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- Australian Institute of Horticulture
- Arboriculture Australia
- International Society of Arboriculture (USA)
- Australian Chapter of International Society of Arboriculture

Arborist Report

Project	**1380 Pacific Highway** **Turramurra NSW 2074** Ref: 2023-1089 Job: 67154
Client	**Rebel Property Group** 1380 Pacific Highway Turramurra NSW 2074
Client Contact	**John Fitzgerald** T: 9235 7800 M: 0421 721 702 E: jfitzgerald@rebelproperty.com
Prepared by	**Sir William D Home T/A Dr Treegood** Level 5 Arborist Diploma Horticulture Diploma Horticulture (Arboriculture) Certificate Horticulture Certificate Tree Surgery

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1 Summary

1.1 Proposed building works is removing of existing buildings and carparks and expanding the road entrance of Kissing Point Road to Stonex Drive.

1.2 These proposed building works will require the removal of two Jacaranda trees on Pacific Highway -Trees 1 and 2. These trees are growing next to high-voltage power lines where the canopy has been modified for clearance of powerlines.

1.3 Trees 3, 4, 5, and 6 - Jacaranda mimosifolia– are growing in and around existing car park proposed to be removed as they fall within building footprint.

1.4 Stonex Drive is to be modified to allow a greater movement of cars into Kissing Point Road. By allowing 2 exit lanes from car park and one entry line into car park

1.5 Tree 7 – Eucalyptus robusta, Tree 8 – Eucalyptus robusta, Tree 9 – Eucalyptus pilularis, Tree 10 – Pittosporum, Tree 12 – Eucalyptus acmenoids, Tree 13,14 and 15 – Eucalyptus microcorys, Tree 16 – Eucalyptus robusta, Tree 17- Eucalyptus robusta, Tree 18 – Brachychiton acerifolius, Tree 19 – Syzgium Smithii and Tree 20 – Heptapleuram SPP will need to be removed as they fall within the building footprint of the driveway on Stonex Drive.

1.6 Tree 14 – Eucalyptus microcorys - has a misshapen canopy which predominantly leans over existing road. With the removal of this tree, it would expose the remaining canopies of Trees 15 and 13. Trees 15 and 13 will have over 10% incursion into Tree Protection Zone (TPZ).

1.7 Tree 11 – Pittosporum undulatum - has been removed.

1.8 The proposed plans have an adequate area which can be re landscaped in between the two major retail areas. This possibly can be done with specimen trees which have seasonal change.

1.9 The proposal is to create a new loading zone on Pacific highway which would require power lines to be relocated. It would be preferable if these power lines were installed underground. This would allow the possibility planting and landscaping in the front of the building with specimen trees and low garden beds as used in Sydney city council in their urban and built-up areas.

2 Aims of the Report

2.1 Carry out site assessment of trees growing in and around proposed development at 1380 Pacific Highway Turramurra

2.2 Give a landscape significance rating and SULE rating and provide possible areas for re landscaping.

3 Method

3.1 In preparation of this report, a ground level visual tree assessment (VTA[1]) was undertaken.

3.2 No aerial (climbing) inspections, woody tissue testing, or tree root mapping were undertaken as part of the preparation of this report.

3.3 Heights, widths and diameters were estimated by eye from ground level.

3.4 No digging or root exposing work was done.

3.5 The comments and recommendations contained in this report are based on findings from the site inspection.

3.6 Have used SULE ratings and landscape significant ratings to give suitability for preservation.

3.7 Due Diligence Flora and Fauna Assessment Report prepared by Narla Environmental for Rebel Property Group – November 2023 was reviewed.

[1] VTA-Visual Tree Assessment undertaken by tree professionals is a recognised (International Society of Arboriculture) systematic method of identifying tree characteristics as hazard potential. Journal of Arboriculture, Vol. 22, No. 6, Nov. 1996. VTA is also an assessment method described by Claus Mattheck in the Body Language of Trees – a handbook for failure analysis. The Stationery Office, London (1994).

4 Site Observations

4.1 Trees 1 and 2 – Jacaranda mimosifolia - are growing on street front of Pacific Highway. Trees 3, 4, 5, and 6 – Jacaranda mimosifolia - are growing in middle of block in around existing car park. Trees 7, 8 – Eucalyptus robusta and Tree 9 - Eucalyptus pilularis - are growing next to main vehicle entrance into block on south-eastern corner. Trees 10 ,11 – Pittosporum and Tree 12 – Eucalyptus acmenoids are growing on the southern side of the block next to the parking bays. Trees 13, 14 and 15 - mature Eucalyptus robustas - are growing on southern side of block next to existing driveways and pathways.

4.2 Tree 1 – Jacaranda mimosifolia - has a height of 6 metres with a canopy spread of 6 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 4 out of 5. It has a dominant crown class with 50% canopy cover and has a TPZ of 3.6 metres. The canopy has become misshapen due to significant powerline clearing. The central leaders have been removed, possibly for powerline clearing.

4.3 Tree 2 - Jacaranda mimosifolia- is a multiple trunk specimen growing in the raised garden bed where the base of trunks has been buried. The tree has a height of 8 metres with a canopy spread of 8 metres and is mature in age. It has a health rating of 5 out of 5 and a structure rating of 4 out of 5. The tree has a dominant crown class with 70% canopy cove. This canopy is misshapen due to powerline clearance. The tree has a TPZ of 4.8 metres.

4.4 Tree 3 - Jacaranda mimosifolia - has a canopy height of 6.5 metres with a canopy width of 9 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It has a dominant crown class with 70% canopy cover. The tree has a TPZ of 6 metres.

4.5 Tree 4 -Jacaranda mimosifolia - has a height of 10 metres with a canopy spread of 10 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It has a codominant canopy with 60% canopy cover. The tree has a TPZ of 8.4 metres.

4.6 Tree 5 - Jacaranda - has a height of 10 metres with a canopy spread of 10 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It has a codominant canopy with 70% canopy cover. The tree has a TPZ of 7.2 metres.

4.7 Tree 6 – Jacaranda mimosifolia – is a multiple trunk specimen with a height of 9 metres, width of 8 metres and has an age classification of overmature. The tree has a health rating of 4 out of 5 and a structure rating of 3 out of 5. It has a dominant crown class with 50% canopy cove. This tree has major cambium damage to all three trunks. This cambium damage would be impacting 60% of the trunk diameters.

4.8 Tree 7 - Eucalyptus robusta - has a height of 13 metres with a canopy width of 8 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It is a dominant tree with 50% canopy cover. The tree has a TPZ of 8.4 metres.

