Flat A 15 Well Walk 2016/6491/P

I am commenting on aspects of this application as they relate to trees and to groundwater.

The BIA is inadequate for demonstrating the safety of extending the basement at 15 Well Walk both for trees and for neighbouring properties. The Groundsure searches and reports are desk-top studies that are poorly informed and inadequate for our area with its complex hydrogeology; this part of Well Walk particularly so.

Groundwater and Local Springs

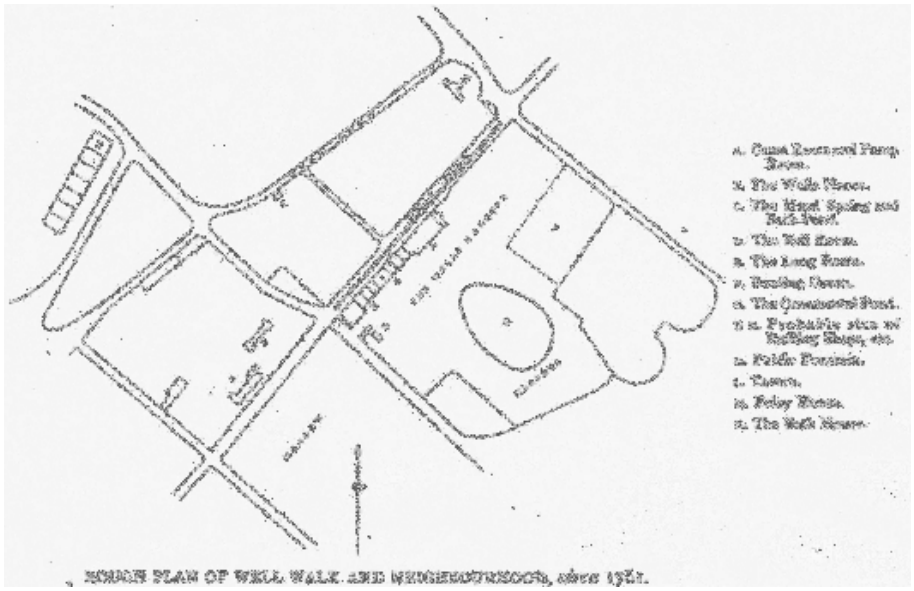
From the BIA:

> *"2.8 By 1915 Chalybeate Spring is shown as Chalybeate Well indicating that groundwater levels feeding the spring have reduced."*

A change of name is hardly evidence that groundwater levels have reduced. This is referred to as a fountain in other historic documents (see below): what do they propose this signifies?

> *"2.15 With the exception of the Chalybeate Spring/Well no springs are shown on the historical plans close to the site indicating that shallow groundwater is not present."*

Far from it. This is a known spring line.



PUBLIC CHALYBEATE FOUNTAIN IN WELL WALK, *circa* 1845.

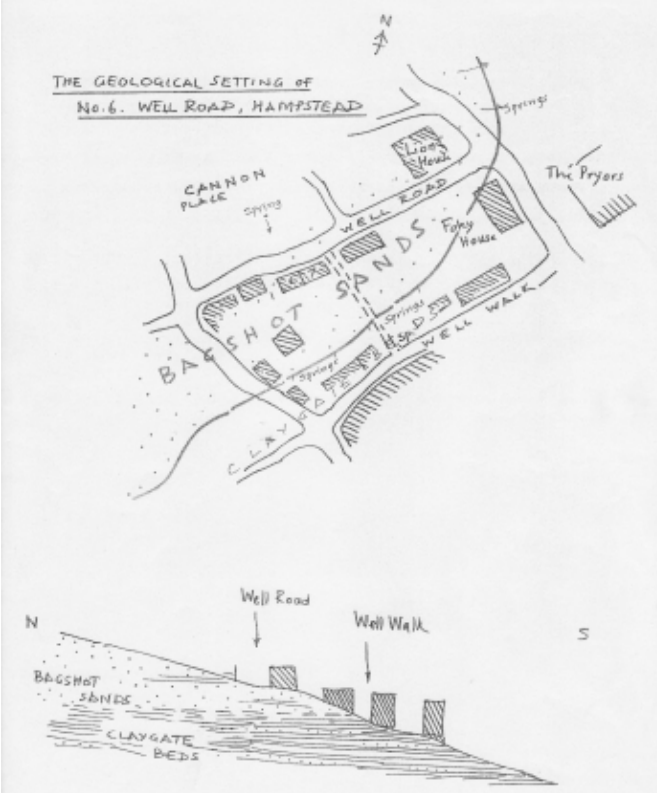
This c1761 map of the immediate area demonstrates the practical use being made of the local springs in the past. While some of this water was piped then and is now, there is still evidence of other groundwater and springs.

