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## **Arboricultural Report: Tree Protection Methodology**

*Relating to the site:*

**Dorking Road, Brooklyn, Wellington  
(Omaroro Reservoir)**

Attention:  
Mel Wykes

Report Prepared:  
February 2020

Site Visit:  
22 February 2020

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## 1 Brief

This report has been commissioned by Mel Wykes of Beca. Arb Innovations Limited have been engaged to assess 1 Podocarpus Totara (Totara) located at the end of Dorking Road on council road reserve to the entrance of Prince of Wales Park.

### The scope of the works as per the fee agreement:

Undertake a site visit to inspect the identified Totara tree, and assess what protection measures need to be put in place while construction works are underway, to construct the reservoir as per the drawing; 326233-CE-4003 - DORKING ROAD ACCESS PLAN.

### This assessment aims to:

- Assess plans provided.
- Perform a site visit to collate data and take photos.
- Assess the potential effects of the proposed development on the affected trees.
- Outline basic tree protection conditions for development sites.
- Provide options and recommendations for construction methodologies/design in order to protect the trees during and post-development
- Compile a report and submit to the client.

### 1.1 Proposal

The plan provided (appendix 1) proposes the widening of the existing entrance way to Prince of Wales Park.

The proposed works consist of a timber pole retaining wall with compacted hardfill material, topsoil and grass to form a widening of the existing access suitable for vehicle access.

Construction access for this work is to be from Dorking Road. The expected plant for this work would include an excavator, a small drilling rig for installation of the timber poles, trucks for deliveries of materials and removal of rubbish and site clearance materials, lifting equipment (such as a hiab or a small crane) and concrete trucks for delivery of concrete.

The work would be expected to start with clearing of the existing planting. Following this there would be removal of any existing topsoil over the footprint of the widening, including a working space on the outer side of the retaining wall. This would be cleared and stripped using an excavator and removed from site by truck. Holes would be bored to the founding depth for the timber pole retaining wall using a small drilling rig. A small amount of concrete will then be placed at the base of the excavated holes as a foundation for the timber poles. These poles would then be

placed in the holes, braced in position and concrete would then be placed around the poles to secure them in the drilled holes.

The cleared ground surface behind the new wall will be benched by excavator to provide level surfaces for placing the compacted backfill material onto. After the concrete has gained strength, rough sawn timber will be placed against the poles to retain the backfill. Backfill will be placed in layers including a subsoil drain in filter material near the base of the fill. The layers of backfill will be compacted as required and finished with a layer of topsoil. Reinstatement will include sowing with grass and planting.



Photo 1 – showing current site, with Totara tree and proposed vegetation to be removed.

## 1.2 Limitations

- All observations relied upon in this report are limited to the condition of the trees at the time of inspection. This report does not make assumptions on any works prior to those observed on the site visit.
- Assumptions have been made about the location of both structural and absorbing roots based upon formula derived from the Australian Standard *AS-4970-2007 'Protection of trees on development sites.'*
- This report is intended for the use of the property owner and all parties involved in the consent process. It shall not be used for any other purpose. This report is to be used as documentation providing the client with appropriate information on the trees and must be updated when/if any further works are carried out.
- All development information is based on drawings attached to this document. Arb Innovations cannot guarantee the accuracy of these documents.
- Any additional conditions of consent from the governing authority must be considered alongside this report.

## 2 Methodology

- During the site visit a VTA (Visual Tree Inspection) was performed.
- All observations were made on the condition of the trees at the time of inspection.
- This inspection was completed from ground level.
- All assessments are based on what could be observed from ground level.
- No invasive diagnostic tools were used.
- All findings can be found in the tables below along with photos taken during the site visit.

### 3 Tree Information and Photos

Table 1: Tree Data

	Tree 1
<b>Botanic name</b>	Podocarpus Totara
<b>Common Name</b>	Totara
<b>Canopy spread N – S</b>	8m
<b>Canopy spread E – W</b>	5m
<b>Height (M)</b>	10m
<b>Health</b>	Fair
<b>Comments</b>	Single stemmed tree growing with an asymmetrical canopy formation due to close proximity of tree behind. The tree is showing good vigour with no obvious defects
*Note: all measurements are approximations only	





Photos showing Totara

#### 4 Observations

The Totara tree was found to be located within an area of Council Road reserve growing amongst other vegetation and trees. There is a row of assorted native and exotic shrubs growing along the front edge of the Totara that are proposed to be removed. These can be seen in the photo in section 1.1 of this report.

