



Arboricultural Impact Assessment Report

Cherry St. Fox St. Roundabout BALLINA NSW 2478

Prepared for: Ballina Shire Council

Prepared on: 08 July 2020

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Introduction

This report was requested by the Team Leader Concrete Construction and Drainage Ballina Shire Council. This report provides an assessment of two mature *Melaleuca quinquenervia* Broad Leaf Paperbark trees located in the road reserve. Proposed works to upgrade the intersection of Cherry and Fox Streets Ballina, include the construction of a roundabout and resurfacing of the existing road. Additionally the relocation of shared pathways and stormwater are proposed in proximity to the trees. This report considers the proximity of the trees to the proposed works and the potential impacts upon the trees. Both trees are listed on the Ballina Shire Council Significant Tree Register.

Methodology

A Visual Tree Assessment was conducted from the ground only and no invasive or diagnostic techniques were used when examining the tree. VTA observes the external indications given by the tree at the time of inspection to determine health and the structural integrity of the tree.

A tangent height gauge was used to measure tree height. Diameter at Breast Height (DBH) and other site measurements were taken using a double sided 10m diameter/measuring tape.

DBH was measured at 1.4m above ground level.

SRZ was calculated by measuring the trunks diameter immediately above ground level.

TPZ and SRZ radius was to Australian Standards using the arborlogix.com.au calculator.

Observations

Species	Common name	DBH	Height	Canopy Spread	Health	Age	TPZ	SRZ	SULE
Melaleuca quinquenervia Tree 1. West of intersection	Broad-leaved Paperbark	760mm	14m	15m	Average	Mature	9.1m	3.1m	1C
Melaleuca quinquenervia Tree 2. East of intersection	Broad-leaved Paperbark	870mm	12m	8m	Good	Mature	10.4m	3.3m	1C

Tree 1: Located on the corner of Fox and Cherry streets on the western side of the intersection. The tree is in small turfed area confined by the road 0.75 m to the south and 3.5m to the east. The shared pathway is 0.7m to the north. Three other trees of same age and species are planted in a group further to the North West.

The tree appears in average to below average health. Foliage is normal and dense with no indication of pests or disease present at the time of inspection. The canopy is asymmetrical towards the North West due to heavy reduction pruning for overhead power line clearances on the eastern side. The tree has developed an adventitious shoot from the lower trunk as a result of pruning. It is assumed that the majority of the trees roots exist in the grassed area of the road reserve and may have been impeded upon over the years by works to the footpath. The root system is observed mounding at the base of the tree and not visible within other parts of the road reserve. It is assumed that the tree has a deep rooted system.

Tree 2. The tree is located on the corner of Fox and Cherry streets on the eastern side of the intersection. The tree is located in a turfed area confined by the road 0.5m to the north. Unsealed parking bays are 1.6m east of the tree. The shared pathway is 7m to the south.

The tree begins an avenue of same species plantings along Fox Street.

The tree appears in average health. Foliage is normal and dense with no indication of pests or disease present at the time of inspection. The canopy has been reduced approx. 25% on the southern side by pruning for overhead power line clearances.

Discussion

The trees form part of an avenue along Fox Street and have been listed on the Ballina Shire Council Significant Tree Register for historic values and natural / biodiversity values.

The avenue effect is not consistent on the western side of Cherry Street, where no opposing trees have been planted (or may have been removed for previous development)

In the case of both trees, neither has an opposite planted in the adjacent road reserve.

Australian Standard AS4970-2009 Protection of Trees on Development Sites states encroachment greater than 10% is a major encroachment of the Tree Protection Zone.

The existing road will be excavated and resurfaced to a similar depth using concrete slabs. The positioning of the curbs will not change and the encroachment into Tree Protection Zones from road works will not be greater than currently exists.

The existence of tree roots within the scope of works is unknown. It is assumed roots have been opportunistic in colonising some areas beneath the surrounding hard surfaces wherever air and water have been available.

Of greater concern is the redirection of storm water within the site. A major encroachment of the TPZ occurs in the case of Tree 1.

Excavations will take place approximately 700mm from the base of the tree, effectively severing all roots in the northern and western quadrants of the TPZ and incurring by approximately 45%. The encroachment for the road works is an additional 45% in the southern and eastern quadrant. A total encroachment of 91% has been calculated.

It is my opinion that the tree cannot cope with an encroachment of this scale and will not remain viable in the long term.

