FIRST STEPS LTD
To Success

To Mr Oliver Froment
Regarding Planning Application **2012/5825/P** to Camden Council.
21st November 2014

You inform me that the following assertions are made concerning my view on the existence or otherwise of a model of the ground adequate for the purposes of design and construction; my answer to them is embedded in **Red**, placed behind each item as listed. There are some items I could not locate from the files on the Camden web site but will be happy to respond to if they can be indicated to me; these I have indicated in **Blue**

Geological modelling and cross-section.
2.56 Dr de Freitas claims there is no diagrammatic geological cross section provided.

Section 2.5 of the Arup Report, including Table 1, provides a clear geological characterisation of the site. Table 1 is not the same as a geological model and its illustration by way of a vertical section. The distribution of the boundaries separating the various ground types and the uncertainties associated with them have to be put on paper as a section for a designer to appreciate the risks that may be involved with loading or unloading particular segments of the ground relative to other segments nearby. Further, onto that cross section should also be put the water levels and their likely variation. **This is spatially related data and Tables are not the vehicle for conveying such data; Geological Sections are**. Geological Sections should be used and their absence betrays a design effort that fails to appreciate how geology is used in practice, and how to design and construct in the ground.

Section 6.2.2 and Table 2 provides greater detail. Same comment as above – **even though ARUP write just below Table 2 that the junction between the Claygate Member and the London Clay may be to the west of that shown on the map there is no cross section to explain that or what it can mean** – and what it can mean is that the Survey are right but shallow slope movements have carried Claygate material from its boundary over the ground down slope, now occupied by the site, so laying down a shallow aquifer beneath the site that is likely to be sensitive to seasonal, if not daily rainfall. **This happens to be a matter of great significance for design and construction.**

The Listers Supplementary Ground Investigation20, (Page 5, Ground Conditions) provides full details of ground investigations and a full description of strata in boreholes BH1 - 4.None of this provides a model of the ground but simply a record of what was found at separate locations. **The site is on sloping ground – should the boundaries be joined up with horizontal lines or sloping lines?** And what about the ground water – where is it in relation to these boundaries? **Water levels are reported by Lister in a Table but no attempt is made to show where they sit in relation to solid**

geology or how they relate to each other – such is the stuff of a geological model.

16 GEA Ground Investigation Report (Appeal Doc Ref. 04a.2a) **I could not find this**

17 Supplementary Ground Investigation, Listers (Appeal Doc. Ref. 04A.8) **I could not find this**

18 Development Control Committee Transcript 3/4/2012 (Appeal Doc. Ref 02.5).**I could not find what is referred to**

19 Further borehole monitoring, Listers (Appeal Doc Reg 06.6). No Geological Model is provided – just a table of levels

20 Supplementary Ground Investigation, Listers, April 2012 (Appeal Doc. Ref. 04A.8). **I could not find this**

8 Pilgrim's Lane Appeal Statement Doyle Town Planning and Urban Design
16 I am unsure as to what document this refers to but in the e-mail dated 29 November 2013 from Richard Ball to Mr Tullock there is the following
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2.16 The assessment of groundwater and its change, for the purposes of supporting this application, is therefore questionable and that has implications for the management of groundwater which is accepted by the applicant as being necessary. The designs for this need to be revised to show they accommodate greater background flows and can cope with short term bouts of infiltration.(from the de Freitas First Steps Report)

Comment from Mr Ball *The current information presents a method of mitigating against the impact of the basement on groundwater flow, it is not complete in detail, but demonstrates that the effects can be ameliorated as per DP27 Clause 2.3. We agree that a detailed design is required, however consider that this could be requested as a Planning Condition*.
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There is no way this can be done at Planning stage without first having the adequate ground water data and second having a correct geological model intro which to place it; neither exists.

2.57 A very clear characterisation can be obtained from Tables 1 and 2 of the submitted BIA. These are based upon extensive ground investigations. Importantly, these place the potential sensitive geological condition at a point outside the site. I presume this refers to the ARUP report commented on above under 2.56. **I repeat – there is no ground model in that report.** The nearest the ARUP report comes to indicating a ground model for the site is with its modelling of groundwater flow. The model itself is a hydrogeological idealisation for the purposes of MODFLOW software but to get such an idealisation right you need a geological model to start with – and there is no such model. What's more ARUP got the hydraulic gradient wrong and a cross section, which does not exist, might have helped them get it right.

The borehole records (recognise by the independent reviewer as

'extensive') suggest that the boundary between Claygate Members and London Clay appears to be located to the west of the site (BIA 8.3). The word "extensive" used here is a meaningless play with semantics. **It does not matter how many boreholes are sunk if none of the data they recover is used properly** and none of them are used properly for establishing a ground model and for measuring water levels with time. Ground investigation and ground models cannot be valued on the basis of quantity alone – the quality of the work is crucial also and in this case the quality required to provide safe design and construction is missing.