

Landmark Trees

FURTHER INVESTIGATION REPORT:

52-54 Avenue Road
London
NW8 6HS

REPORT PREPARED FOR:

52 Avenue Road Limited
c/o Lomas & Company, Bridge House,
12 Market Street,
SK13 8AR Glossop

REPORT PREPARED BY

Adam Hollis
MSc ARB MICFor FArbor A MRICS C Env

Ref: DML/52AVR/PCS/01

Date: 19th December 2021

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Site Details

Site Address: 52-54 Avenue Road, London NW8 6HS

Client / Agent: 52 Avenue Road Ltd

Surveyor: Kim Dear

Date of Inspection: 15th December 2021

Instruction

Carry out Picus Tomograph and Resistograph decay detection on the main stem of silver maple T6.

Picus Sonic Tomography

The Picus Sonic Tomograph is made by a German company called Argus-Electronic-GmbH. It is a specialised electronic instrument which can 'look' internally into a branch or tree trunk and display a computer generated image of its condition. It achieves this by measuring the speed that sound travels through the wood in a number of different positions and directions. Sound travels fastest through solid wood. Decayed wood will slow its path. By measuring the speed that sound takes to pass through a tree, an idea of its condition can be obtained.

The PICUS Sonic Tomograph consists of 8 to 14 sonic sensors. These sensors are spaced out evenly around the circumference of the trunk. They detect stress waves induced by manual impact propagated through the wood. Time-of-sound-transmissions are used to generate two-dimensional pictures that document decay and cavities.

The sounds are generated manually by tapping on a number of metal nails with a hammer. Special sensors fixed around the stem read the interval the sound takes to travel through the wood. Once all nails have been tapped, and recordings taken, the computer software works out a visual image that requires professional assessment to assess decay.

Resistograph Tests

The Resistograph is a drilling instrument that probes the tree with a micro-drill with a 3mm tip and a 1.5mm x 400mm shaft; this allows testing to a depth of 40cm. As the probe advances it measures the resistance encountered and feed rate of the needle. Undecayed wood gives a high reading whilst dysfunctional wood or cavities give a lower reading.

The instrument used was the IML Resistograph PD400 which has a greater capability than earlier models. There are 5 different speed settings and the data is recorded electronically. The readings show the measured resistance as a black line and the feed rate of the needle as a blue colour. It is useful to have the 2 settings as with previous models, friction on the needle could give a falsely high reading. Although there is still friction on the needle with the PD400 the feed rate will change as decay is encountered. This is depicted on the traces shown below.

T6 Details

Species: Silver maple (*Acer saccharinum*)

Diameter: 780mm

Height: 17m



Photograph 1: Cavity at base of T6

Observations

This tree is situated 8 metres to the east of the property's boundary wall. The main stem bifurcates at 2.5m with co-dominant stems rising and branching to a height of 17m. There is epicormic growth from ground level to a height of 3m. The crown appears to be in a moderate condition, with some sparseness to the south and further epicormic sprouts within the crown interior indicative of physiological stress. There is also a break-out wound in the primary forks at c. 10m above ground where a historic limb failed (and cavity we previously reported), the species having a reputation for such. There is a cavity opening 10cm in diameter to the south of the stem at ground level (shown in Photograph 1). On physical examination this progresses 25cm horizontally towards the centre of the stem where stringy decayed wood, typical of honey fungus (*Armillaria*), is encountered. Probing at 45 degrees down into the root ball, there is softness and decay to a depth of 50cm.



Photograph 2: Stringy rot within cavity typical of honey fungus.

Results

One tomograph was taken, at a level 5cm above ground, just above the basal cavity. The tomograph shows pockets of decay (purple) and cavitation (blue) spreading up into the stem, with incipient decay coloured green and internal cracks (yellow).

