Arboricultural Impact Assessment

8 Alan Avenue Seaforth

Prepared by Alex Austin

For

Leah Poole

December 2020

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1 Summary

Alex Austin, an AQF level 8 Arborist, was commissioned by Leah Poole to complete an Arboricultural Impact Assessment for the proposed re development of 8 Alan Avenue Seaforth.

This document and data has been prepared in accordance with Australian Standard 4970: 2009 *Protection of trees on development sites.*

The site inspection was completed Friday the 16th of July 2020 where 21 trees were inspected and are now subject to this report. Complete tree data can found be in the table located in the Appendix. The trees have been tagged and mapped on the site plan.

The 21 tree comprise of

- 2 A Retention Value Trees numbered 1 & 18.
- 2 B Retention Value Trees numbered 8 & 16.
- 17 C Retention Value Trees.

If the current proposed construction is to proceed, then

12 Tree numbered 2, 3, 6, 7, 9, 10, 13, 14, 15, 16, 19 & 20 are proposed for removal

9 trees numbered 1, 4, 5, 8, 11, 12, 17, 18 & 21 can be retained if the tree protection measures in the report are adhered to.

In order to ensure the 9 trees nominated for retention remain viable during and post construction, tree protection measures including, the engagement of a project arborist, ground protection matts, tree protection fencing, tree protection signage, mulching, a restriction of activities within Tree Protection Zones (TPZ's) and compliance reporting, must be incorporated into the project. .

A Tree Protection plan has been prepared and can be located in the Appendix.

This document must be used in its entirety.

Further questions are to be directed to:

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2 Background

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The trees have been tagged and mapped on the site plan.

2.1 Reviewed Documents

- Site plan, by GeoServ, dated 2/4/2020
- Complete DA Plan Set by JR Residential Design, dated 11/12/2020
- Draft demolition and Tree Protection Plans by JR Residential Design, dated 19/10/2020
- Landscape Plan, by Site Design + Studios Dated 3/12/20
- GROUND FLOOR / SITE STORMWATER DRAINAGE PLAN, by Law and Dawson, Issue A, dated Nov 2020.

3 Legislation.

3.1 Vegetation SEPP

The subject trees are protected by the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP). Trees proposed for removal or pruning, are covered by the SEPP unless they are considered an imminent danger to life and property (By a AQF Level 5 or above Arborist) and require a permit to be issued by Council

4 Aims and Objectives

- Determine the Retention Value and required area for each tree to be protected and remain viable during and post construction.
- Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.
- Encroachments to the TPZs are to be minimized prior to construction.
- Works within the defined Tree Protection Zone shall utilize special measures to avoid or minimize adverse impacts on trees.
- Provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during construction.
- The trees to be retained must be protected from all other demolition, excavation and construction activities.

5 Methodology

5.1 Tree Health and Condition

The inspection of the trees was made from the ground and involved inspection of the external features only. No invasive, diagnostic or laboratory testing was carried out.

Tree height and canopy spread were estimated and trunk diameter (DBH) and Diameter at Root Crown (DRC), have been measured with a diameter tape where applicable.

Data including species, age class, health, structure, landscape significance, defects, life expectancy were recorded. Tree species were identified using available seed and fruit during the site inspection.

All photographs were taken at the time of the site inspection by the inspecting arborist. Photographs have been altered for brightness and/or cropped only.

5.2 Tree Protection Zone and Structural Root Zone

The Tree Protection Zone method has been derived from the Australian Standard 4970–2009: *Protection of trees on development sites*.

The Tree Protection Zone (TPZ) is defined as a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown. It is the area required to provide for the viability of a tree to be retained where it is potentially subject to damage by development.

The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (DBH) by 12

$$TPZ\ radius = DBH \times 12$$

The trunk diameter method has been used in this report to determine the TPZ. This area provides a general guide where the roots are likely to be located.

The Structural Root Zone (SRZ) is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.

$$SRZ\ radius = (D \times 50)^{0.42} \times 0.64$$

5.3 Retention Value

A simplified rating system consisting of 4 categories as a summary of the survey's cascading process. The retention value considers the trees health and structure, age class, defects, life expectancy and significance in the landscape. The retention value method has been derived from the British Standard 5837:2012.

- A– Retention Value (Green) Trees of high quality suggesting considerable efforts should be made to retain these trees.
- B – Retention Value (Blue) Trees of moderate quality suggesting reasonable efforts should be made to retain these trees.
- C – Retention Value (Grey) Trees of low quality and significance, These trees may be removed or retained without significant impact to the longevity of the landscape.
- R – Remove (Red). Trees that are not worthy of preservation and should be removed due to defects, weed species and high hazard values.

6 Findings

6.1 Suburb Map

Figure 2. The map of the suburb showing the location of the site. (Source: Sixmaps 2020)

6.2 Aerial Photo

Figure 3. Aerial photo. (Source: Sixmaps 2020)

6.3 Site Conditions

The site is a large residential northwest facing block with a existing brick home.

