TREE HEALTH AND STRUCTURAL INTEGRITY REPORT

OUR REF: JM/3174R/sh

YOUR REF:

DATE: Monday 2nd June 2014

CLIENT: Hortech Ltd

SITE ADDRESS: Seven London Plane trees at;
Cartwright Gardens, and
Woburn Square Gardens,
Gordon Square Gardens, and
Malet Street Gardens
London, WC1.

DATE/TIME OF VISIT: Friday 25th April and Wednesday 14th May 2014

PEOPLE PRESENT: Mr J Mills and Mr R Potter from Hortech on the 25th April and Mr J. Mills and Mr J. Lawson on the 14th May 2014.

REPORT COMPLETED BY: Mr Jason Mills

Note

In reading and understanding the contents of this report it should be remembered that no tree can be deemed risk free. As with all things in the natural environment, they are subject to unpredictable forces such as extreme weather, effects of disease, and man's influence upon them. We investigate every obvious and available facet of the tree's structure and its surroundings in reaching a conclusion as to a level of risk. These conclusions and recommendations seek to reduce the level of risk the tree may pose to one that could be considered acceptable, given the tree's location, site use, and owner's acceptance of the level of risk and the perception of its value to the environment. No tree can ever be considered completely hazard free, and regular monitoring of the tree and its surroundings should be undertaken by the owner and their appointed specialist advisors, where necessary on a cyclic and recorded basis.

REPORT REFERENCES

As a progressive company, we keep abreast of research data relating to arboriculture. All observations, recommendations and works are based on current industry standard reference material and extensive FA Bartlett research findings derived from the company's own facilities at University of Reading UK and Charlotte in the USA. A selection of pertinent items is shown in Appendix 2.

REPORT LIMITATIONS

A Basic* tree risk assessment and tree health inspection were conducted on each tree identified in the scope-of works. Trees not included in the scope-of-work were not inspected. Tree details are approximations made to a level that is required for the purposes of this report. These tree details include species identification, tree dimensions, age range and vigour entered within the report. Observations were made from ground level, the tree was not climbed.

All tree risk assessments undertaken during surveys or inspections either on single trees or multiples of trees, use the methodology established by the International Society of Arboriculture, in the publication, "Best Management Practice – Tree Risk Assessment" (Smiley, Matheny and Lilly 2011) and in the F.A. Bartlett publication 'Tree Risk Management' (Smiley, Fraedrich, Hendrickson 2009), Principles of Tree Hazard Assessment & Management (HMSO Lonsdale 1999), Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines, 4th Edition (Harris, Clark and Matheny 2004). This format may be specifically detailed in text related to reports on single and smaller groups of trees but will be implicit for large scale surveys unless specified to the contrary by the client.

It is not possible to maintain trees free of risk, some level of risk must be accepted in order to experience the full range of benefits that trees provide. As such we reference the recently published document by the National Tree Safety Group (NTSG), Common sense risk management of trees (Forestry Commission 2011). This document provides guidance on trees and public safety in the UK for owner's managers and advisors.

Note: *Basic assessment as described in the ISA BMP for tree risk assessment is a detailed visual inspection of a tree and surrounding site that may include the use of simple tools. It requires that a tree risk assessor walk completely around the tree trunk looking at the site, above-ground roots, trunk and branches.)

TREE PRESERVATION ORDER & CONSERVATION AREA PROTECTION

The tree Preservation Order (TPO) and Conservation Area (CA) status of the trees inspected has not been established. Before any recommended tree works are carried out as prescribed within this report, clarification must be obtained from the Local Planning Authority on the status of each tree as to whether it is subject to a Tree Preservation Order (TPO) or is protected by virtue of its location in a designated Conservation Area.

TREE DETAILS

The trees were initially visited on Friday 25th April 2014 by Mr J. Mills and Mr R. Potter from Hortech who pointed out the relevant tree locations and provided copies of site location plans. The four sites were revisited on Wednesday 14th May with Mr J. Mills and Mr J. Lawson in attendance to complete the inspections and tests.

In all 7 No. London Plane (*Platanus x hispanica*) trees were inspected as follows;

Tag No(s).	Location	Estimated age (years)	Estimated Height in metres	Stem diameter (mm)	Crown spread			
					N	E	S	W
477	Gordon Square	120 (+/-20)	31.5	1230	11	12	11	16
495	Gordon Square	120 (+/-20)	33.5	890	11	5	5	6
503	Gordon Square	120 (+/-20)	32.5	1200	4	10	4	10
511	Gordon Square	120 (+/-20)	30.5	965	7	9.5	8	8
587	Woburn Square	140 (+/-20)	30.5	1460	11	9.5	9.5	8.5
750 (361)	Malet Street Gardens	140 (+/-20)	34.0	1170	5.5	10	7	11.5
433 (622)	Cartwright Gardens	120 (+/-20)	29.5	1250	10	12.5	10	11.5

The further inspections and testing has been carried out following concerns as to the health and safety of the specified trees, which were raised during routine inspections carried out by a third-party. In addition, it is understood that a branch or piece of a branch is alleged to have previously fallen from tree 503, involving a member of the public. We are unaware of any conclusive evidence that part of the tree did fall to ground.

All of the specified trees are located in areas in which public access is available beneath their respective canopies and the public highway is within falling distance of each tree inspected. Site intensity in the vicinity of all specified trees is considered to be high.

Tree Evaluation

Each tree's root zone, root flare and buttresses were inspected and, where necessary, were probed. The stem and main scaffold limbs were visually inspected and probed where access allowed. The tree's crown, main branch framework and shoot extension growth were inspected from the ground with the aid of binoculars. Any accessible limb or stem unions suspected of having decay or cracks were also probed. Results from these assessments are included in the text below.

Additionally evidence of fungal activity, and disease was investigated and noted.

AERIAL MAP

Aerial Map showing the location of the seven London Plane trees.

Map courtesy of Google Maps.

