

## **Summary of an Investigation into the Condition of Grafted Beech in North Yorkshire.**

The location is a next to a busy road in North Yorkshire a major route between Teesside and the coastal areas around Whitby and Scarborough. It is estimated trees were all originally grafted at the lower stem and the graft was probably about around 30-50 cm above ground level when the trees were planted.

Before thermal imaging was carried out, a visual survey was carried out by at least three highly experienced arboriculutralists. All of whom could find no apparent reasons for suspecting there was anything untoward in the trees health or structural condition.

Trees Project Limited was asked to inspect the trees as part of a routine inspection programme at the site. Our own visual inspection noted that although the trees were quite short in height and the graft point appeared to have sunk below ground level there was nothing to indicate that the trees were anything but healthy.

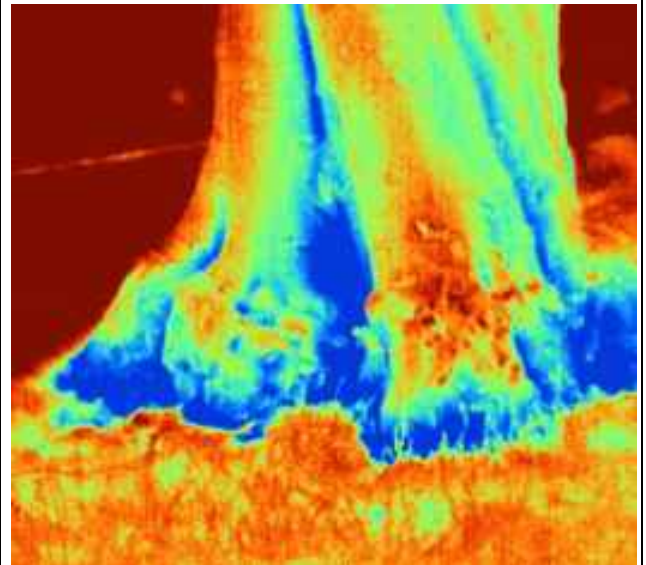
A thermal imaging survey was undertaken and it was apparent that there were significant volumes of dysfunctional wood at the very base and below ground level. Calculations indicated that there was between 50 and 80% dysfunction at the base of each tree (Table 1). The likelihood of basal failure descriptions from Low to Severe can be colloquially described as: Low, unlikely to fail in the foreseeable future; Moderate, failure possible at some point in the future if the condition deteriorates but unlikely before the next inspection; High, at some point if there is a significant wind load within the next year; and Severe, failure could be imminent even without a significant wind load. Occasionally trees lie close to boundaries of two likelihood descriptions and may be classified as Low-Moderate, Moderate-High etc.

Table 1

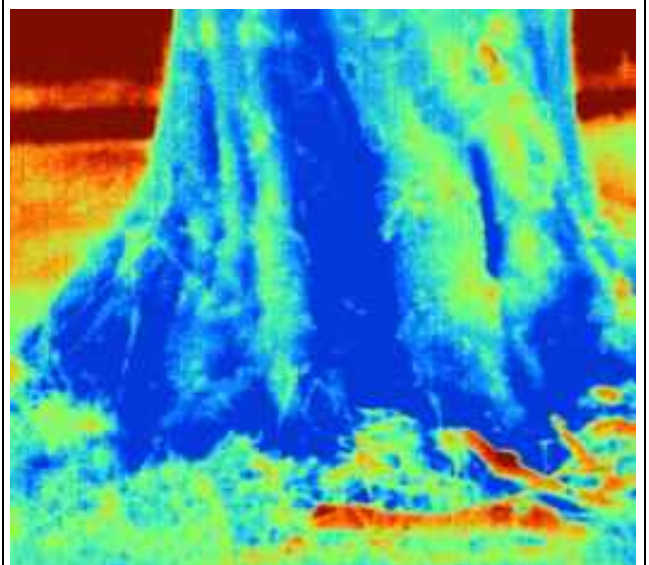
Tree Surveyed	% basal dysfunction	Likelihood of basal failure
Tree 7	60-70	Moderate-high
Tree 8	70-80	High
Tree 9	70-80	High
Tree 10	60-70	Moderate-high
Tree 11	50-60	Moderate

The thermal images from trees 7, 8 and 11 show the differences between calibrated thermal images as the dysfunction progresses from 50-60% at the base of tree 11; to 70-80% at the base of tree 8.

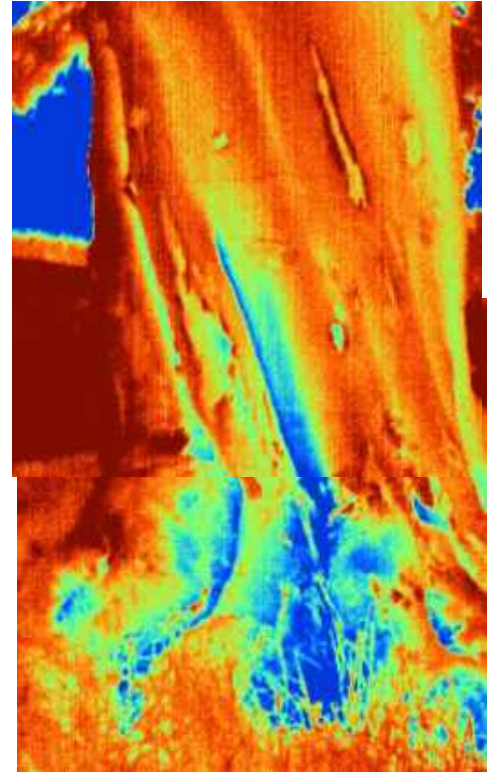
Tree 7: There is some root damage and areas where dysfunction is closer to the surface indicated by dark-blue areas at the base and between buttresses but there are some signs of healthy buttressing indicated by red-orange colours.



Tree 8: There is extensive root damage indicated by extensive dark-blue areas at the base with few signs of healthy buttressing.



Tree 11: There is some root damage and areas where dysfunction is closer to the surface indicated by dark-blue areas at the base and between buttresses but with healthy buttressing indicated by red-orange colours.



Given the amount of temperature depression it was highly likely that there was decay associated with the dysfunction and so following the analysis of the thermal images an increment core sample was taken from the very base of tree 7. Once the increment corer was inserted about 10 cm it could be pushed freely into the centre of the tree, unfortunately this also meant a core sample could not be extracted. The thickness of the residual wall was comparable with the 30-40% expected.

On much closer inspection it was obvious that the original root stock had degenerated; almost completely in the case of tree 8. This had been replaced by the stem tissue above the graft creating a new root system; hence the graft zone had the appearance of having sunk below the soils level in places. A detailed appraisal of the vigour of the trees in relation to the size of the canopy and their location is being undertaken.