Review of BIA by structural engineer appointed by no. 4 Park Village West. (received by email 23/11/2012)

3 PARK VILLAGE WEST NW1 4AE

Review of planning application 2012/5182/P to Camden Council with respect to Camden development Policy DP27.

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Summary

Report summary

1. Planning application 2012/5182/P proposes a basement extension of 3 Park Village West NW1 4AE. Concerned to understand the potential impact of the proposed construction upon their property and residential circumstances, Lord and Lady Browne-Wilkinson of 4 Park Village West instructed me to consider the application and provide relevant advice.

2. In assessing the application currently posted on the London Borough of Camden website I have accounted for the requirements of relevant planning and other statutory controls and have, in particular, set the content of the application against the stated requirements of the first three parts of Camden Development Policy DP27 for basements and lightwells. I have also considered the guidance on these requirements published by Camden.

3. Initially I have identified information that it is necessary to have in order to evaluate the risks relevant to any urban basement development and have shown which items must be determined and transparently justified for comparison with each of DP27 parts (a), (b) and (c). The information and justification provided by the application have been compared with those requirements.

4. The Arup report to Camden, which I have identified in the report, provides a system for progressively screening and acquiring information specific to the Camden district in order to arrive at the same level of knowledge and risk assessment. The application states that it has used that method and I have analysed the way in which it does so.

5. It is my opinion that the application fails in all respects to comply with the requirements of the parts of Camden Planning Policy DP27 that I have considered.

6. My instructions are to advise the Clients of the potential impact of the basement development proposed by the application upon their property. I cannot do so because there is not sufficient information and reasoning within the application to make that possible. This makes the application unsuitable for approval in its present form.

7. For the same reason I cannot comment on specific impact upon residential circumstances. Instead, I have identified three common sources of inconvenience for those living near such developments. They are the physical presence of the works, delays which exacerbate the impact of that and both inconvenience and mental stress resulting from the need for damage caused by the developments to be repaired. Inconvenience cannot be avoided entirely but proper compliance with DP27 provides opportunity for it to be significantly reduced. The level of compliance exhibited by the application would negate that opportunity.

1 Introduction and purpose of report

8. This report is concerned with planning application 2012/5182/P to the London Borough of Camden (Camden), which proposes the extension of 3 Park Village West NW1 4AE by constructing a basement. Lord and Lady Browne-Wilkinson of 4 Park Village West (the Clients) instructed me to advise them of the potential impact of the basement development proposed by the application upon their property and residential circumstances.

9. I am Michael Eldred MSc. CEng. FIStructE MICE, Director of Eldred Geotechnics Ltd and a Consultant in the disciplines of Geotechnical, Geoenvironmental, Civil and Structural engineering. The assessment which follows is exclusively of matters falling within these disciplines. They have been considered in the context of Camden's Local Development Framework (LDF) and other relevant statutory requirements.

10. I have referred to a number of documents while preparing this report. Technical publications are listed at the end of the report and are cited in the text according to their listed numbers thus [No]. References to "the application" mean the relevant planning application documents published on the Camden website. I have also referred to the following documents published by Camden. *Development Policy 27, Basements and Lightwells* (DP27), *Camden Planning Guidance 4, Basements and Lightwells*, (CPG4), which provides guidance on the implementation of DP27, and Ove Arup & Partners Ltd report to Camden entitled *Camden geological, hydrogeological and hydrological study – Guidance for subterranean development*. I have referred to this as the Arup report. It forms the basis for preparing the basement impact assessments (BIA) that Camden require as part of planning applications for basement development.

2 Statutory requirements

2.1 Relevance

11. The potential impact of construction work on neighbouring property is considered by planning legislation, the Building Regulations and the 1996 Party Wall etc Act (PWA). The jurisdiction of the Building Regulations is limited; they do not require anything to be done except for the purpose of securing reasonable standards of health and safety for persons in or about the buildings. Consequently they cannot be invoked to control anything but potentially very severe impact on neighbouring property. The PWA is concerned with any level of impact upon neighbouring property caused by permitted work. When planning consent is required the Act comes into effect only after consent. That consent has the potential to affect the administration of the Act, and the flow of control from planning legislation to the PWA needs to be considered.

