Landmark Trees

FURTHER INVESTIGATION REPORT:

Whitestone House

Hampstead

NW3 1EA

REPORT PREPARED FOR:

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Ref: JFA/WSH/PCS/02

Date: 8th May 2019

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Site Details

Site Address: Whitestone House, Hampstead NW3 1EA

Client / Agent: Jonathan Freegard Architects, 5 Tredegar Square, London E3 5AD

Surveyor: Kim Dear

Date of Inspection: 2nd May 2019

Instruction

Carry out Resistograh testing of two trees, T4 and T8 and carry out Picus Tomograph Decay detection on the main stem of T5.

Resistograph Testing

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 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.

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.

T4 Details

Species: Horse chestnut (*Aesculus hippocastanum*)

Diameter: 855mm

Height: 17m

Photograph 1: T4

Observations

This mature tree is situated on the southern boundary of the property 0.5 metre from the fenceline. It leans south west and part of the stem is in contact with the top of the fence at 2m. There is a cavity from ground level to 1.8 metres height to the south. The cavity has callous wood around its periphery and is starting to occlude.

A previous inspection of this tree took place in September 2016, when Resistograph tests were carried out on the three cardinal points away from the cavity. Although not a direct comparison as the drillings were not performed in the identical locations, three similar tests were performed on 2nd May 2019 to ascertain if decay had increased the size of the cavity. A further test was carried out at 1.7 metres to the East, as the cavity has a twisting of 40 degrees from ground level, and the remaining stem wall is noticeably narrower at this height.

