

London Borough of Camden

**23 Downside Crescent
London, NW3 2AN**

**ASSESSMENT OF DOCUMENTATION SUBMITTED
TO SUPPORT PLANNING APPLICATION 2014/7587/P**

February 2015

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London Borough of Camden.**23 Downside Crescent, NW3 2AN****Assessment of documentation submitted to support planning application
2014/7587/P****February 2015****TABLE OF CONTENT**

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London Borough of Camden.**23 Downside Crescent, NW3 2AN****Independent assessment of documentation submitted to support planning application 2014/7587/P****February 2015****1. Introduction**

A planning application has been submitted to London Borough of Camden for the redevelopment of 23 Downside Crescent, NW3 2AN, to include construction of a basement under the existing structure and the paved rear patio area. 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. GCG are also to review the objections raised against the scheme by local residents and establish whether these raise reasonable concerns that need to be addressed prior to award of planning permission, or require specific measures or methodologies to be implemented after planning permission is granted.

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:

- 23 Downside Crescent. Basement Impact Assessment. Reference: 140381/KH, Dated by 25 November 2014. By Conisbee.

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 Camden Planning Guidance 4, 2013.
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.
5. the criticisms made by the neighbours raise reasonable concerns about the technical content or considerations of the submission which should be addressed by the applicant by way of further submission, prior to planning permission being granted.
6. the criticisms made by the neighbours raise any relevant and reasonable considerations in respect of the structural integrity or condition of the road and the neighbouring properties which may be unknown or unaccounted for by the submission or which would benefit from particular construction measures or methodologies in respect of the development following a grant of permission for the development.

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 BIA produced includes the three screening flowcharts from CPG4. These are used to identify those areas that require further investigation. No issues are identified in association with surface flow and flooding impact, nor for subterranean flow. The slope stability screening flowchart identifies three issues where the answer is such that CPG4 requires ‘further investigation’, these being that the London Clay is the shallowest strata on site (beneath a thin band of made ground), that there is evidence of shrink-swell behaviour, and that the basement will significantly increase the differential depth of foundations.

It is concluded that the screening Stage of the BIA is present; however, comments from objectors and from the site specific investigation report appended to the BIA call into question whether it has been undertaken in a sufficiently comprehensive manner (further discussed below, in Section 9). Questions 2 and 4 of the surface water flow flowchart (Conisbee reports points 3.1.2 and 3.1.4) in particular are called into question, while question 6 of the surface flow flowchart, addressing surface water flooding, appears to have been entirely neglected.

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

The BIA includes a section on scoping that addresses three issues. Reference is made to the proportion of hard surfaces, where it is concluded that the proposals will not result in an increase in ground and subsurface water flows. The water table is listed as an item that may impact on the design, where it is stated that de-watering may be required to address perched water. Reference to neighbouring properties is made, stating that “the design will ensure the temporary and long term stability of these adjacent structures is maintained at all times.”

No specific consideration is given to the previously noted issue of possible shrink-swell behaviour (though it is noted that this issue was addressed to some degree within Stage 1).

The stage concludes by stating that “no negative impacts” are anticipated that “cannot be suitably addressed in the detailed design stage”. However, it is considered that this conclusion is unsound.

Stage 2 of the BIA is therefore present, but it is not considered that all issues have been adequately addressed.

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.

Appended to the BIA is a desk study and ground investigation report (dated October 2014, reference J13331), completed by Geotechnical & Environmental Associates (GEA). Given that the GEA report is dated earlier than the BIA report, it appears likely that the investigation was not undertaken in response to the conclusions of Stages 1 and 2 of the BIA process. However, the ground investigation does incorporate the stages recommended by the ‘Arup report’.

Contrary to the recommendations in the ‘Arup report’ the two boreholes completed do not appear to have been surveyed to Ordnance Survey datum, and the period of groundwater monitoring appears to be inadequate (Boreholes completed early November; monitoring continued to end of November only).

However, it is also noted that GEA reported in detail on the presence of shallow groundwater. Concerns were raised within the GEA report that this might not be perched groundwater within the made ground but might indicate some more complex groundwater conditions, possibly associated with a drain which it was supposed might be leaking. GEA recommend trial pits to proposed basement formation depth, or as deep as can be achieved, be undertaken to investigate groundwater flow into the excavation, and that further monitoring of the existing standpipes be undertaken to investigate long term/seasonal fluctuation.