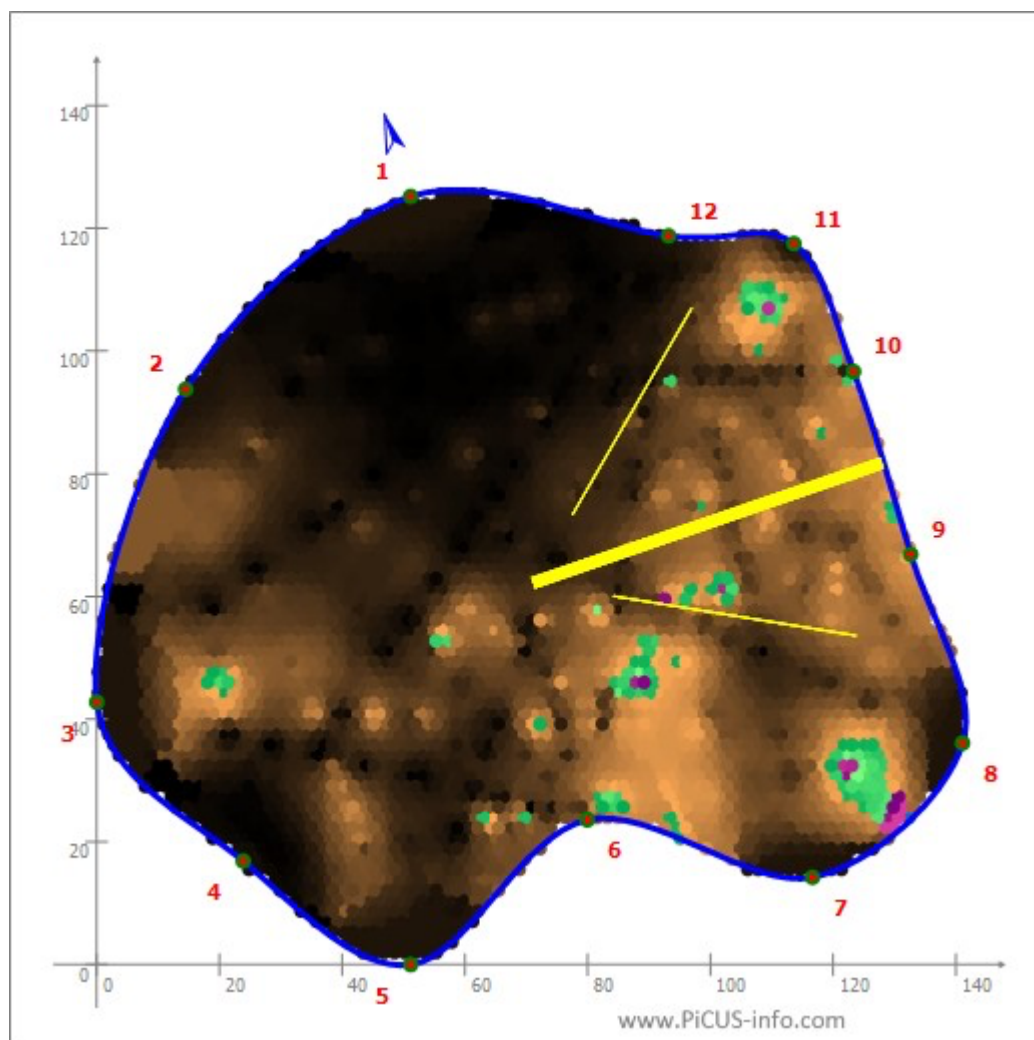


Figure 1: Tomograph of T6 taken at 5cm above ground level (just above cavity)

Table 1: Findings of Resistograph testing undertaken

Direction	Height	Results
North	5cm	0-2cm bark; 2-31cm sound wood; 31-34.5cm variable decay; 34.5-40cm sound wood
East	5cm	0-1.5cm bark; 1.5-38.5cm sound wood; 38.5-40cm decay
South	5cm	0-2cm bark; 2-6.5cm sound wood; 6.5-14cm early incipient decay; 14-14.1cm barrier zone; 14.1-40cm sound wood
West	5cm	0-1.7cm bark; .7-9cm sound wood; 9-11cm decay; 11-40cm sound wood

The individual traces are provided for reference within Appendix 1.

