

November 16, 2020

RE: Works under the dripline of T026

Lily Burrows
City Planning
Dunedin City Council
PO Box 5045
Dunedin 9058

Dear Lily,

As per your November 10, email request regarding proposed and previously undertaken works at number 17C Melrose Street within the dripline of T026.

The works relate to Planning Application LUC-2020-546. The schedule tree T026 is described in the 2GP tree list (Appendix A1.3) as a Wellingtonia (*Sequoia sempervirens*) and shown as growing on number 47 Garfield Avenue.

In relation to previous works:

1. I visited both properties (numbers 17C Melrose Street and 47 Garfield Avenue) with and at the request of DCC Monitoring and Enforcement Officer, Nic Jepson on the afternoon of October 19.

As a result of that site visit, I advised Mr Jepson via email [subject: Re: URGENT - Review of damage to significant tree at 47 Garfield Avenue] that there had been;

'changes to ground level (removal of the upper layer of soil) and post-hole digging have taken place under the natural drip-line of the tree, which is the tree protection zone according to the operative District Plan (by default this also means the works have taken place inside the tree protection zone according to the proposed 2GP). The works have potentially removed over 40% of the trees rooting system.

Secondary, yet more importantly to the excavation works taking place under the tree protection zone, the works have taken place inside the structural root zone. As the name would suggest, the structural root zone is where structural roots are considered to exist, and damage to these roots could compromise the structural integrity of the tree (i.e. cause the tree to fall over).

Shortly thereafter I sent a follow-up email describing and comparing the approximate tree protection zones/driplines according to the DCC Operative District Plan, the proposed DCC second Generation District Plan and the international standardised area^(*) for a tree protection zone. In that email, I also described and documented the approximate location of the structural root zone – images one and two.

* The Standards used to calculate the tree protection and structural root zone were the Australian Standard AS 4970:2009 Protection of Trees on Development Sites, the British Standard: BS 5837:2012 Trees in relation to design, demolition and construction, and the American National Standard: ANSI A300 (Part 5) - 2012: Management of Trees and Shrubs During Site Planning, Site Development, and Construction.

2. Generally speaking, a tree's root system is typically radial and horizontal. In clay-loam soils, tree roots are usually located less than 20 to 30 centimetres below the surface and grow outward far beyond the branch tips of the tree.

At the October 19 site visit works had already been undertaken, including post hole boring and the removal of at least 40cm soil on the 17C Melrose Street side of the dripline (image three). The soil removal works involved lowering the existing ground level along the boundary line between numbers 17C Melrose St and 47 Garfield Ave, with the excavation basically running parallel to and about 1m from the boundary fence (image four).

- 2.1 Based on the depth and proximity of the cut (soil excavation) to T026, I estimated that approximately 40% of all roots have been removed, including up to 30% of the structural roots.
 - 2.2 According to international standards, an incursion of more than 10% into the tree protection zone is considered a major incursion, and no works should take place inside the structural root zone
3. There were a number of fence post-holes dug and left open – these holes had no fence posts in them at the time

In relation to the proposed works

- *a retrospective resource consent application for Works within the dripline of significant tree T026*
4. Application LUC-2020-546 contains a hand-drawn Site Plan which may or may not be to scale (image five). It shows a 0.6 x 12m long proposed retaining wall running 1.8m from the boundary. It shows a stump that does not appear in the photos taken on October 19 and indicates that the fence is built inside the boundary by an unspecified distance.

Arboricultural recommendations re application LUC-2020-546

Based on the excavation works having already been undertaken, upon Council approval, the following recommendations and conditions shall apply to resource consent LUC-2020-546.

5. No further excavation or soil removal shall take place within the 2GP dripline of T026 (*see image one*)
6. All existing 'open' fence post holes shall be backfilled with top-soil - fence posts shall not be placed in these holes and no additional holes shall be dug within the 2GP dripline of T026
7. A 600mm tall retaining wall shall be erected no closer than 1.8m from the fence line (*as per image six*).
 - 7.1 During construction of this wall, no materials or equipment shall be placed or stored on the soil currently over the roots of T026
 - 7.2 During construction of this wall care shall be taken not to disturb or disrupt the soil currently over the roots of T026, and no damage or further root cutting shall occur to any of the roots of T026
 - 7.3 If condition 7 and/or condition 7.2 cannot be completed due to the proximity of the roots and/or the proximity of the soil over the roots, then the position of the retaining wall shall be moved further away from the fence so the construction can be achieved
8. The retaining wall shall extend from the side of the raised garden bed (*as shown in image five and indicated in image six*) and run parallel to the fence extending to beyond the outside edge of the 2GP dripline of T026

