

Arboricultural Impact Assessment Report

Prepared for
Tim Neal

Site
17 Falconer Street
West Ryde

Date
9 November 2022



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1 Introduction

- 1.1 The following Arboricultural Impact Assessment Report was commissioned by Tim Neal. The report is an assessment of seventeen trees within or adjoining 17 Falconer St, West Ryde.
- 1.2 The aim of the report is to determine the tree's landscape significance, condition and vigour, provide appropriate development setbacks and make recommendations for tree retention or removal considering Ryde City Development Control Plan and AS4970-2009.
- 1.3 It is proposed to demolish the existing dwelling and construct a new two storey residence. Two specimens identified as Trees 2 & 5 are exempt under Ryde City Council's DCP and may be removed. One tree less critical for retention will require removal to facilitate the design, while fourteen trees can be retained. The vehicular crossover shown within the documents has been approved for construction in a letter dated 20/10/22 reference No CRS2011/388696 by Ryde City Council. It is recommended a Project Arborist be engaged to supervise the vehicular crossover and driveway within a 5m radius of the two street trees. Trees 10 & 13 will require Selective Pruning as specified in Sections 4.4.9 & 4.4.12 of the report.

2 Methodology

- 2.1 The trees were visually inspected from ground level to determine the crown condition, class, structural defects, decay, signs of stress, epicormic growth and dieback (refer Appendix A & B)
- 2.2 Useful Life Expectancy (ULE) was determined. A ULE rating provides an estimate of a tree's expected remaining life span and considers the age, life span of the species and considers the current condition, vigour and major defects (refer Appendix B).
- 2.3 A Significance of a Tree Assessment Rating System (STARS) was determined. A STARS rating establishes the contribution a tree has to the overall landscape, amenity qualities or importance due to species, size, historical/cultural planting or significance to the site (refer Appendix C).
- 2.4 No root exploration, internal probing or aerial inspection was performed.
- 2.5 Tree height was measured with a Nikon Forestry Pro and rounded to the nearest metre. Canopy spread and age were estimated, while Diameter at Breast Height (DBH) and Diameter Above Root Buttress (DRB) were measured. The lowest branches of the park trees overhanging into the property were measured with an external laser measure.
- 2.6 The comments and recommendations in this report are based on findings from a site inspection on 9 March 2022.
- 2.7 A list of literature used in the preparation of this report is provided in the bibliography section.

2.8 Plans and documents provided in preparing this report include:

- Detail and Contour Plan Sheet 1 Issue A dated 27/5/22 by New Way Surveying
- Landscape Plans Drawing Nos DA-01 – 04 Revision B dated 7/11/22 by Grindstone Landscapes
- Stormwater Management Layout Drawing Nos S1 & S1 Issue C dated 9/11/22 by ALW Civil Engineers
- Sheet Nos 1 – 21 Revision C dated 6/9/22 by ANSA Homes

3 Observations

3.1 The Site

3.1.1 The subject site is a residential property identified as Lot 6, DP13078, 17 Falconer St, West Ryde. The property is a relatively flat parcel of land located on the western side of Falconer St. The site is bounded by residential properties to the north and Carara Reserve to the south and west (refer Figure 1)

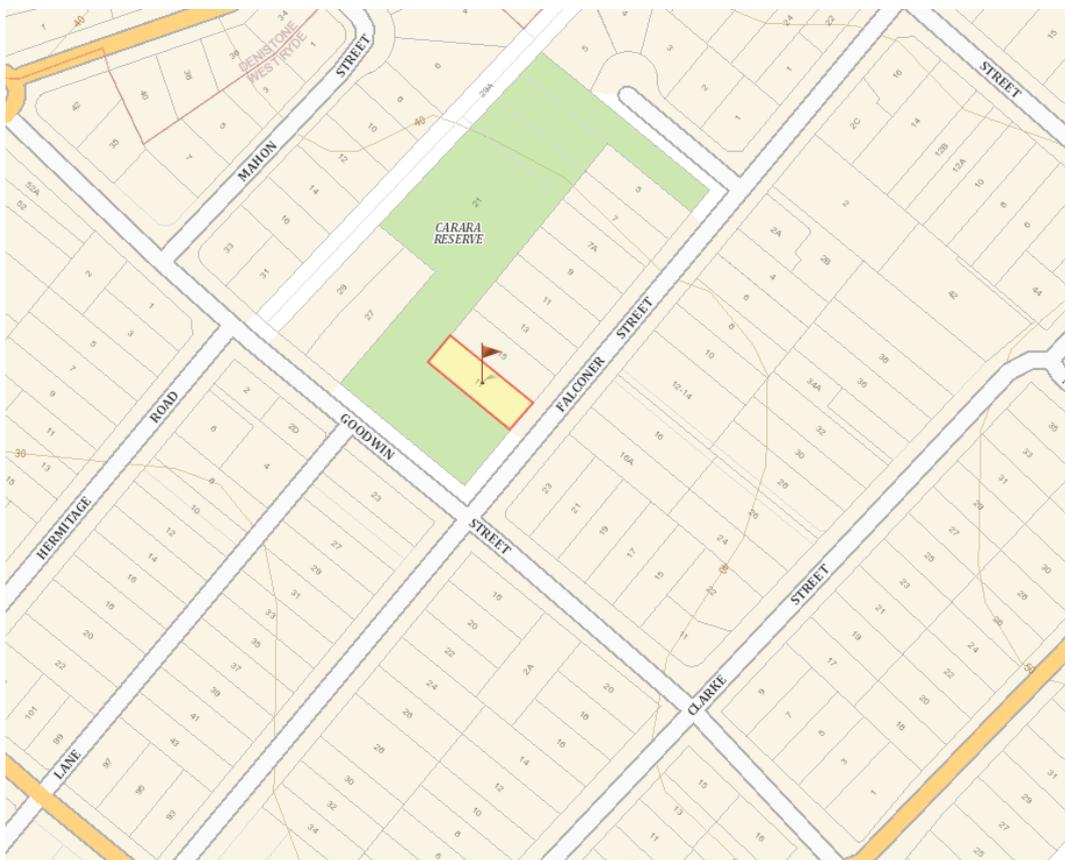


Figure 1. Location 17 Falconer St, West Ryde (NSW Six Maps <https://maps.six.nsw.gov.au/>)

