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Tree Condition and Decay Assessment

Prepared for

43 Elsworthy Road
Primrose Hill
London
NW3 3DL

Prepared by
A.C. Kimberlee BSc (Hons) Arboriculture, M Arbor A, PTI.

Date: 23rd January 2022

Version: 1

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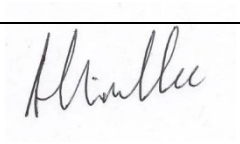
Client:	Mr Gareh	Ref:	AK/ 399/200122
Location:	43 Elsworthy Road Primrose Hill London NW3 3DL		
Date of site Inspections:	11th January 2022		
Survey Inspector(s):	Aran Kimberlee BSc (Hons) Arboriculture M Arbor A, PTI.		
Report Author:	Aran Kimberlee BSc (Hons) Arboriculture M Arbor A, PTI.		
Signature:		Date:	20th January 2022

The statements made in this report do not take account of extreme climate, vandalism or accident, whether physical, chemical or fire. The author cannot therefore accept any liability in these factors, nor where prescribed work is carried out in an incorrect and/or unprofessional manner in accordance with current good practice. The authority of this report ceases at any stated time limit within it, or if none is stated after two years from the date of the survey or when site conditions change, or pruning or other works unspecified in the report are carried out to, or affecting, the subject tree(s), whichever is sooner.

1.0 Instruction and Purpose of Report

1.1 I have been verbally instructed by Mr Gareh to carry out a tree safety inspection and decay assessment of the mature Black Locust tree growing in the front garden of 43 Elsworthy Road in London.

1.2 The purpose of my inspection was to assess the structural integrity of the tree on-site using decay testing equipment, from these results assess the level of risk the tree might pose to persons and property and to give appropriate recommendations, if any, for management of the tree. If significant defects are observed in relation to targets then the risk of harm will be assessed using the Quantified Tree Risk Assessment (QTRA) system. The method of which is detailed below in section 4.0 of this report.

1.3 In addition, give appropriate recommendations, if any, for management of the tree in report format.

2.0 Report Methodology & Limitations

2.1 I carried out the survey and decay assessment on the 11th January 2022. The weather was fine and the visibility good.

2.2 The inspection process consisted of a general ground based visual assessment, followed by a decay assessment Investigating the internal parts of the tree using a PiCUS Tomograph and IML Resi-F Resistograph (micro-drill).

- The Resistograph is an invasive method of assessing the structural quality of the wood in the internal parts of a tree. The drill has a testing depth of 400mm, and the test is generally carried out in quadrants or in three locations on the main trunk around the decayed area/s to ensure the test does not miss any significant decay.

- The PiCUS Tomograph measures the velocity of sound waves in wood in order to detect decay and cavities in standing trees noninvasively. The acoustic velocity depends on the modulus of elasticity and the density of the wood itself. Most damage and disease cause fractures, cavities, or rot and reduce the wood's elasticity and density. The sketch displays the basic working principle, in that sound waves cannot take a direct path through the wood if there is a cavity between the transmitter and receiver. The acoustic waves are created manually with a small metal hammer and sonic sensors (receivers) record the signals. Little pins are used for coupling the sensors to the wood. Number and positions of the test points are critical to the accuracy of the scan. By using both acoustic travel-time information and geometry data of the measuring level the software calculates tomograms that show the apparent sonic velocities, the so-called sonic tomograms acoustic

tomograms. The speed of sound in wood correlates with wood quality and is therefore a measure for the breaking safety of the trunk. The PiCUS sonic tomogram shows the residual wall thickness. Using this information, where deemed appropriate, the calculations on the website www.treecalc.com can show the breaking safety of the trunk (Source: argus-electronic gmbh). Treecalc has not been used for this assessment on this occasion.

2.3 The assessment consisted of an above ground inspection only and soil type has not been ascertained on site. Therefore, this report makes no reference to the possible effects of tree roots and shrinkable soils, and any possible effects on building foundations or underground services.

2.4 Unless otherwise specified in the recommendations, this report is valid for 12 months from the date of site inspection. The condition of trees can change due to the effects of pests and disease or following severe weather conditions or other abiotic factors. The report is valid only for typical weather conditions. Healthy trees or parts of healthy trees may fail in unusually high or unpredictable winds or violent storms and, as the consequences of such weather phenomena are unforeseeable, the author of this report cannot be held liable for any such failures.

