

**Council's Response to Arboricultural Issues raised by Cranbrook Basements and Basement Force in the July/September 2013 Publication Consultation, RBKC, April 2014**

Mr K O'Connor  
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26-28 Hammersmith Grove  
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28 August 2013

Our Ref: 13134-Letter1-280813-JB.docx

Dear Mr O'Connor

Re: Tree comments on the Royal Borough of Kensington and Chelsea proposed planning policy changes relating to basements

You have instructed me to review the proposed planning policy changes recently published for comment by the Royal Borough of Kensington and Chelsea (RBKC), and to advise on the reliability of the tree related information. I have seen the Alan Baxter Residential Basement Study Report reissued in March 2013 and the RBKC Basements Publication Planning Policy dated July 2013, and I focus on these two documents.

I provide this advice based on my experience and qualifications in forestry, biology and arboriculture, a summary of which is included as Enclosure 1. Barrell Tree Consultancy is one of the largest planning based tree consultancy practices in the UK, with six Chartered professionals dealing with 400-500 projects a year. The bulk of these deal with trees in a planning context, with a significant proportion of our work centred around the London Boroughs. More details of our Practice credentials can be reviewed at [www.barrelltreecare.co.uk/about-us.php](http://www.barrelltreecare.co.uk/about-us.php).

Dealing first with the Alan Baxter Report, I have carefully studied it and note that, although there are specific and detailed comments on tree issues, there is no record of that advice being verified by a qualified tree professional or of the author having any tree-related credentials. This reduces the weight that can be given to the tree related content to that of a lay-person, rather than a tree professional. In the context that the report is introduced as a professional piece of work written by professionals, the failure to clearly set out this obvious limitation is grossly misleading, creating the impression that the tree analysis should be given the same weight as the engineering analysis, when the reality is that it has nothing like that status.

More specifically, I identify the following content in that report that could be reasonably considered as misleading as follows:

Report reference	Content	Comment
9.7.1	<p><i>“British Standard 5837, 2012 (Trees in relation to design, demolition and construction) suggests that basements should not be constructed within a distance of twelve times the diameter of the trunk of a tree.”</i></p>	<p>This is a grossly misleading statement and I reference 7.6.1 of BS 5837 to support this point: “Where it is proposed to form subterranean structures, e.g. basement extensions, within the RPA, it is essential to avoid excavating down through the rootable soil if trees are to be retained. In some cases, it might be technically possible to form the excavation by undermining the soil beneath the RPA.”</p> <p>BS 5837 makes no reference to the depth that RPAs might extend to and so that is a matter for arboricultural interpretation and judgment for each individual set of circumstances. Indeed, BS 5837 provides specific guidance on soil assessment at 4.3.1: “A soil assessment should be undertaken by a competent person to inform any decision relating to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the root protection area (RPA);</li> <li><input type="checkbox"/> tree protection;</li> <li><input type="checkbox"/> new planting design; and</li> <li><input type="checkbox"/> foundation design to take account of retained, removed and new trees.”</li> </ul> <p>BS 5837 has considered the matter of basements near trees and the advice is that it is feasible if an informed assessment of the circumstances is carried out.</p> <p><u>It is difficult to see how this advice can be reasonably interpreted as suggesting that basements should not be constructed within RPA</u></p> <p>As the author has pointed out, BS 5837 states that in some cases, it might be technically possible to construct a basement by undermining the soil beneath the RPA. However, the effect this will have on the stability of the trees and the soil structure is unknown. No evidence is presented to suggest that basements could be constructed within the RPA.</p>

<p>9.7.2</p>	<p><i>“It may be acceptable for a basement to be partially under the canopy of a tree but the method of construction adopted should not damage the tree and this needs careful consideration at the planning stage.”</i></p>	<p>Again this is misleading because the word ‘partially’ is used to create the impression that there is some limitation on how far under trees a basement could extend. There is no credible or widely published reference that limits this aspect. Provided that the rootable soil volume remains undisturbed, in principle, all the area beneath any tree could be undermined with no adverse impact on the tree.</p> <p>The supporting evidence for this is the numerous examples of mature trees being successfully moved around the world with stabilised root balls (See examples in Enclosure 2 to illustrate this point). If tree canopies could only be partially undermined, then it would not be possible to successfully move mature trees, which is patently not the case.</p> <p><u>There is a significant body of industry experience and circumstantial evidence to refute the contention that there is some sort of limitation on the extent that basements could extend beneath the canopies of trees.</u></p> <p>These comments are not relevant. The author is comparing the transplanting of trees with tunnelling beneath them. Transplanted trees have access to the subsoil and are not positioned on top of a concrete structure. These are two completely different scenarios. The Council is not aware of a significant body of industry experience or circumstantial evidence that proves that tunnelling under trees will not affect the soil structure and/or stability of the tree.</p>
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Report reference	Content	Comment
9.7.4	<p><i>“Basements which extend under trees or Root Protection Areas<sup>2</sup> at any depth should not be permitted even though it may be possible to demonstrate that it is technically feasible.”</i></p> <p><sup>2</sup> The root protection area (RPA) is defined in BS5837:2012 as a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability, and where the protection of the roots and soil structure is treated as a priority.</p>	<p><u>This is the personal opinion of the author and not supported by any technical tree-related reference that I am aware of.</u></p> <p>What makes this particular statement even more misleading is the inappropriate reference to BS 5837, which does not support the opinion, but is presented as though it does. As the extract opposite correctly explains, RPAs deal with areas and is a tool, not an absolute measure. It was never designed to take specific account of variations in rooting depth. The most relevant recommendation from BS 5837 that explains this point in context rather than the selection opposite is in 4.6.2 and 4.6.3 as follows:</p> <p><i>“4.6.2 The RPA for each tree should initially be plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.</i></p> <p><i>4.6.3 Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:</i></p> <ul style="list-style-type: none"> <li><i>a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);</i></li> <li><i>b) topography and drainage;</i></li> <li><i>c) the soil type and structure;</i></li> <li><i>d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.”</i> <p><u>There is nothing in these BS 5837 recommendations that support the author’s lay opinion.</u></p> </li></ul>

