



ARTEMIS
TREE
SERVICES



Site

10 Pike's End
Eastcote,
Pinner
HA5 2EX

Prepared for

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Prepared by

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Decay Detection DD-33654

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Table of Contents

1. Brief	1
2. Report limitations	1
3. Introduction	1
4. Methodology	2
5. Documents provided	2
6. Findings	2
7. Analysis	3
8. Conclusions	4
9. Recommendations	4
Appendix 1. Tree survey schedule	
Appendix 2. Drill readings	
Appendix 3. Document record	

1. Brief

- 1.1 Artemis Tree Services Ltd has been instructed by Caroline Shanbury to undertake decay detection investigation of one Oak tree (T2) using a Resistograph PD400 microdrill and provide recommended management actions based on our findings.
- 1.2 The investigation has been promoted by the previous discovery of a fungal fruiting bodies at the base of the trunk and subsequent decay detection investigations by TMA consultants recommending re-investigation every 3 years.

2. Report limitations

- 2.1 Climbing inspections have not been carried out as part of the investigation.
- 2.2 Conclusions and recommendations relate to the condition of the site and tree at the time of the inspection only. Comments valid for a period of 1-year from the date of this report.
- 2.3 By their very nature, trees can never be entirely free of risk. The laws and forces of nature dictate a failure rate, even among intact trees with no apparent defects. The recommendations in this report cannot guarantee the elimination of all risk.
- 2.4 The report does not include risk assessment of trees in relation to subsidence.

3. Introduction

3.1 Qualifications

- 3.1.1 I hold an FdSc in Arboriculture from Northampton University and Level 5 HE Diploma in Arboriculture from Moulton College. I have also hold Lantra Professional Tree Inspection (PTI) certification.

3.2 Site Description

- 3.2 The tree is located on the front lawn, to the East of a private residential property.

3.3 Trees

- 3.3.1 The tree in question is a mature Oak (*Quercus robur*) Full tree details and observations from the initial visual assessment are recorded in Appendix 1.

4. Methodology

- 4.1 Decay detection was undertaken using a Resistograph Resi-PD400 microdrill. The Resi-PD400 accurately measures the drilling and feed resistance along a needle as it is inserted at a constant rate into the wood of a tree. This enables small changes of internal wood structure to be detected. Readings from each drilling can be found in Appendix 2 of this report.
- 4.2 Tree height was recorded using a Haglofs Digital Clinometer and laser distance measurement device. Stem diameter measurement was recorded using a diameter measuring tape.

5. Documents provided

- Tree survey schedule (Appendix 1.)
- Resistograph drill readings (Appendix 2.)

6. Findings

6.1 Decay detection

- 6.1.1 The tree was drilled a total of 19 times. It was drilled at the cardinal and inter-cardinal points at 0.05m from ground level with two additional measurements taken directly adjacent to the fungal fruiting body on the North side. It was then drilled at the inter-cardinal points at 0.5m above ground.
- 6.1.2 An additional measurement was taken across the north side of the stem (from NW towards N) at around 0.1m to try and get a better understanding of the diameter (as opposed to depth) of any possible decay area next to the fungal fruiting body.
- 6.1.3 Tables 1 provides an interpretation of the readings. The reading graphs are included in Appendix 2.

Table 1

Tree ref.	Drill no.	Position	Interpretation
T2	1	0.05m North	Typical amplitude for sound wood up to 23cm depth. Drops in amplitude at 23-40cm indicating area of advanced decay/hollowing. Measurement taken into buttress root formation adjacent to fungal fruiting body.
T2	2	0.05m North-East	Typical amplitude for sound wood up to 39cm depth. Slight drop in amplitude at 39-40cm depth indicating possible initial stage decay.
T2	3	0.05m East	Typical amplitude for sound wood up to 14cm depth. Slight drop in amplitude at 14-18cm depth indicating possible initial stage decay. Measurement taken into buttress root formation.
T2	4	0.05m South-East	Typical amplitude for sound wood up to 4cm depth. Small area with lower amplitude from 4-5cm, possible initial stage decay though likely part of the cambium/sapwood layer. Measurement taken just below historic fungal fruiting body attachment point.
T2	5	0.05m South	Typical amplitude for sound wood up to 40cm depth. Measurement taken into buttress root formation.
T2	6	0.05m South-West	Typical amplitude for sound wood up to 6cm depth. Small drops in amplitude at 6-9cm and 11-13cm depths indicating possible initial stage decay.

Tree ref.	Drill no.	Position	Interpretation
T2	7	0.05m West	Typical amplitude for sound wood up to 38.6cm depth. Drop in amplitude at 38.6-40cm depth indicating area of decay.
T2	8	0.05m North-West	Typical amplitude for sound wood up to 38cm depth. Drop in amplitude at 38-40cm depth indicating area of decay. Measurement taken into buttress root formation.
T2	9	0.05m North-North-West	Measurement taken directly to left (east) side of fungal fruiting body. Area of localised decay under bark with area of cavity formation to a depth of 4.5cm. Slight drop in amplitude from 7-11.8cm indicates possible initial stage decay.
T2	10	0.05m North-North-West	Measurement taken directly to Right (west) side of fungal fruiting body. Cavity formation from 1-7.5m with automatic retraction of drill.
T2	11	0.1m West	Measurement taken laterally from W side facing North-East, from buttress root towards fungal fruiting body, across area of possible cavity opening (obscured by bark). Automatic retraction of drill from 23.6cm due to cavity formation.
T2	12	0.5m	Typical amplitude for sound wood up to 3cm depth. Drop in amplitude at 3-7cm depth indicating possible area of initial stage decay.
T2	13	0.5m	Typical amplitude for sound wood up to 3cm depth. Drop in amplitude at 3-7cm depth indicating possible area of initial stage decay.
T2	14	0.5m	Typical amplitude for sound wood up to 40cm depth.
T2	15	0.5m	Drop in amplitude from 2-4cm depth indicates possible area of hollowing under the bark. Overall low amplitude from 4-22cm depth, possible initial stage decay. Measurement taken above historic fungal fruiting body attachment point.
T2	16	0.5m	Typical amplitude for sound wood up to 6cm depth. Drop in amplitude at 6-8cm depth indicating possible area of initial stage decay.
T2	17	0.5m	Typical amplitude for sound wood up to 4cm depth. Drop in amplitude at 4-6cm depth indicating possible area of initial stage decay.
T2	18	0.5m	Typical amplitude for sound wood up to 4cm depth. Drop in amplitude at 4-6cm depth indicating possible area of initial stage decay.
T2	19	0.5m	Typical amplitude for sound wood up to 4cm depth. Drops in amplitude at 4-20cm and 22-24cm depths indicating possible area of initial stage decay.