2.2 Planning legislation

12. I am not expert in planning legislation but wish to draw attention here to matters of fact and to comment upon them from the standpoint of a construction professional.

13. Development policies form one tier of the Camden LDF. DP27 states that "The Council will only permit basement and other underground development that *does not* cause harm to the built and natural environment.....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;.....". (The italics are mine). CPG4 explains what is meant by harm to the built environment and failure to maintain the structural stability of neighbouring properties.

14. DP27 thus places the onus on developers to demonstrate (give proof or evidence) that a scheme meets Camden's stated requirements before any planning consent can be entertained. Nothing less will do.

15. The importance of this becomes evident when it is realised that it is solely DP27 that imposes a statutory requirement for designs to limit the risk of damage to neighbouring property to "slight"[1]. But for the existence of DP27, any amount of damage caused by a development to neighbouring property would be permissible, provided that it did not threaten the health and safety of persons in or about the property. Since DP27 is a planning control, permitted, schemes could be deemed to have satisfied the DP27 requirement whether or not they really do. Thereafter, limitation of damage by design would be a matter largely controlled by the judgement and consideration of the developer's design and construction team.

16. Compliance with the stated requirements of DP27 before planning consent is granted is thus essential. Once permission is granted the opportunity to exert control is lost; permitting a development subject to a condition that implies it should be changed to comply with DP27 would seem to be an untenable contradiction in terms. Careful consideration of the amount of detail actually required at planning stage is necessary.

2.3 The Party Wall etc Act

17. In terms of impact on neighbouring property, this Act is sometimes seen as a convenient means of picking up the pieces left by a planning determination; a kind of fail-safe measure. Such interpretations are wrong and misleading.

18. In the present context it is important to understand that the Act imposes no limit on the degree of damage that may be considered acceptable. It is rather an instrument intended to give the parties reasonable rights and to allow both settlement of disputes and award of compensation without resort to the Courts. As such it deals with the execution of work and its consequences, not the estimation of risk required by DP27.

19. Situations governed by the Act are prescribed and rules are given that concern the rights of the parties, the manner of executing relevant work, and making awards as between the parties. The powers of party wall surveyors are restricted to administration of the Act. It is for the developer to comply with other statutory requirements. Very importantly, party wall surveyors have no authority to enforce compliance with planning decisions or conditions.

20. There is no doubt that the provisions of the Act may be interpreted to allow party wall surveyors to negotiate and agree on designs and methods that minimise damage to neighbouring property, and that on commercial development negotiations are likely to be taken to a fairly advanced technical level. On residential schemes, once planning permission has been granted, it is sometimes exceedingly difficult to persuade a developer's team that the final design should consider ground and structural movement/damage in anything but a trial and error way. To some extent this, as the Arup report points out, is because residential basements often do not attract the same type of organisation as those involved in commercial work. It is also likely to be because, planning consent obtained, the engineers are concerned only with Building Regulations approval, which is concerned principally with the safety of the developer's project, not movement and damage of neighbouring property.

21. In such cases, the end result can depend upon the attitudes of the party wall surveyors concerned, and here it has to be realised that they have no responsibility for the adequacy of the developer's work and, officially, no control over design apart from refusing to agree that affected parts of the work can start until it is adequate. If Camden has not seen fit to insist on full compliance with DP27 at planning stage, the parties have no satisfactory baseline design from which to start and in some circumstances that can increase the risk of damage to neighbouring property.

3 Compliance requirements for DP27

22. Camden give the first three requirements of DP27 as follows. "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 and (c) avoid cumulative impact on structural stability or the water environment in the local area".

23. CPG4 and the Arup report provide guidance aimed at helping developers satisfy DP27. They do not supplant the development policy itself but it is relevant that the Arup report uses as its precedent environmental risk management models that require each decision and informing statement to be transparently justified for peer review.

