JACKSONS NATURE WORKS
34 CALOOLA CRESCENT, BEVERLY HILLS 2209
9 150 4430
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Mr S Gartner
Co. 1010 – 1014 Pittwater Road
Collaroy NSW 2097

12th June 2024

Dear Sean,
RE: RFI by Northern Beaches Council at 1010 – 1014 Pittwater Road, Collaroy

1. Background

A Development Application (DA 2023/1395) has been lodged with Northern Beaches Council to demolish the existing and the construction of a mixed use development on Site (development works).

To prepare this report we have reviewed the following documents:

- Arboricultural Assessment Report by Jacksons Nature Works, dated 24.6.2023 (AAR/JNW 2023).
- RFI by Northern Beaches Council.

This report will provide Council with our discussions and recommendations for their approval.

2. Observations

The same tree numbering used in this report are those used in the AAR/JNW 2023 for ease of reference.

3. Discussions

3.1 The following comments are advised in response to Councils request and the modified design:

1. Council's Landscape Officer has calculated the encroachment within the TPZ of Tree 12 at 19.5%.
2. JNW calculated an encroachment of 10.95%.
3. It is my position the increase over the threshold of 10% as noted in Section 3 of AS 4970 – 2009 is assessed to be acceptable for the following details:
    a. Tree 12 is in good condition and in typical form for a Cook Pine with a self-correcting trunk.
    b. I am happy to accept Council's calculation of 19.5% as opposed to my calculation of 10.955, an increase of 9.05%.
    c. The proposed development is outside the SRZ radius of 2.6m radius which will maintain this tree's stability as noted in Section 3.3.5 SRZ of AS 4970 – 2009.

d. The remaining portion of the TPZ remains undisturbed and contiguous with the TPZ.
e. No canopy pruning is required to undertake the development works.
f. The availability of soil moisture will not be affected by the development works, plus access to soil nutrient.
g. To guide arborists and developers Mr G Paroissien (GP) of Landscape Matrix has produced a guide to the level of encroachments beyond the 10% threshold – refer below.
h. The level of encroachment as described by GP "moderate".
i. The moderate level is supported as " the tree is in good health and vigour and is not a particularly sensitive species", plus as noted above the development is outside the SRZ, no pruning is required and the remainder of the TPZ remains undisturbed and contiguous with the TPZ.
j. No changes to the design is required.

I trust these details will allay the concerns of Council.

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Consulting Arborist 1695
Graduate Certificate in Arboriculture AQF Level 8 (Honours)
Diploma Horticulture (Arboriculture) – AQF Level 5
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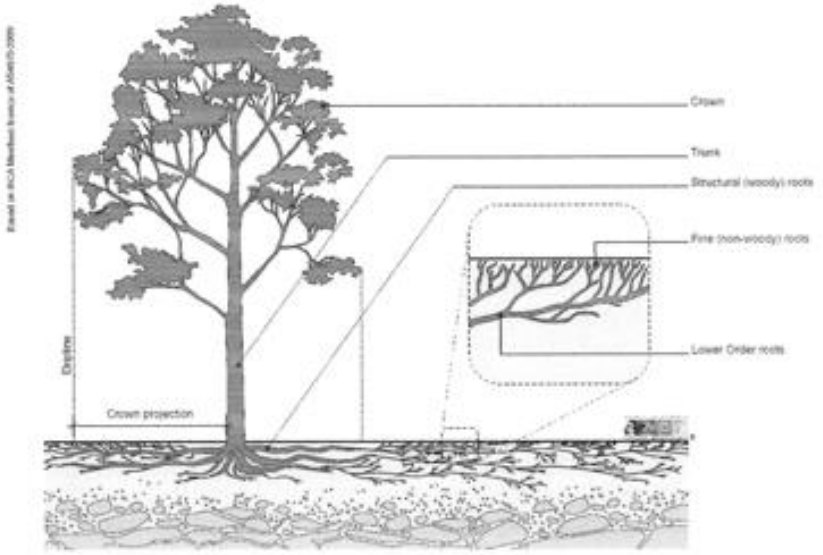
Certificate in Horticulture (Landscape – Honours)

IMPACTS WITHIN TREE PROTECTION ZONES ON DEVELOPMENT SITES

1. Introduction

Construction works have the potential to impact on trees through damage to or removal of roots and branches in addition to damage to tree trunks.

