ATWORTH ARBORICULTURE LTD

DECAY DETECTION ON 6 TREES AT BEECHWOOD HOUSE, HAMPSTEAD LANE, N6 4RU.

Prepared for: David Williams, Beechwood House Estate Management.

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

Site Address: Grounds of Beechwood House, Hampstead Lane N6 4RU.

Client: David Williams, Beechwood House Estate Management

Instruction: To visually assess 6 trees at the site and carry out decay detection tests as required

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.

Brown=Good wood

Green = Early decay (or included bark)

Pink= Advanced decay

Blue= Cavity

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 can penetrate to a depth of 40cm. As the probe advances it measures the resistance encountered and feed rate of the needle. Good healthy wood gives a high reading and poor dysfunctional wood, or cavity gives a lower reading. The readings are presented in Appendix 1 at the foot of the report.

The instrument used was the IML Resistograph PD400 which has far more 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 the F400 friction on the needle would give you a false high graph. Although there is still friction on the needle with the PD400 the feed rate will change as decay is encountered. The readings are at the foot of the report.

Tree 3 : Beech *Fagus sylvatica* Diameter 163cm Height 22m Spread 8m

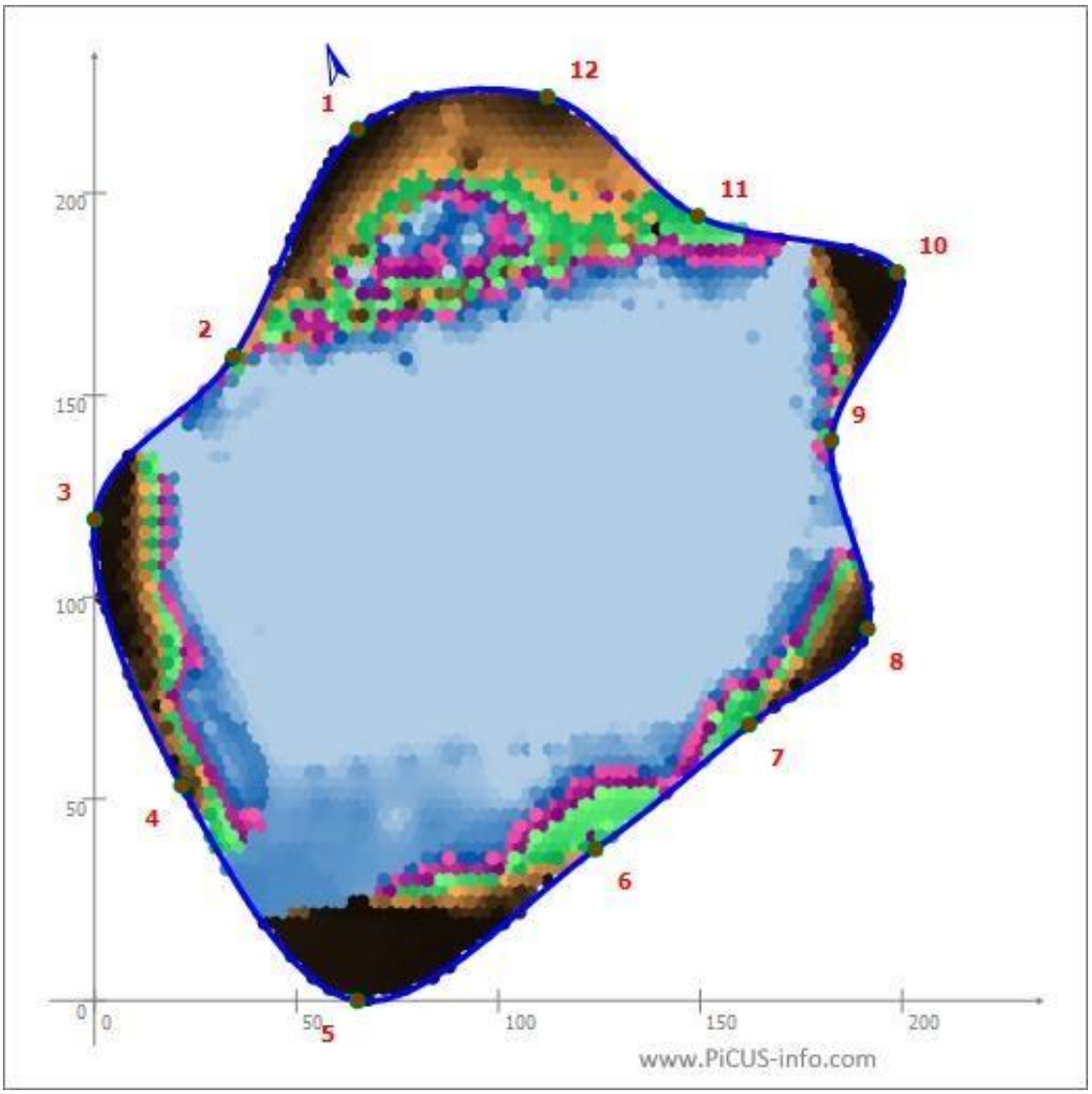
General Observations: This beautiful mature beech tree grows at the west side of Beechwood house, and was very likely to have been part of the original "beech wood".