The totara tree was found to be in a healthy state and in a fair condition. The tree has a singular stem and an asymmetrical crown formation due to a large karaka tree growing behind in close proximity.

Overall the tree displayed reasonable health and structure and no sign of decline or damage was present during the VTA.

Photos and tree data in section 3 show the current site condition.



## 5 Recommendations for Tree Protection

To ensure the protection of the Totara tree throughout the development process we recommend implementing a Tree Protection Zone.

The Tree Protection Zone (TPZ) will be considered an area where restricted activities apply to all contractors working on site. The author has considered the tree in its current location and established the TPZ as a maximum encroachment distance without the supervision of a site Arborist. This is a critical measure put in place to protect the tree parts most vulnerable to damage in a development environment; the roots, trunk and branches.

The TPZ will be clearly defined in this report and must be communicated to all contractors working on the site. Appendix 2 shows the approximate location of the TPZ using an aerial photograph. In this case the extent of the TPZ will be the exterior dripline of the tree's canopy.

### A) TPZ location

- **Pre works commencement**

The TPZ will be defined as the area within the extent of the dripline of the canopy. This has been shown on the aerial in appendix 2. Tree protection fencing and signage will need to be erected at the perimeter of this TPZ in accordance with the Tree Protection Fencing specifications and Tree Protection Signage specifications in this report.

*See Appendix 2 for image of approximate TPZ location.*

- **During the removal of existing hard surfaces, vegetation and installation of new retaining wall and hard surfaces**

The TPZ fencing is to be either removed or modified under the supervision of the site Arborist only. Fencing is to be re-erected at the end of each working day. During this stage steel mesh fencing can be substituted with waratah and mesh barriers where permitted by the site Arborist.

It is recommended that all vegetation removal is carried out by a suitably qualified arboricultural contractor that is a certified NZArb (New Zealand Arboricultural Association) Approved Contractor.

A monitoring Arborist is recommended to be onsite to supervise the extent of the excavation and installation of the retaining wall to ensure that if any roots are exposed appropriate measures can be taken to ensure minimal damage.

### B) Permitted activities

The TPZ is to be treated as a no go zone to all contractors outside of scheduled works permitted in this report.

The following activities are **NOT** permitted within the TPZ and are to be listed on the tree protection signage

- Storage of **any** materials: soil, concrete, building waste, paints etc

- Opening or alteration to the tree protection fencing without consent from the site Arborist.
- Site washout/run off of silt, paints, materials, chemicals, etc where they could run into the TPZ.
- Machinery movement or foot traffic within the TPZ. It is important to note that compaction of soil commonly kills trees on development sites.
- Adjacent machinery operations where they could impact on the trees i.e. physical damage, causing injury to trunk and/or branches.
- Any ground works not permitted in this report. If entry or alterations to the TPZ are required outside of scheduled works permitted in this report, the site Arborist must be contacted immediately to approve and oversee the works on site prior to entry or alterations.

### **C) Access to the TPZ**

- Foot traffic access may be required during the removal of the existing vegetation . Under the supervision of the site Arborist, contractors may enter the TPZ so long as the soil is adequately protected from compaction. If this is deemed to be insufficient, a load sharing surface must be installed for foot traffic.
- Required access must be communicated in advance to the site Arborist and approved. A minimum of 24 hours notice is to be given.

## **6 Removal of existing vegetation**

The proposed removal of the existing vegetation must be carried out by an approved contractor as outlined above in section 5 A, bullet point 2.

Once vegetation is removed, the TPZ fencing must be erected and remain in place until such a time that the monitoring Arborist agrees to remove or modify the fencing.

Any excavation that is needed within the TPZ must be approved by the monitoring arborist and must be monitored to ensure no root damage occurs.

No excavation is to be carried out with a 1m radius of the trunk of any tree unless deemed appropriate and necessary by the site Arborist.

## **7 Installation of new retaining wall and pathing.**

The maximum encroachment distance to the Totara tree will be the to the extent of the TPZ or to a distance approved by the monitoring arborist, if within the TPZ. Note that the plan shows the construction been 0.5m outside of the dripline of the tree.

The proposed retaining wall will need to be installed no closer than this zone. All installation methodologies will need to consider this area as a no go zone. If this soil area is disturbed it

is likely to have a detrimental effect on tree health. For the trees to be retained it is imperative that this area is adequately protected.

