Arboricultural Consultant: Kim Gifford
[redacted]

Picus Sonic Tomographic Test Report
59 Redington Road NW3.

1.1 Test date: 27th August 2020 by Mr. Kim Gifford, undertaken in the area of test and at the time of inspection.

1.2 Method: using Picus software Q74std, 10 modules in accordance with manufacturers manual. *Visual Tree inspection references, Principles of Tree Hazard Assessment and Management by David Lonsdale and The body language of trees by Claus Mattheck and Helge Breoer. The Arboricultural Association guidance note 7 tree surveys a guide to good practice. Lantra award Professional tree inspection.*

1.3 Instruction: I Kim Gifford Arboricultural Consultant (see profile page)

My brief is to carry out decay detection/assessment using a Picus Sonic Tomograph tests at: 59 Redington Road, NW3.

The test will involve taking readings at an appropriate level determined by the requirements of the specimen defect. I am to make recommendations on the immediate and future management of the subject tree based on the test findings.

1.4 Background: I understand that there has been concerns about the safety of this specimen. As a result of this inspection, it was felt that further investigation was required to determine the extent of decay so that he could make an informed decision on the future management.

1.5 Picus Test Methodology:

The method of decay detection is based on the fact that solid wood is a better sound wave conductor than wood that is decayed or structurally damaged. The Picus Sonic Tomograph consists of a set of sensors which are strategically placed around the area of the tree previously identified as potentially having decay or a structural fault. Each sensor is connected to a nail which is tapped through the bark into contact with the wood. This process is virtually non-invasive to the tree's system. The sensors are connected by a data cable to a power supply and laptop computer. Each nail is tapped in turn and the sound wave flight paths are measured by each of the sensors. The test data is compiled by the Picus system software algorithm into a matrix of collected values. This results in a dense network of sound velocities through a cross-section.

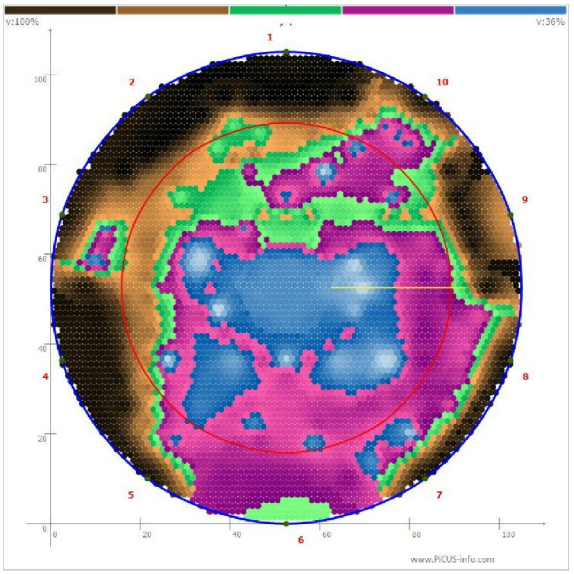
The velocity of sound through wood depends on the degree of elasticity and density of the material. Tree damage such as white rot, brown rot, soft rot, cavities, and cracks reduce the elasticity and density of the wood.

The data from the sensors is translated by the computer software into a representative colour tomographic image of the cross-section of the tree. This tomogram gives information about the presence of decay, cavities, and faults in the tree. Features such as remaining wall thickness, the opening angle of cavities and percentage of solid, decayed or altered wood can be measured by the computer.

Final analysis of the tomogram has been undertaken to see the following recommendation below. *Note: All recommended works should be undertaken in accordance with British Standard Institutes Recommendations for Tree Works B.S.3998:2010*

1.6 Oak (Quercus robur)
'Rear garden nearest the house'
Test undertaken in fine weather conditions.

Test 1 @ level: 50cms approximately from ground level.



Test point 1 orientation North.

Picus Test Analysis:

The measuring point readings give evidence of sound velocities overall in the area of test representation showing as altered timber. The tomographic images shown above has a percentage amount of decayed timber. With reference to the 'colour chart see figure 2', the slower sonic speed of sound is represented by three bands of data representation blue/violet/white being the slowest altered/decayed timber, green being faster altered timber, brown being fast sonic-speeds solid timber.

(see Picus sonic representation chart figure 2).

