

Internal Decay Assessment of Holm Oak T3


Parsonage Court
Church Road South
Portishead
BS20 6PH

For Parsonage Court Management Company Ltd

October 2023



Record Sheet

Report title	Internal Decay Assessment of Holm Oak T3
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Prepared by	Jim Walker <i>MICFor MArborA</i> 

Alltree
Cutlers Green
Chewton Mendip
Somerset
BA3 4NE

T 01761 241871
E info@alltree.co.uk
W www.alltree.co.uk

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1.0 Introduction and scope of survey

- 1.1 I was instructed by Eugene Grebenyuk to carry out an internal decay assessment of holm oak T3 as recommended in our report of November 2022.
- 1.2 The investigation was carried out on 4th October 2023.
- 1.3 A detailed visual tree assessment was not undertaken but any obvious defects or features were noted.
- 1.4 The survey was undertaken using an IML Resi-PD400 digital wood inspection drill, more commonly referred to as a Resistograph.
- 1.5 Comments and recommendations are limited to the findings of the resistograph survey only and are valid for a period of twelve months from the date of this report.

2.0 Resi-PD400 Resistograph - explanatory notes

- 2.1 The PD400 measures the drilling resistance of wood and comprises a portable micro-drill with a 400mm x 1.5mm needle and a 3mm drill tip. The drilling needle is driven into the wood under constant drive and the energy required along the drilling depth is measured and electronically recorded.
- 2.2 The PD400 measures both the drill resistance (shaft friction) and force required to push the needle into the wood. The captured data is evaluated and processed to deliver a measuring curve, which is presented as a digital line graph. The drill resistance curve is shown in green and the feed force in blue.
- 2.3 Interpretation of these measurement profiles not only helps to determine variations in wood density and condition but also the ratio of sound wood to decayed wood.
- 2.4 The resistograph measures wood quality at specific drilling points only. Decay levels may differ above or below the points of measurement.
- 2.5 The estimated t/R ratio is provided with the results. 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, Mattheck affirms that this ratio should be no less than 0.3 (or 30% of the radius). If the ratio is less than this, then remedial work should be undertaken to reduce the lever-arm of the affected stem.
- 2.6 It should be noted that this calculation is provided as a baseline safety factor only. Research has shown that trees can remain safely standing with t/R ratios significantly less than 0.3. When assessing risk of stem failure, the t/R ratio is therefore utilised in conjunction with other factors including the type of decay, tree species, age, stem geometry, height, aspect, exposure, load and vitality.

3.0 Inspection notes

Tree no.	T3	Tree species	Holm oak <i>Quercus ilex</i>			
Height (m)	18m	Stem diameter at 1.5m	107cm	Age class	Mature	
Crown spread in four cardinal directions (m)			North	South	East	West
			6m	8m	8m	7m
Physiological condition		Good				

Growing 10m east of building. Overhanging adjacent garden.
 Damage to buttress roots. Basal epicormics. Ingrown metal.
 Acute fork at approx. 2m above ground level (agl) to 3x stems; divides again at 4m agl.
 North stem -
 Bark death/decay/hollow sounding from 1.5m-3m agl on east and north aspects.
 Cavity/decay on southwest aspect from 2m-3.5m agl - decay extends through to east aspect with rib of live growth to south (resistograph test R4).
 Adaptive growth - 4x functional columns of sound wood between decayed zones.
 South stem - secondary stem at 3.5m agl.
 East stem - decay from union to 3m agl on northeast aspect.
 2x Cobra braces at approx. 10m agl.
 Water pocket in crevice on north aspect.
 Past pruning wounds. Major deadwood and squirrel damage.
 Crown thinning on north aspect.



Pl. 1 – Holm oak T3

4.0 Resistograph findings

- 4.1 Eight resistograph readings were taken between 135cm and 250cm agl to investigate the extent of decay affecting the north stem and the ratio of residual sound wood.
- 4.2 The results are presented in section 6.0 and summarised in the table below. When calculating the t/R ratio, the depth of bark has been excluded. Figures are rounded to the nearest 5mm.

