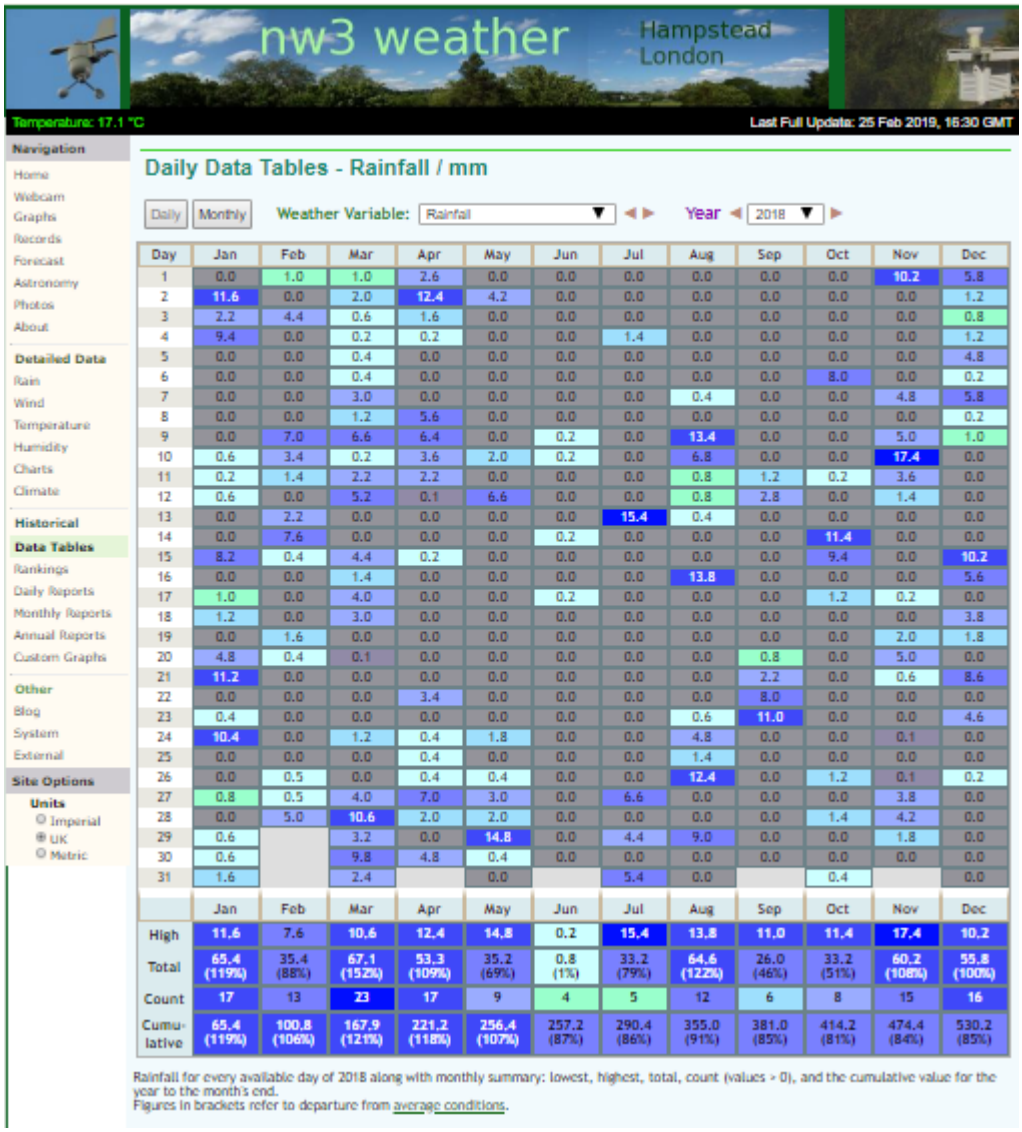
The Heath & Hampstead Society

The Society examines all Planning Applications and Notices of Intent for trees relating to Hampstead, and assesses them for their impact on conservation and on the local environment.