7. Analysis

- 7.1 Using Mattheck and Breoler's "t/R ratio", which suggests that a tree should have a minimum of 33% holding wood across the radius of the stem, tree T2 should have a minimum of 19.47cm sound wood around the outside of the stem.
- 7.2 The diameter of the tree (118cm) is larger than the depth possible to measure to with the machinery (40cm of the radius). Given the decay strategy of the fungal fruiting bodies on the stem (*Ganoderma resinaceum*), it is highly likely (and been assumed) that the heartwood has been compromised and has areas of decay/hollowing.
- 7.3 Based on the drill readings (Table 1), the trunk has an average of 9.3% decay of the area measured, though this is predominantly on the North side (measurement 1 shows around 42.5% decay). If it is assumed that the heartwood not measured (ie between 40-59cm of the radius) is completely hollowed, the average area of decay would raise to around 41.3% at 0.05m.

- 7.4 Measurements 10 and 11 indicate an area of localised decay under the bark, on the N side of the trunk, approximately 6.5cm deep and 7cm wide.
- 7.5 Measurements taken at 0.5m show smaller areas of low amplitude near to the surface though this could also be attributed to the bark and cambium layers. The exceptions are measurements 15 and 19 which show decay localised to the areas with the fungal fruiting bodies (or historic attachment points). These both show lower amplitude, rather than areas of significant hollowing or cavity formation.
- 7.6 There are visible buttress roots forming at the base of the stem, particularly on the North side, indicating that the tree is responding to the infection and reinforcing the stem accordingly.
- 7.7 The tree has been crown reduced previously with around 1m regrowth, however, regular reductions of the crown should be carried out to reduce the wind sail and lever action on the stem and therefore the likelihood of failure.

8. Conclusions

- 8.1 Following the decay detection investigation, it is my opinion that the tree currently poses a low risk of harm to people and property.
- 8.3 The tree has developed some areas of localised decay, adjacent to the fungal fruiting bodies though has started to develop buttress roots to help compensate and strengthen.
- 8.2 The tree should be reduced back to previous points to reduce likelihood of failures and maintained with cyclical reductions every 2-3 years.
- 8.3 Follow up decay detection with sonic tomography (Picus or similar) should be undertaken within the next two years.

9. Recommendations

- 9.1 Reduce the crown back to the most recent points (approx. 1-1.5m regrowth at time of inspection) and maintain with cyclical reductions every 2-3 years.
- 9.2 Follow up decay detection with sonic tomography (Picus or similar) should be undertaken within the next two years.

Appendix 1

Tree Ref.	Species	Height (m)	Stem diameter (cm)	Crown spread (m)	Age class	Physiological condition	Structural condition	Observations
T1	English Oak (<i>Quercus robur</i>)	24	118	18	M	G	F	<p>Historically crown lifted (occluded wounds) and crown reduced with around 0.5-1m regrowth.</p> <p>Pruning wound at around 6m to SW shows good wound wood development and no visible decay of exposed sapwood.</p> <p>Some deadwood within crown(minor and major) typical of species. Buttress root formation at base of stem, notably towards E and N.</p> <p>Fungal fruiting body at 0.05cm on NNW side of stem with the appearance of Ganoderma resinaceum with historic bracket attachment point at around 0.2m NW. Localised audible hollowing around fungal fruiting bodies between buttress roots up to around 0.4m.</p> <p>Second historic fungal fruiting body attachment point at 0.3m to SW with localised audible area of hollowing around and down to ground level.</p>

Appendix 1

Survey Key

Diameter (mm)

Stem diameter in millimetres measured at 1.5m above ground level. Where the stem is divided below 1.5m, measurement is taken as directed by BS:5837 Annex C.

Branch Spread (m)

Radial crown spread in metres, measured for each of the four cardinal points of the compass from the centre of the trunk.

Age class

(NP) Newly planted – a tree within 3 years after planting
(Y) Young – a tree within its first one third of life expectancy
(EM) Early Mature – a tree within its second third of life expectancy
(M) Mature – a tree in its final one third of life expectancy
(OM) Over Mature – a tree having reached its maximum life span and is declining in health and size due to old age
(V) Veteran – a tree in the second or mature stage of its life and has important wildlife and habitat features including; hollowing or associated decay fungi, holes, wounds and large dead branches.
(A) Ancient – a tree in the ancient or third and final stage of their life that is of interest biologically, aesthetically or culturally because of its age, size and condition