3.2 The Trees

3.2.1 Seventeen trees were assessed, details of the trees, their dimensions, condition, Useful Life Expectancy (ULE) and landscape significance (STARS) are attached in Appendix A.

3.2.2 A desktop search of NSW Six Maps 1943 aerial images shows 17 Falconer St and the southern section of Carara Reserve was a vacant parcel of land, devoid of trees. Subsequently all trees within Carara Reserve fronting Goodwin St and Falconer St were planted (<https://maps.six.nsw.gov.au/>)



Figure 2. 1943 aerial images of the property (<https://maps.six.nsw.gov.au/>)

4 Discussion

4.1 Tree Protection, Ecological and Heritage Significance

- 4.1.1 Tree Management Controls for Ryde City Council apply under part 9.5 of DCP 2014, and The Biodiversity and Conservation SEPP 2021. Council's Tree Management Controls generally protect any tree with a height greater than 5m or with a stem circumference of 450mm at breast height, some exemptions apply.
- 4.1.2 However exemptions do not apply if the tree is listed on the City of Ryde's Significant Tree Register; or is located on a site classified as being part of a vulnerable, threatened or endangered ecological community, or provides or has the potential to provide habitat for native fauna or fauna classified as vulnerable or threatened under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999; is or forms part of a heritage item; or is within one of the five heritage conservation areas,
- 4.1.3 The trees are a mix of planted exotic and planted local species. No trees assessed are listed as endangered under the NSW Threatened Species Conservation Act.
- 4.1.4 The property is not listed as an item of heritage, nor does the property fall within a conservation area under Ryde City Council's LEP 2014.
- 4.1.5 Applying the above the Trees 2 & 5 are exempt under the terms of Ryde City Council's Tree Management Controls.

4.2 Tree Retention Value and Landscape Significance

4.2.1 It is possible to determine a tree's significance and retention value based upon several factors including size, condition and maturity coupled with the methodologies STARS and ULE.

4.2.2 Generally trees identified as having a medium to long ULE and of high landscape value in addition to trees exhibiting good vigour on neighbouring properties are given a high priority for retention in the design process.

Trees 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 17 meet this criteria

4.2.3 Trees identified with a medium landscape value together with a medium ULE and are less critical and may be marked for removal when design options to retain the tree have been exhausted.

Tree 1 meets this criteria

4.2.4 While trees assessed with a short ULE and a medium to low STARS value are unsuitable for retention and should be removed. Council or the tree owner's approval must be sought prior to tree removal.

Trees 2, 5, 15 & 16 meet this criteria

4.3 Appropriate Development Setbacks

4.3.1 Australian Standard 4970-2009, Protection of trees on development sites provides appropriate guidelines to ensure the long-term viability and stability of trees to be retained on development sites.

4.3.2 Tree Protection Zones (TPZ) are based on the diameter of the tree measured at 1.4m above ground level x 12 (refer Table 1 for calculated TPZ's). The TPZ is measured from the centre of the tree's trunk to the proposed edge of excavation/development works. The TPZ is where construction, trenching, soil level changes and use of machinery should be excluded.

4.3.3 The Structural Root Zone (SRZ) is the area required for stability, a far larger area is necessary to maintain a viable tree. Therefore, **no** excavation or construction shall encroach within the SRZ (refer Table 1 for calculated SRZ's). The SRZ is determined adopting the formula from AS4970 where the SRZ radius = $(D \times 50)^{0.42} \times 0.64$. Where D = trunk diameter, in m, measured above the root buttress.

4.3.4 Under AS4970 a minor encroachment of 10% of the area is allowable, provided this is compensated for elsewhere and contiguous to the TPZ. Should more than a 10% encroachment occur then the Project Arborist must demonstrate the tree/palm can be protected and remain in a viable state.

4.3.5 When determining the impacts of an encroachment into the TPZ, some consideration may be given to the following;

- The potential loss of root mass resulting from the encroachment determined by root mapping (number, size and percentage)
- Species tolerance to root disturbance
- Age and vigour of the trees
- The presence of existing or past structures (with solid footings) or obstacles which may affect root growth.

Tree No	Total DBH (cm)	DRB (cm)	TPZ radius (m)	TPZ Area (m ²)	SRZ radius (m)
1	40	33	4.8	72	2.1
3	42	53	5.0	80	2.6
4	41	44	4.9	76	2.4
6	52	51	6.2	122	2.5
7	54	86	6.5	132	3.2
8	38	44	4.6	65	2.4
9	27	30	3.2	33	2.0
10	51	54	6.1	118	2.6
11	22	31	2.6	22	2.1
12	68	81	8.2	209	3.1
13	47	59	5.6	100	2.7
14	33	36	4.0	49	2.2
16	14	17	1.7	9	1.6
17	40	42	4.8	72	2.3

Table 1. Tree Protection & Structural Root Zones

4.3.6 Tree sensitive construction techniques such as pier and beam, suspended slab systems or discontinuous footings can minimise the impact upon a tree’s root system and must be adopted should a major encroachment into the TPZ be contemplated.

