

Simon Pryce Arboriculture

Report

Client: Ms C Stanford

Site: 59 Cromwell Avenue, Highgate, London, N6 5HP

Subject: Decay assessment of mature oak

Inspection date: 26 October 2022

Report date: 1 December 2022

Reference: 22/063

Author: Simon Pryce, BSc, FArborA, RCarborA, CBiol, MICFor

I Introduction

- 1.1 This report has been prepared on the instructions of Ms C Stanford of 59 Cromwell Avenue, London, N6 5HP. I have been asked to inspect an oak tree growing in the back garden, to assess its structural condition and to recommend any necessary or appropriate work.
- 1.2 I was asked to do this after some fungal fruiting bodies appeared at the base during late summer and Robert Gibbs, who had recently pruned the tree, recommended investigating its internal condition to assess its safety.

Inspection

- 1.3 Initially the tree and fungus were inspected visually and loose debris and soil was cleared to inspect the tree's base. The tree was also test drilled to assess the extent of internal decay.

2 Background

- 2.1 The tree is a mature Turkey oak growing in a planting bed on the right hand side of the back garden. It has a single vertical trunk about 600mm in diameter, increasing to about 700mm at ground level, with little flare at the base. It is about 12m high, although it had been crown reduced not long before, so was possibly 16 to 18m high before that. Some new growth was developing near the pruning cuts, but a photograph taken by Robert Gibbs before it was reduced shows sparse foliage, indicating that it was in poor physiological condition.
- 2.2 The tree is in Highgate Conservation Area, so it would normally be necessary to give Haringey Council six weeks notice of any proposed work. However in view of the fungal growth Mr Gibbs emailed Haringey on 9 September advising that it came under the exemption under which work necessary to address risks to safety can be carried out after giving the council five days notice. He advised that, rather than felling it immediately, he preferred to carry out a 40% crown reduction so it could survive a little longer and the Council's report of 11 September stated that they did not object.

3 Observations

- 3.1 The fungus was growing at the base of the tree on the west side facing the house and is a giant polypore, *Meripilus giganteus*. This was a single cluster, which was not particularly large for this species. It can develop from the wider root system, but there were no signs of any other growth near the tree.

4 Test drilling

- 4.1 The tree was test drilled with an IML PD microdrill, a purpose built instrument that measures and plots the resistance to a small diameter drilling needle, giving an accurate picture of the tree's internal condition. This focussed on the lower trunk and the deeper roots exposed by digging. The annotated readings are attached and discussed below. The outside of the tree is at the right hand side of the charts with the drill running in to the left. North is to the left as looking at the tree from the back of the house and the tree is about 70cm across at ground level, so the drill reaches well past the centre of the trunk, which is at the 30 - 35cm mark.
- 4.2 The instrument takes separate readings of the drag on the rotating drill (drilling curve) shown as a single black line, and the linear resistance to penetration (feed curve), shown as a filled blue line. Of these the feed curve is more important as it measures any decay directly. This found that the inner trunk is decayed and that this slightly off centre towards the south and west, but that there is sound wood all around the decay.