The landscape has trees predominantly along the north eastern boundary.

The site is dominated y a large Eucalyptus at the rear.

The remained of the site is lawn with a slight slope to the north west.

Figure 4. The site frontage can be observed. (Source: Austin 16/7/20)

Figure 5. Typical site conditions in the rear garden can be observed. (Source: Austin 16/7/20)

7 Proposed Construction

The proposed development works onsite include the demolition of the existing dwelling and the construction of a new larger house with associated drainage and landscape works.

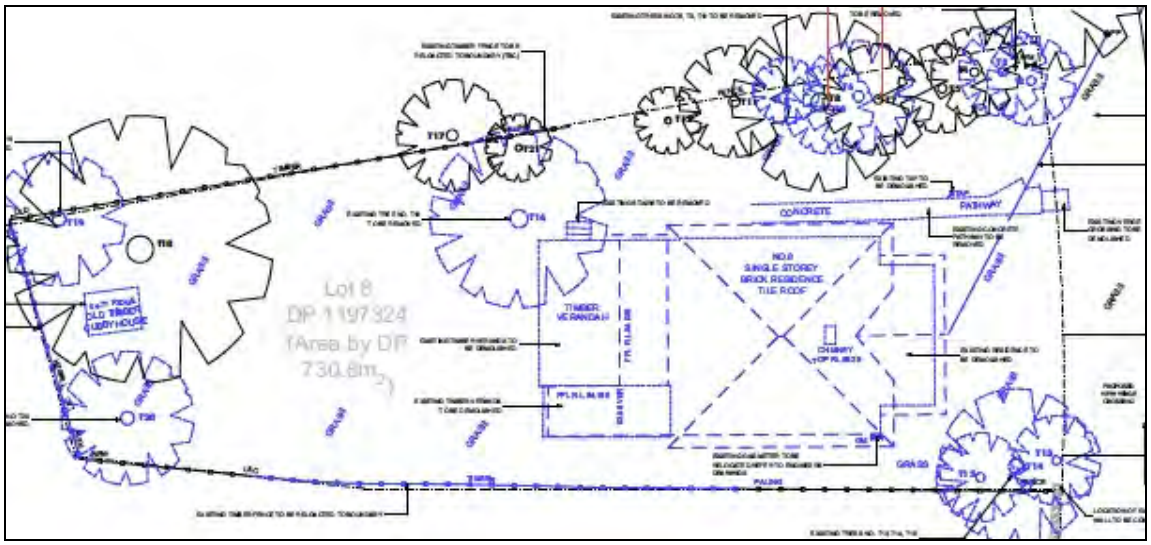


Figure 6: The existing site layout. (Source Demolition Plan by JR Residential Design, dated 19/10/2020)

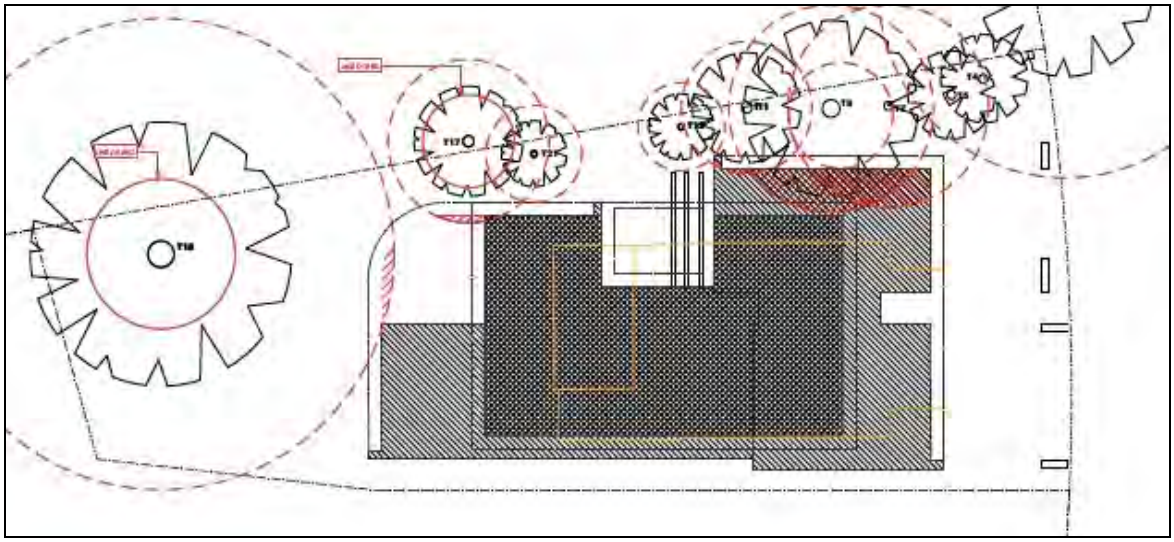


Figure 7: The proposed layout with the red hatched circles indicating TPZ areas. . (Source Tree Protection Plan by JR Residential Design, dated 19/10/2020)

8 Tree Survey

21 trees were inspected and had their attributes recorded. Complete tree data can found be in the table located in the Appendix. The tree location plan can also be found in the appendix.

