

# **Council's Response to Arboricultural Issues raised by Cranbrook Basements and Basement Force, RBKC, April 2014**

## **Document 61: David Gilchcrist – Horticulturist**

1. The submission dated 19<sup>th</sup> March 2014 is a copy of the earlier submission from 2013.

## **Document 55: Barrell Tree Consultancy – 25 March 2014**

2. **Para. 3.2** – This appears to be the author's opinion taking exception to our comment made within the first response. No arboricultural input required.
3. **Para 5.1** – States that a 50% basement footprint seems unreasonable when attempting to achieve a green landscape, although the author views an 85% footprint as reasonable. No reason or justification has been given for this opinion.
4. The author has misinterpreted the information within Appendix 1, which does not investigate root activity beyond the property boundary as suggested. The exploratory excavations were undertaken within the site boundaries. This example was included to demonstrate that site conditions commonly found in RBKC can encourage deep rooting from trees.
5. **Para 5.2** – Nothing of note here except the author appears to have a different interpretation of the word heritage to us. We are trying to preserve the tree cover within RBKC. Not all the trees will be exceptional but we are seeking not just to protect exceptional trees.
6. Enclosure 3 of author's submission refers to Victoria Embankment Gardens where there are a number of trees of varying age, some of which are located above the Circle and District Underground line. However, it is important to note that the tunnels are run along the southern strip of the gardens close to the south border. Therefore, in addition to the 1 metre of soil above the tunnels, the trees have unrestricted access to the soil beyond the tunnels. This is a similar type of growing medium comparable to leaving 50% of garden space free of basement. It is important to note that the trees were planted after the construction of the underground railway was completed. Therefore, there was no tunnelling under existing mature specimens.
7. **Footnote 12** – The author refers to Enclosure 2 of his previous submission. Enclosure 2 provides photos of a large fig tree that was apparently transplanted in 2004. There is a further photograph of the tree taken in 2009 in its new location. Having studied these photo's we have concerns that the tree in the 2009 photo is not the same tree that we see being moved in the 2004 photos. Not only does the 2009 tree have a much smaller canopy but the lower stem and main scaffold limbs bear no resemblance to the tree in the 2004 photos. Using Google Streetview we were able to view the tree from the west, north and east. These varied views cast considerable doubt on whether the tree in the 2009 photos is same tree as seen in the 2004 photos. In addition to this, the submission is of limited relevance as transplanting trees bears little resemblance to excavating/tunnelling beneath trees and constructing a basement.

8. **Conclusion** - The author revisits his earlier opinion that an 85% basement footprint is acceptable but 50% is not. However, no evidence has been submitted to justify this claim. We are not attempting to argue specifically that 1 metre of soil is insufficient to establish trees of all sizes. This statement doesn't take into account the issues of water logging/drought and containerisation created by having a basement beneath trees and in some cases party wall/building footings potentially restricting lateral root growth.

#### **Document 72: John Booth – 15 March 2014**

9. **First paragraph:** Author doesn't appear to have read the policy through and believes that trees are the only justification for the basements policy revision..
10. **Second paragraph:** The author acknowledges that roots can be found at depths up to 3 metres deep. However, he then goes on to state that *“where a suitable rootable soil volume can be maintained there is no arboricultural justification for any limitation on subterranean development.”* In most scenarios this statement is reasonable. However, it doesn't really consider the issues specifically related to residential basement construction in this borough and the potential impact on trees. The effect of which can effectively containerise trees in a manner similar to trees planted in brick/stone planters with little or no access to soil beyond the restrictions of the planter.
11. **Third paragraph:** The author quotes the following from BS 5837: *“it might be technically possible to form the excavation by undermining the soil beneath the RPA”. However, it is equally possible that this untested method of construction might also not be possible.*
12. **Concluding paragraph:** See first paragraph.