To London Borough of Camden, Development Control Team

Planning Ref: 2019/1055/T
Address: 46 Parliament Hill
Description: FRONT GARDEN: 1 x Birch (T1) - Fell to ground level.
Case Officer: Tree Allocation
Date: 27th February 2019

This property is in an area that suffers subsidence due to silt erosion by groundwater action. The property itself is reported as having a history of subsidence for which the rear part of the house was underpinned 40 years ago.



Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.0	1.0	1.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	10.2	5.8
2	11.6	0.0	2.0	12.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2
3	2.2	4.4	0.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
4	9.4	0.0	0.2	0.2	0.0	0.0	1.4	0.0	0.0	0.0	0.0	1.2
5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
6	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.2
7	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	4.8	5.8
8	0.0	0.0	1.2	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
9	0.0	7.0	6.6	6.4	0.0	0.2	0.0	13.4	0.0	0.0	5.0	1.0
10	0.6	3.4	0.2	3.6	2.0	0.2	0.0	6.8	0.0	0.0	17.4	0.0
11	0.2	1.4	2.2	2.2	0.0	0.0	0.0	0.8	1.2	0.2	3.6	0.0
12	0.6	0.0	5.2	0.1	6.6	0.0	0.0	0.8	2.8	0.0	1.4	0.0
13	0.0	2.2	0.0	0.0	0.0	0.0	15.4	0.4	0.0	0.0	0.0	0.0
14	0.0	7.6	0.0	0.0	0.0	0.2	0.0	0.0	0.0	11.4	0.0	0.0
15	8.2	0.4	4.4	0.2	0.0	0.0	0.0	0.0	0.0	9.4	0.0	10.2
16	0.0	0.0	1.4	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	5.6
17	1.0	0.0	4.0	0.0	0.0	0.2	0.0	0.0	0.0	1.2	0.2	0.0
18	1.2	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
19	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.8
20	4.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.0	5.0	0.0
21	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.6	8.6
22	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0
23	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.6	11.0	0.0	0.0	4.6
24	10.4	0.0	1.2	0.4	1.8	0.0	0.0	4.8	0.0	0.0	0.1	0.0
25	0.0	0.0	0.0	0.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0
26	0.0	0.5	0.0	0.4	0.4	0.0	0.0	12.4	0.0	1.2	0.1	0.2
27	0.8	0.5	4.0	7.0	3.0	0.0	6.6	0.0	0.0	0.0	3.8	0.0
28	0.0	5.0	10.6	2.0	2.0	0.0	0.0	0.0	0.0	1.4	4.2	0.0
29	0.6		3.2	0.0	14.8	0.0	4.4	9.0	0.0	0.0	1.8	0.0
30	0.6		9.8	4.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	1.6		2.4		0.0		5.4	0.0		0.4		0.0
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	11.6	7.6	10.6	12.4	14.8	0.2	15.4	13.8	11.0	11.4	17.4	10.2
Total	65.4 (119%)	35.4 (88%)	67.1 (152%)	53.3 (109%)	35.2 (69%)	0.8 (1%)	33.2 (79%)	64.6 (122%)	26.0 (46%)	33.2 (51%)	60.2 (108%)	55.8 (100%)
Count	17	13	23	17	9	4	5	12	6	8	15	16
Cumulative	65.4 (119%)	100.8 (106%)	167.9 (121%)	221.2 (118%)	256.4 (107%)	257.2 (87%)	290.4 (86%)	355.0 (91%)	381.0 (85%)	414.2 (81%)	474.4 (84%)	530.2 (85%)

Daily Rainfall for NW3 in 2018
see http://nw3weather.co.uk/wxdataday.php?year=2018&vartype=rain

The Crawford Report is dated 18th February 2019 and states that previously fine cracks widened over the previous 2-3 months i.e. November to December. Since these months are *well after* the silver birch will have lost its leaves, rains will have rehydrated the clay component of the underlying soils, and any rainwater escaping from downpipes or drains could have also caused heave, this statement alone refutes any idea that trees could be a cause.

The rainfall measured by *NW3 Weather* over the preceding year near the southern part of the Heath (see 2018 rainfall chart on previous page) illustrates that this pattern of cracking could not possibly be due to vegetation-related subsidence: the cracks would have widened through June-July 2018 and CLOSED 2-3 months before the report if the cracks were related to trees or to expansive clays responding to the 5 periods of heavier rainfall in October-December.

