

An Arboricultural Report on a Tulip Tree on land owned by 'The Blue Dolphin'

Kingston,

Devon

Prepared for

Ms Karen Freeman

By

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Date of site inspection: 19th June 2024

Report prepared by Rupert Baker BSc(Hons), Dip Arb (RFS), M Arbor A.

Is a consultant and plantsman who works in arboriculture, forestry, and horticulture, though he also still 'gets his hands dirty'. He has over 40 years' experience in these fields, and works with trees and woodlands, and manages, designs, plants and establishes orchards and arboreta. He carries out tree risk surveys using the QTRA system to assess risk; development surveys to BS5837:2012, veteran tree management, woodland planting and management advice and arboretum and orchard design and layout.

He keeps his qualifications up to date with courses, research, and discussion. He is a member of the Royal Forestry Society, the Arboricultural Association, and the Tree Register of the British Isles. He is fully insured for Professional Indemnity and Public Liability in respect of tree and woodland surveys, and for carrying out works for clients.

1.0 The Purpose of the report

1.1 To assess the health and condition of an early-mature Tulip Tree, (*Liriodendron tulipifera*), growing on the edge of the lane opposite the Pub, on land used as pub garden/parking, and report on its condition.

2.0 The methodology and limitations of the report.

2.1 The inspection of the tree was carried out from ground level. The weather at the time of the inspection was dry and clear with good visibility. The inspection comprised an examination of the tree's basal area, trunk, and branch structure. The base of the tree and the root buttresses were assessed for decay using a sounding hammer; the state of the crown, and branch unions, was examined visually from the ground. The height of the tree was measured by triangulation, and the diameter by girth tape, at dbh. Measurements are given in metric, in metres(m) and centimetres(cm).

2.2 The report is valid for a period of 1 ½ years (eighteen months) from the date of survey. The condition of the tree, and its immediate surroundings, can change as a result of climatic conditions, severe weather, and the effect of diseases, pests, and abiotic factors such as excavation, soil movement, or compaction.

3.0 Site description and description of the tree.

The tree is an early-mature Tulip Tree (*Liriodendron tulipifera*). It is 23m high, with a stem diameter (dbh) of 71cm. It stands about 95m above sea level, exposed to the prevailing SW winds and to winds from other quarters. It has a lane to its SW, with the pub building and a cottage on the other side; and the pub garden/car park to its NE; with the cellars building adjacent to the NW; the footpath to the pub from the garden passes the NW side of the tree's base. There is an old foul-waste cover in the lane immediately adjacent; this was lifted during the inspection; showing sewage drainage pipe running directly beneath the tree, heading NE; with other drains running into the chamber from its southern and western sides. The soils in the area appear to be fine-textured silty clay loams of the Denbigh1 Series, over Devonian slates of the Dartmouth Formation - Marine sediments heated and compressed by

later vulcanism. Trees grow well on such soils provided they are not compacted by vehicle movements. (Source – on-site observation and BGS and SSEW maps).

- 3.1 The tree has a clear stem for 2m, dividing into the crown at this point, with 5 major and 4 more minor 2nd-order stems arising from the same area, and then branching to form the crown; although ivy obscured a proportion of the unions, they appeared sound enough with no obvious signs of included bark. The base of the tree was carefully examined; on the southwestern side, the bark and cambium tissue beneath was all dead, around half the circumference of the stem. Its canopy was thin on the southwestern side, with dieback developing - a result of the lack of conductive tissue at the base of the stem; the north-eastern side of the canopy showed vigorous growth; in general there were sound unions between more minor limbs.
- 3.2 Because of the degree of root death and surface decay at the base of the tree, I drilled it in four places using a Sibert DMP digital microdrill; the resulting graphs are attached to this report below. 3 drillings were made in the western quadrant at the base of the tree; the 4th hole in northeastern side from higher up, to assess its rate of growth. From this latter it could be seen that the tree had grown rapidly; this is confirmed by a photograph taken in 1981 with no evidence of the tree being present. The basal drillings showed that decay was starting to develop; the wood of Liriodendron is non-durable, and the base of the tree is likely to continue to decay quite rapidly. Given the location of decay at its base, and the direction of the prevailing winds, it is most likely that the tree will fail in the direction of the pub garden and car park area. The risk posed by the tree was assessed using the QTRA system (see below).