5 Discussion

- 5.1 *Meripilus* is particularly common on older beeches and less occurs less frequently on other species, including oak, maples and horse chestnut. On beech it decays the deeper, older roots and can develop for a number of years before producing the fruit bodies. Some trees respond by producing new roots, but this does not always compensate for the strength loss and it can lead to uprooting. This is largely based on observations of beech, which is by far the most common host. David Lonsdale ⁽¹⁾ commented that the mechanical effects of its decay on other hosts are not documented and I have observed that some oaks in my area survive for a long time, although they produce fruiting bodies each year. Oak timber is naturally stronger and more durable than beech, which could account for that.
- 5.2 The readings show a slightly off centre column of decay in the middle of the trunk, but there is a significant thickness of sound wood and in places the decayed wood appears to have retained some strength, e.g. in readings 1 and 6. The thickness of sound wood is between about 12 and 30cm, the average being about 20cm. An engineering formula sometimes applied to hollow trunks is that they retain a safety margin provided thickness of sound wood is more than $0.3 \times$ the trunk radius (t/R), both figures measured under the bark. In this case the bark is about 3cm thick on average, so that would be $17/27$ or 0.62 . That is well over 0.3 , but this method needs to be used with caution, as the trunk will not be a perfect circle, the wall thickness is irregular and decay by *Meripilus* tends to be below ground. Work by Frank Rinn ⁽²⁾ covers this in more detail.
- 5.3 The mathematical approach above takes no account of tree management and the recent crown reduction will have reduced the mechanical load on the lower trunk and the root system considerably. Another study by Rinn ⁽³⁾ found that a 20% reduction in height and spread reduced wind loading at the tree's base by about 50% and the recent reduction was heavier than that.
- 5.4 This indicates a significant safety margin, although there is significant decay above and below ground. However the sparse foliage last summer indicates that the tree's physiological vitality is declining, so it will become progressively less able to resist the decay. Therefore it would be advisable to monitor it, particularly the condition of the regrowing foliage and any increase in fungal growth in the summer / autumn.

Simon Pryce

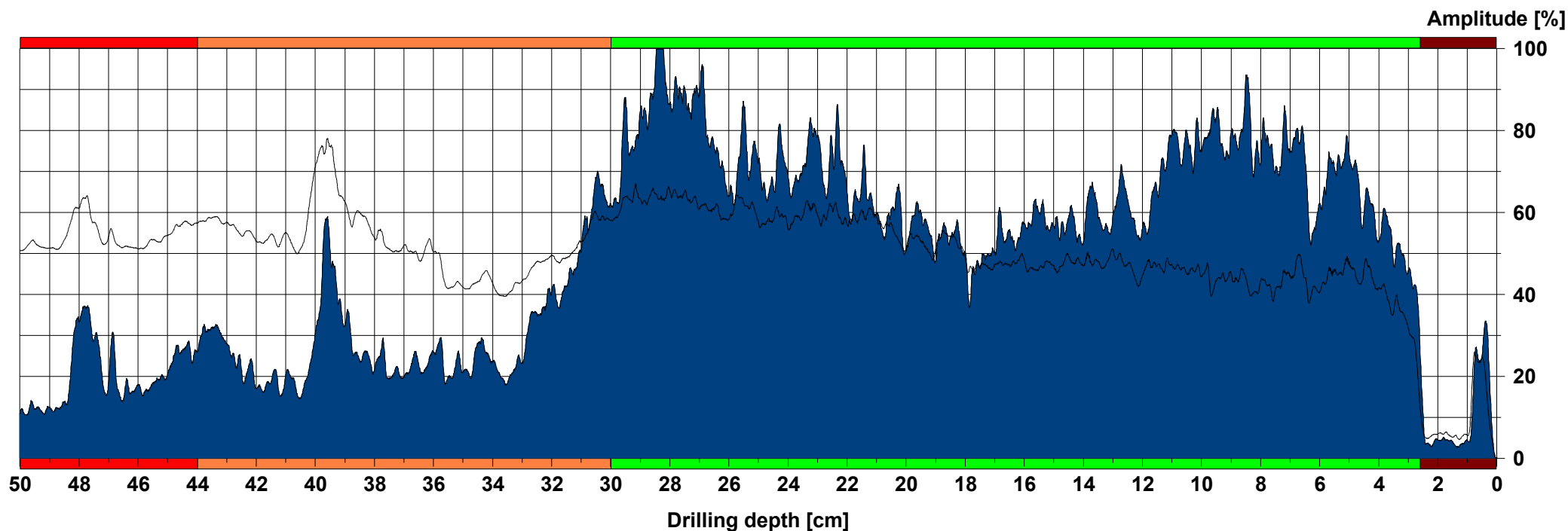
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References

