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Mrs L Flavin
Clerk to the Parish Council of Broughton and Old Dalby
Broughton Cottage
60 Main Road
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Leicestershire
LE14 3HB

Dear Mrs Flavin

Turkey Oak – The Green, Main Street, Old Dalby

Further to our meeting on 22nd May, I have pleasure in submitting the following report on the Turkey oak tree growing on The Green, at the junction of Main Road and Chapel Lane. This is based upon the ground level inspection of the tree undertaken at the time of our meeting. The oak was already a tree we had been instructed to inspect within a review of the trees for which the Parish Council are responsible. However, prior to us commencing the review, concerns were raised over the structural condition of the oak by Leicestershire County Council's Highway Tree Inspector. In view of this, the Parish Council commissioned this specific detailed individual tree assessment.

a) Location

The Turkey oak is located at the western end of The Green, close to the junction of Main Road and Chapel Lane, as shown in the Google Earth reproduced below. The Green is situated within the village conservation area.



b) Details and Dimensions

Species:	Turkey oak (<i>Quercus cerris</i>)
Life stage:	Fully mature
Approximate height:	17 metres
Stem diameter:	1235 millimetres at 1.5m 1780 millimetres at base (over buttresses)
Crown radii:	North: 10m; South: 14m; East: 12m; West: 13.5m
Orientation & height of lowest branch	South side - 4.5m
Physiological condition:	Good
Structural condition:	Poor
Previous pruning:	Crown lifted to increase clearance over adjacent roads but not otherwise significantly reduced



Photograph 1: Turkey oak tree viewed from the south-east

c) Observations

The lower section of the trunk is heavily swollen and clearly extensively decayed. The north-western side is flattened as a consequence of it ceasing to grow and there was an old perennial fruiting body of the Southern bracket decay fungus (*Ganoderma australe*) at the base in the centre of this flattened section. This fungus causes a white-rot of the colonised wood due to the preferential initial selective destruction of the lignin. The wood is generally degraded relatively slowly by the fungus, retaining its tensile strength for a considerable period. During this time the tree typically responds by producing compensatory growth, as has happened in this case, the oak having developed large buttress roots to either side of the flattened area.



Photograph 2: Flattened north-western side of the base with the fungal fruiting body arrowed



Photograph 3: Large buttress root on the southern side that has developed in response to the basal decay

On the eastern side, there are two adjacent cavity openings, within which I found further old fruiting bodies of the Southern bracket fungus. The basal cavity extends under almost the entire radial cross section of the trunk and I was easily able to fully insert the 1.2 metre length of my steel shafted trenching spade into one of the openings.



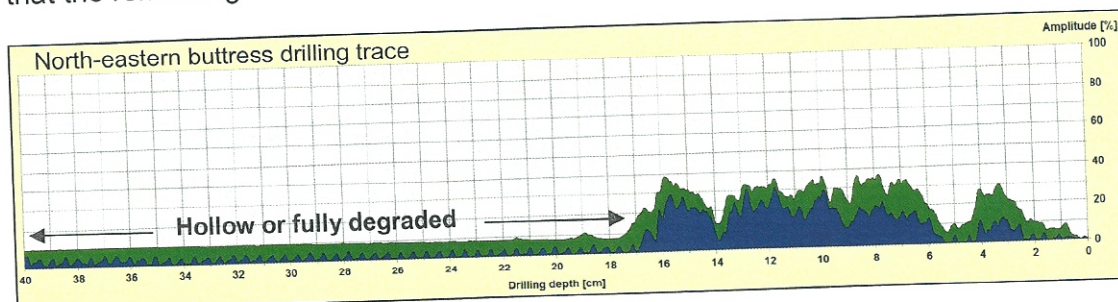
Photograph 4: Basal cavities on the eastern side, with the handle of the fully inserted trenching spade arrowed