4.4 Development Impact Assessment

4.4.1 **Tree 1**, works within the 4.8m TPZ include:

- New dwelling offset ~ 0.8m
- Proposed alfresco area within the tree’s footprint.

The proposal is a major TPZ/SRZ encroachment. The tree is proposed to be removed.

4.4.2 **Trees 2 & 5** do not meet the requirements of a prescribed tree and may be removed.

4.4.3 **Tree 3** is a street tree under the care and control of Ryde City Council. Works within the 5.0m TPZ include:

- Proposed new driveway and vehicular crossover offset ~ 2.6m
- Proposed stormwater drainage lines offset at ~4.9m

The proposal is a major TPZ encroachment accounting for ~ 15m² or 18.7% of the TPZ. It is understood the driveway design has been approved for construction in a letter dated 20/10/22 reference No CRS2011/388696 by Ryde City Council. It should be noted the Tree Protection Zones shown in the stamped and approved Vehicular Crossover Plan dated 20/10/22 are indicative and do not show the true TPZ of Tree 3.

4.4.4 **Tree 4** is a street tree under the care and control of Ryde City Council. Works within the 4.9m TPZ include:

- New driveway and vehicular crossover offset ~ 2.7m
- Stormwater drainage line offset and pit ~ 4.6m to the west

The proposed driveway and vehicular crossover account for ~12.7m² or 16.7% of the TPZ, while the stormwater drainage line accounts for <0.5m² or 0.5% of the TPZ. The proposal is a major TPZ encroachment of ~13.2m² or 17.2%. It is understood the driveway has been approved for construction in a letter dated 20/10/22 reference No CRS2011/388696 by Ryde City Council. It is also noted the Tree Protection Zones in the stamped and approved Vehicular Crossover Plan dated 20/10/22 do not show the true TPZ of Tree 4.

4.4.5 **Tree 6** works within the 6.2m TPZ include:

- Stormwater drainage line offset ~ 3.8m to the north east
- Stormwater drainage line and pit offset ~ 5.5m to the north

The encroachment covers an area of ~ 16.5m² or 13.5% of the TPZ. The proposal is a marginal encroachment and within an acceptable level of tolerance for the species.

4.4.6 **Tree 7** works within the 6.5m TPZ include:

- Stormwater drainage line offset ~3.4m
- New dwelling offset ~ 4m
- Demolition of the existing dwelling offset ~5m accounting for 8.5m² or 6.4% of the TPZ.

The proposal covers an area of ~ 20m² or 15.1% of the TPZ. There is an existing dwelling offset ~5m and the presence of this structure is an impediment to root development. Clause 3.3.4 (g) of AS4970 allows consideration to be given to existing structures which impact root growth. When consideration is given to the existing dwelling the proposal accounts for ~11.5m² or 8.7% of the TPZ and is in accordance with a minor and acceptable encroachment.

4.4.7 **Tree 8**, works within the 4.6m TPZ include:

- Stormwater drainage line offset ~ 2.6m
- Demolition of the existing dwelling offset ~ 4m
- New dwelling offset ~ 2.8m

The encroachment covers an area of ~ 8m² or 12.3% of the TPZ. The existing dwelling is an impediment to root development and accounts for ~ 1.8m² or 2.8% of the TPZ. When consideration is given to the existing dwelling the proposal accounts for 16.2m² or 9.5% of the TPZ and is in accordance with a minor and acceptable encroachment. This is also within an acceptable level of tolerance considering the species *Melaleuca quinquenervia* have a very good tolerance to root disturbance.

4.4.8 **Tree 9** was not plotted on the most recent survey plan, works within the 3.2m TPZ include:

- Demolition of the existing driveway
- Area of soft landscaping.

It is considered the removal of the hard surfaces and an increase in area of soft landscaping will be beneficial to the tree's growing environment. The proposed demolition and landscaping can be managed under the supervision of a Project Arborist.

4.4.9 **Tree 10** works within the 6.1m TPZ include:

- Stormwater drainage line offset ~ 4.6m
- Demolition of the existing dwelling offset ~ 4.1m
- New dwelling offset ~ 5.1m

The proposal covers an area of ~ 14.6m² or 12.4% of the TPZ. The existing dwelling which is an impediment to root development accounts for ~ 12.5m² or 10.6% of the TPZ. When consideration is given to the existing dwelling, the proposal is a minor and acceptable encroachment of ~2.1m² or 1.8% of the TPZ.

It is likely the lowest 3 x inferior 1st order branches < 50mm in diameter hanging into the property will require selective pruning to collar to achieve new roofline clearances.

4.4.10 **Tree 11** works within the 2.6m TPZ include:

- Demolition of the existing driveway
- Area of new soft landscaping.

The removal of the concrete driveway and increase in area of soft landscaping will be beneficial to the tree's growing conditions. The proposed demolition and landscaping can be managed under the supervision of a Project Arborist.

4.4.11 **Tree 12**, works within the 8.2m TPZ include:

- Stormwater drainage line offset ~ 4.5m
- Demolition of the existing dwelling and rear verandah offset ~ 4.4m limited to one quadrant of the TPZ accounting for ~13% or 6.2% of the TPZ
- New dwelling offset ~ 5.9m

The encroachment covers an area of ~ 33.5m² or 16% of the TPZ. The existing dwelling and rear verandah are impediments to root development and account for ~13m² or 6.2% of the TPZ. When consideration is given to the existing structures the design is a minor and acceptable encroachment of ~20.5m² or 9.8%. This is also within an acceptable level of tolerance considering the species *Melaleuca quinquenervia* have a very good tolerance to root disturbance.