Discussion

The Tomograph shows pockets of decay above the cavity, surrounded by more extensive incipient decay distributed across the south and east of the stem cross, as confirmed by the Resistograph drillings. Although the fruit are not currently visible due to the time of year, honey fungus (*Armillaria mellea*) is a common pathogen of the species and the texture (stringy) and mode of decay (root collar) are signatures of the fungus. This pathogen first colonises the root system before the decay it causes moves upwards to the stem base. Whilst the decay in the above ground stem is not yet advanced, it is undoubtedly advancing in terms of penetrating the tree's defences, and clearly visible, advanced / cavitated at and below ground level (photograph 2). The seat of decay is of course in the roots and the image at 5cm above ground could be considered as the tip of the iceberg with the probe accordingly penetrating 25cm horizontally and 50cm at a downward incline. It is my experience that *advanced* root decay is likely to manifest in the root collar and stem base as showing signs of substantive colonisation, as we are beginning to see here. In terms of overall prognosis, for this American tree, I would defer to the USDA publication:

https://www.srs.fs.usda.gov/pubs/misc/ag_654/volume_2/acer/saccharinum.htm

Shoestring root rot (Armillaria mellea) is common on the species and kills trees that are already in a weakened state.

The condition of the inner and southern crown, internal stress cracks and the penetration of incipient decay across the stem base indicate a weakened state. The tree is considered to have a limited useful life expectancy of <10-20 years in a residential open space.

Management Recommendations

Option 1

Crown reduce by 2m in height and spread

Re-inspect in 1yr; monitor crown condition for any signs of dieback or thinning in interim.

Option 2

Fell and replace with new healthy specimen subject to Conservation Area / planning consent

(NB These recommendations are made independent of tangential planning considerations which are outside the scope of this report and are addressed separately in our cover letter DML_52AVR_Lttr_02).

Appendix 1

RESISTOGRAPH TRACES

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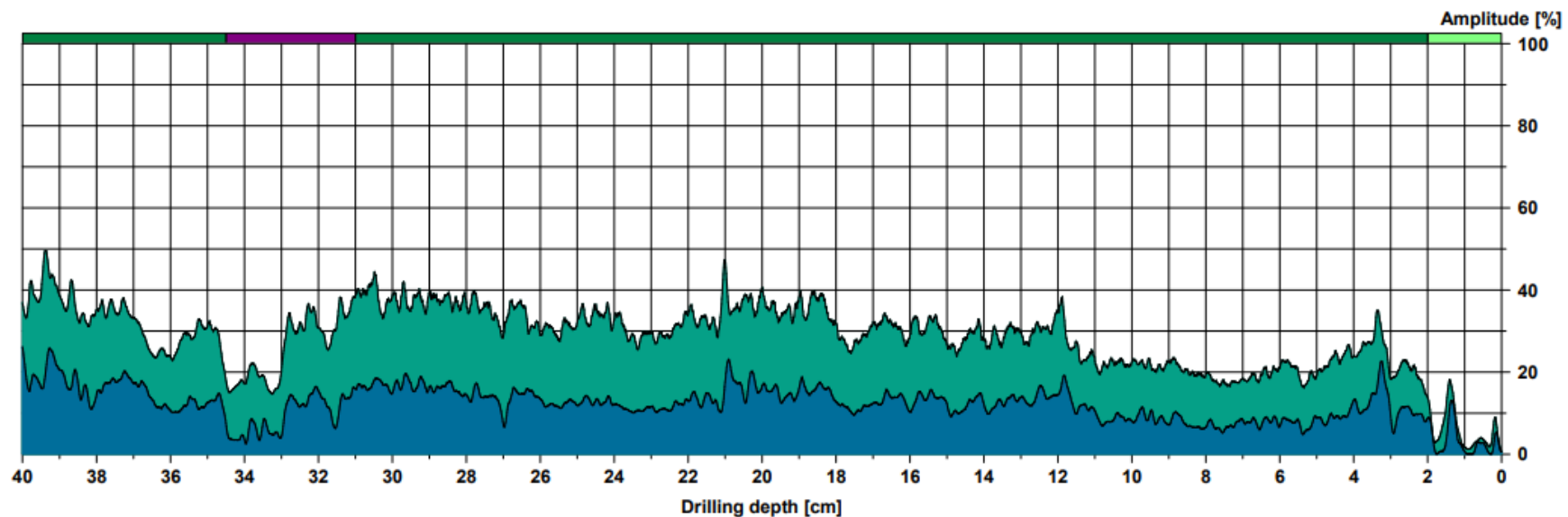
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Measuring / object data