It is therefore evident that the BIA does contain a Stage 3 – Site investigation and study, stage. The investigation is reasonably comprehensive, but the investigation report itself identifies areas where further works are required, and it is not considered that the report is adequate to meet 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.

There is no Stage 4 included within the BIA. The earlier conclusion within Stage 2 of ‘no negative impacts’ has apparently been taken as the basis to conclude that no further assessment is required. It is not considered that this is an adequate assessment of the situation.

It is concluded that the BIA is insufficient to meet the requirements of CPG4.

5. Assessment of methodology

The proposed works involve the formation of the new basement through the installation of underpins within the London Clay. Typically, this is an appropriate methodology for the scale and form of the proposed development within the ground conditions present.

However, details of the methodology are considered inadequate. There is no indication as to the construction sequence, or when/if propping to the underpins is proposed. It is evident from the structural engineer's sketches that there is an internal load bearing wall within the existing structure, and that this is to be extended through the new basement by means of a new load bearing wall to the basement slab/ground beam. However, from the sketch, it does not appear that this will be achieved by underpinning the internal wall, so it is unclear how the stability of the existing structure will be maintained during construction.

It is hence considered that the methodology is in general appropriate to the scale of the proposed development and the nature of the site. However, insufficient details of the methodology are provided to establish whether the actual proposals are suitable.

6. Basis of BIA conclusions

The conclusions of the BIA are based on a ground investigation (including a desk top study). However, the recommendations and conclusions from the ground investigation do not appear to have been incorporated within the assessment of ground conditions undertaken for the BIA.

The BIA has been authored by a named individual author, whose listed professional qualifications meet the requirements for the land stability assessment and the surface flow and flooding assessment. However, they do not meet the requirements for an individual completing the groundwater flow assessment. The GEA report is authored / checked by individuals so qualified. However, since the conclusions of the BIA do not appear to have incorporated the recommendations made by GEA in their report, it is not considered that the authors of the GEA report can be viewed as authors of the BIA.

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)". The BIA states that the basement is to be constructed to the footprint of the existing semi-detached property and to the rear extension; however, it is clear that it also extends under an external patio area, and, due to the presence of roof lights, it in fact extends a little beyond the existing rear extension. Hence the proposal extends beyond the footprint of the existing structure, and 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 should 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 to the assessment of the BIA; 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;”

There is no ground movement assessment and hence no assessment of potential damage to 23 Downside Crescent or the neighbouring structures. It is therefore considered that the developer has not positively demonstrated that structural stability will be maintained.

There is no proper hydrogeological assessment for the site; instead an assumption is evidently made that the presence of a thin band of Made Ground over London Clay will generate perched groundwater which can be readily dealt with as necessary on site, as is typically the case for such conditions. However, there are local hydrogeological factors present which are atypical, and the developer has not positively demonstrated that the scheme will not adversely affect local drainage / runoff.

There is no consideration of cumulative impact.

It is considered that the requirements of DP27 are not met.

8. Neighbours’ concerns

A number of objections to the scheme have been raised by neighbours. Some of these relate to issues of the size and character of the development, and are therefore not relevant to the issues covered by the BIA.

Concerns are raised in general about the lack of detail regarding the effect of the proposed works on the surrounding properties, and how these effects will be mitigated.

Many of the objections focus on the potential for the proposed works to adversely affect sub-surface groundwater flow. In particular, these raise concerns about run-off from the tennis courts present to the rear of the property, and the possibility of changes to groundwater flow around the building resulting in water pooling around the neighbouring properties, leading to softening of the clay and structural movement / damage.

It is also reported that a neighbouring structure already experiences significant water ingress problems into a cellar, and the concern is raised that the proposed works will exacerbate this.

One objector questions the accuracy of the statement in the BIA regarding overall gradient along the carriageway of Downside Crescent, though does so from the point of view of groundwater flow rather than slope instability.

It is reported that movement of the patio to number 21 has recently occurred, and a concern is expressed that further damage will occur to No21 more generally due to ground movements resulting from the proposed works.

The potential for negative impact on trees is also identified amongst the neighbours' objections; however the planning submission includes a comprehensive Arboricultural impact assessment report which shows that there are in fact no causes for concern regarding impact on existing trees.

It is considered that the neighbours' concerns do identify a number of issues that have not been adequately addressed within the BIA

9. Assessment and Recommendations

As previously noted, it is considered that the submitted documentation fails to comply with CPG4 and DP27, and that a number of significant issues should be addressed before the planning process should progress.