4.4.12 **Tree 13**, works within the 5.6m TPZ include:

- Demolition of the existing driveway
- Stormwater drainage line offset ~5.5m
- Demolition of the existing garage

The proposal accounts for < 0.5m² or < 1% of the TPZ. The proposed increase in area of soft landscaping will be an improvement the tree's growing conditions. The proposed demolition and landscaping can be managed under the supervision of a Project Arborist.

The lowest 2nd order 120mm diameter branch overhanging into the property will require selective pruning to collar to achieve new roof/building line clearances.

4.4.13 **Trees 14, 15, 16 & 17** other than soft landscaping no works are proposed within the Tree Protection Zones.

5 Conclusions/Recommendations

5.1 Seventeen (17) trees were assessed, the proposal seeks to demolish the existing dwelling and construct a new residence adopting a larger footprint to the existing dwelling.

5.2 Two (2) specimens identified as Trees 2 & 5 are exempt under the terms of Ryde City Council's DCP and may be removed.

5.3 The plans indicate one (1) tree less critical for retention will require removal.

High Retention	Less Critical for Retention	Low Retention
-	1	-

Table 2. Trees proposed for removal

5.4 The vehicular crossover approved for Construction under Ryde City Council's letter dated 20/10/22 reference No CRS2011/388696 is a major TPZ encroachment to Trees 3 & 4. It is strongly advised a Project Arborist be engaged and be in attendance to supervise all works within a 5m radius of Trees 3 & 4.

5.5 The plans show that fourteen (14) trees including twelve (12) high retention value and two (2) low retention value trees can be retained.

High Retention	Less Critical for Retention	Low Retention
3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 17	-	15 & 16

Table 3. Trees to be retained and protected

5.6 Trees 10 & 13 require Selective Pruning in accordance with (Code S, Clause 7.2.4 under AS4373-2007) as specified Sections 4.4.9 & 4.4.12 of the report.

5.7 All **approved** pruning work be undertaken in accordance with Safe Work Australia's – Guide to Managing Risks of tree Trimming and Removal Work

5.8 It is also recommended that a fully qualified and insured AQF Level 3 Arborist carry out the work in accordance with Australian Standard 4373 – 2007 Pruning of Amenity Trees.

5.9 The retained trees shall be protected in accordance with the following Tree Management Specification.

6 Tree Management Specification

6.1 Pre-commencement and Arboricultural Hold Points

6.1.1 Prior to demolition and construction works, a Project Arborist shall be appointed to supervise all tree protection procedures detailed in this statement. The Project Arborist shall have a minimum level 5 AQF qualification in Arboriculture.

6.1.2 The demolition and construction works are subject to site monitoring by the Project Arborist. These visits are to ensure the protection measures are maintained in good order and works within the Tree Protection Zone (TPZ) meet with this Arboricultural Method Statement and AS4970.

6.1.3 It is the responsibility of the Project Manager to provide a minimum 3 days' notice to the Project Arborist for the pre-determined witness points.

6.1.4 Any breaches to this Specification shall be reported immediately.

6.1.5 The following pre-determined stages are Project Arborist hold points to document the works and demonstrate an inspection has taken place.

Hold Point	Action	Project Arborist Supervision
Tree Protection	The Project Arborist shall inspect the Tree Protection Fencing and any necessary Ground Protection complies with Appendix E & F and section 6.2.	Inspected, documented & certified by Project Arborist
Machinery Access	An access route for machinery shall be determined prior to construction works. Any temporary ground protection within the Tree Protection Zones shall be undertaken as per Appendix E & F and section 6.2	Inspected, documented & certified by Project Arborist
Demolition Works including demolition of the driveway	The Project Arborist shall be in attendance during the removal of any existing structures within the TPZ of retained trees.	Inspected, documented & certified by Project Arborist
Earth Works	The Project Arborist to monitor any earthworks within the TPZ's. Note these works must be undertaken by hand or with an air knife.	Inspected, documented & certified by Project Arborist
Practical Completion	The Project Arborist to inspect and assess the trees condition and provide certification of tree protection at all the above-mentioned Hold Points.	Inspected, documented & certified by Project Arborist

Table 4. Hold Points for Project Arborist Inspections

6.2 Tree Protection – to be installed prior to commencement of works

6.2.1 Trunk Protection and Tree Protection Fencing shall be installed prior to commencement of works and be maintained in a good condition during the construction processes.

- 6.2.2 Trunk Protection shall be achieved by strapping hessian or carpet underlay around the trunk followed by placing two metre lengths of timbers (100 x 50mm) spaced at 100mm intervals and secured together with galvanised wire. The timber slats shall be strapped around the trunk to avoid mechanical injury or damage. No wire/nails or securing devices shall damage or contact the trunk.
- 6.2.3 Tree Protection shall consist of a 1.8m high chain link temporary fencing erected at the distances nominated in Appendix F - Tree Protection Plan.
- 6.2.4 Weatherproof signage indicating the area is a Tree Protection Zone (TPZ) shall be displayed on the fence line at 10m intervals. Signage shall be a minimum A4 and state No Access – Tree Protection Zone and include the contact details of the Project Manager and Project Arborist.
- 6.2.5 Once erected, the TPF shall be regarded as sacrosanct and shall not be removed or altered without prior agreement of the project arborist.
- 6.2.6 Attention shall be given to ensuring the TPZ remains rigid and complete and excludes all construction activity and storage of materials.
- 6.2.7 Ground protection shall consist of a layer of geotextile fabric spread with a 100mm layer of fine woodchip mulch and overlaid with thick recycled railway sleepers, timber planks or steel plates in accordance Appendix E.
- 6.2.8 Mulch shall be spread within the TPZ's of the retained trees or as instructed by the Project Arborist. The mulch shall consist of mixed leaf and fine woodchip mulch as certified to AS4454:2012 Composts, Soil Conditioners and Mulches. Mulch shall be spread to a depth of 75mm and maintained at this depth for the duration of works.