Additionally the tree also interferes with the safe intersection sight distance (distance to detect vehicles approaching in conflicting traffic streams) according to Austroads Standards. This is a mandatory criteria under the RMS & Austroads guide to road design Part 4b: Roundabouts (2015) To ensure safe gaps in traffic can be detected. Refer to appendix 1.2 for sight line justification. To comply with current Austroads and Australian Standards the tree is proposed for removal.

In the case of Tree 2. Excavations for underground services (water) have been redirected outside the calculated TPZ. Road works encroach upon the north-western quadrant of the TPZ by 15%, a major encroachment.

The presence of tree roots within the scope of works is unknown. It is assumed roots have been opportunistic in colonising some areas beneath the surrounding hard surfaces wherever air and water have been available.

Indications of tree roots such as mounding in the roads surface, were not detected in the 15% encroachment area.

It should be considered that works will take place within the footprint of the existing road and to a similar depth. Works may not encounter any roots or effect the tree any more than at present.

Repairs to the curb are a greater risk to the tree and encroach upon the Root Protection Zone. The RPZ is an area required for tree stability. The close proximity to the trunk implies that structural roots may be encountered beneath the concrete. Evidence of this can be seen to the south east where the curb has lifted by 50mm. The curb may also be acting as a root barrier, deflecting tree roots and restricting their growth into this area.

The tree is a healthy tree with good vigour that has shown previous tolerance to disturbance within its root zone without indication of stress or signs of decline. It is my opinion that the tree will cope with the incursion and remain viable after the works.

The impacts of development upon a tree can take several years to become evident. Damage to the root system is common cause of tree decline and death and is the most common form of damage associated with development sites. (AS 4970 p24).

Recommendations

Tree 1. The tree requires removal under Ballina Shire Council Policy Urban Vegetation on Public Land Acceptable Reasons Part A: To comply with planning legislation being RMS sight line requirements and section 88 of NSW Roads Act 1993 number 33. In compliance with section 2f of the policy, council must provide a letter of notification to property owners adjoining the significant tree. Notification of the removal is to be added on council's web page and a minimum exhibition and comment period of 14 days. Removal works are to be carried out under the councils Contractor Management System using suitably qualified arborists adhering to site safety and industry best practices.

Tree 2.

AQF level 5 Arborist is to monitor all works inside the TPZ and ensure they are carried out to Australian Standards.

It is important to observe the tree protection measures required in the 10.4m radius and described in Appendix 2. The grassed area south of the tree, along with the parking bays to the east will contain roots and should be protected from the compaction of heavy machinery. The area must either be excluded or ground protection mats (Track Mats) used to minimise the impacts.

In accordance with AS4970-2009 section 3.3.3 an area of compensation equivalent to 15% is required to be added to and continuous with the remaining TPZ. The turfed area extending west to the road side curb is proposed and the equivalent of 51 m must be designated for the benefit of the tree and its root system. Any further development should be restricted to exclude hard surfacing and compaction in these areas as they are important sources of water and nutrients to the tree.

Works to the north of the tree encroach upon the Root Protection Zone. If excavation is required to replace the existing curb then roots in this area should firstly be identified using careful excavation techniques (such as vacuum excavation) AQF level 5 Arborist is required to supervise all works and ensure they are carried out to Australian Standards.

Any roots exposed during road works within the TPZ encroachment area must be neatly severed (as soon as possible) using clean sharp tools such as a secateurs or a hand saw. AQF level 5 Arborist is required to supervise all works and ensure they are carried out to Australian Standards.

Any roots exposed during works with a diameter greater than 30mm should be kept moist until they can be reburied. Dampened hessian cloth wrapped around larger roots or draped over and into the soil/root interface will aid in reducing moisture loss and prevent roots from drying out.

Lower limbs of the tree, likely to be damaged by heavy machinery should be pruned prior to commencement of works. Pruning must be carried out to Australian Standard AS 4373 Pruning of Amenity Trees and performed by a suitably qualified AQF Level 3 arborist or above.

Following works the tree requires annual monitoring for a minimum period of 2 years. This should be carried out by an AQF Level 5 arborist to assess the impacts and monitor for signs of decline.

Tree protection measures as outlined in section (4) AS4970 are required to be in place for the duration of the works.

- * Protective fencing to height of 1.8m (AS 4687 Temporary fencing and Hording) to be erected surrounding the tree. This may not be practical to the full extent of TPZ radius, however the area should be indicated/marked on the ground and restrictions observed.

- * Signs identifying the TPZ should be placed and be visible from within the development site. To comply with AS 1319–1994 Safety signs for the occupational Environment.