8.1 2 A Retention Value trees

2 A Retention Value Trees numbered 1 & 18 were identified in the site. The trees have good health and fair structure and a tree life expectancy of 25 years. The trees have high significance in the landscape .Considerable efforts must be made to conserve the trees through the project.

8.1.1 Tree 1 – *Lophostemon confertus* (Brushbox) - Council

Tree 1 is located on the council verge at the front of the neighbouring property. The tree has a high landscape significance and long life expectancy. Tree 1 is in proximity to the works and must be protected from damage. The existing driveway is to have ground protection matts and tree protection fencing installed to protect the TPZ from damage.

Figure 8: Tree 1 in the landscape. (Source: Austin 16/072020)

8.1.2 Tree 18 *Eucalyptus saligna* (Sydney BlueGum)

Tree 18 is a large tree in good condition situated in the rear corner of the site. It has high landscape significance and a long useful life expectancy.

Figure 9: Tree 18 in the landscape. (Source: Austin 16/072020)

8.2 2 B Retention Value trees

Tree numbers 8 & 16 are the B Retention Values trees. Trees in this category generally posses fair or better health and structure and have life expectancies greater than 15 years. Reasonable attempts should be made to retain the trees through the project as they have the ability to be continuing components of the landscape

8.2.1 Tree 8 *Glochidion ferdinandi* (Cheese tree)

Tree 8 is located on the northern boundary. The tree has good attributes is a desirable native species and the tree has a long life expectancy.

Figure 10: Tree 18 in the landscape. (Source: Austin 16/072020)

8.2.2 Tree 16 *Cedrus atlantica* (Atlas cedar)

Tree 16 is located a good example of a *Cedrus atlantica* (Atlas cedar). Tree 16 is located in the middle of the block, the existing deck is located in the TPZ and SRZ. Tree 16 is of medium landscape significance as it is dominated by tree 18 located behind. The tree has good health and structure as well as good prospects as a long term landscape component however, its position has ultimately conflicted with the design options presented.

Figure 11: Tree 16 in the landscape. (Source: Austin 16/072020)

Figure 12. The canopy of Tree 16 when viewed from the street is indicated by the green shaded polygon. (Source: Austin 16/7/20)

8.3 17 C Retention Value trees

The remaining 17 trees present as C Retention Value. C Retention Value trees should not be considered a constraint on development as they have reduced health or condition, or have short life expectancies or have low landscape significance or are easily replaceable due to their small size. If trees in this category are to be retained, they must be protected from construction activities.

8.3.1 Tree 20 *Cinnamomum camphora* (Camphorlaurel)

Tree 20 is a small self sown *Cinnamomum camphora* (Camphorlaurel) which is considered an undesirable species due to its weed seed production potential.

Figure 13: Tree 20 is located in the rear corner of the site. (Source: Austin 16/072020

8.3.2 Northern Boundary trees

A group of trees both planted and self sown are located between the residences of 6 & 8 Allan Ave. Screening benefits are provided.

Figure 14: Tree 5, 6, 7, 8 & 9 can be observed in the landscape. (Source: Austin 16/072020)

9 Impact from the Proposed Works.

9.1 12 Tree Removals

Tree numbers 2, 3, 6, 7, 9, 10, 13, 14, 15, 16, 19 & 20 are proposed for removal as part of the project.
Tree 16 is B Retention Value and the remaining trees are of C Retention Value.

9.2 9 Trees for Retention

Nine (9) Trees can be retained if the tree protection measures in the report are adhered to.

Three (3) Trees numbered 1, 8 & 17 require specific protection measures

Five (5) Trees numbered 4, 5, 11, 12 18 & 21 require generic protection measures.

9.3 Minor Root Zone Encroachments

9.3.1 Tree 1 *Lophostemon confertus* (Brushbox)

Demolition works/access is likely to occur in the root zone as the existing access is located within the TPZ. The tree must be fenced off to protect it construction activities.
Ground protection matts or rumble boards will be required on the council verge through the TPZ during the demolition and construction phases of the project.

Figure 15: The proposed foot print is not within the TPZ of Tree 1 however, current site access is through the TPZ of Tree 1 indicated by the yellow polygon. (Source Tree Protection Plan by JR Residential Design, 11/12/2020)

Figure 16: Tree 1 can be observed in the landscape. Current site access is through the TPZ of Tree 1 indicated by the yellow polygon (Source: Austin 16/072020)

The proposed masonry and timber front fence is located within the TPZ of Tree 1. The excavation for the masonry pier must be completed by hand and not damage roots larger than 40,mm diameter. It is unlikely that major roots will be identified during the excavation due to the competition in the growing environment in that area by Trees 2 & 3.