4.9 Tree 8 - Eucalyptus robusta - has a height of 8 metres with a canopy spread of 5 metres and is semi- mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It has a co dominant crown class with 60% canopy cover. The tree has a TPZ of 2.4 metres.

4.10 Tree 9 - Eucalyptus pilularis - has a height of 10 metres with a canopy spread of 6 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It has a codominant canopy with 60% canopy cover.

4.11 Tree 10 - Pittosporum undulatum - has multiple trunks with a height of 8 metres and a canopy spread of 6 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 4 out of 5. It has a dominant canopy with 50% canopy cover. There has been a vehicle impact to the canopy cover. The tree has a TPZ of 2.4 meters.

4.12 Tree 11- Pittosporum undulatum – had a height of 6 metres with a canopy spread of 6 metres and is mature in age. This specimen has been removed.

4.13 Tree 12 - Eucalyptus acmenoids- has a height of 12 metres with a canopy spread of 8 metres The canopy is predominantly growing over neighbouring house. The tree is mature in age with a health rating of 5 out of 5 and a structure rating of 4 out of 5. It has a codominant canopy with 70% canopy cover. There is a major bend in the trunk and the canopy cover is uneven. The tree has a TPZ of 8.4 metres.

4.14 Tree 13 - Eucalyptus microcorys - has a height of 16 metres with a canopy spread of 8 metres and is mature in age. The has a health rating of 5 out of 5 and a structure rating of 3 out of 5. It is a dominant tree with 50% canopy cover. The trunk has inclusions at 6 metre mark and the 10-metre mark. It has a TPZ of 7.2 metres.

4.15 Tree 14 - Eucalyptus microcorys - has a height of 12 metres with a canopy spread of 6 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 3 out of 5. The canopy is predominantly growing over the road and there is a major lean in the trunk over the road. The tree has a TPZ of 9.6 metres.

4.16 Tree 15 - Eucalyptus microcorys - has a height of 12 metres with a canopy spread of 8 metres and is mature in age. The tree has a health rating of 5 out of 5 and a structure rating of 5 out of 5. It has a dominant crown class with 60% canopy cover. The tree has a TPZ of 9 metres.

4.17 Tree 16 - Eucalyptus robusta - has a height of 11 metres with a canopy spread of 3 1/2 metres and is mature in age. TPZ 2.4 metres and SRZ of 1.68 m health rating 5 out of 5 and a structural rating of 5 out of 5. Codominant canopy with 45% canopy cover. Has a SULE writing moderate and a low landscape significant rating.

4.18 Tree 17 - Eucalyptus robusta - has a height of 8 metres with a canopy spread of 3.5 metres and its mature in age. As a TPZ of 2.4 metres and an SRZ of 1.68 metres. Has a health ratting of 5 out of 5 and a structural rating 5 out of 5. As an intermediate crown class with 30% canopy cover. Has a SULE ratting moderate and a low landscape significant rating.

4.19 Tree 18 - Brachychiton acerifolius - has a height of 8 metres with a canopy spread of 5 metres and is mature in age. Has a TPZ of 3.6 metres and an SRZ of 1.97 metres. Has a health rating of 5 out of 5 and a structural rating of 2 out of 5. This tree has a trunk inclusion at 1 metre. Has a codominant crown class with 70% of canopy cover. Has a short SULE with a low landscape.

4.20 Tree 19 - Syzgium smithii - has a height of 6 metres with a canopy spread of 4 metres and is semi-mature in age. Has a TPZ of 2 metres and an SRZ of 1.68 metres. Has a health rating 4 out of 5 and a structural rating 4 out of 5. Has an intermediate crown class with 40% canopy cover. It has a one-sided canopy. Has a medium SULE and a low landscape significant rating.

4.21 Tree 20 - Heptapleuram SPP - has a height of 8 metres with canopy spread of 4 metres and is mature in age. This tree has a health rating of 5 out of 5 and a structural rating of 3 out of 5. Has a codominant crown class with 15% canopy cover. Has a TPZ of 2.4 metres and an SRZ of 2metres. Has a medium SULE rating and a low landscape significant rating.

4.22 Proposed construction works are to knock down existing building and car park area and create a new medical centre with possibly six rental facilities with lobbies and bathrooms, this will incorporate a new driveway complex on Kissing Point Road which will require the relocation of Stonex Drive. Closer towards southern boundary. And to widen the road to have loading zones along Pacific Highway. And a larger turning area from kissing point road onto the Pacific highway.

4.23 Tree 11 – Pittosporum undulatum - has been removed.

5 Conclusions

5.1 All Trees will fall within proposed footprints of new driveway and building works and expansion of loading zone area in front of building on Pacific Highway.

5.2 The street front on Pacific Highway can be re landscaped. And if power lines were put underground new significant trees could be planted in this area to form a street canopy.

5.3 StoneX driveway can be re landscaped with trees planted on either side of the driveway to form a possible Ave.

5.4 The Pacific Highway frontage is to be modified to have a loading zone area and a greater turning zone from Kissing Point Rd into the Pacific Highway. Trees one and two fall within this footprint of major road improvements. I would make assumption the power poles and overhead power lines would need to be removed and more than likely would be transferred to underground power lines. This allows the ability for possible tree planting along the footpath area and possible small landscape areas in and around the trees as used scene used by Sydney City Council.

5.5 The large area in between the two retail areas in the centre of the site could be a possibility for a new landscape area with specimen trees to form an idyllic corridor for pedestrian traffic and shoppers.

