

SONIC DECAY DETECTION
at:
Oakwood House Nursery
Hungerford Road
Huddersfield
West Yorkshire
HD3 3AL

Client:
Portland Nurseries

Client Address:
Oakwood House
2 Hungerford Road
Huddersfield
HD3 3AL

Client Telephone:
01484 533322

JCA Ref:
16209/RH

JCA Limited
Arboricultural & Ecological Consultants

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1. Introduction

1.1 Purpose of the Report

1.1.1 Sonic Decay Detection Tests are required to assess the internal condition of trees at:

Oakwood House Nursery, Hungerford Road, Huddersfield, West Yorkshire, HD3 3AL.

1.1.2 This report details the results obtained from the Sonic Decay Detections and provides recommendations based on these findings for any necessary arboricultural works required, in order to reduce liability for the tree owners and with a view to safety and the long-term management of a sustainable tree cover.

1.2 Terms of Reference

1.2.1 I am instructed by **Michael Murphy**, of **Portland Nurseries** to visit the site, undertake the tests, and prepare the findings in a report.

1.3 Scope of the Report

1.3.1 The tests were carried out on two trees which were noted to have defects which merited a Sonic Decay Detection Test to be undertaken. These trees were identified as **T6** and **G2** in the initial arboricultural report.

1.4 Survey Details

1.4.1 The tests were conducted by **Robert Hickey** FdSc *Arboriculture,* who was assisted by **Simeon Haigh** BSc (Hons).

1.3.1 The tests were undertaken during August 2020.

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2. Tree Location and Tree Description

2.1 Tree Location

2.1.1 The site is a nursery, which is bordered by a busy road to the south (Hungerford Road). **T6** is situated along the southern boundary between the property and Hungerford Road, **G2** is situated around 8m into the property next to a small fence which separates the carpark from the rest of the property.

2.2 Tree Descriptions

2.2.1 There are two trees in question.

2.2.2 **T6** is a mature Sycamore (*Acer Pseudoplatanus*) which is situated north of the boundary wall bordering Hungerford Road, this is a high risk tree with the potential to fall across the road and into the nursery, **T6** has a wound at around 1m, on its southern side, with fungi *(Trametes*) growing from it.

2.2.3 **G2** is an early-mature Robinia (*Robinian Spp.*) which is situated in the property, its adjacent to a small fence, it has a north-west lean and overhangs a gathering area for children and the staff of the nursery. This is a high-risk tree with the potential to fall into the carpark or nursery.

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3. Decay Detection Equipment

3.1 Sonic Decay Detection (Picus Sonic Tomograph)

3.1.1 The Picus Sonic Tomograph is a specialised electronic instrument which is used to assess the internal structure of a tree branch or stem. The condition of the tree is assessed by measuring the speed that sound travels through the wood in a number of different directions from a number of set positions.

3.1.2 The Picus Sonic Tomograph works on the basis that sound travels faster through solid wood (healthy wood) than softer/denatured wood (decayed wood) or air/voids (cavities). Therefore, by measuring the speed it takes for sound to travel from one point to another through the tree, across a known distance, an idea of the structural condition of the wood can be obtained.

3.1.3 Small nails are inserted into the tree at specific points around the circumference of the branch or stem at a height where an assessment of the internal structure is required. Specialist sensors, which are used to record the time taken for the sound to travel through the wood, are attached to each of the nails. Sound is generated by tapping each nail in turn with an electronic hammer. Each sensor records the time taken for the sound to travel through the wood, the results of which are relayed directly to a computer.

3.1.4 The results are displayed as a computer generated image which shows the cross section of the branch or stem tested. The image is colour coded, with each colour determined by the speed that sound travelled through the wood and therefore an indication of the wood density. The slower speeds (indicating denatured/compromised wood, decayed areas or cavities) are highlighted on the image providing information about the internal structure of the tree and based upon this, management recommendations can be made.