1866 OS map showing large pond downstream of 15 Well Walk

The 1761 map and 1866 OS map of the area show the large pond where Gainsborough Gardens now are, originally fed by a spring originating in Well Road, later directed via a conduit running below Wells passage (that

also fed the Chaylebeate well, also known as a spring). Well Road and Well Walk in parts are well known to be on a surface spring line along the boundary of the Bagshot Sands and the Claygate Beds (to see the water flow at this boundary look at the video of the well uphill from here on: http://www.heathandhampstead.org.uk/planning) with some of this groundwater passing on downhill within the silt and sand partings of the overlying Head and the Claygate Beds. The Bagshot-Claygate beds boundary drawn on the British Geological Survey map is dashed, indicating that's its exact position – as drawn on the BGS map - is variable and not confirmed. This is supported by the borehole reported near here which shows Bagshot sand present for 1.5 m.

Dr Eric Robinson of University College London has drawn a geological map of the area (originally for another address in the locality), which indicates the springs and the spring line and should be of concern for 15 Well Walk:



From the BIUA: *"2.13 The available borehole records inspected did not identify groundwater within the shallow sand layer but encountered seepages within the underlying clay. Groundwater within the shallow sand layer is likely to be seasonally dependant."*

This sounds a little understated when compared to the trial pits that the arboriculturalist dug and reported on: "*The sub-soil in the trial holes from approximately 300mm deep was sandy and saturated at the bottom of the pits. Water was rising to within 50cm of the top of the pit indicating that it was waterlogged. The pits needed to be bailed out to be inspected."*

That the water required bailing out from sand gives some indication of the groundwater flow into this area, and the significant probability that the water table could be encountered while digging out this basement extension.

The rainfall for the whole of August 2012 was 31.7mm (only 60% of average rainfall for the month of August over a 30 year period see: http://nw3weather.co.uk/wxdataday.php?vartype=rain&year=2012) with 15.8mm of this rain falling on August 5th, 4 days prior to the arboriculturalist's survey. It is possible that the water encountered was the tail end of surging from the wet day of August 5th. Considering the previous significant wet day was 24 days prior, and there was only a total of 1.2mm of rainfall recorded from August 6th to the 9th it is unlikely the water encountered was at the peak of a surge. Either way, it indicates that continuous testing across periods of both high and low rainfall to investigate the local conditions – surging in particular - is essential, as supported in 'Camden geological, hydrogeological and hydrological study. Guidance for subterranean development':

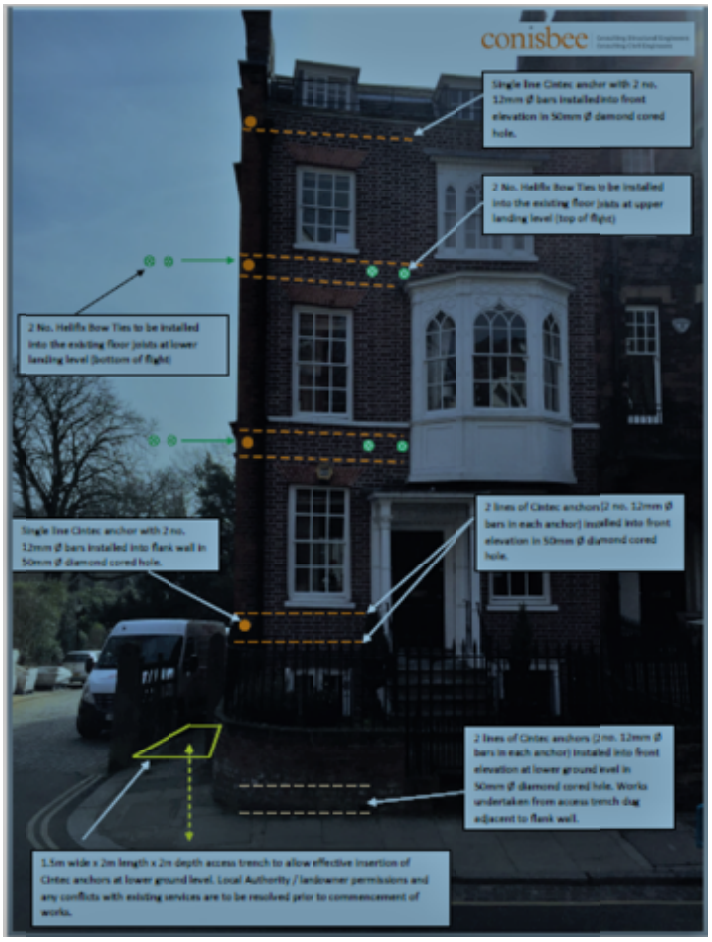
Para 290: *'There is a more significant water table in the Bagshot Formation and it is possible that this may have a seasonal range of up to 50 centimetres, typically.'*