6.3 Restricted Activities

- 6.3.1 The following activities are restricted within the Tree Protection Zone;
- Parking of vehicles or plant
 - Installation of temporary site offices or amenities.
 - Wash down areas
 - No mechanical excavation
 - Preparation of chemicals including paint, cement or mortar.
 - Vehicular movement
 - Pedestrian access
 - Excavation, trenching or tunnelling unless under the supervision of the Project Arborist
 - No ground level changes are permitted

6.4 Installation of Services

- 6.4.1 Where feasible, all underground services will be routed & installed beyond the identified TPZ's. Where it is impossible to divert services beyond the TPZ's, detailed plans showing the proposed routing will be drawn in conjunction with advice from an AQF Level 5 Arborist.
- 6.4.2 The method for trenching within a TPZ shall either be by hand methods e.g. hand digging with a spade or trowel or an air spade. Trenchless technology such as directional underground boring shall be considered in the first instance.

- 6.4.3 Topsoil and subsoil excavated from the trench shall be deposited into separate piles and kept apart and covered until required for backfilling.
- 6.4.4 No roots > 30mm in diameter are to be severed without prior agreement with the Project Arborist.
- 6.4.5 In cases of extreme heat or unless the trench is to be backfilled within the same day, all exposed roots > 30mm in diameter shall be wrapped with damp hessian to prevent drying out.
- 6.4.6 Where is it necessary to sever any woody roots, they shall be clean cut with secateurs or a pruning saw.
- 6.4.7 The underground services shall be positioned below the network of protected roots without causing damage to roots > 30mm in diameter. The hessian shall be removed prior to backfilling.

6.5 Back filling

- 6.5.1 Once works have been completed, backfilling shall be undertaken by hand using the subsoil first. The subsoil shall be filled into the trench in layers of no > 20cm and each layer shall be gently consolidated. Once the subsoil has reached the level of the existing subsoil, the topsoil shall be placed on top until the original levels are reached.

6.6 Construction of masonry fencing and retaining walls

- 6.6.1 Where retaining walls or masonry fences are proposed, exploratory hand excavation to a depth of 600mm will determine the presence of any woody roots > 30mm in diameter. Exploratory trenching shall be under the supervision of and documented by the Project Arborist.
- 6.6.2 In cases of extreme heat or unless the footings are to be backfilled within the same day, then the exposed roots shall be covered in damp hessian until back filling takes place.
- 6.6.3 Backfill shall be undertaken in accordance with section 6.5 of the method statement.

6.7 Installation of Driveway

- 6.7.1 All driveway construction works shall be undertaken under the direction of the project arborist.
- 6.7.2 Spread a 75mm layer of fine woodchip mulch to soft landscape areas of the TPZ outside the footprint of the driveway alignment.
- 6.7.3 Ground protection shall be installed within a 2-metre radius of the driveway alignment in addition to the tree protection fencing.
- 6.7.4 Removal of organic material (grasses, mulched areas, twigs, fallen leaves, etc.) is to be undertaken using a rake. Existing weeds shall be removed by hand or by non-chemical means (e.g. steam). No glyphosate chemicals (weed killer) shall be sprayed within the TPZ to remove existing weeds.
- 6.7.5 No compaction of driveway footprint is recommended.

.17 Falconer St, West Ryde

6.7.6 Spread a shallow bed of sand in the driveway footprint area using the previous driveway surface for access where possible – sand shall be installed using wheelbarrows or similar, no machinery is permitted, and the sand shall be levelled using hand tools.

6.7.7 Formwork shall be removed following concrete cure;

6.7.8 Remove ground protection and add 50mm depth of compost mixed with biochar to areas of ground protection mulch.

6.8 Soft and Hard Landscaping

6.8.1 Installation of soft or hard landscaping including paving, turf or plant material within the TPZ shall be undertaken by hand.

6.8.2 Planting holes are to be hand dug with a shovel or garden trowel.

6.9 Breach of tree protection

6.9.1 Any above or below ground damage (including soil compaction) to a protected tree shall be reported to the Project Arborist immediately.

6.9.2 Where activities occur which breach the tree protection measures, the Project Arborist shall be advised immediately and work within the TPZ be halted until an assessment has been made and any mitigation measures deemed necessary have been undertaken.

Any questions relating to this preliminary arboricultural assessment report should be directed to the undersigned.



Glenyss Laws

Graduate Certificate in Arboriculture, The University of Melbourne (AQF Level 8)

Diploma of Horticulture (Arboriculture) TAFE NSW (AQF Level 5)

Assoc Diploma Applied Science (Landscape) TAFE NSW

ISA Tree Risk Assessment Qualified Assessor (2014)

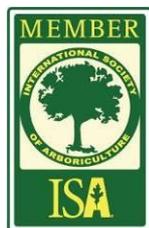
Member I.A.C.A & I.S.A

Qualified and Practicing Arborist/Horticulturist.