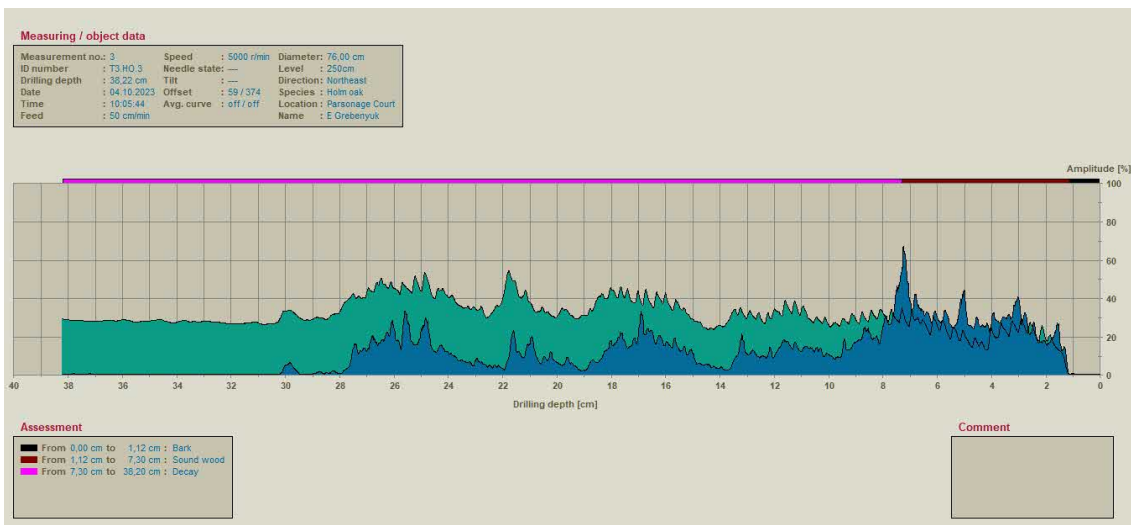
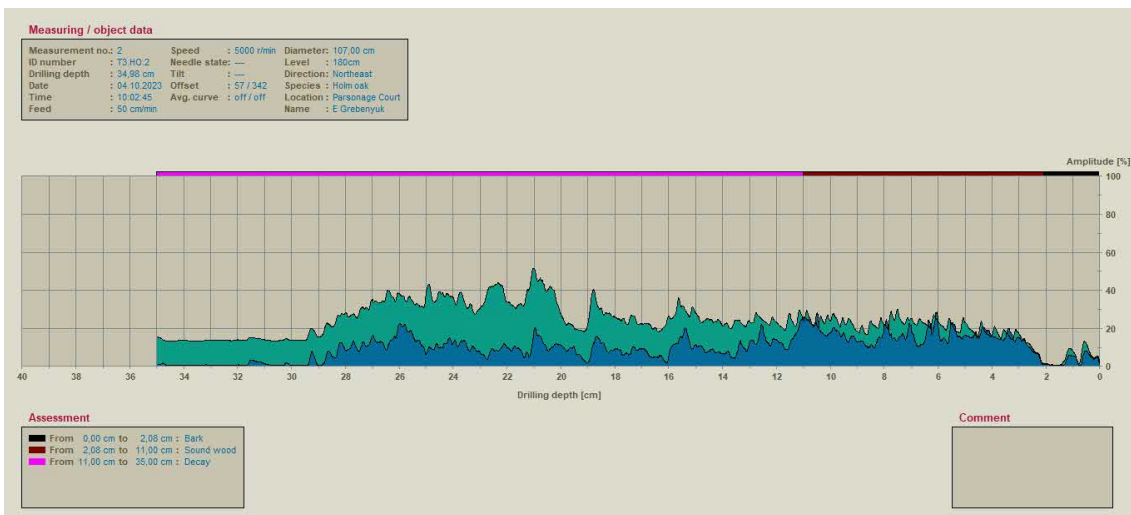
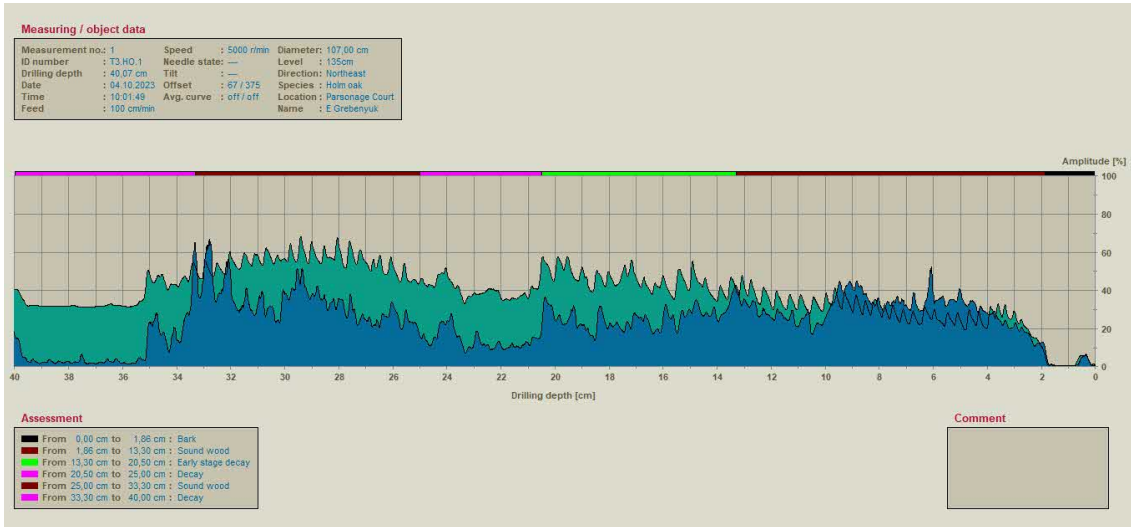
Drill no.	Cardinal pt.	Height (cm) agl	Stem Radius (cm) R	Radial depth of sound wood including bark (cm)	Radial depth of sound wood excluding bark (cm) t	t/R ratio
R1	Northeast	135	53.5	13.5	11.5	0.21
R2	Northeast	180	53.5	11.0	9.0	0.17
R3	Northeast	250	38.0	7.5	6.5	0.17
R4	South	250	38.0	7.0	5.0	0.13
R5	East	250	38.0	1.0	0.0	0.00
R6	Northwest	200	38.0	6.0	4.0	0.10
R7	Northwest	250	38.0	8.5	7.0	0.18
R8	Southeast	180	53.5	25.0	23.5	n/a