2.5 The conclusions of this report will remain valid for 12 months from the date of the inspection, but any alteration or deletion from this report will invalidate it as a whole.

2.6 The trees on site have not been tagged.

3.0 Site Details

3.1 Access to the site is from 43 Elsworthy Road, Primrose Hill in London. The decay assessment was carried out on a mature Black Locust (*Robinia psuedoacacia*) tree, located in a small, raised bed in the front garden adjacent to the footpath, road and parking area close to Elsworthy Road. London Plane (*Platanus x hispanica*) pollarded trees line the pavements along the residential road.

3.2 The Site appeared to be moderately sheltered to the prevailing west south-westerly winds.

3.3 Soil type on-site has not been ascertained.

3.4 No checks have been carried out to ascertain any legal protection such as Tree Preservation Orders or Conservation Areas that might cover the site.

4.0 Condition of Tree

4.1 T1 is a mature Black Locust (*Robinia psuedoacacia*) which naturally leans towards the property at 43 Elsworthy Road. An adjacent street tree which has been regularly pollarded has caused T1 to lean towards the property at 43 Elsworthy Road with a crown bias to the south-east.

Photograph 1: T1 Black Locust leaning towards 43 Elsworthy Road

4.2 During the survey multiple fungal brackets (*Perenniporia fraxinea*) were observed growing on the main trunk at 1-3 metres around all aspects. Seasonal fungal was also observed growing at the base of the tree believed to be L*aetiporus sulphureus*. The main trunk was sounded with a nylon mallet which indicated significant internal hollowing and decay. In order to ascertain the extent of decay the PiCUS tomograph and a Resistograph has been used (findings are detailed below in section 5.0 of this report). The tree exhibited large reactive buttressing particularly on the northern and north-western sides of the tree.

Photograph 2: T1 Black Locust with multiple fungal brackets on main trunk.

4.3 The physiological condition of the tree was difficult to assess due to the time of year. However, I did not observe any significant crown dieback or deadwood and can only assume that when in leaf the crown would appear to be healthy.

4.4 The risk associated with unpredictable branch loss due to factors such as summer branch drop cannot be quantified. Should these trees lose additional, relatively healthy and structurally sound branch within the period covered by this report, I advise that these trees would then require re-assessment as soon as possible after the event.

5.0 Decay Assessment Findings

5.1 The PiCUS Tomograph and the Resistograph (micro-drill) have been used in order to ascertain the level of decay within the main trunk up to approximately 0.1m from ground level on the tree. The readouts for both tests can be found in Appendix 3 of this report. The following details were observed when testing the trees:

Resistograph observations

Structural buttresses were drilled wherever possible in order to assess decay which may be affecting structural aspects of the tree which may not have been represented in the PiCUS tomograph.

- The first test was carried out at the base of the northern side of the main trunk. This test showed very high resistance as it passed through reactive growth in the buttresses to 280 mm. Thereafter, the resistance drops suddenly to full depth of 400mm indicating significant decay in the main trunk.

- The second test on the eastern side of the tree was drilled and showed a high resistance through a buttress up to 150 mm after dropping rapidly to very low resistance up to the full depth of 400 mm.

- The third drill test carried out on the southern side of the trunk indicated high resistance up to a depth of 140mm before dropping substantially to a depth 300mm. At 300mm depth automatic drill retraction occurred, this is where the drill passes through decayed wood or internal hollowing and starts to drill back into wood of high resistance. It is likely that the drill passed through a small area of reactive wood or a knot within the trunk.

- The fourth test was carried out on the western side of the main trunk and showed very high resistance drilling through reactive growth wood to a depth of 130mm. The resistance dropped low beyond this point to a depth of 360 mm where automatic needle retraction occurred.

PiCUS Tomograph observations

- A PiCUS assessment was undertaken to ascertain the extent of decay in the main trunk and in order to assess the risk of failure from the base of the tree. The imagery (see Appendix 2) indicates that at the point of the decay test there is approximately 29% of sound wood recorded. The PiCUS tomograph imagery showed evidence of significant dysfunctional wood/decay with the trunk of the tree where the decay test was carried out. Areas on the tomograph showing up as blue, white, green and pink colours are normally associated with dysfunctional wood or areas of decay. The tomograph shows significant damaged and decayed wood throughout the main trunk with only sound wood located on the buttresses to the north, south, south-east and south-western aspects. I believe that this amount of decay is present throughout the main trunk from ground level up to approximately 3-4 metres where decay fungi was observed. Given the heavy lean

of the tree towards the property and significant decay present throughout the main trunk. I believe this tree has a high probability of failure.