Since 1997

Assumptions/Disclaimer

- Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of inspection: and
- The inspection was limited to visual examination of the subject trees without dissection, probing or coring.
- No risk assessment was commissioned or carried out as part of the investigation.
- Trees are living organisms whose health and condition can change rapidly. Any changes to the soil surrounds e.g. excavation or construction works or extreme weather events will invalidate this report.
- There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.



Prepared by Glenyss Laws
Consulting Arborist
Revision A

BIBLIOGRAPHY/REFERENCES

Barrell J (1995). 'Pre-development Tree Assessments', in Trees and Building Sites, Proceedings of an International Conference held in the Interest of Development a Scientific Basis for Managing Trees in Proximity to Buildings. International Society of Arboriculture, Illinois, USA pp132-142.

IACA (2010) IACA Significance of a Tree, Assessment Rating System (STARS). Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

Stamped and approved Vehicular Crossover Plan and Letter dated 20/10/22 Reference No CRS2011/388696 by Ryde City Council.

Standards Australia (2009), AS4970-2009 Protection of trees on development sites.

Standards Australia (2007), AS4373-2007 Pruning of amenity trees.

APPENDIX A Tree Survey Notes

Tree No	Tree Species	Age Class	DBH (mm)	DRB (mm)	Tree height (m)	Crown diameter (m)	Crown condition	Crown class	ULE	STARS	Root Zone/ Defects/ Services	Comments
1	<i>Camellia sasanqua</i> (Camellia)	M	220, 190, 160 & 140 x 2	330	8	7	4	D	2	2	Gr,Rt/-/-	
2	<i>Lagerstroemia indica</i> (Crepe Myrtle)	S	Multi	-	5	4	4	D	5	2	Gr/-/-	Forms numerous multiple leaders
3	<i>Sapium sebiferum</i> (Chinese Tallow)	M	420	530	12	7	4	D	2	2	Gr,Pa,K/-/-	Street tree under the care and control of Ryde City Council.
4	<i>Sapium sebiferum</i> (Chinese Tallow)	M	410	440	9	3	3	Partial S	2	2	Gr,Pa,K/-/-	Street tree under the care and control of Ryde City Council.
5	<i>Acer palmatum</i> (Japanese Maple)	Dead	-	-	4	6	0	C	4	3	Gr/D/-	
6	<i>Eucalyptus sp.</i>	M	410	510	16	15	3	C	2	1	Gr,Pa/-/-	Park tree under the care and control of Ryde City Council. The lowest 3 rd order north western branch approx. 120m in diameter overhangs 1.2m into the property and achieves a 5.4m ground clearance
7	<i>Eucalyptus pilularis</i> (Blackbutt)	M	540	860	24	16	3	C	2	1	Ga/-/-	Park tree under the care and control of Ryde City Council.
8	<i>Melaleuca quinquenervia</i> (Paperbark)	M	380	440	10	4	3	C	1	1	Ga/-/-	Park tree under the care and control of Ryde City Council.

Tree No	Tree Species	Age Class	DBH (mm)	DRB (mm)	Tree height (m)	Crown width (m)	Crown condition	Crown class	ULE	STARS	Root Zone/ Defects/ Services	Comments
9	<i>Melaleuca Styphelioides</i> (Prickly Paperbark)	M	270	300	8	2 n/s 4 e/w	3	S	2	1	Ga/-/-	Park tree under the care and control of Ryde City Council. The lowest north western inferior 1st order branch approx. 60mm in diameter achieves an approx. 5.8m ground clearance.
10	<i>Melaleuca quinquenervia</i> (Paperbark)	M	450 & 220	540	15	6	4	C	1	1	Ga/-/-	Park tree under the care and control of Ryde City Council. The lowest 3 x inferior 1 st order branches < 50mm in diameter overhanging into the property achieve an approx. 6.1m ground clearance.
11	<i>Melaleuca Styphelioides</i> (Prickly Paperbark)	M	220	310	7	5	3	C	2	1	Ga/-/-	Park tree under the care and control of Ryde City Council.
12	<i>Melaleuca quinquenervia</i> (Paperbark)	M	680	810	16	9	3	C	1	1	Ga/-/-	Park tree under the care and control of Ryde City Council.
13	<i>Eucalyptus robusta</i> (Swamp Mahogany)	M	470	590	16	10	3	C	2	1	Ga/-/-	Park tree under the care and control of Ryde City Council. 1 x 2 nd order 120mm diameter branch overhanging into the property achieves a 5.1m ground clearance.
14	<i>Melaleuca bracteata</i> (Black Tea Tree)	M	330	360	8	5	3	C	2	1	Ga/-/-	Park tree under the care and control of Ryde City Council. 1 x 1 st order branch approx. 150mm in diameter an accounting for approx. 60% of the canopy achieves an approx. 6.1m ground clearance.
15	<i>Melaleuca bracteata</i> (Black Tea Tree)	dead	-	-	4	0	0	-	4	3	Ga/-/-	Park tree under the care and control of Ryde City Council.

Tree No	Tree Species	Age Class	DBH (mm)	DRB (mm)	Tree height (m)	Crown width (m)	Crown condition	Crown class	ULE	STARS	Root Zone/ Defects/ Services	Comments
16	<i>Melaleuca bracteata</i> (Black Tea Tree)	S	140	170	5	1 n/s 3 e/w	3	S	3	2	Ga/-/-	Park tree under the care and control of Ryde City Council.
17	<i>Melaleuca quinquenervia</i> (Paperbark)	M	350 & 180	420	9	10	3	D	1	1	Ga/-/-	Park tree under the care and control of Ryde City Council.