Restricted activities within the TPZ include:

- *Storage

- *Dumping of waste

- *Parking of vehicles and plant

- *Preparation of chemical including cement products

- *Wash down and cleaning of equipment

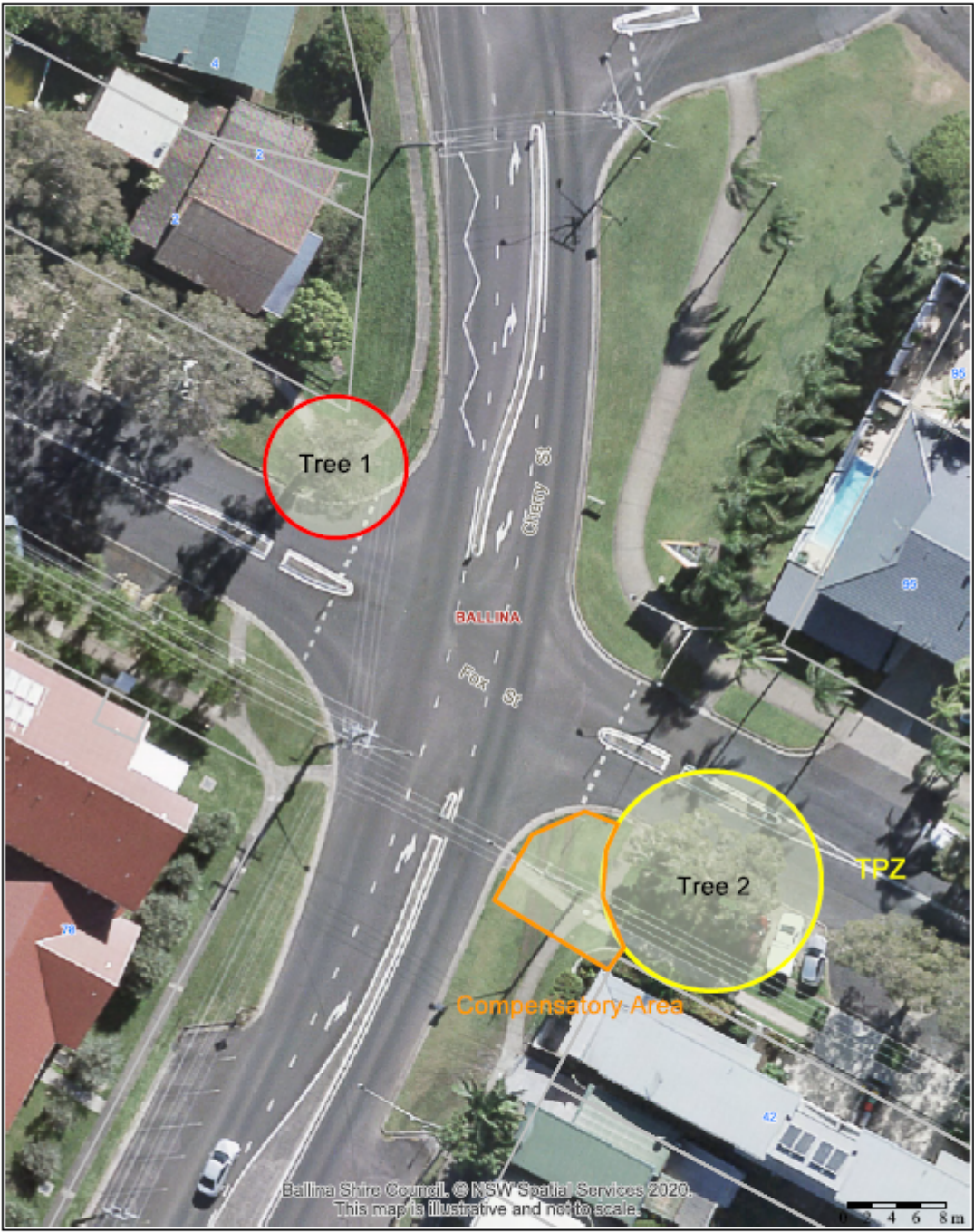
Conclusion

The tree plays an important role in the character of the street. Every effort should be made to ensure the effects from proposed works upon the tree are minimised and that future development give consideration to the health of the tree.

The tree is in good health and given the correct protection measures are adhered to, is expected to tolerate the disturbance.

The impacts of development upon a tree can take several years to become evident and continued monitoring is required.