4 **The implications of the survey data, and recommendations.**

- 4.1 The QTRA figures listed below show the risk posed by the tree. The system has been upgraded, taking account of developments in risk assessment; each Target, Size, and Probability of Failure range is now denoted by a number, relating to a range of outcomes calculated using Monte Carlo simulations – a statistical method of improving the realistic accuracy of probabilities. Briefly, QTRA involves an inspection to assess the likelihood of a tree, or a part thereof, failing in the following year; combined with an assessment of the size of the part likely to fail (to give a numerical rating to the damage it could inflict when it fails), and an assessment of the likelihood of the target area being occupied by vehicles, pedestrian, or structures. In the case of structures, the value of the structure and its rebuild cost is also taken into account. These ratings are then used to derive an overall risk rating. So a sound tree standing in a quiet area would be given a low rating; one in a busy place with small dead limbs likely to fall, but unlikely to cause serious damage would also be given a low risk rating; whereas a potentially dangerous tree close to a valuable target, be it a structure or people, would be given a high risk rating.
- 4.2 The ratings produced by the system give the likelihood of the tree in question failing, *and* causing damage or injury, in the following year.
- 4.3 In safety terms, one must apply the Tolerability of Risk framework (ToR) to QTRA. There are two threshold values. A Risk of Harm less than 1/1,000,000 is broadly acceptable and already 'As Low As Reasonably Practicable' (ALARP). A Risk of Harm 1/10,000 or greater is unacceptable when imposed on third parties, and should not ordinarily be tolerated. Between these two thresholds, the Risk of Harm is in the Tolerable region of ToR and will be tolerable if it is ALARP. Where risks are in the range 1:10,000 to 1:1m, management decisions must be made, considering the benefits and costs of risk control, including the benefits provided by trees that might be lost to risk control measures.

4.4 A description of each parameter:

Target rating.

This is calculated in relation to the areas the tree has as a potential target, as a ratio. The rates of use were assessed during inspection, based on the type of target. The tree is 23m high; as mentioned above, it is most likely to fail in the direction of the pub garden and car park; but has the pub, an adjacent cottage, Park Cottage, the lane, and the building used as cellars and storage all immediately adjacent and potential targets. Given the relative position of the tree and targets, and the location of the decay, I have given it a target rating in Range 3.

Impact rating

This relates to the size of the tree; banded into diameters: rating 1= 450mm + diameter, rating 2= 250-450mm, rating 3= 100-250mm, rating 4= 25-100mm, etc. Trees are rated according to their species, crown architecture, and condition. Here, the most likely failure is of the whole tree; which at its current size would give an impact in range 1.

Probability of Failure rating:

This is set out in bands, increasing by a factor of 10; and based on an assessment of the tree's condition; In this case I have assessed the Probability of Failure (PoF) in the next year as being in range 4 for a whole-tree failure

Risk rating – Risk of Harm

Is a compound of the above inputs, to give an overall risk of the tree or a part failing, hitting someone or something, and causing damage or injury, in the next 12 months. With the inputs described above, this gives a risk rating of 1:400,000.

As described above, the risk the tree poses is at a level where management decisions have to be taken; the risk rating listed above is for the next year only; and given the likely future progression of decay, it is my professional opinion that the tree will become unstable and need removal in the near future.

An additional issue is the risk posed to contractors working on the tree; given its location, it will need to be sectionally dismantled; and this will need to be carried out either using remote access with a MEWP (Cherry-picker), or by climbing; The tree will become unsafe to climb and cut large sections off as it continues to decay.

4.5 **Conclusion:** Given my inputs, the risk posed by the tree in the next year is thus in the range where you need to consider what to do to reduce the risk it poses; and this risk will rapidly increase as time goes on.

4.6 **Recommendations:**

Have the tree sectionally dismantled, before the end of the year.

5. Arboricultural Constraints

5.1 Legal Constraints:

The tree is not covered by a Tree Preservation Order (TPO); nor is it within a Conservation Area. As I have recommended that works are carried out to the tree, when it is decided to have the work done, there is no need to notify South Hams District Council and await their response, before having it carried out.