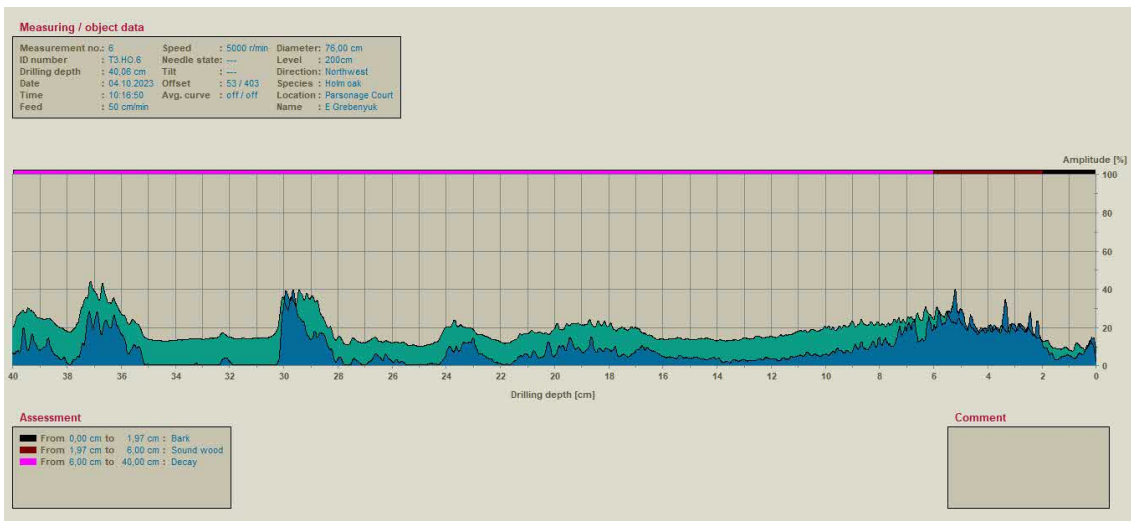
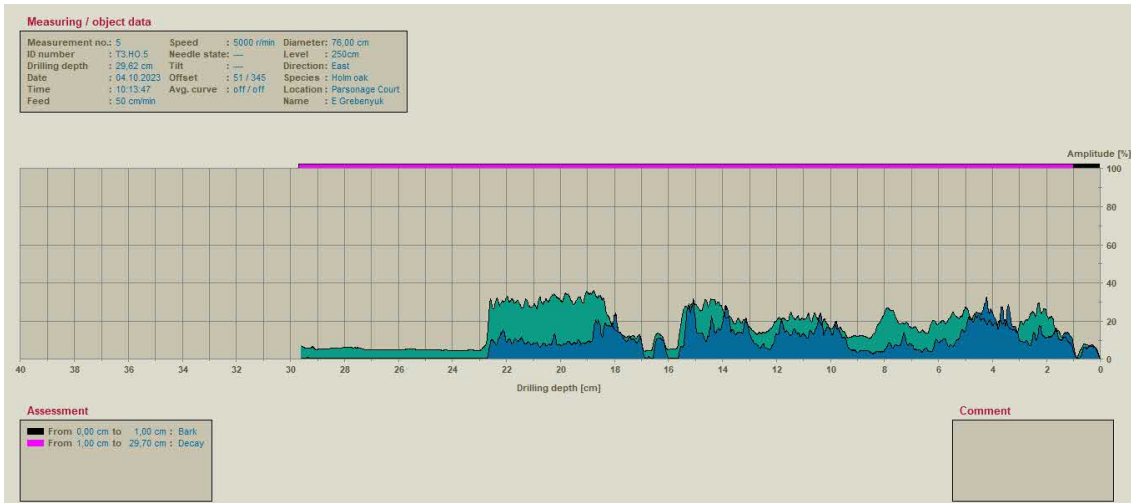
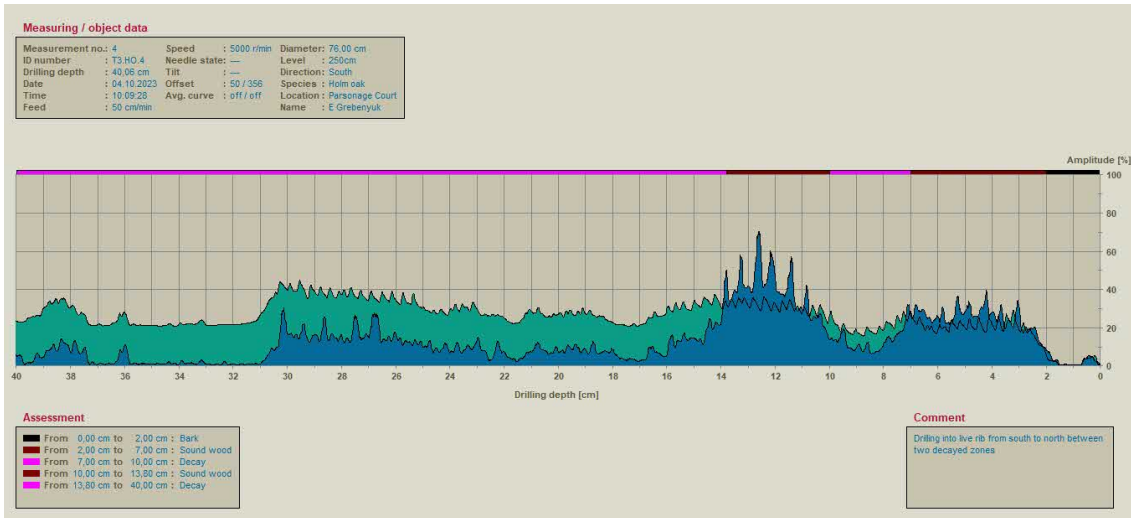
5.0 Discussion and management recommendations