If, during construction of the retaining wall the soil area is required to be exposed for prolonged periods, moist cardboard and hessian is to be affixed to the soil edge with retaining pins and kept wet to reduce root dehydration.

## **8 Works Methodology**

Below is a breakdown of each section of the project and measures that shall be taken to ensure minimal effect upon the tree.

### **8.1 Vegetation removal**

As identified in this report, some vegetation around the Totara tree is to be removed. All tree work must be done using a qualified NZArb Approved Contractor.

### **8.2 Excavations, removal of existing hard surfaces within the TPZ**

Any excavations and or the removal of existing hard surfaces within the dripline shall be by hand, using non-destructive methods and under the supervision of the site Arborist. Alternative methods of excavation such as; air spade, hydro vac are permitted and recommended.

No excavation is to be carried out with a 1m radius of the trunk of any tree unless deemed appropriate and necessary by the site Arborist.

## **8.4 General Notes**

### **8.4.1 Roots**

At any time, during excavations near any of the trees, any roots that are found that are greater than 40mm are not to be cut without the site Arborist's approval.

All roots smaller than 40mm that are cut must be cut cleanly without tearing or ripping; appropriate tools are to be used when pruning roots. Once cut, the area must be back filled with soil. It is recommended that the site Arborist be notified prior to any root pruning. Pruning shall be carried out by the site Arborist.

### **8.4.2 Notification**

Advanced (minimum 24hrs) notification of any works within the Tree Protection Zone must be given to the site Arborist.

### **8.4.3 Root moisture retention**

At any time where roots are exposed to open air they need to be kept moist and backfilled with premium top soil as soon as possible. Dehydration of roots is a major cause of tree decline on development sites.

Dependant on the application there are a few options to keep roots moist.

In short periods of root exposure (less than 2 hours) temporary watering can keep roots

moist prior to backfilling.

During longer periods of root exposure (more than 2 hours) hessian or peat can be used to keep the area moist. Hessian covering wet cardboard works particularly well on vertical soil faces as it can be pinned into the soil to retain contact and moisture.

By implementing the above methods all care will be taken to ensure minimal impact to the tree.

## 9 Specifications

### 9.1 Mulching

Spreading mulch in the TPZ will improve the current soil health by retaining moisture and providing food for microorganisms responsible for producing available nutrients to the trees. Any tree stress sustained during the development can be offset by mulching.

Aged arborist mulch is to be spread throughout the entire TPZ. Mulch is to be spread 10cm thick and not piled up against the trunk or over the root flare leaving a 10cm gap.

Mulch needs to be re-applied after 12–24 months or when it has broken down amongst the soil.

### 9.2 Fencing

Temporary steel mesh fencing with a minimum of 2 meters in height securely affixed to each other to be installed as TPZ fencing referred to in this report.

### 9.3 Signage

Signage shall be installed on the TPZ fencing with the site Arborist's contact details and shall not be removed without permission from the site Arborist.

Signage must be clearly visible on all sides of the TPZ.

The signage will outline a summary of restricted activities within the TPZ as outlined in section 4 of this report.

### 9.4 Contractor inductions

An induction process for all contractors/sub-contractors should be held prior to any entry into the TPZ. This prestart induction is run by the site Arborist and covers procedures for working onsite around the trees, along with the processes required for work within the TPZ. Once the prestart is finished, each person signs onto the prestart record, acknowledging the procedures in place for this site.

Any contractors or visitors entering or working within the tree protection fencing will need to be inducted by the site Arborist before carrying out work, acknowledging their responsibilities and the procedures for working around the trees.

This report should be included in the onsite documents and should be mentioned during prestart meetings at the start of each day when works are being carried out in proximity to the TPZ.

## 10 Site Arborist

A site Arborist must be appointed prior to any works starting onsite, supplied with this report and any conditions of consent supplied by council regarding the trees and permitted activities.

The site Arborist must be suitably qualified with a minimum NZQA Level 4 qualification in arboriculture or overseas equivalent.