The house is 30m east of the tree. A footpath runs north south 5m west of the tree. It grows in a woodland area of the grounds. A child swing has been erected 15m south east of the tree.

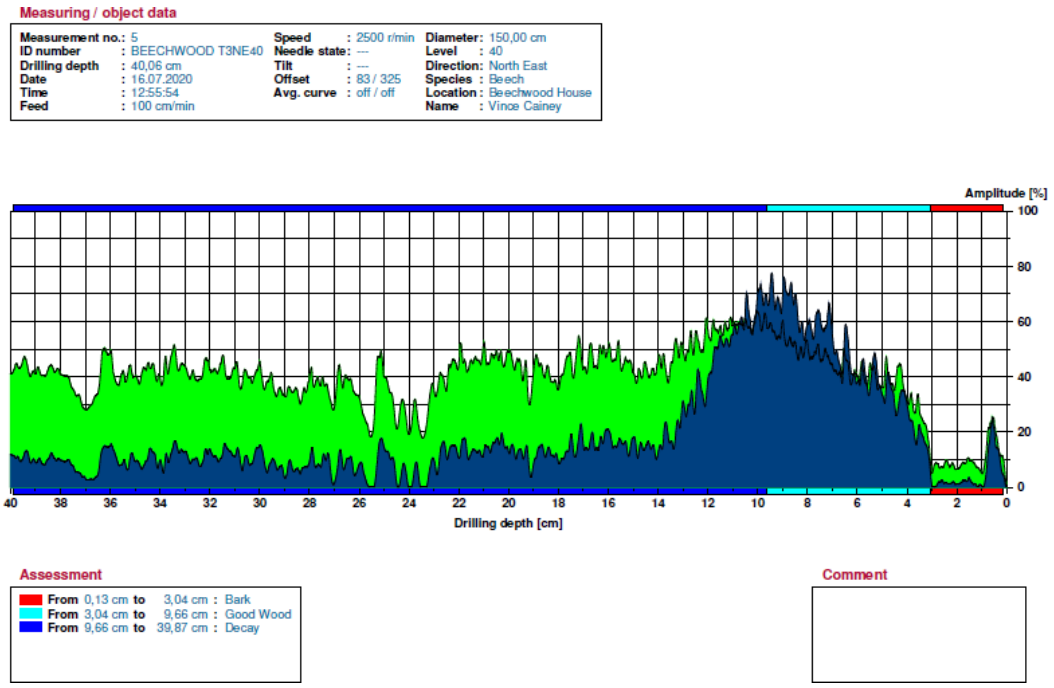
A Ganoderma bracket was observed at ground level east on the stem. Also some black staining and exudates south east, north east and North West at 20cm above ground level. The trunk has developed cankers and burrs up the stem, at 8m above ground level, which is quite normal given its mature age.

The crown breaks at 8m above ground level. The shape is very good with good leaf size and cover.

A Picus test and Resistograph was used on this tree.



Direction	Height of Test	Result
East	30cm	1-14cm= good wood, 14-39cm= decay
North East	40cm	3-9cm=good wood, 9-39cm= decay.