Results

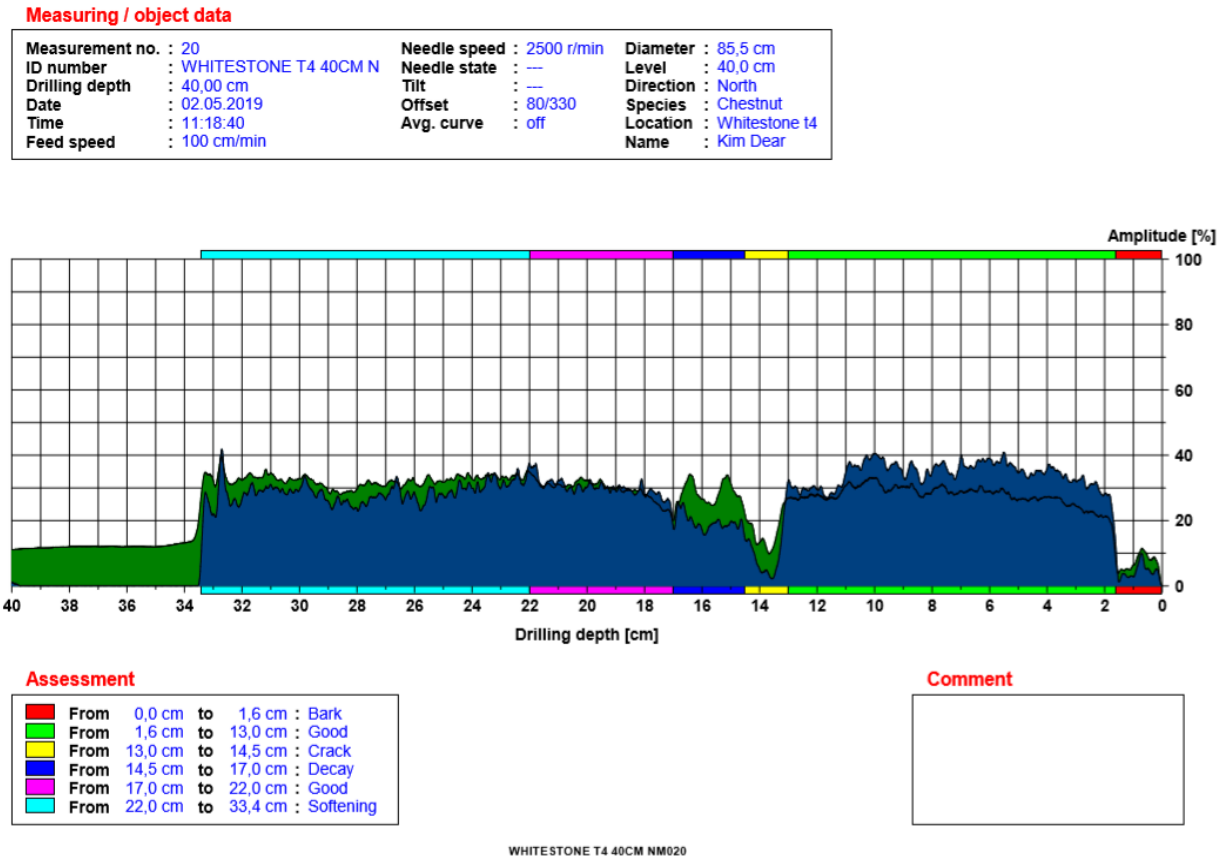
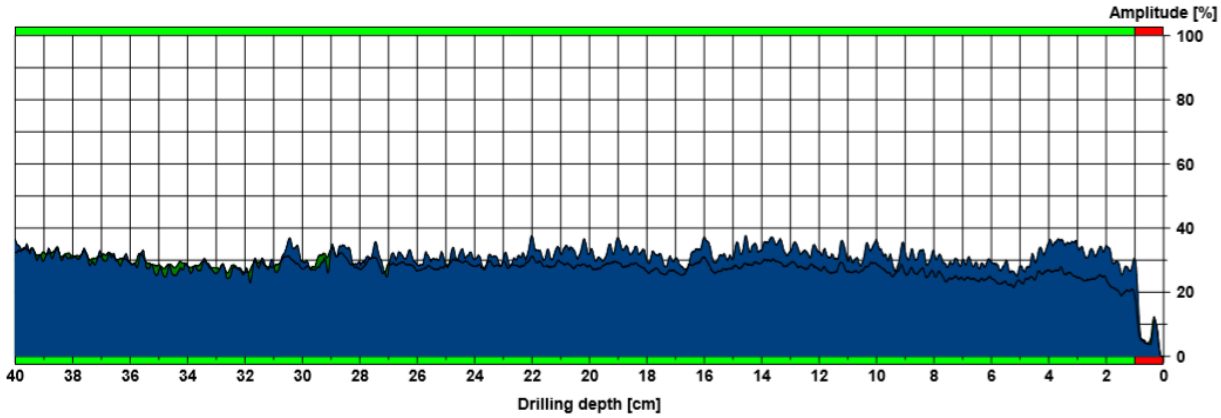


Figure 1: Resistograph trace of drilling of north side of stem 40cm above ground level

Measuring / object data

Measurement no.	: 21	Needle speed	: 2500 r/min	Diameter	: 85,5 cm
ID number	: WHITESTONE T4 40CM E	Needle state	: ---	Level	: 40,0 cm
Drilling depth	: 40,00 cm	Tilt	: ---	Direction	: East
Date	: 02.05.2019	Offset	: 82/309	Species	: Chestnut
Time	: 11:20:03	Avg. curve	: off	Location	: Whitestone t4
Feed speed	: 100 cm/min			Name	: Kim Dear



Assessment

From	0,0 cm	to	1,0 cm	: Bark
From	1,0 cm	to	40,0 cm	: Good
From	0,0 cm	to	0,0 cm	:
From	0,0 cm	to	0,0 cm	:
From	0,0 cm	to	0,0 cm	:
From	0,0 cm	to	0,0 cm	:

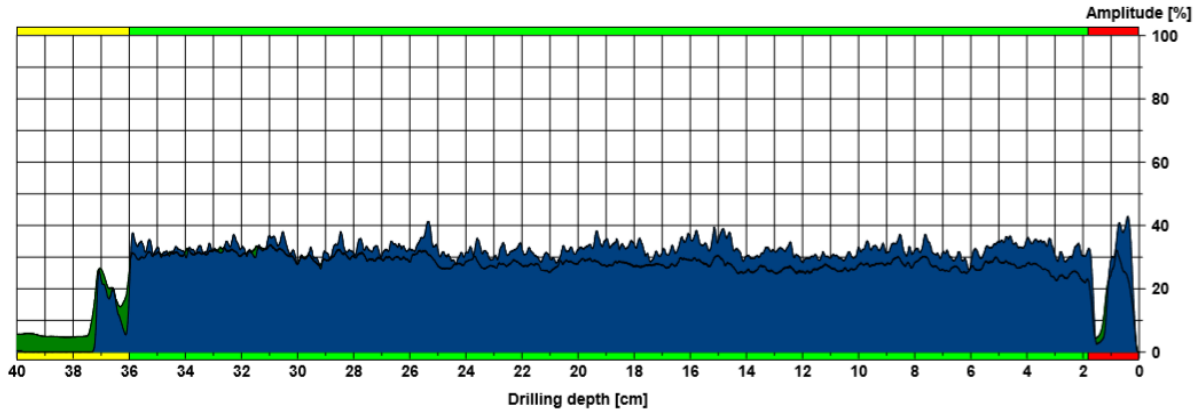
Comment

WHITESTONE T4 40CM EM021

Figure 2: Resistograph trace of drilling of east side of stem 40cm above ground level

Measuring / object data

Measurement no.	: 22	Needle speed	: 2500 r/min	Diameter	: 85,5 cm
ID number	: WHITESTONE T4 40CM W	Needle state	: ---	Level	: 40,0 cm
Drilling depth	: 40,00 cm	Tilt	: ---	Direction	: West
Date	: 02.05.2019	Offset	: 79/293	Species	: Chestnut
Time	: 11:21:24	Avg. curve	: off	Location	: Whitestone t4
Feed speed	: 100 cm/min			Name	: Kim Dear



Assessment

From	0,0 cm	to	1,8 cm	: Bark
From	1,8 cm	to	36,0 cm	: Good
From	36,0 cm	to	40,0 cm	: Decay/Cavity
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

WHITESTONE T4 40CM WM022

Figure 3: Resistograph trace of drilling of west side of stem 40cm above ground level