24. Referring to each of the three requirements (a) to (c) above in turn, it is possible to state fairly simply a number of matters about which information is needed to make decisions and for which the information must be reported to permit peer review. The list is not exhaustive.

25. Structural stability of the building and neighbouring property depends upon:

(i). The condition and construction of the buildings and their sensitivity to movement

(ii). How much ground movement will occur in consequence of the basement construction

(iii). How much the basement walls will move

(iv). How much the buildings will move

(v). How much building damage these movements will cause.

26. These effects depend in turn upon:

(vi). The fabric, structure and engineering properties of the ground

(vii). Ground water levels and behaviour

(viii). Method and sequence of construction

(ix). Method and sequence of supporting the sides of the excavation and basement walls temporarily during construction

(x). Resistance of the temporary supports to movement

(xi). Quality of site management and technical supervision.

27. Avoiding adversely affecting drainage and run-off or causing other damage to the water environment depends on:

(xii). The fabric, structure and engineering properties of the ground

(xiii). Ground water levels and behaviour

(xiv). Balancing the characteristics of existing and proposed surface water disposal regimes

28. Avoiding cumulative impact on structural stability or the water environment in the local area depends on:

(xv). Accounting for the presence of any existing nearby subterranean development

(xvi). The potential effect of basement excavation on larger scale slopes and other topographical features in the area

(xvii). The fabric, structure and engineering properties of the ground

(xviii). Ground water levels and behaviour.

29. Points (i) to (xviii) are required information for any urban basement development. The Basement Impact Assessment (BIA) procedure advocated by the Arup report includes a screening process designed to make applicants aware of features specific to the Camden district that may prompt the need of further work in order to provide that information. The BIA process and my eighteen points thus have the same purpose, but the linkage between the screening questions and those points noted under each of the DP27 requirements might not be obvious to non technical readers. The next section considers first the response of the application to the requirement to provide the information listed under points (i) to (xviii) and then the way it deals with the BIA screening process.

4 Response of the application

4.1 Information points (i) to (xviii)

Item	Information required	Response
(i)	The condition and construction of the buildings and their sensitivity to movement	A general description of age and accommodation is given; no useful information is provided about construction or sensitivity of the houses, although garden wall foundations are stated, without records, to have been found 0.8 to 0.9m below external ground level.
(ii)	How much ground movement will occur in consequence of the basement construction	No information provided
(iii)	How much the basement walls will move	No information provided; the BIA states that analysis will be done later.
(iv)	How much the buildings will move	No information provided; the BIA states, without justification, that disturbance is expected to be negligible.
(v)	How much building damage these movements will cause	No information provided; note that BIA statement about expected level of "disturbance" does not equate to any expected damage class.
(vi)	The fabric, structure and engineering properties of the ground	Geology is noted from maps as London Clay and the BIA states that borehole records for No.5 park Village West and other locations have been seen. None of these records are provided though and there is no information about soil properties other than a reference to "stiff" clay. The BIA states that ground conditions will be investigated later.

Item	Information required	Response
(vii)	Ground water levels and behaviour	The BIA asserts that there will not be any requirement for dewatering excavations because there is no groundwater table on site and the ground is London Clay. There is no information provided either to substantiate this statement or enable any assessment of groundwater behaviour.
(viii)	Method and sequence of construction	An outline description is given of the way the basement will be formed by underpinning. I refer to this again in a later part of this report.
(ix)	Method and sequence of supporting the sides of the excavation and basement walls temporarily during construction	Reference is made to the need for temporary propping to support the sides of the basement after surrounding walls have been underpinned. Only one level of propping is intended and that is shown in the wrong place on the drawings provided...
(x)	Resistance of the temporary supports to movement.	No information is provided.
(xi)	Quality of site management and technical supervision	Various statements are made with the intention of providing reassurance on these matters, and I do not doubt their sincerity. Examined closely, though, they have less practical substance and commitment than might at first be supposed. More detail is needed.
(xii)	As (vi)	As (vi)
(xiii)	As (vii)	As (viii)
(xiv)	Balancing the characteristics of existing and proposed surface water disposal regimes	The BIA contains a number of statements about surface water drainage and appears to assume that these satisfy the requirement for surface water run off to be no more after development than before. In fact, the existing lower ground floor garden has three times as much permeable surface than is intended for the basement. The new paved lower ground floor will incorporate a shallow storage system and when this cannot discharge by evaporation (during August flash floods and throughout the winter) any excess will be pumped to the sewer, increasing run off. The provision does not fulfil the DP27 requirement.
(xv)	Accounting for the presence of any existing nearby subterranean development	No information is provided