<p>9.7.6</p>	<p><i>“In addition to requiring basements built outside the footprint of buildings to have a depth of topsoil with appropriate water retention and drainage arrangements for the cultivation of gardens, there has to be a limit on how much of a garden can have basement construction beneath it. This is to ensure that trees can be planted to replace existing species that die and also to provide a hydraulic connection between the surface and the perched water table, so that rainwater can enter the ground to</i></p>	<p>Whilst the thrust of this paragraph is acceptable, i.e. that sufficient rootable soil volume should be retained to allow existing and future trees to survive and thrive, the idea that “there has to be a limit on how much of a garden can have basement construction beneath it.” is an uninformed opinion that is not supported by any technical or factual evidence. There are numerous examples of trees growing over structures in shallow rooting depths and thriving into maturity. An obvious one is the underground line passing beneath Embankment Gardens (See images in Enclosure 3) where mature plane trees are growing on soil depths of about 1m.</p>
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Report reference	Content	Comment
	<p><i>maintain the current status quo within the groundwater regime of the Borough."</i></p>	<p>In principle and practice, there is no reason why basements could not occupy a full garden area and have no adverse impact on present or future trees, provided sufficient rootable soil volume is secured. However, this would need to be assessed in the context of depth of soil above the basement roof, i.e. the greater the garden coverage, the more depth that is likely to be required.</p> <p><u>There is no tree-related technical evidence to support the contention that "there has to be a limit on how much of a garden can have basement construction beneath it."</u></p> <p>In his comments relating to RBKC's basements SPD adopted in 2009, the author states that "a depth of 1m is unlikely to be able to sustain potentially large trees, and a minimum of 1.5m would be a more appropriate starting point." This statement conflicts with the comment made above where he suggests that 1 metre of soil in Embankment Gardens is more than satisfactory for the mature plane trees there.</p> <p>Due to the many below ground constraints encountered by tree roots in RBKC such as vaults, party walls, building foundations etc, it is not uncommon to find roots belonging to large trees at depths in excess of 1 metre. Therefore, the Council agrees with Mr Barrell's comments of 2009 with regards to soil depth needing to be in excess of 1.5m for the establishment of large trees.</p>

<p>9.8.1</p>	<p><i>“The size of basements built outside the footprint of an existing house has to be limited for the following reasons</i></p> <p><i>a) ...</i></p> <p><i>b) Large tree and shrub planting to maintain the character of the gardens and landscape of residential areas within the Borough.”</i></p>	<p><u>Again, this is the lay opinion of an author with no tree credentials.</u></p> <p>There is no evidence to support or reasons to justify the limitation of basement areas outside a building footprint because it limits large tree and shrub planting. As for the point above, provided there is sufficient rootable soil depth, which is a matter to be assessed on a site-by-site basis, trees do not provide a defensible constraint on basement garden coverage.</p> <p>It is the Council’s opinion that the increase of basement extensions within RBKC could compromise the natural drainage of gardens due to insufficient connectivity between the soil surface and the upper aquifer. For this reason, the Council would seek to limit basement footprints to maintain the connection between the soil above basements and the deeper soil beyond.</p> <p>Mr Barrell made the following comments in response to RBKC’s Subterranean Development SPD in 2009:</p> <p><i>“If new tree planting is to be sustainable without supplementary watering in times of drought, then it is important that the soil above basements has direct connections with deeper soil beyond the footprint.”</i></p> <p>His comment in response to section 9.8.1 of ABA’s report somewhat contradicts his earlier opinion.</p>
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<p>9.8.6</p>	<p><i>“The other factor that will need to be considered in limiting the size of a basement under a garden is the requirement to retain the ability to plant large trees. This requires areas of gardens to be kept clear of construction. In most cases a 3m strip at the rear of the garden will be sufficient to allow trees to grow, but this may depend on the nature of the garden and of the trees themselves. Where there are large gardens, a much wider strip or further areas should be left without subterranean construction beneath them to allow for extensive tree planting.”</i></p>	<p><u>Again, this is a lay statement clumsily dealing with issues beyond the author’s area of expertise.</u></p> <p>It is simply not correct to imply or state that tree planting and growth will be affected by basement coverage without referencing the depth of rootable soil. Provided a sufficient depth of soil is available, in principle, any tree would be able to grow anywhere over the top of a basement. There is also no obvious link between garden size and the width of any strip, assuming that a strip is necessary in the first place, which it is not. There is also no explanation why the strip has to be at the rear; why not at the sides?</p> <p><u>This is a poorly constructed and reasoned statement that is not worthy of any significant weight.</u></p> <p>It is logical to have the basement free strip to the rear of the garden as most trees in RBKC are planted in this area probably due to the limited size of most rear gardens in the borough. It is also good practice to plant trees away from building elevations to avoid conflict.</p> <p>The following comment was made by Mr Barrell in 2009, which contradicts the comment he made above:</p> <p><i>“It is very important that soil for new tree planting above a basement has a direct connection with soil beyond the basement footprint that may be on or off the site. This is so that roots of trees growing on top of basements can grow into surrounding areas and have the maximum potential to explore and utilise those soil resources, which will reduce the stress on them in periods of drought. Trees that are isolated in islands of soil above basements are more likely to be vulnerable to drought stress, which is likely to become a common feature of urban conditions as climate change begins to bite. We consider it important that new landscaping is sustainable without the need for supplementary watering, which can only be achieved for larger trees if there is the potential to draw on water reserves deeper than 1m.”</i></p>
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13.3.5	<p><i>“The requirement that provision be made for large tree and shrub planting to maintain the character of gardens in the Borough may further restrict the area of gardens which can be built under.”</i></p>	<p>This statement is set in the context of site conditions that should influence the extent of basements beneath gardens. As explained above, it is not the case that the requirement for large tree planting may restrict the area of gardens that can be built under.</p> <p><u>As the area of basement coverage increases, it is the rootable volume of soil that becomes critical, not a simplistic measure of area.</u></p> <p><b>This comment again contradicts the comment made by the author in 2009. See above (9.8.6)</b></p>
14.8	<p><i>“The location of existing trees and their species on or within 6m of the site and a description of the existing garden and</i></p>	<p>For trees off the site, BS 5837 recommends at 4.2.4 c): “the position of trees with an estimated stem diameter of 75mm or more that overhang the site or are located</p>