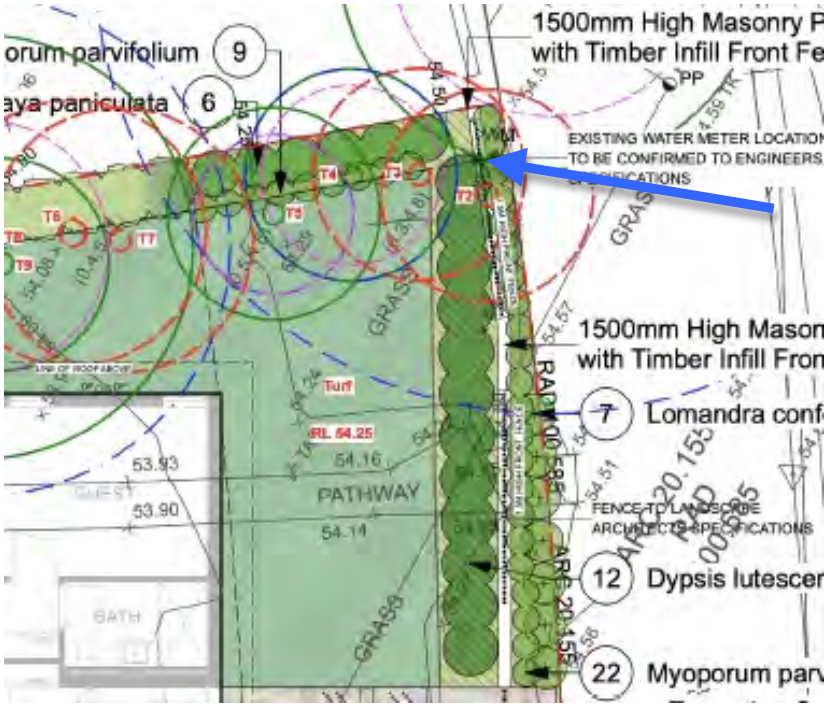


Figure 17: The masonry pier for the front fence is indicated by the blue arrow. (Source: Landscape Plan, by Site Design + Studios Dated 3/12/20)

9.3.2 Tree 18 *Eucalyptus saligna* (Sydney BlueGum)

Tree 18 *Eucalyptus saligna* (Sydney BlueGum)has a 0.4% root zone encroachment. This is a minor encroachment and will not impact tree viability.

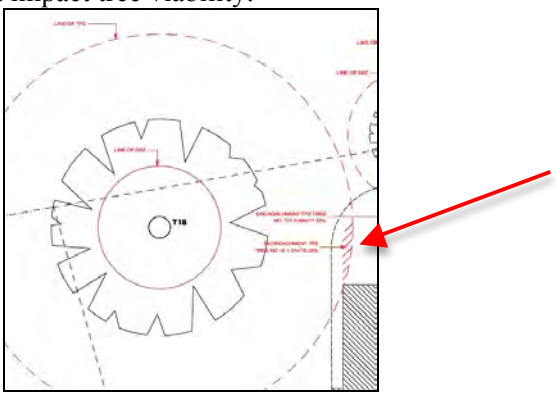


Figure 18: The proposed foot print has a 0.4% encroachment into the TPZ of Tree 18. (Source Tree Protection Plan by JR Residential Design, dated 11/12/2020)

9.3.3 Tree 17 *Morus ngra* (Mulberry) Neighbours tree

Tree 17 is a *Morus nigra* (Mulberry) located along the boundary on 6 Allan Ave. The tree is a fruit tree that often self sows. There is a large surface root growing onto 8 Allan Ave which must be protected to preserve the viability of Tree 17. Tree 17 has a 1.5% root zone encroachment.

This is considered a minor encroachment under Australian Standard 4970–2009: *Protection of trees on development sites*. The required excavation works ainthe TPZ are to be completed The large surface root must be protected with mulch through the life of the project.

Figure 19 (Left): The proximity of neighbours Tree 17 to the boundary can be observed (Source: Austin 16/072020)

Figure 20 (Right): The surface root can be observed. (Source: Austin 16/072020)

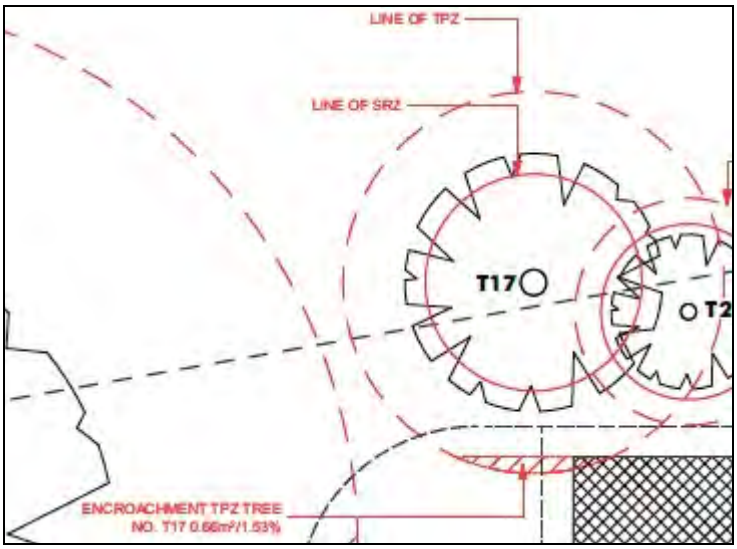


Figure 21: The proposed foot print has 1.5% minor encroachment into the TPZ of Tree 18. (Source Tree Protection Plan by JR Residential Design, dated 11/12/2020)