#### **Document 56: Forbes Laird Consultancy – 24 March 2014**

13. Response to comments made on RBKC document *“Trees and Basements, February 2014”*
14. **Para 9:** The author does not disagree with the quote used from the AAIS research note 'Tree Root Systems' (Dobson 1995) which states that *“All trees can develop a deep root system (2-3 metres deep) if soil conditions allow”*. He then expands on the following sentence from 2.1: *“However, this ability will be influenced by the capacity of different species to tolerate varying soil conditions”* by stating that he agrees with the recommendation in BS5837 towards site specific advice from relevant specialists.
15. **Para 10:** The author agrees that the three points raised in 3.1 are good and relevant questions that should be addressed when considering undermining trees.
16. **Para 11:** The main issue regarding tunnelling under the RPA's of trees is that it is an untried technology. No evidence has been submitted by any party relating to tunnelling under trees in residential gardens and the impact it had on any of the trees concerned

17. **Para 12:** The author mentions RBKC's concerns regarding physical root constraints and agrees with our concerns regarding the potential for droughting and water-logging.
18. **Para 14. i):** RBKC disagrees with this statement. The comments made in section 2 and the appendix were made to demonstrate that in certain circumstances, selected species of trees have the ability to root at depths well beyond 1 metre deep. This is not the case for every species and is also affected by soil and site conditions.

## **Basement Force (Document 14) - Landmark Trees – 18 March 2014**

19. **Page 4. Para 2:** The author has made an assumption that the soil type at Egerton Crescent is poor quality and is conducive to deep rooting. There is no evidence to suggest that this is the case.
20. **Page 4. Para 4:** The author suggests that the two studies (Gasson and Cutler 1990 and Dobson 1995) have been superseded by more recent studies. This is not the case and is merely the author's opinion. The case study evidence presented in the appendix of document "*Trees and Basements, February 2014*" is proof that these documents are anything but obsolete.
21. The author then goes on to state "*The thinking that trees need or require deep rooting in normal conditions is outdated and discredited*". Once again the case studies in the appendix prove quite clearly that this is not the case. In addition to this, RBKC suggests that trees planted above a concrete basement in a garden contained by party wall footings are not growing in normal conditions.
22. **Page 5. Para 2:** The author refers to suitable soil depths quoted from 'Practical Forestry for Agent and Surveyor' (Hart 1991) However, in this instance the document is irrelevant as these depths refer to open grown trees and not urban trees containerised above basements with lateral rooting constraints.
23. **Page 6. Para 4:** The 'Trees and Basements' document did state that the trees in the Town Hall courtyard are situated above a basement in shallow soil. The Council acknowledges that this was included in this supporting document in error. The courtyard where these two trees are located does not have a basement level beneath it and the trees have direct contact with the soil beneath.
24. **Page 7. Fig.4:** This picture shows the various shrubs and a rather small odd shaped tree in a planter. There are no trees of any size or maturity in this planter. Therefore, this is of no relevance.
25. **Page 8:** This page contains pictures of open grown trees where they have unrestricted access to free draining soil with no lateral or vertical constraints. Once again these pictures are irrelevant as they are not urban trees containerised above basements with potential rooting or drainage constraints. The author also suggests that healthy mature trees can be grown in small planters. The Council disagrees with this and notes that no examples have been provided.
26. **Page 9:** The author claims that mature trees can be grown in very small planters. This statement definitely needs to be quantified. It also contradicts what has been included at Fig.1, Fig. 2 and Fig.5 where it has been clearly demonstrated that large trees will spread their roots laterally to some distance in natural open grown scenarios. The two small evergreen oak trees shown at Fig.7 will probably not grow any larger than they are now, simply due to the very limited soil volume available. The pomegranate tree to which the author refers appears to be more of a shrub no more than 2 metres in height, which again does not have sufficient soil volume to increase its canopy height or spread. The Council fails to see how these examples are relevant to the establishment of trees in residential gardens that will have their growth limited due to lack of a suitable growing medium.
27. **Page 10:** The author concludes by stating that trees of any size will, in his opinion, establish and mature growing in soil on top of a basement. However, he has not provided any valid evidence within his statement to back up this claim.

