monitoring that indicates that the proposed works will be above the groundwater level. It is concluded within the BIA that since the basement is to extend to about 3.0m bgl, and groundwater lies at about 7.5m bgl, there will be no groundwater issues. However, the impact of the basement will extend below the permanent works depth, since the temporary works are to include sheet steel piles which must extend below the formation level of the proposed excavation. No details of the length of these piles is given (such details would reasonably be determined in the design process after planning consent has been achieved), and hence it is not positively proven that these piles will not impact on the sub-surface groundwater environment. However, it is not considered likely that piles extending to 7.5m bgl would be required for the scope of works proposed.

7.1 Issues to be addressed prior to planning permission being granted

It is recommended that the applicant carry out an assessment of the predicted ground movements resulting from the proposed works, and provide an assessment of the resulting predicted damage category for 18 Prince Arthur Road. This should be done prior to the granting of planning permission. The assessment may be submitted in the form of an addendum to the main BIA, rather than a full revision of the original submission. While it is stated in the BIA that “the depth of the proposed basement will not extend below the depth of the existing recent underpinning”, as built records confirming the depth and condition of the underpins should be included, since such details are integral to the viability of the proposed construction methodology.

7.2 Issues to be addressed following planning permission being granted

Once the design for the sheet pile wall has been completed, the applicant should confirm the planned toe depth of the piles. If the toe depth is no deeper than 7m bgl, the conclusion that the works will not have an adverse effect of the water environment (and hence no cumulative effect) would appear to be sound, and no further assessment of the ground water conditions should be required.

However, in the event that the sheet pile design selected extends to 7m bgl or deeper, it is recommended that the applicant be required to provide a sub-surface flow analysis confirming that the proposed works have no detrimental impact on groundwater.

8. Conclusion

GCG were appointed by London Borough of Camden to review Basement Impact Assessment documentation relating to planning application 2014/4617/P for 9 Ellerdale Road NW3 6BA, to determine compliance with the requirements of CPG4 and DP27.

Geotechnically, the proposed scheme appears viable, with an appropriate methodology for construction having been selected.

The submitted BIA documentation is comprehensive and addresses the majority of issues required, but fails to demonstrate that the structural stability of the neighbouring building will be maintained.

It is therefore considered that the submission is not compliant with CPG4 and the requirements of DP27 (a to c).

It is recommended that a ground movement assessment and associated damage assessment be provided by the applicant for the neighbouring 18 Prince Arthur Road; assuming that this demonstrates that structural stability will be maintained, the application would then be considered to be compliant with CPG4 and DP27.

This report was completed by Dr Phil Smith on behalf of GCG LLP; the report was peer reviewed by Mr Kelvin Higgins and Ms Helen Scholes, both of GCG.

The author's and reviewers' technical and professional qualifications are as follows:

Phil Smith: BEng, MSc, PhD, DIC

Kelvin Higgins: BSc, MSc, DIC, CEng, FICE, FCIHT

Helen Scholes: BSc, MSc, DIC, CGeol, EurGeol, FGS.

9. References

The following documentation was reviewed:

Information submitted by the applicant to LBC, and downloaded from the LBC 'planning portal' website or provided directly by LBC to GCG:

- Ground Investigation and Basement Impact Assessment Report, 9 Ellerdale Road, London, NW3 6BA. Report number J14075. By Geotechnical & Environmental Associates. Dated July 2014.
- 9 Ellerdale Road, London NW3 6BA. Construction Method Statement. By Price & Myers. Dated May 2014.
- Design & Access statement, 9 Ellerdale Road, Hampstead NW3. Undated.
- Planning Statement in respect of 9 Ellerdale Road, London NW3. By CgMs consulting. Ref: 15328. Dated July 2014.
- Heritage Statement. 9 Ellerdale Road, London NW3 6BA. By CgMs consulting. Ref: CW/15328. Dated June 2014.
- Tree survey and Arboricultural method statement. 9 Ellerdale Road, London, NW3 6BA. By Martin Dobson Associates Ltd. Dated 4 June 2013.

List of drawings reviewed:

- 000: Site Location Plan (by Lee J Davidson, dated 24.04.13)
- 001: Existing Basement Plan (by Lee J Davidson, dated 04.04.13)
- 002: Existing Ground Floor Plan (by Lee J Davidson, dated 04.04.13)
- 003: Existing First & Attic Floor Plans (by Lee J Davidson, dated 04.04.13)
- 004: Existing Section A-A (by Lee J Davidson, dated 04.04.13)
- 005: Existing Section B-B (by Lee J Davidson, dated 04.04.13)
- 006: Existing Front Elevation (by Lee J Davidson, dated 04.04.13)
- 006: Existing Side Elevation (by Lee J Davidson, dated 04.04.13)
- 008: Existing Rear Elevation (by Lee J Davidson, dated 04.04.13)
- 011/01: Proposed Basement Plan (by Lee J Davidson, dated 18.05.13)
- 012/02: Proposed Ground Floor Plan (by Lee J Davidson, dated 02.05.13)

- 014/02: Proposed Section A-A (by Lee J Davidson, dated 04.04.13)
- 015/01: Proposed Section B-B (by Lee J Davidson, dated 18.05.13)
- 016/01: Proposed Front Elevation (by Lee J Davidson, dated 18.05.13)
- 017/01: Proposed Side Elevation (by Lee J Davidson, dated 04.04.13)
- 018/01: Proposed Rear Elevation (by Lee J Davidson, dated 18.05.13)

Additional documentation reviewed:

- Camden geological, hydrogeological and hydrological study; Guidance for subterranean development, Issue 01, November 2010 ('The Arup report').
- Camden Planning Guidance, basements and lightwells, CPG4, 2013.
- Camden Development Policy DP27: Basements and lightwells. (Camden Development Policies 2010-2025).