6.0 Tree Risk Assessment

6.1 The Quantified Tree Risk Assessment (QTRA) system applies established and accepted risk management principles to tree safety management. Firstly, the targets (persons and property) upon which trees could fail are assessed and quantified, thus enabling tree managers to determine whether or not and to what degree of rigour a survey or inspection of the trees is required. Where necessary, the tree or branch is then considered in terms of both impact potential (size) and the probability of failure. Values derived from the assessment of these three components (target, impact potential and probability of failure) are combined to calculate the probability of significant harm occurring.

6.2 The system moves the management of tree safety away from labelling trees as either "safe" or "unsafe", thereby requiring definitive statements of tree safety from either tree surveyors or tree managers. Instead, QTRA quantifies the risk of significant harm from tree failure in a way which enables tree managers to balance safety with tree value and operate to a predetermined limit of reasonable or acceptable risk. The QTRA system also require an allocated target range; mapping of land use by road classification; estimated levels of pedestrian occupation; and estimated structure values. Whilst surveying I only saw a brief glimpse of site usage on the site and therefore, I advise that my target appraisal is considered against the knowledge of site managers or users.

6.3 The target ranges can vary from each site. The ones used during the risk assessment are as follows:

- Target 1: Estimated pedestrian usage 720-73 per hour; property repair or replacement cost £2 000 000 – £200 000 and/or 47000 – 4800 vehicles per day at 30 mph.

- Target 2: Estimated pedestrian usage 72-8 per hour; property repair or replacement cost £200 000 – £20000 and/or 4700 – 480 vehicles per day at 30 mph.

6.4 Should the client consider this estimate to be inaccurate he should report back to Dartforest Limited. so that the risk assessment can be refined.

6.5 QTRA Advisory Thresholds

Thresholds	Description	Action
1/1 to 1/1000	**Unacceptable** Risks will not ordinarily be tolerated	• Control the risk
1/1000 to 1/ 10 000	**Unacceptable** (Where imposed on others) Risks will not ordinarily be tolerated	• Control the risk • Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	• Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value • Review the risk
1/ 10 000 to 1 000 000	**Tolerable** (Where imposed on others) Risks are tolerable if as low as reasonably possible (ALARP)	• Assess costs and benefits of risk control • Control the risk only where a significant benefit might be achieved at reasonable cost • Review the risk
1/ 1 000 000 or less	**Broadly Acceptable** Risk is already as low as reasonably possible (ALARP)	• No action currently required • Review the risk

Source: Quantified Tree Risk Assessment User Manual V5.1.3

6.6 The risk of harm from and has been calculated at 1/3 000 which is within the Unacceptable threshold (Where imposed on others) Risks would not ordinarily be tolerated.

7.0 Recommendations

Tree No.	Species	Observations	Recommendations	Work Priority
T1	Black Locust	• Mature tree leaning and crown bias to south. • Buttress growth formation around trunk particularly on northern, north-west and north-eastern aspects. • Multiple fungal brackets observed from 1 m to 4 metres on all aspects of main trunk (*Perinniporia fraxinea*) • Sounded with nylon mallet which indicated significant decay in main trunk and internal hollowing. • Picus and Resistograph test carried out.	• The results of the decay tests indicate that the tree is extensively decayed with a high risk of failure. • Fell to near ground level.	**High/ Medium - Works recommended within 3 months**

6.1 In the event of any new defects, concerns or the occurrence of seasonal fungal fruiting bodies on any of the trees with high targets, Dartforest Limited should be contacted as soon as possible in order to re-assess the tree/s and update this report.

6.2 All tree works should be undertaken to BS3998:2010 Recommendations for Tree Works. It is strongly recommended that any tree surgery works are undertaken by highly skilled and qualified contractors.