Item	Information required	Response
(xvi)	The potential effect of basement excavation on larger scale slopes and other topographical features in the area	The BIA demonstrates that there are no larger scale slopes and other topographical features in the area.
(xvii)	As (vi)	As (vi)
(xviii)	As (vii)	As (viii)

4.2 BIA screening

30. Part 1 of the application BIA answers all of the preliminary screening questions set out in the Arup report correctly and points to other parts of the BIA for further comment. Those comments either fail to recognise the need of the second scoping stage of the screening process or suggest that the necessary work and investigation will be carried out after grant of planning permission. The screening process has not been followed through and in consequence the BIA fails to demonstrate in a logical and transparent way that the proposal meets the requirements of DP27.

4.3 Further comment on item (viii) method and sequence of construction

31. The application proposes to form the basement by first underpinning all of the walls bounding the basement area to a depth slightly below the intended basement formation level (the level to which ground will need to be excavated to allow the basement to be constructed). According to the drawings provided, this means that the party wall with No 4 will be left with foundations about 3.8m below lower ground floor level for a distance of 3m from the rear face of the building and, supposing that house and garden wall footings have the same depth, about 0.9m below lower ground floor level from that point to the front of the houses.

32. That is probably the best way to cause the party wall to crack vertically for its full height above the change in foundation level. Reference to the planning documents for the basement of No 5 shows that the corresponding underpinning there was to step up gradually towards the front in accordance with normal good engineering practice and the general indications of both the Building Regulations and the NHBC.

33. Because the party wall between Nos 4 and 5 has been partially underpinned, the ground below No 4 has changed and moved by some unknown amount. The rear and other walls in No 4 that are at right angles to the party wall have been strained. Those were unavoidable consequences of the work at No 5. My Clients were not resident at the time and have no knowledge of what happened, or of how much damage occurred and was repaired under the Part Wall Act. The proposed work at No 3 will cause more movement and probably at least some damage to No 4. That damage might be exacerbated by the presence of distortional forces remaining in the

walls following the work at No 5. They could have weakened the walls' inherent resistance to further damage. Item (i) is relevant.

34. Should any scheme receive consent, my Clients would then be entitled by the Party Wall Act to require other parts of their house beyond the party wall to be underpinned. That is a possibility that must be accounted for under item (xv) when considering the requirement of DP27 part (c). Figure 23D of the Arup report, which refers to possible ground water dam effects of multiple basements, is relevant.

35. The situation at the boundary with No 1 Park Village Mews requires further consideration. There, it is possible that an abrupt change of foundation level is intended at the points where the garden boundary walls with No 4 and the property shown as No 1 Albany street on the site plan intersect the rear wall of No 1. Stepping the foundation levels up in that situation would involve carrying out underpinning beyond the site in the rear gardens of those houses.

36. It is also the case that the design intends water draining to the basement planter against 1 Park Village Mews to pass into the clay supporting the underpinning of that building. Concentration of water in clay supporting foundations is a common cause of subsidence damage.

37. According to the drawings provided, it is intended to place some form of temporary support against the existing building walls between ground level and the existing footings. Once the underpinning is complete, the basement excavated and the reinforced concrete walls lining the basement are constructed, the supports are to be transferred to the lining walls until the new lower ground floor level slab completes the basement box.