Appendix 1: Site Map and Tree Locations



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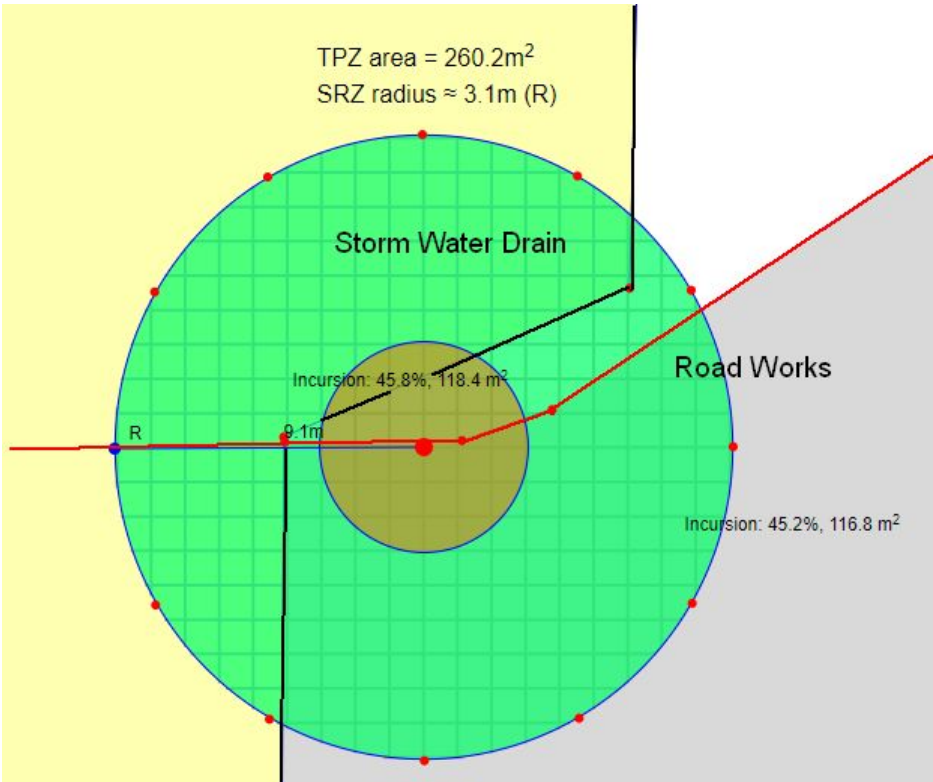
Tree Locations and TPZ with compensatory area

ballina shire council
geographical information system

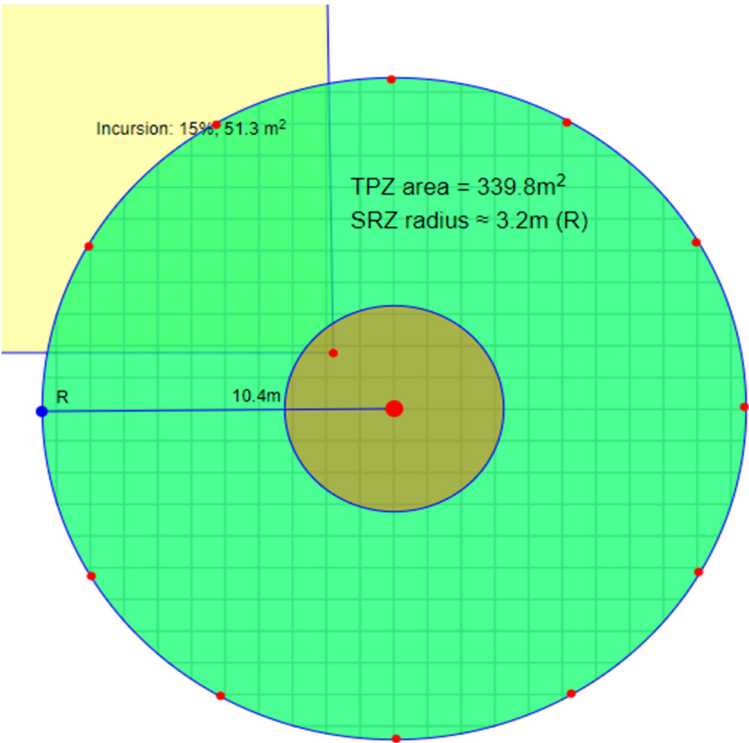
Projection: GDA94 / MGA zone 56
Date: 5/07/2020

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Appendix 2: TPZ incursion calculator showing development (road & drainage)



