SIMON JONES ASSOCIATES Ltd.
ARBORICULTURAL PLANNING CONSULTANTS

Arboricultural Consultancy - Tree Surveys
Planning & Development · Hazard & Safety
Tree & Woodland Management - Expert Witnesses

17 CROSS ROAD
TADWORTH
SURREY KT20 5ST

Tel: (01737) 813058
E-mail: sja@sjatrees.co.uk

Principal: Simon R. M. Jones Dip. Arb. (RFS), F. Arbor. A., Arb. Assoc. Registered Consultant
Associate: Mark Mackworth-Praed BA (Cantab), M.Sc., F. Arbor. A., Arb. Assoc. Registered Consultant

Report on Trees at Formosa Amenity Garden London W9

Compiled & presented by
Simon R. M. Jones, Dip. Arb. (RFS), F. Arbor. A.

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CONTENTS

APPENDICES.

1. INTRODUCTION.

1.1. Instructions.

1.1.1. Simon Jones Associates have been instructed by the Board of Directors of Formosa Amenity Ltd, c/o No. 44 Warrington Crescent, London W9.

1.1.2. We were instructed to visit Formosa Amenity Garden, and survey the trees growing within the grounds. The purpose of the survey is to assess their physiological and structural condition, their potential, and the risks associated with them.

1.1.3. We were further instructed to look for evidence of tree related subsidence in the garden and identify the locations where this has occurred and where it is likely to occur in the future. This includes the drafting of a survey to be sent to all properties on the garden, the collation and interpretation of the data received, and the establishment of which houses have had subsidence and what has been its likely cause.

1.1.4 On the basis of our findings, we were instructed to make recommendations to:

- ensure the trees are kept in good health while reducing the risk of future risk subsidence to properties
- identify special or urgent measures for trees that are potentially causing a risk to properties
- provide long term options for future tree removal and a planting scheme so that the aesthetic quality of the garden can be retained.

1.1.5. These recommendations are to be made in the context not just of finding a solution or solutions that will work, but also that will be acceptable to the Local Planning Authority.

1.2. Plans and Documents.

1.2.1. We have seen copies of various plans, documents and past correspondence; including the Tree Preservation Order No 419 of 1992.

1.3. Disclosure of Interests.

1.3.1. We have no connections with any of the parties involved in this case which could influence any of the opinions expressed in this report.

1.4. Limitations of Use.

1.4.1. All rights in this report are reserved. No part of it may be reproduced or transmitted, in any form or by any means, or stored in any retrieval system of any nature, without our written permission. Its content and format are for the exclusive use of the addressee in dealing with this site. It may not be sold, lent, hired out or divulged to any third party not directly involved with this site without the written consent of Simon Jones Associates.

2. THE SITE.

2.1. Site Visit.

2.1.1. We visited the site and inspected the trees on the 7th December 2010, 7th January and 25th January 2011. Weather conditions were overcast with intermittent rain. A further inspection was made on the 24th of May 2011; on this occasion the trees were in leaf.

2.1.2. The information contained in this report covers only those trees that were examined, and reflects the condition of these specimens at the time of inspection. We did not have access to the trees from any adjacent properties; we have thus confined our observations of them to what was visible from within this property and from the surrounding public areas.

2.1.3. The trees were inspected from the ground; but selected trees were climbed to assess the extent of cavities. No samples of wood, roots, or soil were taken for analysis. The assessment of potential hazards has been based on an external examination only, in accordance with the methods of 'Visual Tree Assessment'[1], and the International Society of Arboriculture *Tree Hazard Evaluation* process which gives a hazard rating to each tree in relation to its failure potential, the size of those parts liable to failure, and the likely severity of third-party damage in the event of failure.

2.1.4. As the inspection was visual only, no guarantee, either expressed or implied, of the internal condition of the wood of the trees can be given. Furthermore, no warranty that problems or deficiencies may not arise in the future can be given.

2.1.5. Care has been taken to obtain all information from reliable sources, and all data has been verified where possible. However, no guarantee can be given of the accuracy of information provided by others.

2.2. Site Description.

2.2.1. Formosa Amenity Garden is a triangular shaped area surrounded by terraces of four and five storey houses on Castellain Road, Sutherland Avenue, and Warrington Crescent. I understand that these houses were all built between 1850 and 1893. Those at the southern end of Warrington Crescent are Grade II listed.

[1] Mattheck and Breloer "The Body Language of Trees", *Research for Amenity Trees No. 4, 1994*.

2.2.2. Ground level of the garden is significantly lower than that of the surrounding roads, which I understand were built up with spoil excavated for foundations and cellars of the houses.

2.2.3. The majority of the houses have retained their original layout, but Nos. 4-38 Warrington Crescent have had ground and first floor extensions added at the rear, which takes them much closer to the gardens and the adjacent trees.

2.2.4. The ground within the garden is fairly level, except for a gentle mound, probably man-made and no more than 1m in height, at the southern end to the south and south west of the Blue cedar tree no. 76. The garden is mainly covered by lawn, containing four borders that contain trees, shrubs and other herbaceous planting. A gravel footpath of between 3m and 3.5m width runs along the rear of the surrounding houses; adjacent to this, and in most cases just within the lawn area, there are several trees growing.

2.3. The Trees.

2.3.1. We surveyed 82 trees growing within the garden, and a further three trees growing in the rear garden of No. 85 Sutherland Avenue. Species, dimensions and assessments of risks associated with these specimens can be found in the Tree Schedule at **Appendix 1**. For ease of identification tree numbers assigned in the 1992 survey have been adhered to: these numbers appear in the tree schedule and on the enclosed tree location plan. Numbers 1 to 54 correspond to the tree numbers in the Tree Preservation Order (see paragraph 2.5.9 below).

2.3.2. These belong to nineteen different species, of which London plane, with 60 examples, is the most populous. All but one of these are growing in single rows, alongside the gravel path between the garden lawns and the boundary walls of the surrounding houses.

2.3.3 Two London planes have been removed since our previous inspection T28 and T34 (10/00227/TPO). Tree number 42, a Laburnum was felled in 1992.

2.3.4. The London planes range in height from 10m to 19.5m; trunk diameters at 1.5m above ground level range between 500mm and 1040mm. Based on the current diameters of their trunks, I estimate that the pollarded London planes are in the region of 90 to 120 years old. Accurate aging of regularly pollarded trees is always difficult, as pollarding tends to reduce annual incremental growth of trunks, and thus restricts diameters; but it would not be unreasonable to use the trunk diameter of the large plane (no. 62) in the centre of the garden as a guide, as its diameter is only 70mm wider than that of the largest of the pollarded trees (no. 50), and I estimate that this specimen is in the region of 100 years old.

2.3.5. I have seen opinions reached by other arboricultural consultants (appeal decision 6th June 1994) that the plane trees may have been planted “at the turn of the century” or “at the end of the last century”, but neither of these opinions appear to be supported by any evidence, and in my view, either one could be correct. It should be possible to establish the ages of these specimens precisely by extracting incremental cores from their trunks; but technically LPA consent would be required to do this, and in any case I cannot see the necessity of being more accurate than the 90 to 120 year range calculated above; accordingly this exercise has not been undertaken.

2.3.6. With the exception of the large tree (no. 62) in the centre of the garden, all of the plane trees have pollarded in the past, and have been subjected to re-pollarding since. I understand that the trees were pollarded in 1972, and then in 1978; since the making of the Tree Preservation Order in 1993, regular tree work applications have been made (and granted) for proposed re-pollarding, most recently in 2010. I understand that currently the trees are being re-pollarded biennially; but prior to 1999 these works were not undertaken on such a regular basis.

2.3.7. Old pollard points at between 9m and 10m above ground level indicate that at some time the trees were pollarded to these heights; it appears that later they were allowed to grow and then re-pollarded at higher places, between 10m and 15m above ground level. It is to these latter heights that the trees are currently being cut back to.

2.3.8. The Sycamore (tree no. 1) and Lime (tree no. 2) at the southern end of the garden have been heavily reduced; both trees were originally pollarded at 6m above ground level, and then re-pollarded at 8m.

2.3.9. The trees all appear to be of average or above average vitality, precisely because they are re-growing strongly as a result of re-pollarding. Shoot extension lengths and leaf size, colour and density all appear normal, and in the range of what would normally be expected for a recently pollarded plane.

2.3.10. The structural condition of the pollarded planes is less good. Many have decay cavities that have formed behind previous pruning wounds, and in some cases these have joined up and become quite extensive. 20 trees have abnormal swelling or “Bottle-butt” at their bases, indicative of decay or defects within, and tapping of the trunks with an acoustic hammer gives many changes in tone, also indicating decay or degraded wood within. The majority of the trees are of no more than moderate structural condition; 31 have significant defects and are of indifferent structure, and seven have significant and irremediable defects and are of poor structure.

2.4. Hazard Evaluation.

2.4.1. To indicate whether any of the defects identified by our survey present a hazard that require remedial works we have assessed all the trees for potential hazard in accordance with the International Society of Arboriculture *Tree Hazard Evaluation* process[2]. This gives a Hazard Rating to each tree in relation to its failure potential, the size of those parts most liable to failure, and the likely severity of third-party damage in the event of failure. Hazard ratings do not define a numerical line for action, between removal, treatment, and no treatment. They are simply used as an

[2] MATHENY, N. P. and CLARK, J. R. (1994). Evaluation of Hazard Trees in Urban Areas*. International Society of Arboriculture.*

aid to the arboricultural surveyor and the tree owner in the assessment of the likelihood and possible effects of tree failure, and the actions that should consequently be taken.

2.4.2. The results of this assessment are shown in columns 10 to 13 of the Tree Schedule, headed Failure potential, Size of Part, Target use, and Hazard Rating. On a scale of 3 to 12, the evaluation gives Hazard Ratings of 6 and above to 22 trees (nos. 1, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, 19, 23, 25, 26, 29, 44, 45, 47, 51, 55, 56). These are scores that indicate a "noticeable" rating, which normally indicates that remedial works are required to manage hazards identified. The hazards presented by these trees are discussed in detail at section 5.

3. PLANNING CONTEXT AND HISTORY

3.1. Conservation Area.

3.1.1. The gardens (and the surrounding houses) are within the boundary of the Maida Vale Conservation Area, designated in 1968. The Conservation Area guide mentions trees only once: "The tree lined streets, vistas and major private amenity spaces combine to give the entire area a leafy character and enhance the character of the buildings and the layout of roads."

3.1.2. The Formosa Amenity Garden may perhaps be described as a "major private amenity space", and thereby contributing to the leafy character of the Conservation Area; but this contribution is largely limited to the residents of the surrounding roads whose properties overlook the garden, as the terraces of houses block all but a narrow glimpse of the trees from any of the surrounding roads.

3.2. Tree Preservation Order.

3.2.1. A Tree Preservation Order (TPO), titled "City of Westminster Tree Preservation Order (No. 419) 1992", was made in 1992 and confirmed on the 26th Of January 1993. The number allocated to each tree in that Order is shown in the second column of the Tree Schedule at Appendix 1.

3.2.2. The TPO originally covered 62 individual specimens and one group of three trees. One tree (no. 61) is within the garden of No. 153 Sutherland Avenue and was not included in our survey. Since the time the Order was made three trees (T28, T34 and T42) have been removed following consented applications made to Westminster City Council.

3.2.3. The grounds for making of the TPO were quoted as:

"(i) The loss of the trees would be detrimental to the visual amenity of the area

(ii) An Order is desirable to protect the trees from indiscriminate lopping and felling and their replacement when necessary is essential.

(iii) It is considered expedient in the interests of the amenity to the public generally that a Tree Preservation Order be made to safeguard the preservation and future management of the trees."

3.2.4. It has been a matter of some debate as to whether the TPO meets government guidelines for the making of TPOs; and in particular, whether their loss would be detrimental to the visual amenity of the area (rather than of the garden itself) when they cannot be seen from any of the surrounding roads. I understand that the LPA have given some weight to the fact that some of the trees can be viewed from the upper floor(s) of a nearby tower block; but this still does not seem to comply with the key criteria for the making of a TPO.

3.2.5. At the time the TPO was made, The Department of the Environment Circular 36/78 'Trees and Forestry' provided guidance on the expediency of making TPOs, and stated **"[TPO's] should be used to protect selected trees and woodlands if their removal would have a significant impact on the environment and it's enjoyment by the public … [LPA's] ought to be able to show that a reasonable degree of public benefit**

would accrue before [TPO's] are made or confirmed. The trees … should therefore normally be visible from a public place (such as a road or footpath), although, exceptionally, the inclusion of other trees may be justified."

3.2.6. Since that time fresh guidance appeared in the Department of Communities and Local Government publication *Tree Preservation Orders – A Guide To The Law And Good Practice* (2000, revised April 2009) (widely known as the "Blue Book"). This document states:

"TPOs should be used to protect selected trees and woodlands if their removal would have a significant impact on the local environment and its enjoyment by the public. LPAs should be able to show that a reasonable degree of public benefit would accrue before TPOs are made or confirmed. The trees, or at least part of them, should therefore normally be visible from a public place, such as a road or footpath, although, exceptionally, the inclusion of other trees may be justified. The benefit may be present or future; trees may be worthy of preservation for their intrinsic beauty or for their contribution to the landscape or because they serve to screen an eyesore or future development; the value of trees may be enhanced by their scarcity; and the value of a group of trees or woodland may be collective only. Other factors, such as importance as a wildlife habitat, may be taken into account which alone would not be sufficient to warrant a TPO. In the Secretary of State's view, it would be inappropriate to make a TPO in respect of a tree which is dead, dying or dangerous.

LPAs should be able to explain to landowners why their trees or woodlands have been protected by a TPO. They are advised to develop ways of assessing the 'amenity value' of trees in a structured and consistent way, taking into account the following key criteria:

(1) visibility: the extent to which the trees or woodlands can be seen by the general public will inform the LPA's assessment of whether its impact on the local environment is significant. If they cannot be seen or are just barely visible from a public place, a TPO might only be justified in exceptional circumstances;

(2) individual impact: the mere fact that a tree is publicly visible will not itself be sufficient to warrant a TPO. The LPA should also assess the tree's particular importance by reference to its size and form, its future potential as an amenity, taking into account any special factors such as its rarity, value as a screen or contribution to the character or appearance of a conservation area. In relation to a group of trees or woodland, an assessment should be made of its collective impact;

(3) wider impact: the significance of the trees in their local surroundings should also be assessed, taking into account how suitable they are to their particular setting, as well as the presence of other trees in the vicinity.

3.2.7. Whilst this guidance post-dates the making of the TPO that covers the trees in the Formosa Amenity garden, it is useful in my view, to consider whether these trees would currently be considered worthy of a TPO under these criteria, in the hypothetical situation that they were not covered and were being assessed for inclusion in an Order now. There is little doubt in my mind that despite their presence within the Conservation Area, and the fact that they might be deemed suitable for their setting, they should not be so considered.

3.2.8. Nevertheless, the TPO exists, and consequently no works can be carried out to these specimens without the consent of Westminster City Council. Since the Order was applied, several applications have been made, mostly for the re-pollarding of the London planes.

