

**Findings of the preliminary investigation of the Radio Oak (TV-eken).
Nov 23, 2011**

Undertaken Sunday 20th November 12,00-21,00 by Jonathan Hartill ISA Certified arborist and Dip Arb together with Johan Gustavsson ISA Certified arborist and HND Arb. These are arborists from Gothenburg with international qualifications in arboriculture.

In co-ordination with and reviewed by Frank Rinn, physicist and living in Heidelberg, Germany and Quentin Nicholls, Fellow of the Arboricultural Association of the United Kingdom, Prof Dip Arb, former chairman and trustee of the UK Arboricultural Association, currently living in Brisbane Australia.

Results of the preliminary investigation to assess the status of the Radio Ek .

Is this tree acutely dangerous? Does this tree require immediate removal?

Method:

- High frequency sound tomography (Rinntech) of the entire stem from 0-10cm above mulch to 4,20m. Detailed structural analysis.
- Collection of data from 97 separate sensors using 47,045 separate run-time readings providing clear 3 dimensional imaging for wood strength and density analysis.
- Using wood strength evaluation software supportable wood strength loss estimations have been made and graphs presented for analysis.
- Preliminary results are clear and findings reviewed and confirmed by peers.
- Computer simulated wind load modeling with Arwillo 1.20 Scientific Software and actual use of tree form in situation undertaken.
- Inputs for actual stem parameters used.
- Analysis of tree shape and form.
- Windforce distribution and loading.
- Bending moment
- Torsion moment in the stem.
- Calculated wind speed 33m/s
- Crown area 92m squared.
- Height crown area centre 8m
- Height crown force center 9m
- Wind force on crown 10kn
- Stem base bending moment 89kNm
- Parameters are tree height, terrain exponent, Kg/m³ Air density, Gust factor, Resonance factor, No topology correction.

Preliminary conclusions from the work.

The maximum value of relative strength loss is about 40% thus we do not see any need for drastic or immediate decision in relation to felling the tree. In addition the wind loads of this tree in comparison to the stem dimensions seem to be quite small. One obvious aspect is the transparency (=porosity) of the crown due to retrenchment and previous pruning.

The most important aspect is to remove torsion by the wind. We have calculations that illustrate where pruning can be undertaken to reduce wind load by 40% thus building in even higher safety parameters under higher wind load situations.

Recommendation from this investigation:

Stop the felling decision.

Further investigation

The ancient oak is a complex bio-dynamic organism for which accurate evaluation is complex. Assessments should be based on actual evidence supported by data.

The complexity required to reach precise conclusions over management in an urban environment requires multi-disciplinary expertise ranging from physics, arboriculture, qualitative tree risk assessment, biodynamics, biodiversity conservation, ecology, landscape architecture, mycology, and historical knowledge of the tree.

To reach an appropriate and satisfactory conclusion for all parties, accepting all aspects of management, we recommend a team of specialists with inter- disciplinary expertise to resolve amicably the fate of the Radio oak.

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