THE TESTS; USING A SONIC TOMOGRAPH (PICUS)

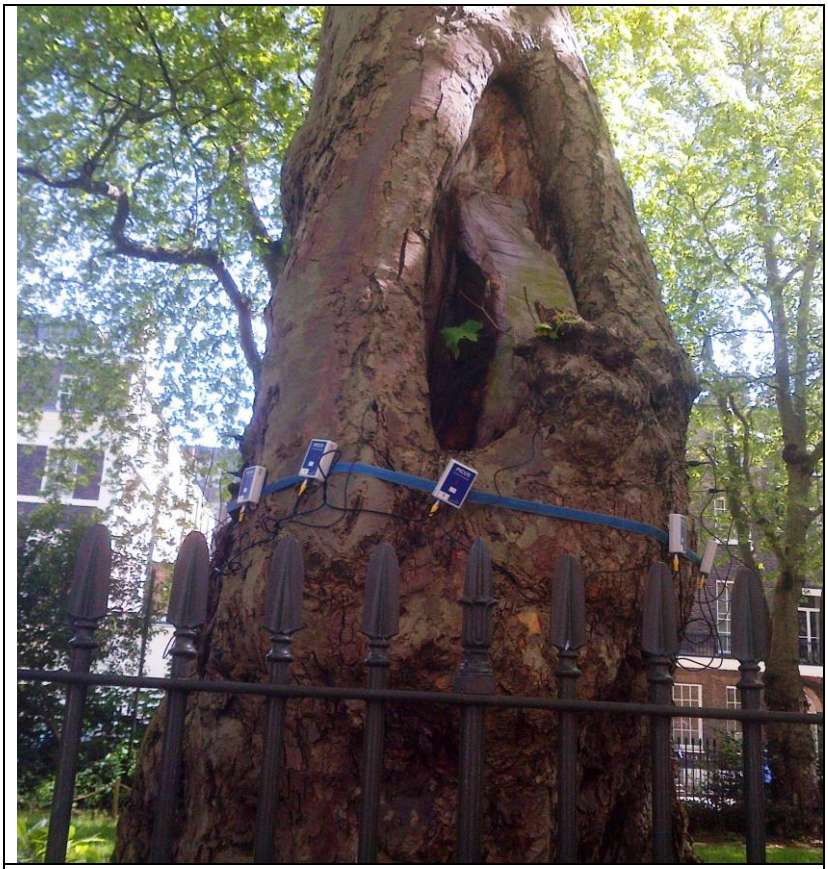
With the exception of tree No. 750 (361), a PICUS* test was conducted for each specimen. Insufficient space was found between tree No. 750 (361) and the nearby wall to install the apparatus and carry out a PICUS test; however inspection at the base of the main stem did not suggest that a PICUS test was required.

Trees Nos. 511 and 587 were tested at the base of the highlighted cavities within the main stems, at 2.4 metres and 1.8 metres above the ground level respectively in order to assess the extent of any decay in the main stem. The remaining trees were tested as close to ground level as possible to assess extent of any basal decay.

*Picus testing (Sonic Tomograph) enables almost un-injurious testing of a suspect tree stem. Sensor units are attached to adjustable webbing and small nails are driven into the bark to contact the sapwood tissue beneath. Each of the twelve nails is struck with a test hammer. Each blow is picked up by the sensor array around the tree stem (sound travels fastest through solid wood and very slowly through decay). The relative speeds of reception are uploaded onto a data file and processed into a visual image of the interior of the tree stem, using the software provided with the Sonic Tomograph. This image (Tomogram) indicates solid wood (Brown colours) to voids/damaged tissue (Purple/Blue colours). This information is for inclusion along with other data in the overall assessment of a tree's condition.

For all tests the site of sensor 1 was located on the north side of the tree stem. The subsequent eleven sensors were spaced at regular intervals around the tree stem at a corresponding height (see photograph below).

PHOTOGRAPH OF LOCATION OF SENSORS

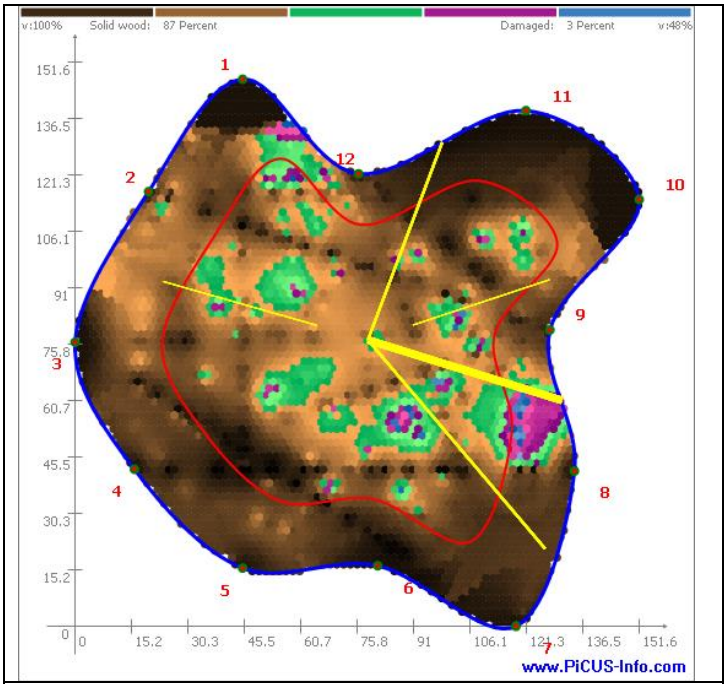


Picture 1 – The photograph above shows the sensors attached to the main stem of tree No. 587 at 180 centimetres above ground level.

FINDINGS

TREE NO. 477 - LONDON PLANE

RESULT OF SONIC TOMOGRAPH (PICUS) TEST



Tomogram at 35 centimetres above ground level.

Analysis of PICUS Sonic Tomogram;

The sonic tomograph (Picus) test was conducted as close to ground level as was possible at the time, avoiding the flare of the buttressing and local obstruction. The results (Tomogram) show small mottled areas of damaged wood (Purple/Blue colours) and partially damaged wood/incipient decay (Green colour) within the central, northern and eastern areas of the main stem. Overall 87% of the cross-section is represented as solid wood, 10% as partially damaged wood and 3% damaged/ decayed wood. The small areas of damaged and partially damaged wood possibly indicate isolated areas of softened wood. However the mottled pattern is indicative of infection, and has similarities with tomograms displaying infection by the soft rot fungus *Kretzschmaria deusta*.

The circumferential red line on the Tomogram indicates Mattheck's't/R' ratio, (when the stem of a tree with a full crown is two thirds or more hollow the probability of failure is high). It can be seen that the small mottled areas are predominantly contained within the circumferential red line.

The yellow radial lines shown on the tomogram indicate possible cracks or barriers to the sound-waves in the wood. The thickness of the yellow lines displayed by the software is indicative of the relative size of the underlying crack. In this case there is a network of cracks on the eastern side of the main stem, the wider indicated crack between sensors 8 and 9 is considered to be in part influenced by included bark.

Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry and has average vitality with minor dead wood amounting to less than 5% of the crown mass. The calculated live crown ratio (LCR) of the tree is 70%, which is acceptable. The crown above the over-extended limb emanating at 10.0 metres on the west side of the main stem is heavily weighted.

There are cavities in scaffold limbs at 13.0 metres on the north side of the main stem, overhanging the footpath and at 12.0 metres on the east side of the main stem, to which is attached a fungal fruiting body of the species *Inonotus hispidus*.

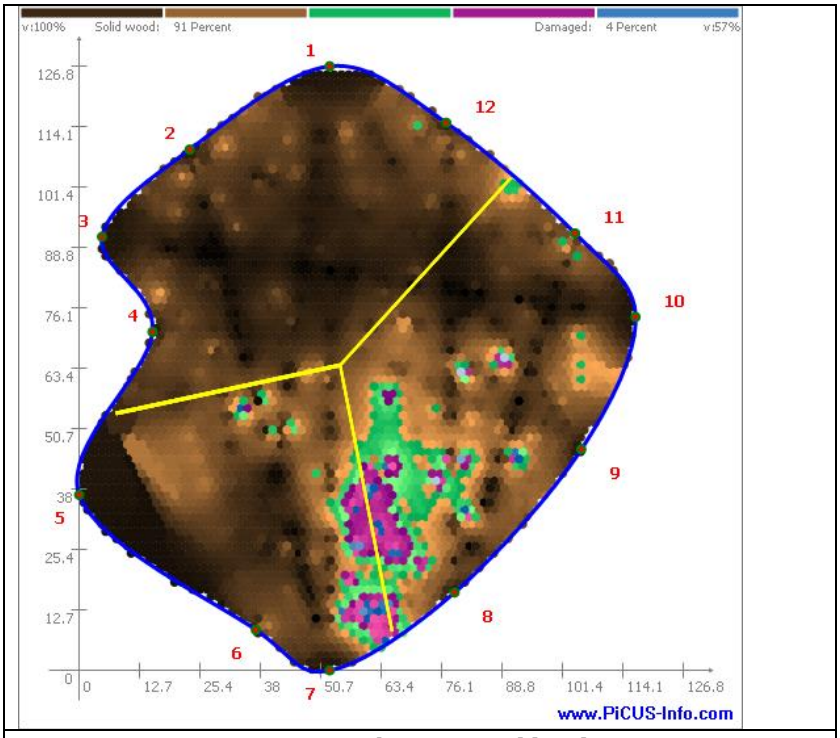
The co-dominant stems have been historically restrained by the installation of bracing systems. There is taut invasive bracing at approximately 15.0 metres and a more recent non-invasive belt system, which is allowing for some stem movement at 19.0 metres.

Prior to inspection of the base of the main stem the ivy and basal growth was cleared to a sufficient extent to allow a preliminary inspection of the main stem and buttressing. Inspection here revealed no evidence of any fungal fruiting bodies, including those of *Kretzschmaria deusta,* however the base of the stem to the north was partially obscured by dense vegetation. Tapping the exposed buttressing with a mallet revealed no evidence of hollow sounds that would suggest underlying decay. The main stem displays a minor lean to the south, which is not currently considered to be significant.

As a result of the location of this tree, being adjacent to the boundary wall of the gardens, it is likely that historical disruption in the root-zone has occurred, however there is no visible evidence of any recent root severance.

TREE NO. 495 - LONDON PLANE

RESULT OF SONIC TOMOGRAPH (PICUS) TEST



Tomogram at 10 centimetres above ground level.

Analysis of PICUS Sonic Tomogram;

The sonic tomograph (Picus) test was conducted as close to ground level as was possible at the time, avoiding the flare of the buttressing. The results (Tomogram) show damaged wood (Purple/Blue colours) on the southern side of the main stem. Overall 91% of the cross-section is represented as solid wood, 5% as partially damaged wood and 4% as damaged/decayed wood. The relatively small areas of damaged wood likely indicate isolated areas of softened wood, possibly related to decay within central root zone, which may be expected for a tree of this maturity.

The yellow radial lines are considered to likely indicate the presence of radial cracking.

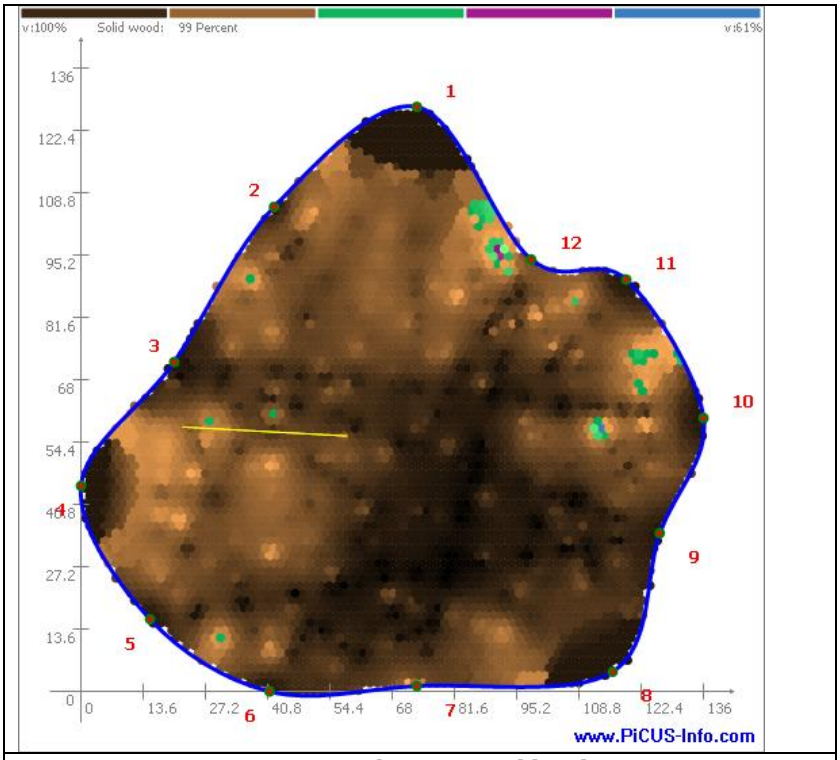
Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry and has below average vitality, it is sparse throughout with an estimated foliage density of 75% when compared to neighbouring London Plane trees of similar age. The crown contains less than 5% deadwood up to 30 millimetres in diameter, which overhangs the public footpath. The calculated live crown ratio (LCR) of the tree is 80%, which is acceptable.