3.2.9. The majority of successful applications submitted are for the re-pollarding of the plane trees. However there are instances where applications for removal of trees have been submitted because of the damage to adjoining properties, but these applications have been unsuccessful.

4. RISKS OF BUILDING SUBSIDENCE.

4.1. Trees and Clay Soils.

4.1.1. The garden and surrounding houses stand in an area that has been shown to overlie a shrinkable clay subsoil. Trees can cause damage to buildings by extracting water from shrinkable clays, causing volumetric changes which may result in foundation movement. Modern building practice seeks to prevent this by carrying the structure below ground to a depth at which experience indicates that further desiccation of the subsoil is unlikely. Many older buildings have very shallow foundations, within the likely depth of influence of tree roots, and are consequently prone to movement; to what extent depends on the depth of the foundations, the species and vitality of the tree(s), the shrinkage potential of the soil, and the distance between the tree(s) and the building.

4.2. Investigations to Date.

4.2.1. It has been commonly known for several years that many of the houses surrounding the garden have suffered from movement or subsidence, and that the trees in the garden may have been implicated in this damage. As a result of this, the trees have been subjected to an annual management plan to try and reduce their water uptake and thereby to reduce or remove their impact on the buildings.

4.2.2. In order to compile a clear picture of the problem a questionnaire was sent out to all houses in 1997. This produced information confirming that 39 properties had suffered from some movement and consequent cracking of masonry or plaster to that date. These are listed in column 2 of ***Table 1*** below. Of these, 13 reported that some underpinning had been undertaken.

4.2.3. A further questionnaire was sent out in early 2011 to update and (subject to response) broaden the information regarding the subsidence of houses. A summary of the results of this questionnaire can be found at **Appendix 3**. A plan showing the responses received in both 1999 and 2011 is at **Appendix 5**.

Road	House nos. reporting damage (1997)	House nos. reporting damage (2011)	Total numbers
Castellain Road	4, 8, 10, 12, 16, 18, 22, 26, 28, 30, 32	2, 12, 20	13
Formosa Street	12		1
Sutherland Avenue	145, 151, 153, 155, 163, 165, 167, 169, 173, 175, 177, 179, 183	177	13
Warrington Crescent	18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 42, 46, 50	4, 8, 20, 26, 28, 30, 34, 36, 40, 42	17

Table 1: **Properties that have reported damage of some kind**

4.2.4. The 2011 questionnaire was sent to 86 properties, and yielded 22 replies. Six replies covering five properties on Castellain Road were received; five replies covering five properties on Sutherland Avenue were received, and eleven replies were received covering eleven properties on Warrington Crescent. It is perhaps notable that 50% of the replies came from Warrington Crescent, and that seven of these were from properties 2 to 36, which are those with rear extensions that are closer to the pollarded plane trees (as close as 5.8m) than any other houses around the garden.

4.2.5. Fourteen of these properties reported cracking of masonry or plaster, jamming windows or doors, or insurance claims made as a result of these problems. Four of these (Nos. 2 and 20 Castellain Road and Nos. 8 and 40 Warrington Crescent) had not responded to the 1997 questionnaire; No. 4 Warrington Crescent had responded, but reported no cracking.

4.2.6. The reply from No. 8 Warrington Crescent may perhaps be discounted in any consideration of whether damage has been caused or contributed to by trees. At its closest point it is 18.4m from the nearest London plane tree (no. 3), and 14.4m from the Common lime tree no. 2. Reported damage is confined to the kitchen window on the western elevation as having “always jammed”, and a reason for this was suggested as a “poor fit due to alteration in frame”. At the distance this house is from the adjacent trees, I am inclined to think that the likelihood this has been caused or contributed to by trees is very low.

4.2.7. At my site visit in May I was engaged in conversation by a leaseholder at No. 10 Warrington Crescent, who confessed that he had not returned his questionnaire, but that there was cracking within his property. The 1997 questionnaire had also not been returned from this house, but it appears that it might also have been experiencing some movement, and so this property is also shown on the Subsidence plan at **Appendix 5**.

4.2.8. All these reported problems have occurred since 1993, after the trees were first pollarded, and after the cycle of re-pollarding was well established. In the cases of at least five properties (Nos. 26, 28, 30, 36 and 40 Warrington Crescent), the problems have occurred (or re-occurred) since the regular biennial re-pollarding regime has been in operation.

4.2.9. In total therefore, in 1997, 2011 or both, 44 of the properties that give onto the garden have reported damage consistent with subsidence.

4.3. Soil type and shrinkability.

4.3.1. The British Geological Survey map for this area, Sheet 256, indicates that this property overlies a subsoil of London clay.

4.3.2. Information taken from site investigations confirms the presence of London clay. Analyses of samples taken from various locations in or adjacent to the garden show that the clay has Plasticity Indexes ranging between 41% and 54%. This represents a soil of high shrinkage potential.

4.4. Foundation Depths.

4.4.1. Site investigation reports undertaken within recent years have made it possible to build up a reasonably clear picture of the original depth of foundations of these houses. Evidence shows that the houses on Castellain Road have original foundation depths of approximately 750mm; houses on Sutherland Avenue have depths of 1300mm, and houses on Warrington Crescent have depths of between 900 and 1000mm.

4.4.2. The National House-Building Council Standards, Chapter 4.2., "Building near trees" recommends a minimum depth for house foundations on shrinkable clay soils where these are sited close to trees. This is based on experience gathered on many sites where building subsidence has occurred, and trees have been shown to have been implicated in this damage.

4.4.3. On soils of high shrinkability where a 15m tall tree (the likely maximum height of the planes prior to re-pollarding) of moderate water demand (such as London plane) is situated at a distance of approximately 5.7m (the distance between tree no. 5 and the western elevation of No. 14 Warrington Crescent) the NHBC Standards recommend a minimum foundation depth of 1.9m, which is significantly deeper than the original foundation depth of this house. Whilst this does not prove that these trees have caused the damage to the surrounding houses, it does show that in many other similar situations, trees have been implicated in such damage, and that the existing foundations are inadequate in such proximity to these trees, and would be even in the absence of damage.

4.5. Likely Effect of the Trees.

4.5.1. In many of the cases of building damage around the gardens live plane tree roots have been found in boreholes, raising the possibility that the closest trees are implicated in the damage that has occurred. This possibility is further supported by the fact that in some cases significant soil desiccation has been found, and by the recording of seasonal variations in structural movement (consistent with seasonal variations in the likely water uptake of trees) in at least one other case.

4.5.2. London plane is known as a tree which has a moderate propensity for being implicated in subsidence claims in relation to other species, and has frequently been implicated in cases of building damage. This has been at distances of up to 15m. Thus all these trees have at least one property within their potential influencing distance, and most of the properties have at least one tree within influencing distance. (Those properties which appear not to have a plane tree within 15m are Nos. 4, 6 & 60 Warrington Crescent, and Nos. 139, 141, 189 & 191 Sutherland Avenue).

4.5.3. The remaining species (Horse chestnut, lime and sycamore) have also been implicated in cases of building damage on shrinkable clay soils, at distances of up to 23m (in the case of Horse chestnut) and 20m (for the Horse chestnut and lime). Consequently, all the properties at the southern end of the gardens are in the potential zones of influence of tree nos. 55, 56, 1 and 2.

4.5.4. Taking into account the locations, sizes, physiological condition and likely root disposition of these trees I am of the view that it is likely that most of them will have significant numbers of roots growing adjacent to and possibly even beneath the foundations of the surrounding houses. As the soil is of high shrinkability, and foundations depths are not deep, I think it highly likely that the trees have indeed contributed to the subsidence damage that has occurred over the last few years.

4.6. Management of subsidence risk.

4.6.1. Over recent years, an attempt to manage the risk of subsidence has been made by re-pollarding the planes. As noted above, this has been done since at least 1972; since the making of the TPO in 1992, regular tree work applications for the undertaking of these works have been made, with the most recent works being carried out in April 2010 (10/00227/TPO).

4.6.2. The returned questionnaires reported structural underpinning having occurred at 17 properties since 1985. Four of these have been to properties on Warrington Crescent, seven to properties on Sutherland Avenue, and six to properties on Castellain Road. Four of these (Nos. 12a, 12b and 26a Castellain Road, and No. 145 Sutherland Avenue) have been undertaken since 2000, and the most recent (No. 26a Castellain Road) was in 2010. Furthermore, cosmetic works as a result of building movement have been reported from nine properties (seven on Warrington Crescent and one each on Sutherland Avenue and Castellain Road); the most recent of these occurring to No. 30 Warrington Crescent in 2011.

4.6.3. Accordingly it is clear that damage has continued to occur over the last twenty years, even though the trees have been regularly reduced and controlled in size during this time. This suggests that the regular re-pollarding of the trees has not been fully effective.

4.6.4. The Horticulture LINK project 212 “CONTROLLING WATER USE OF TREES TO ALLEVIATE SUBSIDENCE RISK” concluded in its final report (May 2004) that

“Total tree water use (transpiration) was reduced by crown-reduction”, which can be equated to the re-pollarding ; but that “Trees recovered their canopy leaf areas to pre-pruning amounts very quickly (1-3 years) following crown-reduction to normal industry standards.”

4.6.5. The report went on to conclude that “Crown-reduction reduced soil drying by trees in the year of pruning, but the effects were generally small and disappeared within the following season, unless the reduction was severe, in which case the effects were larger and persisted for up to two years.”

4.6.6. These findings appear to have been borne out in the Formosa Amenity garden, where despite the regular pollarding regime, cases of building movement and cracking of masonry or plaster have continued to arise. Nos. 26, 28, 30, 36 and 40 Warrington Crescent have all reported damage over recent years since re-pollarding has been undertaken biennially.

4.6.7. It is clear therefore, that despite what may be the best intentions, the current management of the trees is not working. Furthermore, the current management regime is having an impact on the condition and future life potential of the trees. This is examined in the following section.

4.7. Future subsidence risk.

4.7.1. As all the planes are being regularly pollarded and consequently are of approximately the same size, and soil tests taken from different locations around the garden all show a highly shrinkable soil, the risks of the trees causing further building damage if they are retained in the future will be a factor of the distance they are from the houses, and the foundation depths of those houses.

4.7.2. The clearly greatest risks of further subsidence occurring will be to Nos. 12 to 36 Warrington Crescent, which are located between 5.5 and 5.8m from the trees, and particularly to those house that have not already been underpinned. (Currently I only have information to show that No. 22 has been underpinned, but I have no evidence to show whether this is the entire rear of the house, or just part of it.)

4.7.3. Whilst these houses clearly face the greatest risk of further damage, the other properties surrounding the garden are also at some risk. The differences in risks to these remaining properties are not easy to differentiate, but in order to assist in any future planning I have attempted to do so: the shallow foundations of those houses on Castellain Road that have not already been underpinned probably represent the second highest risk of damage in the future: the closest trees are 11.6m from the trees.

4.7.4. The third highest risk might be to the remaining houses on Warrington Crescent (Nos. 38-56) where most trees are over 12m from the houses, but trees nos. 24 and 25 are 10.7 and 10.3m away.

4.7.5. The houses on Sutherland Avenue possibly face the lowest risk of damage due to their deeper foundations; but they are slightly closer to the trees (between 9 and 10m) than the properties on Warrington Crescent and Castellain Road.

4.7.6. Current information suggests that seven properties on Castellain Road, seven on Sutherland Avenue and four on Warrington Crescent have been underpinned; should evidence of further houses having been underpinned come to light, this order of risk might have to be re-considered.

5. TREE CONDITION AND POTENTIAL.

5.1. Physical condition.

5.1.1. The inspection of the London planes has revealed that the majority of trees are in apparently average physiological condition. Leaf size and density, and shoot extension lengths are all what might be expected for trees of this age subjected to this type of management, partly because they are re-growing strongly as a result of re-pollarding.

5.2. Structural condition.

5.2.1. No evidence was found to indicate that any of the planes are currently unstable or in an unsafe condition such that they may be likely to blow over and could thereby damage any of the adjacent properties, or cause injury to users of the garden. No evidence of parasitic fungal sporaphores that would denote fungal infection was found, and no evidence was found to suggest that any of the trees are completely hollow.

5.2.2. However, of the fifty- three pollarded London planes inspected it was found that thirty-seven, which equates to 66% of them, have cavities of significance, Where it was not possible to ascertain the extent of the cavity from ground level, a climbing inspection was undertaken; twenty-one trees were inspected in this manner. These are trees nos. 8, 9, 11, 12, 13, 16, 17, 18, 20, 23, 24, 29, 38, 40, 44, 45, 47, 50 and 51. As a result of the climbing inspection none of the trees exhibit signs which would suggest that the trees are liable to imminent collapse.

5.2.3. The climbed inspection undertaken confirmed that four trees contain extensive decay; these are the plane trees nos. 11, 18 and 26 and the Horse chestnut no. 55. It is advisable in the interests of health and safety that these specimens are removed as the existing pollarding regime will not prevent the decay expanding. This decay does not render these trees imminently dangerous; but it is extensive enough that the LPA would have difficulty resisting their removal in the event an application for this was submitted. These are examined in more detail below. Photographs of the trunks of these specimens are at **Appendix 2**.

5.2.4. Tree no. 11 has abnormal swelling at the base of the trunk with a cavity at 1m above ground level which measures 110mm across, 130mm high, has a horizontal extent of 200mm, and a downward extent of 300mm. There is also a large cavity on the east side of the trunk at 2.3m above ground level which measures 260mm across, 500mm high, has a horizontal extent of 330mm, a downwards extent of 410mm and extends upwards to beyond 600mm. Differences in tone when the trunk is tapped with an acoustic hammer confirm the internal defects and suggest that the column of hollowness extends further up the trunk up to at least 4m from ground level.

5.2.5. Tree no. 18 has a fissure on its east side between two buttress roots (with a horizontal extent of 160mm). Differences in tone when the trunk is tapped with an acoustic mallet suggest internal defects from between 1.75m to 2.5m. There are also two significant cavities, the first is at 2m from ground level (which measures 160mm across, 500mm high, a horizontal extent of 100mm and a downwards extent of 100mm), the second is at 3m from ground level (and measures 150mm across, 200mm high, has a horizontal depth of 300mm and a 45° downwards extent of 510mm).

5.2.6. Tree no. 26 has a significant cavity on its south side that measures 200mm across, 260mm in high, 280mm inwards, an upwards extent of 300mm, and a downwards extent of 370mm. This cavity has significantly decayed wood and hollowness within. Significant changes in tone when the trunk is tapped with an acoustic mallet up to 2m in height confirm the extent of the internal defect. The tree should be removed for sound arboricultural management reasons.

5.2.7. Tree no. 55 has a single trunk with a significant cavity at 0.4m which measures 200mm across at its widest point and is 670mm in high.

5.2.8. Minor defects were noted on the remaining trees but were not considered, due to their size or location, to be of significance. However, it is advisable that the trees are inspected on a regular basis to ensure that none of the trees become hazardous.