The ground conditions, consisting of a thin layer of Made Ground overlying London Clay, would in most cases result in a simple hydrogeology, where there was no significant subsurface flow within the clay and only minimal perched water / seepage from within the Made Ground. Under such circumstances, a full hydro-geological report would not generally be necessary. This appears to have been the conditions assumed to apply within the BIA.

However, there are clearly a number of factors that make this site atypical.

From the borehole logs, there is no evidence that the London Clay will be significantly more permeable than is typically the case. Since the plan footprint of the basement is currently covered either by the existing structure or by an area of paved patio, it is clear that vertical infiltration into the ground over the plan area of the proposed basement is already negligible, and the low permeability of the London Clay means that the construction of the proposed basement will have no significant impact on sub-surface flow (horizontal or vertical) through the London Clay, since this may reasonably be assumed to be negligible.

There appears, though, to be the potential that the site receives enhanced surface flow/shallow sub-surface flow (through the Made Ground) from the tennis courts behind the property. The GEA site investigation report also identified the potential for ground water issues to be encountered during the proposed works, and made recommendations for further investigations to confirm the hydro-geological conditions on site. Additionally the groundwater monitoring period is inadequate, and gives no indication of what if any seasonal variation occurs.

Associated with this there is clearly some uncertainty as to the cause of the existing damage to the rear extension to number 23 (and also to the neighbour's patio, as reported in the neighbours' objection). The BIA discusses this, confirms that the damage appears to be due to rotational movement of the rear extension away from the main structure, and suggests that it is subsidence due to consolidation of the underlying clay. However, there are a number of factors that may be influencing the observed behaviour of the structure, and it is not clear the mechanism of movement is clearly understood.

It is apparent that the rear extension is founded at a shallower depth than the main body of the structure, so it may be that the movement has resulted simply from time related consolidation. If this were the case, then it would not be seasonal movement. Moreover, given the assumed age of the building and extension, it would be expected that movement would largely have ceased, and consequently the crack width would be stable.

Discussion of this movement is, though, associated with discussion of shrink-swell behaviour of the ground; such behaviour typically causes cracks to open as the ground dries out and shrinks, then close up as the ground re-saturates during winter and swells. The Arboricultural report indicates the presence of a high-water demand tree (the poplar) close enough to possibly affect the moisture content of the clay under the rear extension, which could contribute to shrink/swell behaviour. However, the site investigation shows groundwater above the top of the London Clay, and the moisture content values recorded for the clay are not indicative of desiccated conditions. If the crack is the result of shrink-swell behaviour, then it is to be expected that it would have been closed up to some extent during the time of the ground investigations, since these were undertaken in November, when soil moisture levels should have recovered to some extent from the summer minimum.

It is also possible that the groundwater noted during the site investigation has led to a softening and loss of strength of the surface of the London Clay since the structure was originally constructed. In this later case, the local hydrogeology may be impacting on the strength and stiffness of the soil, and so might have an influence on the ground movements that will result from the proposed works. Further, changes to the hydrogeology may result in adverse impacts on the surrounding structures: replacing the Made Ground under the patio with an impermeable basement may in such circumstances have a significant effect.

It is therefore considered that in this case, the site specific features are such that a hydrogeological study should be undertaken. It is also advisable to undertake some research into the history of the cracking between the main structure and the rear extension (to confirm whether the crack width is varying seasonally, or is stable).

The proposed works will be directly underpinning another structure (the party wall to No21), and will involve an excavation of significant depth close to a second (No25). Such engineering works will inevitably cause some amount of ground movement, and therefore some degree of damage to the structures concerned. DP27 places the requirement on the developer to demonstrate that the proposed scheme will maintain the structural stability of the building and the neighbouring properties. Therefore, a ground movement assessment, including building damage predictions for 23 Downside Crescent and for the neighbouring buildings, is required.

Since the magnitude of any ground movements that result from the proposed development depend on the methodology of construction, sequencing, propping, etc., it is also necessary for the construction methodology to be more fully developed and presented.

No specific issues can currently be identified as requiring to be addressed after planning permission is granted, since it is considered that currently the application is insufficiently detailed to enable any such, more minor, issues to be identified.