The crown above the over-extended limb emanating at 12.0 metres on the west side of the main stem is heavily weighted, with dense branch ends. There are some minor decayed old pruning wounds and storm damage but little debilitating decay evident that compromise crown structure. The tree stem is in adequate condition; however there is a girdling root which in time may constrict growth of the associated buttressing. Tapping the exposed buttressing with a mallet, revealed no hollow sounds that would suggest underlying decay. As a result of the location of this tree, being adjacent to the boundary wall of the gardens, it is likely that historical disruption in the root-zone has occurred, however there is no visible evidence of any recent root severance.

TREE NO. 503 - LONDON PLANE

RESULT OF SONIC TOMOGRAPH (PICUS) TEST



Tomogram at 15 centimetres above ground level.

Analysis of PICUS Sonic Tomogram;

The sonic tomograph (Picus) test was conducted as close to ground level as was possible at the time, avoiding the flare of the buttressing and local obstruction. The results (tomogram) show some small areas of damaged wood (Purple/Blue colours) and partially damaged wood/ incipient decay (Green colour) on the north-eastern side of the main stem. Overall 99% of the cross-section is represented as solid wood, 1% as partially damaged wood and 0% damaged/decayed wood. The small areas of damaged and partially damaged wood possibly indicate isolated areas of softened wood are highly localised.

There is one narrow yellow radial line between sensors 3 and 4, which is considered likely in this case to indicate a minor, contained radial crack.

Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry and has average vitality with minor dead wood amounting to significantly less than 5% of the crown mass. The largest deadwood observed is visible at 24.0 metres above ground level which overhangs the footpath and road. The calculated live crown ratio (LCR) of the tree is 75%, which is acceptable. The crown has been historically reduced, the regime has since lapsed and there is currently approximately 5.0 metres of re-growth.

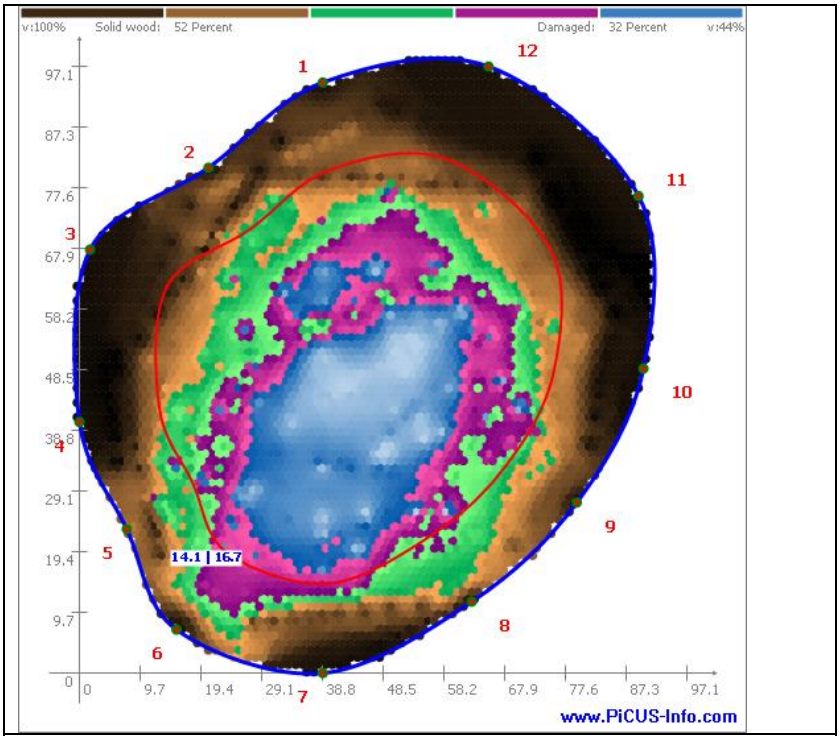
There are rubbing and fused limbs at 18.0 metres; the smaller diameter limb has little lower internal foliage growth. There are some minor decayed old pruning wounds and storm damage but little debilitating decay evident that compromise crown structure.

There is a 70 millimetre diameter woodpecker hole at 12.0 metres on the west side of the main stem, which is indicative of underlying decayed/weakened wood. The remaining tree stem is in adequate condition and tapping the exposed buttressing with a mallet, revealed no hollow sounds that would suggest underlying decay.

As a result of the location of this tree, being adjacent to the boundary wall of the gardens, it is likely that historical disruption in the root-zone has occurred, however there is no visible evidence of any recent root severance.

TREE NO. 511 - LONDON PLANE

RESULT OF SONIC TOMOGRAPH (PICUS) TEST



Tomogram at 240 centimetres above ground level.

Analysis of PICUS Sonic Tomogram;

The sonic tomograph (Picus) test was conducted to assess the extent of decay at the base of the large cavity within the main stem at approximately 240 centimetres above ground level. The results (tomogram) show a central area of damaged/decayed wood (Purple/Blue colours), resulting from decay development at the point of a previously lost large limb/co-dominant stem. Overall 52% of the cross-section is represented as solid wood, 16% as partially damaged wood and 32% damaged/ decayed wood.

The tomogram indicates the decay to have been well compartmentalised by the tree.

The area of decayed wood (illustrated in the tomogram image as blue) is suggested by the software to have lost approximately half of the strength of the solid wood shown in brown colours.

The circumferential red line on the Tomogram indicates Mattheck's't/R' ratio, (when the main stem of a tree with a full crown is two thirds or more hollow the probability of failure is high). It can be seen that the sound wood is generally at the boundaries to satisfy the ratio. Above the testing level, the cavity opening is 12 centimetres wide, representing approximately 4% of the 300 centimetre circumference.

Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry, has average vitality, and contains no significant deadwood. The calculated live crown ratio (LCR) of the tree is 75%, which is acceptable. Inspection of the crown from ground level reveals that it has been historically reduced but only partially, as there is evidence of pruning cuts on the north side of the main stem, but not to the south. There are some minor decayed old pruning wounds but little debilitating decay evident that compromise crown structure.

The main stem divides into two-co-dominants at approximately 10.0 metres above ground level at a relatively tight union. Higher up at 20.0 metres above ground level these limbs have been braced. The remaining scaffold limbs appear acceptable from ground level.