5.2.9. The regular removal of shoots and branches as part of the re-pollarding regime has resulted in the plane trees being wounded on a consistent and regular basis. Some of the older pruning wounds are considerable in size, consistent with pollarding having been commenced at too late a stage in these tree’s lives, and necessitating the removal of large stems or branches. At the same time, the regular removal of the energy-producing parts of the trees (the leaves) is reducing the amount of starch the trees produce. The poor woundwood formation around many wounds, the decayed wood and the formation of cavities and hollowness are all consistent with the trees no longer having enough energy-producing potential to produce sufficient starch to enable efficient occlusion of pruning wounds and the effective resistance to decay.

5.2.10. The effect of this is that the trees are in a spiral of decline, and are unable to prevent the spread of decay that has started at the sites of pruning wounds. This decay will continue to spread, most probably at an ever increasing rate as physiological condition declines, and this is likely to result in other specimens than the four listed above having to be removed for safety reasons over the years to come. London plane has a genetic lifespan in excess of 250 years, and can achieve 350 years; but the poor structural condition and increasing decay of these specimens leads me to believe that most are unlikely to survive for more than another 40 years.

6. CONCLUSIONS

6.1. Subsidence.

6.1.1. It is clear that trees appear to be continuing to contribute to movement and subsidence of surrounding houses, despite the regular pollarding regime, which clearly is not working.

6.1.2. Nos. 12 to 36 Warrington Crescent are those properties most at risk of further movement and damage, due to their closer proximity to the trees than houses elsewhere.

6.2. Tree condition and longevity

6.2.1. By continually depleting the tree’s energy producing capability, the current pollarding regime is diminishing the trees ability to combat the many wounds and pockets of decay that exist, and thereby reducing both their structural condition and life expectancy.

6.2.2. It is clear therefore that the current pollarding regime is not sustainable in the long-term and will lead to the decline and removal of most of these trees within the next 40 years.

7. RECOMMENDATIONS

7.1. Safety works.

7.1.1. I recommend that the four specimens (tree nos. 11, 18, 26 & 55) that are at high risk of collapse are removed. The three planes nos. 11, 18 and 26 are covered by the TPO and therefore will need a tree work application; felling of the Horse chestnut no 55 will need prior notification being made to the LPA six weeks before the works can be undertaken.

7.2. Prevention of Future Damage to Adjacent Houses.

7.2.1. In order to significantly reduce the soil water uptake of the remaining trees, and thus to minimise the likelihood of further subsidence damage, three possible options exist. These are discussed below. Continuing with the biennial pruning regime is not included as an option as it is clearly not preventing further damage.

- The changing of the management regime to annual rather than biennial pollarding
- The changing of the management regime to the annual pollarding of alternate trees rather than the biennial pollarding of all the trees
- The installation of root barriers
- The felling and removal of the trees

7.3. Changing of management regime to annual.

7.3.1. As noted above in section 3, The Horticulture LINK project 212 "CONTROLLING WATER USE OF TREES TO ALLEVIATE SUBSIDENCE RISK" concluded that "Crown-reduction reduced soil drying by trees in the year of pruning, but the effects were generally small and disappeared within the following season, unless the reduction was severe, in which case the effects were larger and persisted for up to two years." It could be argued that the current biennial re-pollarding is severe, but as it has not prevented building movement or subsidence it might therefore be reasonable to assume that the effects of the re-pollarding may not be persisting for two years, and that it is possible that putting the regime onto an annual cycle would produce a significant reduction in water uptake from the soil.

7.3.2. Careful monitoring of soil moisture and building movement, with appropriate allowances for precipitation rates, would be necessary to confirm how long and to what extent the moisture content of the soil is being stabilised by the biennial pollarding, and whether shortening the cycle to annually might be beneficial. However this would have cost implications, and alternatively the operation could be trialled without any prior testing of its likely results by simply implementing annual re-pollarding and reviewing any effects.

7.3.3. However, there are four problems with this approach. Firstly, moving from a biennial to an annual regime will almost double costs, and if this is done without prior monitoring, and these increased costs bring about no change, it would be difficult to justify why such an experiment was undertaken. Secondly, the LPA has made it clear in the past that it would not be prepared to approve applications for annual re-pollarding. Thirdly, there would be a significant reduction in the visual amenity provided by the trees, in that only one year's growth would ever appear, reducing the contribution the trees make to the character and appearance of the garden. Fourth, the removal of all growth every year would further diminish the energy producing potential of the trees, whilst actually increasing their need for energy by producing more frequent wounding.

7.3.4. Accordingly I do not regard moving to an annual re-pollarding regime as a viable option. It would be costly in financial, amenity and arboricultural terms, and would not guarantee a cessation of the risk of building movement or subsidence. Furthermore, it may not be acceptable to the LPA.

7.4. Changing of management regime to annual pollarding of alternate trees.

7.4.1. A change to the current management regime of re-pollarding all the trees every two years to the annual pruning of alternate trees might be likely to reduce the total amount of moisture removed from the soil by all the trees combined, by reducing the total leaf area of all the trees at any one time. However, this will have no effect on the likelihood of an individual tree causing soil subsidence adjacent to the property closest to it, as individuals will still be pruned biennially.

7.4.2. So any successful reduction in the risk of subsidence brought about by such a pollarding regime would be subject to specific root disposition, in that it would only reduce the risk of subsidence where more than one tree is affecting the soil adjacent to a property, and where the combined effect of these trees is sufficient to cause a problem when only one of the trees isn't. This is not possible to measure, and so the effectiveness of such a regime is very difficult to predict. In my experience this practice is more usually untaken for either cash flow reasons or for aesthetic reasons, in that by avoiding re-pollarding all the trees at one time, it enables the continuous presence of foliage within a row of trees.

7.4.3. So the only way to establish whether this would help would be to implement it, and then to monitor the results. The problem with such a trial would be twofold: firstly it is highly unlikely to prevent any further instances of building movement or subsidence, and if it only reduces the number of instances the problem will persist, albeit possibly to a slightly reduced degree. Secondly it might take several years to establish whether it is reducing the instances of subsidence or not; and if it is not, it will delay the implementation of a more certain solution.

7.5. Installation of Root Barriers.

7.5.1. Root barriers can be an effective way of preventing root growth and thus subsidence damage on clay soils. Typically, a root barrier is comprised of a flexible membrane that cannot be penetrated by tree roots installed in a trench that is then back filled. The barrier extends from ground level to a depth below which roots are unlikely to grow.

7.5.2. To be effective, root barriers should comply with current guidelines (Marshall, Patch & Dobson 1997, "Root Barriers and Building Subsidence", Arboricultural Practice Note 4. *Arboricultural Advisory and Information Service*). These state that root barriers should extend below the likely depth to which roots will grow, protrude above ground level, may need to extend either side of the tree a distance equivalent to its anticipated mature height, withstand being cracked by differential soil movements, and be impenetrable to tree roots. It should be noted that root barriers can often be bypassed or even penetrated, and once roots have got to the other side, they may proliferate if soil conditions are favourable.

7.5.3. However, two specific factors need to be taken into account before using such barriers. Will the severance of roots necessary to install a barrier cause ground heave on the other side of the tree next to the building the barrier is designed to protect; and will the severing of roots necessary to install the barrier cause unacceptable damage to the tree.

7.5.4. Any risk of ground recovery following root severance must properly be a matter for the expertise of a structural engineer: however, in this case, the houses all pre-date the trees. Accordingly it is reasonable to assume that they were built on earth that was not of reduced volume due to the actions of the trees. Therefore the severing of roots and the consequent cessation of water extraction and rehydration of the soil beyond the barrier will cause the soil to recover to the volume it was at the time the houses were built, rather than to swell or heave to a greater extent.

7.5.5. Hence the risk of soil heave and subsequent building heave should be insignificant, and may be discounted.

7.5.6. Excavation of a trench into which a root barrier is installed necessarily results in the severance of all existing tree roots. Severing of tree roots in this way, particularly if they are cut coarsely by an excavator rather than cut cleanly with a saw or secateurs, cannot be anything other than damaging to these trees by reducing the uptake of water and nutrients from the soil, and creating many new wounds for the tree to deal with. As these trees are currently in a state of stress due to the regular re-pollarding and the amount of above ground wounds they are having to occlude, the removal of roots that would both reduce the input of energy into the tree whilst also increasing the need for it would be likely to accelerate the rate of decline.

7.5.7. The extent to which this would occur is difficult to predict, but it will to a great extent depend on the distance from the trunks that a barrier is installed, and consequently the amount of roots severed, and the number and sizes of wounds created. If root barriers were to be installed in the gardens, they could only be situated within the 3 to 3.6m wide gravel path that runs between the trunks and the boundary walls of the adjacent private gardens. But as the pollarded trees are all growing immediately adjacent to this path, and a working space of at least 500mm from the boundary walls would be required, the furthest from the trunks that the barrier could be placed could be as little as only 2.5m away. At this distance it is likely that a substantial number of roots would have to be severed, of which some could be of considerable size.

7.5.8. Furthermore, this trench would actually be within the root plates of the larger specimens (those of trunk diameters of 625mm or greater; and there are 32 such specimens). The root-plate of a tree (as distinct from its root spread) is the central coherent heavy mass of interwoven roots and soil particles, shaped like a disc or inverted cone, extending around the base of the trunk, which provides most of a tree's anchorage.

7.5.9. The total spread of a tree's roots typically extends much further than the radius of the root-plate, but the root-plate is likely to make a far greater contribution to stability than the outer roots. When the root anchorage of a tree undergoes major failure, therefore, the root-plate slides or lifts out of the ground as a discrete mass, but the outer roots generally break and remain in the ground. Severing roots within root plates will reduce a tree's stability in the soil, and produce a risk of collapse.

This could occur here, in the cases of those 32 specimens where root plates could not be avoided.

7.5.10. Accordingly I do not believe that the installation of root barriers is a feasible way of removing the risk of subsidence being caused by the existing trees. However, a root barrier might have a role to play in preventing new trees causing subsidence damage in the future; this is discussed elsewhere in this report.

7.6. Felling of trees.

7.6.1. It is self-evident that the felling and removal of trees would remove any effect they might be having on the soil and on the movement of adjacent properties, thereby removing all risk of further damage. As discussed above, this should allow the soil to rehydrate and should not create a risk of soil or building heave. However, there are problems with this approach, which are discussed below.

7.6.2. The removal of trees prior to replacement planting would reduce the extent of tree cover in the garden, and remove some of the screening it provides. If the adverse reaction of several residents to the 2000 proposal to remove 17 trees is a guide, there could be a considerable amount of opposition to any proposed felling.

7.6.3. Secondly the LPA has made it clear over recent years that it is unlikely to look favourably on any applications to fell trees, unless they have physiological or structural defects that make their retention untenable. Furthermore, on the one occasion an appeal was made against the LPA’s refusal to consent to the removal of some trees (1994 – ref. LRP25/X5990/08), the appeal was dismissed.

7.6.4. This appeal decision set a precedent and could be paramount if and when an application to fell further trees is made; accordingly it is worth re-visiting. The letter dismissing the appeal stated: **“The Secretary of State notes your concern that the trees are in poor condition but while accepting this point agrees with the Inspector that they are not a potential hazard.**” This means that unless circumstances have changed significantly since that time, and there is little evidence to show that they have, the LPA and the Planning Inspectorate (in the event of an appeal) are unlikely to consent to the removal of any trees that are not hazardous.

7.6.5. The letter continues: **"He also notes your concern that the trees have caused foundation movement and damage but accepts the Inspector's belief that recent pruning of the trees will help to minimise the water uptake and so alleviate the situation."** In this case I believe that circumstances have changed, in that while the pruning may have alleviated the situation (and that remains to be confirmed) it certainly hasn't prevented it. Therefore I take the view that the continued damage could be used to support a future application for tree removal.

7.6.6. However, this is likely to have to be accompanied by already established replacement planting, as the letter continues: **"...there is ample space for planting potential replacements in locations where they could develop whilst the existing trees are retained. [The Secretary of State] also agrees that the felling of the appeal trees would not improve the scope for planting."** It concludes: **"If suitable replacements are planted and allowed to establish, it would provide a rational justification for a programme of removing the existing trees, but until such time it would be preferable to retain all of the existing trees."**

7.6.7. These comments are a clear indication that if replacement trees are planted and established the LPA would find it very difficult to resist a future application for felling of trees. The wording suggests that this should not be the felling of all the pollarded planes at the same time, but rather the phased removal of a number or section of trees as part of an ongoing programme.

7.7. Recommended course of action.

7.7.1. Having reviewed these possible options, I am of the view that the optimum way forward is to pursue the option of removing and replacing the trees. I recommend that this should be done in a phased manner over a number of years, to suit budgetary constraints.

7.7.2. The trees to be prioritised for removal and replacement should be those that are at high risk of collapse (nos. 11, 18, 26 and 55), followed by those adjacent to Nos. 12 to 36 Warrington Crescent (nos. 3-14).

7.7.3. In order to minimise the impact of the removal of these trees on the visual amenity of the garden, their removal should be preceded by the planting and establishment of replacement trees. If the Warrington Crescent side is confirmed as the first place to plant replacement trees, if possible these should be planted all along that edge of the garden at the same time, to ensure that all the replacements would be consistent in size and age.

7.7.4. Removal of these trees might then be undertaken in two or more phases, perhaps by removing alternate specimens first, at an appropriate interval prior to removal of the remainder.

7.7.5. Following the replacement of trees in the southern section of Warrington Crescent, it would then be likely to be less intrusive if the northern section of that road was done. The presence of the large London plane no. 62 and the various trees (nos. 76 to 83) in the border to the north of it will help screen the rear elevations of those properties in views from the rear of properties on Sutherland Avenue and thus soften the impacts of the removals.

7.7.6. Replacement of the trees on the southern boundary adjacent to the rear of Castellain Road would be the next suitable part of the garden to deal with: this is because the presence of the various trees nos. 57 to 67 will afford some screening of the rear elevations of these properties while the replacements become established.

7.7.7. Replacement of the trees on the western side of the garden alongside the rear gardens of properties in Sutherland Avenue is likely to have the greatest impact on the appearance of the garden, as except for the small planting beds at the north and south ends of this side, there is currently only lawn between the centre of the garden and the existing trees. Consequently replacement planting may have to be more advanced along this section before the existing trees could be removed.

7.8. Planting proposals.

7.8.1. In order to replicate the existing character of the garden, to demonstrate to the LPA that replacement planting proposals are appropriate, and to produce trees that will be in scale and context with the existing buildings, replacement trees should be of a species capable of a significant ultimate height (so they will remain in context with the surrounding houses), tolerant of clay soils, tolerant of future pruning, possibly including pollarding, and not of high water demand (as designated by the NHBC) so that future risks of subsidence are not created. For these reasons I believe that London plane would be the most appropriate species to plant, and it would maintain a continuity of landscape during the replacement and replanting programme.

7.8.2. One other species could be suitable for selection; this is Lime (*Tilia sp*.), which also meets all the above criteria. There are many varieties of lime, but the best-known (Common lime – *Tilia x europaea*) would not be suitable for the garden as it produces copious basal suckers, and is attractive to sap-sucking insects, which create sticky secretions (known as “honeydew”). Small leafed lime (*Tilia cordata*), of which there are several varieties and cultivars, is likely to be more appropriate.