9. Once the retaining wall has been constructed, topsoil shall be added along the entire length of the retained area (between the retaining wall and cut surface of the roots/newly exposed bank) to a depth of approximately 500mm. On top of the topsoil, a layer of wood-chip mulch at least 100mm deep shall be applied to form a mulch cover from the edge of the retaining wall to the edge of the fence along the full length of the retained area (*image six*)
10. The layer wood-chip/mulch shall be maintained at the given depth for at least four (4) years
11. No herbicides, chemical weed suppressant or additives shall be used in the retained area for at least four (4) years
12. No fertiliser or plant growth promoters shall be applied to or used in the retained area for at least four (4) years
13. The tree shall be irrigated over the months of December, January, February and March for at least four (4) years from December 2020.
 - 13.1 The irrigation shall involve a commercially available soak-hose [i.e. a soaker or weeper hose or equivalent] attached to and run off the domestic water supply. The soak-hose is to run the full length of the retained area and be positioned as close as practical to the base of the fence (*image six*)
 - 13.2 Irrigation shall be applied every second week starting in the second week of December, with the water running through the system for at least three (3) hours but not more than 4 hours per irrigation event
14. The tree shall be monitored for movement at the base, for change of lean and tip decline for at least four (4) years. Monitoring shall take place at six monthly intervals, with a record documenting who, what measurements were taken and when for each monitoring event. Monitoring documentation shall be made available upon request by DCC Monitoring and Enforcement Officers.
 - 14.1 If movement or decline are detected then a new course of action or a revised tree management programme shall be required to ensure the ongoing safety of the residents and vitality of the tree.

As per your request, I have provided a relatively concise report. If you require an explanation of any of the recommendations provided, or documentary evidence to support any of the content in this report please do not hesitate to ask.