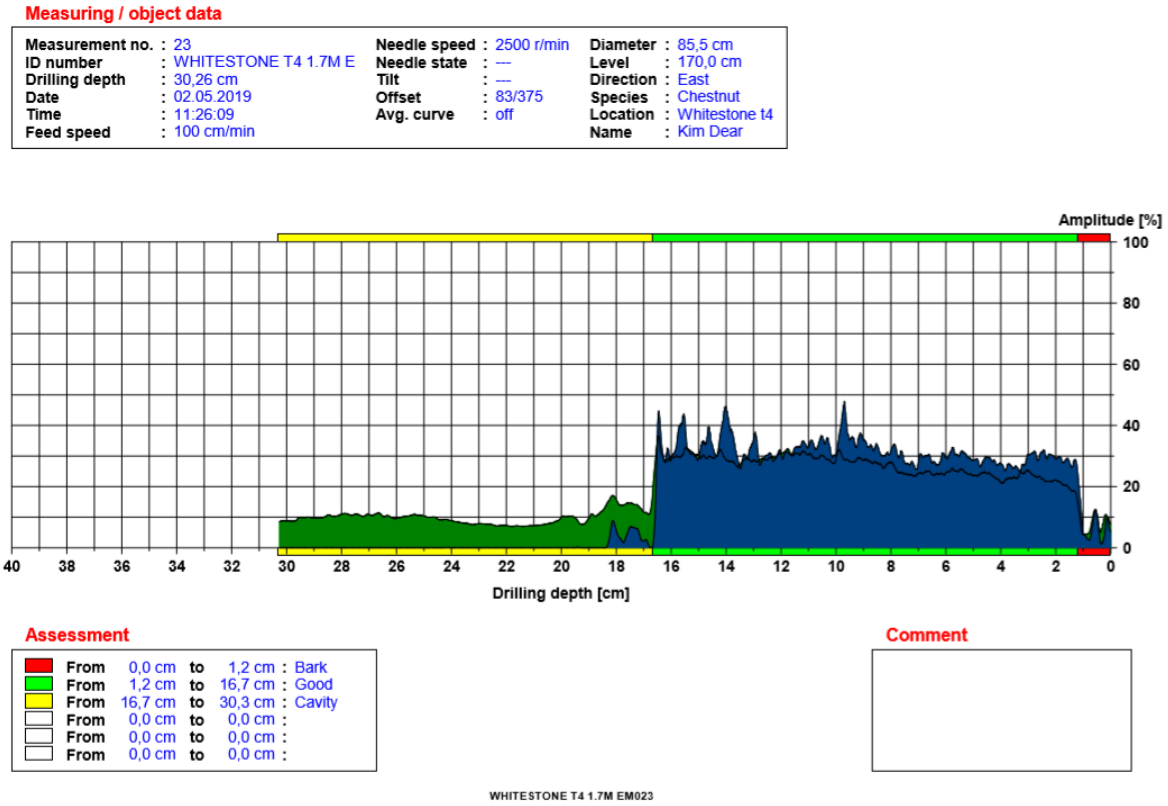


Figure 4: Resistograph trace of drilling of east side of stem 170cm above ground level

Discussion

Comparison of the Resistograph traces from 2016 with those shown above showed no significant alteration in the structural integrity of the stem.

Recommendations

Crown reduce by 3-4m to reduce wind loading within 12 months

T5 Details

Species: Horse chestnut (*Aesculus hippocastanum*)

Diameter: 1050mm

Height: 18m

Photograph 2: T5 (note cavity indicated by arrow)

Observations

This mature tree is 10 metres East of T4, 0.5m from the southern boundary of the property. It has a cavity at 4 metres above ground level (as shown in Photograph 2) and further cavities throughout the crown. This tree was tested by Picus Sonic Tomography in 2016, and was shown to have a substantial cavity at 30cm above ground level.

The tree was pollarded between 15-20 years ago, and has substantial regrowth from the pollard heads.

A climbing inspection was also carried out, and a plumb line dropped from the cavity at 4 metres confirms the tree is hollow into the root ball below ground level.

