

**Response to documents associated with the application 2015/6734/P for
a basement at 10 Clorane Gardens NW3 7PR**

Summary

S1. My initial assessment dated 5th Feb 2016 raised a number of concerns which, in my opinion, prevented the application from satisfying the requirements of DP27. These points have now been considered by Gabriel Geo Consulting (GGC) who is advising the applicant and Campbell Reith (CR) who are advising Camden Council.

S2. I have reviewed their opinions and comments but remain of the opinion that the requirements of DP27 have yet to be satisfied. My reason for this view is that whilst basements in Clorane Gardens exist and therefore can be built, the more there are the more difficult it becomes to know the effects each will have on subsequent basements and the affects subsequent basements will have on existing conditions. In short, each basement raises the level of technical data required for the next one, especially when the next one is "next door"

S3. I believe a basement at No. 10 can be safely constructed but to do so requires a deeper appreciation of ground conditions than exists at present. The reasons for this view are explained below.

Details

1. Gabriel Geo Consulting (GGC) responded on the 4th March 2016 to the points raised by my report of 5th Feb 2016 in a letter addressed to Mr Stuart Eaves, and to avoid confusion this letter will use the numbering of GGC

Gabriel Geo Consulting

Point 1. The adequacy of the ground investigation was raised by First Steps (paras 4.1 and 17) because No.12, next door, already has a basement and it is likely that the conditions of the ground adjacent to it have been affected by such work.

1a. GGC respond by saying that the BH nearest to No,12 (BH2) detects the conditions that are there. That is not really addressing the concern raised.

1b. First, BH2 samples a tiny fraction of the ground and there is no idea of how the conditions encountered are representative of what else is there; we are talking about relaxed ground – a matter of considerable significance to subsequent calculations of displacement where stiffness rather than strength is required.

1c. In that regard it is significant that plots of SPT with depth for the SPT's in BH2 show no increase with depth as do the values in BH1 taken away from

the possible influence of No12's excavation. This is shown in Fig1 that accompanied the First Steps report. Trends over many metres for insitu tests undertaken in a regular and repeatable way are considerably more significant than hand held Pocket Penetrometer values of samples recovered, and are telling us something. What that is has not been considered by the application.

1d. Concerns raised by First Steps paras 4.1 and 17 remain.

Point 2. Here the cumulative impact of a further basement is considered, as First Steps considered this to be inadequately understood (paras 4.4 and 21 to 24).

2a. GGC respond by asserting that *"each of the basements concerned are discrete basements which the ground water would flow, or more likely seep, round so our opinion that there should be no cumulative impact is considered to be sound."* This is an assertion and residents would prefer some evidence that it is so. The following need to be considered.

2b. No.14 does have a basement, contrary to what is claimed in 4.9 of Campbell Reith's audit

2c. Knowledge of groundwater here is very poorly constrained by facts. The ground investigation for No.10 consists of two BH's and four groundwater measurements in 2015, one in each hole on 11th and 18th Nov 2015 and two in April 2016. That is not a lot of data.

2d. Water levels are not known from any other location than these two boreholes and although the relative levels in those BH's agrees with what could be expected from topography alone to be the general direction of flow, no conclusion on directions of flow can be made on only two locations.

2e. The word "dam" has been used in the First Steps report in the sense used by Arup in their guidelines; an interruption to the flow path. It does not mean – although it can mean – a continuous barrier created by basements, but enough of a barrier to affect local levels. If No.10 constructs a basement there will be three basements in a row; 10, 12 and 14. What will be their cumulative effect on ground conditions at No.12? The application offers no evidence of what is happening at this location in Clorane Gardens.

2f. The levels measured are not related to rainfall yet the neighbours' experience is that their water levels can rise rapidly in wet weather; there appears to be a fast response of groundwater to rainfall and that is not unexpected, as explained in the First Steps report.

2g. The location within the BH's at which water pressures are below the formation level for the basement and whilst this is sensible for measuring likely uplift pressures it reveals nothing of what is happening to groundwater within the material that has to be excavated. A contractor could be seriously caught out in bad weather by the change in condition of this material.

2h. Thus, concerns raised by First Steps paras 4.4 and 21 to 24 remain

Point 3. Here the meaning and implication of the differences measured in BH1 and 2, as raised by First Steps (para 16) are considered and judged to be of no concern. Two points need to be made here.

3a. The data produced by the SPT's cannot be dismissed as "*well within the scatter that would be expected for these SPT tests*". The data for BH1 produces a consistent trend that increases and that for BH2, approximately 17m away, does not.

3b. The data from BH1 shows a change in the systematic increase in strength with depth which corresponds with the geological boundary between the Claygate strata and the London Clay which gives confidence in using the data. So the difference between the data from the two BH's is significant.

3c. These differences are not "scattering"; further, changes in moisture content are not the issue; para 16 was concerned with an understanding of the vertical profile and what the differences mean for design and construction.

3d. The concerns raised by First Steps in point 16 have not been answered.

