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ARBORICULTURAL IMPACT ASSESSMENT REPORT RELATING TO THE PROPOSED DEVELOPMENT AT NUMBER 15 LYNDHURST TERRACE, LONDON, NW3 5QA – REVISION 1: FEBRUARY 2017.

CLIENT NAME:	Mr Emanuel Mond 15 Eton Garage Lambolle Place London NW3 4PE **Ref:** None specified
REFERENCE:	FH-Mond-15-Lyndhurst-Terrace-London-NW3-5QA
DATE OF VISIT:	26th February 2016 **TIME:** 11.00am
PEOPLE PRESENT:	Dr. Frank Hope Mr Emanuel Mond

1.0 FORMAL DETAILS.

1.1 My name is Dr. Frank Hope and I am currently 66 years of age. I am an independent Arboricultural Consultant based at Chestnut House, Northside, Thorney, Peterborough. The practice specialises in arboriculture, urban forestry, biological sciences and project management. I have advised many major clients during the past thirty years, for example, Sainsburys, Midland Bank, Alfred McAlpine, P&O, Ministry of Defence, Environment Agency, The Health and Safety Executive, Metropolitan Police, Local Authorities, Insurance Companies and Loss Adjusters.

1.2 For five years (April 1998 to April 2003), I acted for the Office of the Deputy Prime Minister (ODPM) as an Inspecting Officer on Tree

Preservation Order Appeals. This provided me with a detailed insight into this topic.

1.3 In addition to having a doctorate and masters degree in Biological Sciences (research on woody plants), I hold the National Diploma in Arboriculture (RFS) which is the foremost practical British qualification in trees and their management. I also hold numerous general horticultural qualifications, the most notable of which is the National Diploma of Horticulture (now the Master of Horticulture (RHS)).

1.4 I am a retired Fellow of the Arboricultural Association, and a retired Fellow of the Institute of Groundsmanship. I am a past member of the education committee of the Arboricultural Association, past vice Chairman of the East Anglian Branch, and am a past member of the governing council. I am also a past member of the governing body of the East of England Show.

1.5 During 1997 I was one of three people commissioned by the Arboricultural Association to develop a computerised model capable of assessing the future risk of subsidence damage to buildings when trees are growing close-by.

1.6 For further detail on my qualifications and experience see Appendix -A-.

2.0 AUTHORITY AND BRIEF.

2.1 The initial authority for this commission was provided by Mr Emanuel Mond in the form of an email dated the 24th of February 2016.

2.2 The objectives of this commission are to:

- inspect the trees growing within, and adjacent to, number 15 Lyndhurst Terrace, London, NW3 5QA;
- discuss the implications of any legal protection of the trees;
- carry out an inspection of the trees, and describe their overall condition, age, and safe life expectancy;
- quantify the quality of the trees in accordance with the category rating definitions in the current British Standard 5837;

- assess if the proposed development of the property will affect the condition, visual amenity, or safe life expectancy of the trees;

- make specific comment on the Arboricultural report produced by Mr Simon Pryce.

3.0 BRIEF DESCRIPTION OF THE SITE.

3.1 Number 15 Lyndhurst Terrace is relatively small, modern, single-storey and two-storey, detached residence located on a generally level site, on the western side of the road, between numbers 13 and 17/19 Lyndhurst Terrace, London (See the picture below).

Picture taken on the 26th of February 2016 showing the front of number 15 Lyndhurst Terrace.

3.2 The house faces approximately north-eastwards, and is currently accessed via a gravel-covered driveway off Lyndhurst Terrace. A poor quality, brick-built wall forms the front boundary of the property, and a very poor quality, 2.5 metre to 3.0 metre high brick-built wall runs along the northern boundary separating numbers 15 and 17/19 Lyndhurst Terrace (See the second picture on page 4 below). The height of this wall has been increased in the past, and soil movement has occurred at its base.

Picture taken on the 26th of February 2016 showing the rear of number 15 Lyndhurst Terrace.

Picture taken on the 26th of February 2016, showing the section of the gravel hard-standing area at the front of number 15 Lyndurst Terrace, and the poor quality brick-built wall along the boundary.

3.3 The front garden of the property is small, and is approximately rectangular in shape. It is currently covered with gravel, and is used for vehicular parking. The front garden contains no vegetation of note other than a self-set, poor quality Ivy (*Hedera helix*) climbing shrub growing up against the adjacent garage of number 17/19 Lyndhurst Terrace.

3.4 The rear garden of the property is small, rectangular in shape, and is covered mainly with concrete flagging. A small shrub border containing mixed species shrubs, a small Yew (*Taxus baccata*) and a Bay (*Laurus nobilis*) is located along the northern boundary.

3.5 There is an extremely poor-quality Horse Chestnut (*Aesculus hippocastanum*) tree located in the front garden of number 17/19 Lyndhurst Terrace, and a relatively small *Eucryphia* shrub is located in the rear garden of that property. A mature Lime is located to the front of number 13 Lyndhurst Terrace.

Picture taken on the 26th of February 2016 showing the Horse Chestnut in the grounds of number 17/19 Lyndhurst Terrace.

4.0 BRIEF PRÉCIS OF THE TREE-RELATED ASPECTS OF THE PROPOSED DEVELOPMENT.

4.1 The current proposal is to demolish the existing house which was built in the 1960s, and to construct a new two-storey residence with a

subterranean basement. No detailed plans for the proposal have currently been produced.

4.2 A previous planning application (Ref: 20-15/6278/P) was made, but was withdrawn following the recommendation for refusal by the Local Planning Authority personnel.

4.3 A total of 6 reasons were cited for the refusal; item number 6 was claimed to be the loss of the Horse Chestnut located in the grounds of number 17/19 Lyndhurst Terrace.