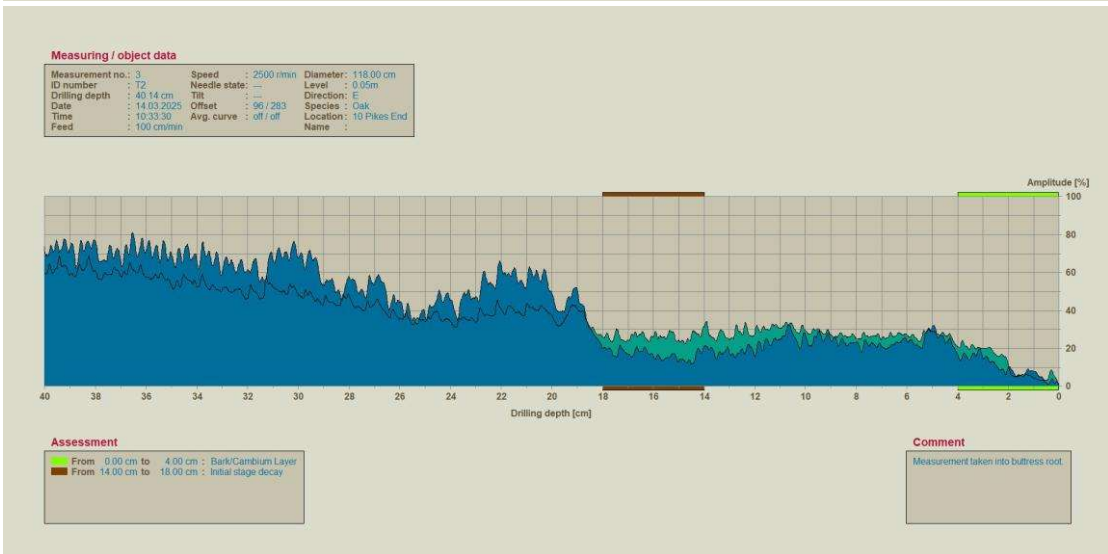
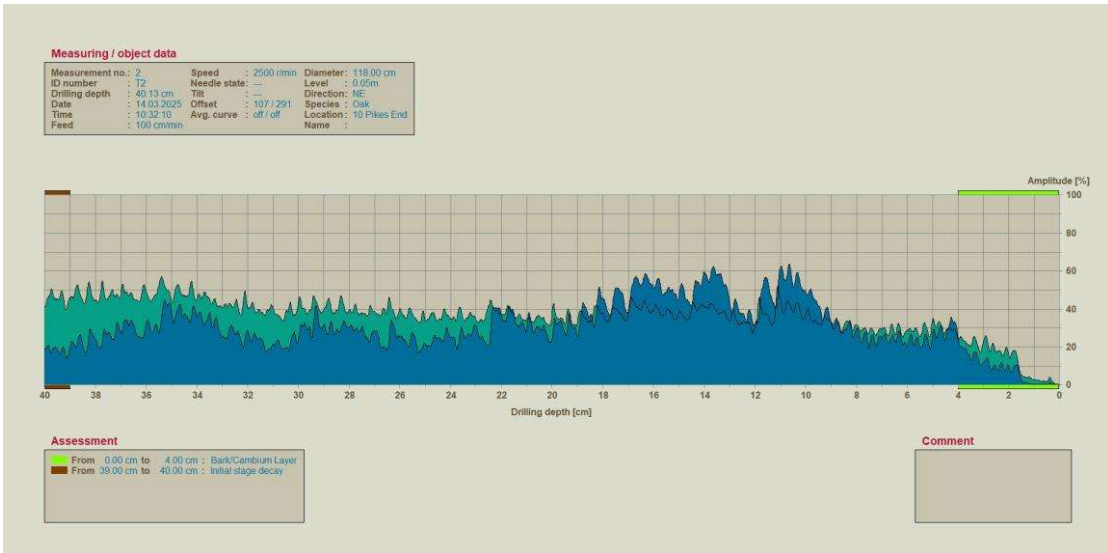
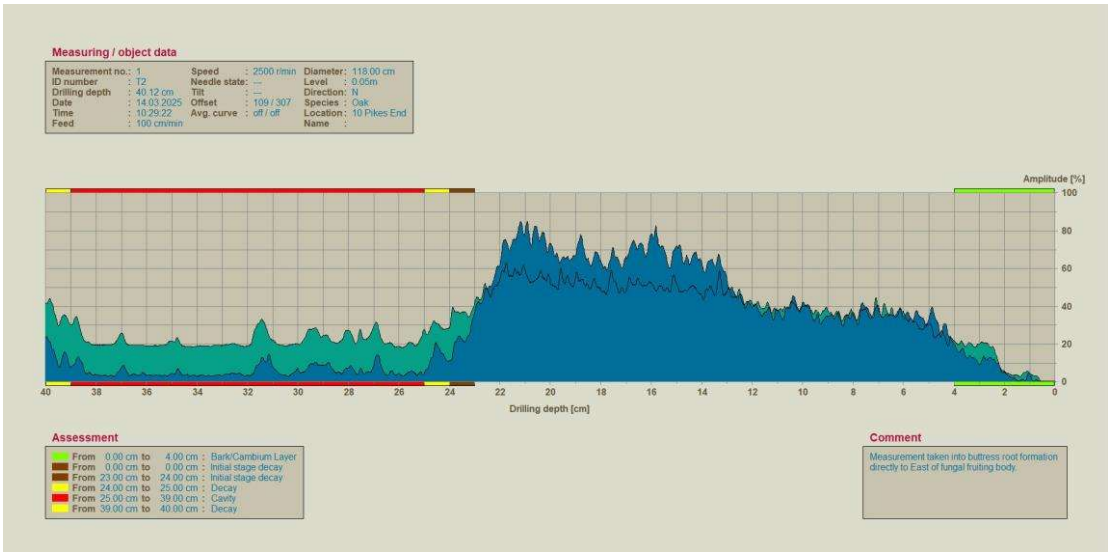
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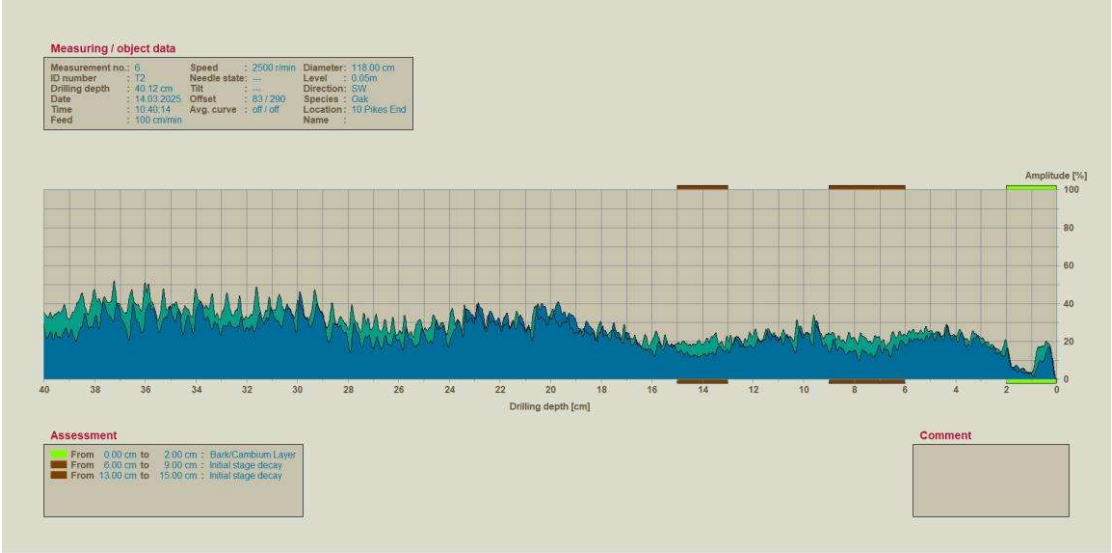
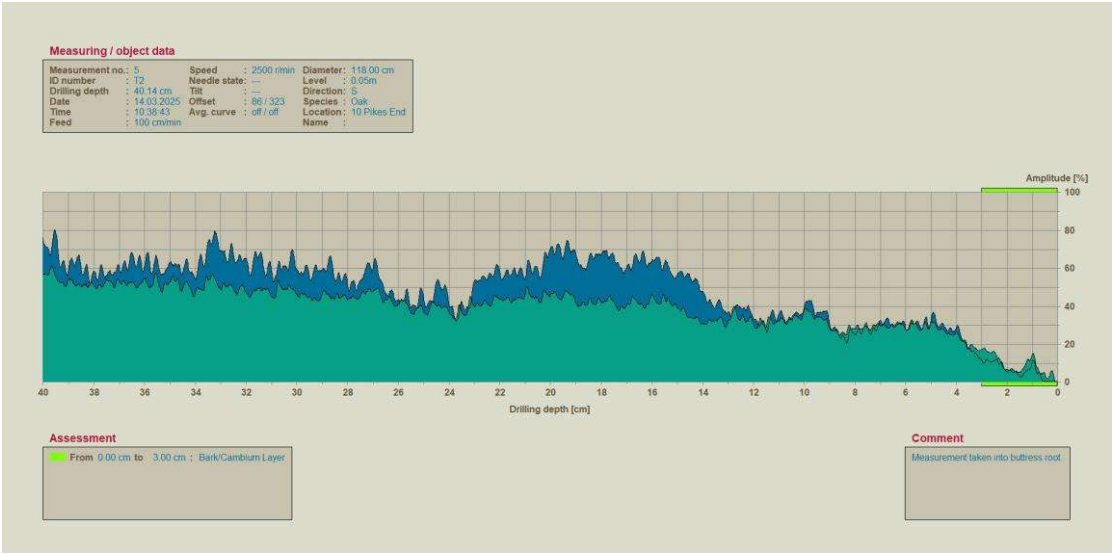
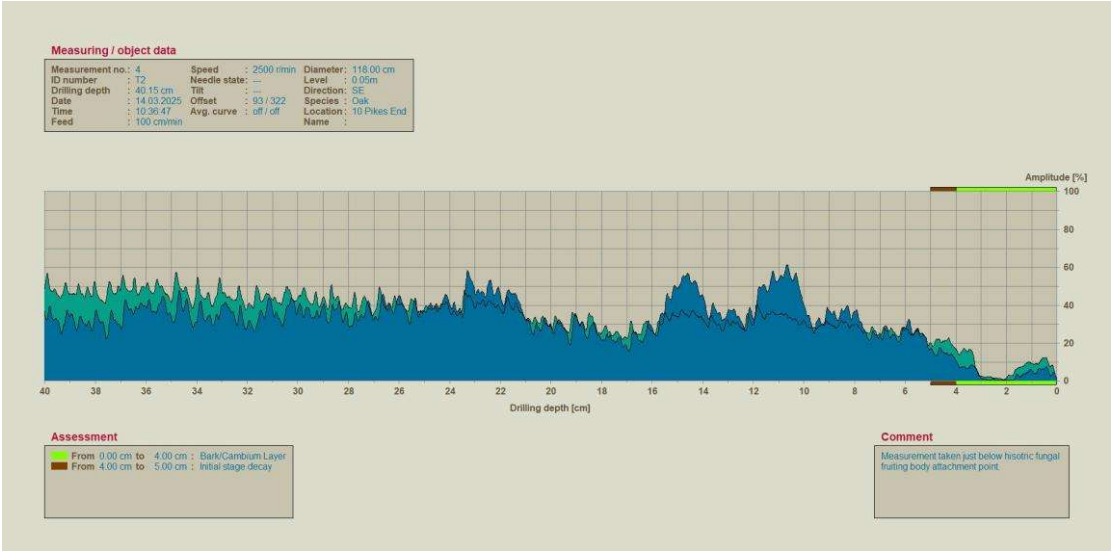
GOOD – a tree in a healthy condition with no significant problems
FAIR – a tree generally in good health with some problems that can be remediated
POOR – a tree in poor health with significant problems that cannot be remediated
DEAD – a tree without sufficient live material to sustain life