Report reference	Content	Comment
	<i>paved areas of the building and adjacent properties</i>	beyond the site boundaries within a distance of up to 12 times their diameter;”. Surely, this is the appropriate reference and the distance could realistically be up to 15m?

Turning to the RBKC Basements Policy Draft, I have the following comments:

Draft reference	Content	Comment
34.3.54	<i>“The desirability to maintain ‘green and leafy’ gardens, flexibility to plant major trees together with the recommendations in the ABA report regarding drainage indicate substantial proportion of the garden should remain free of any development.”</i>	<u>For the reasons set out above, the ABA report advice on tree matters is flawed and should not be given any significant weight in the matter of influencing the proportion of gardens that should remain free of basement development.</u>  This comment again contradicts the comment made by the author in 2009. See comment made above in relation to section 9.8.6 of the ABA report.
34.3.54	<i>“Retaining at least half of each garden area will enable natural landscape and character to be maintained, give flexibility in future planting (including major trees), support biodiversity.”</i>	This statement is misleading relating to trees. <u>There is no demonstrable need to leave any proportion of a garden free of basement development in order to enable flexibility in planting trees if an appropriate depth of rootable soil is retained.</u>  This comment again contradicts the comment made by the author in 2009. See comment made above in relation to section 9.8.6 of the ABA report.
Footnote 13, Page 7 (RBKC Basements Publication Planning Policy July 2013)	<i>“13 Works should be carried out in accordance with BS 5837 2012 (with the exception that tunnelling underneath the root protection area should not be undertaken) and the Council’s Trees and Development SPD.”</i>	This statement is fair except for the inclusion of the phrase “tunnelling underneath”, which cannot be supported by any technical reference. <u>There is substantial evidence that even the biggest trees can tolerate and survive this type of activity.</u>  The Council is not aware of any evidence that very large trees can tolerate tunnelling within/beneath the Root Protection Areas (RPA) (RPA as defined using BS 5837: 2012)

<p>Appendix B 34.3.62</p>	<p><i>“BS 5837 2012 indicates that tunnelling under trees can be an option. Whilst feasible, it will put the tree at risk, and the Council does not judge the benefits that may be gained from a larger basement outweigh the benefits of minimising the disturbance and risk to protected trees. This approach will therefore not be permitted.”</i></p>	<p><u>There is no published evidence that tunnelling under trees will automatically put them at risk.</u></p> <p>Indeed, there is plenty of practical evidence from around the world that this is not the case. RBKC appear to have based this position on lay opinion from the ABA report. If that is the case, then this should be reviewed in the context of balanced advice from professional arboriculturists.</p> <p>The author claims that there is plenty of practical evidence from around the world to prove that tunnelling will not put trees at risk. However, he has not provided any examples to back up this claim.</p> <p>Enclosure 2 of this submission 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 photos we have concerns that the tree in the 2009 photo is not the same tree that has been tunnelled beneath 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.</p> <p>Enclosure 3 of the 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 that leaving 50% of garden space free of basement will create. It is also worth noting that the trees were planted after the construction of the underground railway was completed. Therefore, there was no tunnelling under existing mature specimens.</p>
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In the summary below the author states that there is plenty of evidence that tunnelling under large trees to transplant them is widely practised and generally successful. However, the Council is not aware of any large transplanted trees that have been planted above a basement one metre below the ground. Tunnelling under trees to transplant them to a new location without any rooting constraints is very different to tunnelling beneath a tree in an urban garden to construct a basement and effectively containerise the tree. There are many examples of semi mature trees that have been transplanted to town centre planters that contain either waterlogged trees or drought stressed trees. It is possible that tunnelling beneath established trees to build a basement could create the same type of problems.

My review of these two documents has identified an apparent failure of RBKC, through ABA, to seek professional advice on the tree issues, which has resulted in a misleading position based on lay opinion to influence the emerging policy. Whilst I do not at all suggest that my opinions represent a definitive or final position on any of the flaws exposed above, I regularly deal with precisely these matters, which places me very well to present a realistic analysis of the issues. In that context, I offer my view on the main issues, based on my experience and awareness of appropriate technical references.

There is no evidence that I am aware of to confirm or prove that tunnelling under trees automatically affects their health or stability. Indeed, there is plenty of evidence that this can be done and it is done on a regular basis in the context of moving mature trees, which is the only practical reality check that we have. Of course, if it is not done with appropriate care and proper planning, then harm will arise, but that does not mean it cannot be achieved if the proper controls are in place. Such controls are available within the planning system and are used on a daily basis to effectively protect trees on construction sites.