- 1) Lonsdale D (1998) Tree hazard assessment and management, Research for Amenity Trees no.7, HMSO, ISBN 0 11 753355 6
- 2) Rinn F (2013) Shell wall thickness and breaking safety of mature trees, Western Arborist, Fall 2013
- 3) Rinn F (2014) How much crown pruning is needed for a specific wind-load reduction?, Western Arborist, Spring 2014

Measuring / object data

Measurement no. :	1	Needle speed :	2500 r/min	Diameter :	60,0 cm
ID number :	22/063	Needle state :	---	Level :	5,0 cm
Drilling depth :	50,37 cm	Tilt :	-20°	Direction :	N
Date :	26.10.2022	Offset :	84/273	Species :	Turkey oak
Time :	12:42:18	Avg. curve :	off	Location :	59 Cromwell Avenue
Feed speed :	100 cm/min	Name :	Stanford		



Assessment

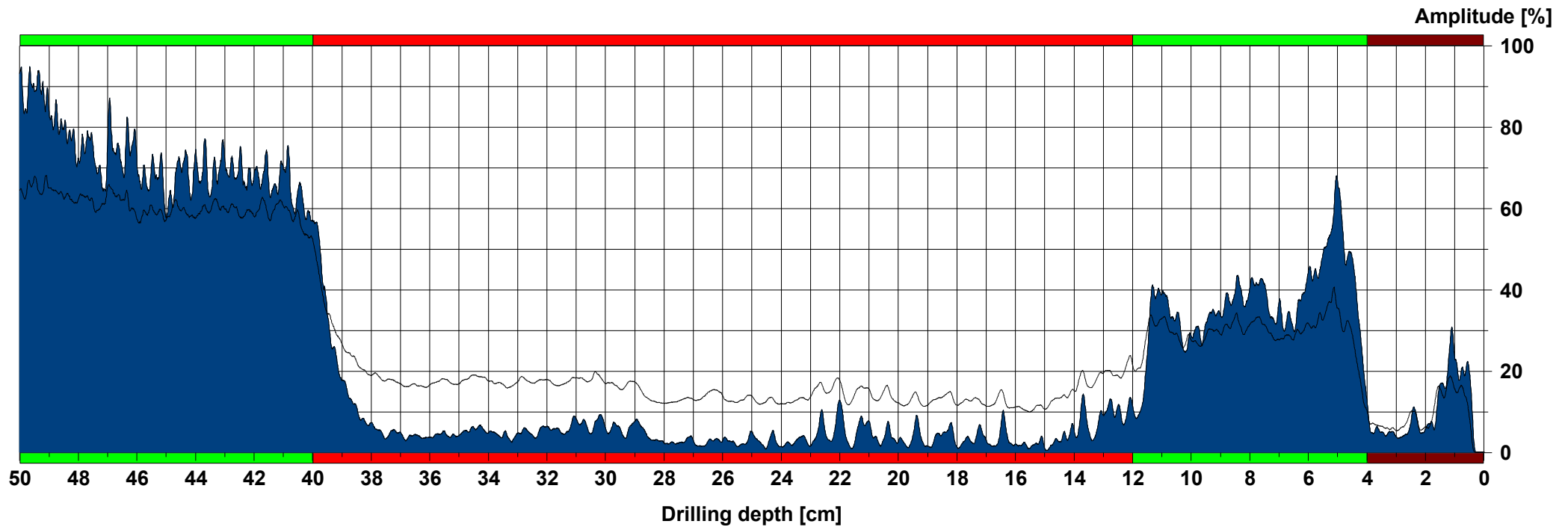
From	0,0 cm	to	2,6 cm	:	Bark
From	2,6 cm	to	30,0 cm	:	Sound wood
From	30,0 cm	to	44,0 cm	:	Early decay
From	44,0 cm	to	50,0 cm	:	Decay
From	0,0 cm	to	0,0 cm	:	
From	0,0 cm	to	0,0 cm	:	

Comment

From N (left) at ground level. Mainly sound wood to about 30cm, nearly half way into the trunk. Resistance drops after that but serrated profile shows that the grain texture is still present. That becomes less apparent after 44cm