Structural Condition

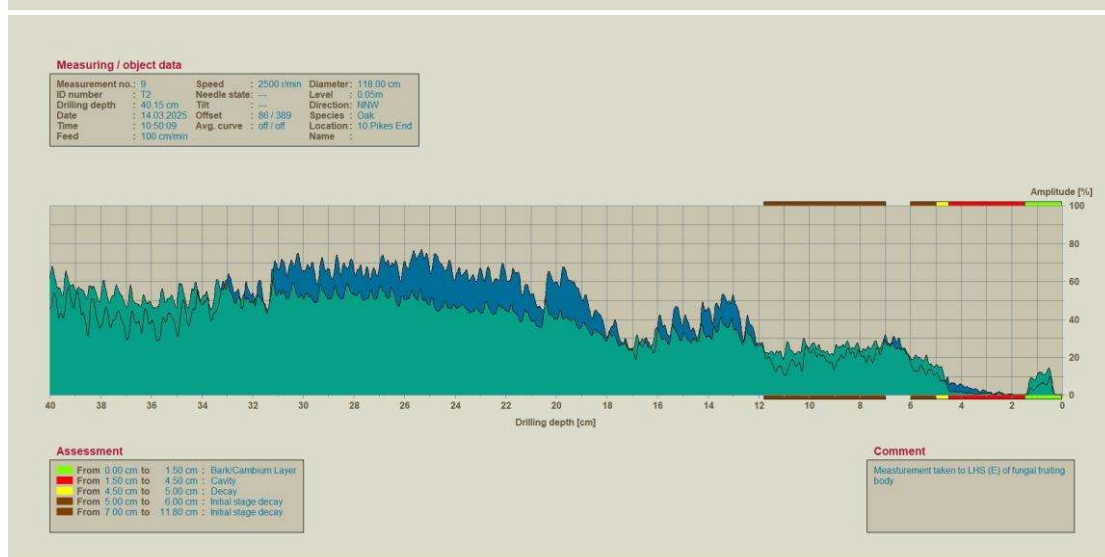
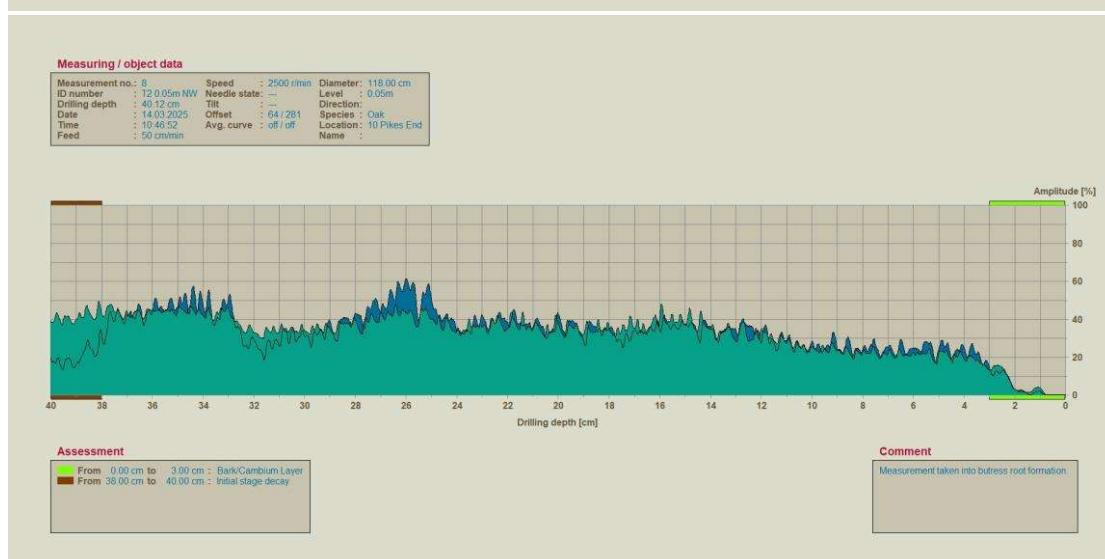
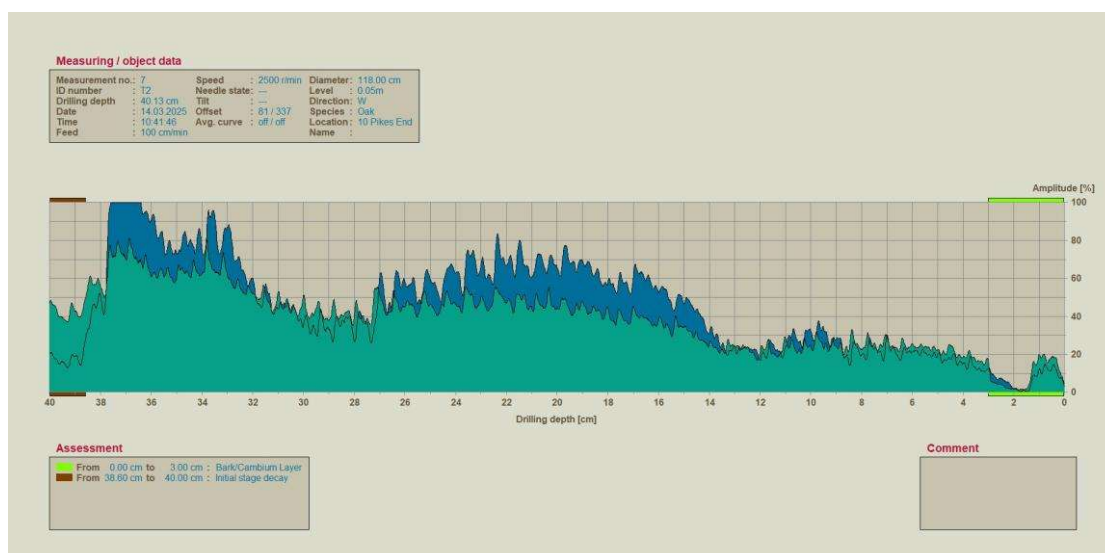
An assessment of the structural/safe condition of the tree categorised into:

GOOD – a tree in a safe condition with no significant defects
FAIR – a tree in a safe condition at present but with defects or with significant defects that can be remediated
POOR – a tree with significant defects that cannot be remediated