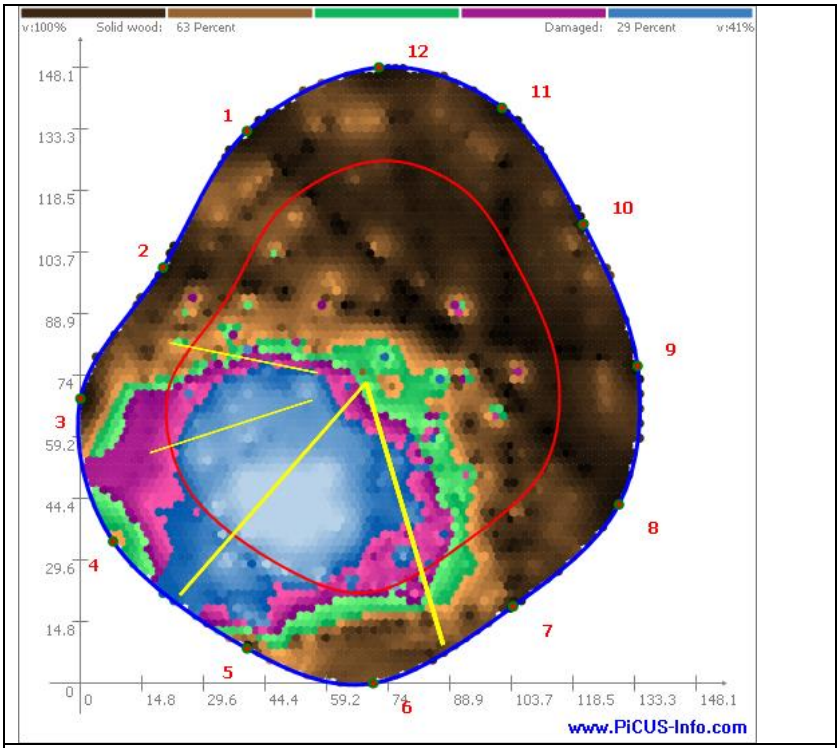
The tree stem is in degraded condition as it contains a cavity at the suspected point of previous major limb attachment, since removed/failed. The cavity extends from 2.5 to 2.9 metres above ground level and is 12 centimetres wide at the mouth opening. Probing with a metal spike reveals the cavity to extend 25 centimetres horizontally toward the centre of the main stem and at least 25 centimetres vertically downwards. There are strong ribs of reaction wood at the perimeter of the cavity opening. Tapping the main stem with a mallet produced hollow sounds beneath the cavity from 2.5 metres extending down to 1.9 metres above ground level on the south and south-east sides of the main stem.

Tapping the exposed buttressing with a mallet, revealed no hollow sounds that would suggest underlying decay in the basal area of the stem.

As a result of the location of this tree, being adjacent to the boundary wall of the gardens, it is likely that historical disruption in the root-zone has occurred, however there is no visible evidence of any recent root severance.

TREE NO. 587 - LONDON PLANE

RESULT OF SONIC TOMOGRAPH (PICUS) TEST



Tomogram at 180 centimetres above ground level.

Analysis of PICUS Sonic Tomogram;

The sonic tomograph (Picus) test was conducted at the base of the large cavity within the main stem at approximately 180 centimetres above ground level, to assess the extent of decay. The results show an off-centre area of damaged/decayed wood (Purple/Blue colours) on the south-west side of the main stem, likely resulting from decay development at the point of a previously lost large limb/co-dominant stem. Overall 63% of the cross-section is represented as solid wood, 18% as partially damaged wood and 29% as damaged/decayed wood.

The tomogram indicates the decay to have been relatively effectively compartmentalised by the tree.

The area of decayed wood (illustrated in the tomogram image as blue) is suggested by the software to have lost in excess of half of the strength of the solid wood shown in brown colours.

The circumferential red line on the Tomogram indicates Mattheck's't/R' ratio, (when the main stem of a tree with a full crown is two thirds or more hollow the probability of failure is high). It can be seen that the sound wood on the north side of the main stem is sufficient to satisfy the ratio. On the south side of the main stem the sound wood is insufficient to satisfy the ratio. However it should be noted that the software has exaggerated the extent of decay in this area, a visual assessment of the residual wall adjacent to sensor 4, indicates approximately 12 centimetres of sound wood. The cavity opening is 60 centimetres wide, representing approximately 14% of the 440 centimetre circumference.

Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry, has average vitality, and contains no significant deadwood. The calculated live crown ratio (LCR) of the tree is 70%, which is acceptable. The crown has been historically partially reduced with evidence of pruning cuts on the side of crown encroaching into the gardens. There are branches throughout the crown with abrupt angles, some estimated to be 90 degrees.

The bark at the underside of the lowest scaffold limb on the north-west side of the main stem at approximately 15.0 metres contains numerous cracks and loose bark, suggesting heavy loading; this is confirmed by the three vigorous vertical sprouts that have developed along the length of the scaffold limb, likely following historical storm damage.

The tree stem is in a degraded condition, as it contains a cavity at the suspected point of major limb attachment, now lost. The cavity extends from 1.8 metres to 3.5 metres above ground level and is 30 centimetres wide at the mouth opening, representing 7% of the 440 centimetre circumference. Probing with a metal spike reveals the cavity to extend 50 centimetres horizontally toward the centre of the main stem and at least 30 centimetres downwards and to the west and east.

Tapping the exposed buttressing with a mallet, revealed no hollow sounds that would suggest underlying decay in the basal area of the stem. There is a large protruding burr/ area of dysfunction on the east side of the main stem, which is not considered to currently have a significant effect on structure.

There has been historical disruption in the root zone of the tree. To the north within Woburn Gardens a hoggin-surfaced footpath has been installed and to the south a short brick wall is located at the boundary.

TREE NO. 750 (361) - LONDON PLANE

As noted above, a sonic tomograph (Picus) test was not conducted on tree No. 750 (361) because insufficient space was found between the tree and the nearby wall to install the apparatus and carry out a PICUS test, however inspection at the base of the main stem did not suggest that a PICUS test was required.

Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry, good architecture and has average vitality with no significant deadwood. The calculated live crown ratio (LCR) of the tree is 75%, which is acceptable. Parts of the crown have been historically reduced with evidence of pruning cuts on the side of crown encroaching into the gardens. It has been some time since re-pruning and there is between 4.0 and 5.0 metres of re-growth at the pruning points.