The resulting Picus test is of acceptable limits in relation the altered timber. This ratio called a 'trunk ratio' TR (*reference Claus Mattheck*) has been calculated to be a guideline in terms of stability and rigidity of cylindrical structure. Although a debated theory in arboriculture in general terms the TR of 30% is an average.

1.7 Recommendation:

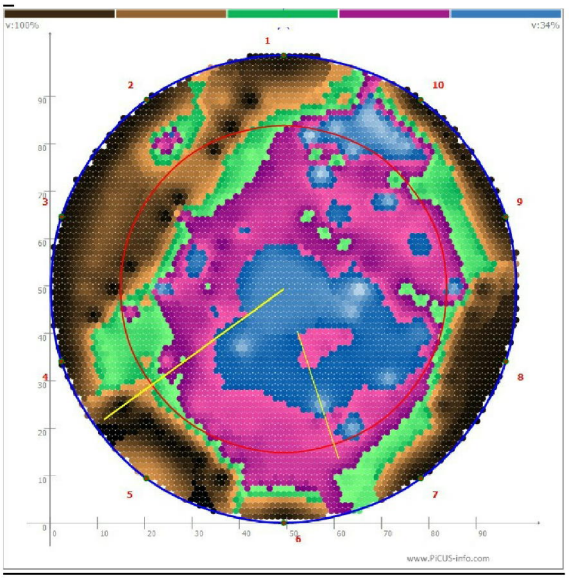
It is evident that this specimen has decayed and stressed timber across in the trunk at 150cms.

In conclusion the overall condition of this Oak has some structural defect however enough sustainable wood to maintain its structural integrity at the time of inspection.

It would be appropriate to recommend that the Oak should be managed on a two-year cycle to reduce the stress from the decayed areas. Crown reduce overall by 1m to 2m.

1.8 T2 Oak (Quercus robur)
Rear garden furthest from the house.

Test 1 @ level: 50cms approximately from ground level.



Test point 1 orientation North.

Picus Test Analysis:

The measuring point readings give evidence of sound velocities overall in the area of test representation showing as altered timber. The tomographic images shown above has a percentage amount of decayed timber. With reference to the 'colour chart see figure 2', the slower sonic speed of sound is represented by three bands of data representation blue/violet/white being the slowest altered/decayed timber, green being faster altered timber, brown being fast sonic-speeds solid timber.

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1.9 Recommendation:

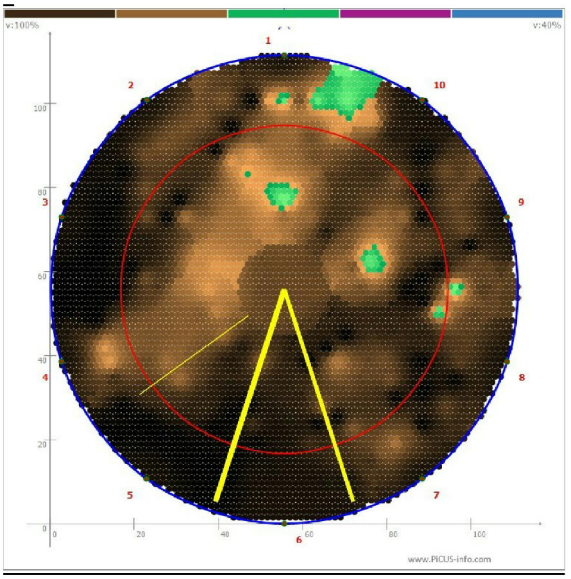
It is evident that this specimen has decayed and stressed timber across in the trunk at 150cms.

In conclusion the overall condition of this Oak has some structural defect however enough sustainable wood to maintain its structural integrity at the time of inspection.

It would be appropriate to recommend that the Oak should be managed on a two-year cycle to reduce the stress from the decayed areas. Crown reduce overall by 1m to 2m.

2.0 T3 Copper Beech (Fagus sylvatica purpurea)
In neighbouring garden.

Test 1 @ level: 30cms approximately from ground level.



Test point 1 orientation North.

Picus Test Analysis:

The measuring point readings give evidence of sound velocities overall in the area of test representation showing as sound timber. The tomographic images shown above has a percentage amount of sound timber. With reference to the 'colour chart see figure 2', the slower sonic speed of sound is represented by three bands of data representation blue/violet/white being the slowest altered/decayed timber, green being faster altered timber, brown being fast sonic-speeds solid timber.

(see Picus sonic representation chart figure 2).