7.8.3. Consideration could be given to planting trees in two different configurations, either replicating the current linear rows alongside the gravel paths, or by planting trees in borders as has already been undertaken in three locations in the garden. Two options for such planting are shown on the Tree Planting plan at Appendix 6. Of these options the latter is likely to be cheaper, as fewer trees will be required.

7.8.4. The choice between these options will primarily be a matter of landscape design; but I see a distinct advantage in combining the two as is the case at present. The linear rows reflect the linear nature of the terraces of housing, and will provide consistent softening and screening of these terraces in views from the garden; whilst the internal borders, planted with a wider variety of species and sizes of trees, provides greater variety and interest within the garden.

7.8.5. If linear rows of London planes are chosen, care must be taken to prevent any re-occurrence of the subsidence problems that are occurring now. To achieve this I recommend that trees should be planted no closer than 7.5m from the rear elevations of the existing houses, to comply with the suggestions of the Subsidence Claims Advisory Bureau (1999).

7.8.6. Furthermore, if a greater level of protection is required, a root barrier should be installed beneath the gravel path adjacent to Nos. 12 to 36 Warrington Crescent, where the houses are closest to the path and the likely planting location. This should extend to 3m depth, so it is below the maximum depth that roots have been found adjacent to these properties. It would not necessarily have to be installed before the trees are planted; this could be done up to perhaps five years following planting. As a preliminary guide, a 100m section of root barrier (reaching from No. 12 to No. 36 Warrington Crescent) could cost £3000 to supply and supervise the installation of; and might cost a further £3000 to install.

7.8.7. Following replacement planting, a decision should be made as to whether the new trees should be pollarded in the future, and if so, at what height. If they are to be pollarded it will be important that this is done as soon as they reach this size: in this way pruning wound sizes can be kept small, allowing the trees to readily occlude them, thus minimising the exposure of heartwood and avoiding decay in the future.

7.8.8. The sooner replacement planting can be undertaken, the sooner the new trees can become established, the sooner the existing trees can be removed, and the sooner the subsidence problems will be resolved. If it is possible to commence re-planting in the 2011 to 2012 planting season (November to March) it would obviously shorten by a year how long the existing situation continues. The amount of time between replacement planting and a planning application for the removal of trees standing a reasonable chance of being agreed to by the LPA will depend to a great extent to the sizes of replacement trees. The larger they are planted, the shorter the time will be. Once a decision has been made regarding species and planting configurations, costings for the supply and planting of different sized trees can be gathered, in order that budgetary considerations can be applied to the timing of the replacement programme.

7.8.9. Trees of almost any size can be sourced, but the relationship between size and cost is not a constant one, and costs rise at a significantly steeper rate than size. Furthermore, larger trees incur sometimes greatly increased transportation and planting costs. The tight vehicular access to the Formosa garden may be a problem when deciding on this, and is likely to dictate a maximum planting size. Alternative methods of delivering large trees to the garden might include the use of a large crane or a helicopter; but the height and depth of the surrounding houses might make a crane unfeasible, and a helicopter is likely to be very expensive.

7.8.10. Consequently I think that the optimum balance of size and cost in this case, and of instant impact and successful establishment, is likely to mean replacement with extra heavy standards or possibly semi-mature specimens. Ultimately this is a decision that will be mostly influenced by financial considerations, and I suggest that once species are decided, alternative prices are sought for trees of at least two different sizes.

7.8.11. Purely as a guide at this stage, if trees are planted at “Standard” size (2.5m height), a purchase price of somewhere between £30 and £60 a tree might be expected, but with discounts for quantities purchased. Then transport, planting and post-planting aftercare costs will have to be added. For “Extra heavy standard” size (3.5m in height), a purchase price of up to £70 might be expected. So for example, if a row of 15 planes at Extra heavy standard size were planted at 7m spacings adjacent to Nos. 12 to 36 Warrington Crescent, a budget figure of perhaps £2500 should be allowed for. For semi-matures, there is a huge variance in prices dependant on availability, and transportation costs can be much higher, so a budget figure would have to be considerably higher.

7.8.12. However, there would be definite advantages in the long-term of planting all the replacement trees at one time. The purchase price per tree would be lower, and these specimens would then be all of the same size, age and provenance, which will produce a more uniform appearance, and thus a more formal character. Assuming a phased removal of the existing specimens, trees planted now will be more established and much larger when later applications to fell sections of the existing trees are made, thereby increasing the likelihood of approval. If this were done, with Extra heavy standard trees at 7m spacings, a total of 52 specimens would be required, for which a budget of perhaps £6,500 would be needed. Precise quotations can be obtained once a decision is made on how to proceed.

7.8.13. Even if replacement trees are planted in some part of the garden during the forthcoming planting season, it may be unlikely that the LPA would agree to an application to fell non-hazardous trees as soon as next year. Accordingly it would be wise to allow for re-pollarding to be undertaken next year as planned. A more realistic target would be to remove the first tranche of trees in the spring of 2014, thus avoiding the need to re-pollard those specimens that year.

Simon R. M. Jones Dip. Arb. (RFS), F. Arbor. A.

APPENDIX 1

SIMON JONES ASSOCIATES Ltd.
ARBORICULTURAL PLANNING CONSULTANTS

Arboricultural Consultancy - Tree Surveys
Planning & Development · Hazard & Safety

17 CROSS ROAD
TADWORTH
SURREY KT20 5ST

Tel: (01737) 813058
E-mail: sja@sjatrees.co.uk

Director: Simon R. M. Jones Dip. Arb. (RFS), F. Arbor. A., Arb. Assoc. Registered Consultant
Associates: Mark Mackworth-Praed BA (Cantab), M.Sc., F. Arbor. A., Arb. Assoc. Registered Consultant

Schedule of Trees

at:

Formosa Amenity Garden, London W9

Compiled & presented by:

Simon R. M. Jones Dip. Arb. (RFS) F. Arbor. A.

May 2011

Tree Schedule: Explanatory Notes

Formosa Amenity Garden, London W9

This schedule is based on a tree inspection undertaken by Guy Stephens of Simon Jones Associates Ltd., on 7th December 2010, 7th January and 25th January 2011. Weather conditions at the time were overcast but dry. Deciduous trees were not in leaf. A further inspection was made by Jamie Newman on the 24th of May 2011; on this occasion the trees were in leaf.

The information contained in this schedule covers only those trees that were examined, and reflects the condition of these specimens at the time of inspection.

The trees were inspected from the ground only and were not climbed, and no samples of wood, roots or fungi were taken. A full hazard or risk assessment of the trees was not undertaken, and therefore no guarantee, either expressed or implied, of their safety or stability can be given.

Trees are dynamic organisms and are subject to continual growth and change; therefore the dimensions and assessments presented in this schedule should not be relied upon in relation to any development of the site for more than twelve months from the survey date.

1. Tree No.
The tree numbers used are from the First Schedule of TPO No 419 of 1992.. Tree numbers 101 to 103 have been used as a result from a recent enquiry.

2. T.P.O. No.
Number assigned to tree in the Westminster City Council Tree Preservation Order no. 419 of 1992, as shown in the schedule and on the plan.

3. Species.
'Common names' are given, taken from MITCHELL, A. (1978) A Field Guide to the Trees of Britain and Northern Europe.

4. Height.
Measured approximately, shown in metres.

5. Average Crown Spread.
The average diameter of the canopy, shown in metres. In the case of trees with greatly asymmetrical crowns, separate distances may be quoted in relation to points of the compass.

6. Trunk diameter.
Trunk diameter measured at approx. 1.5m above ground level; or in case of trunks that divide into separate stems between adjacent ground level and 1.5m , or at base, shown in millimetres.

6. Physiology.
Health, condition and function of the tree, in comparison to a normal specimen of its species and age.

7. Structure.
Structural condition of the tree – based on both the structure of its roots, trunk and major stems and branches, and on the presence of any structural defects or decay.
Good: No significant physiological or structural defects, and an upright and reasonably symmetrical structure.
Moderate: No significant pathological defects, but a slightly impaired physiological structure; however, not to the extent that the tree is at immediate or early risk of collapse.
Indifferent: Significant physiological or pathological defects; but these are either remediable or do not put the tree at immediate or early risk of collapse.
Poor: Significant and irremediable physiological or pathological defects, such that there may be a risk of early or premature collapse.
Hazardous: Significant and irremediable physiological or pathological defects, such that there is a risk of imminent collapse.

8. Comments.
Where appropriate, comments have been made relating to:
-Health and condition
-Safety
-Structure and form including cavities and defects in trunk; measurements of cavities, including opening size, inwards/downward extent and orientation; notes of changes in tone when tapped with an acoustic hammer
-Estimated life expectancy or potential

9. Cavity.
Cavity greater than 100mm in diameter noted on the tree:

10. Location.
Orientation of cavity noted that is greater than 100mm in diameter:

11. Failure Potential.
Rated low, medium, high or severe, in accordance with the I.S.A. "Tree Hazard Evaluation Form", 2nd Edition.
Low - defects are minor (e.g. dieback of twigs, small wounds with good woundwood development)
Medium - defects are present and obvious (e.g. cavity encompassing 10-25% of the circumference of the trunk, co dominant stems without included bark)
High - numerous and/or significant defects present (e.g. cavity encompassing 30-50% of the circumference of the trunk, multiple pruning wounds with decay along a branch)
Severe - defects are very severe (e.g. heart rot decay, fungal brackets along the main stem, cavity encompassing more than 50% of the trunk)

12. Size of Part.
Diameter of part of tree identified as being at the greatest risk of failure: less than 150mm diameter, from 150mm to 450mm diameter, from 450mm to 750mm diameter, or more than 7850mm diameter, in accordance with the I.S.A. "Tree Hazard Evaluation Form".

13. Target use.
Usage or occupancy of area in which people or property could be harmed in the event of failure of a tree or parts of it. Rated occasional, intermittent, frequent or constant, in accordance with the I.S.A. "Tree Hazard Evaluation Form".

14. Hazard Rating.
Rating of relative tree hazard potential, derived from an aggregation of Failure Potential, Size of Part and Target Use, designed to inform decisions regarding hazard abatement. Rated negligible, low, noticeable or high in accordance with "Well-maintained Highways", Code of Practice for Highway Maintenance Management.

Tree Schedule

Formosa Gardens, Warrington Crescent, London

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
1	T1	Sycamore	9m	5m N 4m E 4m SE 3m S 3.5m W	580mm	Average	Indifferent	Located close to the entrance with evidence of soil compaction near base caused by vehicles accessing the site; some damage to buttress roots. Mechanical damage on W side of main stem at 0.9m, 1.3m and 2.6m, possibly caused by high sided vehicles accessing the garden. Has been pollarded in past at both 6m and 8m. Pruning wounds are occluded.			Medium	>750mm	Intermittent	Noticeable
2	T2	Common lime	8m	3.75m N 3.5m E 3.5m S 3m W	580mm	Average	Indifferent	Located close to the entrance to garden with evidence of soil compaction near base. On main trunk there is a slight discolouration of wood between 300mm and 1.3m. Bifurcates at 3.7m, both stems, to N and SE, of approx. 450mm diameter at point of origin. Has been pollarded in past at both 6m and 8m.	Yes	S side of N stem	Medium	150-450mm	Intermittent	Low
3	T3	London plane	12m	2.5m N 3m E 2.75m S 3.5m W	560mm	Average	Moderate	The main trunk trifurcates at 4.5m, three co-dominant stems all approx. 450mm diameter at point of origin. Minor cavity noted at 5m on N stem estimated to be 50mm wide. Second co-dominant stem located at the centre of the fork. The third co-dominant stem forks again at 6m into sub-lateral branch. There are a further three smaller stems, all of which are approx. 1m in height and are orientated to W. No significant cavities present at time of inspection and no significant change in acoustic tone on the main stem.			Low	<150mm	Intermittent	Low
4	T4	London plane	12m	2.75m N 2.75m E 3m S 2m W	500mm	Average	Moderate	Bifurcates at 3.1m; first co-dominant stem orientated to SW approximately 500mm at union. Second co-dominant stem forks further at 3.6m both stems approximately 400mm at point of origin. One stem growing NW divides further at 5m; second sub-dominant orientated E. Cavity noted on stem growing NW and orientated to S. No significant change in the acoustic sound on the main trunk.	Yes	S side of NW stem	Medium	150-450mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
5	T5	London plane	12m	3m N 2.75m E 3m S 2.25m W	550mm	Average	Moderate	Slight lean towards W. Abnormal swelling or Bottle-butt at base. Single trunk which bifurcates at 10m. Cavity at 2.5m SE side; measures 300mm vertically, 60mm across, depth 170mm, no associated column of decay with this cavity, good surrounding woundwood. When struck with acoustic mallet only differences of tone are noted on the sides of the cavity, no changes in tone above or below confirming that there is unlikely to be any columns of decay or hollowness.	Yes	SE side of main trunk	Low	150-450mm	Intermittent	Low
6	T6	London plane	12m	2m N 2m E 2m S 3m W	570mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Tree leans W and bifurcates at 4.1m. One stem orientated to SW; second co-dominant stem orientates to NE and has a small cavity at 3.3m but has been almost occluded by the woundwood second cavity at approximately 11m. There is no change in tone when using an acoustic hammer.	Yes	On NE sub-dominant stem	Medium	450-750mm	Intermittent	Noticeable
7	T7	London plane	12m	2m N 2m E 2.5m S 2.5m W	720mm	Average	Moderate	Trunk leans slightly to W; bifurcates at 4m; stems are up to 500mm in diameter at union. Cavity on N side at 4.75m and just below the junction of a sub lateral growing to cavity E measures 60mm in diameter with depth of 70mm surrounded by bulge of reaction wood. This cavity is of only minor significance.	Yes	Sub dominant stem orientated to E	Medium	450-750mm	Intermittent	Noticeable
8	T8	London plane	12m	1.5m N 2m E 2m S 2m W	580mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Trunk leans slightly to SW; At 2.7m on N side of main trunk is a cavity measuring 150mm across; horizontal depth of 280mm and downwards at a slight angle to 580mm – water-filled. Does not appear to be any decay above, has dense surrounding reaction wood. Second cavity on SE side also at 2.7m is 90mm in diameter, horizontal depth of 170mm, does not appear to be any associated column of decay above or below. No definite changes in tone when trunk struck with acoustic mallet. Intermittent swelling on main trunk up to 4m. Bifurcates at 4.3m. Stem to W is approx. 400mm diameter at union, no cavities found. Stem to E approx. 400mm diameter at point of origin.	Yes	N & SE sides of main trunk	Medium	450-750mm	Intermittent	Noticeable