6 Recommendations

6.1 All trees need to be removed to allow building works of driveway and proposed buildings and new outdoor areas.

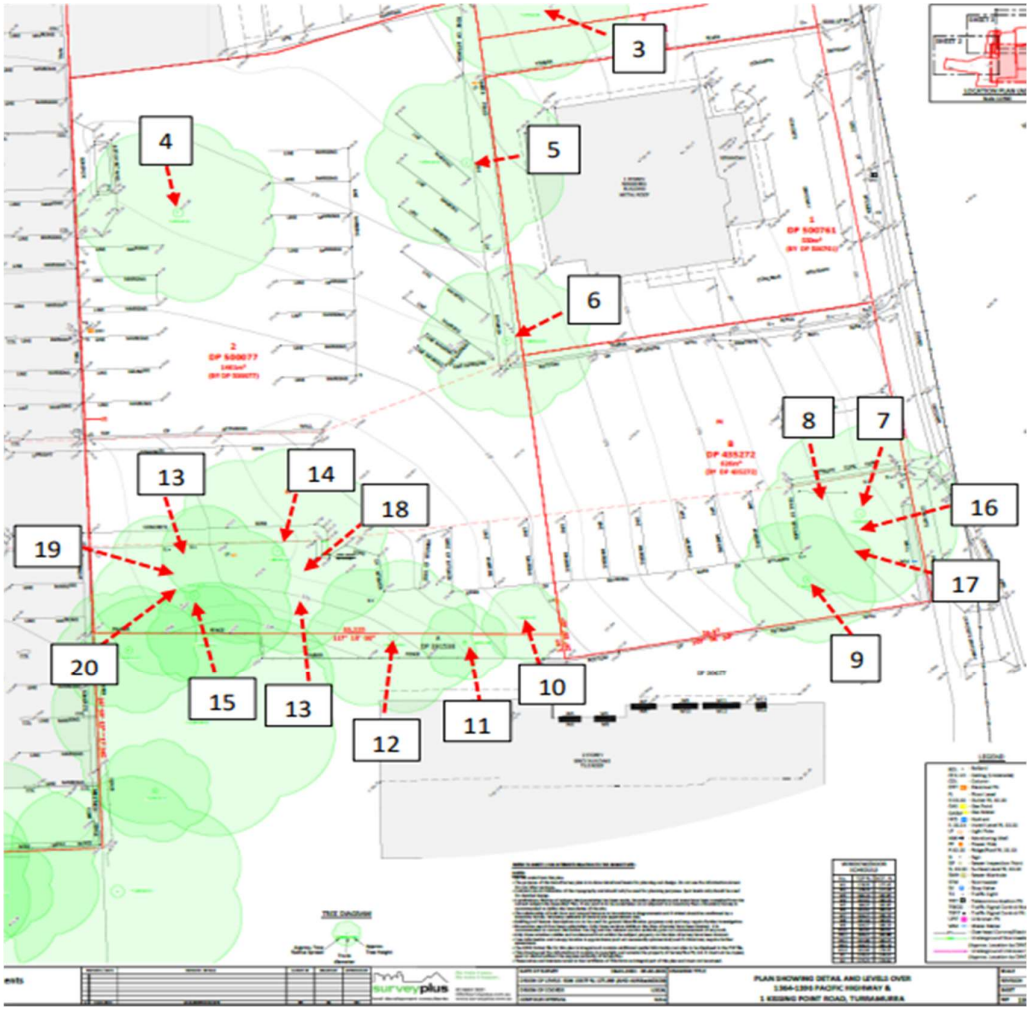
6.2 The open area between the two retail buildings and the void area will be a very effective area for new landscaping to occur.

6.3 When relocating power lines along Pacific Highway it would be ideal to put these power lines underground to allow future tree planting with tree pruning is not required to give power line clearance

6.4 Replacement plants to be endemic species as outlined within the report – Due Diligence Flora and Fauna Assessment Report.