TPZ incursion calculator showing development Tree 2. Road works



Shaded areas indicate extent of existing development. Source: proofsafe.com.au

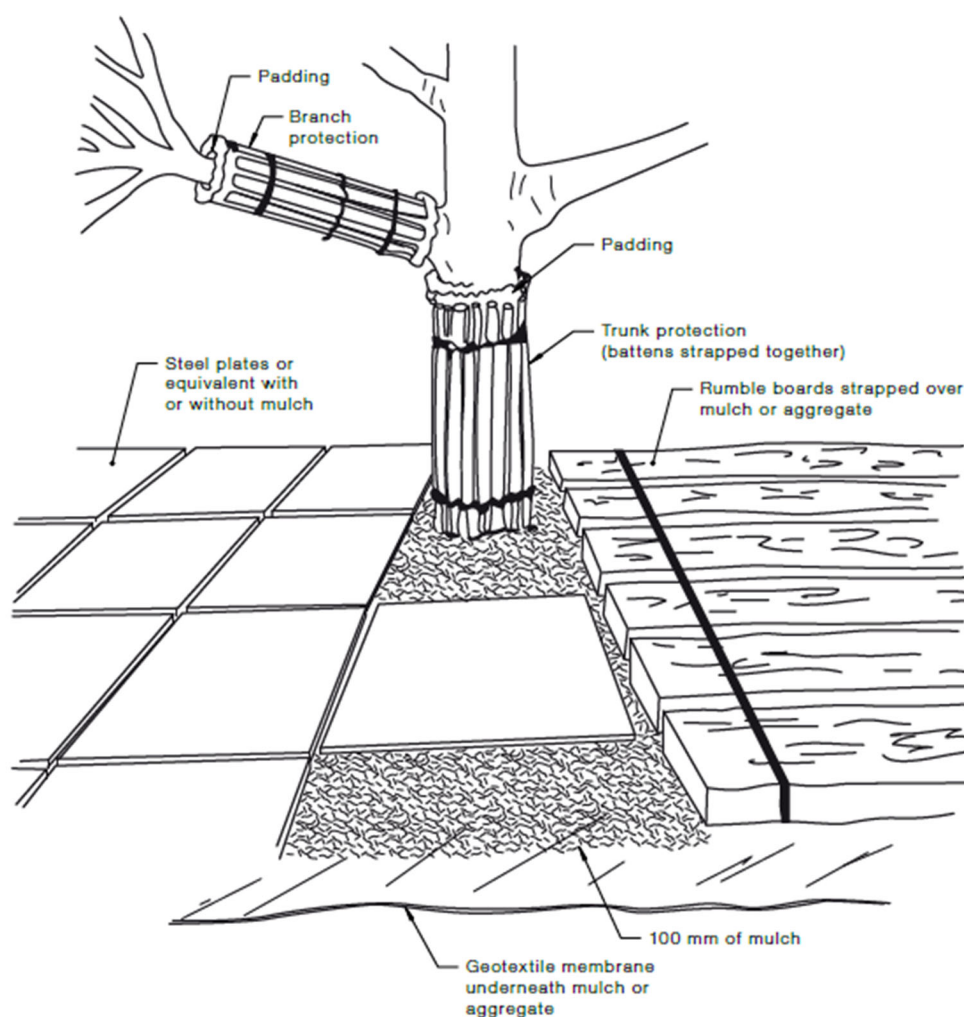
Appendix 3: AS 4970-2009 (section 4) tree protection measures.

4.2 ACTIVITIES RESTRICTED WITHIN THE TPZ

Activities generally excluded from the TPZ include but are not limited to—

- (a) machine excavation including trenching;
- (b) excavation for silt fencing;
- (c) cultivation;
- (d) storage;
- (e) preparation of chemicals, including preparation of cement products;
- (f) parking of vehicles and plant;
- (g) refuelling;
- (h) dumping of waste;
- (i) wash down and cleaning of equipment;
- (j) placement of fill;
- (k) lighting of fires;
- (l) soil level changes;
- (m) temporary or permanent installation of utilities and signs, and
- (n) physical damage to the tree.

Appendix 3.1: AS 4970-2009 (section 4) other protection measures.



NOTES:

- 1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
- 2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION

Appendix 4: Tree images



Tree 1: Proposed for removal. *B. Branch 30/06/2020*



Tree 2: Looking east and showing grassed area for compensation. B. Branch 30/06/2020



Tree 2: Indications of tree roots just outside the scope of works. B. Branch 30/06/2020

References:

Australian Standard AS4970-2009 Protection of trees on development sites.

Australian Standard AS4373-2007 Pruning of amenity trees.

Ballina Shire Council, Urban Vegetation on Public Land 2018.

Guide to Road Design Part 4B: Roundabouts (Austroads 2015) Section 3.2.2 and Section 3.2.3.

ProofDocs, 2019, https://proofsafe.com.au/tpz_incursion_calculator