2018 was a little drier overall than previous years, particularly in June, but generally followed the rainfall pattern of the last 3 years. These have been different from the previous few decades with long periods of dry weather followed by short bursts of heavy rainfall. In Hampstead this has had the effect of producing surges in the groundwater: a phenomenon that exacerbates silt erosion from the Claygate beds and from the siltier horizons within Band D of the London Clay Formation. This appears to have aggravated and increased the frequency of potholes and road collapses as well as cracking in buildings across this geological region over the last couple of years.

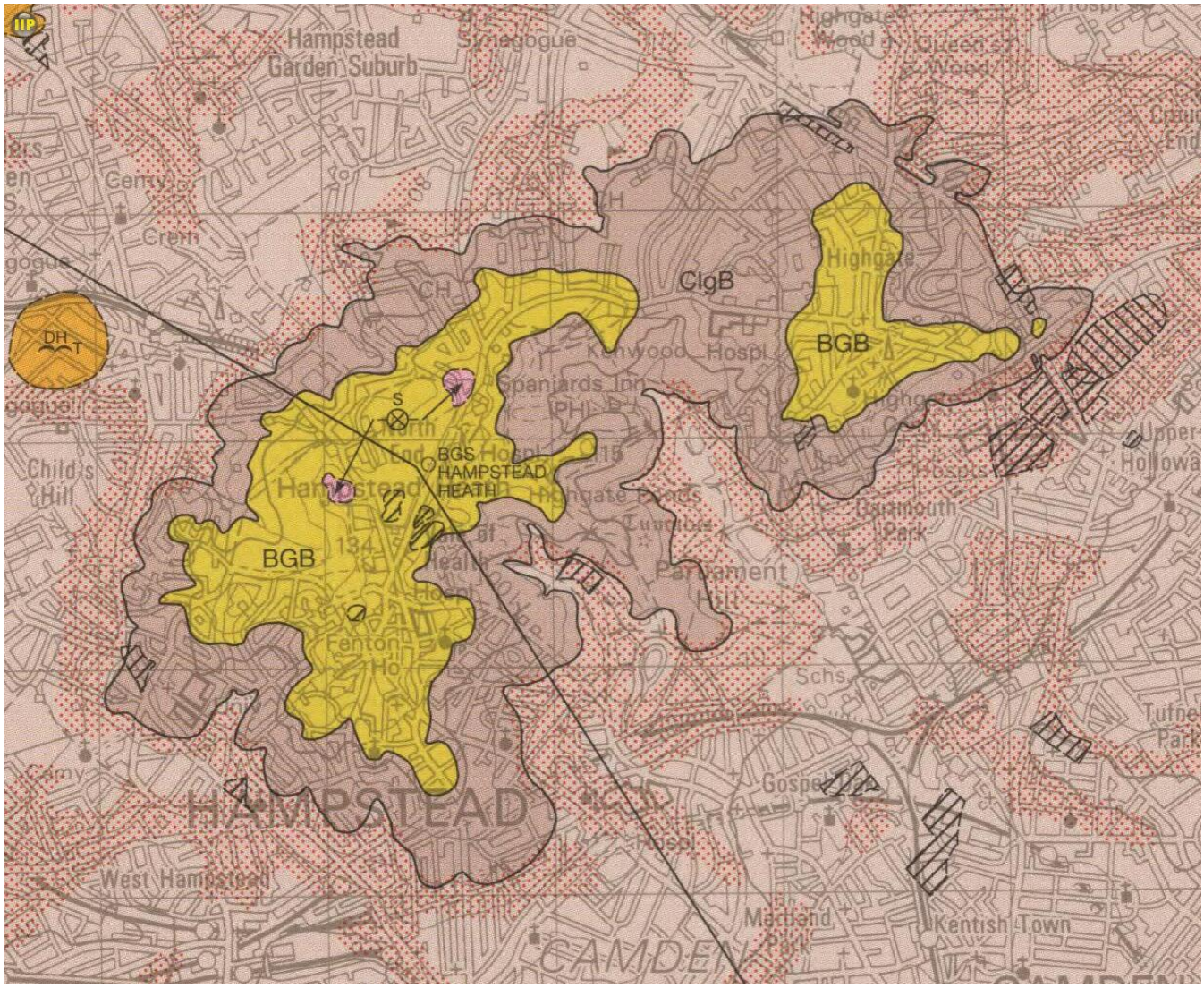
The Crawford Report is not accurate about the underlying soil which is not London Clay per se, but *Band D of the London Clay Formation*, close to the Claygate Beds with which it shares a variable hence not fully certain and overlapping boundary, and which has a layer of overlying Head: a potentially unstable solifluction of silts, sands and clays that washed down from the hill above only a few thousand years ago.