End AK/ 399/ 200122

8.0 Bibliography

British Standards Institution (2010) British Standard Recommendations for Tree Work -BS 3998:2010

Fay N, Dowson D, Helliwell R (2005) Tree Surveys: A guide to good practice *Guidance Note No. 7 Arboricultural Association*

Lonsdale D. (1999) Principles of Tree Hazard Assessment and Management TSO

Matheny N. P. and Clark J. R. 1994 A photographic guide to the evaluation of hazard trees in urban areas, Second Ed. *International Society of Arboriculture*

Mattheck C. and Breloer H. 1994 The Body Language of Trees: A handbook for failure analysis *TSO*

Matteck C and Bethge K 1998 The Structural Optimization of Trees *Springer-Verlag, Naturwissenschaften*

Mitchell A (1974) Collins field GuideTrees of Britain and Northern Europe *Harper Collins Publishers*

QTRA Tree Safety Management (2014) Quantified Tree Risk Assessment User Manual Version 5

Schwarze F.W.M.R (2008) Diagnosis and Prognosis of the Development of Wood Decay in Urban Trees *ENSPEC*

Appendix 1: Individual Tree Risk Survey

APPENDIX 2: INDIVIDUAL TREE RISK SURVEY

Site:	43 Elsworthy Road, London, NW8 6HP	**Surveyor:**	Aran Kimberlee
Client:	Mr Gareh	**Assessment Date:**	11th January 2022
Brief:	VTA Assessment of significant trees growing within the boundaries of the site listed above	**Viewing Conditions:**	Good
		Job Reference:	

Tree no.	Species	Age Range	Height (m)	Stem dia. (mm)	Vitality	Targets and Comments	Management	Target Range	Size Range	Prob Range	Risk Index	Inspection Frequency
T1	Black Locust	M	18	800	M	• Mature tree leaning and crown bias to south. • Buttress growth formation around trunk particularly on northern, north-west and north-eastern aspects. • Multiple fungal brackets observed from 1 m to 4 metres on all aspects of main trunk (*Perinniporia fraxinea*) • Sounded with nylon mallet which indicated significant decay in main trunk and internal hollowing. • Picus and Resistograph test carried out.	• The results of the decay tests indicate that the tree is extensively decayed with a risk of falling onto the property. • Fell to near ground level.	2	Prop	3	3K	-

KEY-
HEADINGS & ABBREVIATIONS

REF:	TREE REFERENCE NO.
AGE RANGE:	Y= YOUNG, SM= SEMI MATURE, EM= EARLY MATURE, M = MATURE, PM = POST MATURE
STEM DIA:	STEM DIAMETER MEASURED AT A HEIGHT OF APPROXIMATELY 1.3 METRES
VITALITY:	A MEASURE OF PHYSIOLOGICAL CONDITION.
	G= GOOD, M= MODERATE, P= POOR, MD = MORIBUND, D= DEAD,
QTRA RISK RATING:	RISK OF SIGNIFICANT HARM ¸ 1,000 = RISK INDEX (E.G. RISK INDEX 20 = RISK OF SIGNIFICANT HARM 1 IN 20,000)