Trees in **Green** assessed with a high landscape value coupled with a medium to long ULE are allocated a high priority for retention.

Trees in **Blue** are assessed as less critical for retention, their retention should be a priority with removal considered when design options have been exhausted or adversely affecting the proposal.

Trees in **Pink** are of low retention value, nor require special works or design modifications to be implemented.

Tree in **Orange** are considered hazardous, in irreversible decline or environmental weed species and recommended for removal irrespective of development.

APPENDIX B

Notes on tree inventory schedule.

Tree No:	Relates to number on site diagram.
Species:	Botanical and Common Name
Age Class:	Y Young- recently planted S Semi mature- <20% of life expectancy M Mature- 20-80% of life expectancy O Over mature- >80% of life expectancy
Height:	In metres
Crown Diameter:	In metres
Crown Class:	D Dominant Crown extends above general canopy; not restricted by other trees. C Co-dominant Crown forms the bulk of the general Canopy but crowded by other trees. I Intermediate Crown extends into dominant/ codominant canopy but quite crowded on all sides. S Suppressed Crown development restricted from Overgrowing trees.
Crown Condition:	Overall vigour and vitality 0 Dead 1 Severe decline (<20% canopy density; major dead wood) 2 Declining (20-60% canopy density; twig and branch dieback) 3 Average/ low vigour (60-90% canopy density; twig dieback) 4 Good (90-100% canopy density; little or no dieback or other problems) 5 Excellent (100% canopy density; no deadwood or other problems)
Root Zone:	C Compaction D Damaged/wounded roots E Exposed roots Ga Tree in garden bed Gi Girdled roots Gr Grass K Kerb close to tree L+ Raised soil level L- Lowered soil level M Mulched Pa Paving/concrete/bitumen Pr Roots pruned O Other
Defects:	B Borers C Cavity D Decay F Previous failures I Inclusions L Lopped M Mistletoe/parasites S Splits/Cracks T Termites O Other

Services adjacent structures:

Bs	Bus stop
Bu	Building within 3 metres
Hvo	High voltage open wire construction
Hvb	High voltage bundled (ABC)
Lvo	Low voltage open wire construction
Lvb	Low voltage bundled (ABC)
Na	No services above
Nb	No services below
Si	Signage
Sl	Street light
T	Transmission lines
U	Underground services
O	Other

STARS: Significance of a Tree Assessment Rating System (copyright Institute of Australian Consulting Arborists 2010)

ULE: Useful Life Expectancy adapted from Barrell J (2001)

1	Long ULE	Trees that appear to be retainable at the time of assessment for more than 40 years
2	Medium ULE	Trees that appear to be retainable at the time of assessment for more than 15-40 years
3	Short ULE	Trees that appear to be retainable at the time of assessment for more than 5-15 years
4	Remove	Trees that should be removed within the next 5 years
5	Small, young or regularly pruned	Small trees less than 5 Metres in height or young trees less than 15 years old but over 5 metres in height.

APPENDIX C

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

Table 1.0 Tree Retention Value - Priority Matrix.

		Significance				
		1. High		2. Medium	3. Low	
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years	Green		Blue	Pink	Orange
	2. Medium 15-40 Years					
	3. Short <1-15 Years	Pink		Pink		
	Dead	Orange		Orange		
Legend for landscape matrix						
Green		Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.				
Blue		Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.				
Pink		Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.				
Orange		Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.				