d) Decay Detection Tests

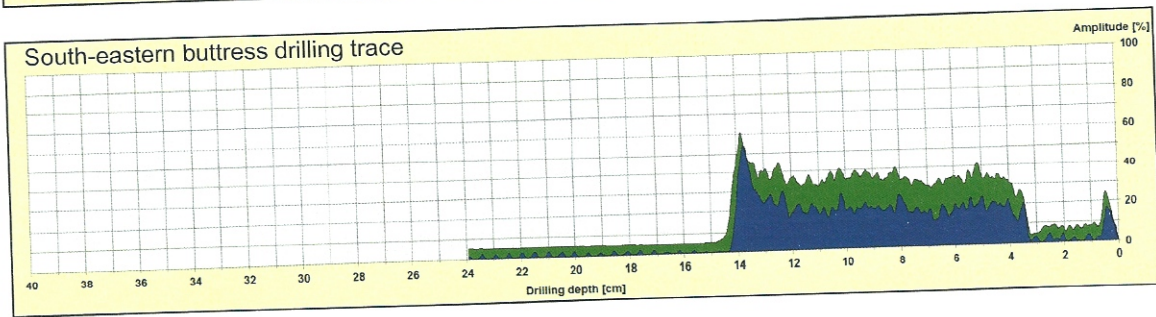
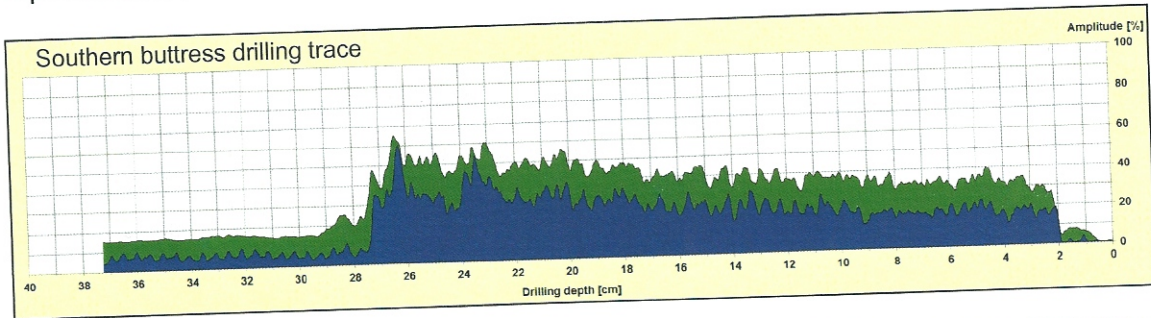
The initial inspection indicated that the tree is entirely reliant on its buttress for support, the central section of the trunk being completely hollow. To further confirm the extent of internal decay associated with the fungal colonisation, I carried out a series of drillings with a Resi PD400 decay detection micro-drill, the bit of which is 40cms long.

The micro-drill has two motors; the drill motor that rotates the needle and the feed motor that advances the needle – this is unaffected by how hard you push the machine against the tree. The drill curve (green) rises across the profile due to the increased friction on the drill shaft towards the centre, and is higher in denser wood. The feed curve (blue) is not as affected by shaft friction and should normally be below and run parallel but at a shallower angle to the drill curve. Spikes in the feed curve can be due to strong reaction wood/barrier zones or indicative of early white rot.