Results

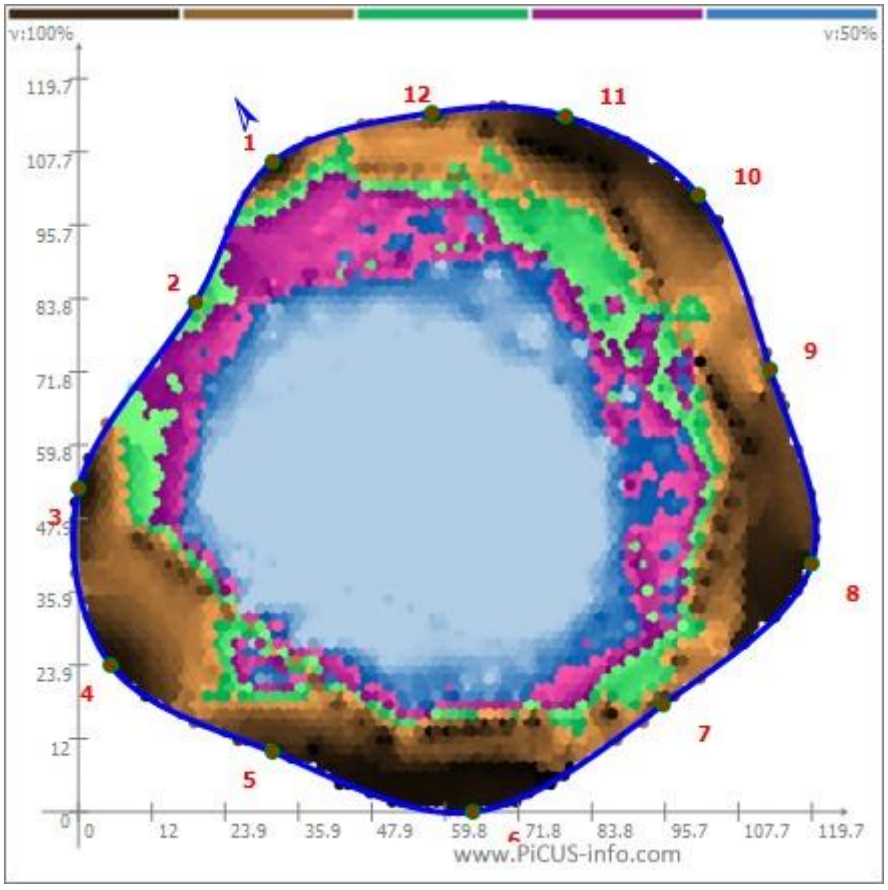


Figure 5: Tomograph of main stem of T5 taken at 40cm above ground

Discussion

The combination of the extent of the decay cavity at the base of the main stem both radially and axially and the leverage effect of the pollard regrowth indicates a high likelihood of failure at the stem base.

Recommendations

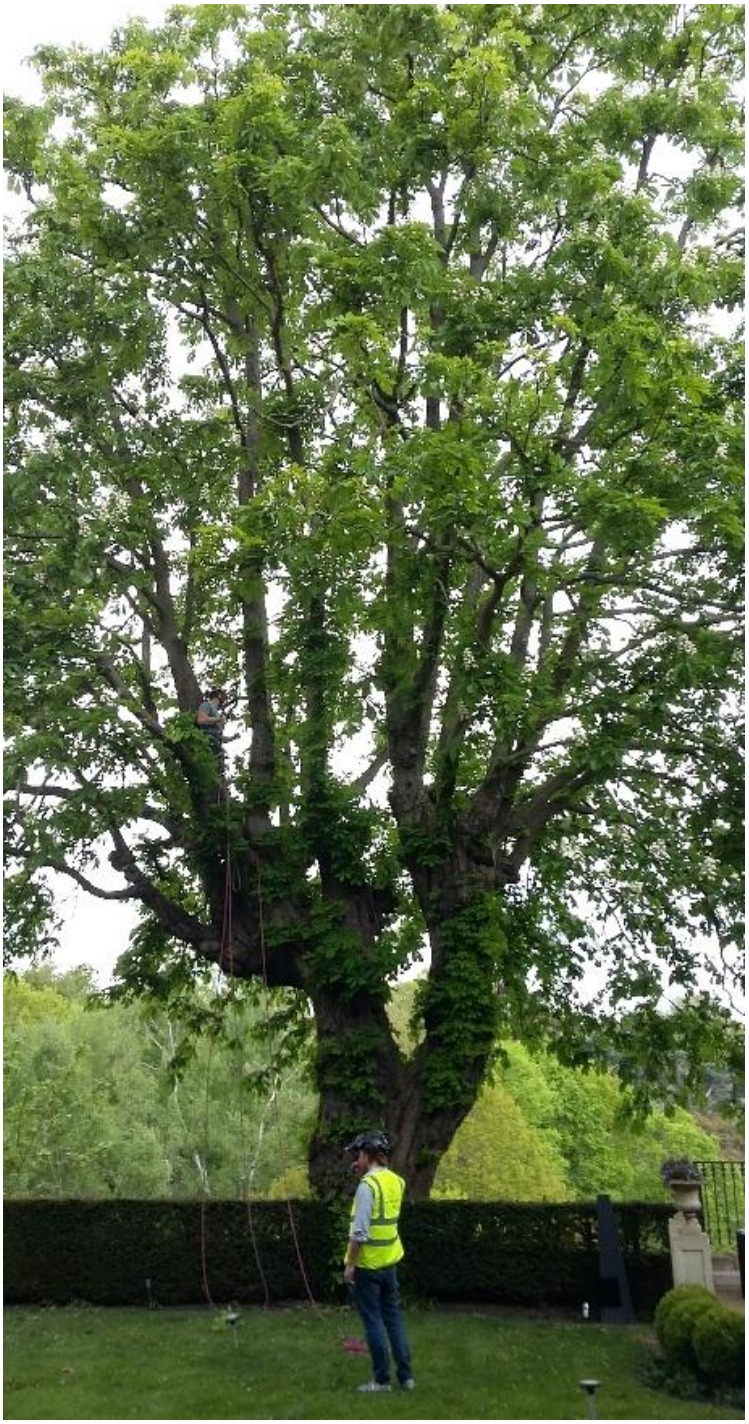
The tree should be either felled or re-pollarded to 4m in height within 12 months.