4.4 Item 6 of the "Decision Notice" states the following:

"*The proposed development by virtue of the basement excavation would result in harm to the root protection area of a mature chestnut tree in the front garden of 17 Lyndhurst Terrace which would impact upon the visual amenity and character of the conservation area contrary to policies CS14 (Promoting high quality places and conserving our heritage), CS15 (Protecting and improving our parks and open spaces and encouraging biodiversity) of the London Borough of Camden Local Development Framework Core Strategy and policies DP24 (Securing high quality design) and DP25 (Conserving Camden's heritage) of the London Borough of Camden Framework Development Polices.*"

4.5 The owner of number 15 Lyndhurst Terrace submitted a pre-development Arboricultural report produced by Wassells, dated the 15th of October 2015 (Ref:WAS15-2015), relating to the vegetation located within the garden of number 15 Lyndhurst Terrace, and the adjacent garden, i.e. number 17/19 Lyndhurst Terrace.

4.6 The owner of number 17/19 Lyndhurst Terrace, submitted an Arboricultural report produced by Mr Simon Pryce (Ref: 15/114) dated the 15th of January 2015 (probably a typographical error as he did not actually visit the site until the 12th of January 2016). This report addressed his perceived issues relating to the vegetation in the grounds of number 17/19 Lyndhurst Terrace, and the juxtaposition of the proposed subterranean development.

4.7 This Arboricultural Impact Assessment report has been commissioned to provide guidance on the tree-related aspects of the proposed development. All other non-tree related aspects of the development will be addressed by others.

5.0 INTRODUCTION TO TREE PROTECTION (STATUTORY).

5.1 Local planning authorities look upon trees as being highly beneficial to the locality. To ensure that any important specimens, or significant groups of trees, are retained, they may place **Tree Preservation Orders (TPOs)** on them. In other situations, villages or whole districts may be classified as **Conservation Areas**. In these instances certain trees in the designated area will be protected. When trees are protected, legal procedures must be followed before any work is carried out.

5.2 When trees are protected by Preservation Orders, no work should be carried out on them without prior written consent from the Local Planning Authority. Once an application is made, the Authority personnel must inspect the trees, and make a decision within a statutory eight week period as to whether the work can go ahead. If no decision is made within the eight week period, the appellant (person making the application) can appeal to the Planning Inspectorate, for non-determination. If the Local Authority refuses the application the appellant still has the right to appeal.

5.3 The legislation for Conservation Areas is slightly different to that of Preservation Orders. Trees with trunk diameters of less than 75mm at breast height are exempt from the legislation, and no application is required to carry out any work on them. Trees with trunk diameters of between 75mm and 100mm can be removed without permission, if their removal is to allow the further development of other trees growing close-by.

5.4 When an application is made to carry out work on a tree located within a Conservation Area, the Local Authority must make a decision within a statutory six week period (not eight as with TPOs). The Local Authority has three options, namely,

1. *Give written permission to carry out the work.*

2. *Make no written decision within the six week period. If this occurs the application is accepted by default, and the owner of the tree(s) can carry out the proposed work, but it must be completed within two years of the initial application.*

3. *Refuse consent to carry out the work. If this option is selected the Local Authority must protect the tree(s) with a Preservation Order. In this instance, the owner of the trees has the right to appeal, and*

the Local Authority must be able to show that the tree(s) are, in fact, worthy of protection. (Bolding added by Dr. Hope).

5.5 If a tree protected by a Preservation Order, or is located in a Conservation Area, is killed, or wilfully destroyed, the owners of the tree, and the contractor who did the work, can both be prosecuted. The fines for killing, or wilfully destroying a tree can be high, i.e. the current maximum is £20,000 per tree, and there is an automatic requirement to re-plant. The current maximum for minor unlawful infringements, such as pruning, is £2,500.

5.6 Trees which are dead or dangerous are exempt from the legislation (both Preservation Orders and Conservation Areas), although if such trees are removed, the onus of proving that they fell into one of these categories lies with the tree owner. Whenever possible it is strongly recommended that the Local Authority be given at least five days notice before any work on such trees is carried out.

6.0 THE LEGAL STATUS OF THE HORSE CHESTNUT IN THE GROUNDS OF 17/19 LYNDHURST TERRACE.

6.1 Numbers 15 and 17/19 Lyndhurst Terrace are both located within the Fitzjohns Netherall Conservation Area.

6.2 The Horse Chestnut in the grounds of number 17/19 Lyndhurst Terrace is legally protected by virtue of being within the Conservation Area, and by a Preservation Order (Ref: 21H-T49). The existence of the Preservation Order was confirmed by email from Mr Tony Young of the London Borough of Camden, to Ms Samantha Hale, on the 18th of February 2016.

6.3 No data have currently been made available in relation to any other legally protected trees within the curtilage of number 17/19 Lyndhurst Terrace, and the date of the Preservation Order of the Horse Chestnut has not been provided.

6.4 At least one previous Planning Application to carry out works on the Horse Chestnut has been made. The justification for the most recent severe pruning was that the tree kept losing large branches, i.e. it was unsafe. The Local Planning Authority accepted this assessment and allowed the works to be carried out.

6.5 As the Horse Chestnut is legally protected it is strongly recommended

that no further work should be carried out on it without prior written consent from the Local Planning Authority.

7.0 INTRODUCTION TO BRITISH STANDARD 5837.

7.1 British Standard 5837 is the industry standard, and nationally accepted, document for providing recommendations in relation to the juxtaposition of trees and buildings. Although not a statutory document, the British Standard now forms the basis for all arboricultural impact assessments relating to development sites. It was revised and updated in April 2012.

7.2 In an attempt to identify which trees are worthy of retention, the British Standard suggests a category rating for all trees growing on, or adjacent to, proposed development sites.

7.3 The Cascade chart printed on page 10 below for ease of reference, explains the various categories identified within the British Standard.

7.4 The four broad categories and ratings in the current British Standard have been modified slightly from those of the previous, 2005 edition. Category "R" is replaced with category "U", whilst categories "A", "B" and "C", retain the same three sub-categories.

7.5 **One of the most fundamental changes in the new category rating system has been the recognition that trees that cannot be realistically retained as living trees in the context of the current land use for longer than 10 years are given the rating of "U".**

7.6 Trees which are classified as having a British Standard 5837 category rating of "U", are of such poor quality, or have such a short safe life expectancy, that they should typically be removed from a site. However, the British Standard notes that category "U" trees can have existing, or potential, conservation value which might be desirable to preserve in certain instances, but only where issues of safety can be appropriately managed.