9.4 Major Root Zone Encroachments

9.4.1 Tree 8 *Glochidion ferdinandi* (Cheese tree

Tree 8 is a semi mature *Glochidion ferdinandi* (Cheese tree) with good opportunity to become a long term landscape component. A total of a 15% encroachment is considered to be necessary if the proposal is to proceed in its current form. . The existing ground levels are to stay the same. All required excavation works are to be completed by hand.. This is considered a major encroachment under Australian Standard 4970–2009: *Protection of trees on development sites*. The tree is semi mature and of good health., It is anticipated that if the adjacent lower quality trees are removed as planned and the proposed works within the TPZ are completed by hand , the tree will tolerate the major encroachment and will remain viable post construction.

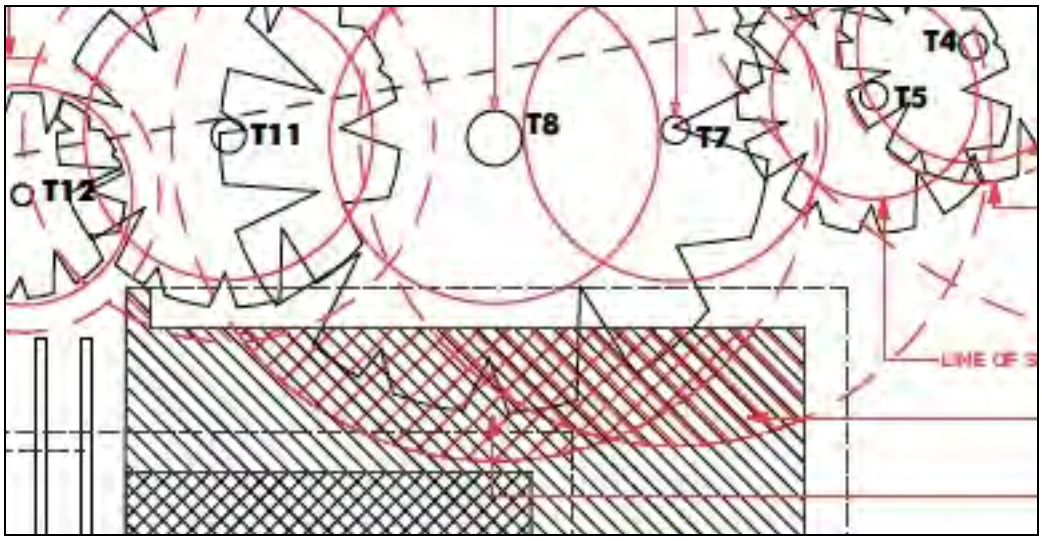


Figure 22: The proposed foot print has a 0.4% encroachment into the TPZ of Tree 18. (Source Tree Protection Plan by JR Residential Design, dated 11/12/2020)

Figure 23: The TPZ of Tree 8 is indicated by the measuring tape in the image (Source: Austin 16/072020)

10 Measures to minimise impacts to retained trees.

In order to minimise the impact of the proposal, the following measures must be incorporated into the works;

10.1 Project Arborist

An official "Project Arborist" should be commissioned to oversee the tree protection, any works within the TPZ's and complete certification.The Project Arborist should have minimum five (5) years industry experience in the field of arboriculture.

10.2 Tree Removals

The trees nominated for removal should be removed at the beginning of the project. The project. The trees nominated for retention must not be damaged during the tree removal works.

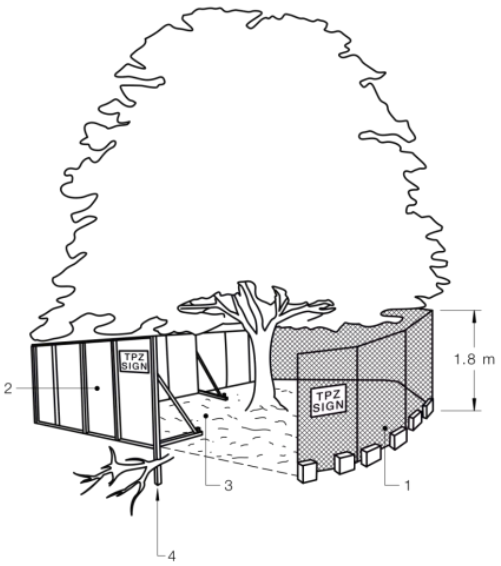
10.3 Tree protection fencing

Trees nominated for retention with works in the TPZ's must be fenced off and protected from construction activities as per the fencing method described below.