### **Basement Force (Document 13) – Planting on Garden Basements, 16 March 2014**

28. This submission looks at two properties where trees have apparently been planted above basements.
29. The first example in Bedford Gardens provides photos showing a multi stemmed tree in the almost completed garden. The author claims that the tree is “50 year old mature” specimen. However, from the photo provided I would age the tree at nearer 15 years old.
30. The second example provides a picture of a small tree planted above a front garden basement in Chelsea Park Gardens.
31. These examples simply demonstrate that it is possible to plant trees above basements. Whether they survive and reach full maturity is yet to be seen. No other examples are provided of large trees on top of basements in private residential gardens.

### **Basement Force (Document 3) Soils in RBKC - example boreholes**

32. This document contains a handful of borehole results from RBKC all showing made ground above the sub soil layer. It then suggests in the conclusion that this is the norm within the borough, which is not the case. However, this submission is irrelevant as there are no known tree health/establishment issues in the borough.

### **Basement Force - Representation by Basement Force (Force Foundations Ltd) in support of submitted Response Form**

33. **Para’s 39 to 44** have been addressed above or in my previous submission of December 2013.
34. **Para 224:** Three basement car parks have been mentioned in this paragraph as they have trees growing above them. However, no information has been submitted relating to the depth of soil, tree health, basement footprint etc. However, RBKC did investigate the entrance to the Hyde Park car park, which does pass under some mature plane trees in the park. Royal Parks were unable to confirm whether any trees were lost as a result of the tunnel being constructed. It is important to note that the trees above the entrance tunnel are not limited by any lateral constraints Therefore, they are not effectively containerised and the tree roots have access to the soil beyond the entrance tunnel. In addition to this, the depth of soil above the entrance tunnel appears to be several metres deep as the tunnel heads downwards from Park Lane towards the car park. The car park footprint beyond the entrance tunnel does not appear to have any trees growing above.
35. **Para 234:**
  - a. The Council has not stated that trees need more than a metre of soil depth to establish. It appears that Basement Force has misinterpreted information within the Trees and Basements supporting document. The point made was that a basement beneath a tree and other constraints such as foundations could effectively containerise the tree leading to various plant establishment issues.
  - b. The author suggests that soil in the borough is of poor quality. No conclusive evidence has been submitted to justify this statement. In fact, between the 17<sup>th</sup> 19<sup>th</sup> centuries Chelsea was dominated by orchards and market gardens suggesting quite

the opposite. Certainly there is no documented evidence to suggest that plant establishment in the borough has ever been a problem due to poor soil quality.

- c. Soil volume alone is not the only requirement for successful tree establishment. The concern with certain basement scenarios is the containerisation of the tree. This has been addressed above at paragraph a. Also see **'Example 3'** in the **'Trees in Planters'** section below.
- d. The 'Trees and Basements' document did state that the trees in the Town Hall courtyard are situated above a basement in shallow soil. The Council acknowledges that this was included in the supporting document in error. The courtyard where these two trees are located does not have a basement level beneath it and the trees have direct contact with the soil beneath.

### **Basement Force (Document 1) – RBKC Basement Working Group – 18 February 2014 Arboricultural Input by Landmark Trees**

*“90% of trees roots are found in the top 600mm of soil. i.e. the living part of the soil where there is oxygen and nutrient cycling microbes. There is comparatively little biological activity below this depth.”*

36. **RBKC response:** This issue of root depth has been addressed in the 'Trees and Basements' supporting document under the 'Tree roots in the urban environment' section. The case studies in the appendix of this document also provide evidence that the text book statement made by Landmark Trees is not entirely relevant in urban settings.