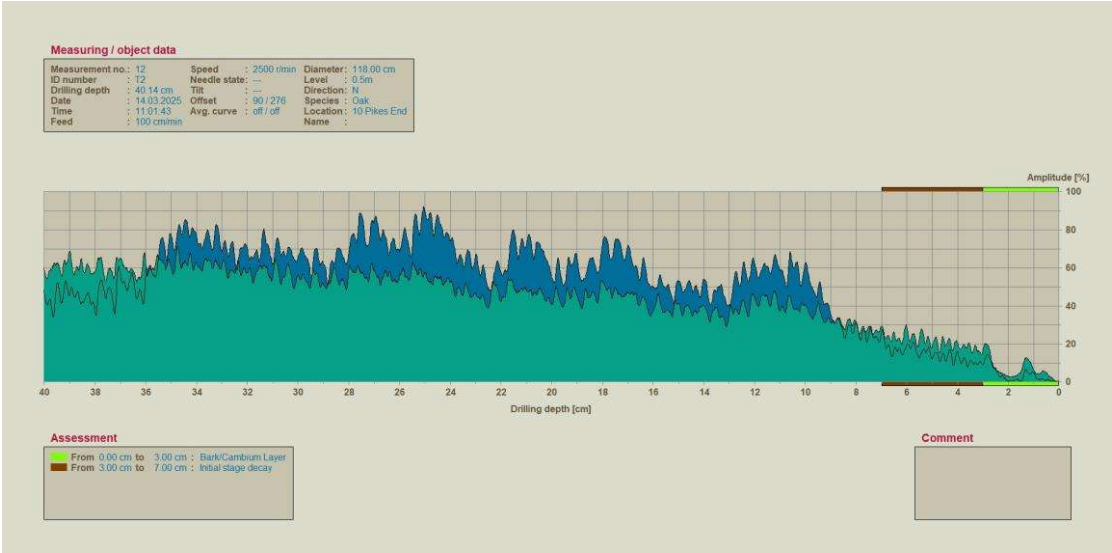
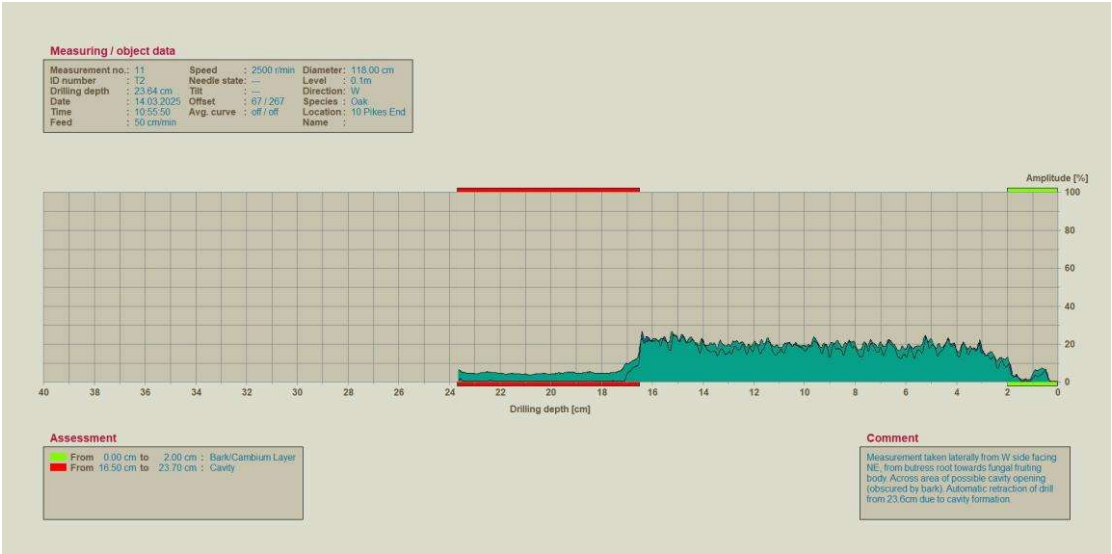
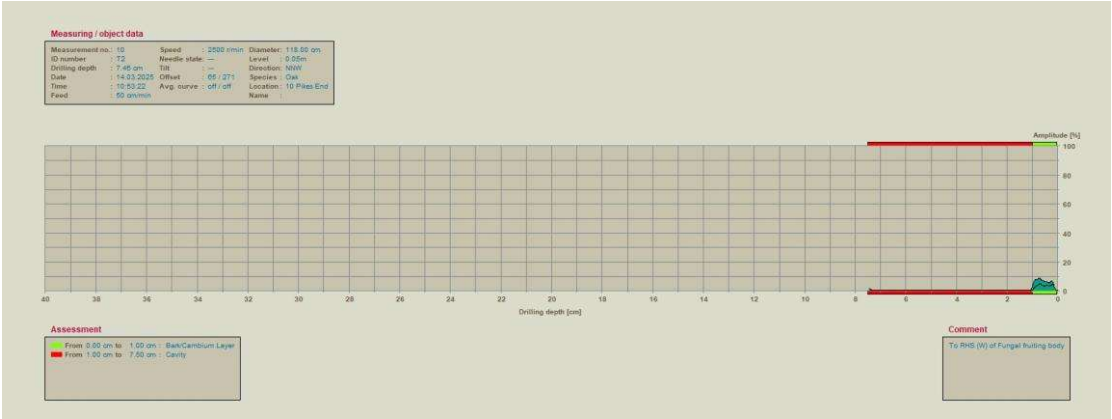