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4. The Decay Detection Investigation

4.1 The Picus Sonic Tomograph

4.1.1 We are advised that the following pictorial representation should be interpreted as follows:

- Dark/Light Brown = solid wood/slightly less solid wood (healthy).
- Green = intermediate wood (the beginning of decay).
- Pink = soft/denatured wood (decayed).
- Blue = very soft/extremely denatured wood (advanced decay).
- White = no wood (a hollow/cavity).

4.1.2 Please note that the red line indicated on the tomograph images indicates the t/R ratio (t = thickness, R = Radius). This refers to the ratio between the radius of the trunk and an area of decay within the trunk.

4.1.3 Past studies suggest that a tree trunk that is decayed or hollow, but which still has one third of its radius intact with solid/sound wood all around its circumference, only has a minor reduction of its safety factor (approximately 29%). In theory, if the decay is enclosed within this red line on the tomography we can assume that the tree has only a minor reduction in its safety factor and if the decay has spread outside of the red line, then the tree is likely to have a more significant reduction in its safety factor and therefore more likely to fail. However, this can only be used as a rough guide and there are many other factors, such as the size of the tree, physiological condition, density of the crown with relation to prevailing winds etc. and targets to consider, should the tree fail.

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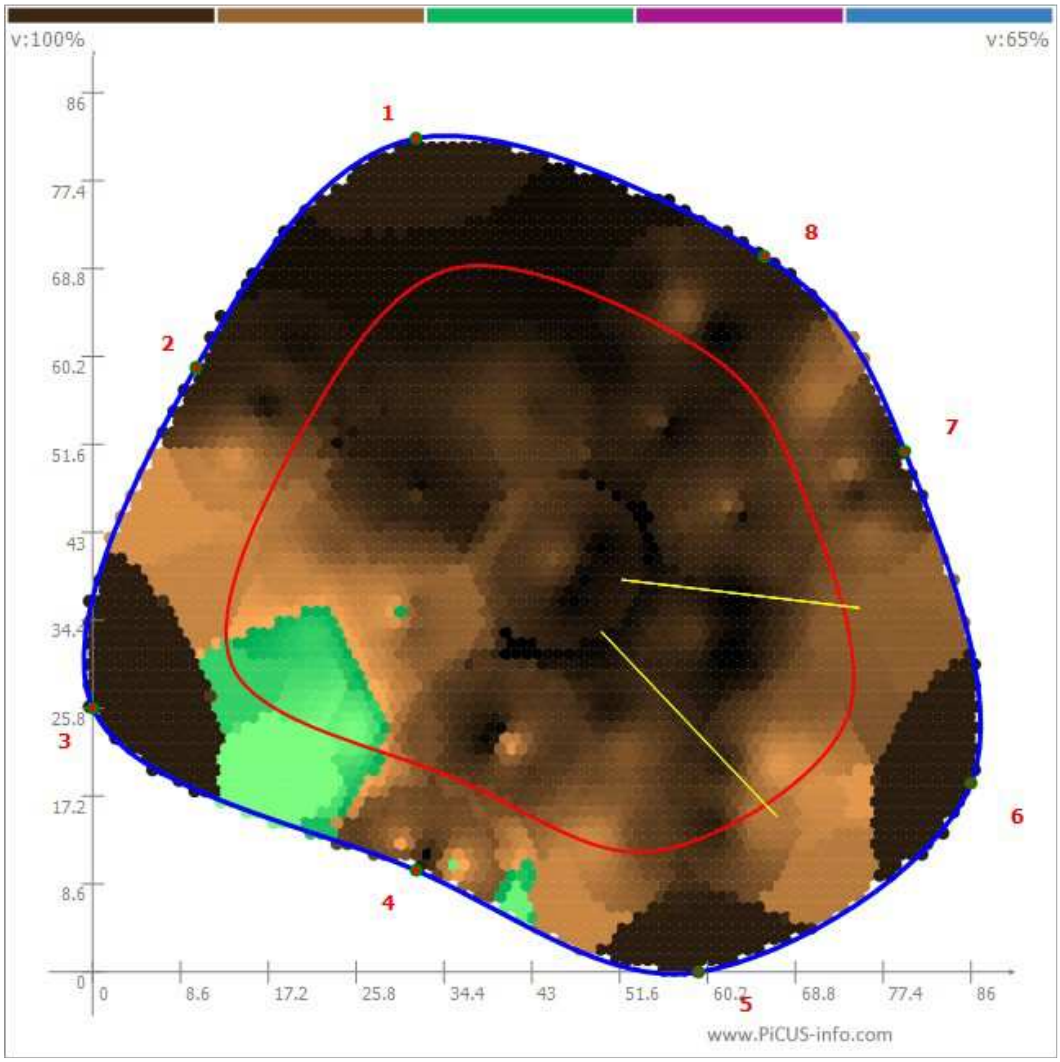
4.2 The Picus Sonic Tomograph Results (T6)