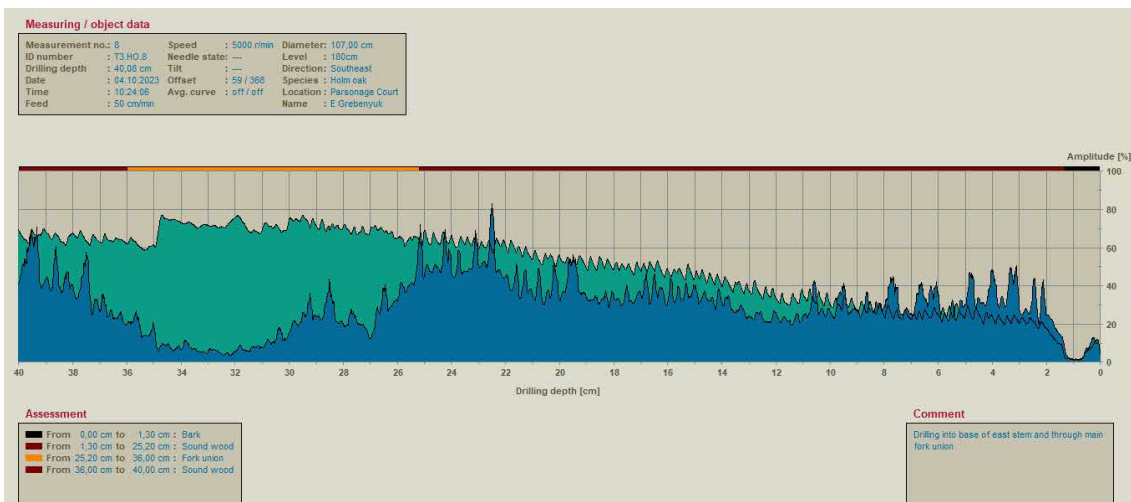
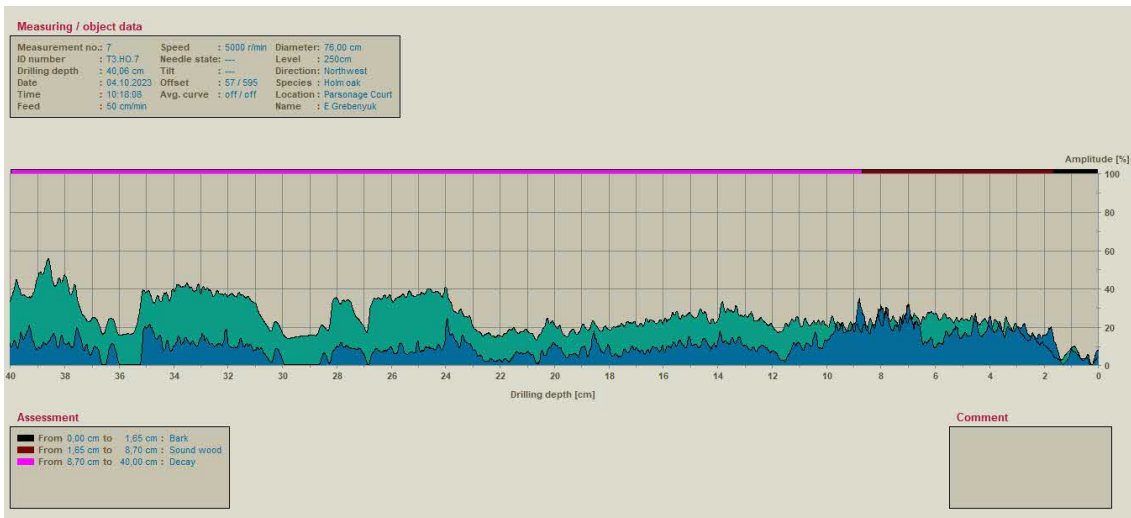
- 5.1 The findings indicate extensive decay of the north stem between 135cm and 250cm agl.
- 5.2 The ratio of residual wall on the northeast aspect (readings R1, R2 and R3) ranges between 6.5cm and 11.5cm (17% to 21% of the stem radius).
- 5.3 R4 taken into the live rib of growth on the south aspect, between the two decayed zones, reveals only 5cm of sound wood.
- 5.4 R5 taken into the dysfunctional bark on the south aspect identifies no residual wall indicating that the decay bisects the stem at this point from east to west.
- 5.5 R6 and R7 taken on the northwest aspect identify only 4cm and 7cm of sound wood respectively (10% and 18% of the stem radius).
- 5.6 R8 taken into the base of the east stem and through the main fork union indicates 23.5cm of sound wood before encountering some decay on either side of the union.