It seems that the issue has been wrongly focused on whether it can be done; it can be and there is no evidence that a reasonable default is that it cannot be. Instead, the issue would have been better focused on the depth of rootable soil that is necessary to support existing trees and new trees. Of course, there is no generic or formulaically derived answer to this because of the great variability of soil conditions and individual tree growth characteristics. However, there is plenty of evidence that large trees can adapt to survive on very thin layers of soil. Furthermore, it is a matter of sensible interpretation that if there are no roots at a location in a soil profile then, provided the rootable soil is undisturbed, whatever happens beyond that is unlikely to affect adjacent trees. It may well be that depths greater than 1m are needed in some circumstances, but that would not preclude development beneath the rootable soil depth. There is no question that to build successfully beneath trees is technically challenging, but there is no evidence to support the position that it cannot be done or that it is inappropriate.

In the face of this lack of evidence that it cannot be done, it seems more appropriate to adopt a stance of placing the burden on the applicant to prove it can be done rather than dismissing the possibility outright. In this context, the onus would be on the applicant to provide the investigation details and the supporting technical analysis to demonstrate that the project is feasible. This is no different to planning for any above-ground development near trees, where careful excavations to identify the location of important roots is routinely used to inform the precise extent of new development.

reasonably demonstrated that a proposal is feasible and there will be no significant adverse impact on retained trees or future tree planting. It would then be down to the experts to analyse the specific circumstances of each site and make the case, which seems much more appropriate than an outright ban based on poorly informed opinion.

If required, I would be happy to provide further clarifications on any of these points and attend any forum necessary to probe the depth of the opinions I have set out above.

Yours sincerely

Jeremy Barrell BSc FArborA DipArb CBiol FICFor FRICS

Enclosures:     1: Brief qualifications and experience of Jeremy Barrell  
                    2: Images of tree moving  
                    3: Images of trees in Victoria Embankment Gardens, Westminster

## Enclosure 1: Brief qualifications and experience of Jeremy Barrell

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- 1 Formal qualifications: I have an Honours Degree in Environmental Forestry (1978). I am a Fellow of the Institute of Chartered Foresters (1996) and a Fellow of the Royal Institution of Chartered Surveyors (2008). I am a Fellow (1989) and Registered Consultant (1994) of the Arboricultural Association (AA). I was an AA Approved Contractor from 1984–1995. I am a Chartered Forester (1980), a Chartered Biologist (1993), a Chartered Surveyor (2008) and hold the Royal Forestry Society's Professional Diploma in Arboriculture (1990). I am a Law Society 'Checked' expert witness and a founding member of the Institute of Expert Witnesses. In 2001, I was honoured with the AA Award for services to Arboriculture and, in 2010, I become the American Society of Consulting Arborists' first Registered Consulting Arborist resident in the UK.
- 2 Practical experience: On leaving University in 1978, I joined the Forestry Commission as a Field Surveyor and began my tree contracting business in 1980. For the next 15 years, I developed this contracting business, leaving it in 1995 to concentrate full-time on consultancy. Barrell Tree Consultancy ([www.barrelltreecare.co.uk](http://www.barrelltreecare.co.uk)) is now a well-established advisory practice, with a focus on the legal and planning aspects of tree management.
- 3 Professional experience: I have been dealing with tree hazard assessment throughout my career. Between 1993 and 1996, I was a DoE tree preservation order (TPO) appeal inspectors reporting to the Secretary of State. This involved impartially assessing a whole range of tree management issues, including TPO administration and subsidence damage. I have had a long career acting as an expert witness, from Magistrates Courts to the High Court. Most recently, I was the expert for the successful Claimant in *Poll v Bartholomew* (2005), and the successful Defendants in *Atkins v Scott* (2008) and *Micklewright v Surrey County Council* (2010). I also acted for the Defendant in the recent failed criminal prosecution, where the Woodland Trust was acquitted in *HMA v The Woodland Trust*. A summary of my expert witness experience can be downloaded from [www.barrelltreecare.co.uk/case-studies/barrell-legal-cases.PDF](http://www.barrelltreecare.co.uk/case-studies/barrell-legal-cases.PDF). In 2009, I attended and passed the LANTRA Professional Tree Inspection course, which is the premier tree inspection accreditation scheme in the UK.
- 4 Continuing professional development: I regularly lecture all over the world and have written more than 70 papers and articles on tree management ([www.barrelltreecare.co.uk/resources.php](http://www.barrelltreecare.co.uk/resources.php)), including acting as the guest contributor on arboriculture for the Horticulture Week Opinion column since 2009. I specialise in developing tree assessment methods that are published on a dedicated website at [www.TreeAZ.com](http://www.TreeAZ.com). I was on the panel that produced BS 5837 (2005) and I am currently involved in producing the new BS 8545 on tree production and planting.



## Enclosure 2: Images of tree moving

The first three images provided by Adam Tom from Brisbane of moving a fig in 2004, which still survives today. Note the depth of the undercut of the whole root system to move it to a new location, which is no different in principle to excavating a basement beneath the tree.





Enclosure 2: Images of tree moving



The image below is another fig moved by Adam Tom in Brisbane. I took the photo in 2009 and the tree had been moved about six years previously. Although the circumstances of individual trees will vary, this series of images demonstrates that, in principle, trees can tolerate disturbance beneath them as long as the rootable volume of soil remains undisturbed.





### Enclosure 3: Images of trees in Victoria Embankment Gardens, Westminster

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A number of the mature plane trees in Victoria Embankment Gardens, Westminster, are growing in less than 1m of soil directly above the Circle line tube that runs beneath. There are many other examples of mature trees surviving and thriving on shallow depths of soil. It is indefensible to state that this is not the case in principle, although the circumstances of individual trees will vary.



# DAVID GILCHRIST

*NDH (Hons), M HORT, PD Arb, DHE, Cert Ed, FArb, N Sch*

## HORTICULTURIST

Mr K O'Connor

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Cranbrook Basements

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15<sup>th</sup> August 2013

Dear Mr. O'Connor

**Ref: Plant comments on the Royal Borough of Kensington and Chelsea proposed planning policy changes relating to basements.**

You have instructed me to review the proposed planning policy changes published by the Royal Borough of Kensington and Chelsea RBKC), and to comment on draft planning policies 34.3.49 and 34.3.54.