Measurement no.:	1	Speed	: 2500 r/min	Diameter:	90,00 cm
ID number	: 52 avenue rd SILVER MAPLE 5cm N	Needle state:	---	Level	: 5cm
Drilling depth	: 40,10 cm	Tilt	: ---	Direction:	North
Date	: 15.12.2021	Offset	: 77 / 316	Species	: Silver Maple
Time	: 12:31:08	Avg. curve	: off / off	Location	: 52 Avenue rd
Feed	: 100 cm/min			Name	: Kim Dear



Assessment

From	0,00 cm to	2,00 cm	: Bark
From	2,00 cm to	31,00 cm	: Sound Wood
From	31,00 cm to	34,50 cm	: Variable decay
From	34,50 cm to	40,00 cm	: Sound Wood

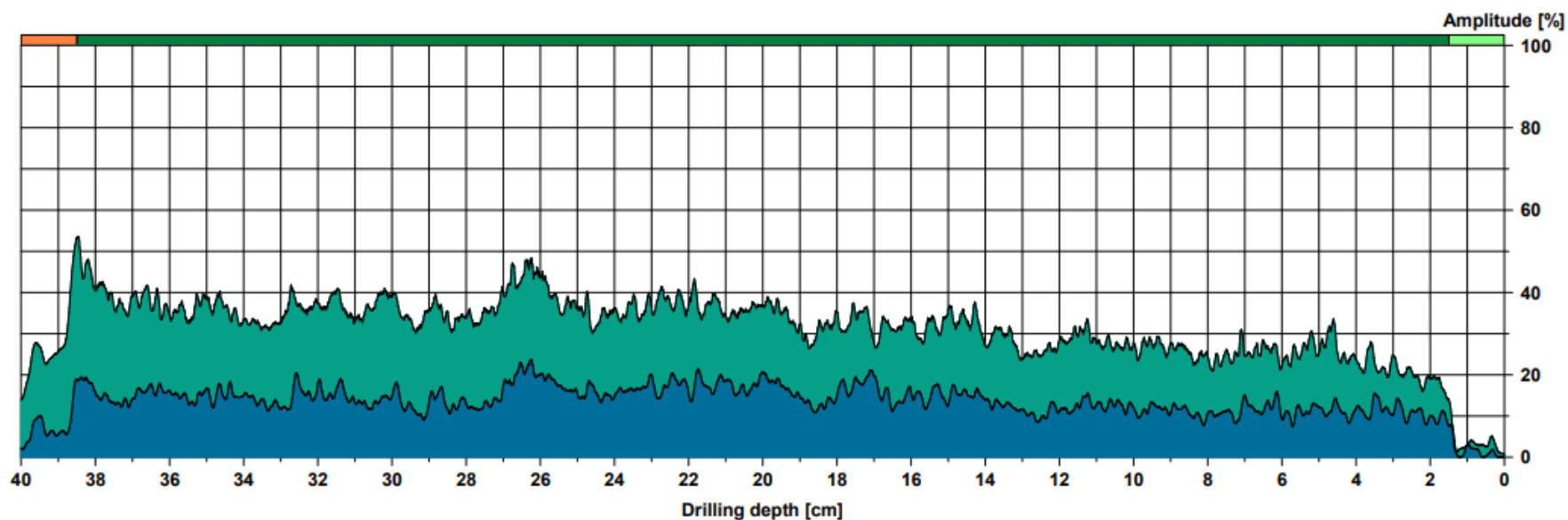
Comment

Drilling adjacent to cavity, peaks at 3 and 12cm possible barrier zone as section between slightly soft.

