First Steps Ltd.

Prof. R. Doganis,
95, South Hill Park,
London NW3 2SP

Dear Professor,

6th January 2011

Planning Application No.2010/6491/P at 97a South Hill Park

1. This letter is in response to your request for professional advice concerning the extent to which the proposal submitted by your neighbours to Camden Council satisfy Camden's requirements as described in their recommendations DP23 (Water) and DP 27 (Basements & light wells).

2. The opinions recorded here are based on the following documents;

2.1 The Design and Access Statement from the architects Martin Evans, dated 22 November 2010

2.2 Plans and drawings that illustrate the above SH9a-PL-GA-02; -03; -04; -07; -08, and -09.

2.3 Copies of the above, numbered A, A1, A2, and B submitted by Bel Etage Ltd., one of Freeholds of 97and opposed the proposed works as recorded in a letter to Camden dated 16th December 2010. These drawings are annotated to illustrate aspects of the demands the proposal will make on the structural integrity of No.97.

2.4 A Report commissioned by the proposers entitled "Hydrological assessment-97a South Hill Park" and written by the environmental consultants "ESI" of Shrewsbury.

In addition to these, reference has been made to the following sources;

2.5 Camden Development Policies (2010) DP23 (Water) and DP 27 (Basements & light wells).

2.6 Camden geological, hydrogeological and hydrological study; guidance for sub-terranean development. (2010). A report commissioned from ARUP by the London Borough of Camden

2.7 Ellison, R.A., Woods, M.A., Allen, D.J, Forster, A., Pharoah, T.C. and King, C. (2004) Geology of London. *British Geological Survey.*

The site and surroundings have also been visited in the company of Prof. Doganis (4th Jan 2011).

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3. As explained in more detail below I find the application does nothing to reassure either Camden Council or the neighbours that the guidance provided by Camden in its documents DP23 and DP 27 has been followed, nor has any regard been given to the Report specially commissioned from ARUP by Camden to assist developers cope with issues of water and ground stability, and this despite the case history of flooding associated with basement development a few doors away at No.85.

4. In the document DP23 Camden outlines its concerns regarding water and highlights subjects where reassurance is requested of a developer. In particular Camden seeks a reduction in surface water run-off (DP23.9) and an absence of impact upon the neighbours (DP23.12). The brief seen (2.1 and 2.2 above) does neither of these; this may be because these items have been considered and found to be insignificant, but if that is so such documents and the calculations they require should be submitted.

5. In this regard the applicant has commissioned a report on the hydrology of the site from the consultant "ESI" as noted in 2.4 above however the primary thrust of this report addresses the likelihood of water draining from the Hampstead and Highgate ponds to 97a South Hill Park as a consequence of the works; and of course they will not because the works are geographically higher than the water level in these ponds. There is no issue with that conclusion. However the flow of water from these ponds to the site is not the issue here; the concern here is shallow water travelling within a metre or so below ground level.

6. The "ESI" report addresses the aspect of near-surface water and here the impression it conveys is that there is nothing to be too concerned about; this is not helpful and indeed can be misleading for those unacquainted with the subject. It is this near-surface water that can cause periodic wetness round cellars and inundation of gardens. It flows in the mantle of transported material derived from the down-slope wasting of the Bagshot and Claygate bed outcrops just uphill of South Hill Park. This mantle might be no more than a metre thick but can vary from place to place, being thickest in the former courses of its down-slope movement when it migrated as a viscous flow (akin to a mud-flow) during the latter stages of the Ice Age. The top of the London Clay over which this mantle was transported was itself much disturbed and it is unfortunate that the report describes the clay as "featureless" because this is not accurate; the boreholes provided by the report show this not to be so and also reflect the variation that can occur over short distances (see for example the BH's 1, 2, and 3 TQ28NE/77-79; Cressy Lane).

7. The near-surface hydrology is a feature that warrants greater detail than has been given to it in the "ESI" report. South Hill Park is recorded as a street liable to flooding from overloaded storm water and sewer networks (flooded in 2002) in the Camden Development Policies document of 2010 (Map 2). A distance of five doors away from No.95 and six from No.97, at No.85 a cellar was "flooded" as a result of basement work at No.87 to which it is attached. This is on the same side of the road as 95 and facing the Heath, like 95. Further, the "ESI" report records that *"It is known that gardens at the properties on South Hill park are often waterlogged in wet conditions; this indicates lack of drainage due to the underlying clay"* That is correct but sits

awkwardly with the suggestion on the next page *"Such seepage can be dealt with by landscaping or external drainage works and need not be considered prior to development of the extension"*. The spirit of DP23 indicates that the upper levels of the ground in the South Hill Park should be inspected before work commences in them to assess their potential for flow as it is too late to leave this until the work commences, as suggested by the conclusions of the "ESI" report. A well logged trial pit is all that is required to obtain appropriate design details for dealing with the water expected.