### **The site Arborist will be responsible for the following:**

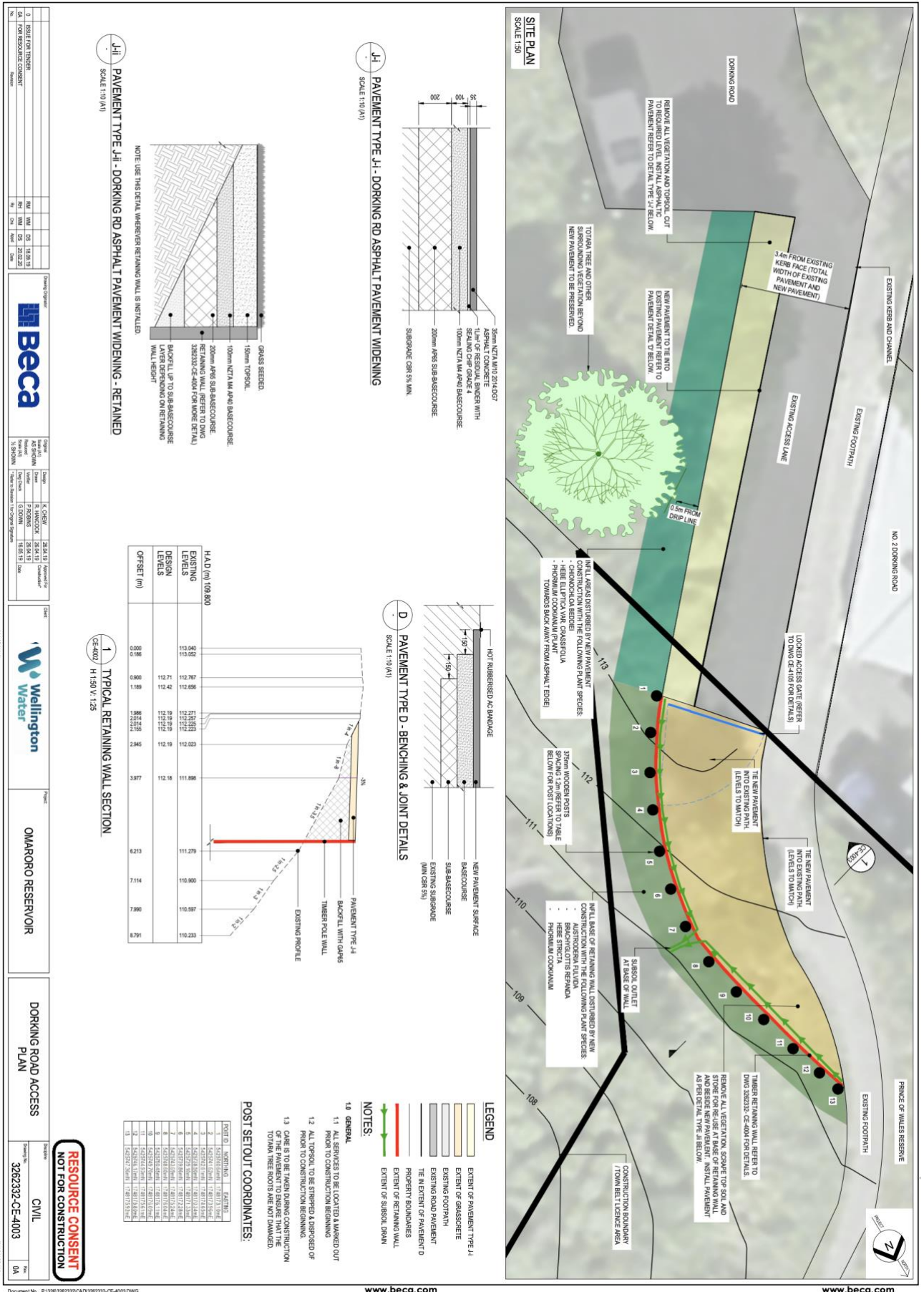
- Overseeing all works adjacent to or within the TPZ.
- Inducting contractors onto site as per contractor inductions section of this report.
- Overseeing or performing canopy pruning and any root pruning if necessary.
- Overseeing all other works specified in this report.
- Compiling compliance notes during site inspections as per the reporting section of this report and any other relevant conditions of consent requirements.
- Be on call for any unscheduled tree issues during the development.

### **Reporting to site Arborist**

If at any time the identified tree is damaged or unexpected works are likely to damage the tree including the canopy, roots, trunk or surrounding soils the site Arborist must be contacted immediately, prior to this work commencing.

If damage has been caused, it is imperative that it is reported to the site arborist immediately. The site arborist must visit the site, record data on the damage and implement a treatment/remediation plan.

# Appendix 1 – Supplied Plan



## Appendix 2 – Location of TPZ

*Image shows approximate TPZ location*