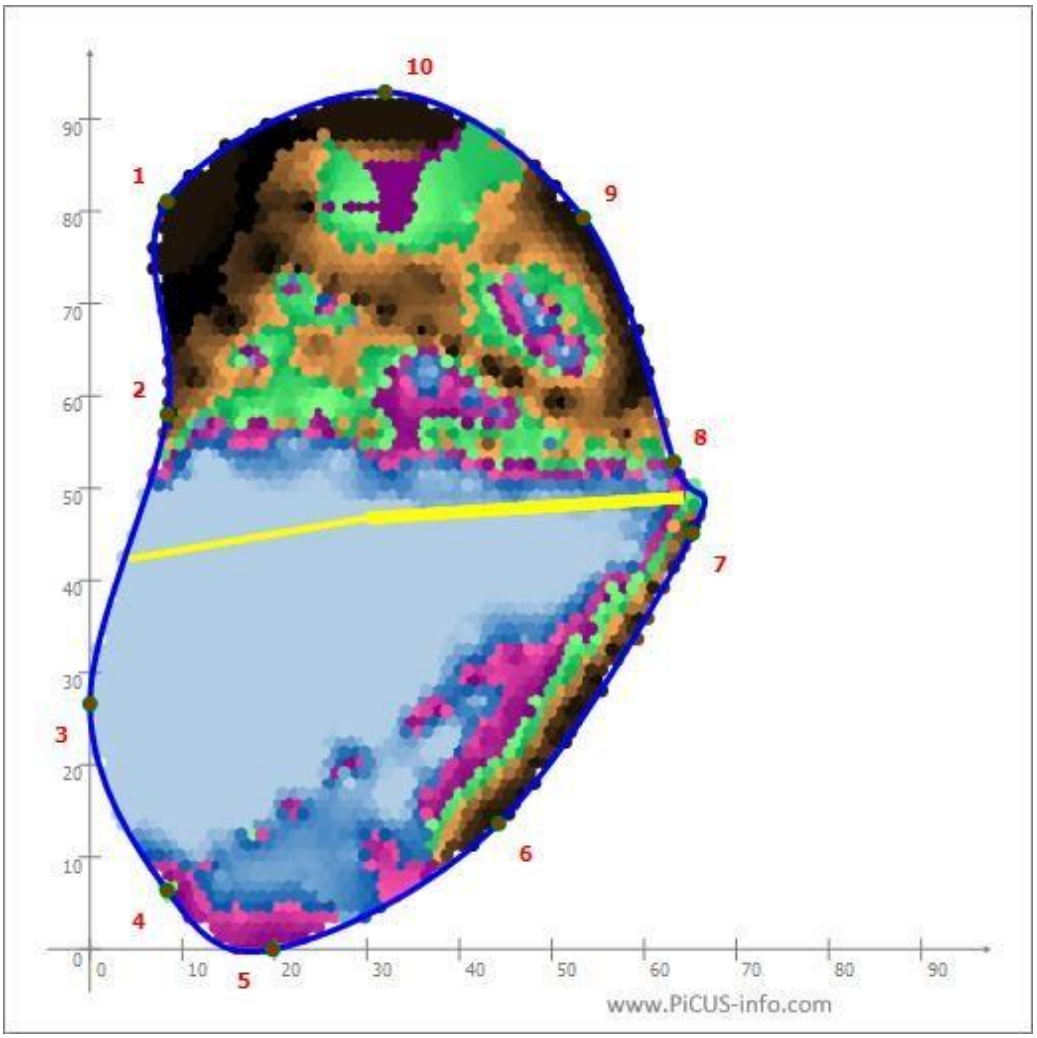


Conclusion: This is a very old tree which is reaching the end of its natural life span. The Ganoderma brackets are indicative of the fact that it has probably developed white rot within its stem, as the Tomograph indicates a significant cavity coloured blue and there is very little good wood left within the stem structure to guarantee the trees integrity. The Resistograph tests back up that the tree stem is significantly decayed.
The tree itself occupies a large area at this site, and because it is sheltered, the target area is relatively low. Should the tree fail, it would not reach the main house, but could cause damage to the surrounding trees, none of which are as historically significant as this tree.

Recommendations: This tree is at risk from failing. Due to the trees location the target area is minimal. The tree management would depend on the owner's attitude to risk. To leave the tree is to accept it could fail at any time. It would not be sensible to reduce the tree as beech trees do not generally respond well to reduction, especially as it is under stress. Should it decided that the tree is too unsafe, the requisite consent from the local authority would not be a problem with this evidence. Any tree work should only be carried with the correct permissions and undertaken by a tree surgeon with the relevant insurance and qualifications, working to BS3998(Tree work) 2010.

Tree 5: Hornbeam *Carpinus betulus* Diameter 680mm Height 12m.

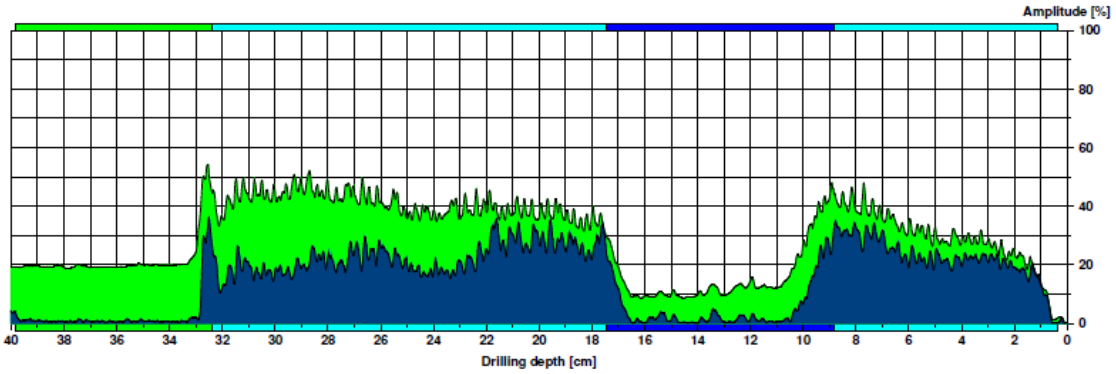
General observations: This mature Hornbeam is growing on the northern side of the driveway, diagonally opposite tree 5. The drive is 2.5m south of the tree. A yew hedge has been recently planted north and south of the tree, within 50cm of the tree.
There is a bark wound on the south side of the tree at 0.5m above ground level, and a cavity was observed north at ground level.
The crown is very sparse for the species and shows signs of apiacal die back.
A Picus test and Resistograph were taken of the tree.