- 5.7 The combined findings suggest that the ratio of sound wood to decay is on the borderline of accepted safety margins to avoid compression (bending) failure in high winds. The tree is of good vitality and responding to the increased stresses with compensatory incremental growth. However, the relatively thin outer wall combined with bisection of the stem by decay increases the risk of stem failure.
- 5.8 In my opinion, the tree may be retained dependent on a crown reduction to ease wind loading and mechanical stress on the decayed northern scaffold stem and fork union. Holm oak generally tolerates quite severe pruning; therefore, dependent on its response, the tree could be maintained at a reduced scale within tolerable safety margins.
- 5.9 The tree is subject to a Tree Preservation Order (TPO ref. 167) and therefore planning consent must be obtained from North Somerset Council prior to any works being undertaken.
- 5.10 The recommended work should be carried out within six months.
- 5.11 There is an active badger sett in the vicinity as well as potential bat roost features within the tree. A qualified ecologist should be contacted for advice.
- 5.12 Management recommendations:
Reduce crown height by 3-4m.
Reduce lateral growth by up to 2m.
Retain all internal growth.
Reshape and balance to natural outline as feasible ensuring that all pruning cuts are made at healthy lateral branches of sufficient size and foliar bearing capacity.
All work to be carried out in accordance with BS 3998:2010 Treework - Recommendations and/or industry best practice.
- 5.13 The tree should be visually inspected annually and a repeat internal decay assessment undertaken in 2026.