Measuring / object data

Measurement no. :	2	Needle speed :	2500 r/min	Diameter :	60,0 cm
ID number :	22/063	Needle state :	---	Level :	5,0 cm
Drilling depth :	50,41 cm	Tilt :	-32°	Direction :	S
Date :	26.10.2022	Offset :	76/270	Species :	Turkey oak
Time :	12:45:41	Avg. curve :	off	Location :	59 Cromwell Avenue
Feed speed :	100 cm/min	Name :	Stanford		



Assessment

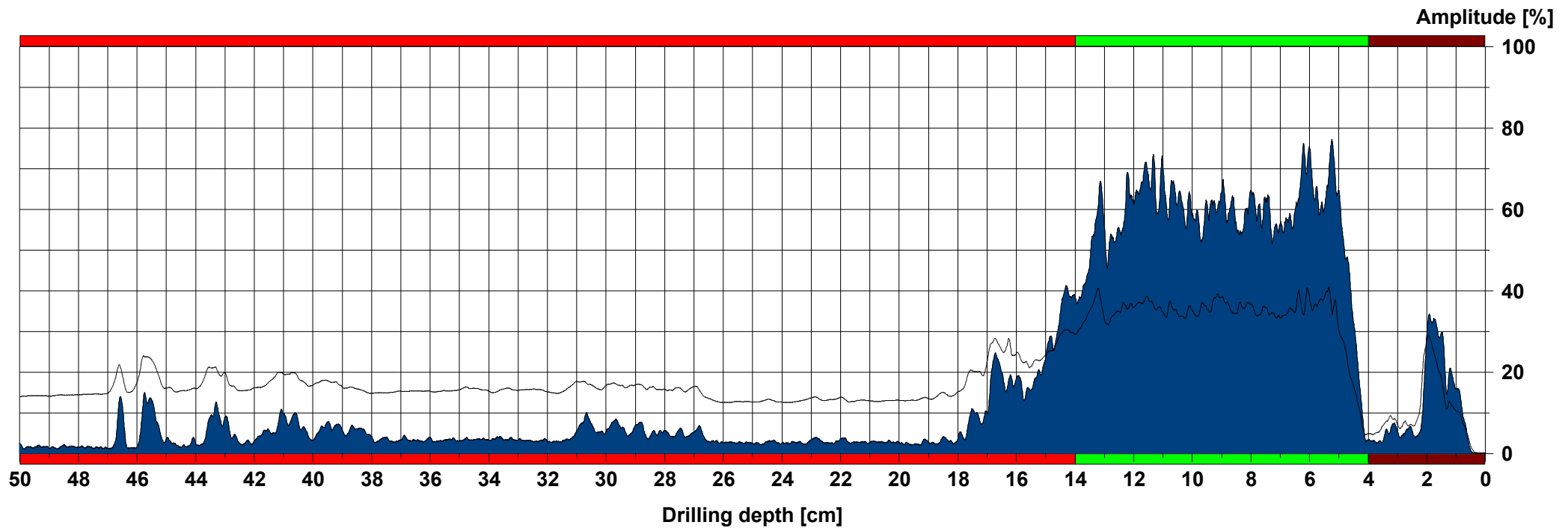
From	0,0 cm	to	4,0 cm	:	Bark
From	4,0 cm	to	12,0 cm	:	Sound wood
From	12,0 cm	to	40,0 cm	:	Decay
From	40,0 cm	to	50,0 cm	:	Sound wood
From	0,0 cm	to	0,0 cm	:	
From	0,0 cm	to	0,0 cm	:	

Comment

From S (right), angled down. Significant pocket of decay, but the steep transition from sound wood, particularly at about 40cm indicates that the tree is compartmentalising to resist its spread