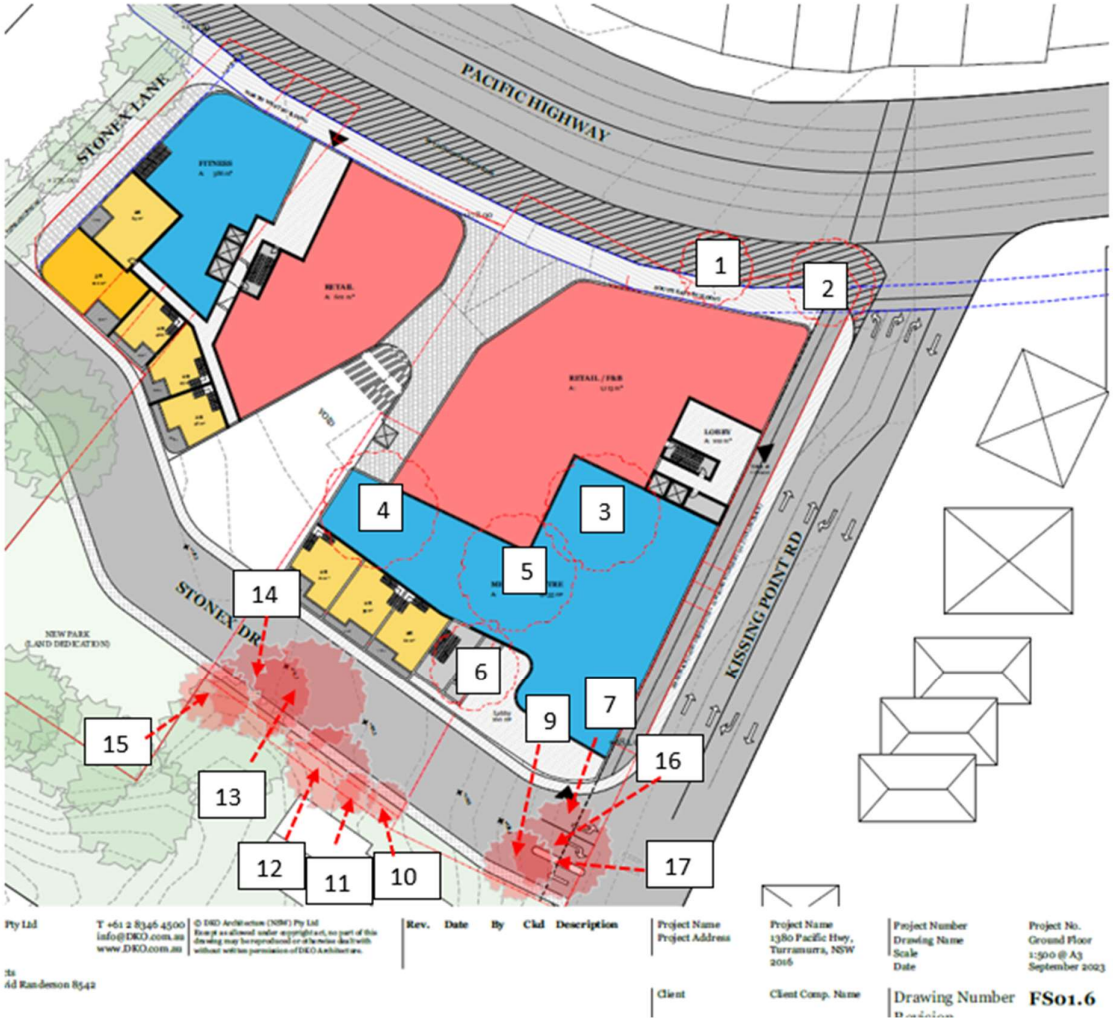
7 Survey

7.1 Figure 7.1 - Detailed survey with tree locations – red arrows indicating trees for removal.



8 Site Plans

8.1 Figure 1 – Ground floor – red arrows indicating trees for removal.



9 Tree Assessment Survey Sheets

9.1 Page 1

1.0 Tree Assessment Survey Sheet

CLIENT: Rebel Property Group

Job: #67154

DATE : 23/11/2023

Page number: 1/2

Location : 1380 Pacific Highway Turramurra

WEATHER : Fine

Version: 0.4

Tree #	Species Botanical name Common name	Trunk Diameter @1.4m CM	Trunk Diameter (buttress) CM	Height MT	Width MT	Age	TPZ MT SRZ	Health 1 = Poor 5 = Excel	Structure 1 = Poor 5 = Excel	Canopy Cover %	Crown Class	SULE Rating Landscape Significance	Tree Surgery	Suitability for Preservation	Comments
1	*Jacaranda mimosifolia*	30cm	45 cm	6	6	M	3.6 2.37	5	4	50%	D	Medium 5-Low	8	MODERATE	Misshapen canopy Centre of tree has been removed
2	*Jacaranda mimosifolia*	30cm, 20cm 15 cm,15cm 15 cm	90 cm	8	8	M	4.8 3.17	5	4	70%	D	Medium 4-Moderate	8	MODERATE	Misshapen canopy Growing in raised garden bed which has buried trunk
3	*Jacaranda mimosifolia*	30cm, 40cm	60 cm	6.5	9	M	6 2.67	5	5	70%	D	Long 4-Mod to Low		MODERATE	Well-shaped tree
4	*Jacaranda mimosifolia*	50cm 20cm, 40cm	90 cm	10	10	M	8.4 3.17	5	5	60%	C	Long 4-Moderate		MODERATE	
5	*Jacaranda mimosifolia*	60cm	80 cm	10	10	M	7.2 3.01	5	5	70%	D	Long 4-Moderate		MODERATE	Branch failure at the southern side
6	*Jacaranda mimosifolia*	40cm 30cm, 30cm	90 cm	9	8	OM	7.2 3.17	2	2	40%	D	Remove 5-Low	1100% 14 3	LOW	Declining tree, major cambium damage on east side extend to 6 m
7	*Eucalyptus robusta*	55 70 cm	80cm	13	8	M	8.4 3.01	5	5	55%	D	Long 4-Moderate		MODERATE	
8	*Eucalyptus robusta*	8 m	30 cm	8	5	SM	2.4 2	5	5	60%	C	Long 5- Low		MODERATE	
9	*Eucalyptus pilularis*	13 m	40 cm	10	6	M	3.6 2.25	5	5	60%	C	Long 4-Moderate		MODERATE	
10	Pittosporum undulatum	10cm,10cm 8cm, 6 cm	60 cm	7	6	M	2.4 2.67	2	2	10%	D	Remove 6-Very Low		VERY LOW	Vehicle has impacted canopy

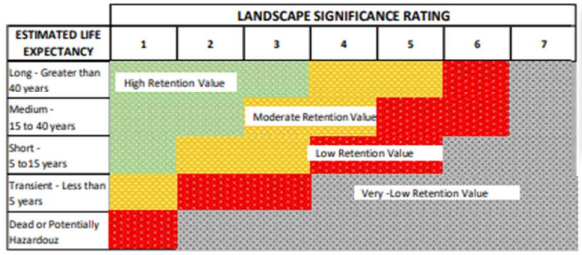
Tree surgery:
1. Deadwood.
2. Reshape Crown.
3. Wound repair.
4. Insect control.
5 Improve soil conditions (mulch, fertility, aeration etc).
6.Investigate cavites
7.Thin crown, consider installation of cabling/bracing and/or retain and fence off for public safety.
8.Line clearance of structures or service wires.
9. Remove attached plant.
10.Root girdling.
11 Remove.
12. No tree surgery required.
13. Requires tree protection measures. .
14. Borer damage.
15.Fungal or bacterial damage.
16. Monitor.
17. has been pruned

Age classification:
Y - Young
SM - Semi Mature
M - Mature
OM - Overmature
V - Veteran

Crown class:
D - Dominant
C - co-dominant
I - intermediate
S - Suppressed

SULE
L = Long
M = Medium
Sh = Short
R = Remove
Sm = Small
U = Unstable

Landscape Significance
1 - Significant
2 - Very High
3 - High
4 - Moderate
5 - Low
6 - Very Low
7 - Insignificant



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9.2 Page 2

1.0 Tree Assessment Survey Sheet

CLIENT: Rebel Property Group

Job: #67154

DATE : 23/11/2023

Page number: 2/2

Location : 1380 Pacific Highway Turramurra

WEATHER : Fine

Version: 0.4

Tree #	Species Botanical name Common name	Trunk Diameter @1.4m CM	Trunk Diameter (buttress) CM	Height MT	Width MT	Age	TPZ MT SRZ	Health 1 = Poor 5 = Excel	Structure 1 = Poor 5 = Excel	Canopy Cover %	Crown Class	SULE Rating Landscape Significance	Tree Surgery	Suitability for Preservation	Comments
11	*Pittsoporum*	15 cm 10 cm	60 cm	6	6		2.4 2.67								Has been removed
12	*Eucalyptus acmenoids*	70 cm	90 cm	15	8	M	8.4 3.17	5	4	70%	C	Medium 4-Moderate		MODERATE	Uneven canopy Bend in trunk
13	*Eucalyptus microcorys*	60 cm	70 cm	16	8	M	7.2 2.85	5	3	50%	D	Medium 4-Moderate		MODERATE	Trunk inclusions at 6 meters and 10 meters
14	*Eucalyptus microcorys*	80 cm	80 cm	12	6	M	9.6 2.01	5	3	35%	C	Medium Low		MODERATE	Termite active on trunk Major lean over road
15	*Eucalyptus microcorys*	75 cm	110 cm	12	8	M	9 3.44	5	5	60%	D	Long 4-Moderate		HIGH	Termite active on trunk
16	*Eucalyptus robusta*	20 cm	35 cm	11	4	M	2.4m 2.13	5	5	30%	C	Med 5-Low		MODERATE	
17	*Eucalyptus robusta*	15 cm	20 cm	8	3 1/2	M	2.4m 1.68	5	5	30%	I	Medium 5-Low		LOW	
18	*Brachychiton acerifolius*	20 cm	29 cm	8	5	M	3.6m 1.97	5	2	70%	C	Short 5-Low		LOW	Trunk inclusion at 1 meter
19	*Syzgium smithii* Lilly pilly	12 cm	16 cm	6	4	SM	2m 1.68	4	4	40%	I	Medium 5-Low		LOW	One side canopy
20	*Heptapleuram SPP*	15 cm	20 cm	8	4	M	2.4m 2m	5	3	15%	C	Medium 5-Low		LOW	Major bend at base of tree trunk