7.7 Item 4.5.8 of the British Standard acknowledges that when categorising a tree, the presence of any serious disease, or tree-related hazards should be taken into account. If the disease or hazard is likely to be fatal, or irremediable, or likely to require sanitation for the protection of other trees, it might be appropriate for the trees concerned to be included in the "U" category, even if they otherwise have considerable value.

TABLE 1 – Cascade Chart for tree quality assessment.

Category and Definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have an existing or potential conservation value which might be desirable to preserve; see 4.5.7			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Tree of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual, or those that are essential components of groups, or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remedial defects, including unsympathetic past management and storm damage), such that they unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Table 2 Identification of tree categories.

Category from Table 1	Colour [A)]	RGB code [A)]
U	Dark red	127-000-000
A	Light green	000-255-000
B	Mid blue	000-000-255
C	Grey	091-091-091

A) Colours verified against http://safecolours.ridgenage.com/palettefiles.html#files [viewed 2012-03-26]

An acceptable alternative to the use of a colour coding scheme on the plans is to suffix the tree category rating adjacent to the tree identification number, for example 217-A, 218-C etc.

Picture taken on the 26th of February 2016, showing two large, open, irremediable decaying wounds on the main trunk on the Chestnut.

Close-up picture taken on the 26th of February 2016 showing one of the large, irremediable decaying wounds on the main trunk.

Pictures taken on the 26th of February 2016, showing large areas of irremediable internal decay in the Chestnut main trunk.

7.8 The definition of category "C" in the British Standard has been modified to some extent compared to the previous 2005 edition. The current edition still recognises that category "C" includes low quality trees, with estimated safe life expectancies of between 10 years and 20 years, but it now incorporates young trees with stem diameters of below 150mm.

7.9 The retention, or removal, of category "C" trees can sometimes be contentious, as Local Authorities invariably wish to retain as many trees on a site as possible. However, although the retention of category "C" trees is laudable, there are many circumstances, even if legally protected, where their removal is both sensible, and reasonable, due to other site related factors.

7.10 The current edition of the British Standard maintains the previous methodology of assessing the safe distance between trees and buildings, i.e. the assessment is based on tree trunk diameter, and is the basis of calculating a theoretical "Root Protection Area".

7.11 The basic calculation of theoretical Root Protection Areas is based on free-growing trees, with no significant spatial root constraints.

7.12 In addition to the concept of a "Root Protection Area", the current British Standard provides increased guidance and recommendations on the physical protection of trees, prior to, and during, the development of a site.

8.0 THE DESCRIPTION OF THE TREES.

8.1 Prior to my involvement in the proposed development of number 15 Lyndhurst Terrace the trees within, and adjacent to, the property were identified and described by Wassells Ltd, and by Mr Simon Pryce.

8.2 The Wassells Ltd report identified four trees, each of which was identified by a numerical reference number. The only tree of significance within their report was the Horse Chestnut located in the grounds of 17/19 Lyndhurst Terrace. This tree was given the reference number "T1"

8.3 The report produced by Mr Simon Pryce identified only two plants, i.e. the Horse Chestnut in the grounds of number 17/19 Lyndhurst Terrace, which he identified as "T1", and an evergreen Eucryphia shrub identified as "T2".

Picture taken on the 26th of February showing the young Eucryphia.

8.4 In item 4.13 of Mr Pryce's report he states the following in relation to the Eucryphia:

"*This is set far enough back from the boundary not to be unduly vulnerable to direct or indirect effect of the proposed work….*"

8.5 I agree with Mr Pryce that the Eucryphia will not be adversely affected by the proposed development at number 15 Lyndhurst Terrace. It can be left in situ, and requires no tree surgery works. No further discussion on the plant will be included within this report.

8.6 For consistency and ease of reference between the various reports, the Horse Chestnut in the grounds of number 17/19 Lyndhurst Terrace has been given the arbitrary reference of "T1" in this report.

Picture taken on the 26th of February 2016 showing the extreme poor quality of the Horse Chestnut (T1), with all of its crown removed.

Tree T1: This is an over-mature Horse Chestnut (*Aesculus hippocastanum*) located in the grounds of number 17/19 Lyndhurst Terrace, approximately 3.0 metres away from the brick-built boundary wall with number 15 Lyndhurst Terrace. The tree is in an extremely poor condition, and it is in terminal decline (See the picture above).

The basal trunk of the tree contains a large, decaying, open cavity, which is irremediable, and will continue to develop for the remainder of the tree's life. However, there are no current signs to indicate that the tree is potentially unstable at the present time.

Picture taken on the 26th of February 2016 showing the large, open decaying cavity at the base of the Horse Chestnut (T1).

At the time of my site visit on the 26th of February 2016, there were no visible signs to indicate that there has been any loss of roots during the changes in level in the garden of number 15 Lyndhurst Terrace. All of the soil removal was from above the base of the foundations of the wall, and the level of the ground against the wall had been lowered by a depth of approximately two bricks.

There is a series of very large, open, decaying wounds located along the main trunk of the tree, i.e. from within 500mm of ground level, to almost all the way up to the point where the tree has recently been topped. The largest wounds are long-standing, and have occurred through limb loss which commenced when the tree canopy started to naturally disintegrate. The wounds contain some callus growth around their open surfaces, although the wounds are so large, and have deteriorated to such an extent, that they will never fully occlude, and the internal tissues will continue to decay

for the remainder of the tree's life, i.e. the decay is irremediable (See the pictures below and on page 17).

It should be noted and appreciated that Horse Chestnut wood is relatively soft and it tends to decay rapidly when exposed to the atmosphere.

Pictures taken on the 26th of February 2016, showing the large, open, decaying cavities, with some callus growth around the old exposed surfaces.

The left-hand picture above clearly identifies a large open decaying wound, with almost no callus growth present. This decay is long-standing, and confirms that the internal tissues of the structural branch would have been decaying, and rotten, for an extended period of time. The internal decay is irremediable, and will continue to extend throughout the tree's remaining life.