*“All trees can live, support themselves structurally and grow to full size with 600mm depth of top soil. Some large trees, such as beech grow to maturity on much shallower soils on exposed, windswept downlands.”*

37. **RBKC response:** This may not be the case for urban trees containerised above basements with potential rooting or drainage constraints. It is accepted that large open grown trees where there is unrestricted access to free draining soil do grow on soils less than a metre in depth. However, this scenario is far removed the constraints typically faced by urban trees in RBKC.

*“Large tree planting is of necessity limited to the corners / boundaries of the small gardens, typically found in the borough; i.e. such planting is likely to take place within the developed strips at the front and back of the property. The 15% provision already allows for such mature tree planting.”*

38. **RBKC response:** This is an incorrect assumption. Garden sizes vary greatly throughout the borough.

*“The existing soil of London gardens is commonly made ground and other low fertility soil, lacking in bio diversity. Replacement soil will be more fertile and ultimately more bio diverse (attractive to roots and nutrient cycling microbes). With rare*

*exceptions (e.g. Hampstead Heath, Richmond Park) the importation of topsoil to London will not displace important native soil and microbes.”*

39. **RBKC response:** The author suggests that soil in the borough is of poor quality. No conclusive evidence has been submitted to justify this statement. In fact, between the 17<sup>th</sup> 19<sup>th</sup> centuries Chelsea was dominated by orchards and market gardens suggesting quite the opposite. Certainly there is no documented evidence to suggest that plant establishment in the borough has ever been a problem due to poor soil quality.

### **Meeting 1 – Thursday 14<sup>th</sup> February 2013**

*“Clay is impermeable. There is no significant water penetration through the clay. Putting a basement into the clay has no impact on water drainage downwards. In areas of clay there is no logical basis for using a decrease in vertical water drainage as a basis for limiting the size of garden basements.”*

40. **RBKC response:** This statement is incorrect. Clay is not impermeable. London clay sometimes causes subsidence problems to low rise buildings. This is because it expands as it absorbs water and shrinks as it dries. Therefore, it is not impermeable. The construction of a basement may even lead to soil compaction on London clay, which could be detrimental to the existing drainage properties of residential garden.

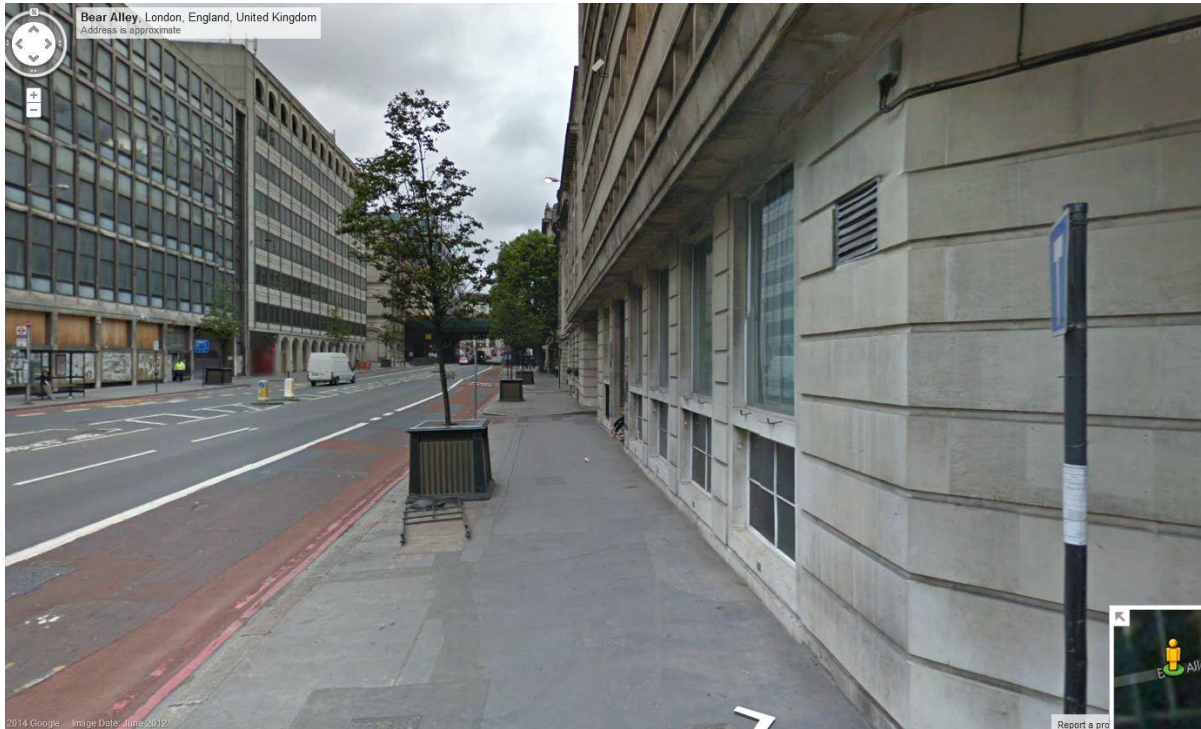
*“River Terrace Gravels have very high permeability – water runs freely through them. Water falling on river terrace gravels moves directly downwards through the gravels and sands until the underlying London Clay is reached. Water needs very small areas in which to move downwards – far less than the 15% current area of garden left unbuilt. In areas of River Terrace Gravels there is no logical basis for limiting garden basement size to less than the current allowable 85%. The proposed 75% and 50% limits are not supported on the basis of water drainage through River Terrace Gravels.”*