Measuring / object data

Measurement no. :	3	Needle speed :	2500 r/min	Diameter :	60,0 cm
ID number :	22/063	Needle state :	---	Level :	5,0 cm
Drilling depth :	50,32 cm	Tilt :	-24°	Direction :	E
Date :	26.10.2022	Offset :	75/262	Species :	Turkey oak
Time :	12:47:30	Avg. curve :	off	Location :	59 Cromwell Avenue
Feed speed :	100 cm/min	Name :	Stanford		



Assessment

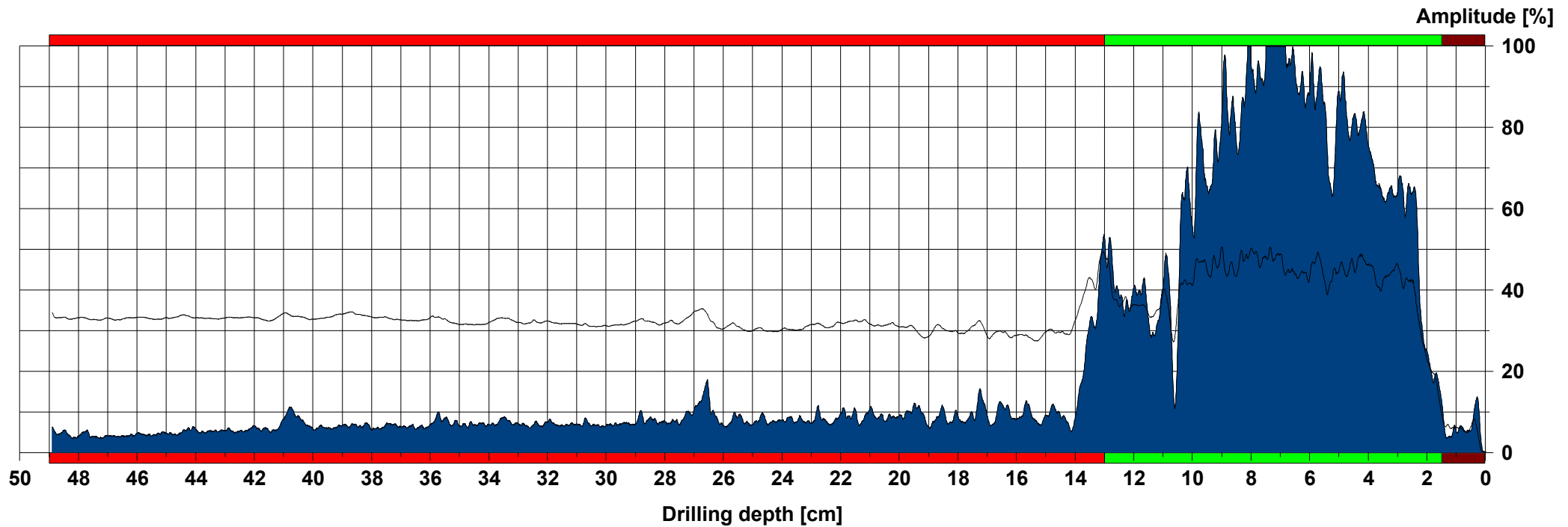
From	0,0 cm	to	4,0 cm	:	Bark
From	4,0 cm	to	14,0 cm	:	Sound wood
From	14,0 cm	to	50,0 cm	:	Decay
From	0,0 cm	to	0,0 cm	:	
From	0,0 cm	to	0,0 cm	:	
From	0,0 cm	to	0,0 cm	:	

Comment

East (far side) at ground level. Sound wood reasonably well compartmentalised, then advanced decay.