Tree surgery:
1. Deadwood.
2. Reshape Crown.
3. Wound repair.
4. Insect control.
5 Improve soil conditions (mulch, fertility, aeration etc).
6.Investigate cavites
7.Thin crown, consider installation of cabling/bracing and/or retain and fence off for public safety.
8.Line clearance of structures or service wires.
9. Remove attached plant.
10.Root girdling.
11 Remove.
12. No tree surgery required.
13. Requires tree protection measures. .
14. Borer damage.
15.Fungal or bacterial damage.
16. Monitor.
17. has been pruned

Age classification:
Y - Young
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Crown class:
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S - Suppressed

SULE
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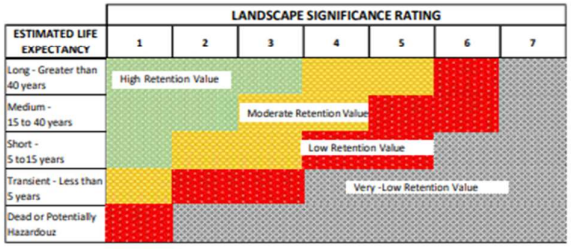
Landscape Significance
1 - Significant
2 - Very High
3 - High
4 - Moderate
5 - Low
6 - Very Low
7 - Insignificant



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10 Photographs

PHOTO 1 (A)

Tree 1 Jacaranda mimosifolia – Half of the canopy is epicormic growth. Main leaders has been removed

PHOTO 2 (B) Date – 23/10/2023

Tree 1 – Jacaranda mimosifolia - Lifted pathways due to root impact.

PHOTO 3 (A)

Tree 2 – Jacaranda mimosifolia - canopy is modified for high-voltage power lines. Notation no trunk flair at base of the tree tree more than likely has been buried.

PHOTO 4 (B) Date – 23/10/2023

Tree 2 – Jacaranda mimosifolia - misshapen canopy from power lines.

PHOTO 5 (C) Date – 23/10/2023

Tree 2 – Jacaranda mimosifolia - root impact to pathway

PHOTO 6 (A)

Tree 3 – Jacaranda mimosifolia - raised soil levels at the base of the tree root are impacting on the small wall.

PHOTO 7 _(B) Date – 23/10/2023

Tree 3 – Jacaranda mimosifolia - root impact to the retaining wall.

PHOTO 8 (A)

Tree 4 – Jacaranda mimosifolia - multiple trunk specimen

PHOTO 9 (A)

Tree 5 – Jacaranda mimosifolia - well-shaped canopy.

PHOTO 10 (B) Date – 23/10/2023

Tree 5 – Jacaranda mimosifolia - branch failure on the southern side. note rubbing crossing branches at rear of photograph.

PHOTO 11 (A)

Tree 6 – Jacaranda mimosifolia - Cambium damage on east and trunk.

PHOTO 12 (B) Date – 23/10/2023

Tree 6 – Jacaranda mimosifolia - has major cambium damage.

PHOTO 13 (C) Date – 23/10/2023

Tree 6 – Jacaranda mimosifolia - Major cambium damage to trunk.

PHOTO 14 (A)

Tree 7 - Eucalyptus robusta- dominant tree , Tree 8 - Eucalyptus robusta – small specimen growing next to dominant Tree 7.

PHOTO 15 (B) Date – 23/10/2023

Trees 8,7,16 and 17 – Eucalyptus robusta.