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
9	T9	London plane	11m	1.5m N 1m E 1.25m S 1.5m W	510mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. At ground level on E side is a small cavity (between two buttress roots) which measures 50mm across and 110mm in length, the downwards extent is 70mm, upwards extent 70mm. Slight lean to the W. Single stem, sub-dominant stem at 8m growing SE. At 2.8m on main trunk are four cavities; first cavity is orientated to N (100mm diameter), second is orientated to E (60mm); third is orientated to E (60mm), vertical downwards depth of 600mm; unable to probe upwards, the horizontal depth of 110mm. Changes in tone downwards from this cavity by 1m (down to 1.75m above ground level). Some differences in tone above this by 600mm to 3.75m. The fourth cavity is orientated to S (90mm diameter) horizontal depth of 90mm. All four have good surrounding woundwood. Differences in tone at 2.4m around the circumference of the trunk, which coincides with the locations and depths of the cavities.	Yes	Main trunk orientated to N,E & S	High	>750mm	Intermittent	Noticeable
10	T10	London plane	12m	2.5m N 2.5m E 1m S 2.25m W	580mm	Average	Good	Differences in tone when buttress roots tapped with acoustic hammer suggest internal defects. At the base on the E side there is significant swelling on the buttress roots extends from the N to SE sectors. Tree leans to W. Bifurcates at 2m; first stem orientated to NW is 450mm at union. Second stem is orientated to S and is 450mm at point of origin. Large cavity at 3.8m with poor wound wood noted on this stem.	Yes	Stem orientated S	Medium	450-750mm	Intermittent	Noticeable
11	T11	London plane	11m	1.5m N 1.5m E 1.75m S 2.75m W	590mm	Average	Indifferent	Abnormal swelling or Bottle-butt at base. Cavity at 1m measuring 110mm across and 130mm in height, the downward extent is 300mm, inwards by 200mm; differences in tone when lower trunk tapped with acoustic hammer suggest internal defects. Cavity on E side of main trunk at 2.3m; trunk 585mm in diameter at this point, cavity has horizontal depth of 330mm, height of 500mm and 260mm across. Probe extends downwards by 410mm and upwards to beyond its full extent of 600mm. Likely that the column of hollowness extends further up the trunk. Differences in tone upwards to 4m to an old occluded pruning wound suggest a column of decay connecting the two; also differences in tone downwards to 1.5m above ground level.	Yes	E side of main trunk	High	>750mm	Intermittent	Noticeable

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
12	T12	London plane	11m	2.25m N 2m E 1m S 2.75m W	550mm	Average	Indifferent	Abnormal swelling or Bottle-butt at base. Significant swelling at 5m which surrounds half the circumference of the main trunk. Slight lean to NW. Cavity on main trunk at 2.5m and is orientated to S measured 140mm across and 240mm in height; good surrounding woundwood, exposed heartwood. Probe can only be inserted horizontally to depth of 130mm. No indication of hollowness extending vertically upwards or down. No differences in tone when struck with acoustic mallet. Second cavity at 5m on main trunk, orientated to E; 120mm in diameter, good surrounding woundwood, probe extends horizontally to 250mm. No significant changes in tone when struck with acoustic mallet. At approximately 8m there are three sub-branches orientated to E, NW and W.	Yes	On S & E sides of main trunk	Medium	450-750mm	Intermittent	Noticeable
13	T13	London plane	12m	3m N 3m E 1.75m S 2.5m W	650mm	Average	Moderate	Slight lean to the NW; 'Crescent shaped' cavity at 4m to W, measures 230mm across with exposed strip of 100mm, extends inwards by 200mm. Old pruning wound, non-occluded, epicormic above. No differences in tone below, however differences in tone above to beyond reaching point at 5m, likely to extend up to next non-occluded pruning wound at 5m on the S side.	Yes	On SW & W sides of main trunk	Medium	450-750mm	Intermittent	Noticeable
14	T14	London plane	12m	4m N 2.5m E 2m S 2m W	680mm	Average	Indifferent	Abnormal swelling or Bottle-butt at base. Significant lean towards NW; trifurcates at 3m, separates into three upright stems. Cavity at 3.2m orientated NE and situated on the stem leaning towards NW. Non occluded wound with exposed heartwood at 5m on E side of SE stem.	Yes	On stem orientated NW	Medium	450-750mm	Intermittent	Noticeable
15	T15	London plane	12m	3m N 2.5m E 2.75m S 2.75m W	670mm	Average	Moderate	Slight lean to SW; bifurcates at 2.8m; insignificant cavity orientated to E on the sub dominant NW stem which has been previously reduced.			Low	150-450mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
16	T16	London plane	12m	3m N 2.75m E 2.75m S 2m W	600mm	Average	Moderate	Possible root severance buttress root orientated towards the NE. Fissure is noted at the base in between two buttress roots, one orientated towards SE, the second is towards the E no evidence of any decay/cavity. Significant swelling noted on main buttress root orientated towards the E. Two cavities are noted on the main trunk at 2.6m and 2.9m, both are orientated towards SW almost fully occluded (with some reaction wood), of significance as only revealing internal heartwood. It is not possible to establish the extent of the decay at the present time. The lower of the two cavities measures 100mm, the second cavity is of a similar size. Main trunk trifurcates at 3m into upright stems; first stem towards the SE and then two further stems leaning towards NE and N.	Yes	On SW side of main trunk	Low	150-450mm	Intermittent	Low
17	T17	London plane	12m	4m N 3m E 2.75m S 2.75m W	660mm	Average	Moderate	Some unidentified fungi noted between two buttress roots on N side. Slight discolouration on W side between two buttress roots at ground level up to 1m; abnormal swelling or Bottle-butt at base. Leans to NW, swelling on the main trunk at 1.4m encompassing half the trunk diameter; trunk bifurcates at 2.9m orientated W & NE. Cavity on W stem with exposed heartwood but good surrounding woundwood.	Yes	Stem orientated W	Low	150-450mm	Intermittent	Low
18	T18	London plane	12m	2.5m N 2.75m E 2.75m S 2.75m W	630mm	Average	Indifferent	Fissure on E side between two buttress roots extends inwards by 160mm. Mechanical damage on lateral root to E. Trunk trifurcates at 6m, three sub-dominant stems to E, W and NE. two significant cavities; 1st on N side of trunk at 2m, measures 500mm in height and 160mm wide at widest point, depth of 100mm, no significant decay upwards, 100mm downwards. 2nd cavity located on E side at 3m; measures 200mm vertically and 150mm across. Probe can be inserted at 45° downwards angle to 510mm and horizontally by 300mm. When lower trunk tapped with acoustic mallet on W side differences in tone heard from 1.75m to 2.5m.	Yes	E side of main trunk	High	450-750mm	Intermittent	Noticeable

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
19	T19	London plane	12m	3m N 3m E 2.75m S 2.5m W	600mm	Average	Moderate	Abnormal swelling or Bottle-butt at base; trunk leans to N. At ground level between two buttress roots, orientated to E is a fissure/cavity which is 60mm across and probes 120mm inwards. Between two buttress roots to N is a cavity with evidence of reaction wood - when using an acoustic hammer a more dull tone is noted. On SW side of main stem at 2.3m are pruning wounds with good woundwood and some exposed heartwood, 60mm across and 150mm in height, probe inwards extends by 70mm and downwards by 30mm.	Yes	SW side of main stem	Medium	450-750mm	Intermittent	Noticeable
20	T20	London plane	12m	3m N 3m E 2.5m S 2.5m W	610mm	Average	Indifferent	Slight lean to N; trifurcates at 4.2m, tight compression forks with evidence of included bark. First upright sub-dominant stem to W, second sub-dominant stem to SE, third sub-dominant stem to NE further divides at 4.4m; cavity at 3.6m on W side of sub-dominant stem measures 220mm vertically, 40mm across revealing sound heartwood, does not appear to have any hollowness behind or cavity further within. Although union is tightly pressed and has evidence of included bark, does not appear at imminent risk of failure and current management of pollarding seems to be negating this risk of failure. No differences in tone when struck with acoustic hammer above or below the cavity.	Yes	Stem orientated W	Medium	150-450mm	Intermittent	Low
21	T21	London plane	10m	3m N 4m E 3m S 2.75m W	630mm	Average	Moderate	Evidence of girdling roots on E side only. Slight lean to N. Bifurcates at 3.1m; co-dominant stem orientated towards W, second stem bifurcates further at 3.9m whereupon there is a dominant stem orientated to E and a sub-dominant stem orientated to SW. This is a slightly smaller tree than the rest.			Low	<150mm	Intermittent	Low
22	T22	London plane	14m	2.75m N 2.75m E 2m S 2m W	680mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Single trunk with lean to N forks at 10m, horizontal stem orientated to SW; bifurcates at 12m orientated E and W. Evidence of significant laterals been removed on the main stem at 2.3m, wounds have been completely occluded.			Low	150-450mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
23	T23	London plane	14m	3.25m N 2.75m E 2m S 2.5m W	670mm	Average	Moderate	Depression between two buttress roots to NW with reaction wood forming around sides. Trunk leans slightly to N. Cavities on SE side of main trunk, first cavity at 2.3m measuring 130mm in height and 70mm across, decay extends 130mm inwards, 120mm upwards and 60mm downwards. Second cavity at 2.6m and measures 450mm vertically, 90mm across, probe extends horizontally by 430mm. Differences in tone above this cavity to beyond reaching point which is at 5m above ground level and a third cavity which is on NW side at 5m. Likely column of decay or hollowness connecting the two cavities, definite changes in tone.	Yes	On SE side of main trunk	Medium	450-750mm	Intermittent	Noticeable
24	T24	London plane	12m	3m N 2.75m E 3.75m S 3m W	660mm	Average	Moderate	Abnormal swelling or Bottle-butt at base; slight depressions between prominent buttress roots particularly on those to the E. Main stem leans slightly to W; bifurcates at 3.9m one orientated to W, the second to E. Old pruning wound on main trunk on N side at 3m measures 70mm in diameter, good surrounding woundwood, probe extends horizontally in by 90mm. No definite changes in tone above or below the cavity. Reveals internal heartwood, not a significant defect.	Yes	On N side of main trunk	Low	450-750mm	Intermittent	Low
25	T25	London plane	12m	3m N 2.5m E 2.5m S 3.25m W	660mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. On W side of trunk at ground level is a small cavity between two buttress roots the extent of decay is approximately 180mm; on NW side (also between two buttress roots) is a depression in the trunk measuring 740mm in height and 115mm in width.	Yes	Cavity at base	Medium	450-750mm	Intermittent	Noticeable
26	T26	London plane	12m	3m N 3m E 3.5m S 3m W	660mm	Average	Indifferent	Some evidence of mechanical damage to buttress root to N. Significant cavity on S side of main trunk measures 260mm in height and 200mm across, significant decayed wood and hollowness evident. The extent of the inward decay is 280mm, upwards 300mm, downwards decay measured 370mm; a significant change in tone when hitting the trunk on the W side, and a hollow sound all round the main trunk up to 2m in height. Bifurcates at 7m into co-dominant laterals, one to SW and the other to E. Tree should be removed for sound arboricultural management reasons.	Yes	Cavity at base	High	450-750mm	Intermittent	Noticeable

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
27	T27	London plane	14m	3m N 2.5m E 2.5m S 3m W	630mm	Average	Moderate	Damaged buttress roots on SW side at ground level between two main buttress roots, some dead bark is evident, however there is no change in tone. Depression in main trunk at ground level between two main buttress roots orientated towards NE. Trunk leans slightly towards N. Bifurcates at 5m into two significant stems, one orientates to the N, second orientates to the S,			Low	<150mm	Intermittent	Low
28	T28	London plane	n/a	n/a	n/a	n/a	n/a	Tree felled - 07/04845/TPO	n/a	n/a	n/a	n/a	n/a	n/a
29	T29	London plane	12m	2.5m N 4.5m E 2.5m S 1.75m W	640mm	Average	Indifferent	Main trunk leans NE. On the SW side of the main trunk are two cavities; first cavity is at 2.6m from ground level, second cavity is at 3.7m from ground level. First cavity measures 150mm vertically, 90mm across, good surrounding woundwood, extends horizontally by 160mm. No significant or definite changes in tone between the two cavities or below the first cavity. Second cavity measures 120mm in diameter surrounded by woundwood, probe can be inserted horizontally to 300mm and downwards at a 45° angle by 180mm.	Yes	On SW side of main trunk	Medium	450-750mm	Intermittent	Noticeable
30	T30	London plane	12m	2.5m N 2.5m E 2.5m S 1.5m W	680mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. At 1.8m on S side of trunk there is evidence of old pruning wounds which have been completely occluded by the woundwood. Trifurcates at 3m, co-dominant stems from this point, all are approximately 450mm at point of origin; one stem orientates towards the NE, second SE and third to the S.			Low	450-750mm	Intermittent	Low
31	T31	London plane	14m	2.25m N 3m E 3m S 2.25m W	880mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Bifurcates at 2.8m, orientated SW & NE (750mm at the point of origin), NE stem further forks at 4m with a sub-dominant stem orientated to E. Cavities on the stem orientated to E; one at 3m and the second at 3.7m, considered to be insignificant.	Yes	On E side of stem	Low	150-450mm	Intermittent	Low
32	T32	London plane	14m	2.5m N 2.5m E 3.5m S 3m W	660mm	Average	Moderate	Slight lean to N. Bifurcates at 3.5m, dominant stem to E (750mm diameter at point of origin) sub-dominant stem to SW (500mm at point of origin). No significant defects.			Low	150-450mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
33	T33	London plane	14m	2.25m N 2.75m E 2m S 1.5m W	610mm	Average	Moderate	Leans towards NE. Bifurcates at 2.6m, co-dominant stems both 700mm at point of origin, first stem orientated to NE, second to the S. Stem orientated to NE has what appears to be two occluded cavities noted at 3.9m and 6m, possibly old pruning wounds.	Yes	Stem orientated NE	Low	450-750mm	Intermittent	Low
34	T34	London plane	n/a	n/a	n/a	n/a	n/a	Tree felled - 10/00227/TPO			n/a	n/a	n/a	n/a
35	T35	London plane	14m	2m N 2m E 2m S 2m W	570mm	Average	Moderate	Small cavity noted at base orientated towards S. At 2.9m on main trunk orientated to S a lateral has been removed in the past and the wound has been completely occluded. At 3.9m to SE further evidence lateral branch removal.			Low	150-450mm	Intermittent	Low
36	T36	London plane	14m	3m N 3.25m E 3.75m S 3m W	870mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Bifurcates at 2.6m; the stem leaning towards the NE is approximately 700mm at point of origin. At 3.2m on this stem there is evidence of a lateral branch that has been removed and has been completely occluded; evidence of three other laterals that have been removed at approximately 7m, 7.5m and 8m all are completely occluded.			Low	150-450mm	Intermittent	Low
37	T37	London plane	14m	3m N 3.5m E 3m S 2m W	660mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Single trunk with sub dominant stems at 4m orientated to SE and NE. No significant cavities or structural defects noted on this tree.			Low	450-750mm	Intermittent	Low
38	T38	London plane	14m	2.5m N 2.75m E 3m S 2.5m W	780mm	Average	Moderate	Abnormal swelling or Bottle-butt at base. Slight lean towards the E; at 3.4m cavity noted on N side of main trunk, 30mm in diameter, extending inwards by 40mm, of no significance as has good surrounding woundwood and no changes in tone when struck with an acoustic mallet. Second cavity noted on W side of main trunk at 3.3m. Bifurcates at 6m, approx. 600mm at point of origin, N stem further divides into three sub-dominant stems at 10m, no cavities noted.	Yes	N & W sides of main trunk	Low	450-750mm	Intermittent	Low
39	T39	London plane	14m	3.75m N 3.25m E 3m S 4m W	880mm	Average	Moderate	Significant swelling to 1.1m particularly on the N side of the main trunk. Forks at 3.4m. Insignificant cavity on E side.	Yes	Sub-dominant stem orientated to E	Low	450-750mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
40	T40	London plane	14m	2m N 2m E 2m S 2m W	630mm	Average	Moderate	Slight lean towards E; cavity noted at 5m on main trunk orientated towards S; 130mm high, 30mm across, good surrounding woundwood revealing internal heartwood, no definite change in tone when struck with an acoustic mallet above or below the cavity. Of no significance.	Yes	On S side of main trunk	Low	450-750mm	Intermittent	Low
41	T41	London plane	12m	2m N 3.25m E 2.5m S 2.75m W	590mm	Average	Moderate	Swelling on buttress root to NW. Cavity on SW side of main trunk 250mm vertically and 100mm across, some exposed deadwood. There is some decay at the bottom of this cavity but when prodding the cavity extends no more than 50mm, good woundwood surrounds circumference of the wound. Bifurcates at 3.6m; co-dominant stems both approx. 500mm diameter at point of origin. Stem to SE at 6m has a completely occluded wound at approx. 10m. The stem further separates into two co-dominant stems about 0.5m in height; second stem orientates from W; further sub-lateral at 8m approx. 1m in length.	Yes	On SW side of main trunk	Low	450-750mm	Intermittent	Low
42	T42	Laburnum	n/a	n/a	n/a	n/a	n/a	Tree felled in 1992/1993	n/a	n/a	n/a	n/a	n/a	n/a
43	T43	London plane	12m	2.75m N 2.5m E 3m S 3m W	670mm	Average	Moderate	There is damage on a lateral root orientated to E consistent with mechanical wounding or a large vehicle driving over it. Minor cavity in between two prominent buttress roots which is orientated to NE when probed it extends a maximum of 60mm, considered insignificant. Bifurcates at 3.6m into co-dominant stems SW and NE (500mm at the point of origin).			Low	<150mm	Intermittent	Low
44	T44	London plane	12m	1.3m N 3m E 3m S 2m W	620mm	Average	Moderate	Cavity on E side of main trunk at 2.5m measures 180mm vertically, 90mm across, good surrounding woundwood with some reaction wood, probe only extends inwards by 140mm horizontally. No definite changes in tone surrounding cavity when struck with an acoustic mallet. Bifurcates at 4m; co-dominant stems; the first orientated to W and is 500mm at the point of origin; cavity at 6m on NW side, good woundwood formation around. On the same stem evidence of major laterals having been removed and are completely occluded. Second co-dominant stem is 500mm at point of origin, grows to NE, at 5m evidence of lateral having been removed and this has been completely occluded by woundwood.	Yes	On E side of main trunk	Medium	450-750mm	Intermittent	Noticeable