41. **RBKC response:** This statement acknowledges that London clay exists beneath river terrace gravels. Therefore, the Council’s response to the previous paragraph on London clay applies.

## Trees in planters

42. Below are some examples of failed trees in planters in response to Figure's 7 and 8 from Document 14 by Landmark Trees.

43. **Example 1 – Farringdon Road.** City of London Corporation believe this hornbeam tree was planted 8-10 years ago by TFL and state that the trees have not visibly grown since planting. The tree clearly has thin foliage and is stressed. This photo was taken in June 2012.





44. **Example 2 – Lime Street.** Four plane trees were planted outside the Willis building in Lime street approximately 8 years ago. Despite having auto-irrigation the trees started dying back in the first year and two died during the second year after planting. Supplementary watering and feeding is necessary during dry spells. Considering the hardiness of this species it provides a good example of the difficulty in establishing containerised trees.



**Example 3 – Hammersmith Broadway.**

Fig.1 – Lime tree in soil filled raised planter 1971. Available soil volume estimated at 40 cubic metres.



Fig 2. – Same lime tree in 1978. Height: 6 metres approx.





Fig 3. – Lime tree in 2012. Height: 9 metres approx



Fig's 4 & 5. - Tree felled in 2014.



The lime tree was only 9 metres in height in 2012 and the diameter of the stem, taken after the tree was felled in 2014, was only 29cm. (Measured 75cm above ground level). The tree is a particularly small specimen for such a fast growing species that generally thrives in harsh urban conditions. A tree of this species and age would normally be expected to be between 15-20 metres high and have a stem diameter closer to 50cm.

It is estimated that the soil volume available to this tree was in excess of 40 cubic metres. This should be sufficient for a tree of this size to mature normally. Hammersmith and Fulham Council's arboriculturist has informed us that the planter was constructed onto the existing

highway, which makes this example similar to having a large tree above a basement with lateral constraints such as building/wall foundations.

## **Conclusion**

45. With the exception of the report from Forbes Laird Consultancy all the submissions have failed to consider the tree related issues typically faced within this borough that were recently addressed in the RBKC supporting document 'Trees and Basements', of February 2014. There appears to be no consideration of the rooting constraints that are commonly found in this borough and much of the evidence submitted relates to open grown trees in rural areas.
46. There is little or no evidence relating to the establishment of healthy trees of all sizes above basements or the undermining of existing trees in small residential gardens. Therefore, it is not surprising that the submissions received have not been able to provide evidence or valid examples to justify their claims.