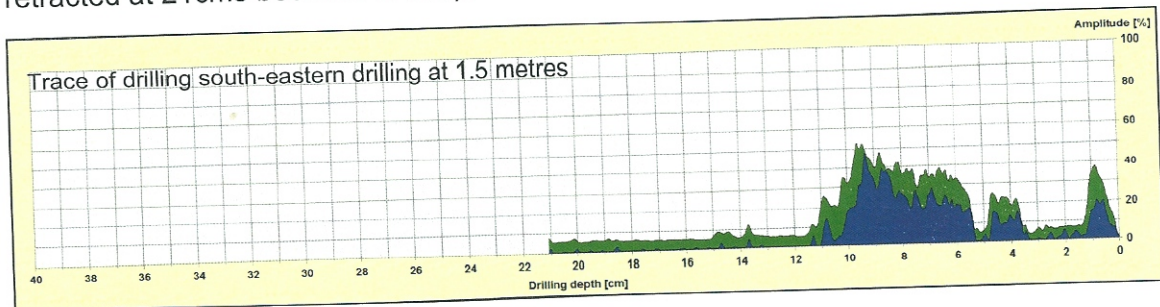
The drilling into the north-eastern buttress (on the left side in photograph 2) indicated that this is fully degraded or hollow beyond a depth of 17cms, where the drill curve falls and flattens. However, the erratic nature of the traces up to this point indicates that the remaining outer shell of wood is already partially degraded.



The drilling into the large southern buttress indicated that this is fully degraded or hollow beyond a depth of 27cms and in the case of the south-eastern buttress, the drilling indicated that the wood is fully degraded beyond a depth of 13.5cms. Only the western buttress appeared to retain a reasonable depth of wood unaffected by the decay. The traces of the drillings into the southern and south-eastern buttresses are reproduced below.



Further drillings into the north-western, south-western and south-eastern sides at a height of 1.5 metres showed that the decay extends up the trunk at least to this level and that the residual shell of apparently structural viable wood at this level ranges from just 10 to 13cms, which equates to an average of around 18% of the radial cross section. The trace of the drilling into south-eastern side, reproduced below, shows the trunk is hollow beyond a depth of 11cms (the needle automatically retracted at 21cms because of this).



e) Conclusions and Recommendations

The fungal colonisation is long-standing and the majority of the cross section of the trunk is hollow from ground level to 1.5 metres and above. The tree's stability is therefore primarily being maintained by the remaining buttress roots. However, the test drillings indicated that the decay is generally poorly compartmentalised and that even where the buttresses are not hollowing, much of the residual wood is colonised and becoming degraded.

The extent of the decay and associated hollowing renders the tree susceptible to collapse either as a consequence of the failure of the buttress roots or the cross sectional flattening of the hollow trunk. Given the proximity of the oak to the road, and the potential consequences if it were to fail, a more cautious approach needs to be adopted than if it were growing in a more isolated situation. Regrettably, I find myself with no option but to recommend that the tree be removed and an appropriate replacement planted in a suitable location nearby.

As I mentioned, having checked our files, it transpires that I inspected the Turkey oak in spring 2003 for Treewise Arboricultural Contractors; the following is an extract from my report, which concluded by recommending the tree be removed.

'The base of the trunk is heavily buttressed but there are openings into the basal cavity between the buttress roots on the southern, south-eastern and south-western sides. Actively growing fungal decay brackets (Ganoderma spp.) are present on the base of the northern section of the trunk, where it was possible to easily push a screwdriver through the decaying tissue. Further fungal decay brackets, presumably of the same pathogen, were evident inside the basal cavity. This was investigated using a French walking stick test borer and the void was found to extend down into the root system, up into the trunk and, most significantly, under the accessible buttress roots. It was clearly evident that the remaining thickness of sound wood surrounding the basal cavity is below the 30% currently accepted safety limit. As the tree is infected with an active fungal decay pathogen its condition will continue to deteriorate until the trunk fails at the base. It is considered that the tree has now reached the point where this failure is imminent, with the probability that it will fall onto the road.'

It is interesting that from the above description it appears the cavity openings have either fully or partially grown over and that the fungus has not developed significantly, the growth of the buttress roots apparently keeping pace with the progress of the decay.

f) Statutory Protection

As the tree is situated within the village conservation area it will be necessary to obtain the agreement of the Borough Council that the tree can be removed without the normal requirement for a six week Section 211 notification.

I trust that this information will prove helpful, please do not hesitate to contact me if you have any queries or require any further assistance.

Kind regards

Yours sincerely

on