Protective fencing is to be installed as close as practicable from the trunk to the TPZ distances listed in the Tree Data table.

Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after the works are complete. The temporary dismantling of tree protection fencing must only be done with the authorisation of the project arborist and/or the responsible authority.

The project arborist is to determine the suitability and extent of the tree protection fencing to be used.



LEGEND:
1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

Figure 24: TPZ fencing specification. (Source: AS 4970:2007).

10.4 Ground Protection

Ground protection matts or rumble boards of suitable thickness to prevent ground compaction and root damage are to be installed in the access route through the TPZ of Tree 1.
If access is required through the TPZ of Tree 8 or Tree 17, then ground protection matts or rumble boards should be installed.

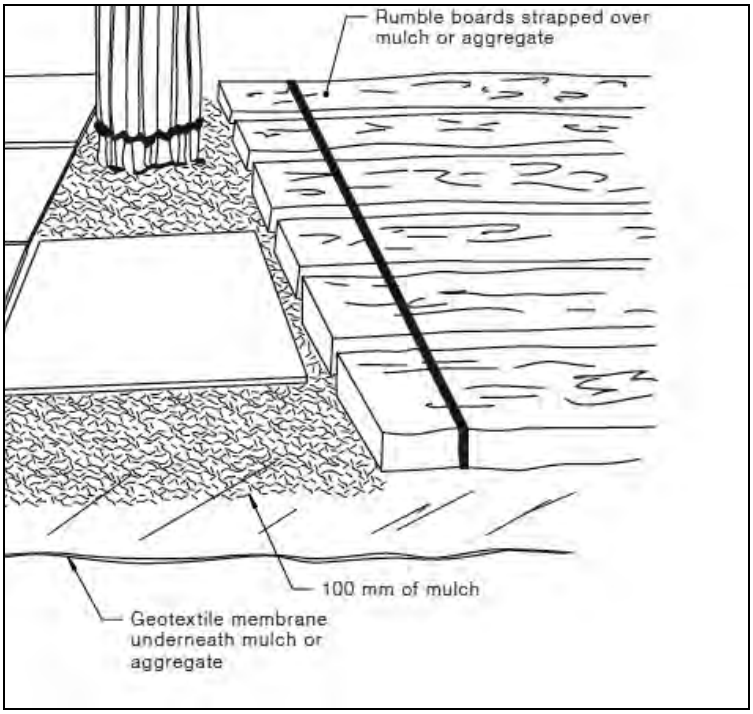


Figure 25: Ground protection details. (Source: AS 4970:2007)

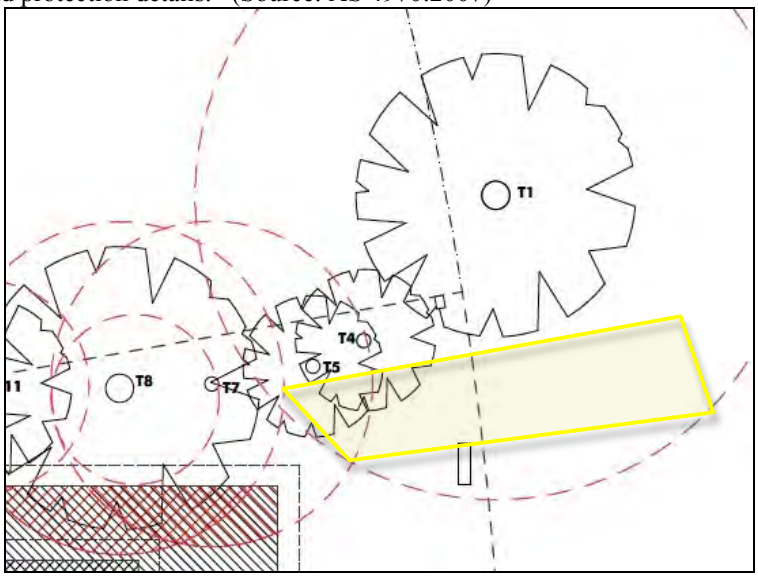


Figure 26: Install ground protection in the current site access is through the TPZ of Tree 1 indicated by the yellow polygon. (Source Tree Protection Plan by JR Residential Design, dated 11/12/2020)

Figure 27: Current site access is through the TPZ of Tree 1 indicated by the yellow polygon requires ground protection. (Source: Austin 16/072020)

10.5 Mulching.

The SRZ for each tree should to be retained be should be mulched where it is deemed practicable. The mulch must be maintained to a depth of 50–100 mm using material that complies with AS 4454.If the existing landscape within the TPZ is to remain unaltered (e.g. turf) mulch is not required, however, it will be beneficial for tree health.

10.6 Tree Protection Signage

The tree protection signage below should be installed at 10m intervals along the Tree Protection Fences.

Figure 28: TPZ signage specification. (Source: Austin 2020).