8. There is another reason for knowing more about the near-surface groundwater, and that the effect it can have upon the geotechnical properties of the ground. The "ESI" report specifically excludes geotechnical considerations from its remit and so it appears that the applicant has sought no advice on the geotechnical consequences of the work proposed. The excavation is not large by comparison with some in the borough but it is on a hill, it will intersect near-surface water-bearing ground, the near-surface geology is more likely to vary in detail than be uniform and the clay at depth exhibits shrinking and swelling such that the garden gate at the back of No.95 is provided with two bolt positions – one for summer and another for winter!

9. Given that as the ambient back-ground character of the ground on site, it is surprising to see substantial structural changes to the north east corner of No.97 proposed with no regard to ground conditions. Here I am guided by the observations from the joint Freeholder, Bel Etage Ltd., (see 2.3 above); these show underpinning of existing foundations, temporary support for the north east corner of the house whilst permanent support is erected, foundations for these and the foundation work for a 23m long waterproof retaining wall sitting on the Party Wall line. This is not trivial work and some has to be done within confined space. All of this suggests that attention must be paid to the advice proffered in DP27; at least to the first three items, viz.

"We will consider whether schemes;
a) maintain the structural stability of the building and neighbouring properties;
b) adversely affect drainage and run-off or cause other damage to the water environment;
c) have a cumulative impact upon structural stability or the water environment in the local area;"

10. This leaves the matter of the foundations for the extension to No.95 unaddressed. These are immediately adjacent to the party wall that is proposed to become part of the retaining wall for the development of No.97. Nothing is known of these foundations; nothing. To engineer next to them without further study is reckless. Some quantitative assessment should be submitted of the deflection the ground will suffer as a result of the change of loads within the existing footprint of No.97 and beyond, where new work is proposed. Without these it is difficult to see how the proposal can satisfy in any way the base-line requirements requested by DP27.

11. Finally, it should be noted that ground water and ground strength are not separate entities but are related; for example, when the water content of the ground changes so does the strength of the ground. This makes it doubly necessary to assess not only water and strength but also their relationship.

12. In addition to all that is described here so far there is the further issue of the excavation in the back garden – into the hillside. The heath side of the garden walls on the 95 – 97 stretch of South Hill Park shows the extent to which walls tend to creep (down-hill) and have to be supported; there is in the order of a 3m change in elevation between the ground on the Heath side of the back fence and the basement of No.95; it is into this slope that the patio for No.97 will be excavated. What happens if this promotes instability? The proposal appears quite unprepared for an incident that could occur in less than one hour under the right (wet) conditions.

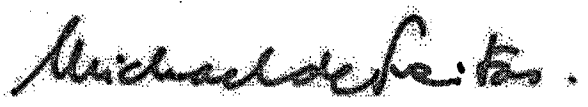
13. This proposal requires significant structural change to an existing building, the construction of foundations and a retaining wall, excavation adjacent to, and possibly below, the foundations of No.95, interference with the existing system of groundwater flow and reduction of support from a natural slope. Yet there is a complete lack of technical support to demonstrate the appropriateness of these proposals for:-

- work in an area that is now known by Camden (2.5 & 2.6 above) to be prone to flooding. The proposal as it stands will do nothing to alleviate flooding but simply aggravate it by adding more water to the storm network,

- work that has the potential for disturbing a delicate system for ground water flow because the ground and its pathways for flow have not been investigated; such work as proposed for No.97could upset that system of flow to the detriment of neighbouring properties if it causes water levels to rise around cellars and foundations, and

- work that has the potential to distort the existing structure of No.97 and notably that for No.95 because the strength and stiffness of the ground beneath and outside the property, are unknown. No calculation of the effect such changes will have on No.95 has been attempted and thus assurances that no detrimental effects will follow the work proposed at No.97 are meaningless.