A minor lateral branch has previously failed, possibly during high winds, but there is little debilitating decay evident that compromise crown structure.

Tapping the exposed buttressing with a mallet, revealed no hollow sounds to suggest underlying decay in the basal area of the stem. There are several protruding burrs/areas on the main stem from ground level extending to 2.0 metres, which are not considered to currently have a significant effect on structure. Higher up on the west side of the main stem there is a cavity with estimated dimensions of 20 x 10 centimetres, which it is assumed has developed at the point of an old branch attachment. Whilst it was not possible to ascertain the depth of the cavity, the wound is surrounded by what appears to be strong ribs of reaction wood.

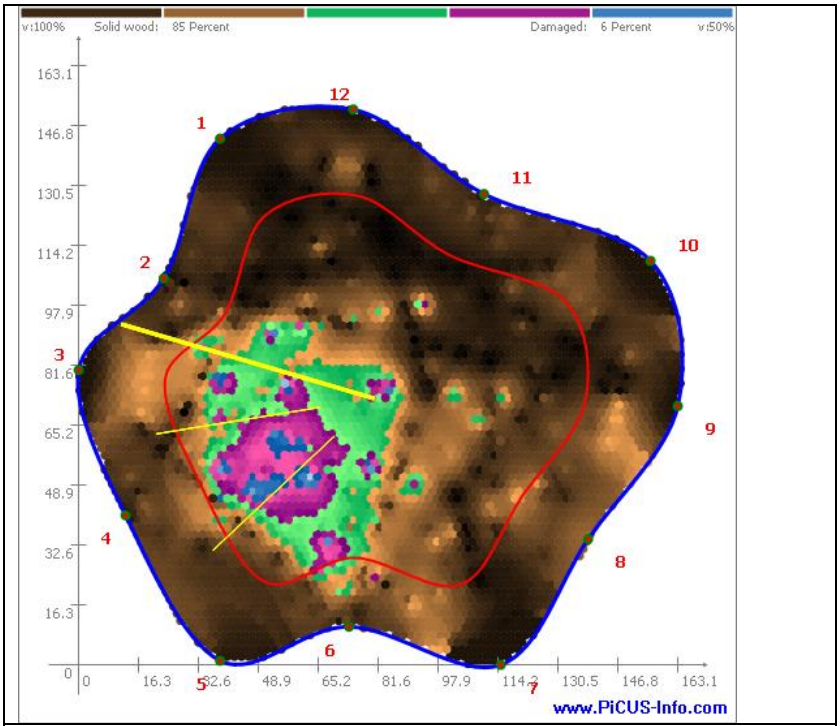
A large surface root has developed almost entirely above ground on the south-east side of the main stem, along and against the brick wall. This is an important structural root and should not be severed, as to do so is liable to affect stability.

Tree No. 750 (361) has had a long-standing relationship with the adjacent brick retaining wall and there is a notable, but not extreme, bowing outwards of the structure opposite the stem of the tree. The wall shows signs of historical and recent repairs to remediate the likely direct damage caused by the tree. The aerial parts of the tree are not currently in contact with the wall, it is therefore probable that root contact with the brickwork coupled with the swaying motion of the tree to be causing on-going progressive movement.

Currently there is 1 centimetre gap between the burring on the north-west side of the main stem and the centre of the adjacent pillar within the wall. At the base of the tree the gap between the main stem and the wall is in the region of 12 centimetres. It is possible to carry out works to the structure of the wall and/or the tree to increase the gap between the main stem and the structure; however there is considered to be no recommended works to the tree to control a root system to prevent future direct damage.

TREE NO. 433 (622) - LONDON PLANE

RESULTS OF SONIC TOMOGRAPH (PICUS) TESTS



Tomogram at 35 centimetres above ground level.

Analysis of PICUS Sonic Tomogram;

The sonic tomograph (Picus) test was conducted as close to ground level as was possible at the time, avoiding the flare of the buttressing. The results show damaged wood (Purple/Blue colours) within the central area of the main stem. Overall 85% of the cross-section is represented as solid wood, 9% as partially damaged wood and 6% as damaged/decayed wood. The location of the damaged wood would suggest decay within the central root system, which may be expected for a tree of this maturity.

It can be seen that the sound wood is sufficient to satisfy the ratio Mattheck's t/R ratio.

The yellow radial lines shown are considered in the case to be an anomaly and in fact indicate the edges of the decay.

The tomograph indicates the decay to be currently weakly invasive and has been effectively compartmentalised by the tree.

Summary of the Visual Tree Assessment (VTA) component of the assessment;

The tree's crown displays minor asymmetry and has average vitality, with no significant deadwood throughout. The calculated live crown ratio (LCR) of the tree is 75%, which is acceptable. Whilst the crown has average vitality, the lower, central growth is of low density, resulting in a relatively sparse internal structure.

The crown on the west side of the main stem is over-extended and relatively heavily weighted. Splits in the bark on the undersides of branches on the western side of the main stem are not considered currently significant.

There is a slight bulge within the main stem from 0.7 to 1.3 metres above ground level on the compression (north-east) side of the tree. The bark beneath the bulge is loose extending down to ground level; conversely the bark on the tension side is smooth. Tapping the main stem and exposed buttressing with a mallet, revealed no hollow sounds that would suggest underlying decay.

As a result of the location of this tree, being adjacent to the boundary railings of the gardens, and the pavement/kerb/road it is likely that historical disruption in the root-zone has occurred, however there is no visible evidence of any recent root severance. In addition the ground surface within the root-zone of the tree is severely compacted.

SOIL TESTS

- Soil samples were collected at the bases of trees Nos. 495 and 433 and have been sent to the laboratory for subsequent testing.

The tests will comprise of:

- 1) pH and macronutrient levels.

RESULTS OF SOIL & pH SAMPLE TESTS

- Soil test results were not available at the time of writing this report; the findings will be included in an addendum letter.

