

Appendix to
Greentrees Tree Report of 03.07.19
concerning a Silver Fir (*Abies alba*) T444
23.10.19



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23.10.19

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Appendix to Greentrees original tree report 03.10.19

Dear John & Darlene,

Further to recent phone conversation about your application LUC.2019.380, 5 Ferntree Drive, Dunedin for the removal of Silver Fir (*Abies alba*) T444, which belongs to the DCC Community & Parks department, I am able to expand a several points within my original tree report dated 03.07.19.

1. As per comment from: Council Landscape Architect & Consultant Arborist

Both Mr McKinlay & Mr Roberts are in agreement with Option 1. in my tree report, to install a 4 Tonne cable bracing system & reduction prune end-weight from several large branches overhanging Lots 1 & 2 at 3 Ferntree Drive, Dunedin. Provided this treework is performed to an industry accepted standard it would lower the risk of branch failure in storms, while maintaining the aesthetic appearance due to a listed tree.

It is generally accepted that a health & safety risk exists if such treatment is required, in order to lower the risk of harm to people & property. Equally, the risk manager needs to balance the costs & benefits of resource allocation in the wider context of managing the urban forest.

2. Historic root cutting during subdivision development in the 1980's

In my tree report, I have mentioned that root cutting during subdivision development by the council of the Ferntree estate in the 1980's was highly likely. This may have happened when grading the roadway & installing all underground services, such as 3 waters, electricity & telco. It would have been common practice among contractors of the period, because there were no standards for working around trees & tree protection was simply ad hoc.

However, concerns remain since the Silver Fir (*Abies alba*) T444 is a gymnosperm (conifer/ softwood) which usually produce compression wood/roots on the leeward side of the trunk to counter the windload forces of the prevailing winds. The sou'wester is the prevailing wind in Dunedin & I would expect to find large structural roots when excavating within TPZ (Diameter = 33m) especially on the northside (leeward) of the Silver Fir tree. In closely observing the 10m² trenches cut for drain connections on 03.07.19 at radius of $\leq 15\text{m}$ only clusters of small adventitious fibrous roots were seen.



If insufficient large structural roots are not present then the possibility of root-plate instability leading to windthrow arises. Establishing the critical structural root spread would require an tree expert ground radar operator to survey & rule out the possible lack of sufficient structural compression roots, particularly on the northside as shown in the shaded elliptical area (pg 5).

The Silver Fir tree has fairly vigorous growth at present & will be adding canopy mass each season. In terms of increasing size & mass the sail-area presented to sou'wester will increase the windloading forces exponentially over time. These wind forces are at least partially dissipated throughout the branch structure but a large proportion travel down the trunk into the ground via the structural roots. It would therefore be prudent to eliminate the possibility of a health & safety risk, by establishing the fact that sufficient structural roots exist.

3. Large girdling root 10cmØ on the southeast quadrant of the root-collar of T444

The large girdling root 10cmØ on the southeast quadrant of the root-collar of Silver Fir T444 is another structural concern as it may lead to instability due to weakness in the root-collar. Taken in combination with possible lack of structural roots on the tree's northside (leeward) a significant health & safety risk may exist.

To establish the integrity of the Silver Fir tree's root-collar it may be necessary to engage an experienced tomographic operator to produce a non-invasive 3D internal imagery of the root-collar area. While there may be some rot in the root collar, the main concern is the extent to which the girdling root is diminishing the perceived external size of the root-collar (Pg 6). If the root-collar was found to be severely compromised (ie strangled to a small diameter) to the point of instability, this would also become a standalone health & safety issue.

4.

It is agreed that the original compensatory replanting offer was insufficient. A revised offer would be to replant the immediate area in rhododendrons, camellias, azaleas & viburnums to compliment the existing planting near the frontage of 3 Ferntree Drive & in addition to offering 20+ sapling trees (2m height x 4cmØ) of suitable species for planting in the nearby Dean St Reserve as reparation & future community amenity. This offer applies should consent to remove Silver Fir (*Abies alba*) T444 be granted & would become a condition of consent (Pg7).

Should you have any queries please do not hesitate to contact me.

Yours sincerely,



Peter Waymouth

Silver Fir (*Abies alba*) T444 with 3x structural canopy defects, a large girdling root & possible root cutting when digging trenches for underground services installation during the 1980's. In July 2019 water mains, sewer & storm water services were connected at 3 Ferntree Drive, under consent LUC.2019.61. Only fine adventitious roots were observed, which would be consistent with historic root cutting in the disturbed soil profile. The trench showed only asphalt, gravel ballast & hard clay beneath the footpath/road. Tomographic inspection of the root collar & a ground radar survey would be useful in establishing the integrity of the tree's longterm stability.



An example of windthrow in a sheltered situation at Chingford Park, Dunedin in 2011, where trunk weakness at the root collar has been caused by root girdling. Severe constriction of the phloem has lead to strangling of trunk growth expansion, allowing a strong south wind to snap the 20cmØ stem neatly at ground level, without any root heave or soil disturbance. Large girdling roots may also proportionally affect the stability of large mature trees, without the presence of fungal decay.

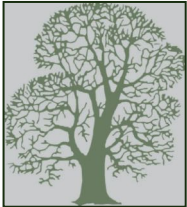


The dark brown girdling root channel is clearly visible in the photos above & below, along with a cluster of small adventitious roots indicating a similar stress reaction often observed in pruned tree roots.



The fallen ≤ 20 year old English beech (*Fagus sylvatica*) stood in the shadow of 2x ≥ 25 m trees of the same species, which have well-flared root collars & have withstood many storms for 120+ years.





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