Yours sincerely



M.H. de Freitas Ph.D.,C.Geol., FGS

(A cv for MH de Freitas is attached)

SHORT BIOGRAPHY
Dr Michael Henry de FREITAS C.Geol., C.WEM

Date of birth: Jan 13th 1942

Present position: Emeritus Reader in Engineering Geology, Imperial College London and Director of First Steps Ltd.,

Higher Education: BSc (Hons) 1st Class. Geology. London 1964
PhD. Engineering Geology. London 1982 DIC 1982

Chartership: Chartered Geologist. 1990
Chartered Water & Environmental Manager 2009

Awards: Sir Henry Miers Prize of the Mineralogical Society; 1964.
Safety in Construction medal of the Institution of Civil Engineers; 1997.
Chevalier L'Ordre des Palmes Academiques; 2001
Rudolph Glossop medal of the Geological Society; 2008

Publications: The authorship of two text books, contributor to three books, editor of seven books, author of 47 refereed papers in geotechnical journals, and of 24 un-refereed publications in conferences.

Membership of Professional Bodies, Learned Societies, etc.:

Geological Society of London (F) 1960 – onwards
International Soc. Rock Mechanics 1967 – onwards
Institution of Water & Environmental Management (M) 1969 – onwards
Royal Geographical Society (F) 1974 – onwards
International Assoc. Engineering Geologists (M) 1979 – onwards
International Assoc. Hydrogeologists 1983 – onwards
British Geotechnical Society (M) 1985 – onwards
Geologists' Association (M) 1989 - onwards

Learned Society (Geological Society) service

2009 – onwards	Chairman London Basin Forum Working Gp. of the Geol. Soc. London
2008	Glossop Lecturer
2005 – 2007	Chairman of the Fellowship and Validation Committee
2004 – 2005	Member of the Fellowship and Validation Committee.
1998 – onwards	Provider of Continuing Professional Development courses
1993 – onwards	Scrutineer for status of Chartered Geologist
1990 – 1994	Member of the Geological Society Awards Committee.
1990 – 19922	Chairman Engineering Group, Geological Society
1988 – 1990	Vice Chairman. Engineering Group of the Geological Society,
1981 – 1984	Editor Quart. Jour. Engineering Geology for the Geological Society.
1978 – 1979	Vice-President of the Geological Society.
1971 – 1984	Editor Geological Society Handbooks.
1976 – 1979	Member of Council of Geological Society and Chairman for the Promotion Co-ordinating Committee

International Society (Int. Assoc. Engineering Geologists) service

1996 – 2003	Chairman for International Assoc. Engineering Geologists Commission on Teaching and Training.
1994 – 1996	Secretary for International Assoc. Engineering Geologists

Research Council and national bodies

1996 – 1997	Chairman of the CIRIA working party report for British Stratigraphical Nomenclature
1991 – 1994	Member of ICE (Ground Board Committee) on Inadequate Site Investigation

1991 – 1993	Member BSI Committee: Ground Investigation, for the revision of BS 5930
1986 – 1988	Panel Member Natural Environment Research Council Research Grants Committee for Geology.

International invitations

1984 – onwards	External Examiner for the Technical University of Delft & Hong Kong, and many universities in the UK.
1974 - onwards	Visiting lecturer to Technical University of Athens; University of Complutense. Madrid; University of Stockholm (KTB); Guest touring lecturer, Beijing and Wuhan. University of Wuhan & University of Seoul.
1997	Commission 4 Rapporteur for Int. Assoc. Eng. Geol. (Athens)
1994	Rapporteur. 7th Int. Congr. Int. Assoc. Eng. Geol. (Lisbon)

Personal consulting

1974 – onwards	Widely on matters of engineering geology to contractors, designers and regulators both in the private and the public sector, in the UK and overseas. Work involving groundwater, stability, materials and recent contracts include:-Brighton Outfall tunnel; Dublin City Corporation (Dublin Port Tunnel); Railway Procurement Agency (Ireland) (Metro North Tunnel & surface works); ARUP Geotechnics (Havant Thicket reservoir); South African Council of Geoscience (Nuclear power sites)

Present employment

My time is divided between teaching on the MSc in Engineering Geology in the Dept. Civil Engineering at Imperial College London, working at First Steps, the company I founded with a colleague in 2000, consulting as outlined above and continuing research with colleagues at Imperial and elsewhere. All major consultants and many contractors have sent staff to our courses; in-house courses are also provided, the largest being to the Royal Engineers at Chatham.