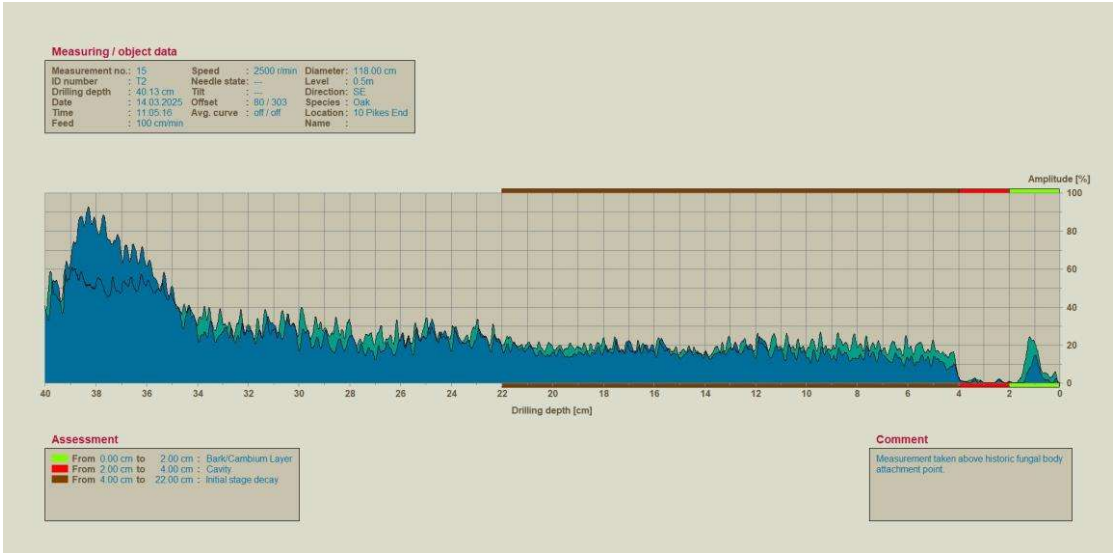
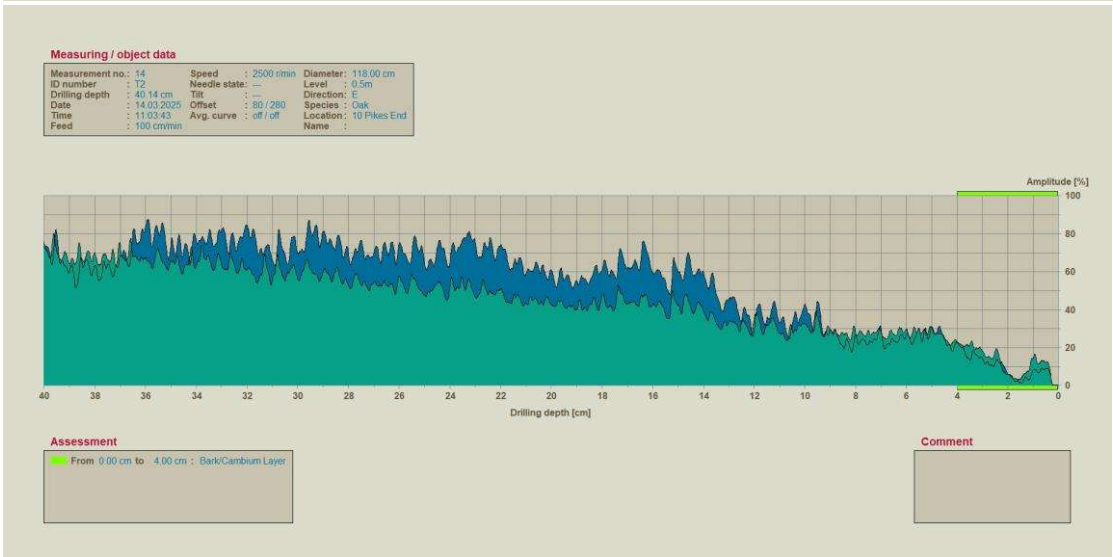
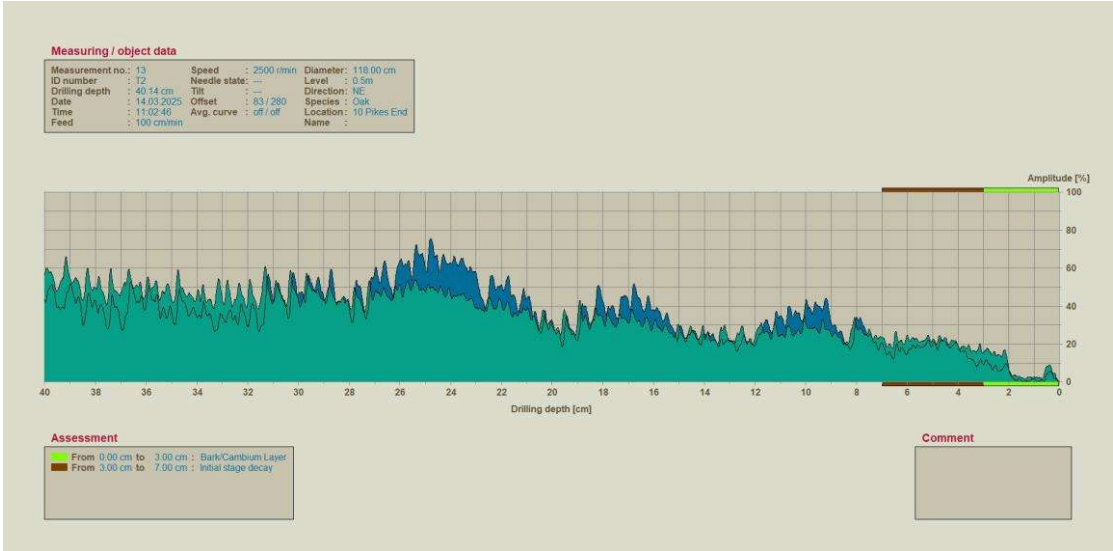
Appendix 2



