Survey of Trees and Decay Testing at

Crane Lodge, Crane Bridge Road, Salisbury. SP2 7TQ

21st July 2023

Prepared by Stephen Woollard

wrc trees

ARBORICULTURAL CONSULTANTS

WESSEX RURAL CRAFTS LTD
REGISTERED IN ENGLAND & WALES · COMPANY No. 600252. · VAT 159 0141 24 · REGISTERED OFFICE: 8A HOLLYBUSH · HORNINGSHAM · WILTSHIRE · BA12 7LE· T: 01985 220457/01985 844594

Contents.

1. Introduction
2. Data Collection
3. Risk Management
4. Limitations
5. PiCUS Sonic Tomography Explanatory Notes
6. PiCUS Sonic Tomography Assessment: Methodology
7. Statutory Protection
8. Conclusions and Recommendations

Appendix 1. Tree Location Plan

Appendix 2. Survey Schedule

Appendix 3. Sonic Tomography

1. Introduction

1.1 WRC Trees were instructed by Paul Boatwright of Wiltshire Council to undertake a safety survey of all trees growing within the curtilage of Crane Lodge, Crane Bridge Road, Salisbury and to conduct PiCUS tomography on one.

1.2 This survey has focused on the safety of these trees only.

2. Data Collection

2.1 The Tree Survey was carried out by Stephen Woollard, a licensed user of Quantified Tree Risk Assessment (QTRA) methodology and holder of a LANTRA certificate for Professional Tree Inspection qualification, on 18th July 2023. The weather was sunny.

2.2 The trees were assessed from ground level employing the Visual Tree Assessment method, using a nylon sounding mallet, steel probe and binoculars where necessary. Otiss Tree Survey software and a GPS enabled handheld device were used to record data and map the tree locations (see Appendix 1 - Tree Location Plan).

2.3 The trees were assessed for physiological health and structural condition, and an assessment of the local environment made. This was to enable identification of any defects predisposing the trees to failure, and where a significant risk to people and property may be posed. This assessment also gives an indication of the vitality of each tree and of its tolerance to competition for nutrients and light, stress, wounding and pathogens.

2.4 The PiCUS tomography was undertaken close to ground level (circa 100mm) employing an IML PiCUS 3 Sonic Tomography System to measure and map any decay present at that level. Results are presented in Appendix 3.

3. Risk Management

3.1 This survey aims to accord with the 'Common sense risk management of trees - Guidance on trees and public safety in the UK for owners, managers and advisers - 2011' as published by the National Tree Safety Group (NTSG). The Health and Safety Executive was consulted in the production of the above publication. It endorses the sensible, proportionate, reasonable and balanced advice to owners on managing the risk from trees set out in their guidance.

4. Limitations

4.1 Trees are dynamic living organisms, whose health and condition can be subject to rapid change, depending on a number of external and internal factors.

4.2 All trees will drop branches during their lifetime and no tree can be considered entirely safe. Trees can be damaged during high winds or extreme weather. Fungal fruiting bodies may appear in the future and can indicate decay or the threat of decay and possible tree failure.

4.3 The conclusions of this report relate to conditions observed at the time of inspection and the results of testing with the IML PiCUS 3 Sonic Tomography System and the IML-RESI PD400 Microdrill. Any significant changes to the condition of the tree, or to the use of the surrounding land, will necessitate a reassessment of the tree. Where other invasive procedures or soil analyses are considered necessary, they will be recommended in the report.

5. PiCUS Sonic Tomography Explanatory Notes

5.1 The PiCUS tomograph measures the time taken for sonic stress waves to pass through the wood of a tree between 8+ sensors that are placed at a predetermined level around the tree stem.

5.2 The differing velocities of these waves help determine the wood density of a cross section of the tree (sonic waves generally travel faster through sound wood than through decayed wood). These velocities are then calculated and interpreted to produce a colour image of the internal decay patterns.

5.3 PiCUS images created by tomography indicate cavities (coloured blue), advanced decay (coloured purple) and early incipient decay (coloured green). Sound wood is indicated by brown areas on the tomogram, with dark brown representing the strongest wood. The yellow lines on the tomogram are where the software predicts there could be cracks.

5.4 The interior red line indicates the t/R ratio. This is based on Mattheck and Breloer's (1994) method for calculating the safety margin of hollow/decayed stems. It is the ratio between the thickness of sound residual wall remaining (t) and the radius of the cross section (R). For a central cavity this ratio should be no less than 0.3 to 0.35 (or 30-35% of the radius). If the ratio is less than this, then remedial work should be undertaken. This calculation is provided as a baseline safety factor and should not be used alone when assessing risk of stem failure.

5.5 The red numbers around the tomogram indicate the position of the sensors.

5.6 The graph axis indicates the dimension of the cross-section in centimetres.

5.7 The tomogram represents a cross-section of the tree at the point of measurement only. Decay levels may differ above or below the point of measurement.