Tree 6: Sycamore

Defect: fungal fruiting bodies, identified as *trametes*, approximately 1m on the wound.

Investigation Height and Location: The main stem at 1m, just below the wound and fungi.

Sensor Locations: Sensor 1 (indicated at the top of the image in red lettering) was positioned directly into the northern side of the stem. The wound and fungi were situated between sensors 3 and 4. A total of 8 sensors were used.



Analysis: a small area of decay can be seen between sensor 3 and 4, the decay is occluding well on the west side, but could be spreading internally to the north and east. Generally however, the tree, especially centrally, is considered to be structurally sound.

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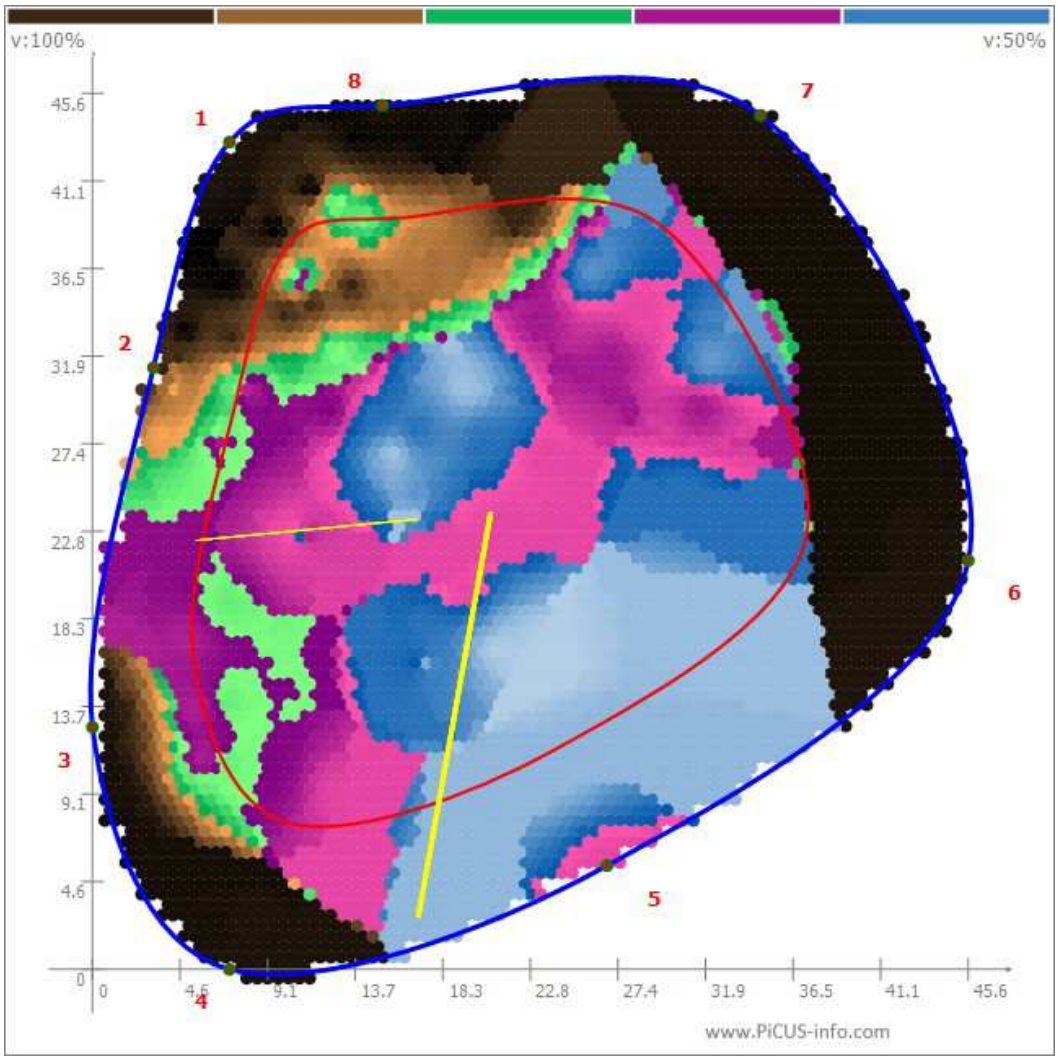
4.3 The Picus Sonic Tomograph Results (G2)