USE OF THIS DOCUMENT AND REFERENCING

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

APPENDIX D
Site Photographs

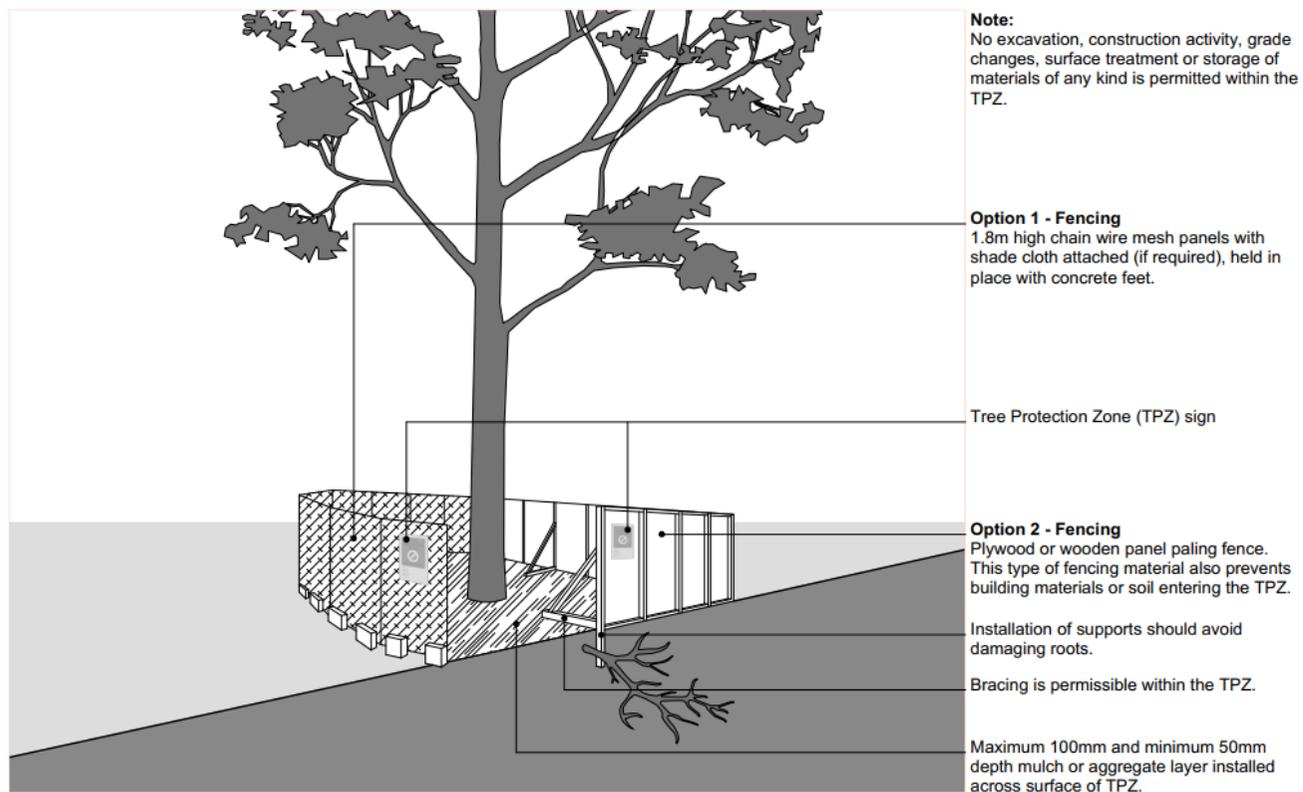


Figure 3. Tree 1 proposed to be removed

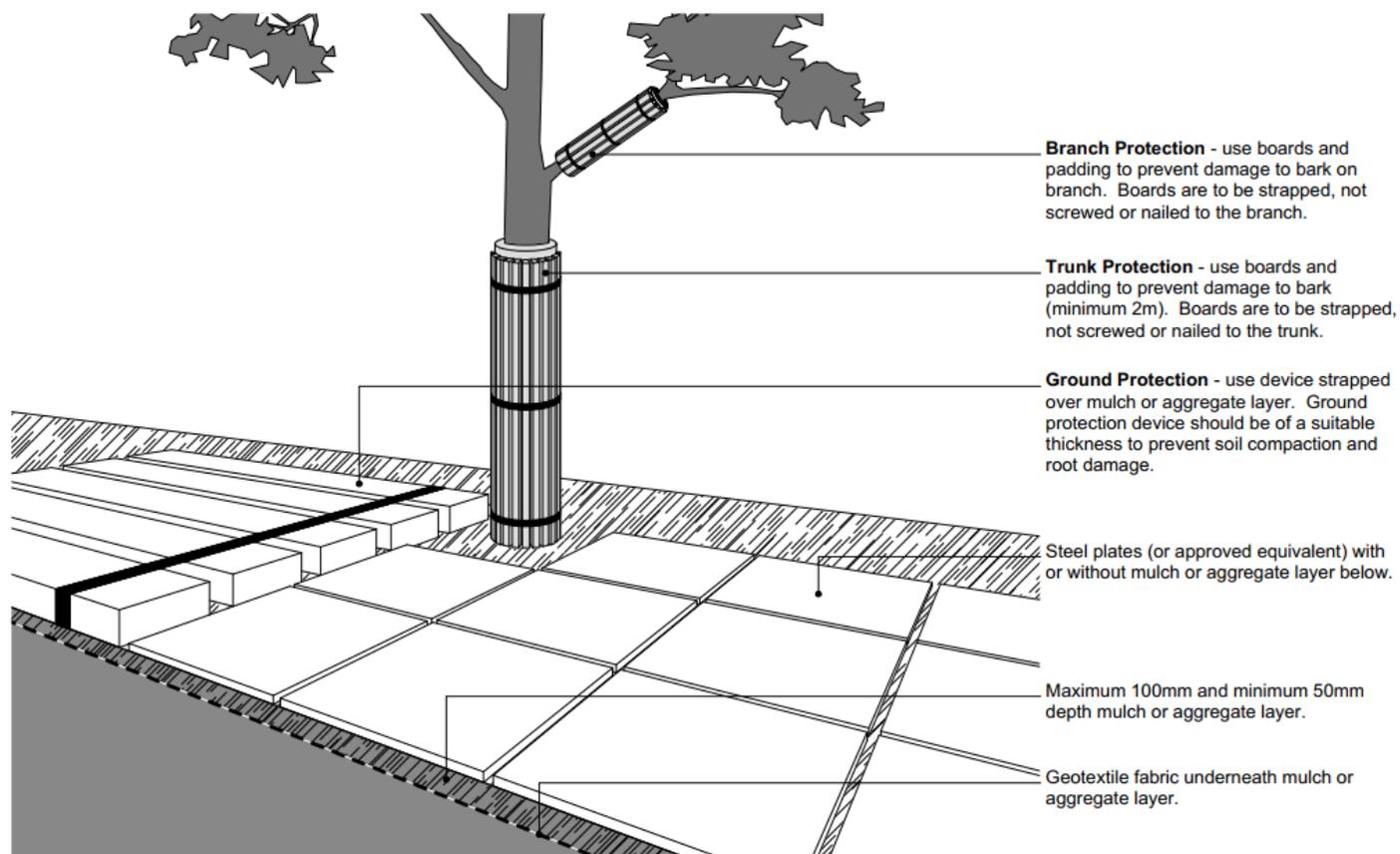


Figure 4. Existing dwelling and concrete driveway in relation to the Carara Reserve trees

APPENDIX E Examples of Tree Protection Measures



Tree Protection Fencing



Examples of Branch, Trunk and Ground Protection

APPENDIX F

Site and Tree Protection Plan

Extract from Site Plan – Sheet 2/21 Revision C dated 6/9/22 by ANSA Homes