I am providing these comments based on my experience and qualifications in horticulture and landscape practices. (Appendix 1)

Yours sincerely

T David Gilchrist

**Comments on the Royal Burgh of Kensington and Chelsea proposed planning policy changes relating to basements as requested by Mr Kevin O’Conner, Director, Project Management, Cranbrook Basements.**

**The comments are in response to the issues listed below in A-H**

**Comments:**

The following comments are made with reference to the proposed Planning Regulation changes within the Royal Borough of Kensington and Chelsea “*Basements Publication Planning Policy – July 2013*”

A.1 metre of soil is sufficient depth located above a basement structure to plant and grow any deciduous or evergreen shrub, deciduous or evergreen tree, herbaceous perennial, bulb, conifer, fern, alpine, ornamental grass, annual, biennial, vegetables, soft fruit, top fruit and lawns.

**This is the author’s opinion, which has not been backed up with any evidence or real life examples.**

B. By way of illustration the following plant genus can be planted and grown successfully in an urban London garden. Lavendula, Cistus, Hibiscus, Juniperus, Picea, Narcissus, Galanthus, Monarda, Helenium, Heuchera, Rhododendron, Viburnum, Magnolia, Prunus, Malus, Sorbus. The initial depth of planting will vary according to the pot/container or root ball size that the plant is supplied. This could range from 50mm to 600mm depending on plant type – This is significantly less than the 1m of soil above



any basement

- C. Removing the old potentially contaminated soil and replacing it with fresh fertile soil to BS 3882:2007 would be good practice and is a positive feature of the Basement process. It would reduce the risk of carry over pests, diseases and impurities that can be present in old soils. This source of inoculum would be removed.

An assumption has been made that existing soil is contaminated, which is probably unlikely in residential property.

D. The new land drainage is essential to the Basement construction, would improve the growing environment for all the plants planted in the new fresh soil. It would reduce the risk of anaerobic conditions developing and improve the growing environment overall.

Newly bought in soil could just as easily be inadequately installed leading to water logging and anaerobic conditions.

E. There is no requirement to limit the size of the basement garden as one metre of structured top soil will provide a suitable growing environment for all plant types as outlined in A & B.

F. Biodiversity is greatly improved when there are a wide range of plants species used in garden planting. Wildlife is attracted to flowering, fruiting and seed bearing plants. It can provide wide ranging habits for wild life to establish and flourish as the garden matures.

G. The design and character of the garden will be a matter for the owner, given that there is no restriction or limit on the plant types that can be planted and grown. One metre of soil depth provides adequate area for plants to obtain moisture and nutrients to sustain healthy growth.

H. The planting and growing of trees above the Basement should not be restricted as many trees have the greatest percentage of their root systems in the top metre of soil (Forestry Commission: Information Note: The Influence of Soils and Species on Tree Root Depth: November 2005). Tree planting would enhance the aesthetic and biodiversity of the gardens and bring many attributes to surrounding landscape.

## **Conclusion:**

**1m of good quality, well drained topsoil above a basement structure will provide an excellent environment for the growth of plants and shrubs whilst strongly encouraging biodiversity – restrictions to the size of basements below gardens should not be made based upon concerns over planting or biodiversity**

This submission makes a very general statement that is not backed up with any evidence or real life examples. The claim that 1 metre of soil above a basement is adequate to grow any type of tree is somewhat vague and does not consider any of the rooting constraints, such as party walls, building foundations etc, that exist in RBKC.

For example, if a tree is planted in one metre of soil above a rear garden basement and basements exist in the rear gardens of the adjacent properties it would be reasonable to assume that the tree has, in effect, been containerised and it is probable that the tree will be faced with waterlogged soil and/or drought conditions depending on the time of year, exact soil type and the site specific constraints on root spread.

The conclusion made is a very general statement that is not relevant to the planting and establishment of trees above basement extensions in RBKC.



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Landmark Trees

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Our ref: LT RSP 2 RBKC 34.3.59

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28 August 2013

Dear Simon

### **RBKC publication planning policy arboricultural input**

#### **Proposed planning policy CL7 a**

Not exceed a maximum of 50% of each garden. The unaffected garden must be in a single area and where relevant should form a continuous area with other neighbouring gardens. Exceptions may be made on large comprehensively planned sites;

#### **Council justifications that could relate to policy CL7 1**

34.3.50 A basement development next door has an immediacy which can have a serious impact on the quality of life, whilst the effect of multiple excavations in many streets can be the equivalent of having a permanent inappropriate use in a residential area with long term harm to residents' living conditions. There are also concerns over the structural stability of adjacent property, character of rear gardens, sustainable drainage and the impact on carbon emissions. For all these reasons the Council considers that careful control is required over the scale, form and extent of basements.

34.3.51 The policy therefore restricts the extent of basement excavation under gardens to no more than half the garden and limits the depth of excavation to a single storey in most cases. The extent of basements will be measured as gross external area (GEA).

34.3.54 The townscape of the Borough is urban and tightly developed in character. However, rear gardens are often a contrast, with an informal picturesque and tranquil ambience, regardless of their size. Whilst basements can preserve the remaining openness of the townscape compared with other development forms, it can also introduce a degree of artificiality into the garden area and restrict the

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range of planting. Retaining at least half of each garden will enable natural landscape and character to be maintained, give flexibility in future planting (including major trees), support biodiversity and allow water to drain through to the 'Upper Aquifer'. 'Garden' is the private open area to the front, rear or side of the property, each assessed separately, and includes unpaved or paved areas such as yards. This policy takes into account the London Plan and the Mayor of London's Housing SPG both of which emphasise the important role of gardens. The National Planning Policy Framework (NPPF) also supports local policies to resist inappropriate development of residential gardens and excludes private gardens from the definition of previously developed land.