6.0 Resi-PD400 Resistograph results

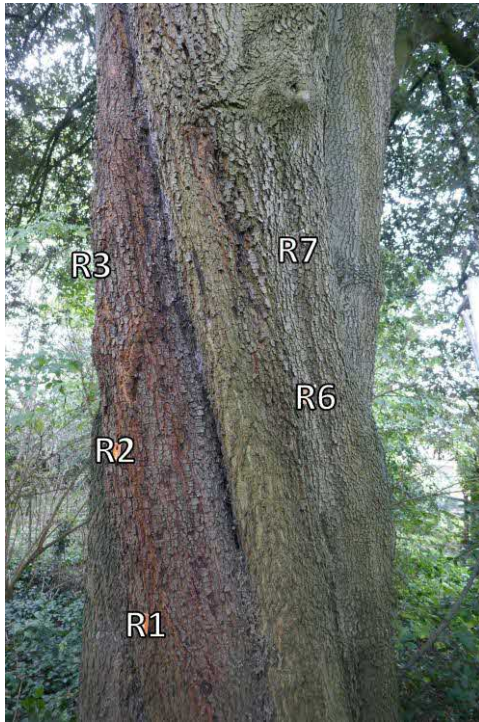




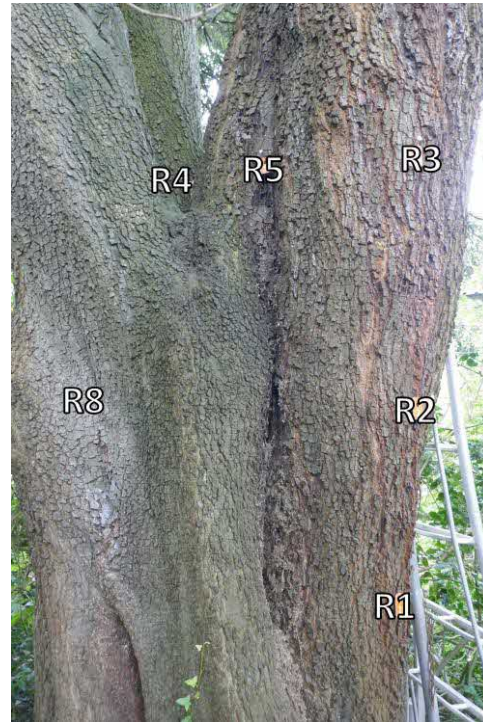


7.0 Photographs

Showing resistograph drill points R1 to R8.



Pl. 2



Pl. 3



Pl. 4



Pl. 5



Pl. 6



Pl. 7

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