In summary, it is considered that the following issues need to be satisfactorily addressed before the application may be considered (in terms of the BIA) to have satisfied the requirements of DP27:

1. Further monitoring of the existing groundwater installations should be undertaken, with additional intrusive works, as recommended by GEA, completed, to enable the groundwater regime to be more fully understood (including how it varies with time).
2. A hydrogeological report should be completed for the site. This should specifically address the relationship between the tennis courts, the site and the neighbouring structures as regards both current hydrogeological conditions, and conditions following completion of the proposed scheme. The temporary case of the conditions during construction should also be considered. (Note also the requirements regarding professional qualifications of the author of the groundwater flow assessment, and the need to consider question 6 of the surface flow and flooding screening flowchart).
3. The construction methodology needs to be more fully developed. While detailed construction calculations are not required, it is necessary to present a full understanding of how the soil and all existing structural elements will be supported throughout the works.
4. A ground movement / building damage assessment report is required, that details predicted movements and likely damage classification for all buildings affected by the proposed works.

10. Conclusion

GCG were appointed by London Borough of Camden to review Basement Impact Assessment documentation relating to planning application 2014/7587/P for 23 Downside Crescent NW3 2AN, to determine compliance with the requirements of CPG4 and DP27.

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

However, the submitted BIA documentation is insufficient. It is clear that this site is less straightforward hydrogeologically than others with similar geology, but the potential complications have not been identified or addressed. The proposed methodology is insufficiently detailed, and there is no assessment of the impact of the proposed scheme on the structural stability of the existing structure or surrounding properties.

It is considered that the application is currently not compliant with CPG4 and DP27.

Recommendations are made as to the minimum additional works and documentation required to achieve compliance with the planning documents' BIA requirements.

This report was completed by Dr Phil Smith on behalf of GCG LLP; the report was peer reviewed by Dr Felix Schroeder and Dr Jackie Skipper, both of GCG.

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

Phil Smith: BEng, MSc, PhD, DIC

Felix Schroeder: MEng, PhD, DIC, CEng, MICE

Jackie Skipper: BSc, PhD, DIC, CGeol, FGS.

11. 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:

- 23 Downside Crescent. Basement Impact Assessment. Reference: 140381/KH, Dated by 25 November 2014. By Conisbee.
- Design, Access & Heritage Statement for Rear Ground Floor and Basement Extensions at 23 Downside Crescent, Belsize Park, London NW3 2AN. October 2014. By Bickerdike Allen Partners. Ref 8323.
- Arboricultural Impact Assessment Report: 23 Downside Crescent, Belsize Park, London, NW3 2AN. By Landmark Trees. Dated 17 October 2014. Ref: BDA/23DWN/AIA/01.
- Letter to Bickerdike Allen Partners from Conisbee (signed by Keith Hirst), dated 5th February 2015 (Ref 140660/K Hirst).
- Letter to LB Camden Planning Officer from Bickerdike Allen Partners (signed by Philip Kavanagh), dated 10th February 2015 (Ref 8323/08-1502pk01).

List of drawings reviewed:

- 8323/D2000/PL1: Existing Location Plan (dated 16 October 2014)
- 8323/D2001/PL1: Existing Ground Floor Plan (dated 16 October 2014)
- 8323/D2002/PL1: Existing First Floor Plan (dated 16 October 2014)
- 8323/D2003/PL1: Existing Section AA (dated 16 October 2014)
- 8323/D2004/PL1: Existing Section BB & CC (dated 16 October 2014)
- 8323/D2005/PL1: Existing Rear Elevation (dated 16 October 2014)
- 8323/D2006/PL1: Existing Side Elevation (dated 16 October 2014)
- 8323/D3001/PL1: Proposed Location Plan (dated 16 October 2014)
- 8323/D3101/PL1: Proposed Basement Floor Plan (dated 16 October 2014)
- 8323/ D3102/PL1: Proposed Ground Floor Plan (dated 16 October 2014)
- 8323/ D3103/PL1: Proposed First Floor Plan (dated 16 October 2014)
- 8323/D3104/PL1: Proposed Section AA (dated 16 October 2014)

- 8323/D3105/PL1: Proposed Sections BB & CC (dated 16 October 2014)
- 8323/D3106/PL1: Proposed Rear Elevation (dated 16 October 2014)
- 8323/D3107/PL1: Proposed Side Elevation (dated 16 October 2014)

Objections to the scheme:

The consultation responses present on the ‘planning portal’ website were reviewed.

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).