T8 Details

Species: Horse chestnut (*Aesculus hippocastanum*)

Diameter: 1200mm

Height: 18m



Photograph 3: T8

Observations

This tree is situated on the northern boundary of the property. It is on a near vertical bank, with a 3-metre difference in ground level north to south. There is a retaining wall included into the stem to the east and west. The crown was pollarded approximately 15-20 years ago, and there is substantial regrowth from the pollard heads, some of which are decayed / exhibit cavities.

Three Resistograph tests were performed, one at the base of the tree, 3 metres below the garden of the property, and two at a level with the garden. These show some varied levels of decay on the north side of the tree. There are no fungal pathogens currently visible, so this decay could be attributable to the damage caused by the proximity of the retaining wall to the stem.

Results

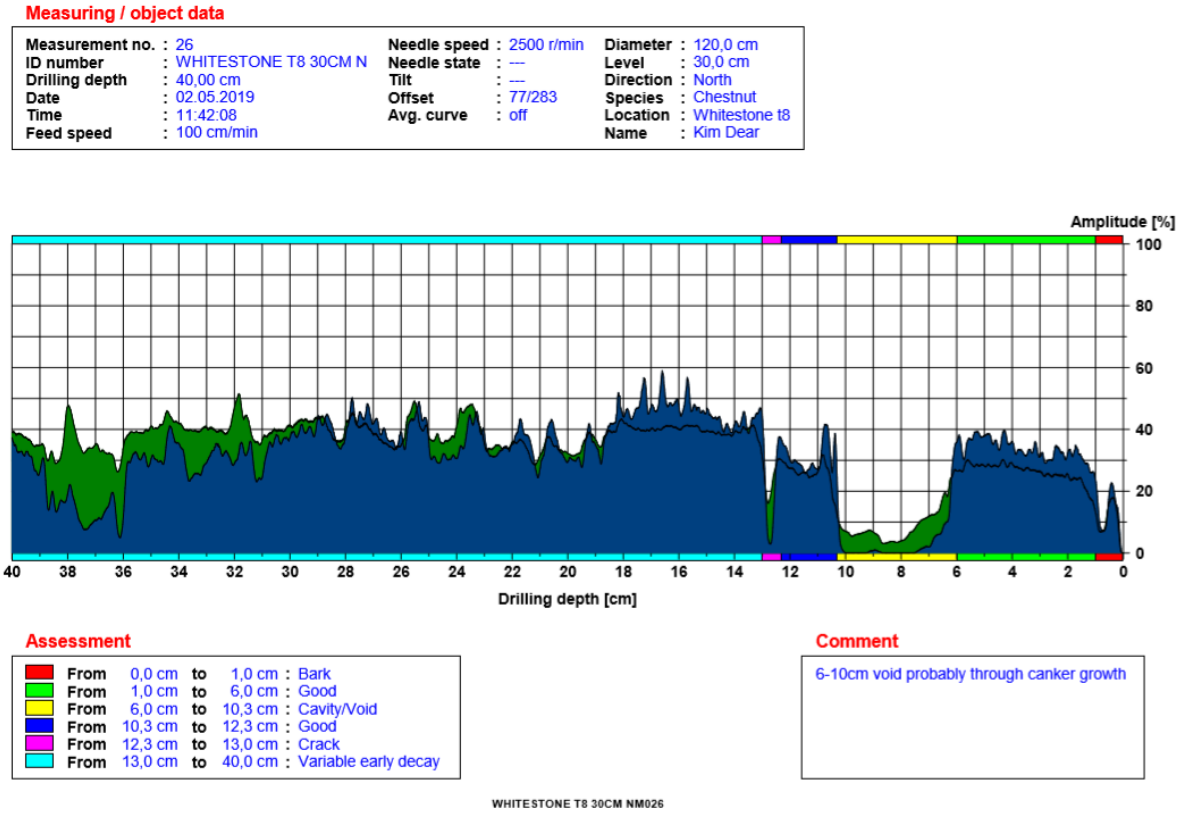


Figure 6: Resistograph trace of drilling of north side of stem 30cm above its base

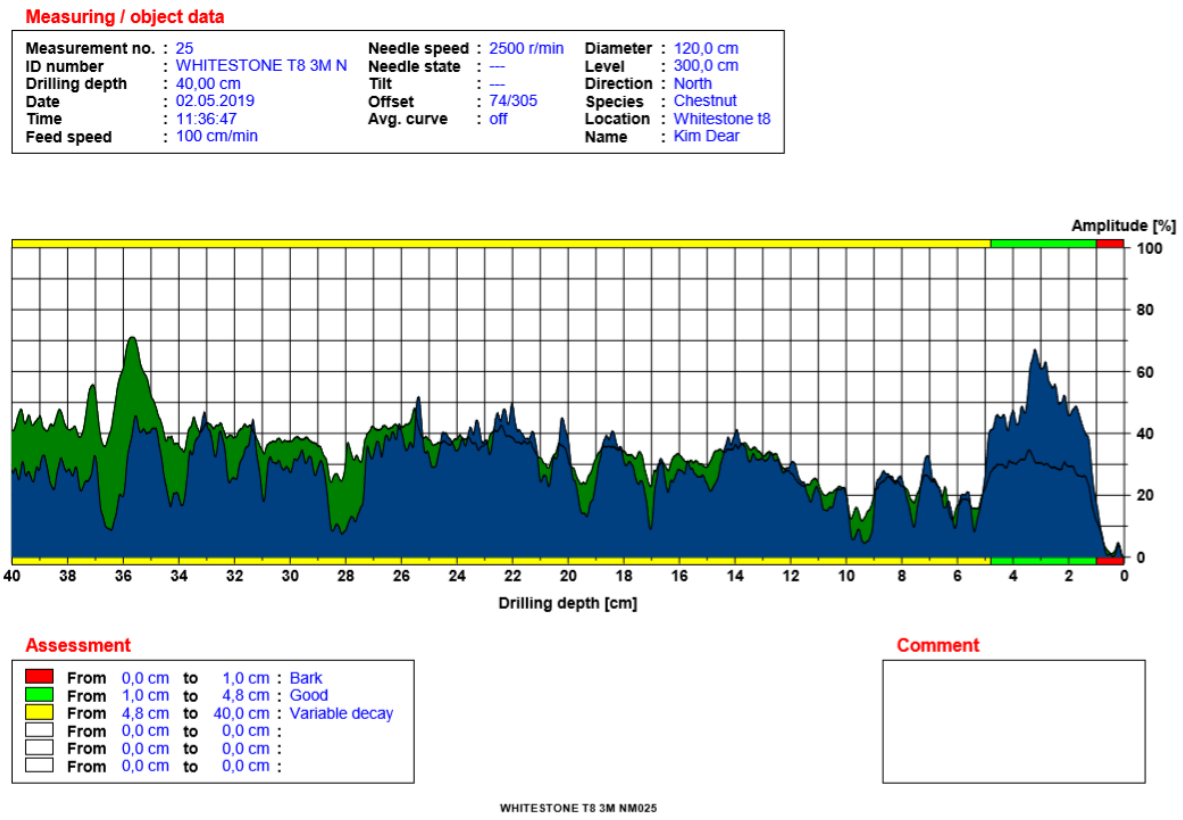


Figure 7: Resistograph trace of drilling of north side of stem 3m above its base (garden level)