INSPECTION FREQUENCY: PERIOD (IN YEARS) TO NEXT INSPECTION BY COMPETENT PERSON

Appendix 3: PiCUS and Resistograph Decay Test Results

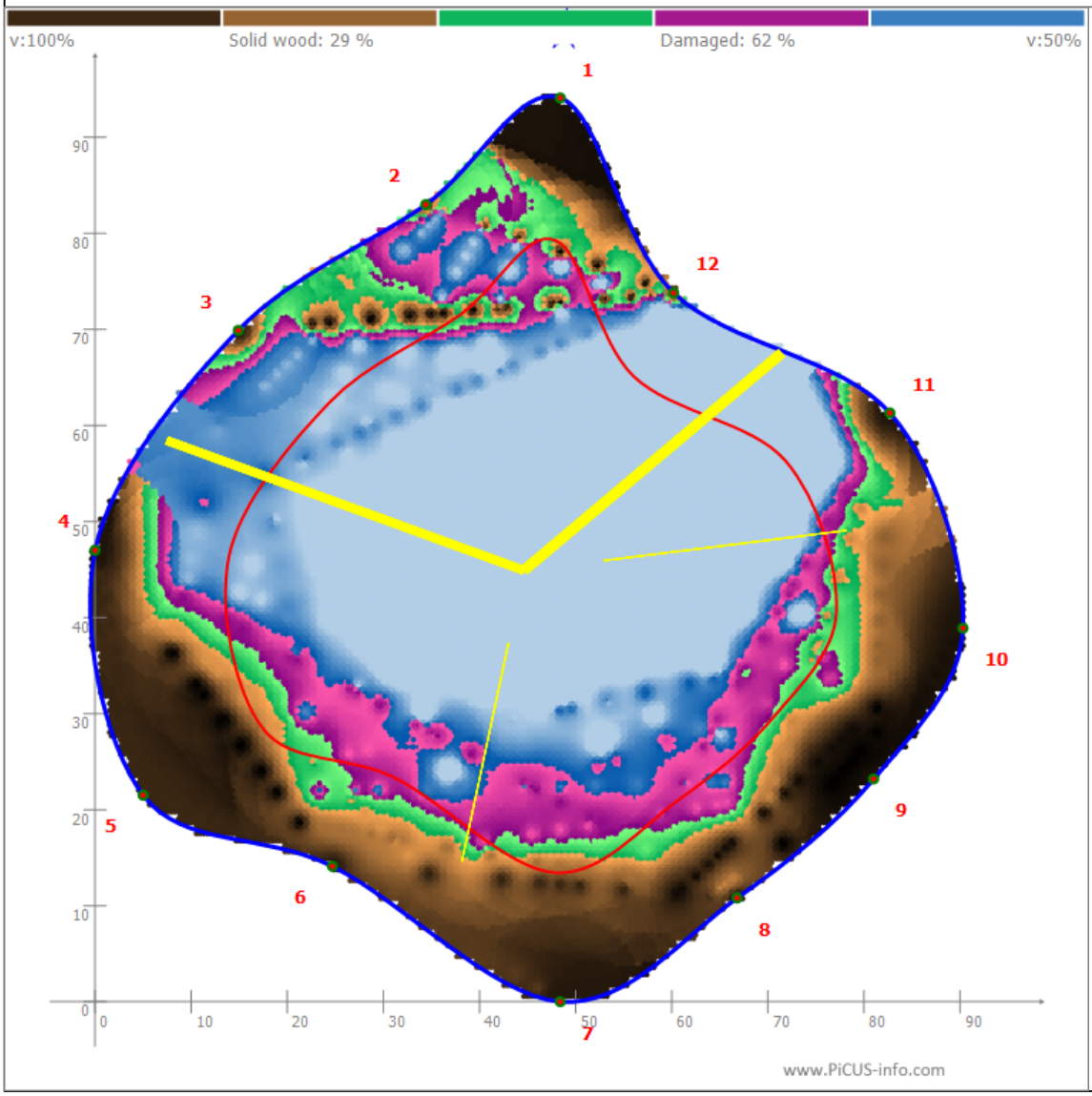
Picus:

Client:

Tree Expert:

Tel: 07594680168
Fax:
Domain: www.dartforesttrees.co.uk
email: aran@dartforesttrees.co.uk

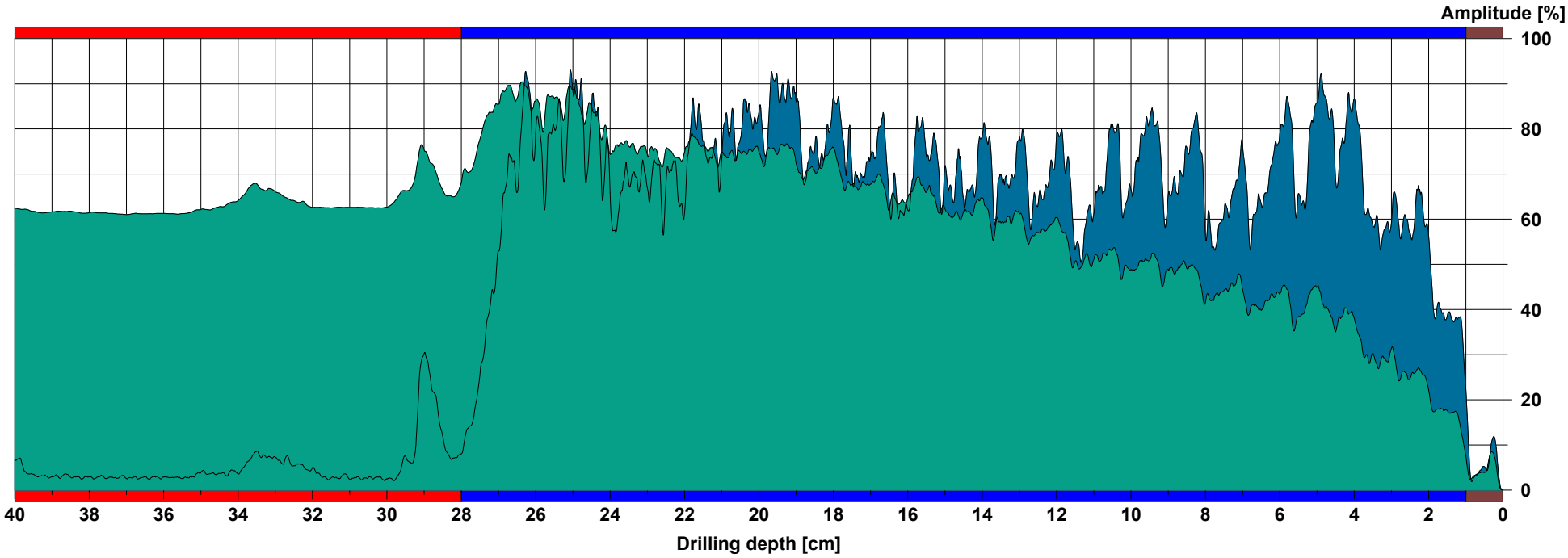
Tree species:		Tree height [m]:	18
Town:		North at measuring point:	1
Neighbourhood:		Crown spread [m]:	
Road:		Position of measuring point 1:	0
		Trunk circumference (130cm height)[cm]:	
Number of tree:	2	Tomography level at height [cm]:	50
Measure date:	1/11/2022 10:35 AM		