The crown of the tree has recently been removed on safety grounds, and the only branches that remain are spindly, arching,

epicormic shoots emanating from the main trunk, close to points were branches have been cut, or lost in the past. These epicormic shoots will never develop into a significant crown.

No photographic evidence has been provided to show the condition of the canopy (branches) of the tree prior to its recent topping. However, the canopy must have been in an atrocious condition to warrant the Local Planning Authority giving permission for such a severe topping.

Picture taken on the 26th of February 2016, showing the mass of epicormic shoots that have developed on the main trunk, close to previous wounds.

In item 4.4 of his report Mr Pryce makes comment on the crown reduction of the Horse Chestnut. The pruning was not a crown reduction, as the photographic evidence clearly shows; the crown was totally removed. The dimensions of the removed branches were in the region of 250mm diameter, which is highly significant for a tree which has been cited by Mr Pryce as being healthy. In my opinion, such a claim beggars belief.

In item 3.1 of Mr Pryce's report he confirms that the tree was pruned approximately three years ago. It was actually pruned prior to June 2012 (See the Google Street Scene image below). The left-hand photograph on page 16 above indicates that the tree is making almost no new re-growth following the topping. The shoots from around the exposed wound at the top of the tree are only in the region of 500mm in length after at least three years of growth, not 1.0 metre as asserted by Mr Pryce. The regrowth is minimal, and shows the lack of vigour in the tree – it is in terminal decline.

Google Street Scene image showing the Chestnut tree (T1) in June 2012.

At the time of my inspection on the 26th of February 2016, I could see no signs of any perennial fungal fruiting bodies on the southern side of the trunk of the Chestnut. Internal decay was visible in a large open wound, but it was not possible to identify the causal pathogen. The report produced by Mr Pryce identifies that the tree has suffered from attacks of Leaf Minor. No signs of Bleeding Canker were visible on the main trunk at the time of my site visit.

9.0 THE BRITISH STANDARD 5837 CATEGORY RATING OF THE HORSE CHESTNUT (T1).

9.1 British Standard 5837 provides a methodology for categorising the quality of trees. As mentioned in item 7 above, four category ratings with three

sub-category ratings are available.

9.2 Mr Wassall carried out an inspection of the Horse Chestnut and gave it a British Standard 5837 category rating of "U". Mr Pryce was of the opinion that the tree was a category "C". There has clearly been disagreement as to the quality of the tree.

9.3 Although the British Standard 5837 category rating system is somewhat subjective, it does, when used appropriately, provide a meaningful assessment of trees.

9.4 The following description is used in the British Standard to identify category "C" trees:

Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

9.5 Mr Pryce asserts that the Horse Chestnut has a British Standard 5837 category rating of "C", which means that he clearly accepts that the tree has the following characteristics:

i. it is of low quality, with an estimated remaining life expectancy of between 10 years and 20 years only (Category "B" is at least 20 years);

ii. it is an unremarkable tree of very limited merit, and or, it has such an impaired condition that it does not qualify to be a category "B" tree;

iii. the tree has no material conservation or other cultural value.

9.6 Horse Chestnuts are long-lived trees which often survive for well over one hundred years. By stating that the Chestnut (T1) is a category "C" tree Mr Pryce accepts that the tree has very little safe life expectancy.

9.7 In item 3.1 of Mr Pryce's report he states:

"*... The top was reduced significantly about three years ago following*

approaches from the motor insurers of the then owner of no.15. Camden's reference 2012/1388/T. ***This has left it with an irregular shape, but the consequent regrowth is giving it a softer and more natural silhouette.*** *It has some cavities in the trunk where branches have been pruned or shed in the past,* ***but there are no signs of major decay or physiological decline.***" Bolding added by Dr Hope).

9.8 In my opinion, the silhouette of the tree is anything but natural when compared to healthy Horse Chestnuts, and there are no signs to indicate that the tree is physiologically sound; as mentioned previously the tree is in terminal decline, not healthy.

9.9 In item 5.1 Mr Pryce continues:

"*The horse chestnut is a mature specimen and has some decay, but is in reasonable structural and physiological condition. It is not declining and in my view warrants retention category C rather than U.*"

9.10 I consider that the claim that the tree is not showing any signs of decay, or decline is simply unrealistic and untenable. The snapping out of large structural branches is a demonstrable sign of structural weakness, and the presence of internal decay of the basal trunk, and in the uppermost pruning point, clearly demonstrates the parlous nature of the tree.

9.11 In my opinion, the comments made by Mr Pryce do not tally in any reasonable way with the definition of a category "C" tree. Mr Pryce has accepted that the tree is of low quality, with less than 20 years of safe life expectancy. He has also agreed that it is an unremarkable tree with little merit, and the tree has no material conservation or other cultural value.

9.12 In my opinion, the category rating assessment of the Horse Chestnut (T1) made by Mr Pryce is unrealistic and does not tall with the category rating definitions in British Standard 5837. In my view the Chestnut simply does not warrant a category "C" classification, and I am extremely surprised that such a classification was allocated to the tree.

9.13 The following description is used in the British Standard to identify category "U" trees:

Category U Those in such a condition that they cannot realistically	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)	See Table 2

be retained as living trees in the context of the current land use for longer than 10 years	• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have an existing or potential conservation value which might be desirable to preserve; see 4.5.7	

9.14 The Horse Chestnut is in an appalling condition, and is in terminal decline. The tree's crown has had to be totally removed on safety grounds, as it has previously shed large structural branches. It does not have the typical visual characteristics of an average tree of the species. The only growths on the trunk are epicormic shoots, which will never form an attractive new crown. There is significant internal decay of the basal trunk, which is irremediable, and the tree is making almost no new annual extension growth.

9.15 In my opinion, the tree has a safe life expectancy of less than ten years. It can be left in situ, but it will never be allowed to produce a full, attractive crown, as if a new canopy was allowed to develop the tree would be a safety hazard.

9.16 The Chestnut contains the following:

i. serious, irremediable, structural defects, and its crown has had to be totally removed;

ii. the large open and decaying wounds confirm that the tree has lost large structural branches in the past, and the only way of making the tree safe was to remove its crown;

iii. the tree is showing visible signs of significant, and irreversible overall decline. The tree is infected with a fungal, wood rotting disease which is significant to the tree's health, and is irremediable.