Direction	Height of Test	Result
East	5cm	8-17cm=decay,17-32cm= good wood, 32cm-40cm=cavity
West	5cm	1-16cm=good wood, 13-39cm=decay

Measuring / object data

Measurement no.	: 9	Speed	: 2500 r/min	Diameter	: 61,00 cm
ID number	: BEECHWOOD T5 E5	Needle state	: ---	Level	: 5
Drilling depth	: 40,05 cm	Tilt	: ---	Direction	: East
Date	: 16.07.2020	Offset	: 64 / 337	Species	: Hornbeam
Time	: 14:55:15	Avg. curve	: off / off	Location	: Beechwood House
Feed	: 50 cm/min			Name	: Vince Cainey



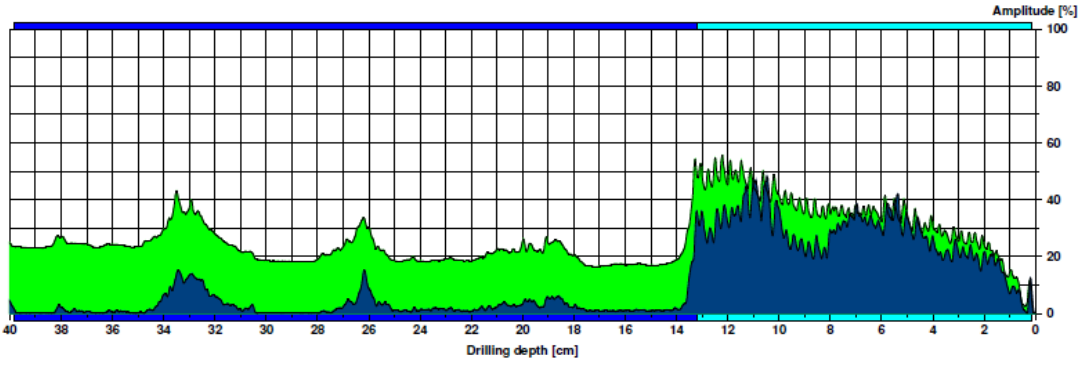
Assessment

From	0,36 cm	to	8,85 cm	: Good Wood
From	8,85 cm	to	17,45 cm	: Decay
From	17,45 cm	to	32,41 cm	: Good Wood
From	32,41 cm	to	39,81 cm	: Cavity

Comment

Measuring / object data

Measurement no.	: 7	Speed	: 2500 r/min	Diameter	: 61,00 cm
ID number	: BEECHWOOD T5 W5	Needle state	: ---	Level	: 5
Drilling depth	: 40,06 cm	Tilt	: ---	Direction	: West
Date	: 16.07.2020	Offset	: 63 / 272	Species	: Hornbeam
Time	: 14:52:19	Avg. curve	: off / off	Location	: Beechwood House
Feed	: 50 cm/min			Name	: Vince Cainey



Assessment

From	0,16 cm	to	13,18 cm	: Good Wood
From	13,18 cm	to	39,84 cm	: Decay

Comment

Conclusion: The Tomograph shows a significant cavity and some advanced and early decay. The yellow line on the Tomograph shows where the software indicates there may be some internal cracking. The thicker the yellow line the larger the crack. The Resistograph indicate significant levels of decay, with also a structural crack running through the stem (indicated by the yellow line on the Tomograph). This will weaken the stem of the tree and also, the tree does appear to be stressed, as indicated by the atypical die back.

Recommendations: This tree has a high likelihood of failure and due to its proximity to the main drive, it is advised that this tree should be felled as soon as practically possible. Permission would need to be obtained from the local council as it is subject to tree preservation order, and only then should a suitably insured and qualified tree surgeon carry out the tree work, working to BS3998(Tree work) 2010.

Vince Cainey BSc

3rd August 2020