FUNGAL, DISEASE OR INSECT, PATHOGENS

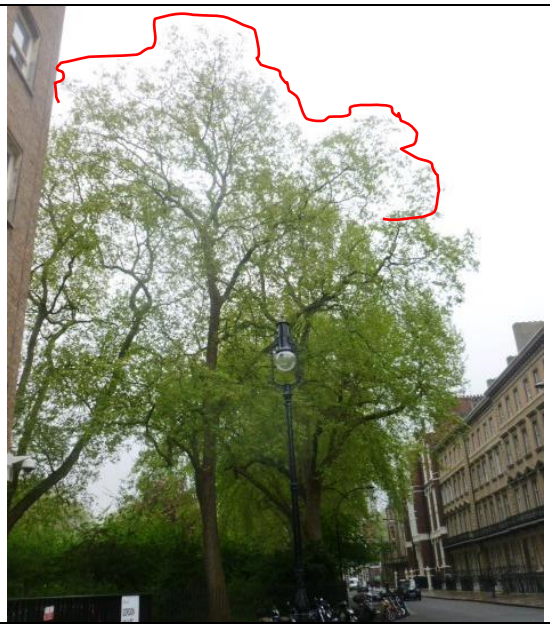
An old fungal fruiting body of *Inonotus hispidus* was observed attached to a scaffold limb on the western side of tree No. 477 at 12.0 metres above ground level. This species of fungus is reported to cause a simultaneous white rot affecting upper portions of the main stem and principal branches. London Plane is a common host of the fungus but is more resistant to failure even when a cavity has formed than other affected species such as Ash. (Green, T and Watson, G. 2011 'Fungi on Trees'. Arboricultural Association. Stonehouse, Gloucs).

Picture 2 – Showing tree No.477 and the *Inonotus hispidus* fruiting body at 12.0 metres.

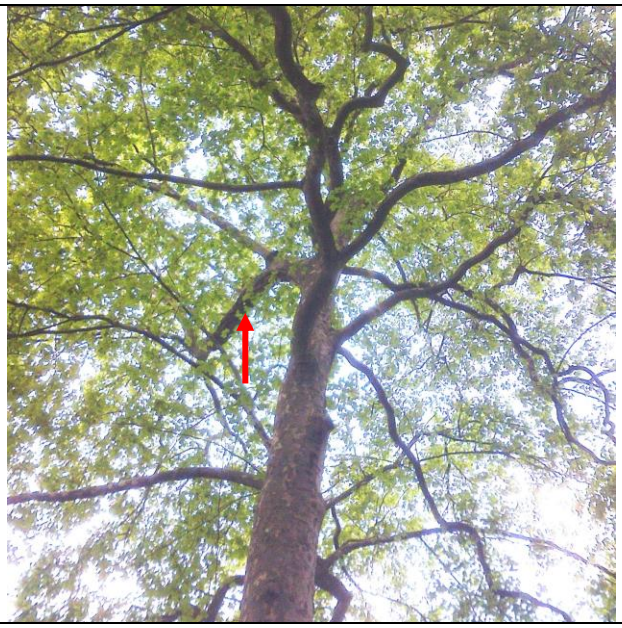
Whilst inspection at the base of tree No. 477 revealed no evidence of colonisation by the fungus *Kretzschmaria deusta*, the tomograph image produced for this tree has characteristics of other images of trees tested known to be infected by this fungus.

The fruit body of *Kretzschmaria deusta* is a black lumpy crust with the appearance of charcoal which produces a soft rot in the stem buttresses and principal roots of a wide range of deciduous trees.

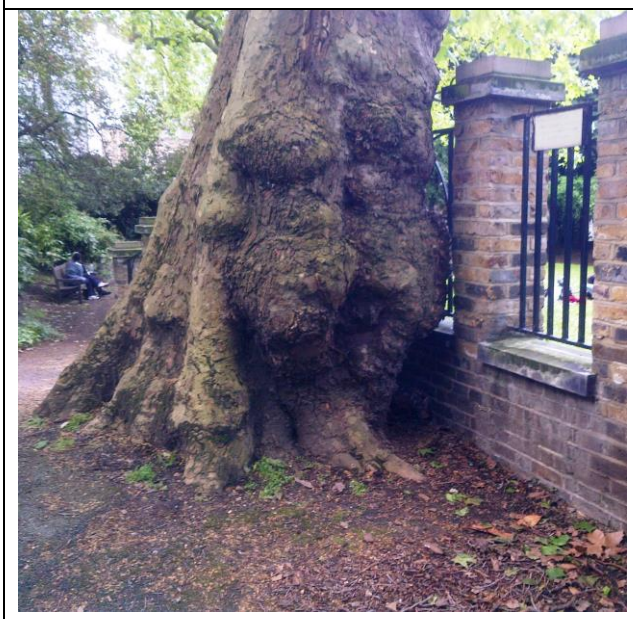
PHOTOGRAPHIC OVERVIEW



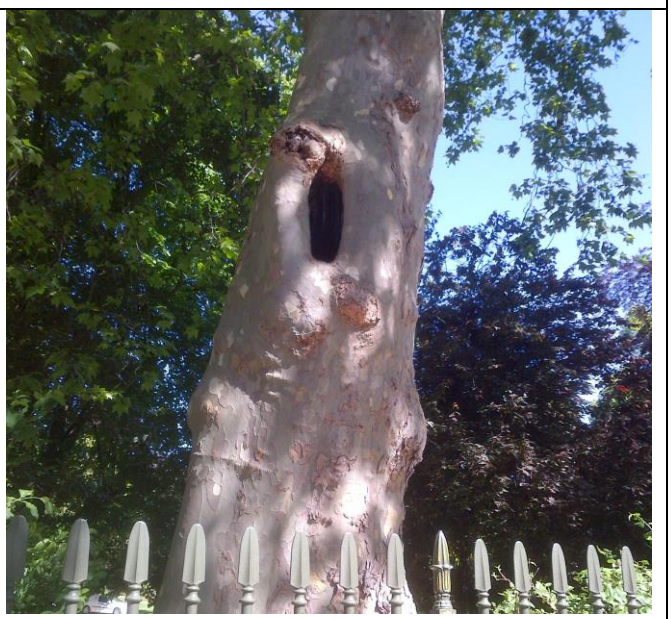
Picture 3 – Tree No. 495 with sparse crown.



Picture 4 – Tree No. 587 with splits and decay at underside of heavily weighted limb.



Picture 5 – Tree No. 433 adjacent to brick retaining wall.



Picture 6 – Tree No. 511, cavity at 2.4 metres above ground level.

CONCLUSION

- In conclusion, we would advise that the structure of tree No. 477 is somewhat weakened by the presence of radial cracks, potentially further weakened by fungus colonization and is considered a moderate risk. It would therefore be prudent to reduce the crown by between 2.0 and 3.0 metres in height and lateral spread. This will remove the over-extended nature of the limb to the west and reduce weight over the weakened base. It will be important to keep the base of the tree clear of vegetation to allow on-going self-inspection for evidence of fungal colonization.