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
45	T45	London plane	12m	3m N 2.25m E 2m S 2.75m W	660mm	Average	Moderate	Tree leans to NE; significant amounts of swelling around the trunk at 1.4m. Two minor cavities are situated on the main trunk at 1.2m. Bifurcates at 2.6m, stem to NE is 450mm at point of origin. Cavity at 3.5m which comprises two individual cavities which have joined together resulting with a ridge of reaction between. N side cavity measures 320mm vertically, 200mm across, S side cavity is 130mm in diameter. Unable to probe upwards due to exposed heartwood but can only probe at an angle downwards by 170mm. Some differences in tone to 500mm below the cavity, no definite changes in tone above this on N stem. Second co-dominant stem is 500mm at point of origin, orientated to W where the sub divides into a sub-lateral at 5m.	Yes	N stem	Medium	450-750mm	Intermittent	Noticeable
46	T46	London plane	12m	3m N 3m E 3.5m S 2.75m W	890mm	Average	Moderate	Tree leans slightly to SW. Trifurcates at 3m into upright co-dominant stems, of up to 500mm at point of origin; evidence of a sub-lateral to SE having been removed. Insignificant cavity on NW side at 5m (60mm in height and 60mm across).	Yes	Stem orientated to NW.	Low	<150mm	Intermittent	Low
47	T47	London plane	12m	2m N 3m E 2.75m S 2m W	710mm	Average	Moderate	Buttress root to SE shows wounding consistent with vehicle damage. Cavity on main trunk at 3.4m on NE side measures 120mm in diameter, depth of 90mm horizontally; cavity at 3.7m on NW side measures 280mm across, 120mm high, no depth to cavity as only has exposed heartwood with surrounding woundwood. Cavity to SW with exposed heartwood is approx. 200mm across and 160mm in height, good woundwood formation but there is some decay. Third cavity at 3.2m, on N side is approx. 70mm in height and 50mm across with good woundwood formation. Bifurcates at 5m into co-dominant stems, stem to NE is 500mm at point of origin and sub-divides into sub-laterals at 10m	Yes	On NE side of main trunk	Medium	450-750mm	Intermittent	Noticeable
48	T48	London plane	12m	2m N 2.5m E 5m S 2.75m W	700mm	Average	Moderate	Trunk leans significantly to SW; bifurcates at approximately 8m, the co-dominant stem orientated to SW is 550mm at point of origin and is approximately 4m in length, further sub-divides into four sub-dominant uprights.			Low	450-750mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
49	T49	London plane	12m	2.25m N 3.5m E 2.75m S 2m W	820mm	Average	Moderate	Cavity between two prominent buttress roots orientated to NW and extends 40mm inwards. Trunk leans to SW bifurcates at 4.3m. Orientated N and S and up to 600mm diameter at point of origin. Two insignificant cavities with good surrounding woundwood orientated to SE on N stem at 8m and 9m.	Yes	Between buttress roots on NW side of trunk	Low	<150mm	Intermittent	Low
50	T50	London plane	12m	3m N 3m E 3m S 3m W	970mm	Average	Moderate	Swelling on main trunk from 1m to 2m, no significant changes in tone when struck with an acoustic mallet. Bifurcates at 2.6m, stem orientated to NE is 800mm at point of origin. Further sub-divides at 6m. The second stem is orientated to S, cavity at 4m on S side measures 140mm across, 200mm vertically, horizontal depth of 130mm; good surrounding woundwood and solid heartwood within.	Yes	Stem orientated to S	Medium	150-450mm	Intermittent	Low
51	T51	London plane	12m	2.5m N 2.2E 4.5m W	810mm	Average	Moderate	Bifurcates at 4.2m, stem orientated to SW is 600mm at point of origin; cavity at 7m orientated to SE. No changes in tone when struck with an acoustic mallet, good woundwood formation which has practically occluded the whole wound, sub-divides at 8m into two co-dominant stems; second stem is 600mm at point of origin; cavity noted at 4.4m orientated to NW, good woundwood formation around the wound. A second occluded cavity is noted on the same stem and orientated to N.	Yes	On sub dominant stems to NW to SE	Medium	450-750mm	Intermittent	Noticeable
52	T52	London plane	12m	2m N 3m E 2.25m S 2.1m W	790mm	Average	Moderate	Slight lean to SW. At 7m sub-lateral orientated to E approximately 2m in length; the central leader kinks quite significantly and is orientated to SW, it then further sub-divides into three uprights.			Low	<150mm	Intermittent	Low
53	T53	London plane	12m	2m N 2m E 2.5m S 2m W	520mm	Average	Moderate	Small cavity is noted in between the prominent buttress roots which are orientated to E (50mm deep). Single stem with sub-laterals coming off on all cardinal points all approximately 0.5m in length. Small cavity noted on main trunk orientated to E which is considered insignificant.			Low	<150mm	Intermittent	Low
54	T54	London plane	12m	3.5m N 3m E 3.75m S 3m W	750mm	Average	Moderate	Bifurcates at 2.9m orientated to SW and NE both 600mm at point of origin. Sub-divides between 8 mad 9m. No significant defects.			Low	<150mm	Intermittent	Low

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
55	n/a	Horse chestnut	12m	3m N 3m E 4.5m S 4m W	800mm	Average	Indifferent	Single trunk with significant cavity at 0.4m, 670mm in height; 200mm at top and 130mm at bottom, exposed heartwood with surrounding woundwood. Wound is typical of mechanical damage. Crown has recently been significantly reduced.	Yes	Main trunk	High	450-750mm	Intermittent	Noticeable
56	n/a	Horse chestnut	12m	4m N 6.5m E 6m S 6m W	760mm	Average	Hazardous	Significant cavity at base orientated to W; 340mm across, 170mm in height, old wound with solid but decaying heartwood, good surrounding woundwood formation; burrs noted on the base orientated to E. There are no buttress roots which suggests that the soil level may have been raised in the past.	Yes	Main trunk	Medium	450-750mm	Intermittent	Noticeable
57	T58	Dawn redwood	18m	4.2m N 4.8m E 4.5m S 4.75m W	520mm	Average	Good	Single vertical trunk with normal taper. Tree of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
58	T60	False acacia	16m	5.7m N 5.8m E 4.5m S 6.2m W	555mm @arf	Average	Indifferent	Twin stemmed from 1.5m; tight compression fork with evidence of included bark; of typical form and structure for species; no actionable defects noted.			Medium	150-450mm	Occasional	Low
59	G1	Purple plum	8.5m	3.5m N 0.5m E 3.5m S 4.5m W	180mm	Average	Moderate	Of typical form and structure for species; asymmetrical canopy as suppressed by adjacent trees; no actionable defects noted.			Low	<150mm	Occasional	Negligible
60	G1	Purple plum	8.5m	3.8m N 5.2m E 2.3m S 3.6m W	305mm @arf	Average	Moderate	Twin-stemmed from 1m; sound union; asymmetrical canopy as suppressed by adjacent trees; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
61	G1	Purple plum	8.5m	1.7m N 3.5m E 3m S 4m W	170mm	Average	Moderate	Asymmetrical canopy as suppressed by adjacent trees; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
62	T59	London plane	19.5m	11m N 10m NE 12.1m E 10.6m SE 10.6m S 12.1m SW 12.1m W 10.7m NW	1040mm	Average	Good	Situated on a raised mound of earth in the centre of the garden; exposed surface roots to N and NE; no damage on upper sides; prolific buttress roots 360° round base of trunk; stout vertical trunk; bifurcates at 4m with large sub-dominant limb leaning to N; dominant stem vertical; main crown break from 4m; all unions appear sound; open growing canopy typical of species in this setting; some of lower boughs starting to become over extended and with ends extending further than the main canopy particularly to the E and SW; however the unions of these limbs at points of origin appear sound. Tree is readily visible as it is the dominant specimen within the site; of high amenity value.			Low	<150mm	Occasional	Negligible
63	n/a	Olive	4m	1.5m	80mm	Average	Good	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
64	n/a	Flowering cherry	4m	1.5m N 2m NE 2m E 3.1m SE 2m S 1.75m W	110mm	Low	Moderate	Sparsely foliated; above average deadwood in crown; above average epicormic growth within crown; no actionable defects noted.			Low	<150mm	Occasional	Negligible
65	n/a	Himalayan birch	6m	4m N 4m E 4.3m S 4.4m W	300mm @arf	Average	Indifferent	Four-stemmed from base; unions appear sound; no actionable defects noted.			Low	<150mm	Occasional	Negligible
66	n/a	Judas tree	4m	1.6m N 2m E 2.5m S 2m W	80mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
67	n/a	Judas tree	4m	1.9m N 2.2m E 1.7m S 2m W	80mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
68	n/a	Myrobalan plum	9m	3m N 3.5m E 2.5m S 1.7m W	175mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
69	n/a	Apple	5m	1.5m	80mm	Average	Moderate	Small suppressed tree; no actionable defects noted.			Low	<150mm	Occasional	Negligible

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
70	n/a	Myrobalan plum	9m	3m N 3.5m E 2.7m S 3.5m W	160mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
71	n/a	Himalayan birch	5m	1.6m N 2.4m E 1.2m S 2.3m W	65mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
72	n/a	Himalayan birch	5m	1.7m N 1.5m E 1m S 2m W	65mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
73	n/a	Himalayan birch	5m	1.8m N 2m E 1.7m S 1.5m W	70mm	Average	Moderate	Of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
74	n/a	Flowering cherry	7m	2m N 1.3m E 2m S 2.2m W	180mm @arf	Average	Indifferent	Twin-stemmed from base; tight compression fork with evidence of included bark; mutually drawn up stems; no actionable defects noted.			Medium	<150mm	Occasional	Low
75	T57	Blue cedar	8.5m	7.1m N 5.1m E 5.3m S 5.7m W	350mm	Average	Indifferent	Prolific buttress roots at base on S and SE; stout vertical trunk; bifurcates at 2.5m to co-dominant stems N and S; tight fork; beginnings of included bark; S stem leans heavily to the W; N stem is vertical to 4m then forks into subsidiary branches some of which lean heavily N and W; results in the tree having no central leader and a low spreading canopy in all directions; at present no risk of failure but should be monitored on a regular basis due to different form.			Low	<150mm	Occasional	Negligible
76	n/a	Himalayan birch	5m	2.7m N 2.5m E 2.7m S 2.7m W	190mm @arf	Average	Indifferent	Twin-stemmed from base; tight compression fork with evidence of included bark; no actionable defects noted.			Low	<150mm	Occasional	Negligible
77	n/a	Mimosa	9.5m	4.6m N 2.9m E 4.9m S 3.7m W	235mm	Average	Moderate	Slight lean to NW; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
78	n/a	Box elder	6m	2.5m N 2.5m E 2.7m S 2.8m W	90mm	Average	Moderate	Of typical form and structure for species; suppressed lower down by adjacent specimens; no actionable defects noted.			Low	<150mm	Occasional	Negligible

No.	TPO no.	Species	Height	Crown Spread	Trunk diameter	Physio - logy	Structure	Comments	Cavity > 100m	Location	Failure potential	Size of Part	Target use	Hazard Rating
79	n/a	Box elder	6.6m	3m N 2.2m E 2m S 2.7m W	130mm @arf	Average	Moderate	Twin-stemmed from base; asymmetrical canopy as suppressed by adjacent trees; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
80	n/a	Flowering cherry	4m	2m N 2.3m E 2m S 1.8m W	130mm @arf	Average	Moderate	Small suppressed tree; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
81	n/a	Flowering cherry	4m	3m N 3m E 4m S 2.6m W	160mm	Average	Moderate	Twin-stemmed from 1m; tight fork with beginnings of included bark; no actionable defects noted.			Low	<150mm	Occasional	Negligible
82	n/a	Flowering cherry	2m	1.3m	60mm	Average	Moderate	Small suppressed tree; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
83	n/a	Himalayan birch	4.5m	2.7m N 2.5m E 1.6m S 2m W	260mm @arf	Average	Indifferent	Four-stemmed from base; tight compression forks with evidence of included bark; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
84	n/a	Hazel	5m	4m N 3.7m E 3.2m S 3.4m W	250mm @arf	Average	Indifferent	Twin-stemmed from base; tight fork with beginnings of included bark; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
85	n/a	Hazel	7m	3.7m N 3.8m E 3m S 2m W	300mm @arf	Average	Indifferent	Multi-stemmed from base; of typical form and structure for species; no actionable defects noted.			Low	<150mm	Occasional	Negligible
101	n/a	Leyland cypress	9.5m	2m N 3.5m E 3.5m S 3.25m W	245mm	Average	Indifferent	Off site tree growing in rear garden of No. 185 Sutherland Avenue; no actionable defects noted.			Low	<150mm	Intermittent	Low
102	n/a	Leyland cypress	10m	3.25m N 3.5m E 3.5m S 3m W	290mm	Average	Moderate	Off site tree growing in rear garden of No. 185 Sutherland Avenue; no actionable defects noted.			Low	<150mm	Intermittent	Low
103	n/a	Leyland cypress	9.5m	2m	170mm	Average	Indifferent	Off site tree growing in rear garden of No. 185 Sutherland Avenue; no actionable defects noted.			Low	<150mm	Intermittent	Low