Measuring / object data

Measurement no. :	4	Needle speed :	2500 r/min	Diameter :	60,0 cm
ID number :	22/063	Needle state :	---	Level :	5,0 cm
Drilling depth :	48,89 cm	Tilt :	-22°	Direction :	W
Date :	26.10.2022	Offset :	78/272	Species :	Turkey oak
Time :	12:55:22	Avg. curve :	off	Location :	59 Cromwell Avenue
Feed speed :	100 cm/min	Name :	Stanford		



Assessment

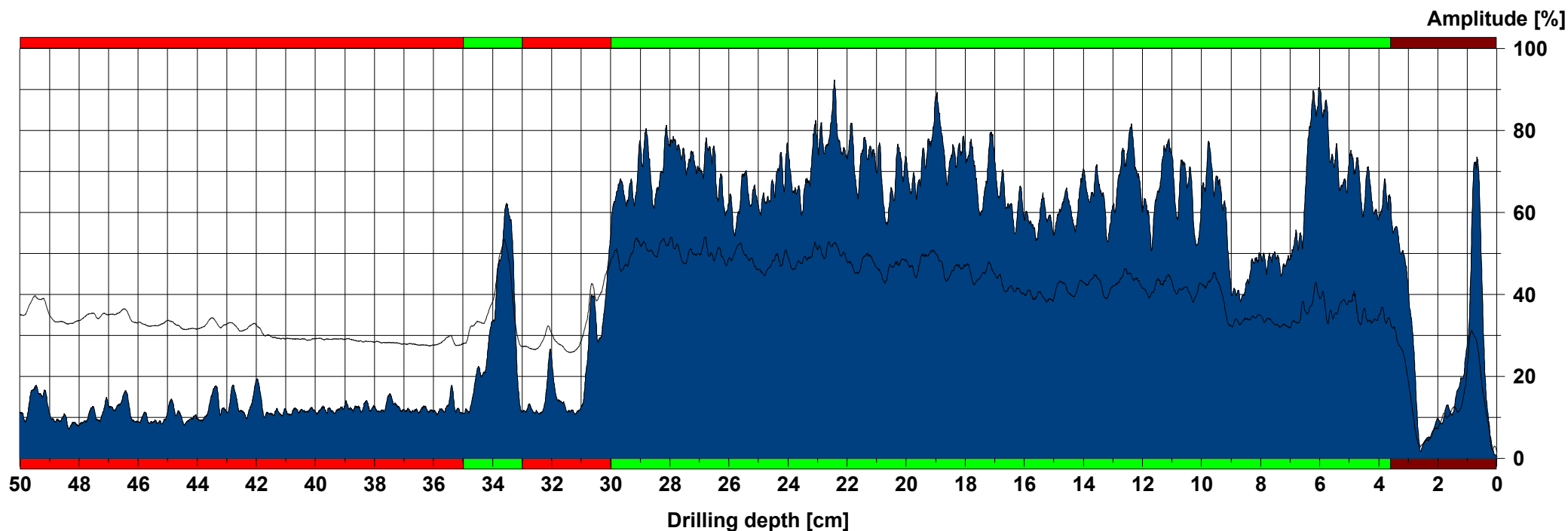
■	From	0,0 cm	to	1,5 cm	:	Bark
■	From	1,5 cm	to	13,0 cm	:	Sound wood
■	From	13,0 cm	to	49,0 cm	:	Decay
□	From	0,0 cm	to	0,0 cm	:	
□	From	0,0 cm	to	0,0 cm	:	
□	From	0,0 cm	to	0,0 cm	:	

Comment

From west (near side), right of fungus. Sound wood followed by internal decay, steep transition indicates that the tree is compartmentalising although there is a sharp dip at 10.5cm.

Measuring / object data

Measurement no. :	5	Needle speed :	2500 r/min	Diameter :	60,0 cm
ID number :	22/063	Needle state :	---	Level :	5,0 cm
Drilling depth :	50,33 cm	Tilt :	-13°	Direction :	W
Date :	26.10.2022	Offset :	82/351	Species :	Turkey oak
Time :	12:58:19	Avg. curve :	off	Location :	59 Cromwell Avenue
Feed speed :	100 cm/min	Name :	Stanford		