52 avenue rd SILVER MAPLE 5cm NM001

Measuring / object data

Measurement no.: 4	Speed : 2500 r/min	Diameter: 90,00 cm
ID number : 52 avenue rd SILVER MAPLE 5cm E	Needle state: ---	Level : 5cm
Drilling depth : 40,05 cm	Tilt : ---	Direction: East
Date : 15.12.2021	Offset : 76 / 293	Species : Silver Maple
Time : 12:36:34	Avg. curve : off / off	Location: 52 Avenue Road
Feed : 100 cm/min		Name : Kim Dear



Assessment

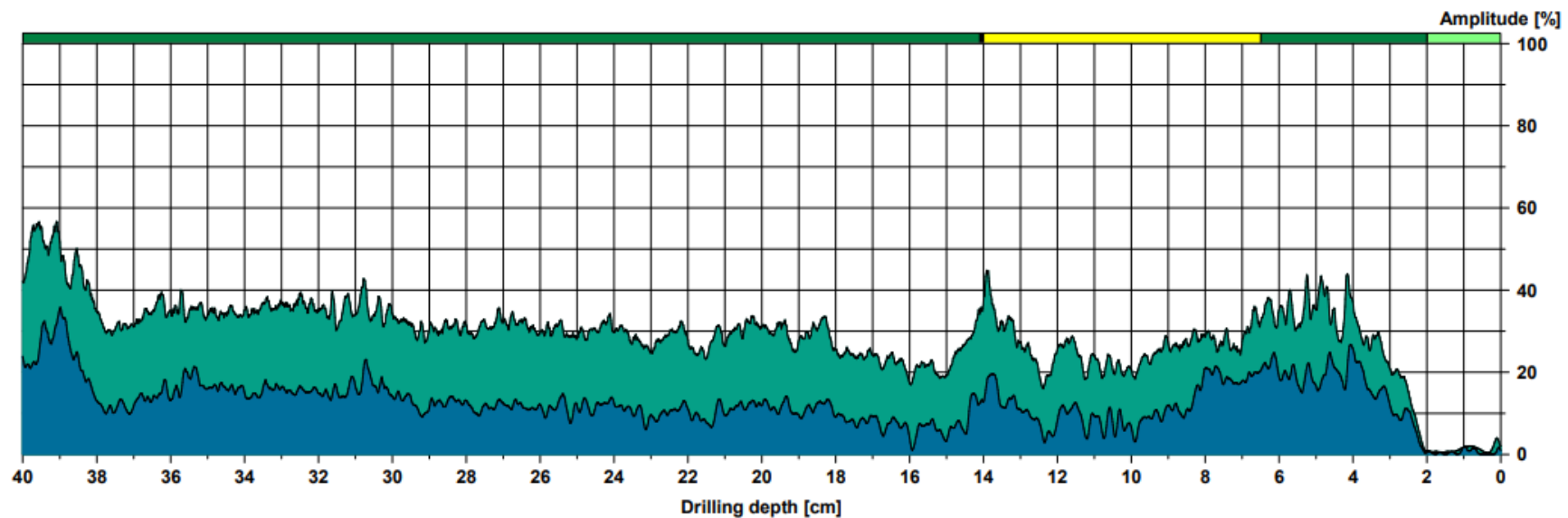
From 0,00 cm to 1,50 cm : Bark
From 1,50 cm to 38,50 cm : Sound Wood
From 38,50 cm to 40,00 cm : Decay

Comment

52 avenue rd SILVER MAPLE 5cm EM004

Measuring / object data

Measurement no.:	3	Speed	: 2500 r/min	Diameter:	90,00 cm
ID number	: 52 avenue rd SILVER MAPLE 5cm S	Needle state:	---	Level	: 5cm
Drilling depth	: 40,06 cm	Tilt	: ---	Direction:	South
Date	: 15.12.2021	Offset	: 80 / 338	Species	: Silver Maple
Time	: 12:34:16	Avg. curve	: off / off	Location	: 52 Avenue rd
Feed	: 100 cm/min			Name	: Kim Dear