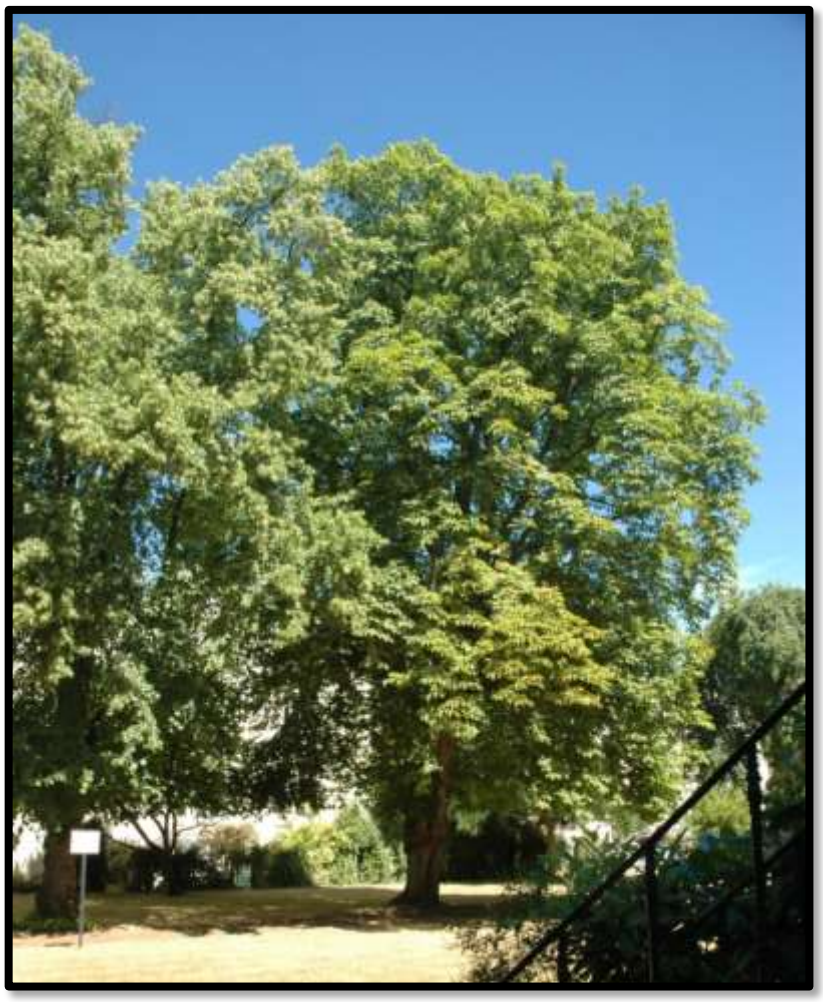
9.17 **In my opinion, the Horse Chestnut has a British Standard 5837 category rating of "U". It can be left in situ, and be allowed to deteriorate naturally, but should not be used to attempt to prevent the proposed development at number 15 Lyndhurst Terrace.**

9.18 The proposed development will not affect the safe life expectancy of the tree.

Picture taken on the 26th of February 2016 showing the total loss of canopy of the Horse Chestnut (T1).

Picture taken on the 28th of February 2016, showing a large Horse Chestnut of a similar aged to the one in the grounds of number 17 Lyndhurst Terrace.

Picture taken in summer showing a large, mature Horse Chestnut in full leaf.



10.0 THE VISUAL AMENITY OF THE HORSE CHESTNUT (T1).

10.1 Healthy, fully-mature Horse Chestnuts make large, majestic trees, which, when grown in the open, provide a high visual amenity to the locality. They typically have wide, broad spreading canopies, and are especially attractive in spring when in flower. They also have attractive fruits and autumn colour. However, the wood of Horse Chestnut is soft, and when they become over-mature there is a high probability that they will start to shed large structural limbs, and they become a potential safety hazard.

10.2 The two pictures on page 22 above taken in winter, compare and contrast the visual amenity of the tree in the grounds of number 17/19 Lyndhurst Terrace with another tree of a similar age, and with a similar trunk diameter. The above picture shows a maturing Horse Chestnut in summer, when in full leaf; note the tree's massive visual amenity.

10.3 In my opinion, the tree within the grounds of number 17/19 Lyndhurst Terrace is an eyesore, and will never regain it previous size or shape. The shape of the tree bares no resemblance to a healthy, full-crowned Horse Chestnut, and the tree has almost no meaningful visual amenity to the Conservation Area.

11.0 THE DEVELOPMENT OF TREE ROOT SYSTEMS.

11.1 There is a general misconception that tree roots grow to great depths within a soil, and often have large "Tap-Root" systems (See Figure 1 below). However, in reality, the root systems of trees are typically shallow, and spread out for considerable distances (See Figure 2 below).

Scanned copies of Figures 1 & 2 of AAIS – APN12.

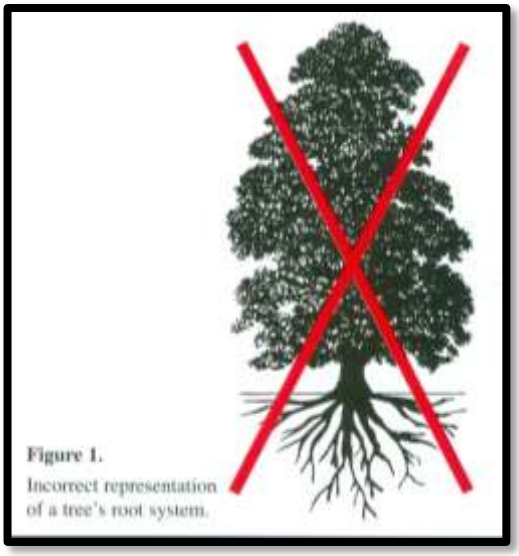


Figure 1.
Incorrect representation of a tree's root system.