10.7 Works within TPZ's

All works within the TPZs must be completed by techniques that do not damage tree roots. Exaction and demolition works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

- Excavation/ demolition by hand
- Excavation/ demolition by machine with Arborist supervsion.
- Excavation using a high pressure water jet and vacuum truck.
- Excavation using an Air Spade with vacuum truck.

Machine excavation is prohibited within the remaining TPZ areas of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

10.8 Activities Restricted within the TPZ

- Machine excavation
- Excavation for silt fencing
- Storage
- Preparation of chemicals, including preparation of cement products
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Soil level changes
- Temporary or permanent installation of utilities and signs
- Physical damage to the tree
- Parking or driving of vehicles/machinery.

10.9 Compliance Inspections & Reports

Inspections should be conducted by the Project Arborist at key points during the construction in order to ensure that protection measures are being adhered to during construction stages and decline in tree health or additional remediation measures can be identified.

Tree inspections and compliance reporting by the project arborist is required:

1. Following the tree removal works, installation of the ground protection for Tree 1, and the installation of the tree protection fencing for Trees numbered 1, 4, 5, 8 11, 12, 17, 18 & 21.
2. During any works within TPZ's of trees to be retained unless specific methodologies are developed and approved by the project arborist.
3. Every 2 months during the works to ensure compliance.
4. At the practical completion of the project.

Following each inspection, the project arborist shall prepare a brief Compliance report detailing the condition of the trees. These reports should contain photographic evidence where required to demonstrate that the protection measures are in place as specified.

Any Non-Compliance Statements shall be submitted to the Project Manager (as well as the clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

11 Conclusion

This Arboricultural Impact Assessment has provided a detailed analysis of the trees that could be affected by development on the subject site.

The requirements for Tree Preservation Zones are in line with AS 4970:2009 *Protection of tree on development sites.*

If tree protection measures including, the engagement of a project arborist, ground protection matts, tree protection fencing, tree protection signage, mulching, a restriction of activities within Tree Protection Zones (TPZ's) and compliance reporting are incorporated into the project, then the 9 trees nominated for retention will remain viable during and post construction.

12 References

Australian Standard 4970: 2009 *Protection of trees on development sites.*

13 Industry Qualifications

- AQF Level 5 & 8 Consulting Arborist.
- ISA Certified Arborist # AU-0348A
- Tree Risk Assessment Qualification (TRAQ) (Exp Oct 2023)
- Advanced Quantified Tree Risk Assessment Registered User # 3692
- Masters of Environmental Law

14 Appendix

14.1 Tree Protection Plan

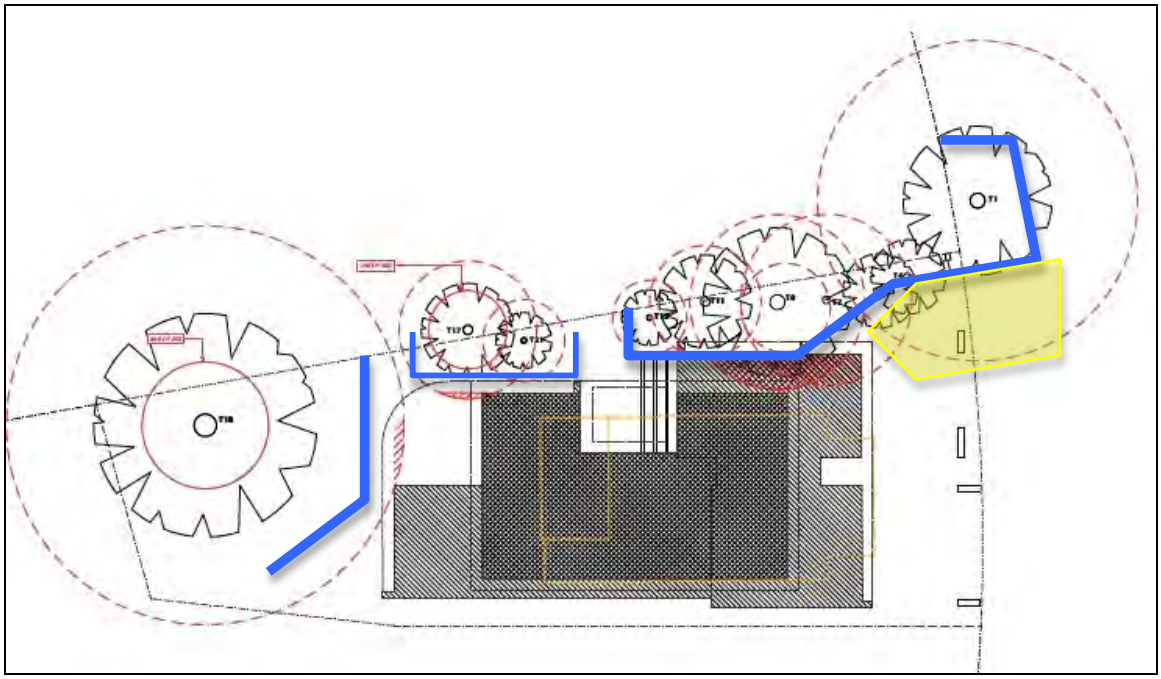


Figure 30: Install ground protection in the current site access which is through the TPZ of Tree 1 indicated by the yellow polygon. Install TPZ fencing at location of blue lines. (Source Tree Protection Plan by JR Residential Design, dated 11/12/2020)