34.3.55 Keeping the unexcavated area of a garden in a single area and adjacent to similar areas in other plots allows better drainage, and continuity of larger planting supporting biodiversity. In back gardens this area will usually be the end of the garden furthest from the building.

34.3.60 Trees make a much valued contribution to the character of the Borough, and bring biodiversity and public health benefits. Works to, and in the vicinity of, trees, need to be planned and executed with very close attention to detail. All applications for basements likely to affect trees either on-site or nearby must be accompanied by a full tree survey and tree protection proposal for the construction phase. Core Strategy Policy CR6 Trees and Landscape will also apply.

### **Council response to my comments to second draft planning policy**

if to the rear the unexcavated area of the garden should normally be at the end of the garden, where it will be adjacent to similar areas in other plots, allowing for better drainage and larger planting.

The growing medium available to trees in an urban environment is different from that in open woodland or grassland where there is generally significantly fewer constraints on root growth. This Borough has a very dense urban environment and tree roots, small and large, have been found much deeper than 1 metre, as acknowledged in the response "roots tend to elongate more in poor soils that are often found in urban gardens". The urban environment provides many constraints to root growth and it may not be conducive to the long term growth and survival of trees to limit the depth of available soil to only 1 metre in back gardens. It is not expected that forest scale trees will be planted too close to the building and the policy does require the natural garden area to be at the end of the garden.

The Council endorses the policy 'right place right tree'.

As noted in the response there are other reasons for the restrictions on the extent in addition to planting.

### **Opinion**

I write at your request in response to the above proposed planning policy CL7 a, the justifications in the proposed planning policy document that seem to relate to this policy and with regard to the comments made in relation to my comments to the second draft planning policy, all of which are shown above.

For the record I state that I am a Registered Consultant and Fellow of the Arboricultural Association, a Chartered Forester, Environmentalist and Surveyor with a Masters Degree in Arboriculture and 25 years experience of the landscape industry - including the Forestry Commission and Agricultural Development and Advisory Service. I am also Chairman of the UK & I Regional Plant Appraisal Committee, inaugurated to promote international standards of valuation in arboriculture.

I start by reiterating the main points that I made in my previous letter to you dated 24<sup>th</sup> April 2013, namely that:

1. The undulation of a garden over a basement is not restricted in any way. A garden over a basement can be as undulating as desired now and at any time into the future.

**Noted. The policy is not intending to create undulating landscapes.**

2. Ground of one metre depth over a concrete basement roof does not restrict the range of planting in any way, including major trees.

**This opinion has not been justified by the author and does not take into account the physical root barriers typically found in this borough may restrict certain species from utilising soil beyond these constraints, which could greatly affect the health and vigour of many trees. It also represents a short term view as it does not take into account the construction of new basements adjacent to one another in neighbouring properties, which could lead to both drainage and drought issues.**

3. Any major tree grown in the UK can reach maturity and live for a normal life span in 600mm of fertile soil. One metre is more than adequate.

**Once again this paragraph does not take into account the constraints mentioned above in response to point 2. The results of the 'Kew Wind Blown Tree Survey' (Gasson and Cutler 1990) suggest that this isn't the case. The survey results show that 56% of trees surveyed had a root plate depth of below 1 metre. It is also worth noting that the gravel subsoil type found at Kew is documented as being the same or similar to the subsoil found within a large area of RBKC. The Arboricultural Advisory and Information Service research note 'Tree Root Systems' (Dobson 1995) states that "All trees can develop a deep root system (2-3 metres deep) if soil conditions allow". However, this ability will be influenced by the capacity of different species to tolerate varying soil conditions.**

4. One metre of soil is more than adequate to structurally support any major tree grown in the UK.

**The Council is not aware of any large mature trees growing in one metre of soil over a basement without having direct access to the soil beyond the basement. Mr Hollis has not provided any examples of this scenario. Therefore, we do not consider this to be a valid comment in this instance. A large tree in a shallow growing medium sitting on top of a concrete basement is different to a large tree growing in a much deeper established soil where it is likely that better cohesion exists between the soil layers in comparison to the relatively shallow soil above a solid basement structure.**

Further to this, having read the revised policy, the associated reasoned justification and the

Council's response to my previous comments to the 2nd draft policy I make the following points.

There is little justification for any garden basement, which has one metre of well-drained top soil placed over the basement roof to be limited in size in any way with regard to tree planting, horticultural planting, greenification or biodiversity. In fact quite the contrary:

According to Natural England, English soils vary from a few centimetres to a metre or more in depth. Although they are young in a world context, they represent about 10,000 years of ecological processes and human modification. Consequently, soil is regarded as a non-renewable resource because it cannot be re-created except within the context of geological timescales. From my viewpoint, the stipulation of a 1m-soil covering for basements is not only luxurious, but wasteful and contrary to Local Agenda 21 (sustainable use of resources).

Urban soil, as the Council has quite rightly mentioned in their response to my previous comments, is often poor quality and detrimental to healthy tree growth. The soil that would be placed on top of any garden basement would be prime soil, far better indeed than the original soil that it will have replaced in every case that I can think of across the borough. So, far from having a negative impact on tree growth, garden basements, with one metre of soil on top, will be a boon to the leafy, green character of the borough's gardens, promoting healthy tree growth above that which would be found in most gardens with their inherently poor soils. At any rate, there is no justification in portraying the impacts of development as unduly negative. Clearly, from a more balanced perspective, there are benefits to be had from basement development; the provision of topsoil and new planting are two of them.

This paragraph makes the unfair assumption that all existing soil in the borough is not only of low quality but also that home owners will place good quality soil above new basements. This paragraph is based on pure assumption only.

