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940/JGBB  
2 May 2014

Dear Mr Quinn,

**33 South Hill Park Ref: 2014/1943/P**  
**35 South Hill Park Ref: 2014/1938/P**

Further to my letter of 15<sup>th</sup> April, I am writing in response to the structural issues raised in the two reports which form Appendix 1a and 1b of Mrs Gailey's letter of 23<sup>rd</sup> April.

**Appendix 1a – Report by First Steps Ltd, dated 23 April 2014.**

*(I have used the same references as in the report)*

- 1.1 The excavation at the rear is approx 2m below the party wall foundation (ref section F-F). The 5m depth referred to only applies in the rear garden beyond the neighbour's property, and is a reflection of the rear garden level sloping upwards, rather than the excavation deepening.

The 'additional' paved area referred to is below ground level and therefore lateral drainage within the soil above this can still occur. Peak sewer inflows are also reduced by the green roof and SUDS proposals.

The flank wall of No. 37 extends down to the cellar. It is not being underpinned and our proposed excavation (ref Section D-D) shows that we are barely encroaching into the 45° zone of influence from this foundation; the limited encroachment involved is considered perfectly acceptable. The BIA therefore does provide comprehensive details to enable the Council to reach an informed conclusion that these proposals do not pose an inappropriate risk to the neighbouring property.

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- 1.2 The buildings have been standing since the 1870's so we would say that they are in a stable form of structural equilibrium with the ground.

A site investigation has been carried out which has found London Clay as expected. Given that the area was previously undeveloped, there is a high degree of certainty that the ground adjacent to and under the flank and party walls is consistent with the clay found in the investigations.

We have assumed the existing foundations to be very shallow, which is a worst case assumption. If they are deeper, then this will if anything be beneficial.

- 1.3 The stability of the flank wall is determined by how well it is tied into the intersecting walls and floors of No.37. The tie bars were presumably installed (many years ago) to improve this. We are not proposing anything that will affect the stability of the wall. As referred to above, the underpinning of our own flank wall barely encroaches into the 45° zone of 37's foundations.

- 1.4 The ground is a stiff London Clay forming a good bearing stratum which is stable in excavation. The investigation does not show that it is in a very delicate state, quite the reverse. The excavation of basements in such ground has been carried out all over London using well established techniques, and this case does not present unusual difficulties. Nonetheless the work will be carried out with the greatest of care and expertise.

- 1.5 The top few metres of soil were found to be a stiff weathered London Clay becoming very stiff. These are favourable soil conditions for the project.

Regarding ground water during construction, the bore holes were dry during the investigation and only very small amounts of water are to be expected during construction due to the lack of porosity in the clay. Our design for the permanent works allows for a higher ground water level, as required by good design practice, but does not affect the neighbours.

- 1.6/7 These are not structural items.

- 2.1 The claims made in the report are firmly rejected. The symptoms described here are entirely normal for Victorian houses with shallow foundations and do not suggest downhill creep in the ground.

- 2.2 Historical settlement and movement in Victorian houses can sometimes include bomb damage, but are usually more to do with shallow foundations, tree roots and method of construction. These buildings are inherently flexible due to the use of lime mortar, and remain robust and safe even when there have been past movement or cracking, whatever the cause.
- 2.3 See previous comments.
- 2.4 We have assumed a worst case for the foundations of 37 (i.e. very shallow). We will not be disturbing the drain to No. 37. The drain to No. 35 will be repaired as necessary during the works.
- 2.5 We have prepared design calculations and details with our CMS, which support the conclusions reached in the BIA.
- 2.6 Although there are of course natural variations in the clay subsoil the investigation found material that is stable and consistent. The variation between stiff and very stiff clay is not significant in terms of structural performance.
- 2.7 The site investigation and sampling methods adopted here are entirely appropriate and commonly used for a project of this nature and revealed sufficient information to ensure the safety and stability of the design.
- 2.8 The Vane tests show increasing strength with depth. Nothing adverse in the results was revealed.
- 2.9 Ditto plus see previous comments regarding the 60ft wall.
- 2.10 This observation is marking the distinction between the weathered London Clay in the first few metres and the stiffer unweathered clay below. There is no evidence of a weak stratum as suggested.
- 2.11 All these issues have been considered; the firm conclusion reached is that the ground is suitable for the proposed works.
- 2.12 We have good knowledge of the ground conditions due to the detailed site investigations, and as stated above have in any event made worst case assumptions regarding the foundation depths at 37.
- 2.13 The ground is suitable for underpinning. Being stiff rather than very stiff does not mean that it is weak or liable to inappropriate lateral movements.

2.14 The basement is designed to resist ground water pressure in accordance with good design practice and British Standards. This does not mean that we expect significant ground water during construction.

3.1 The Ecologia report states that the groundwater readings were taken 7 weeks after the installation of the stand pipes. The investigation found no horizons of granular soil containing free ground water, but very slow seepage through silt / sand partings within the clay, which will not cause problems of ground water ingress during construction.

The dampness in the cellar of No. 37 is a normal feature of such buildings and has no particular significance.

3.2 The ground water readings referred to above were taken after a period of heavy rain. The 'zone of disturbed strength' is not borne out by the test results.

3.3 The evidence of the site investigation is that the ground will be stable during excavation with minimal water ingress. What is described in this point is not relevant to this site.