Comments:

Measuring / object data

Measurement no.:	6	**Speed**	: 2500 r/min	**Diameter:**	144,64 cm
ID number	: T2 Black Locust	**Needle state:**	---	**Level**	: 0.5
Drilling depth	: 40,00 cm	**Tilt**	: ---	**Direction:**	North
Date	: 11.01.2022	**Offset**	: 72 / 293	**Species**	: Robinia pseudoacacia
Time	: 11:05:23	**Avg. curve**	: off / off	**Location**	: 43 Elsworthy Road
Feed	: 50 cm/min			**Name**	: Black Locust



Assessment

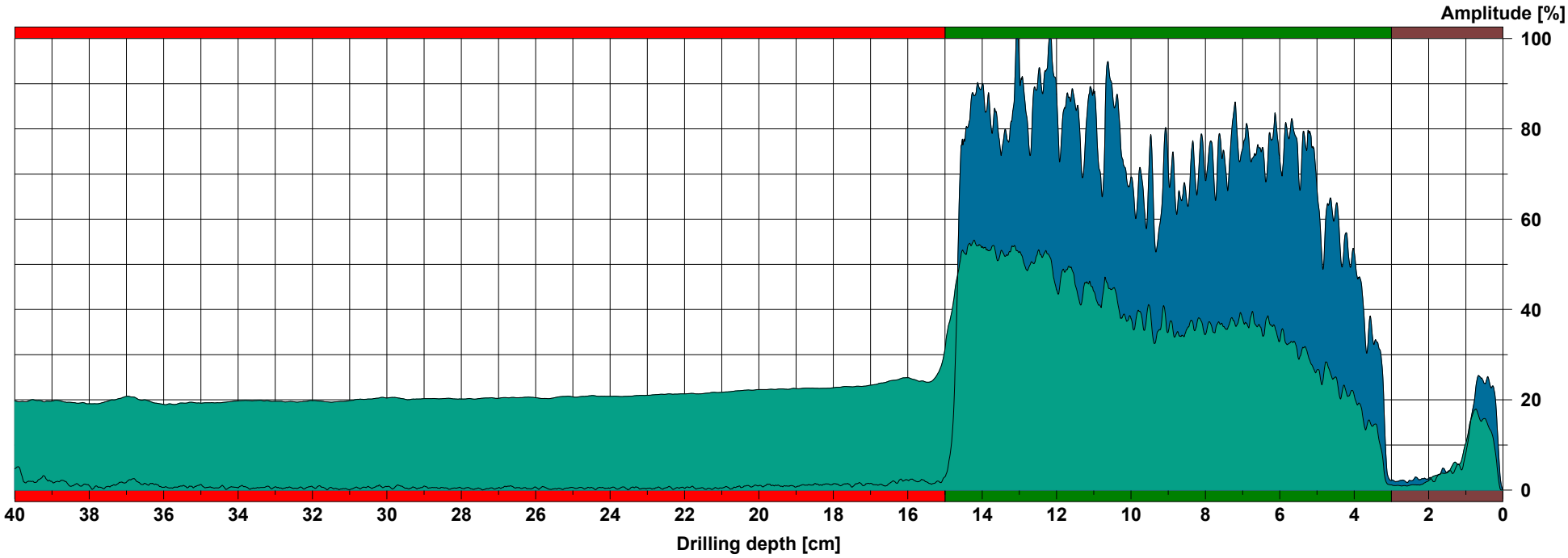
From	0,00 cm	**to**	1,00 cm	: Bark
From	1,00 cm	**to**	28,00 cm	: Reaction Wood
From	28,00 cm	**to**	40,00 cm	: Decay