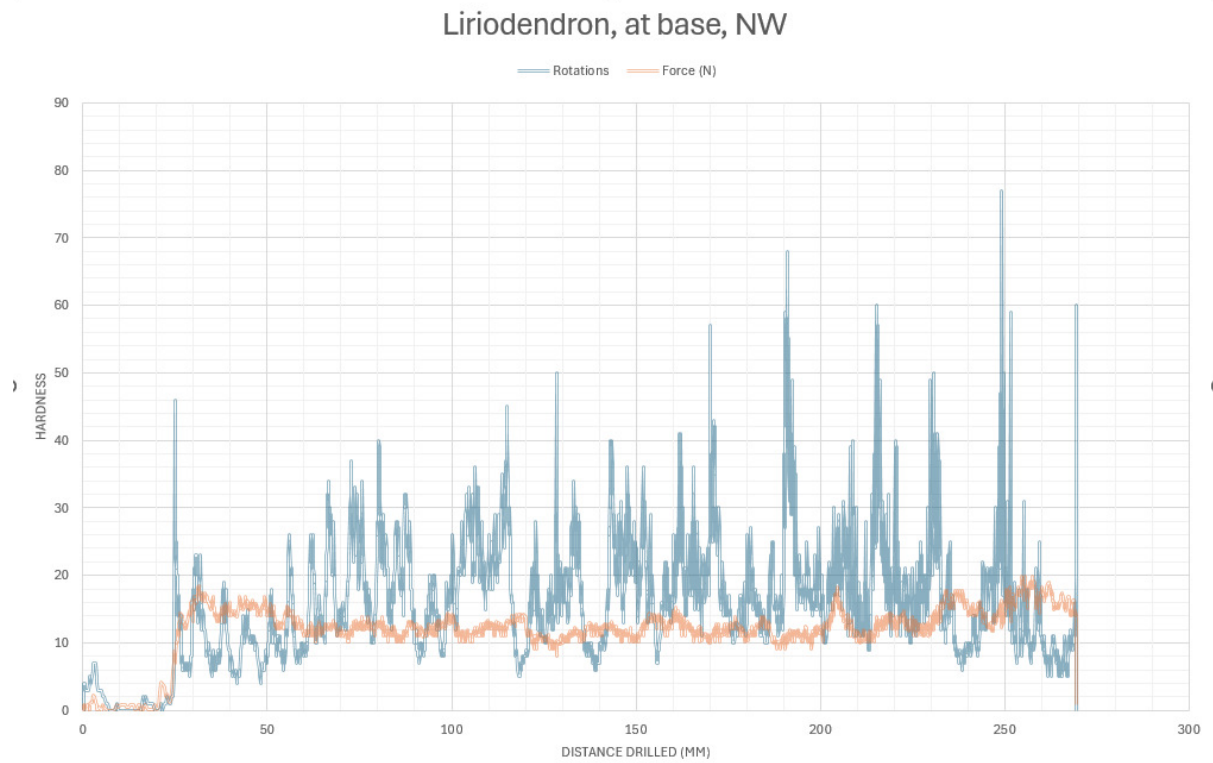
5.2 Ecological considerations

It is an offence to disturb nesting birds, or to injure or disturb bats or damage their roosting sites. Prior to carrying out any work on the trees, the contractors carrying out the work should examine them to ensure that there are no nests or roosts present in the tree.