APPENDIX 2

Photo 1. **Tree no. 11**

Photos 2 & 3. **Tree no. 18**

Photo 4. **Tree no. 26**

Photo 5. **Tree no. 55**

APPENDIX 3

Formosa Amenity
Garden Tree and Subsidence Survey 2011

House/Flat no.	Road	How long lived at this address	Has property experienced any cracking of masonary or plaster since you've lived there	Has property experienced any changes to the windows or doors that make them jam?	If there has been any cracking of masonary or plaster, or jamming of windows and doors was an insurance claim made?	Were any soil tests undertaken?	Was a structural report produced?	Were remedial works undertaken to your property?	Have you had cosmetic works carried out to fix any cracks/ window or door problems?	Has your house been underpinned?	Do you have details that show what part(s) of the property were underpinned	Additional comments
			If so, please give details of the extent of the cracks and when they occurred? (Year)	If so, please give details of the extent of the problems and when they occurred (Year)	If so, please give details of the extent and location of cracks, and year they occurred.	If so, please give details of when (year) the tests were carried out and by whom the tests were done.	If so, please give details of when (year) and by whom the reports were produced.	If so, please briefly explain what those works were.	If so, when	If so, what year please?	Would you be able to let us have details of the works?	n/a
30	Castellain Road	9 years	No	No	n/a	No	n/a	n/a	No	Yes - 1985	No	n/a
										1985		
12 b	Castellain Road	n/a	Yes - 1999 / 2000	No	Yes	Yes - 1998 / 1999	No	No	No	Yes - 2000 / 2001	No	
			Subsidence crack 1999/2000	n/a	n/a	Tests done by structural engineer, Aurther J Ferryman & Associates 128 High Street Bushey Herts 1998/99 0208 950 0508	n/a	n/a	n/a	2000/01	n/a	Pollarding of trees has improved the subsidence issue
Top Flat 2	Castellain Road	3 years	Yes	Yes	No	No	n/a	n/a	No	No	n/a	n/a

			Gentle cracking to both sides of the house some larger cracks around doors	Slight jam of one external door change seasonally	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ground floor, 30	Warrington Crescent	11 years	Yes - since 2000	Yes	Yes - remedial works 2006, new cracks 2007	Possibly	Yes	see 8 and 9	see previous	No	n/a	Understand that the plane trees in the garden cause the subsidence. In present pollarded state beauty has diminished would like to see plane trees near houses suffering from subsidence removed and replaced with small ornamental specimens.
			In the lightwell and sitting room at the rear of the house. Bad cracking in walls, parapets and cornices and consequent damp penetration. An ongoing problem which has recurred from 2000 to 2011	French windows at back leading on to communal garden have dropped and the shutters have warped. Ongoing problem, being replaced by Insurance company this year 2011	In 2000 vertical crack-wide in light well fixed in 2006 new cracks appeared in same place in 2007. In sitting room, cracking on side walls & cornices, remedied 2006, reappeared 2007 ongoing. New insurance claim in progress and remedial work to be done on light, basement& ground floors 2011	Davies Project Managed Subsidence, Bourne House, 3 Redbourne Avenue, Finchley N3 2 BP. Att Glenn J Cleaver	see 9	Remedial works in 2006 and to be repeated 2011 by Davies Project Managed Subsidence		n/a		n/a
20a	Castellain Road	24 years	Yes - since 1987	Yes - 1987-1990	No	Yes	Yes	Yes	n/a	Yes - 1991	Yes	n/a

			From 1987 onwards	1987-1990	n/a	The flat was underpinned in 1991.	Bryan Packman & Marcel	Underpinning of whole building	n/a	1991	Building was underpinned had leave flat for 6 months	n/a
26a	Castellain Road	4 years	No	No	No	n/a	n/a	n/a	n/a	Yes - 2010	Front of building in vault	n/a
		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2010	n/a	n/a
145	Sutherland Avenue	2 years	No	No	n/a	No	n/a	House was underpinned in 2008-09 when major renovation was done and lower ground floor excavated to provide higher bedroom. No structural report available	No	Yes 2008-2009	All four walls	n/a
177	Sutherland Avenue	2 years	Yes	No	No	No	No	No	Yes - 2008	Possibly contact Flat 2 177 Sutherland Avenue	Yes	n/a
		n/a	Minor cracks to masonary around bay window area	n/a	n/a	n/a	n/a	n/a	Sep-08	Possibly contact Flat 2 177 Sutherland Avenue	Mentioned by solicitor when purchasing property	n/a
Flat 4 153	Sutherland Avenue	11 years	No	No	n/a	No	No	No	No	1995	n/a	n/a

Basement/ ground floor flat, 1st Floor flat 141	Sutherland Avenue	24 years	No	No	n/a	n/a	n/a	n/a	n/a	No	n/a	Last tree survey noted possible heave, hence the reason for pollarding regime
Garden Maisonette, 38	Warrington Crescent	8 years	No	No	No	No	n/a	n/a	No	Yes - in 1990s		n/a
			Minor cracks due to temperature changes & new plastering	n/a	n/a	n/a	n/a	n/a	n/a	Cant recall exact date but it was in the 1990s	The rear of the property facing onto the garden	n/a
4	Warrington Crescent	41 years	Yes	Yes	No	No	n/a	n/a	Yes	No	n/a	Cracks appear at various locations at front and back of house. Restore and paint various areas
			n/a	Doubtful damage is due to trees.	n/a	n/a	n/a	n/a	Various over 40 years	n/a	n/a	n/a
Garden flat, 20	Warrington Crescent	28 years	No	Yes	No	No	n/a	n/a	Every few years since 1984, when major works are carried out	No	n/a	n/a
			The house moves all the time of the day over 28 years. Sometimes there is a crack inside that we monitor that opens & closes.	We have to have the doors adjusted every few years.	Currently monitoring jagged crack above windows on garden side, so is the No 22				Every few years since 1984, when major works are carried out			Advised years ago by Mr Akers,Tree Officer at the time to 'water your foundations' whenever there is no hose pipe ban let the house run on both beds each side of our property'

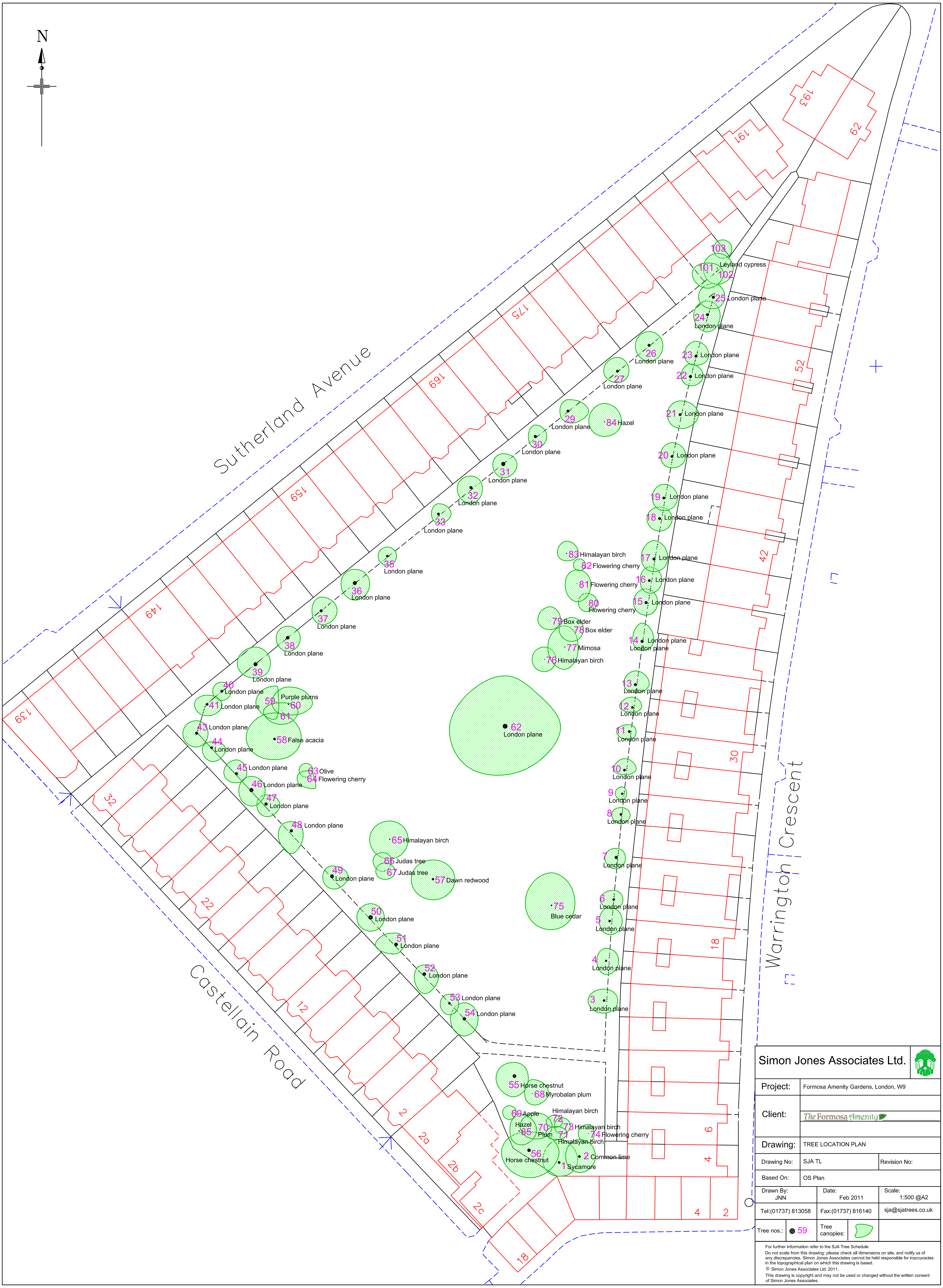
Flat 4, no. 8	Warrington Crescent	12 years	No	Yes Kitchen window at back has always jammed. Poor fit due to alteration to frame.	n/a	n/a	n/a	n/a	No	No	n/a	n/a
42	Warrington Crescent	16 years	yes - 1996	n/a	Yes - 1996	n/a	Underpinnig 1997	Yes	Yes	Yes - 1997	Yes will look for documents	n/a
			Subsidence 1996- significant cracks in basement underpinning required on the garden side	not since underpinning	1996	n/a	will look for documents. Managing agent may hold full details	Underpinning on garden side of property 1997	Repairs and repointing undertaken every 5 years	1997	Yes	n/a
Flat 2/3 28	Warrington Crescent	12 years	Yes	Yes	Yes	Yes	Yes	n/a	Yes - continually over last decade	No	n/a	n/a
			Several large cracks in walls of terrace(party walls and long wall facing Formosa Gardens	Continual problems to back windows (facing Formosa Gardens)	see previous comments	Formosa Management have the details	Formosa Management have the details		Continually over the last decade			n/a
48	Warrington Crescent	13 years	No	No	n/a	n/a	n/a	n/a	Nothing material - only in the normal course of redecoration	No	No	n/a
40	Warrington Crescent	8 years	Yes - 2004	Yes - 2004-2009	Yes	Not this time	n/a	Yes	Yes	Yes - 1998 approx	No	Pillars and parts of wall from ground floor towards pavement and front entrance path down to basement area crack regularly even after repair. Possibly a result of heave/ subsidence

			Cracks in flank and over one door, first floor, also suddenly cracked window, top floor 2004	First floor door 2004-2009. Underpinning to rear of house done approx 1998	Inspection suggested movement due to removal of wall in basement, although does not explain crack in flank wall (to 38)	n/a	Soil report etc prior to underpinning, previous owners have moved away.	Underpinning to rear of building by past freeholders (under insurance)	During routine maintenance/ redocoration	see q. 13	No	n/a
26	Warrington Crescent	Capital Property Management have managed the property on behalf of the landlord for 8 years	Yes	yes				yes	yes			
28	Warrington Crescent	Capital Property Management have managed the property on behalf of the landlord for 8 years	yes	yes				yes	yes			n/a
34	Warrington Crescent	n/a	Yes	No	Yes	Yes - 1997	No	Yes	Yes - 2006	No	n/a	The cracks regularly upto this day, regular maintenance is required

			Cracks in basement flats 34A & 36H, and in ground floor flats 34b & 36G. Cracks usually 2-3mm			See attached letter from True Associates Ltd 3/3/1997 & Borehole Report by Structural Bonding 28/1/97	see surveyors letter q.9	Ceiling & wall cracks made good in flats 34A, 34B, 36H &36G with metal lath reinforcement	Believed to be in 2006 to flats 36G, 36H & Asphalt roof above the rear rooms of these flats		Yes but not if details have been retained	n/a
36	Warrington Crescent	n/a	Yes	No	Yes	Yes - 1997	No	Yes	Yes - 2006	No	n/a	The cracks regularly upto this day, regular maintenance is required
			Cracks in basement flats 34A & 36H, and in ground floor flats 34b & 36G. Cracks usually 2-3mm			See attached letter from True Associates Ltd 3/3/1997 & Borehole Report by Structural Bonding 28/1/97	see surveyors letter q.9	Ceiling & wall cracks made good in flats 34A, 34B, 36H &36G with metal lath reinforcement	Believed to be in 2006 to flats 36G, 36H & Asphalt roof above the rear rooms of these flats		Yes but not if details have been retained	n/a
30	Warrington Crescent	20 years	yes - 1996	yes - 1996	yes - 1996	yes	Yes	Yes	2011	No	n/a	
			Please see attached report dated 1997	Please see attached report dated 1997	Please see attached report dated 1997	Please see attached report dated 1997	Please see attached report dated 1999	Making good of finishes internally and externally	2011	no	n/a	
179 A	Sutherland Avenue	10 years	No	No	n/a	n/a	n/a	n/a	No	Yes	Yes, possibly bay window rebuilt/ refurbished (2 floors) and vertical barrier put out 12" out into garden to protect against tree roots	Underpinned at back
		n/a	Cracks at front from highway trees	n/a	n/a	n/a	n/a	n/a	n/a	unsure	No	n/a
12A	Castellain Road	20 years	Yes - 2000	Yes - 1990 & 2010	Yes	Yes	Yes	Yes	Yes	Yes - 2001	Yes	Insurance is high due to underpinning.