Comment

43 Elsworthy Road 0.5 N

Measuring / object data

Measurement no.	7	**Speed**	2500 r/min	**Diameter**	144,64 cm
ID number	T2 Black Locust	**Needle state**	---	**Level**	0.5
Drilling depth	40,00 cm	**Tilt**	---	**Direction**	east
Date	11.01.2022	**Offset**	68 / 285	**Species**	Robinia pseudoacacia
Time	11:07:06	**Avg. curve**	off / off	**Location**	43 Elsworthy Road
Feed	50 cm/min			**Name**	Black Locust



Assessment

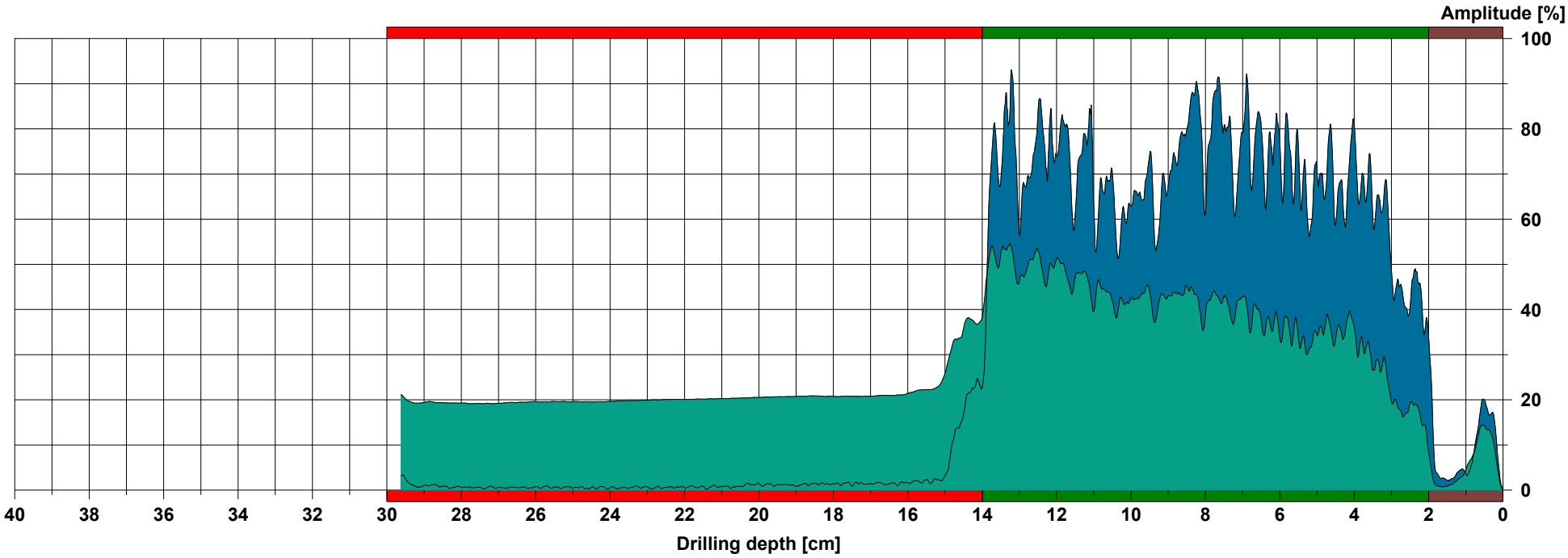
From	0,00 cm	to	3,00 cm	: Bark
From	3,00 cm	to	15,00 cm	: Sound wood
From	15,00 cm	to	40,00 cm	: Decay