Group 2: Robinia

Defect: lifting bark at base.

Investigation Height and Location: 30cm above ground level on the main stem.

Sensor Locations: Sensor 1 (indicated at the top of the image in red lettering) was positioned at the northern side of the stem. A total of 8 sensors were used.



Analysis: Large area of decay can be seen in the centre of the tree and between sensors 2 and 6. The decay appears to be spreading north towards sensors 1.

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5. Discussion, Conclusion and Recommendations

5.1 The internal structure of two trees were tested using of a Sonic Decay Detector (Picus Sonic Tomograph).

5.2 **Recommendations for T6:** The results from the Picus Sonic Tomograph indicate that the tree has low levels of internal decay on its southern edge, therefore the tree is considered to be structurally sound at this time, and no action is required at this current time.

5.3 **Recommendations for G2:** The results from the Picus Sonic Tomograph indicate that there are high levels of decay in the stem, it is therefore recommended that the tree be felled as soon as it is reasonably practical.

5.4 We would be happy to assist should you have any queries regarding any of the information provided within this report.

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I hope that this report provides all the necessary information, but should any further advice be needed please do not hesitate to contact the author.

Signed

.....

Robert Hickey FdSc *Arboriculture, TechArborA*

1st September 2020

For and on behalf of ***JCA Ltd***

Registered Office:

Unit 80
Bowers Mill
Branch Road
Barkisland
Halifax
HX4 OAD

Tel. 01422 376335
Fax. 01422 376232
Email: jon@jcaac.com

www.jcaac.com

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Professional Tree and Ecology Advice nationwide

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- Tree Root Identification

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ECOLOGICAL SERVICES

Ecological Pre-Planning Services

- Phase 1 Habitat Surveys
- Great Crested Newt eDNA Sampling
- Protected Species: Bat, Wintering and Nesting Bird, Badger, Amphibian, Otter, Water Vole, White-Clawed Crayfish, Dormice and Reptile Surveys.
- Preparation for Environmental Impact Assessment (EIA)
- Invasive Species Surveys
- Code for Sustainable Homes

Ecological Post-Planning Services

- Biodiversity Enhancement Plans
- Protected Species Mitigation
- Ecological Management (Bat and Bird box installation and inspection)



HEAD QUARTERS:

Unit 80 Bowers Mill,
Branch Road,
Barkisland,
Halifax, HX4 0AD.

Tel: 01422 376335
Mobile: 07778 391986
Email: jon@jcaac.com
Website: www.jcaac.com

Company Reg No. 05005041
VAT No. 686 4674 78