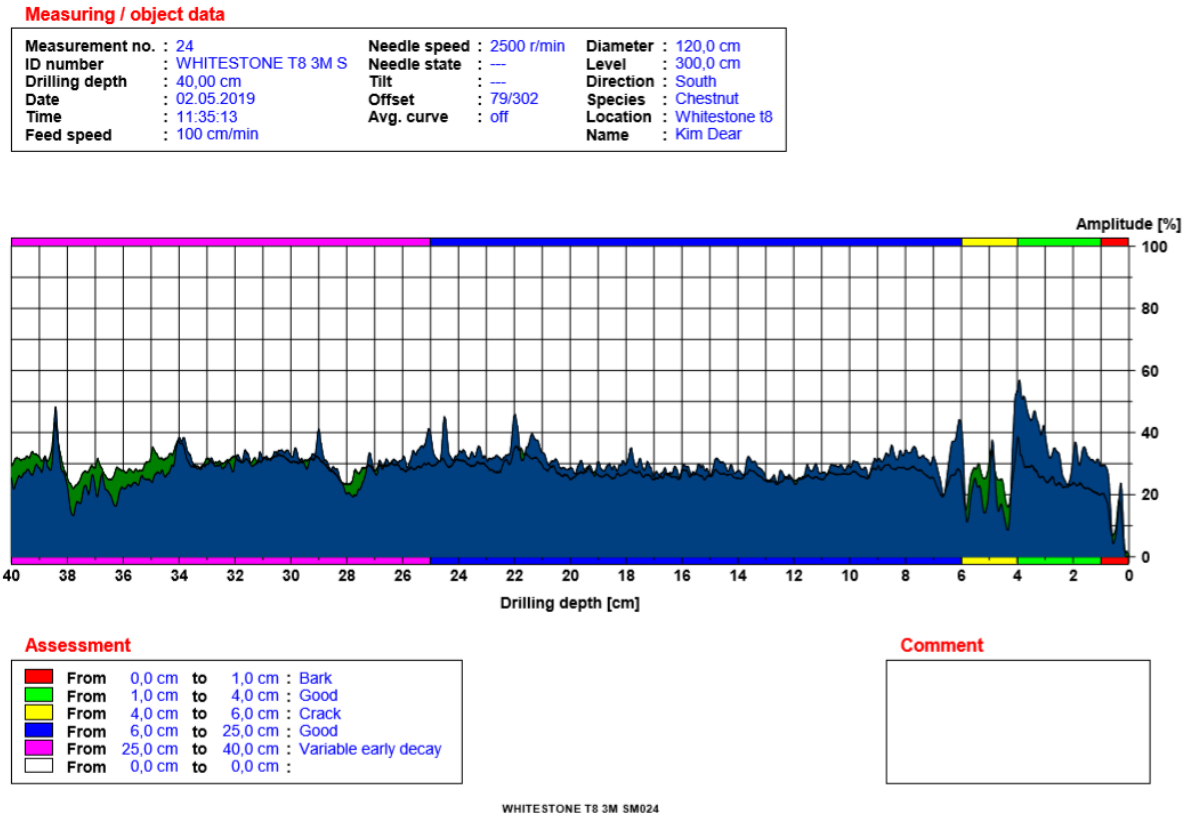


Figure 8: Resistograph trace of drilling of south side of stem 3m above its base (garden level)

Discussion

The Resistograph traces identify they presence of some decay within the main stem but that this decay is not currently of a significant level.

Recommendations

Crown reduce by 3-4m to reduce wind loading within 12 months with a larger (5-6m) reduction of the regrowth from decayed pollard heads.