Assessment

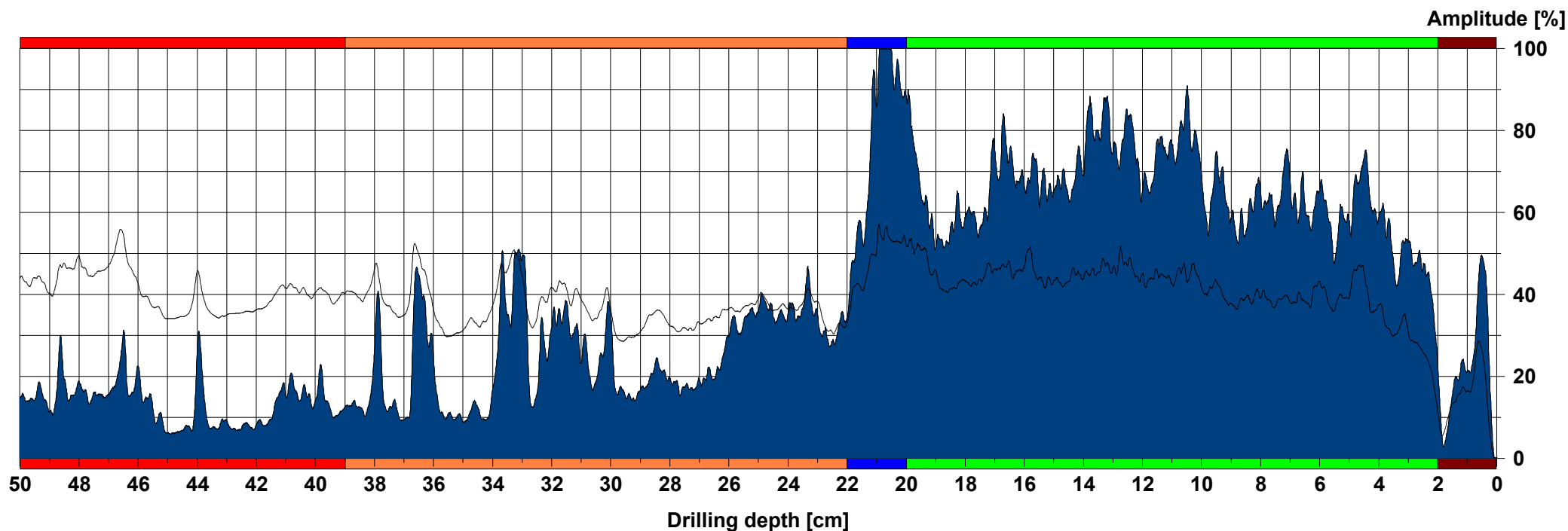
■	From	0,0 cm	to	3,6 cm	:	Bark
■	From	3,6 cm	to	30,0 cm	:	Sound wood
■	From	30,0 cm	to	33,0 cm	:	Decay
■	From	33,0 cm	to	35,0 cm	:	Sound wood
■	From	35,0 cm	to	50,0 cm	:	Decay
□	From	0,0 cm	to	0,0 cm	:	

Comment

W right of the fungus, near reading 4, but shallower angle. Thicker shell of sound wood. Spike at 34 looks like small piece of sound wood, but not likely to make a big difference to strength.

Measuring / object data

Measurement no. :	6	Needle speed :	2500 r/min	Diameter :	60,0 cm
ID number :	22/063	Needle state :	---	Level :	5,0 cm
Drilling depth :	50,34 cm	Tilt :	-23°	Direction :	NW
Date :	26.10.2022	Offset :	73/265	Species :	Turkey oak
Time :	13:00:50	Avg. curve :	off	Location :	59 Cromwell Avenue
Feed speed :	100 cm/min	Name :	Stanford		



Assessment

From	0,0 cm	to	2,0 cm	:	Bark
From	2,0 cm	to	20,0 cm	:	Sound wood
From	20,0 cm	to	22,0 cm	:	Reaction zone
From	22,0 cm	to	39,0 cm	:	Early decay
From	39,0 cm	to	50,0 cm	:	Decay
From	0,0 cm	to	0,0 cm	:	

Comment

NW at ground level. Sound wood to at least 21cm. Spike there could be reaction zone to the decay. Multiple spikes after that indicate gradual spread of the decay.