3.4 Ditto. The proposals are not likely to increase the water content of the clay under the foundations of No. 37.

3.5 The drains of No. 33 and 35 will be repaired if necessary during the course of the works. If there is concern that leaking drains at 37 might flood its cellar, then they should be repaired. This is not an argument against our proposals. It is difficult to respond to anecdotal evidence from further afield.

### Details

I am commenting on the points in this section that might have a structural bearing:

#### Stage 1

Q1a The mantle of transported material was found in only one borehole at No 85, i.e. very localized. There is no evidence of it here, and the geological map does not suggest that it would be found here.

#### Slope

Q1 We do not agree that there is an 18° slope at No. 37, and cannot see how this has been measured.

The garden walls are cracked and leaning because they have shallow and narrow foundations. This is not relevant to the proposals.

Q5/10 See Q1a above. The site investigation found that the 'mantle' was not present.

Stage 2 – slope

13. Engineering details at junctions between 35 and 37 have been carefully considered and are shown in our CMS and drawings.

### Conclusions

1. I have addressed the question of the 60ft flank wall above. The ground conditions are known with a high degree of certainty, and we have made worst case assumptions regarding the existing foundation depth. There is no evidence that the past instability (if any) of this wall was anything to do with foundations, and our proposals will not affect its stability.
2. We do not agree that these structures are in a delicate state of mechanical equilibrium. They have been standing for at least 120 years, and the signs of past movement are normal in such buildings. This type of construction is inherently both robust and flexible, and not significantly weakened by small amounts of historical movement. Notwithstanding this we have prepared our design and details to minimize any impact on neighbouring structures, and will ensure that the works are carried out with the greatest of care and expertise.
3. The ground investigation has provided sufficient information for us to prepare calculations, drawings and method statements, and the contents of this paragraph are accordingly strongly rejected.
5. The CMS assumes that there will not be significant water ingress to excavations during construction, due to the low permeability of the clay, and the absence of any permeable stratum with in the excavation zone. There may be slow percolation of ground water in the longer term and this has been designed for,
6. We have over the last 15 years or so designed at least a dozen basements in various boroughs including Hampstead, which have all been constructed without adverse structural effects on neighbouring properties.

In our experience, the investigation and reports carried out for this project have provided an appropriate level of information for the preparation of the design, and have minimized the risk of unforeseen circumstances arising during construction.

Having said that, the works will be carried out under expert supervision, and the design team will ensure that the selected groundworks contractors are suitably experienced, qualified and insured for this kind of work.

The works will be subject to building control approval and party wall awards.

In the unlikely event that construction methods need to be adjusted to suit conditions encountered on site, these will be subject to rigorous design and approval by the design team, building control and party wall surveyors before any changes are made.

### **Appendix 1b – Eldred Geotechnics Report dated 23 April 2014**

This is a lengthy report but the issues of structural difference with our proposals are relatively few, as follows:

1. Inconsistency between BIA and our design

There is a possible inconsistency in the ground water pressure assumed on the garden retaining walls. This is an arguable point but not relevant to the basement construction. If we accept the Eldred assertion then the garden retaining wall design would need to be slightly modified.

2. Possible overestimate of soil strength

Mr Eldred has compared the results of the site investigation with various sites elsewhere in Hampstead. On a project of this nature the exact strength figure is less important than the consistency and stability of the clay. If Mr Eldred's shear strength figures were accepted there would be no effect on the design.

3. Sensitivity of party wall junction in front alley.

We would agree that this junction is a sensitive position and that the works will have to be carried out with great care, as indeed all of the underground work will be. There is nothing particularly unusual about this type of intersection; in works of this nature there are almost always junctions between walls that are being underpinned and those that are not, and so this does not present unusual difficulty.

4. Criticism of some details of construction method and propping.

There is some detailed criticism of the method of construction proposed, and suggestions for alternative propping arrangements. There is also a comment that problems can occur during construction which might affect the construction method. We would agree that there is more than one way in which this basement can be constructed. The final choice of method will be determined once a contractor is selected, but Mr Eldred's suggestions indicate that he accepts that a basement can be safely constructed here.

5. Responsibility for temporary works design

As Mr Eldred says, the final design of temporary works is usually made by a specialist contractor. We would agree with this but it will be subject to approval by ourselves and by party wall surveyors.

6. Site management and technical supervision

We agree with Mr Eldred's emphasis on the highest standards of site management and supervision.

7. Potential amounts of movement

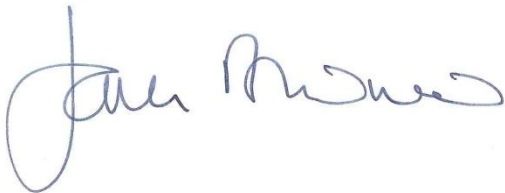
We agree with Mr Eldred that predicting movement in underpinned basements to any degree of accuracy is very difficult. Experience shows that well designed and managed projects do not cause structurally significant movement in adjoining properties. We would recommend that frequent monitoring of levels by a specialist company be carried out during the work so that any issues that arise are quickly identified and rectified.

8. Discrepancy between DMA and BTA drawings ref boundary wall.

Our drawings show the wall rebuilt and this is the intention.

I hope that this response will help to provide the necessary reassurance that the proposed works will not result in any material adverse problems to third parties.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'James Birdwood'. The signature is fluid and cursive, with a large initial 'J'.

James Birdwood  
MA CEng MICE MIStructE