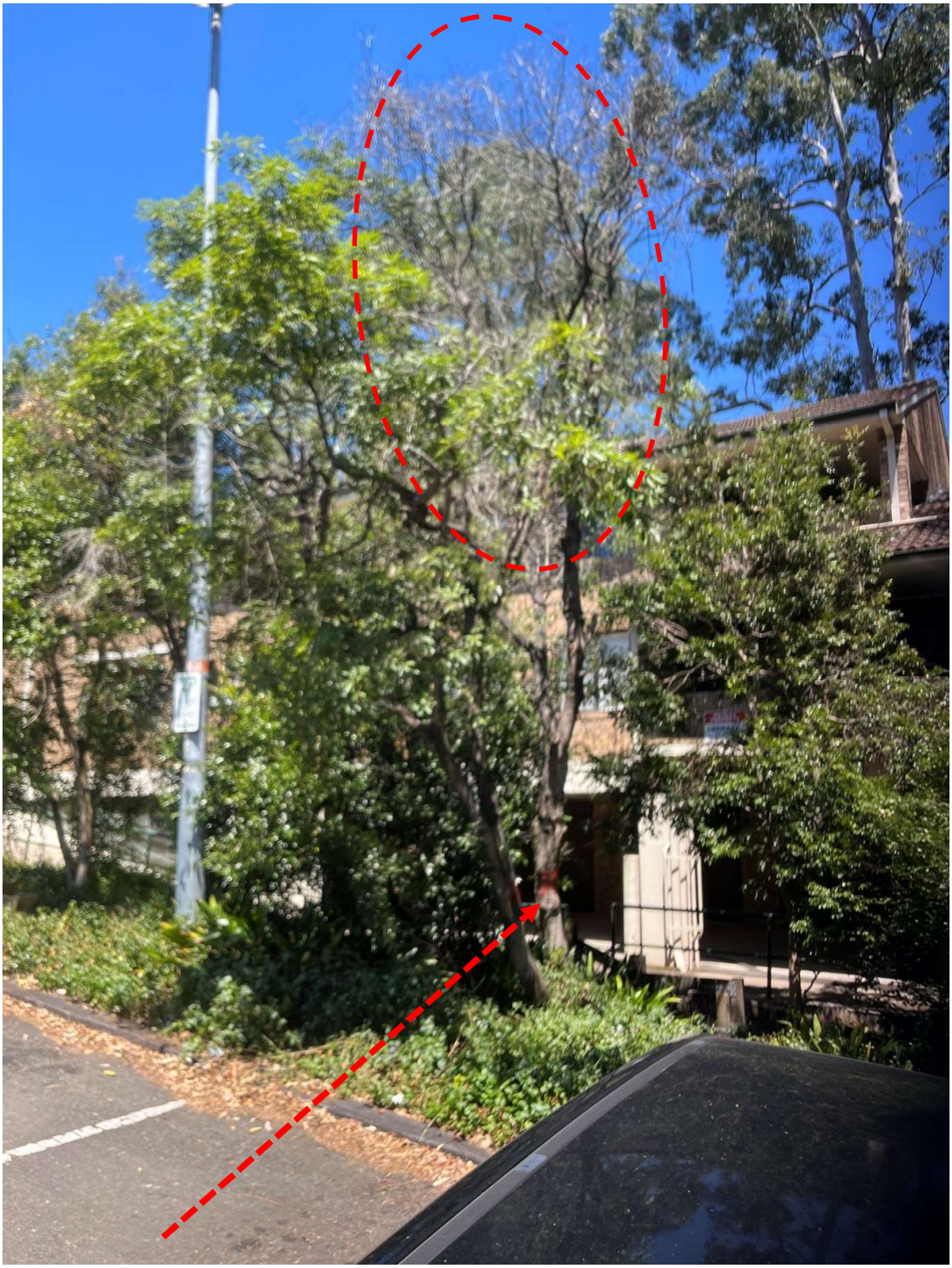
PHOTO 16

Tree 9 – Eucalyptus pilularis - this tree is to be removed.

PHOTO 17 (B) Date – 23/10/2023

Trees 8 and 7 – Eucalyptus robusta and Tree 9 – Eucalyptus pilularis.

PHOTO 18 (A) Date – 23/10/2023

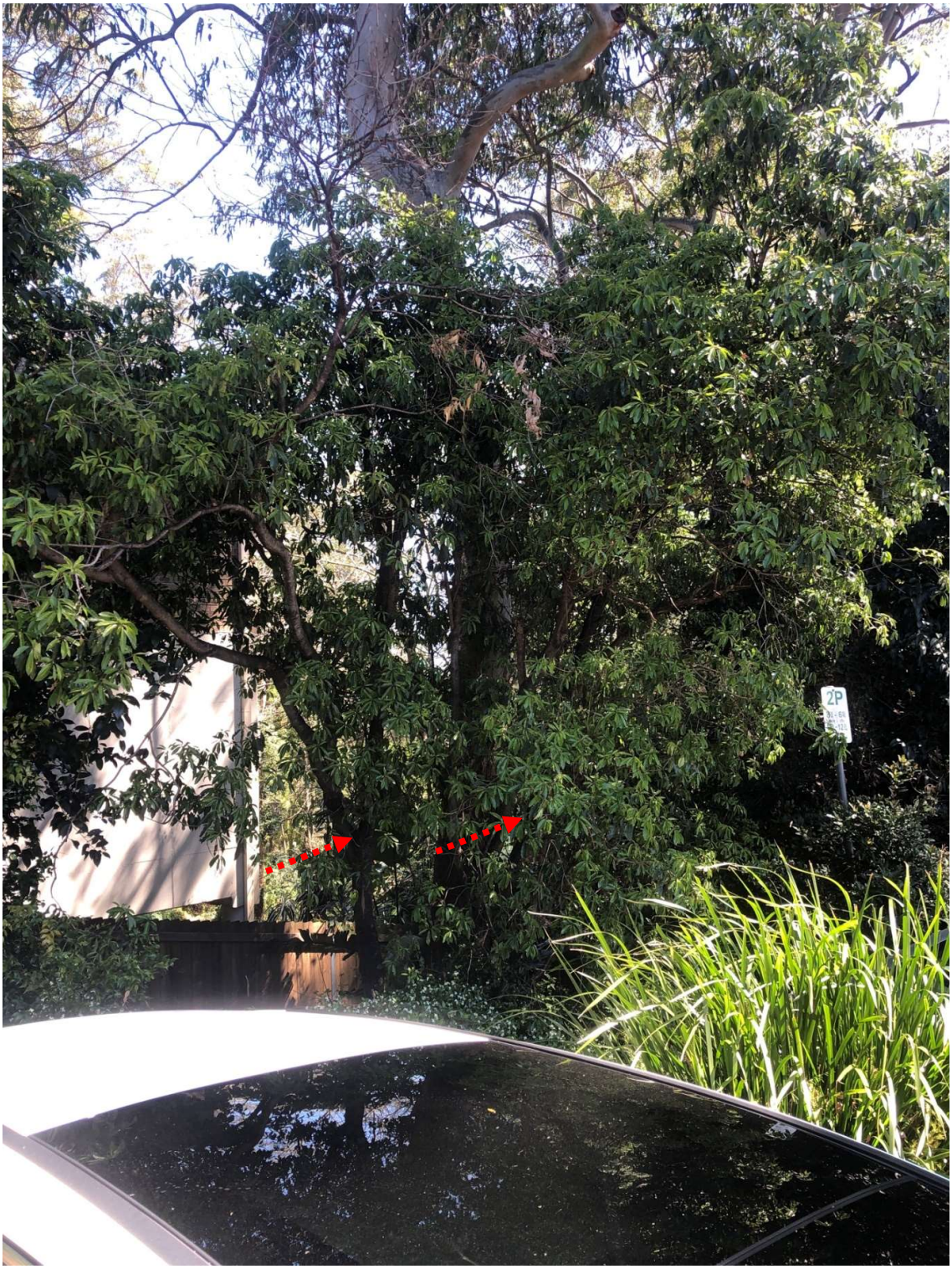


Tree 10 – Pittosporum undulatum - dieback in the upper canopy.

PHOTO 19 (B)

Tree 10 – Pittosporum undulatum - multiple trunk specimen which has suffered branch failure.

PHOTO 20 (A)



Tree 11 – Pittosporum undulatum - multiple trunks specimen growing at the base of Tree 12

PHOTO 21 (B) Date – 23/10/2023

Tree 11 – Pittosporum undulatum - has been removed.

PHOTO 22 (A)

Tree 12 – Eucalyptus acmenoids - canopy predominantly growing over neighbours building.