Comment

43 Elsworthy Road 0.5 E

Measuring / object data

Measurement no.:	8	**Speed**	: 2500 r/min	**Diameter:**	144,64 cm
ID number	: T2 Black Locust	**Needle state:**	---	**Level**	: 0.5
Drilling depth	: 29,62 cm	**Tilt**	: ---	**Direction:**	South
Date	: 11.01.2022	**Offset**	: 66 / 280	**Species**	: Robinia pseudoacacia
Time	: 11:08:41	**Avg. curve**	: off / off	**Location**	: 43 Elsworthy Road
Feed	: 50 cm/min			**Name**	: Black Locust



Assessment

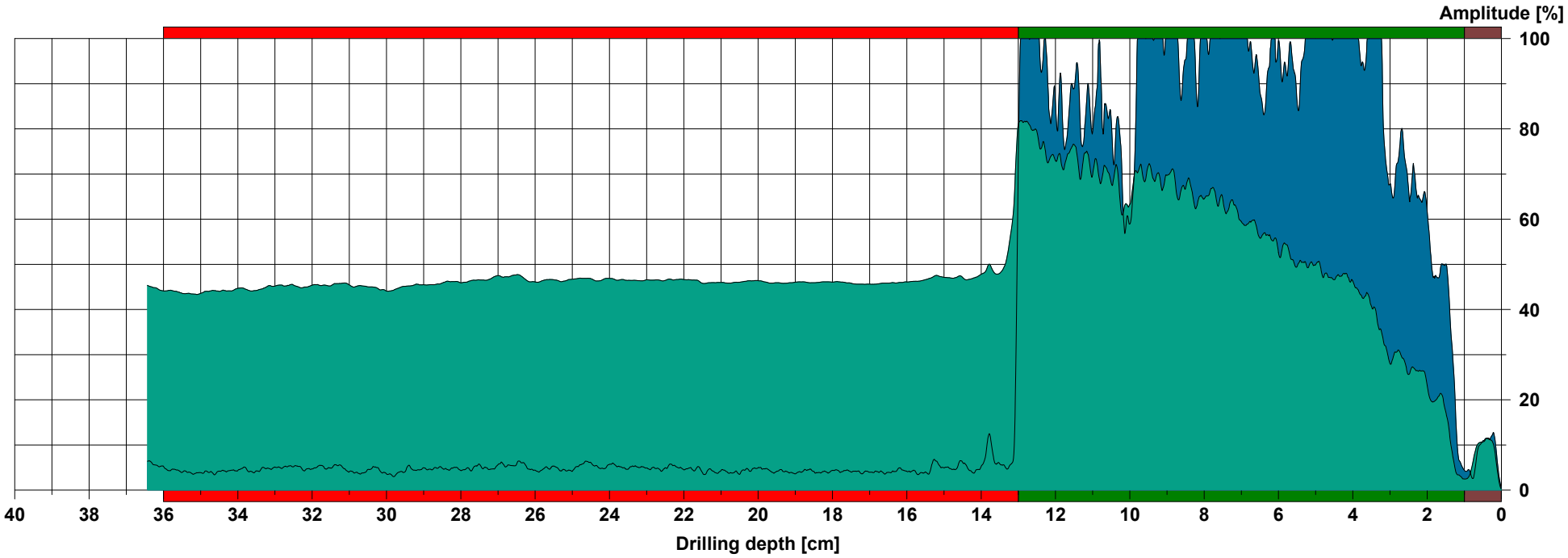
From	0,00 cm	**to**	2,00 cm	: Bark
From	2,00 cm	**to**	14,00 cm	: Sound wood
From	14,00 cm	**to**	30,00 cm	: Decay

Comment

43 Elsworthy Road 0.5 S

Measuring / object data

Measurement no.	9	**Speed**	2500 r/min	**Diameter**	80,00 cm
ID number	T2 Black Locust	**Needle state**	---	**Level**	0.5
Drilling depth	36,43 cm	**Tilt**	---	**Direction**	West
Date	11.01.2022	**Offset**	63 / 282	**Species**	Robinia pseudoacacia
Time	11:10:10	**Avg. curve**	off / off	**Location**	43 elsworthy Road
Feed	50 cm/min			**Name**	Black Locust



Assessment

From	0,00 cm	to	1,00 cm	: Bark
From	1,00 cm	to	13,00 cm	: Sound wood
From	13,00 cm	to	36,00 cm	: Decay

Comment

43 Elsworthy Road 0.5 W