Assessment

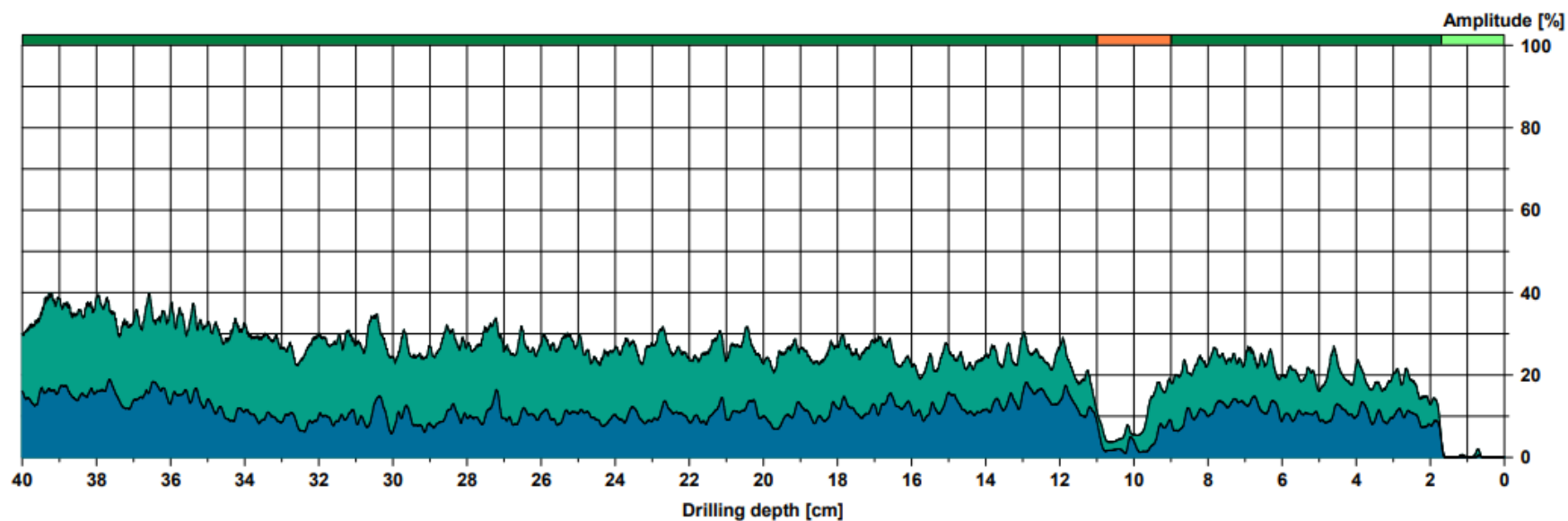
From	0,00 cm to	2,00 cm	: Bark
From	2,00 cm to	6,50 cm	: Sound Wood
From	6,50 cm to	14,00 cm	: EarlyIncipient decay
From	14,00 cm to	14,10 cm	: Barrier Zone
From	14,10 cm to	40,00 cm	: Sound Wood

Comment

52 avenue rd SILVER MAPLE 5cm SM003

Measuring / object data

Measurement no.:	2	Speed	: 2500 r/min	Diameter:	90,00 cm
ID number	: 52 avenue rd SILVER MAPLE 5cm W	Needle state:	---	Level	: 5cm
Drilling depth	: 40,07 cm	Tilt	: ---	Direction:	West
Date	: 15.12.2021	Offset	: 71 / 425	Species	: Silver Maple
Time	: 12:32:20	Avg. curve	: off / off	Location	: 52 Avenue rd
Feed	: 100 cm/min			Name	: Kim Dear



Assessment

From	0,00 cm to	1,70 cm	: Bark
From	1,70 cm to	9,00 cm	: Sound Wood
From	9,00 cm to	11,00 cm	: Decay
From	11,00 cm to	40,00 cm	: Sound Wood

Comment

52 avenue rd SILVER MAPLE 5cm WM002