Para 291: *'Monitoring of groundwater levels over a period of time is therefore necessary.*

Silt Erosion by Groundwater Action

From the BIA *"2.18 The moderate swelling/shrinkage potential is likely to be associated with the London Clay which underlies the Claygate Beds."*
No mention is made at all of the notorious silt erosion that occurs throughout much of the Hampstead area.

Some of the groundwater still running below houses on even moderate slopes can affect them by contributing to ground slip, but its main action is erosion of the significant proportion of silt within the Claygate Beds causing subsidence. Number 46 Well Walk for example – almost directly opposite 15 Well Walk – is having underpinning work to strengthen it and withstand the sub-foundation volume loss from silt erosion by groundwater action. Movement monitoring from 2013 presented in 2016/0242/P showed that ongoing movement *was active*. Looking at 46 Well Walk from the road it can be seen that the main groundwater flow is below the house, west of the front door. This is in line with the eastern side of Wells Passage and thus closely associated with 15 Well Walk.



This part of Well Walk and the road down to Gainsborough Gardens is also notorious for mains water pipe fractures when these pipes have their foundations eroded away by groundwater action on the silt within the Claygate Beds here, resulting in collapse. Escaping mains water itself is very erosive of the silty soil in Hampstead, but it is groundwater action that starts and continues the process.

Trees are another indicator and many areas in Hampstead that would otherwise be saturated with groundwater use water-thirsty trees to alleviate this. Hampstead is known for its particularly abundant leafiness and it is not for nothing that Hampstead even has roads named after this practice: Willow Road, Hampstead Grove, Elm Row etc. Lombardy poplar and lime trees have long been planted along Well Walk to reduce the impact of this water on gardens in the area. Where these trees are taken out, gardens become exceedingly soggy.

This all gives a picture of the challenging local hydrogeology, which requires more than a desk-top study, even for this relatively small project. It is essential that the geotechnical experts for the project test for and plan for the possibility of the basement dig hitting groundwater at a significant flowrate, so that measures can be taken to

protect buildings and trees in the event of this happening. Also, to examine and prepare for the effects of erosion that basement-constrained groundwater can produce. This BIA is not site specific, does not enable Camden to 'assess whether any predicted damage to neighbouring properties and the water environment is acceptable or can be satisfactorily ameliorated by the developer' as stated in DP27.3., and thus is far from satisfying CPG4.

Trees

The arboriculturalist's survey was performed on 9th August 2012. This survey report is now more than 3 years out of date, so considering the extent of encroachment then by the proposed work into the trees' Root Protection Zones, the trees must be re-surveyed to ensure this encroachment is still within the spirit of B.S.5837 (2012).

The report also states that no detailed tree examinations were performed. In view of the bats that frequent this area I would expect to see confirmation that there are no bat roosts, particularly in the lime tree.

I am also concerned about access to the site and lack of space for storage of materials. This invariably means that tree root protection zones become utilised for access and for storage without adequate protection for the weights the roots have to sustain. While the arboriculturalist seems to assume that 'Construction access is expected to be through the existing building and not via the alley or rear garden' and that the basement and foundations are being hand dug due to lack of access and space for machinery, this is not confirmed in a Construction Management Plan. There is no CMP and what is presented is inadequate.

Considering the inadequate level of testing and expert opinion obtained for this application and the previous withdrawn application 2012/0103/P, please do not allow consent to be granted for this application until all these points are cleared up sufficiently. Otherwise please refuse.

Dr Vicki Harding
Tree Officer, Heath & Hampstead Society

1st January 2017