On the subject of taproots and the occurrence of roots at greater than one metre depth, it is well-documented that tree roots are opportunist and will exploit new niches as they become available and attractive to them. Thus, some tree species (mostly of flood plain origin) growing on shallow soil over heavy clay can exploit deeper fissures that open in the clay in times of severe drought, when the upper horizons are desiccated. As stated above, planning necessitates the provision of luxuriant stores of premium top soil on the site to a greater depth than would normally be expected, rich in organic matter and nutrients and less prone to desiccation at such depths. Thus, the privileged roots need not beguile us with their adaptive ability to exploit tortuous nooks and crannies in their otherwise hardened struggle for existence. Indeed, as previously stated, roots in good soil tend to ramify more and elongate less: their roots become more compact and fibrous. Such a root pattern is generally desirous in urban situations, where the more erratic and opportunistic rooting patterns are more readily associated with damage to infrastructure (e.g. drains and foundations). The question must be asked, does this council wish to reserve garden space for the promotion of opportunistic exploitation of soil water reserves at depth by flood plain species (oak, elm, poplar, willow) next to and below vulnerable building foundations? The issue of taproots does not concern arboriculturalists in this country, as these normally wither and die as the sapling grows. I am surprised that anyone has brought the issue up at all. For the benefit of those expressing concern over taproots, I attach a West Sussex County Council primer for its tree wardens on tree roots.

The author has discussed taproots in the above paragraph, although the reason for this is unknown. The Council has not mentioned taproots at any stage of the process as it does not see that they are of any relevance to this subject.

I provide again the figure 1 from Harris<sup>1</sup> which had been omitted from display on the Council's Consultation Responses on Second Draft Basements Policy July 2013. I enclose it for completeness and hope that it will see the light of day this time around.

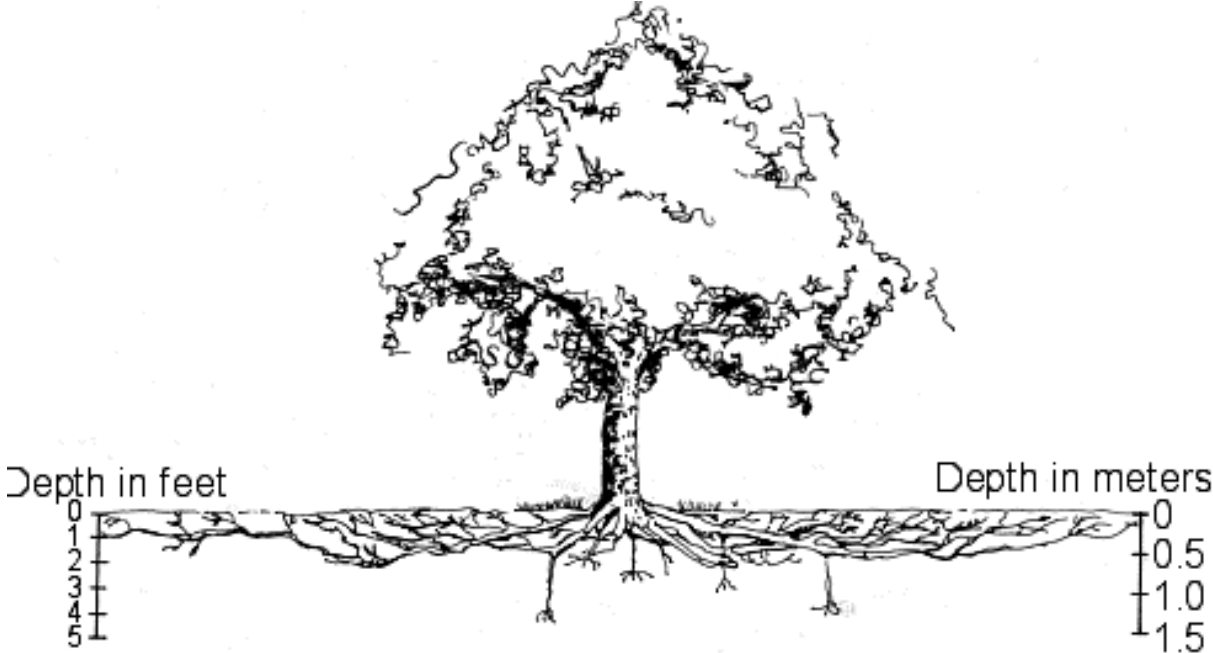


Fig.1: in mature trees the tap root is either lost or reduced in size. The vast majority of the root system is composed of horizontally oriented lateral roots

It is my opinion that garden basements with one metre of good quality top soil place on their roofs, from an arboricultural and horticultural perspective will:

1. Have no detrimental effect on the character of rear gardens.
2. Have no intrinsic reason to cause an appearance of artificiality or restrict the range of planting.
3. Have no negative effect on the natural landscape or character of a rear garden or decrease the extent to which these can be maintained.
4. Not decrease the flexibility in future planting including of major trees.
5. Not decrease herbivorous biodiversity
6. Not decrease the continuity of larger planting.

Existing trees are, quite rightly, fully protected by extant regulation, namely by Tree Protection Orders and automatic protection in Conservation Areas. The size of garden basement allowed by policy will have no effect on the trees so protected. They will continue to enjoy full protection and will be unaffected by policy that allows larger garden basements.

In summary, I conclude that there is no arboricultural or horticultural reason to restrict the size of garden basements at a planning policy level, provided that a healthy covering of good quality topsoil is a requirement.

Please let me know, if I can be of further assistance in the matter.