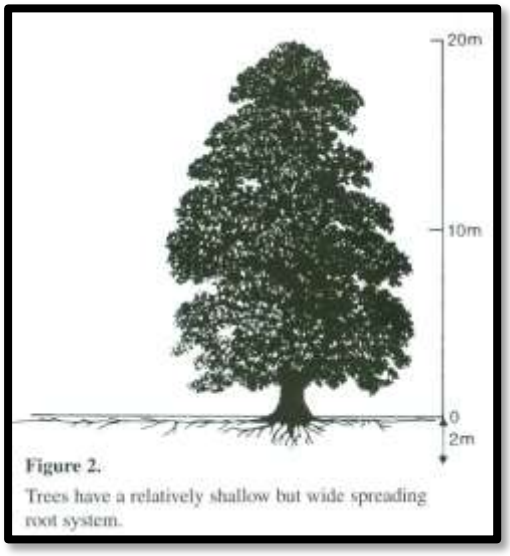


Figure 2.
Trees have a relatively shallow but wide spreading root system.

11.2 Tree roots typically grow parallel with the soil surface, rather than vertically, and on level sites the majority of their roots are within a depth from ground level of between 600mm and 1.0 metre below ground level.

11.3 Roots can be up to 30cm or more in diameter at the base of the trunk of a tree, but sub-divide and taper rapidly as they extend from the trunk. In the vast majority of cases the roots of even large trees are only 2-3cm in diameter, or much less, at a distance of 3.0 metres to 4.0 metres from the trunk.

11.4 **It is critical to appreciate that the calculation of circular Root Protection Areas as specified in British Standard 5837 only works when there are no significant constraints to the spatial root development of trees.** Item 4.6.3 of British Standard 5837 clearly

identifies the potential problems with using circular Root Protection Areas; item 4.6.3 states:

"Any deviation in the RPA of the roots from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:

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;*** (Bolding added by Dr Hope)

b) *topography and drainage;*

c) *the soil type and structure;*

d) *the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management."*

Picture taken on the 26th of February 2016 showing the boundary wall between the Horse Chesntut and area of development.

11.5 In item 4.9 of Mr Pryce's report he states:

"*A substantial part of the tree's RPA is under the front garden of no.15 and the boundary wall is unlikely to be deep enough to be a barrier to root growth…*"

11.6 In item 4.2 of Mr Pryce's report he states:

"*Roots will grow wherever conditions are favourable i.e. there is a suitable supply of air and water, so most tend to be in about the* ***upper 600mm of the soil****, and even shallow excavation or minor level changes can be harmful.*" (Bolding added by Dr Hope).

11.7 On the 29th of February 2016 an "Air-Spade" test was carried out by Ruskins Trees and Landscapes, in the grounds of number 15 Lyndhurst Terrace, i.e. up against the boundary wall. The excavation confirmed that the foundations of the wall were 400mm deep, not including the depth of two recently uncovered layers of bricks being taken into account.

Picture taken on the 29th of February 2016, showing the location of the Air-Spade trench.

Picture taken on the 29th of February 2016, showing the depth of the foundations of the boundary wall.

12.0 CAN ROOTS BE SEVERED WITHOUT CAUSING HARM TO TREES?

12.1 As with the general misconception with the depth of tree root systems, there is also a general misconception that the pruning of roots will necessarily lead to damage to trees. However, as with pruning of branches, this is not the case.

12.2 It is generally accepted within the Arboricultural industry (See item 2 of the current British Standard 5837) that some roots can be severed without causing damage to trees. This is confirmed in The National Joint Utility Group publication entitled "NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – volume 4, Issue 2, 2007", where it accepts that roots of up to 25mm diameter can be severed without specialist arboricultural input, and that roots with diameters greater than 25mm diameter may also be severed in

certain circumstances following advice from a qualified arboriculturalist. It is important to note that although roots of less than 25mm may be severed, special care must be taken where clumps of roots of this diameter are present.

13.0 THE LIKELY TOLERANCE OF HEALTHY TREES TO ROOT DISTURBANCE.

13.1 Healthy trees produce a balance between their root systems and their branch/leaf structure. The balance of growth is known as the root:shoot ratio, and it ensures that the tree has enough roots to provide adequate moisture and nutrients to support the branches and leaves. If the root:shoot ratio of a healthy tree is altered to any extent, the tree will rapidly produce new growth to reinstate the balance.

13.2 As mentioned in item 12.0 of this report, it is important to appreciate that the pruning of a tree's root system does not necessarily mean that it will cause any lasting harm to the tree. This is the fundamental tenet of the use of theoretical Root Protection Areas as advocated within British Standard 5837. It is fully accepted within the British Standard, and the Arboricultural Industry, that some **non-structural roots** can be pruned without harming trees. The critical points in relation to pruning roots are that of maintaining tree stability, and providing adequate amounts of roots for moisture and nutrient absorption.

13.3 Item 4.10 of Mr Pryce's report states:

"*Most of the main structural roots are within about 3x the trunk diameter, so with this tree these would be within no.17/19 and the work would be unlikely to affect the tree's stability directly.*"

13.4 Mr Pryce clearly accepts that pruning of any roots within the grounds of number 15 Lyndhurst Terrace is unlikely to affect the Chestnut tree's stability.

13.5 In item 4.10 of his report, Mr Pryce states:

"*The loss of small feeding roots at the periphery of the root system would reduce its ability to absorb water and nutrients.*"

13.6 The above comment made by Mr Pryce is clearly at odds with the current British Standard 5837, which allows for the severance of roots with

diameters of up to 25mm, and that any sized roots can be severed when outside a theoretical Root Protection Area.

14.0 THE AIR-SPADE INVESTIGATION.

14.1 As mentioned previously, Ruskins carried out an "Air-Spade" investigation at the site on the 29th of February 2016. The specification for the works was to:

i. excavate a 3.5 metre long, by 400mm wide trench along the edge of the boundary wall;

ii. ascertain the depth of the foundations of the boundary wall;

iii. excavate down to 300mm below the base of the foundations of the wall, or 1.0 metre whichever is the greater, if any heavy clay is encountered terminate the investigation;

iv. if any obstructions or sewer pipes are found take pictures and measure them;

v. do not sever any roots with diameters in excess of 25mm. Measure the diameters of all roots in excess of 25mm;

vi. If any roots are significantly decayed ensure that appropriate photographs are taken showing the decay;

vii. take lots of photographs of the trench and roots;

viii. Ideally cover the exposed roots with hessian to prevent them from drying out, or be harmed by frost;

ix. contact the Local Authority Tree Officer, and invite him to inspect the works. Once the trench has been inspected backfill the trench;

x. should the tree officer not wish to inspect the trench backfill it as soon as possible.