The resulting Picus test is of acceptable limits in relation the altered timber. This ratio called a 'trunk ratio' TR (*reference Claus Mattheck*) has been calculated to be a guideline in terms of stability and rigidity of cylindrical structure. Although a debated theory in arboriculture in general terms the TR of 30% is an average.

2.1 Recommendation:

It is evident that this specimen is in a normal condition for its age and species.

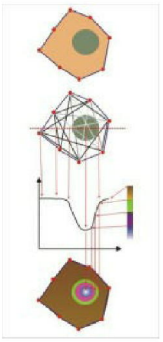
Remedial treatment will be required over a period of time for instance removal of deadwood or selective pruning of overextended branches as required in the future.

Kim Gifford
Gifford Tree Service
[redacted]

7.13.1. Tomogram colours

To display different acoustic conductivity of wood, the PiCUS program uses set colours, assigning one colour to each point of the tomograph. Areas of high velocity are represented in black or dark brown. Areas of low velocity appear in violet, white or blue, and these are the areas that indicate problems. Green areas mark those sections which could not be classified as being either fast or slow, and these areas must be interpreted together with the overall damage.

The colour scale (black, brown, green, violet, blue, white) ranges from 100% velocity (brown) to the slowest velocity (blue). Colours are switched as specific special trigger levels to show the differences, as shown in the following sketch (not drawn to scale):



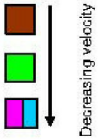
← Plan of a tree with a decayed area

← Theoretical lines of the sonic signals

← Velocities along the red line and their associations with the colour scale

← The tomogram produced

There are three main colour groups to be considered:



1. black / brown
2. green
3. violet / blue / white

The colours violet, blue, and white should be treated as a single class. There is a function to shut off the blue and white colours and present these areas in violet only.

Warning!
In order to read a tomogram correctly, you need **sound knowledge of trees and their diseases**, and you must be familiar with the **working principles of measuring instruments.** DO NOT fell a tree based solely on a tomogram reading. You must first analyse all possible reasons for slow acoustic conductivity, and you will have to apply different investigative methods as needed.

Unfortunately, the results of sonic measurements cannot give information about the exact type of structural loss in a tree. This means a tomogram does not tell us if the violet or blue areas are caused by a cavity, a crack, or by decay – it can only display the levels measured.

Figure 2 Image Colour Representation

Consultant Mr Kim Gifford: Profile

Prior to starting GTS Kim Gifford completed a 4-year apprenticeship in 1972 with the Royal Parks at Hampton Court Palace acquired City and Guilds Horticulture and Arboriculture. In addition to these qualifications Kim Gifford continued his professional development by attending seminars, conferences, studying for the professional diploma and foundation degree in Arboriculture. Further work experience during pre-business period included sub-contracting for Arb. Companies. Work as a lead Arborist for London Borough of Ealing and Arborist in Berlin Germany.

Kim Gifford t/a Gifford Tree Service started trading as a sole trader in 1980 and in 1985 became a partnership. The company specialises in all aspects of Arboriculture. From 2007 Kim Gifford now again, trades as a sole trader in his own right. In 1988 Kim Gifford became an approved contractor with Arboricultural Association after a comprehensive assessment and reassessments in 2002/2007 Kim Gifford served on committees of the Arboricultural Association for 10 years and became the National Chairman of the Arboricultural Association in 2001. Kim Gifford is now an honorary member of the Arboricultural Association.

Kim Gifford personally undertakes Picus sonic decay tests for local authorities and other Arboricultural contractors all over the Southern area of England. Kim Gifford owns the Picus equipment treetesting.com for 13 years and completed over 3000 tests, so he has considerable experience in the analysis of the tomographic images. He provides this service to complement other consultant reports, this is combined with my 42 years' knowledge in Arboriculture.

The whole Picus system has been updated and maintained to the recent Picus manufactures improvements.

Kim Gifford has undertaken many Tree Surveys including Mortgage reports and BS5837 surveys to meet planning authorities' requirements during development proposals plus Tree Preservation applications and planning inspectorate appeals.

Kim Gifford was certificated recently by Lantra training awards with Professional Tree Inspection Certificate 30th November 2013 and Arboricultural Association Certificate BS5837 – Advanced Tree Assessment for Planning 4th May 2016.

Kim Gifford also provides quotations for recommended works, Risk Methods Statements, Health & Safety Policies, Site Specific procedures operation supervision and management services.