			2000 basement flat has a diagonal crack in kitchen and outside wall. Possibly also a hallway (communal) crack which has affected No 10	Front door frame seems crooked, locks moved in 1990 and 2010	see comment in question 6	see Phil in flat 12b	2000/2001 see Phil Flat 12b	Underpinning at back	2001	2001	Yes see comment in q. 11	n/a
Ground floor, 30	Warrington Crescent	11 years	Yes	Yes	Yes	Possibly	Yes	see 8 and 9	see previous	No	n/a	Understand that the plane trees in the garden cause the subsidence. In present pollarded state beauty has diminished would like to see plane trees near houses suffering from subsidence removed and replaced with small ornamental specimens.

APPENDIX 4

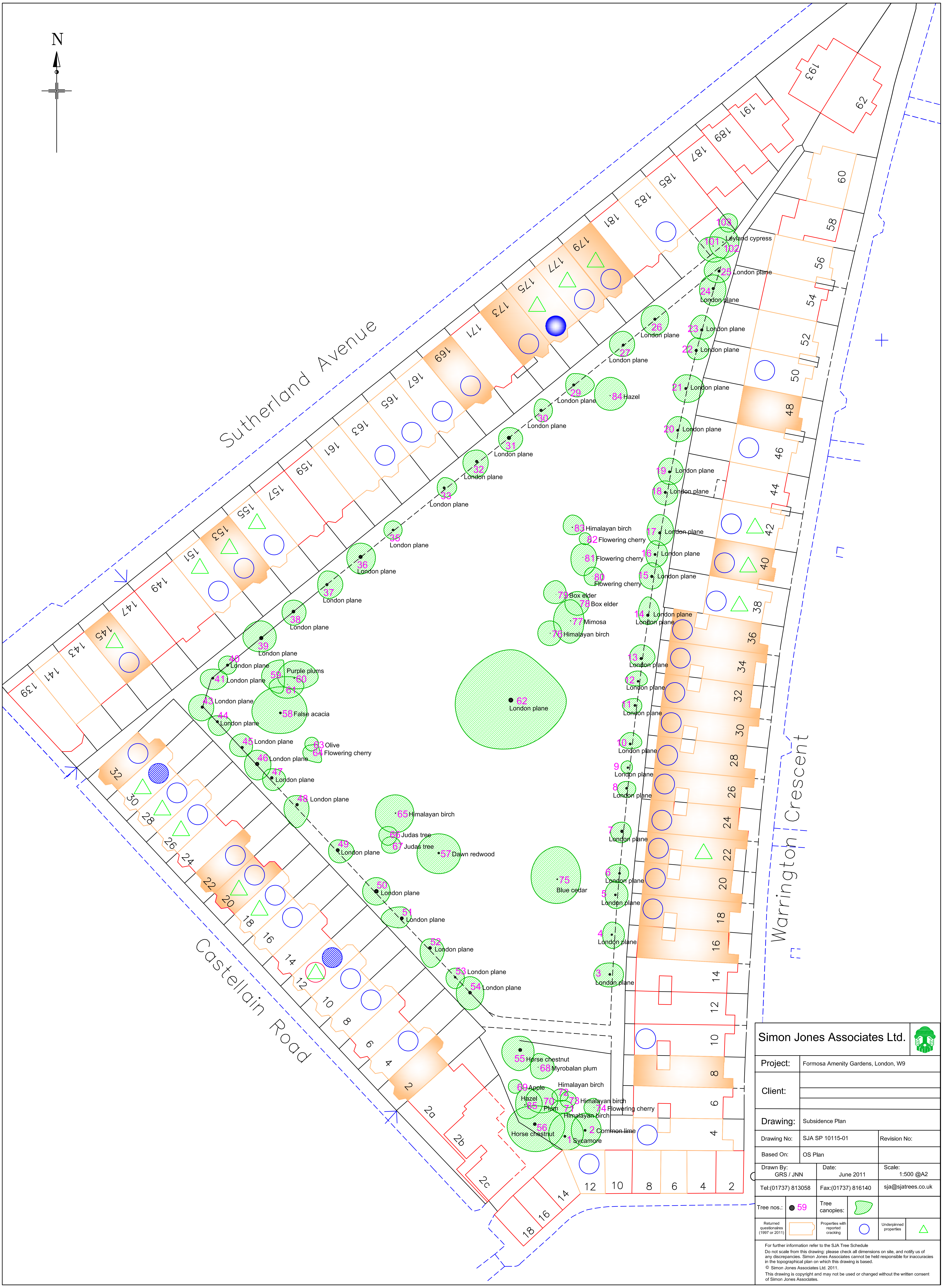


Simon Jones Associates Ltd.	
Project:	Formosa Amenity Gardens, London, W9
Client:	The Formosa Amenity
Drawing:	TREE LOCATION PLAN
Drawing No:	SJA TL
Revision No:	
Based On:	OS Plan
Drawn By:	JNN
Date:	Feb 2011
Scale:	1:500 @A2
Tel:(01737) 813058	Fax:(01737) 816140
sja@sjatrees.co.uk	
Tree nos.:	59
Tree canopies:	

For further information refer to the SJA Tree Schedule

Do not scale from this drawing: please check all dimensions on site, and notify us of any discrepancies. Simon Jones Associates cannot be held responsible for inaccuracies in the topographical plan on which this drawing is based.

APPENDIX 5



Simon Jones Associates Ltd.		
Project:	Formosa Amenity Gardens, London, W9	
Client:		
Drawing:	Subsidence Plan	
Drawing No: SJA SP 10115-01		Revision No:
Based On: OS Plan		
Drawn By: GRS / JNN	Date: June 2011	Scale: 1:500 @A2
Tel:(01737) 813058	Fax:(01737) 816140	sja@sjatrees.co.uk
Tree nos.: 59	Tree canopies:	
Returned questionaires (1997 or 2011)	Properties with reported cracking	Underpinned properties

For further information refer to the SJA Tree Schedule

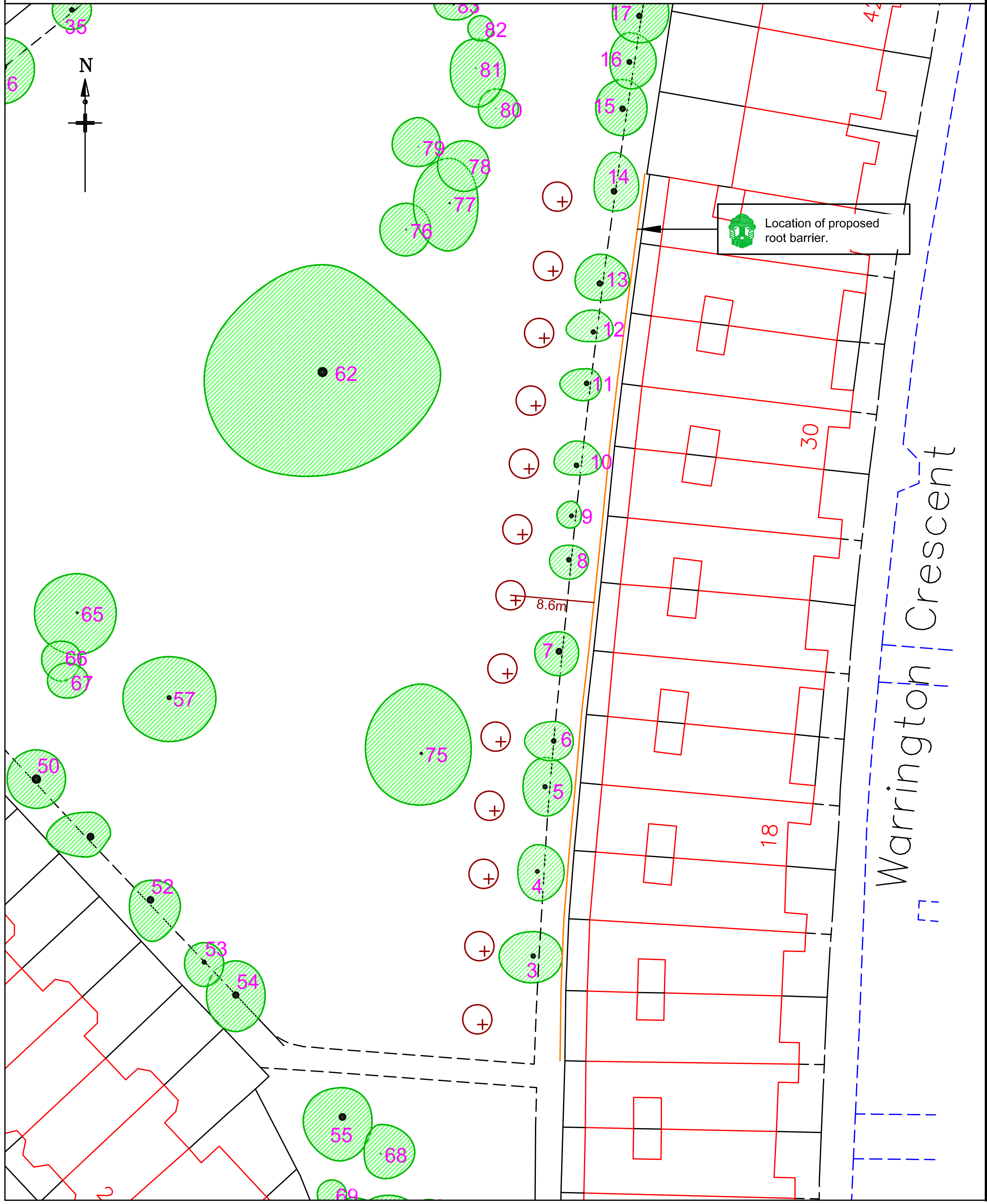
Do not scale from this drawing: please check all dimensions on site, and notify us of any discrepancies. Simon Jones Associates cannot be held responsible for inaccuracies in the topographical plan on which this drawing is based.

APPENDIX 6

Tree Planting - Option 1

Name	Designation	Girth / Height	Root system	Planting location	Quantity	Comments
London plane *Platanus X hispanica*	Extra-heavy Standard	14 - 16 cm / min. 350cm	Container-grown	⊕	13	Planted at regular intervals, no closer than 7.5m from rear elevation of buildings. Will require pruning to maintain height and spread. Size and species to be agreed.

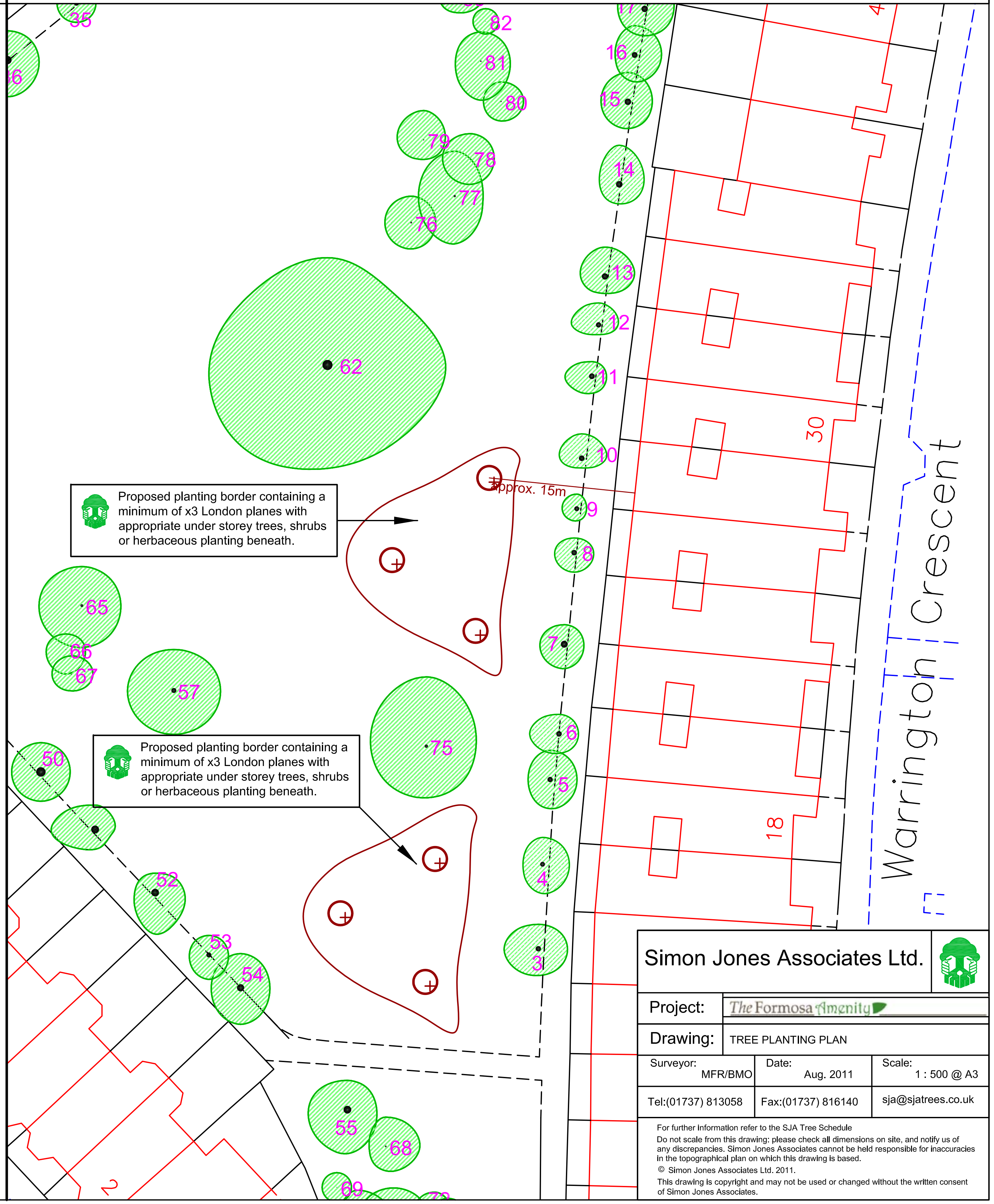
Plant material shall comply with British Standard BS3936: Part 1: 1992, "Nursery Stock, Part 1. Specification for trees and shrubs". Planting shall be undertaken in accordance with British Standard BS4043: 1989, "Transplanting root-balled trees".



Tree Planting - Option 2

Name	Designation	Girth / Height	Root system	Planting location	Quantity	Comments
London plane *Platanus X hispanica*	Extra-heavy Standard	14 - 16 cm / min. 350cm	Container-grown	⊕	6	2 planting beds with 3 trees that can grow to full maturity. Under-storey trees planted beneath. Size and species to be agreed.

Plant material shall comply with British Standard BS3936: Part 1: 1992, "Nursery Stock, Part 1. Specification for trees and shrubs". Planting shall be undertaken in accordance with British Standard BS4043: 1989, "Transplanting root-balled trees".



Simon Jones Associates Ltd.

Project:	The Formosa Amenity
Drawing:	TREE PLANTING PLAN

Surveyor:	Date:	Scale:
MFR/BMO	Aug. 2011	1 : 500 @ A3

Tel:(01737) 813058 Fax:(01737) 816140 sja@sjatrees.co.uk

For further information refer to the SJA Tree Schedule

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