Yours sincerely



Adam Hollis  
MSc Arb F Arbor A MIC For HND Hort  
Chartered Forester  
Fellow & Registered Consultant of Arboricultural Association

1. Harris RW et al 2004; Arboriculture Fourth Edition, Prentice Hall, NJ, America
2. West Sussex County Council

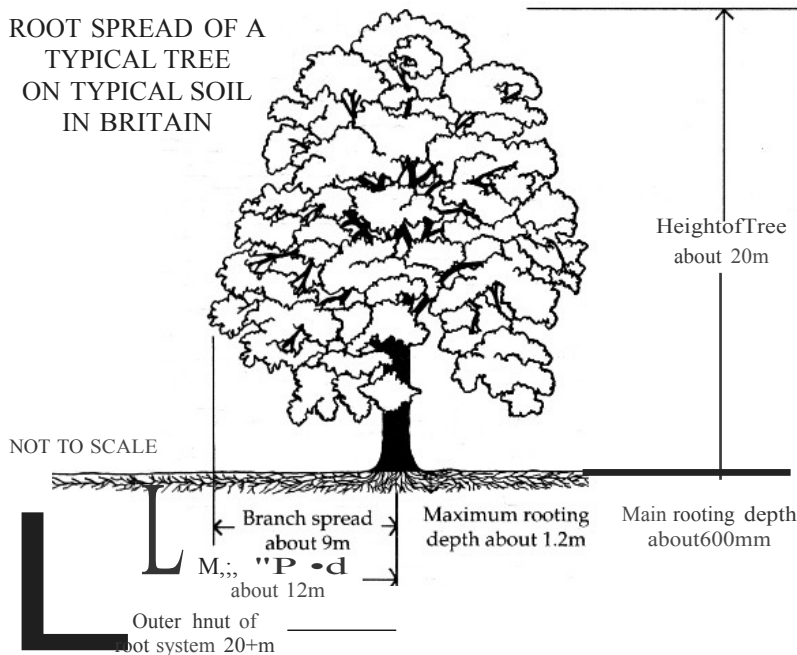
# TREE ROOTS

In the Broadleaf we seem to talk extensively about the physiology of trees above ground so we thought it was about time to go underground and have a look at root systems.

Popular belief seems to be that the roots of large trees penetrate to a dept of several metres and that the deep roots are referred to as 'tap roots' or 'anchor roots'.

In most climatic and soil conditions in the British Isles this is far from true. Tree roots need to obtain water, nutrients and oxygen from the soil and these elements are usually most readily available near to the ground surface. For this reason a trees roots are normally found in the top 600mm of soil.

ROOT SPREAD OF A TYPICAL TREE ON TYPICAL SOIL IN BRITAIN



However, on poorly drained day soils where rainfall is higher than average, the entire root system can be in the upper 300mm of soil. Correspondingly, where the weather is drier, roots will occasionally penetrate as far as four or five metres into the ground in order to gain moisture from a low water table although this is not a common occurrence.

All roots contribute to both the stability and moisture of trees although the uptake of water and nutrients takes place mainly through very fine root hairs (or rootlets) at the ends of the smallest woody roots. Every Spring roots grow millions of these tiny hairs, each of which is a single cell. They only last one or two months and are then replaced, and every Autumn they all die.

Tap roots are a feature of some tree seedlings (eg. oaks) which tend to send down a single

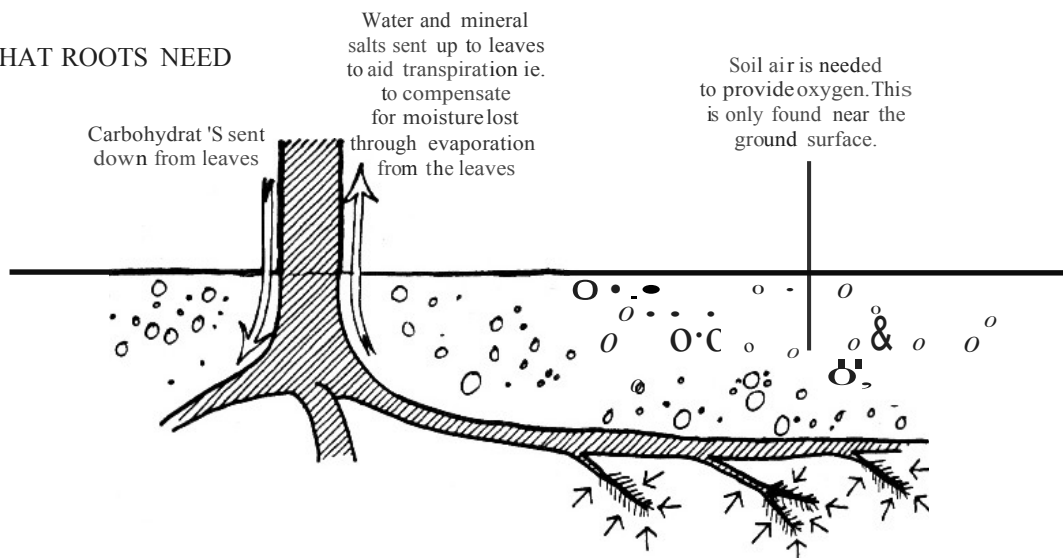
main root. As the tree grows, however, the tap root does not continue to develop – the main direction of root growth is lateral. A mature oak tree will therefore not be a scaled up version of an oak seedling, but will have a differently shaped root system.

The roots of most tree species develop rapidly, sub-dividing, and most of the roots are relatively thin (25mm or less) until they are within two or three metres of the main stem.

Very few investigations seem to have been done into the extent of root spread although it is dear that this varies depending on climate, soil, tree species etc. It is generally though that roots usually extend further than a trees' branches and that root spread is roughly the same as the height of the tree.

The largest root system ever recorded was on a Finnish Pine tree with a total root length of 50km and over five million tips!

WHAT ROOTS NEED





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0 oil moisture and nutrients  
(potassium, phosphorous,  
iron, calcium, magnesium  
and  
trace elements) are picked  
up by the roots - 85% of rain water  
in a wood is  
absorbed by tree  
roots. A mature tree  
can soak up over  
1400

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