The engineer Tomlinson is quoted to support the case that the building is on London clay. Perhaps it would be better to consult a book on London geology. A good overview for those new to the subject can be found in 'London Geology: Special Memoir for the 1:50 000 Geological Sheets 256 (North London) …etc' (2004) by RA Ellison published by the British Geological Survey. I suggest reading the sections on the Claygate Beds, Band D of the London Clay Formation, and Head, while also remembering that four of London's rivers begin in Hampstead due to its geological composition. There is extensive groundwater flow: some intermittent but prone to surging during and post rainfall, some constant along the top of the two water tables (top of the Claygate Beds and top of Band D of the London Clay Formation – see BGS map overleaf) or under pressure in sand partings.

Any property sited in the region of these hydrogeological phenomena should be properly evaluated before blaming trees for subsidence, or when planning to build deeper foundations.

The timing of the increase in cracks indicates the shrinkage NOT to be root induced. As Crawfords state, clay soils re-hydrate in the winter months, causing the clays to swell and the cracks to close – the opposite of what is happening at this address. Numerous repairs to past diagonal cracks at the front of the building are evident. This building could clearly be suffering, like many around it, from silt erosion whereby the subsidence is ongoing and *does not recover* as it is most probably due to volumetric silt loss below the foundations. Since groundwater flow here is in a south-easterly direction it would be expected that silt erosion would initially affect the rear of the building – as has occurred. Now that there is

subsidence at the front of the building there must be a cavity, pipe or previously eroded area into which the silt has now been washed.



Leaking drains are also a more likely culprit than the tree, causing heave immediately following storms, and downward movement during dry periods as that heave gradually settles. Despite the presence of what appear to be cast iron rainwater downpipes either side of the area of cracking, these have been neither surveyed, pressure tested, nor their leaks fixed by replacement or lining. Cracked or displaced below-ground joints – clay joints were often used for cast iron pipes, particularly at bends - are a frequent finding in Hampstead where the foundations of drains and mains are compromised by subsidence due to silt erosion. Cracked drains in Hampstead are also frequently found to have silt within them that has been washed out of the soil by ground water and into the free space of the pipes.

It is evident that:

- the tree is not of a high-water user species,
- what little evidence has been provided refutes the idea the cracking is vegetation or clay-related,
- drains in the immediate vicinity have been neither considered nor tested,
- other local hydrogeological reasons for subsidence have been ignored – indeed the report is ignorant of the actual local geology and the gross geological map provided seems to be saying the entirety of London = clay!

- no continuous movement monitoring has been done to demonstrate appropriate seasonal crack recovery timed with leaf presence/loss and rainfall patterns,

IF roots are found below the building as has been mentioned, then the report should indicate *WHY* it is thought roots should be below the building. I believe roots under a building are indicative of either leaking drains or the presence of groundwater which in itself indicates the type of soil present and is a pointer to the cause of the subsidence. Why else would tree roots go looking for water under a building that should be providing a dry footprint and if – as this report purports – the building is sited on London clay which is supposed to not allow the passage of water?

The insurance company should be fixing the problem i.e.

1) underpinning the front of the house to match the rear and mitigate the effects of *ongoing* subsidence from silt erosion whether this be due to groundwater surging or leaking drains, and

2) fixing any leaking drains so that heave and/or heave recovery are no longer a problem.

Please refuse to allow the felling of this tree that has been well maintained in the past and provides good public amenity at the front of the property, and place a TPO on it.

Dr Vicki Harding, Tree Officer Heath & Hampstead Society