- The main stem structures of trees Nos. 495, 503 and 433 are in acceptable condition, and are a low risk. However each of these trees has issues within its crown, including deadwood and over-extended limbs for which recommendations are prescribed below.

- Trees Nos. 511 and 587 contain significant cavities within their main stems, to an extent that with their currently comparatively full crowns represent a moderate to high risk. For both trees there was no evidence of an active pathogen, it is possible that progression of further decay within these trees will be slow; nevertheless it will be necessary to re-test both trees to monitor the future advancement of decay.

- Tree No. 750 is generally in acceptable condition, and considered to represent a low/moderate risk minor pruning has been recommended to improve balance, along with a climbing inspection to assess the cavity at 6.0 metres, which should confirm whether the risk posed is low or moderate. In addition, works to provide additional space between the tree and the brick retaining wall are suggested.

*** Interpretations of Risk**	(As per Smiley, Fraedrich & Hendrickson 2009)
Critical Risk	Failure imminent: personal injury and/or property inevitable.
High Risk	Failure likely especially during storms: personal injury and/or property damage likely.
Moderate Risk	Failure possible especially during severe storms: personal injury and/or property damage possible.
Low Risk	Failure unlikely: personal injury and/or property damage unlikely.
** Dismantling/surgery risk	Weakened crown anchor points possible, require full risk assessment prior to tree works

RECOMMENDATIONS

Tree No. 477 - London Plane

- Reduce crown emanating from over-extended limb to west by between 3.0 and 4.0 metres and reduce remaining crown by up to 3.0 metres in height and lateral spread to balance.
- Carry out a climbing inspection to assess the extent of decay at cavities within the structural limbs at 12.0 and 13.0 metres and to check the bracing. This may be carried out at the same time as the crown reduction works.

The above works to be carried out within 6 months.

- The tree will require 6-monthly self-inspections to monitor for evidence of *Kretzschmaria deusta* at the base of the main stem.

Tree No. 495 - London Plane

- Reduce crown emanating from limb to west at 12.0 metres by approximately 2.0 metres.
- Remove deadwood in crown.
- Remove girdling root at base of main stem.

The above works to be carried out within 12 months.

Note 1: A soil sample taken at the base of this tree is being tested, once results are known, site specific amelioration of the soils will be prescribed to improve growing conditions.

Tree No. 503 - London Plane

- Remove deadwood in crown at 18.0 metres.
- At the time of the deadwood removal, inspect the fusing branches at 24.0 metres above ground level and remove the smaller touching limb if in excess of 30% of the limb cross sections are damaged.

The above works to be carried out within 6 months.

Tree No. 511 - London Plane

- Reduce entire crown in height and lateral spread by between 3.0 and 4.0 metres to reduce weight and wind-sail over the weakened main stem.
- Check bracing.

The above works to be carried out within 6 months.

- The tree will require a further non-invasive PICUS test at the corresponding height within 3 years to assess the progression of decay.

Tree No. 587 - London Plane

- Remove first and second vertical sprouts on limb located on the north-west side of crown at approximately 15.0 metres; reduce remaining crown in height and lateral spread by between 2.0 and 3.0 metres to reduce weight and wind-sail over the weakened main stem.

The above works to be carried out within 6 months.

- The tree will require a further non-invasive PICUS test at the corresponding height within 3 years to assess the progression of decay.

Tree No. 750 (361) - London Plane

- Re-reduce crown to west growing into the gardens back to previous cut-points (approximately 4.0 – 5.0 metres).
- Carry out a climbing inspection and Resistograph test at 6.0 metres to assess the extent of decay at the cavity within the main stem.

The above works to be carried out within 6 months.

- The tree is located directly adjacent to a brick retaining wall; future direct and possibly mutual damage is inevitable. The length of time until damage occurs above ground will be improved by relocating the coping stone to the north of the stem by approximately 40 millimetres and by shaving off approximately 50 millimetres from the burr on the north-west side of the main stem extending from 0.5 to 1.2 metres.

Tree No. 433 (622) - London Plane

- Reduce the lowest three structural branches on the west side of the main stem which overhang road, (between 9.0 and 15.0 metres) by approximately 2.0 metres and reshape.
- Remove sub-lateral branch on east side of main stem at 8.0 metres above ground level to clear adjacent Cherry tree.

The above works to be carried out within 6 months.

- The tree will require annual self-inspections to monitor the dead bark progressions at the base of the main stem.

Note 1: A soil sample taken at the base of this tree is being tested, once results are known, site specific amelioration of the soils will be prescribed to improve growing conditions.

Note 2: All trees will require annual re-inspections unless otherwise noted.

Note 3: Massaria disease of Plane is an increasing problem in the London urban environment. The assessment of each tree included for visual inspection from ground level, highlighted no Massaria symptoms, however the fungus commonly causes decay on the uppermost section of branches, which can be impossible to see without a climbing inspection/ viewing from above. The London Tree Officers Association has produced a 'Practical Management Guidance' document, Link; http://www.ltoa.org.uk/documents/cat_view/116-massaria-disease-of-plane.

TREATMENTS

Soil samples taken for trees Nos. 495 and 433 are being tested by the Bartlett laboratory, recommendations for treatments to improve conditions will be provided as an addendum to this report.

NOTE: CLIENTS MUST MAKE TREE WORKERS AWARE OF THIS STATEMENT

CAUTION: Trees with structurally weak main stem or branches may not have sufficiently structural strength to withstand dismantling works. The weight of people climbing the tree or using the tree branches as load carrying points may increase the load to the point of tree or branch failure. Persons engaged on such works must undertake a thorough risk assessment of the tree structure before finalising a working method. Alternative work methods to consider may include the use of crane or mobile elevated platform.

I trust this report is helpful to you; should you have any queries or require further advice, please do not hesitate to contact me.

REPORT CLASSIFICATION: Tree Health & Structural Integrity Report

REPORT STATUS: *Completed*

REPORT COMPLETED BY: **Mr. Jason Mills,** AA Tech Cert
Arboricultural Consultant

REPORT REVIEWED BY: **Mr John Lawson**, BSc Hons (For), C.Biol, MSB
Arboricultural Consultant

SIGNATURE:  **CONSULTANT** **DATE: 02/06/2014**

REPORT REVIEWED BY:  **CONSULTANT** **DATE: 03/06/2014**