38. Supporting the sides of even a one storey basement during construction is a complicated process. Basements of small area can be just as complicated as large ones because every support gets in the way of something else and makes for difficult working conditions. It seems that many engineers employed to design a permanent structure believe that designing temporary supports is someone else's responsibility. Eventually, when a contractor is employed for construction, that becomes true. But DP27 requires a scheme to demonstrate that movement and damage will not exceed certain limits before planning consent. That means demonstrating a temporary support scheme which satisfies that requirement in all respects.

39. The temporary support indicated by the application fails to do that because:

(xix) it does not restrict movement of the earth faces exposed during the underpinning process

(xx) it does not support the top of the underpinning, as opposed to the brick footings above

(xxi) it does not prevent the bases of the underpins being pushed inward by the earth pressure beyond the basement and leaves the whole height of the underpinning unsupported against that pressure for the lengthy period from start of basement excavation to completion of the reinforced concrete lining walls.

5 Other matters

40. All residential construction work causes some degree of inconvenience to neighbours. Basement works are potentially the most inconvenient. If those responsible for the work are as considerate and careful as possible, there are three main sources of inconvenience remaining. The first is the visible movement of plant, personnel, imported construction materials and exported waste inherently associated with all subterranean works. Noise and dirt are unavoidable by products. In the present case, allowing for bulking, there would be at least 80 skip loads of soil to be removed and numerous ready mixed concrete deliveries. The work is done in small stages, so these movements occur over what seems to be a long period during which the working and storage space used often has to extend beyond the property.

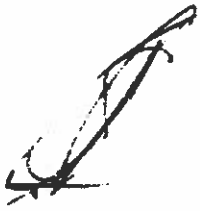
41. The second source of inconvenience is often the actual time taken for the work as opposed to the developer's sometimes optimistic estimate. Groundwork carries with it a high risk that events will not go just as planned, even when all of the possible precautions available from investigation and experience are taken. When they are not or when their results are either misunderstood or ignored the consequent delays and inconvenience can be very considerable. DP27 requirements for information provide a coincidental opportunity for construction management plans to be "best estimate" and publicly helpful accounts of method, timing and effect of a proposal, rather than generalisations and well meaning platitudes such as provided by the BIA. Continuous coordination of purpose between permanent and temporary works designers and knowledgeable leadership aimed at assisting an experienced contractor are also important aids to avoiding unnecessary delay and inconvenience.

42. Frequently, a third source of inconvenience and mental stress, usually for immediate neighbours, is the necessity to have damage caused by the basement works repaired. When basement works are carefully planned and controlled the damage, if any, may be minimal. That is the objective of DP27. In other circumstances, damage may be unnecessary and considerable. In either case, repairs are an aftermath of the construction works that impacts upon those gaining no benefit from the development and can take a long time to resolve. It has been my experience in some poorly prepared cases that damage is half expected by the developer and treated fairly casually as something to be sorted out later.

6 Conclusion

43. My instructions are to advise the Clients of the potential impact of the basement development proposed by the application upon their property. I cannot do so because there is not sufficient information and reasoning within the application to make that possible. This makes the application unsuitable for approval in its present form.

44. I am also required to comment upon the potential impact of the development proposed upon the Clients' residential circumstances. Again, there is not enough relevant information in the application to make specific comment possible. I have however identified three common general sources of inconvenience for those living near such developments. They are the physical existence of extensive movements of both plant and materials and disruption of public access, delays which exacerbate those impacts and inconvenience and mental stress resulting from the need for damage caused by the developments to be repaired. While inconvenience cannot be avoided entirely, proper compliance with DP27 provides opportunity for it to be significantly reduced. The level of compliance exhibited by the application would negate that opportunity.



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23rd November 2012

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[1] **BURLAND J. B. (1997)** Assessment of risk of damage to buildings due to tunnelling and excavation. Proceedings 1st Int. Conf. Earthquake Geotechnical Engineering IS-Tokyo.