



TREE DECAY DETECTION SURVEY & ASSESSMENT

The Thomas Cowley High School, Donington

Robert C Yates

19th May 2022

CONTENTS :

- 1.** Instruction / Terms of Reference
- 2.** Methodology
- 3.** Findings & Conclusions
- 4.** Recommendations

APPENDIX 1 : Resistance measurements

APPENDIX 2 : Location Plan

1.0 Instruction / Terms of Reference

- 1.1** We are instructed by Mr Mark Boothby to carry out a detailed decay detection survey of one mature Yew tree located at Thomas Cowley High School, Donington; this is to include the use of PiCUS™ sonic tomograph. The results of the survey will help in assessing any risk posed by the tree and will assist in providing recommendations for appropriate future management.
- 1.2** Trees are dynamic living organisms, whose health and condition can be subject to rapid changes, depending upon a number of internal and external factors. The conclusions and recommendations contained in this report are based on the tree at the time of inspection, and are subject to the limitations of the specialist nature of this survey. It should be noted that even completely sound, healthy trees, can fail, given sufficiently severe weather conditions.
- 1.3** The inspection and operation of the test equipment was carried out by Robert Yates, who holds the formal qualification Tech.Cert(Arbor.A), the LANTRA Certificate in Professional Tree Inspection and is a professional member of the Consulting Arborist Society and member of the Arboricultural Association and Royal Forestry Society. He is an experienced operator of the Sonic Tomograph device.

2.0 Methodology

- 2.1** The PiCUS™ Sonic Tomography system uses low frequency sound to measure the density of the wood inside the tree. The data produced from twelve separate sensors is converted into a four coloured image representing a cross-section of the tree at the selected measurement height/s. In the images produced the blue & magenta colours represent decay or a cavity, whilst the brown represents sound healthy wood. The green areas generally indicate incipient decay or wood of lesser density.
- 2.2** A secondary device (IML Resi-PD400™) was used to confirm and expand upon the result obtained by sonic tomography. This uses an electrically powered micro-drill to measure the resistance, and hence, the density of the wood, to a maximum depth of 40cm.
- 2.3** The interpretation of all test results, and hence the conclusions drawn there from, are down to the technician who is operating the equipment. Those conclusions and any appropriate recommendations are included in this report.

3.0 Findings and Conclusions

3.1 The subject tree is a mature English Yew (*Taxus baccata*). It is located to the front of the school reception building, adjacent the highway, and is one of a pair of similar trees – See Fig.1. It is approximately 10 metres in height and is of good vitality. It has previously been subject to a crown reduction on at least one occasion. The main area of concern is the lower main stem, in which there is a large cleft with exposed heartwood and fruit bodies of the fungal species *Laetiporus sulphureus* – See Fig.2. This fungus causes a brown rot type of decay, whereby the cellulose is preferentially degraded.



Fig.1 Subject tree (to left), looking southwest

3.2 The Sonic Tomography equipment was installed at 120cm above ground, comparative to the height of the fungal fruit body (See Fig.2). The resulting image, which can be seen in Fig.3, confirms that there is 62% decayed wood, with a further 11% early stage decay. To further confirm the result of the sonic test, the Resistograph (IML Resi-PD400) was used at two locations, corresponding with PiCUS sensors 1 & 3/4 – See Appendix 1 for results.



Fig.2 Lower stem looking northwest, with sonic device in-situ (fungal fruit body circled)