Tree Protection Location Plan Key

Tree Protection Fence

Ground Protection

14.2 Tree Data

Tree no.	Common Name	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	TLE (Yrs.)	Defects	Landscape Significance	Retention Value	Action
1	*Lophostemon confertus* (Brushbox)	72	78	8.6	3.0	10-15	10-15	Good	Good	Mature	25-50	multi stem,	High	A	Retain
2	*Pittosporum undulatum* (Sweet pittosporum)	12	16	2.0	1.5	<5	<5	Good	Fair	Semi-mature	5-10	Suppressed	Low	C	Remove
3	*Cinnamomum camphora* (Camphorlaurel)	20	25	2.4	1.8	5-10	<5	Good	Fair	Semi-mature	15-25	Weed Species	Low	C	Remove
4	*Glochidion ferdinandi* (Cheese tree)	15	20	2.0	1.7	5-10	<5	Good	Fair	Semi-mature	15-25	Co dominant, suppressed.	Low	C	Retain
5	*Magnolia figo* (Port Wine Magnolia)	63	63	7.6	1.5	<5	<5	Good	Fair	Mature	10-15	Multi stem. 1.5m TPZ adequate.	Low	C	Retain
6	*Pittosporum undulatum* (Sweet pittosporum)	31	33	3.7	2.1	5-10	5-10	Fair	Fair	Mature	10-15	Previous branch failure, poor pruning	Low	C	Remove
7	*Gordonia axillaris* (Fried Egg Tree)	38	38	4.6	2.2	<5	<5	Good	Good	Semi-mature	15-25	Multi stem	Low	C	Remove
8	*Glochidion ferdinandi* (Cheese tree)	39	46	4.7	2.4	5-10	5-10	Good	Good	Semi-mature	50+	Co dominant	Medium	B	Retain
9	*Pittosporum undulatum* (Sweet pittosporum)	10	12	2.0	1.5	5-10	<5	Fair	Fair	Semi-mature	10-15	Surface roots on proposed building side.	Low	C	Remove
10	*Viburnum sp*	15	15	2.0	1.5	<5	<5	Good	Fair	Mature	10-15	Multi stem	Low	C	Remove
11	*Jacaranda mimosifolia* (Jacaranda)	25	32	3.0	2.1	5-10	5-10	Good	Good	Semi-mature	15-25	Growing on fence line	Low	C	Retain
12	*Syzygium luehmannii* (Liily Pilly)	15	18	2.0	1.6	5-10	5-10	Good	Good	Semi-mature	25-50		Low	C	Retain
13	*Olea europaea ssp. Cuspidata* (African olive)	20	30	2.4	2.0	<5	<5	Good	Fair	Mature	10-15	Multi stem	Low	C	Remove
14	*Lagerstroemia indica* (Crepe Myrtle)	30	40	3.6	2.3	5-10	5-10	Good	Fair	Semi-mature	25-50	Co dominant	Low	C	Remove

Tree no.	Common Name	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	TLE (Yrs.)	Defects	Landscape Significance	Retention Value	Action
15	*Ceratopetalum gummiferum* (NSW Xmas Bush)	10	12	**2.0**	**1.5**	<5	<5	Good	Poor	Mature	<5	wounds, abnormal lean, root plate failure	Low	C	Remove
16	*Cedrus atlantica* (Atlas cedar)	59	64	**7.1**	**2.7**	10-15	10-15	Good	Good	Mature	25-50	poor pruning wounds, minor deadwood	Medium	B	Remove
17	*Morus nigra* (Mulberry)	31	35	**3.7**	**2.1**	10-15	5-10	Fair	Fair	Mature	10-15	Neighbours tree on boundary with Surface root entering site. Dieback, epicormic growth	Low	C	Retain
18	*Eucalyptus saligna* (Sydney BlueGum)	89	107	**10.7**	**3.4**	20-30	15-20	Good	Good	Mature	25-50	Co dominant stems, <5% deadwood to 60mm diameter. Poor pruning wound.	High	A	Retain
19	*Eriobotrya japonica* (Loquat tree)	12	15	**2.0**		<5	<5	Good	Good	Semi-mature	15-25	Suppressed	Low	C	Remove
20	*Cinnamomum camphora* (Camphorlaurel)	32	36	**3.8**	**2.2**	5-10	5-10	Good	Good	Semi-mature	25-50	Weed species	Low	C	Remove
21	*Magnolia figo* (Port Wine Magnolia)	18	20	**2.2**	**1.7**	<5	<5	Good	Good	Mature	10-15	Multi stem	Low	C	Retain