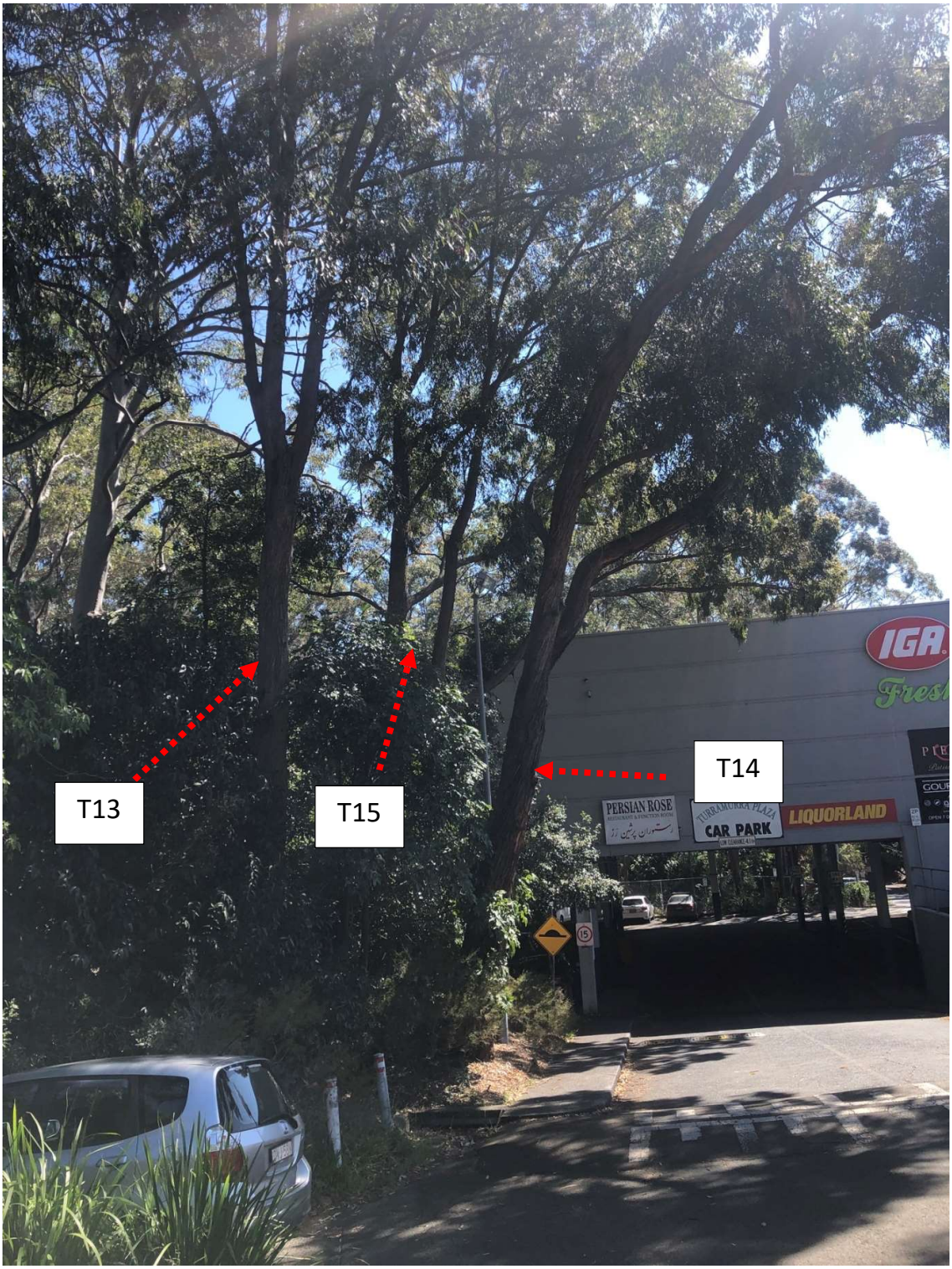
PHOTO 23 (A)

Tree 13 – Eucalyptus microcorys. Trunk inclusion at 6 metres.

PHOTO 24 (B) Date – 23/10/2023

Tree 13, 18, 14. Tree 18 – Brachychiton, Tree 13, 14 - Eucalyptus

PHOTO 25 (C)



Trees 13, 14, 15- Eucalyptus microcorys - Tree 15 is predominantly growing over existing roadway.

PHOTO 26 (D)

Tree 13 – Eucalyptus microcorys - Trunk inclusion at 6 metres.

PHOTO 27 (E)

Tree 13 - Eucalyptus microcorys - trunk includsions at 6 metres and 10 metres.

PHOTO 28 (F)

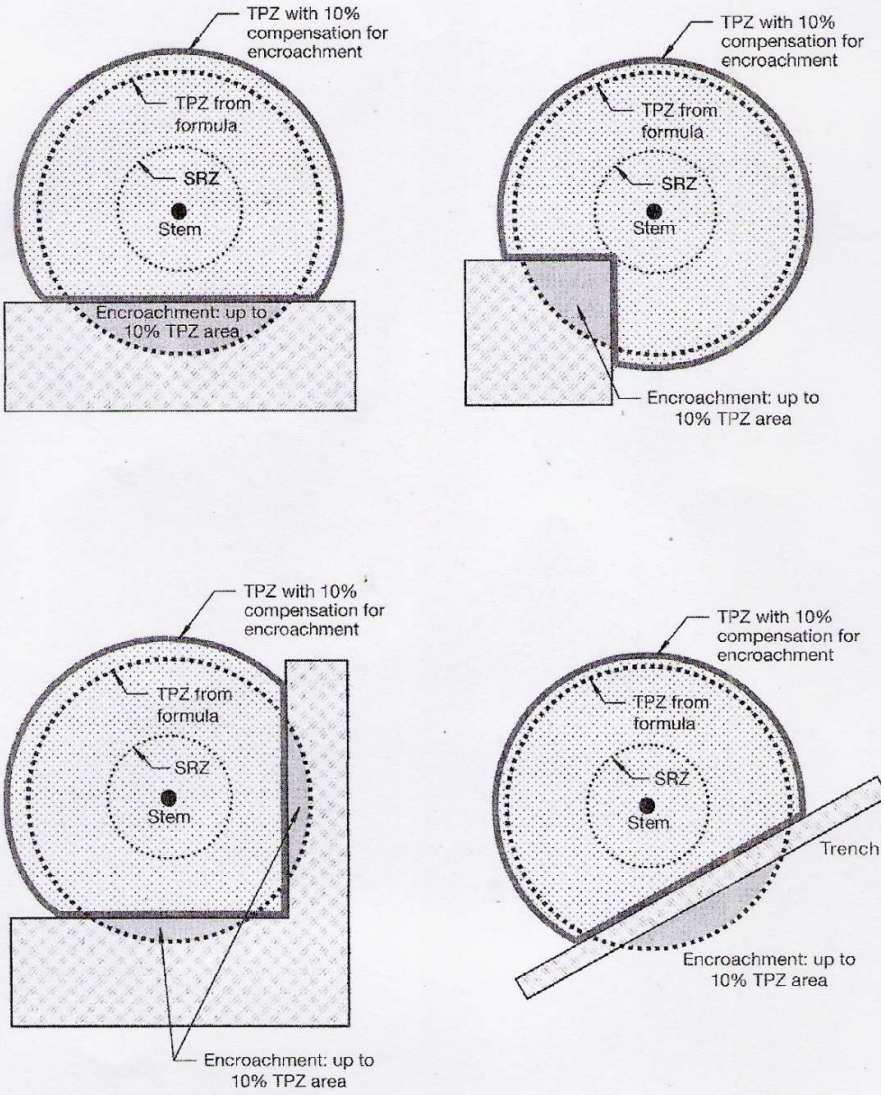
Tree 13 – Eucalyptus microcorys - major lean over road.