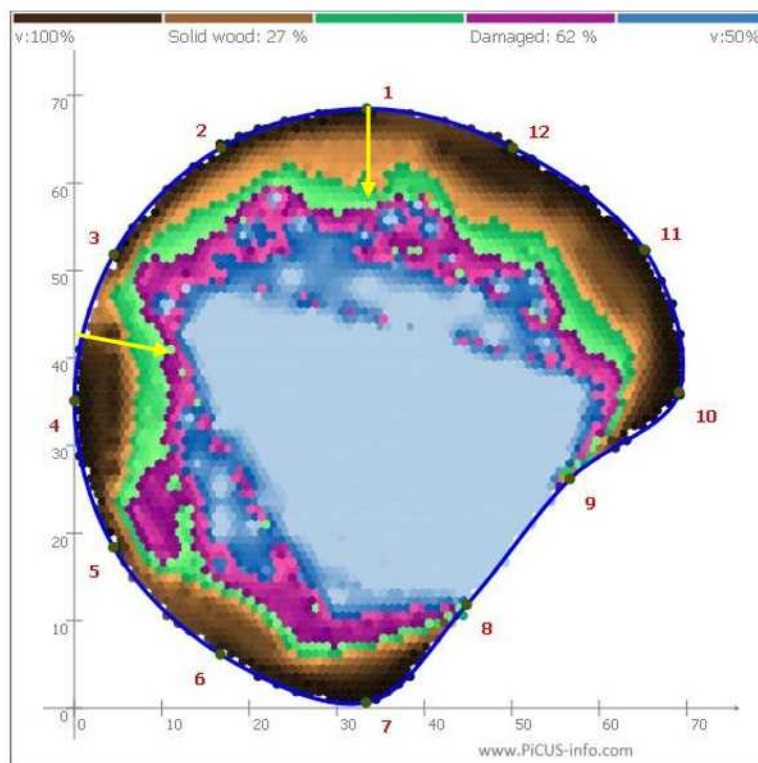


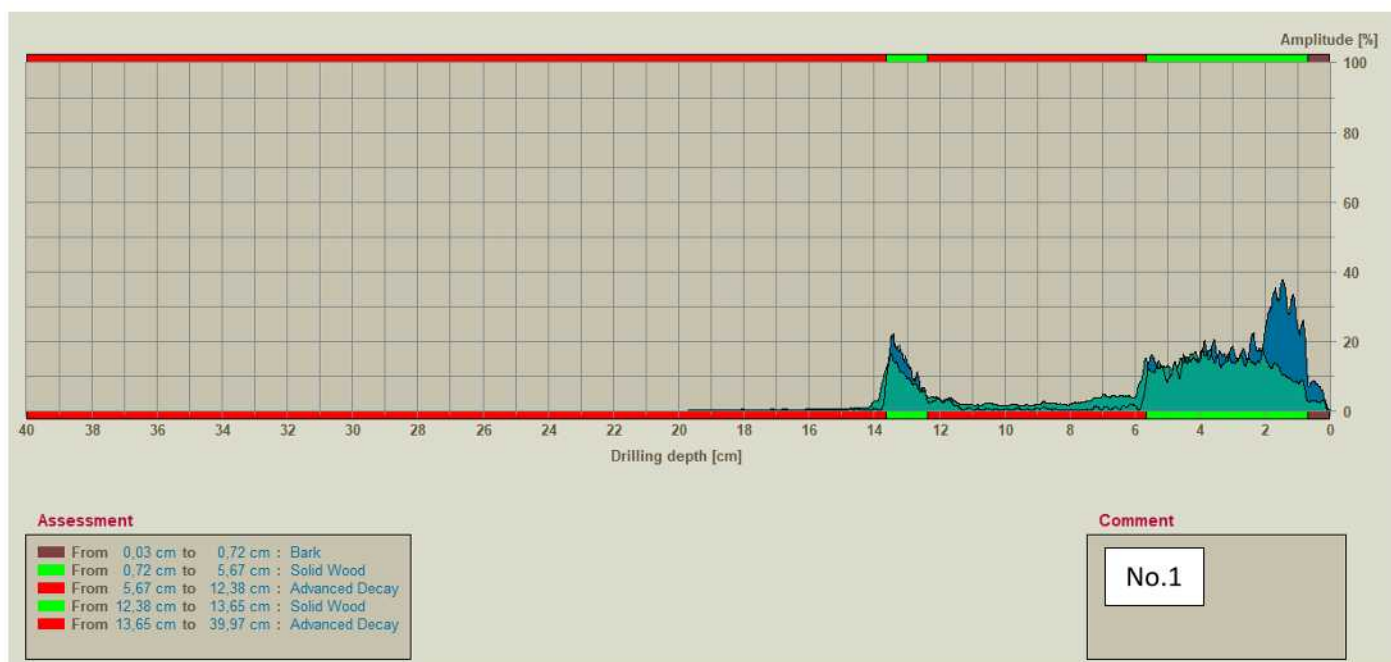
*Fig.3 Tomogram from 120cm above ground level (North to top)
Resistance measurement locations superimposed as yellow arrows*

- 3.3** We are able to conclude that there is a large volume of internally decayed wood or cavity, which if it were not for the relatively small size of the crown, would be of certain detriment to the tree's structural integrity. The amount of decay will not, however, allow for any future growth, and hence maintaining the crown at the same or lesser volume will be essential if the risk of a stem fracture is to be adequately mitigated.

4.0 Recommendations

- 4.1** Reduce crown height by 2.5 metres and spread to north, east and south aspects by 3m (*Note: It would be prudent and appropriate to include the adjacent Yew tree, thus managing the crowns of both trees*). Re-test with similar diagnostic equipment in three years' time.
- 4.2** The crown reduction work is to be undertaken subject to local authority approval, by a suitably qualified professional, in accordance with British Standard 3998 (2010) 'Tree Work – Recommendations'.

APPENDIX 1 : Drilling resistance measurements relative to PiCUS sensor points



APPENDIX 2 : Tree Location Plan (Not to Scale)