14.2 The Air-Spade investigation was terminated at a depth of between 500mm and 600mm below ground level as the contractors were very concerned about the stability of the foundations of the poor quality boundary wall.

14.3 The Air-Spade investigations confirmed the presence of a number of roots beneath the foundations of the boundary wall.

14.4 The exposed roots were inspected visually, and it was confirmed that only one live root with a diameter in excess of 25mm was present within the trench. This root was 100mm in diameter, but exhibited signs of deterioration.

14.5 Other than the one 100mm diameter root all of the other roots were dead, and were significantly decayed. The dead roots are evident in the photographs as the Air-Spade removed the bark. The decay was long-standing.

Picture showing the extensive dead roots within the Trench.

14.6 The results of the Air-spade investigation confirmed that there was no significant number of live roots within the grounds of number 15 Lyndhurst Terrance. All except one root were dead and decayed, and the decay was long-standing. **The results confirm that the Horse Chestnut has been in terminal decline for many years.**

14.7 **The Air-Spade investigations confirmed that the proposed subterranean development at number 15 Lyndhurst Terrace would have no adverse influence on the safe life expectancy of the Horse**

Chestnut. The tree is dying and has a safe life expectancy of less than 10 years, i.e. it has a British Standard 5837 category rating of "U", and should not be used to affect the proposed development.

Picture showing the mass of dead and decaying roots.

Picture showing one of the large decaying roots, and smaller roots dead and decaying roots.

Picture showing large, long-standing decaying roots.

14.8 In item 4.10 of his report Mr Pryce states the following:

"*However, damage to slightly roots could lead to the tree being colonised by honey fungus, which could kill it or decay the roots, leading to longer term stability problems. The fungus is present in the gardens and is a virulent form that has already accounted for several tree losses.*"

14.9 The results of the Air-Spade investigation confirm that the roots within the grounds of number 15 Lyndhurst Terrace have been dead for a considerable number of years, and contain extensive decay.

14.10 If Honey Fungus were present within the grounds of number 15 Lyndhurst Terrace, and there are no signs to confirm it is, it would have been present for many years, and such an infection would be irremediable, and would kill the tree.

14.11 **As the roots of the Horse Chestnut within the grounds of number 15 Lyndhurst Terrace are so decayed, the proposed development of the property would have no adverse influence on the tree whatsoever. The tree can be left in situ if required, and be allowed to die naturally.**

15.0 THE TREE CONSTRAINTS PLAN - BELOW GROUND CONSTRAINTS.

15.1 British Standard 5837 recommends that the influence that trees on, and adjacent to the site, will have on the layout of a development should be plotted on a plan called the "Tree Constraints Plan". In the majority of situations, a theoretical **Root Protection Area** (RPA) is used as a design tool indicating the minimum area around a tree identified as containing sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure should be treated as a priority.

15.2 In order to avoid damage to the roots or rooting environment of retained trees, the RPAs should normally be plotted around each of the category A, B and C trees. This is a minimum area (for conventional foundations) in m^2, which should be left undisturbed around each retained tree.

15.3 **Although the theoretical RPAs of category "C" trees should be plotted, they are of such poor quality that they should not normally be used as a constraint to the development of a site.**

15.4 There is no requirement to plot trees that have British Standard 5837 category ratings of "U".

15.5 For single-stemmed trees the theoretical Root Protection Area should normally be calculated as being equivalent to a "**circle**" with a radius 12 times the effective trunk diameter.

15.6 For trees with more than one main stem, one of two calculation methods should be used. Annex "C" of the current British Standard 5837 describes the methodology of measuring the effective trunk diameters of trees.

15.7 The effective (combined) trunk diameter of trees with two to five stems should be calculated using the following equation:

$$\sqrt{(\text{Stem diameter 1})^2 + (\text{Stem diameter 2})^2 \ldots\ldots + (\text{Stem diameter 5})^2}$$

15.8 The effective (combined) trunk diameter of trees with more than 5 stems should be calculated using the following equation:

$$\sqrt{(\text{Mean stem Diameter})^2 \text{ x number of stems}}$$

15.9 Once the effective (combined) trunk diameter is calculated (for both single-stemmed and multi-stemmed trees), the **radius of the nominal RPA circle** can be ascertained, and the theoretical Root Protection Area can be calculated.

15.10 Where circular RPAs are used, the minimum safe distance between the trees and any soil excavations will be the radius of the nominal circle. For example, if a tree has a single stem (trunk), or combined stem diameter, of 200mm, the radius of the nominal circle will be 2.4 metres (200mm x 12), and the safe minimum distance between the centre of the trunk of the tree and any excavations (without any factors affecting root development) will therefore be 2.4 metres. The RPA would be calculated using the following equation:

Calculating the RPA

$$\text{RPA } (m^2) = \left(\frac{\text{combined stem diameter (mm)} \times 12}{1000}\right)^2 \times 3.142$$

Simplistically the calculation for a 200mm diameter trunk would be as follows:

$$2.4 \times 2.4 \times 3.142 = 18.09 \ (18m^2).$$

15.11 Annex "D" of the current British Standard 5837 provides a table with pre-calculated Root Protection Areas.

16.0 THE CALCULATED ROOT PROTECTION AREAS.

16.1 In item 4.3 of Mr Pryce's report he makes a number of unsubstantiated assertions relating to the theoretical Root Protection Area of the Horse Chestnut (T1). The most important point he makes is in relation to the depth of foundations of the boundary wall, i.e. he considered that the foundations would be shallow; and not a significant factor in the spatial development of the roots of the tree.

16.2 Mr Pryce produced a plan within his report showing the theoretical Root Protection of the Horse Chestnut, although he effectively totally discounted the presence/influence of the Boundary wall.