Point 4. Here First Steps considered (para 18) what a competent contractor can expect and what can be expected from a competent contractor. The point made was that a contractor's ability to do the work well will depend upon their knowledge of unknowns associated with the ground, and that the uncertainties raised by First Steps were thus of some significance. GGC are rather dismissive of this concern.

4a. It must be remembered that a contractor can only price on the basis of what he has been told and his experience, and that the last thing a contractor wants with an excavation beneath a property and adjacent to a neighbouring basement is for the work to stop as a consequence of unexpected circumstances. As of present, the application has

- water level readings for 3 days separated by many days and not related to rainfall,
- measured not in the ground that is to be excavated,
- and in which neighbours have sump pumping at regular intervals depending on the weather,
- on a site where the measured mechanical properties in two close BH's differ in a systematic way,
- where those differences are not explained,
- even though the site is known to be adjacent to an existing foundation,
- and in an area recorded to have been the site of previous brick fields.

4b. The concern raised by First Steps in para 18 has not been resolved.

Point 5. The issue raised here is in the confidence engendered by monitoring; is it real or apparent? First Steps raises the view (para 18) that such confidence as monitoring inspires is apparent unless there is a link between what is being measured and the cause for the change. It is all very well “stopping” and thinking that is “onerous” – the question was and remains, what can be done before this point to prevent that from happening. It all depends on the completeness of the ground model; 4a above does not instil confidence in any ground model that the design and construction method may be using.

5a. The concern raised by First Steps in para 18 has not been acknowledged.

Point 6. The concern here was in the nature of the answer in the BIA to the effect of SUDS. First Steps queried GGC’s answer but this query is dismissed by GGC as “fiction”

6a. Closer reading of what First Steps said at para 25 might have highlighted the words “*directly to the ground without the ameliorating influence of evapo-transpiration*”. GGC appear not have considered this despite the experience of neighbours with their sump pumps.

6b It is not just the change in level of ground water that is relevant here but also the speed at which it changes. Slow infiltration will reduce the rate of water level rise and lessen it as a consequence; rapid infiltration will do the reverse.

6c The application says nothing about this and can say nothing about it because it has not been considered.

6d. The problems raised by First Steps in point 25 have not been understood.

Point 7. Here the question of sumps, piezometers and groundwater are considered but GGC misses the point that First Steps is making at para 26; here the report is not addressing whether groundwater is present and the quality of the tanking in neighbouring basements; it is addressing the question is “What is the cause of the wetness in the gardens?” Surely that should be known.

7a. The cause of wetness in the neighbouring gardens remains unexplained.

Campbell Reith

For clarity and brevity only the Conclusions will be considered, which form Section 5 of the Campbell Reith (CR) report. The numbering in those conclusions will be used here.

5.5 CR make no mention of placing the water level data within a framework of rainfall. The long-term experience of the residents suggests there is a link and quite a strong one, and it would be surprising if there was not, so this is something that should be dealt with by further investigation.

5.6 Further work is requested but it should not be restricted to knowing whether or not permeable horizons are present; the key here is the role they will play in jeopardising the excavation should heavy rainfall occur as ground is exposed, and the steps taken to control that and manage groundwater. Pumping by itself, from within the excavation, as the only solution can be accompanied by internal erosion of the strata, settlement and instability.

5.7 What the ground investigation has not shown is the water levels in the ground to be excavated. Further, the pattern of flow between these properties is not known; there is no water level data for this corner of Clorane Gardens than that from the two BH's at No.10, and CR should explain the basis for their satisfaction with the case provided.

5.9 CR here make two very basic and fundamental assumptions;

- that the ground model is sufficiently accurate to allow good predictive calculations to be made, and here attention must be taken back to the fact that two BH's approximately 17m from each other give seriously different data about the stiffness of the ground, and that much else about the ground is not known as listed in Point 4a above, and
- that good control of workmanship will be in force. Surely CR and Camden must now accept from the body of complaint from residents whose property does not function as it did following the excavation of basements nearby, that it is no longer reasonable to "approve" an application on the assumption that everything will be done as it should during the phase of excavation and temporary support. There needs to be something better and that is what is missing here; it is not provided by wishful thinking.

Conclusion 5.9 is founded on these dreams.

5.10 CR is concerned with trigger levels but makes no mention of the lack of connection between monitoring and likely causes of change; as it stands this is monitoring for the sake of monitoring and something of a sham. There should be a link between the ground response expected, the ground response experienced, the cause of the difference, when a difference of given magnitude occurs, and the action to take.

Conclusions

C1. There is no reason why this basement cannot be built safely and without damage to neighbouring properties provided it is accomplished with good ground engineering.

C2. The gaps in the knowledge required about the ground prevent that quality of engineering required from being achieved.

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C3. This is not a question of “outline” rather than “detail” design; the outline should identify the problems and quantify them sufficiently to demonstrate that a feasible engineering solution to them can be provided. Dimensioning and sequencing the details of that solution is detailed design.

C4. Under these circumstances I believe the application needs further work to meet the standards set by Camden in their DP27.



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