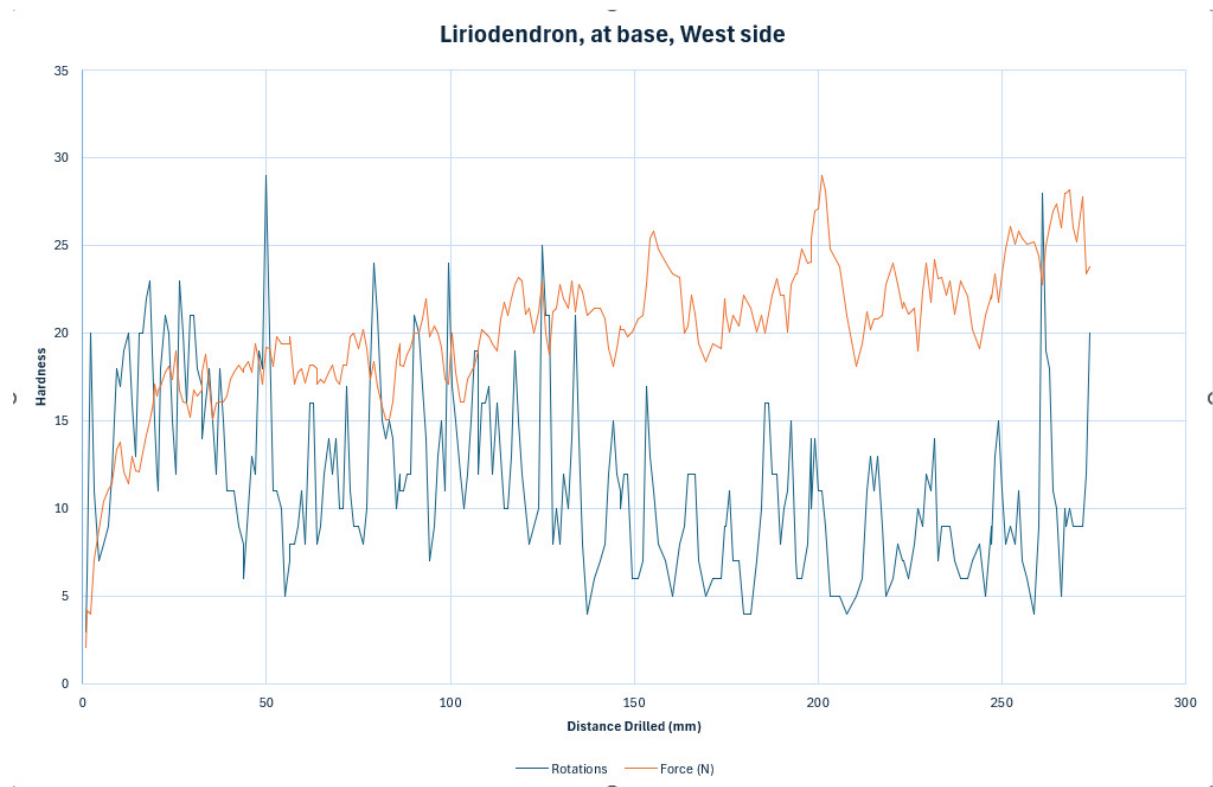
5.3 Specification for Tree Works

Specific tree work operations shall be carried out as per BS3998:2010 and any amendment or re-enactment thereof.

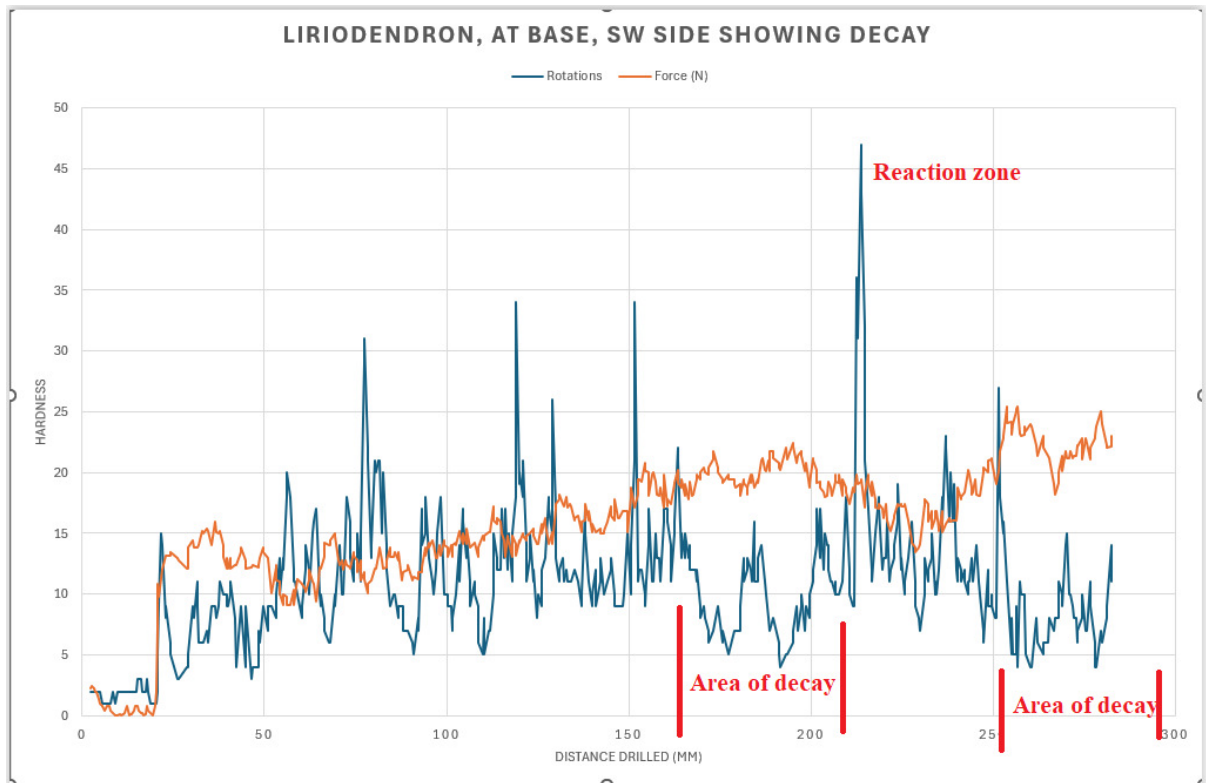
Drilling graphs:



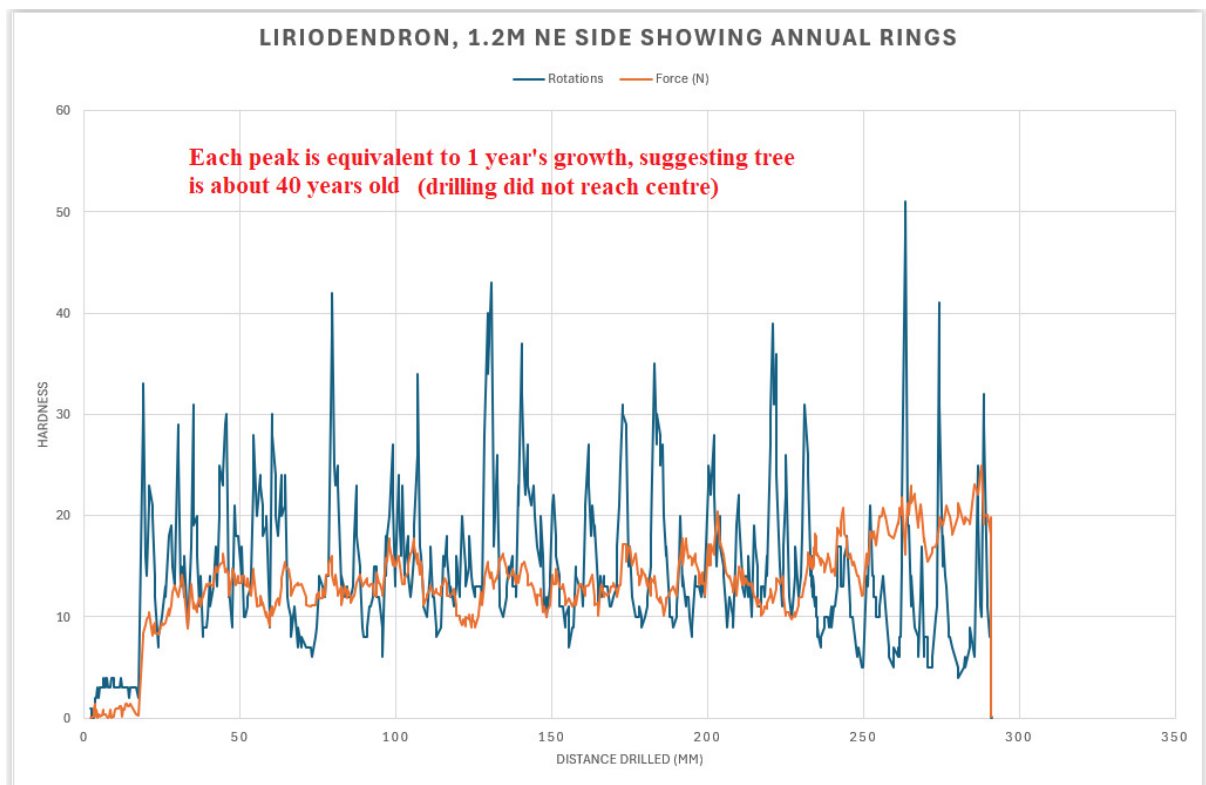
Drilling graph taken at base, NW side



Drilling graph base on west side into dead area



Drilling graph base, SW side, showing areas of decay, with a clear reaction zone



Drilling graph, 1.2m up on NE side showing annual growth rings

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