The typical above and below ground structure of tree growing a in a normal, or uniform growing environment is illustrated in the following figure based on Figure B1 from *AS 4970-2009 Protection of Trees on Construction Sites*:



07 Structure of a Tree in a Typical Growing Environment Scale 1:200 @ A4

2. Tree root systems and their vulnerability to damage during development works

Damage to root systems from construction works commonly occurs through the following activities:

- Level or grade changes - cut and fill;
- Excavation for footings;
- Excavation for drainage and other services installation;
- Hazardous chemicals/materials spills; and
- Compaction through soil level build up, machinery access, storage of materials and installation of temporary structures such as site sheds.

AS4970-2009 identifies that the majority of non-woody, absorptive roots are particularly vulnerable to damage due their delicate nature and proximity to the soil surface. In favourable soil conditions, very high concentrations of these finer roots are usually present in the upper 100 to 150mm of the soil profile. (Craul 1992 and Perry 1982)

While most trees' roots grow in the top 300mm of the soil profile up to 90% can grow in the top 150mm of the profile as root growth is opportunistic and the finer feeding roots of trees occur in the leaf litter layer of the soil. The absorptive capacity of these roots significantly increased by the presence of Mycorrhizal fungi. (Craul 1992, Himelock 1986, Perry 1982)

Due to the proximity of roots to the soil surface compaction of soils during construction activities is also a significant issue potentially affecting root growth. Compacted soils can result in the following:

- Restriction of the rooting area of plants;
- Can slow or stop root penetration;
- Can result in increased branching and thickening of roots; and
- Can result in poor aeration with consequent reduction in moisture penetration, oxygen levels and gaseous exchange essential to root growth. (Day and Bassuk 1994)

3. Determining Tree Protection Zones

A number of methods to determine the likely extent of root zones and appropriate setbacks for tree root protection zones for trees on development sites have been developed in the past. The key criteria used in determining setbacks have been the tree's trunk diameter at breast height (DBH) in conjunction with other factors including the sensitivity of the species in question to environmental disturbance/change, the age of the tree and the tree's health and vigour at the time of assessment.

AS 4970-2009 Protection of Trees on Construction Sites identifies a 'Tree Protection Zone' of 12 times the tree's DBH. In regard to palms, other monocots, cycads and tree ferns the Standard identifies the Tree Protection Zone should not be less than 1 metre outside the crown projection. (Australian Standards Association 2009)

4. What is an acceptable Level of encroachment into a Tree Protection Zone?

AS4970-2009 identifies encroachments of up to 10% of the tree protection zone as a minor encroachment. Where greater than 10% of the tree protection zone is potentially disturbed the Standard identifies this as a major encroachment where the tree's viability needs to be investigated and demonstrated by the project arborist.

The extent of impacts to trees on development sites can be broadly rated using the following guideline/scale of impact:
0% of TPZ impacted – no impact of significance
0 to 10% of TPZ impacted – low level of impact
10 to 15% of TPZ impacted – low to moderate level of impact
15 to 20% of TPZ impacted – moderate level of impact
20 to 25% of TPZ impacted – moderate to high level of impact
25 to 35% of TPZ impacted – high level of impact
>35% of TPZ impacted – significant level of impact

As a general guide it is considered an encroachment of up to 20% of a tree's identified TPZ is within an acceptable threshold providing the tree is of good health and vigour and is not a particularly sensitive species.

A critical factor to consider in assessing encroachments is the actual nature of the encroachment proposed within the TPZ. For example, lightweight elevated structures supported by isolated piers (e.g. decks) will result in significantly less disturbance to a tree's root system than an excavation for a strip footing, retaining wall or basement carpark. When assessing impacts consideration also needs to be given to the need for 'over-excavation' for retaining walls and basement carpark areas to allow for access for water-proofing, drainage etc and mitigating factors such as existing structures.

Where actual soil profile disturbance is minimal and primarily in the form of an elevated lightweight structure 'shadowing' the tree's TPZ area it is considered encroachments of up to 30% to 35% may be acceptable in some instances. In these situations the project arborist should consider factors such as the species, age, health and vigour of the tree in addition to factors such as potential changes to drainage, provision of mulching and irrigation, alternate areas for the tree's root system to populate etc.