16.3 The recent Air-Spade investigation has shown that the assertions made by Mr Pryce relating to the root spread of the Horse Chestnut are fundamentally flawed, and unrealistic. The foundations of the wall are not

shallow, and the vast majority of the few roots that have encroached into the grounds of number 15 Lyndhurst Terrace are dead, and have been decaying for a considerable period of time.

16.4 In item 4.9 of his report, Mr Pryce makes comment about the changed level of ground within number 15 Lyndhurst Terrace, and that roots would have been present in the topsoil, and that they would have proliferated compared to deeper roots.

16.5 The Air-Spade investigation has confirmed that the assertion made by Mr Pryce about the changed level is unfounded. There was no proliferation of roots in the upper soil profile.

16.6 In item 4.10 of Mr Pryce's report he makes comment about the potential encroachment of the proposed subterranean development at the front of number 15 Lyndhurst Terrace.

16.7 The figure of slightly over 20% encroachment of the theoretical Root Protection Area of the Horse Chestnut is, in my opinion, pure speculation. The Air-Spade investigation confirms that the figure of over 20% is grossly inaccurate. It is interesting to note that Mr Pryce calculated the figure to be over 20% encroachment, as this coincides with the typical accepted amount of encroachment by most Arboricultural consultants.

16.8 In my opinion, even if all of the roots had been healthy, instead of being dead and decayed, the actual realistic percentage of encroachment would be in the order of less than 10%, which is generally accepted as not being a significant factor.

16.9 **In this instance I consider the use of the theoretical Root Protection Area calculation for the Horse Chestnut (T1) to be purely academic, and grossly inaccurate. The Air-Spade test has proven that minimal encroachment has taken place over time, and the vast majority of the roots present are dead and decaying.**

16.10 The theoretical Root Protection Area provided by Mr Pryce makes no mention of dead and decaying roots, which is a fundamental flaw in his attempt to claim that the proposed development would have a significant impact on the terminally declining Horse Chestnut. He also makes no mention about the fact that there will be significant natural die-back of the root system of the tree as it canopy will never be allowed to reach its previous dimensions.

17.0 TREE CONSTRAINTS - ABOVE GROUND CONSTRAINTS.

17.1 Item 5.2 of the current British Standard 5837 recognises that it is possible that some above-ground constraints may arise due to various tree-related factors. The British Standards identifies the following potential constraints:

i. the current ultimate height and spread of the trees;

ii. species characteristics, including evergreen or deciduous, density of foliage, and factors such as susceptibility of honeydew drip, branch drop, fruit fall, etc.

17.2 As the Horse Chestnut (T1) is located in the adjacent property, and almost all of its crown has now been removed, there are no above-ground constraints, as it would be unreasonable, and illogical, to attempt to prevent further pruning in the future.

18.0 PHYSICAL TREE PROTECTION.

18.1 The majority of damage to trees on development sites occurs within a few hours of machinery first entering the site. The damage can occur in numerous ways. It can be direct, i.e. where the trees are physically hit by moving plant, or indirect, where the soil structure or levels are changed to such an extent that the moisture regimes are altered. It should also be appreciated that other agencies, such as spilt fuel, or fires can cause significant damage.

18.2 Under normal circumstances it is essential that tree protection measures are put in place before any demolition takes place, and before any construction traffic is allowed on the sensitive sections of a site. However, the Horse Chestnut (T1) in the grounds of number 17/19 Lyndhurst Terrace is separated from the proposed subterranean development by a large, brick-built boundary wall which will effectively provide a far greater degree of protection compared to the guidelines in British Standard 5837.

19.0 CONCLUSIONS AND RECOMMENDATIONS.

19.1 It is proposed to knock down number 15 Lyndhurst Terrace, and re-build it incorporating a subterranean basement.

19.2 There is an over-mature Horse Chestnut located within the grounds of number 17/19 Lyndhurst Terrace, and concern has been voiced in relation to the perceived possible damage the development may have on the tree.

19.3 A young Eucryphia shrub is located within the rear garden of number 17/19 Lyndhurst Terrace, but the Arboricultural consultant of the owner of 17/19 Lyndhurst Terrace has accepted that the proposed development will not affect the plant in any way.

19.4 The Horse Chestnut in the grounds of number 17/19 Lyndhurst Terrace is in terminal decline. The whole of its crown has recently been removed on safety grounds, and there is significant decay and deterioration in the large open wounds at its base and along its trunk.

19.5 Extensive fungal decay is present within the root system of the tree, as confirmed by the Air-Spade investigation. The few roots of the tree which have encroached into the grounds of number 15 Lyndhurst Terrace are almost all dead, and have been decaying for many years.

19.6 The Chestnut is clearly in terminal decline. It has a British Standard 5837 category rating of "U", not "C" as claimed by the owner of the tree.

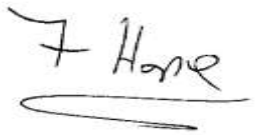
19.7 The proposed development will have no adverse influence on the visual amenity, or safe life expectancy of the Horse Chestnut. The tree can be left in situ and be allowed to die and decay naturally.

19.8 In my opinion, it would be unreasonable, and unjustified, to attempt to use the Horse Chestnut to affect the proposed development of number 15 Lyndhurst Terrace.

20.0 ADDENDUM.

20.1 On the 17th February 2017 revised drawings of the proposed replacement dwelling were issued to me by Sergison Bates architects, including a proposed Basement Plan (305/4200a) and Ground Floor Plan (305/4201a). The proposed development has not changed materially in extent and the findings of my report as set out above remain valid. The proposed development will have no adverse influence on the visual amenity or safe life expectancy of the Horse Chestnut, and in my opinion, it would be unreasonable and unjustified to attempt to use the Horse Chestnut to affect the proposed development of number 15 Lyndhurst Terrace.

20.2 I have seen the email from Ms Kate Henry of Camden Council dated 19th January 2017 which confirms that the Camden Tree Officer, Mr Nick Bell, agreed with the findings of my report above, as originally issued dated 3rd March 2016. As there have been no changes in the findings of this revised report and no changes on site, in my opinion, there is no reason for Mr Bell's views to change.



Revision 1: 19th February 2017