Yours sincerely



Mark Roberts
Roberts Consulting Ltd

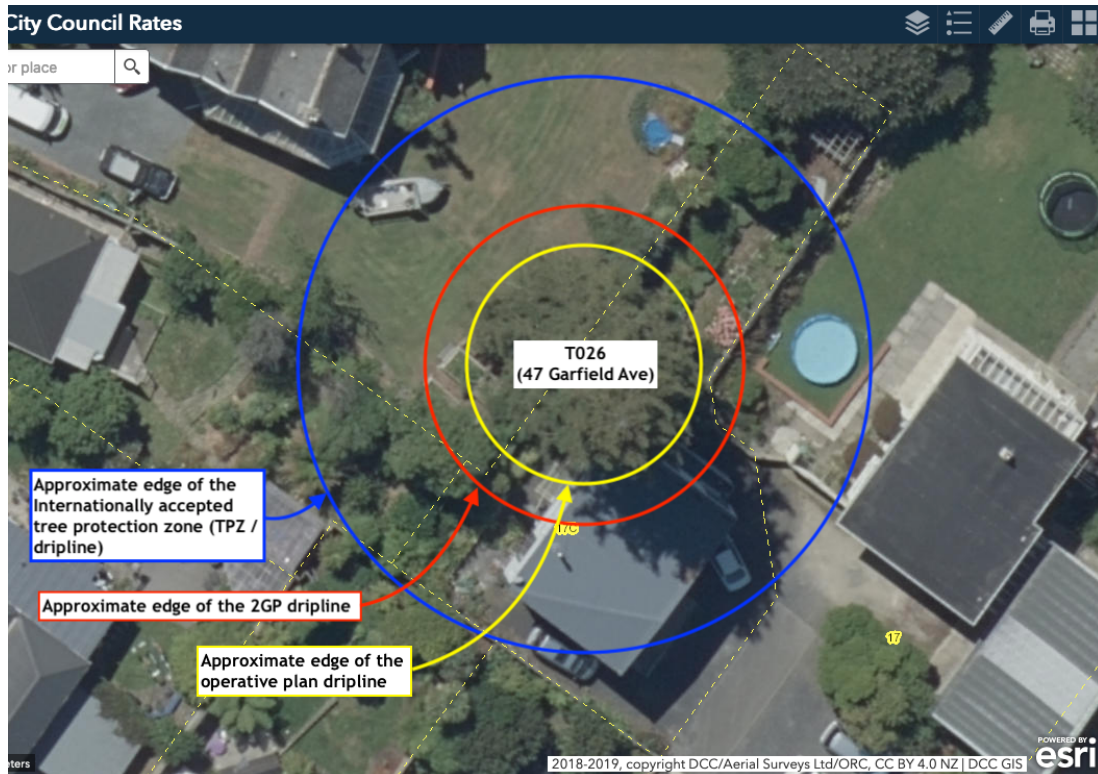


Image one: Image of T026 showing the approximate location the relative drip lines / tree protection zones



Image two: Image of T026 showing the approximate location the structural root zone; *damage to roots in this zone could compromise the structural integrity of the tree (i.e. cause the tree to fall over).*



Image three: Image of T026 taken from inside 17C Melrose Street, showing the extent of the soil removal, proximity of the 'cut' to the boundary line, the clay-loam type soil and the complete absence of roots in the soil beyond the cut face.



Image four: Image of T026 showing the approximate line and extent of the excavation/soil removal works

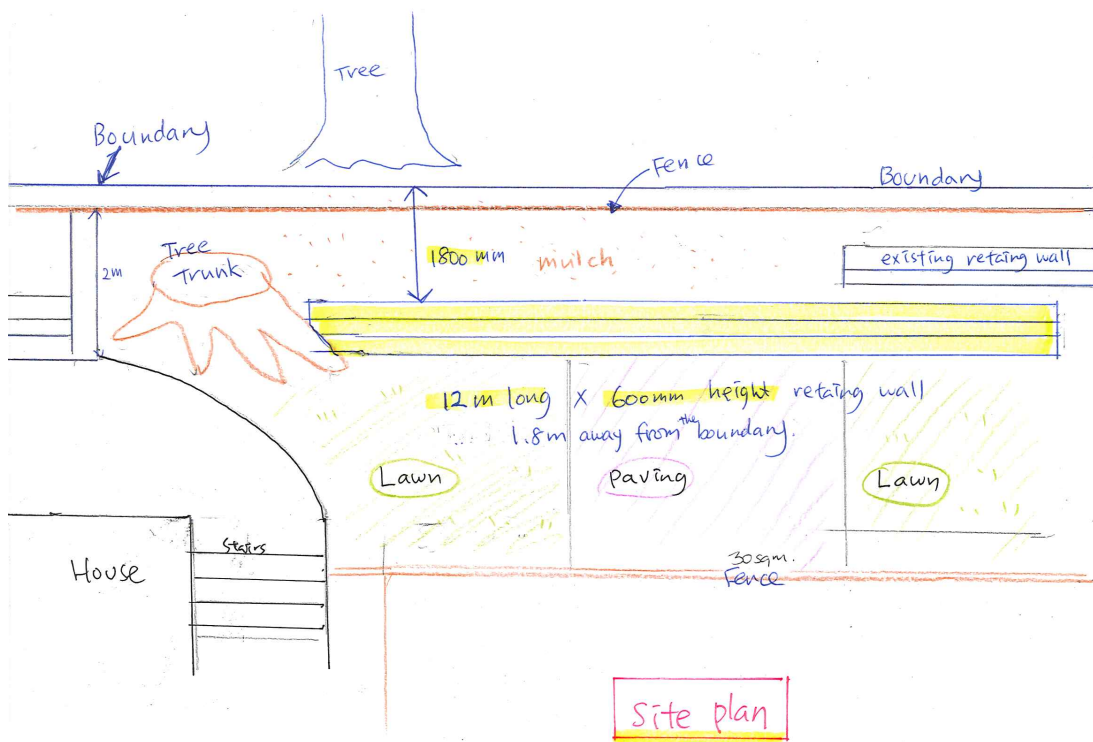


Image five: Copy of the applicant's 02/11/20 Site Plan attached as page 9 of application LUC-2020-546

- The tree T026
- The 'fence'
- The boundary line
- The existing raised garden bed
- The position of the proposed 600mm tall retaining wall (*NB: 1.8m from the fence not 1.8m from the boundary as shown in image five*)
- The retained area
- The location of the irrigation hose