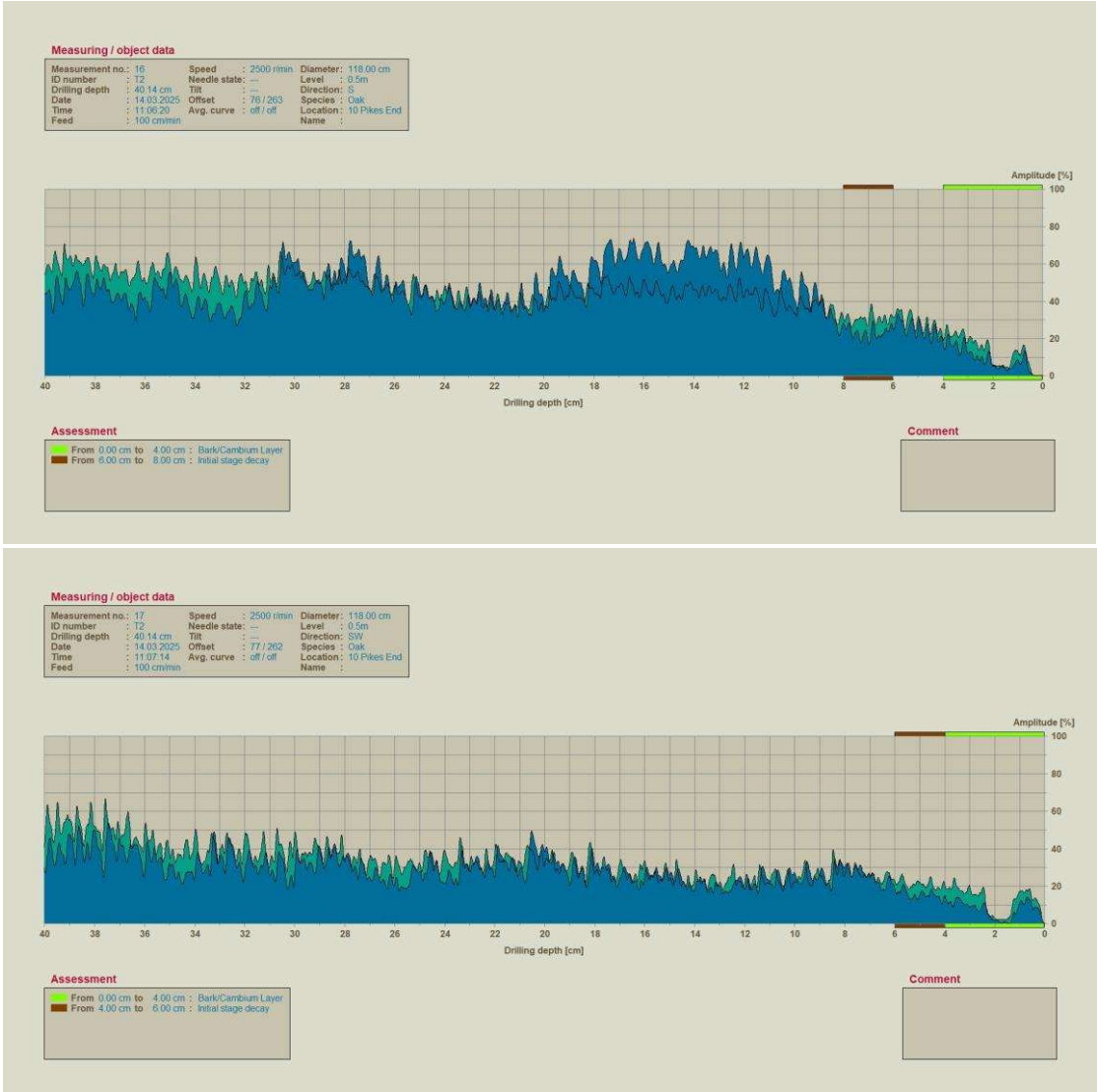
Appendix 2



Appendix 2



Appendix 2



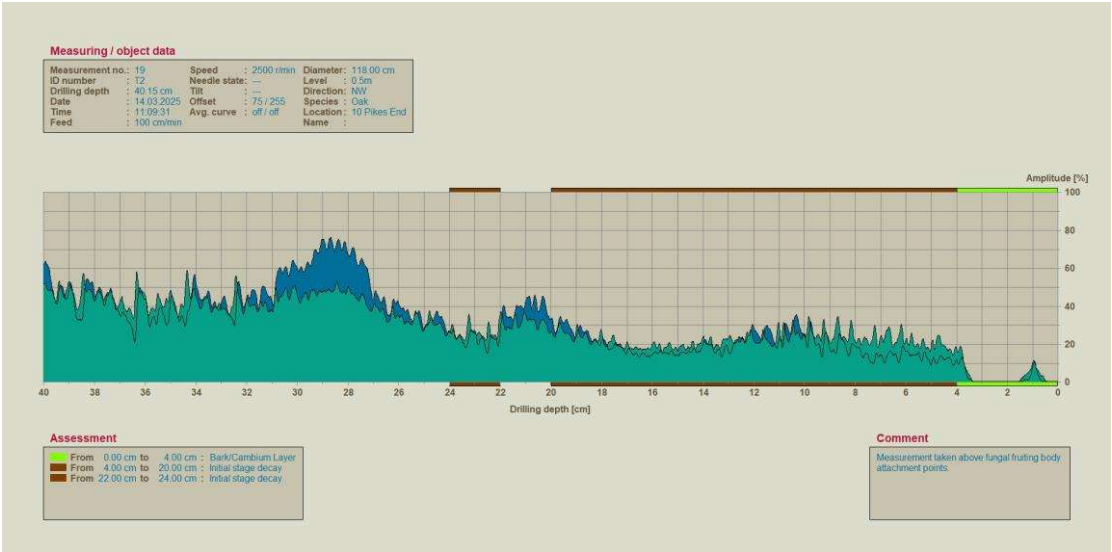
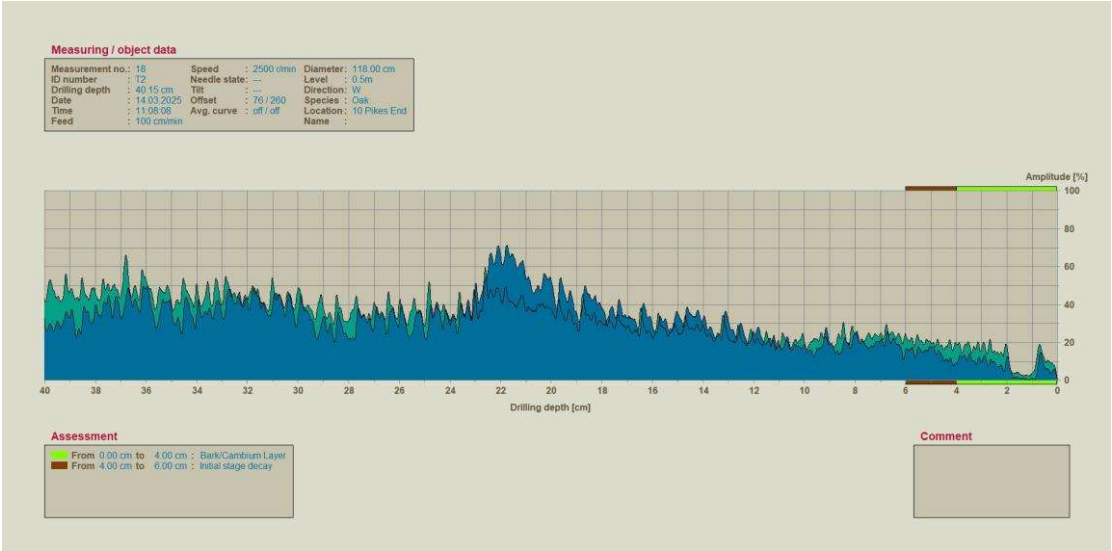




Image 1 - T2 as seen from roadside to South.



Image 2 – Fungal fruiting body attachment points visible to left and above sounding mallet (for scale).

Document record

Document	Editor	Date
DD-33654	Oliver Coleman	14/03/2025