6 PiCUS Sonic Tomography Assessment: Methodology

6.1 The following steps are carried when taking a PiCUS sonic measurement:

1. The measuring level, number, and positions of measuring points are determined. The measuring level is determined according to visual assessment of the tree, which will consider fungal growth, cracks, cavities, damaged bark, etc. The number of measuring points used (typically between 8 and 30) and their position will be dependent on the size and architecture of the stem.
2. The geometry of the measuring level is measured.
3. Equipment is mounted on the tree.
4. Sonic measurement is carried out.
5. Calculation and interpretation of the tomogram (including, for example, use of Mattheck's t/R ratio).
6. Dismantling of the instrument and removal of nails – after tomogram interpretation.

7 Statutory Protection

7.1 A check of the Wiltshire Council Planning Explorer indicates that all of the trees surveyed are protected by the Tree Preservation Order S/SALI/TPO6. The trees are also within the Salisbury Conservation Area.

7.2 The principal effect of a Tree Preservation Order prohibits the cutting down, uprooting, lopping, topping, wilful damage or wilful destruction of any trees subject to their protection without the formal consent of the Local Planning Authority (Wiltshire Council) following a written application.

8 Conclusions and Recommendations

8.1 English Yew (*Taxus baccata*) is the dominant species on site. There is evidence of an historic failure of a codominant stem, common in yew, in G003. Some of the yew trees in G001 have codominant stems and bark inclusions, and whilst some are protected as part of the group it is recommended that they are reduced in height and spread as a cohesive group to mitigate risk of failure.

8.2 Ivy is recognised as ecologically important and wherever possible it is not recommended for severing or removal. However, due to the size and location of T002 and T004 it is recommended that Ivy is severed to facilitate future inspections.

8.3 The results of the PiCUS on T005 a Ginkgo (*Ginkgo biloba*) indicated areas of early and advanced decay stem at the point of testing, generally around the areas of the fruiting bodies of a *Ganoderma sp.* The tomography also indicated a small cavity almost immediately behind a fruiting body (see measuring point 1 in Appendix 3). Other small areas of early decay showed sporadically on the tomography. There is minor dieback in the crown, likely to be a consequence of the fungal infection, but generally the tree's condition is fair. Due to the current and future decay it is recommended that remedial work is undertaken in the form of crown reduction. Removal is not yet considered necessary for safety, and due to the statutory protection, visual amenity and relativel rarity of a Gingko of this size, it is considered worthy of retention for as long as possible.

8.4 To address safety, it is advised that the works and inspections detailed within the survey schedule (Appendix 2) are undertaken within the recommended timeframes from the date of this report.

8.5 Trees at Crane Lodge should be surveyed at an interval of no greater than every two years by a suitably qualified and experienced arboriculturalist, and PiCUS testing of T005 conducted within the same timeframe to measure advance of decay.

Appendix 1. Tree Location Plan

Crane Lodge, Crane Bridge Road, Salisbury. SP2 7TQ

Page size: A3

1 : 300

0 10 m 20 m

N

wrc trees
ARBORICULTURAL CONSULTANTS



Appendix 2. Survey Schedule

Ref.	Species	Structure	Life Stage	Condition	Survey Notes	Control Measures	Timescale
G001	English Yew *(Taxus baccata)*	Group	Early Mature	Good	Group of five yew. Arboreal ivy. Soil level raised against wall, also garden detritus piled in this area. Bark inclusions with some natural braces forming, although some individual trees are but protected as part of group. Good vitality.	Reduce group in height and spread by 1-2 metres.	6 Months
G002	Mixed Species Group	Group	Mature	Fair	Holly, Japanese spindle and one small, dead yew stem which is firm and supported by the Japanese spindle. Arboreal ivy on holly which has been historically topped. Lower half of Japanese spindle stem lying in contact with ground.	No action required.	No Action
G003	English Yew *(Taxus baccata)*	Group	Early Mature	Fair	Pair of yew. Yew to north has historic loss of codominant stem at approximately 0.5 metres leaving both trees sparse where this stem had been.	No action required.	No Action
T001	Irish Yew *(Taxus baccata 'Fastigiata')*	Tree	Early Mature	Fair	Heavily crown lifted, affecting cultivated form. Pruning stubs.	No action required.	No Action
T002	Wellingtonia *(Sequoiadendron giganteum)*	Tree	Mature	Fair	Dense arboreal ivy prevents full inspection. Soil level raised. Lean to northeast. Minor deadwood.	Sever ivy at base and one metre and remove cut section.	6 Months
T003	English Yew *(Taxus baccata)*	Tree	Early Mature	Fair	Bifurcated at approximately two metres with stems fused above.	No action required.	No Action
T004	Lawson Cypress *(Chamaecyparis lawsoniana)*	Tree	Mature	Fair	Arboreal ivy obscures base, stem and main unions. Branch poorly removed over public footpath.	Sever ivy at base.	6 Months
T005	Ginkgo biloba *(Ginkgo biloba)*	Tree	Mature	Fair	Multiple *Ganoderma* fruiting bodies at base. Severed ivy on stem. Historically pruned to clear building. Minor crown dieback. PiCUS test undertaken.	Reduce height by 2-3 metres and balance crown.	6 Months

Appendix 3. Sonic Tomography