PHOTO 29 (A) Date – 23/10/2023

Tree 20 - Heptapleuram SPP, Tree 19 – Syzgium Smithii, Tree 15 – Eucalyptus microcorys

11 (TPZ)Acceptable Incursions to the Tree Protection Zone (TPZ)

APPENDIX 2 – ACCEPTABLE INCURSIONS TO THE TREE PROTECTION ZONE (TPZ)



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

REF:- Council of Standards Australia (August 2009)
AS 4970 – 2009 – Protection of Trees on Development Sites
Standards Australia, Sydney

12 Tree and Trunk Protection Methodology

12.1 Tree Protection Fencing

- The trees to be retained should be protected by means of fencing prior to commencement of demolition (including tree removal) or bulk earthworks.
- The protection fencing should be immovable. It should be constructed from 1.8-metre-high chain link suspended on 2.4m x 45mm galvanised steel pipe.
- The area within should be kept free of all building materials, contaminants and other debris. It should not be used for storage of any building materials.

12.2 Mulching

- The area within the protective fencing should be mulched to a depth greater than 75mm and not exceeding 100millimetre using a leaf mulch or 25-millimetre eucalypt chip. The mulch should be free of weed seeds and other contaminants. If construction access is required within the tree's dripline, outside the protective fencing, heavier mulch should be spread to a depth no greater than 100 millimetres to reduce soil compaction.

12.3 Trunk Protection

- Trunk protection of hardwood timbers should be used to protect the tree's trunk where construction is proposed. This should be fastened around the trunk with hoop iron strapping or similar and padded with carpet underlay or equivalent.

13 Trunk Protection Photograph

14 Guidelines for Excavating near Trees to be preserved

14.1 Monitor the excavation work within a five plus metre radius of the tree. Excavation in this zone is to be done using hand tools, not an excavator.

a) An arborist must monitor all excavation works within the TPZ.

b) Use hand tools to carry out ay work within the drip zone of the tree.

c) Excavation work can be also done with Air Knit or Air Spade.

14.2 An arborist must cut any roots to be removed with a clean sharp handsaw.

d) Cut all roots with clean equipment that is specifically designed to cut roots not with impacted tool.

e) Do not cut large roots (>30mm diameter) closer than halfway from drip line to the trunk.

f) Severance of structural roots of 25mm or more in diameter is not permitted without prior permission of the arborist.

14.3 Wrap any roots found in damp cloth.

g) Protect roots that are exposed during excavation from drying out – wrap etc.

h) Immediately wrap all tree roots uncovered in dampened jute matting or equivalent sacking made or natural fibre cloth, until backfilling takes place. Hessian fibre or Hessian sack. Tree roots must not remain exposed.

i) Clumps of fibrous roots must not be severed/cut and need to be retained as per wrapping instructions in ‘b’. Arborist must inspect to give guidelines.

14.4 Any area within five metres of the tree trunk (limited) should not be used to storage or mixing of building materials as this could change the microorganisms in the soil.

j) Do not store equipment, materials, or chemical based solutions in the TPZ.

k) Do not use heavy machinery within the protection zone.

l) No vehicle access without the agreement of the arborist.

m) If vehicle access require measure must be put in place to prevent compaction.

14.5 Any footing in the zone of the roots is to be built with a pier and beam construction with the aim to give 100mm clearance of the roots.

14.6 Keep the original soil level – RL – where possible – with no disturbance of the soil, including level changes or compaction, within the TPZ without prior consultation with the arborist.

n) Make no changes that will alter the amount of water infiltration surrounding or within the TPZ without the consent of the arborist.

14.7 Any paving installed must allow air and water penetration to the root zone. The pavers must have sand placed between them and not cement as cement would prevent air flow to the root location.

14.8 If any roots are found in this zone, the pavers are to be raised by the placement of washed sand over the roots. This RL should be determined at an early stage of the construction so that the pavers do not go above the damp course of the house.

15 Root Pruning Methodology

15.1 Expose roots with hand tools or air spade or air knife. Clean roots with water or soft brush. Cover exposed roots and soil and prevent foot traffic in area. A trained arborist should inspect toots before pruning or removing roots.

15.2 Cover the roots with wetted rags or natural fibre. Then cover with soil where possible if left exposed for more than one day, or as soon as possible in extreme weather conditions. The natural fibre will break down in time and can be left on roots or buried.

15.3 Clean cut any roots found with a clean and sharp handsaw. The saw or secateurs should be cleaned by dipping in bleach or methylated spirits, or use alcohol wipes, to clean the saw. This can be done after each cut and must be done if pruning roots of different trees. This will minimise the spreading of pathogens or disease.

15.4 Drench the exposed soil with water and mulch soil surface with wood chips and leaf litter, not pine bark or palm fronds.

15.5 Hydrophobic soil may need wetting agent applied to aid in water penetration.

15.6 Cover the exposed soil along the excavation line with jute matting or hessian and apply water to the covering material once a day minimum in cool weather and up to 3 times per day in hot or windy conditions, until the trench is back filled. Hold jute matting in place with pegs or equivalent.

16 References

Urban, J. (2008) *Up by Roots*

Matheny, N. and Clark, J. (1998) *Trees and Development*

17 Glossary

Absorbing roots – common term describing the fine, non-woody, short-lived roots that absorb water and mineral nutrients and that are often infected with beneficial organisms.

Aerobic – a biochemical process or condition occurring in the presence of oxygen.

Air knife – device that directs a jet of highly compressed air to excavate and loosen soil. Used within the root zone of trees or near underground structures such as pipes and wires to avoid or minimize damage to the roots or structure.

Anaerobic – biological process that occurs in the absence of oxygen.

Bark – protective outer covering of branches and stems that arises from the cork cambium or cambium.

Basal (or trunk) flare – the increased diameter where the roots and trunk meet (also known as the root flare or buttress).

Bifurcation – Tree fork - A tree fork is a bifurcation in the trunk of a tree giving rise to two roughly equal diameter branches. These forks are a common feature of tree crowns. The wood grain orientation at the top of a tree fork is such that wood cells interlock to provide sufficient mechanical support.

Branch collar – area where a branch joins another branch or trunk that is created by the over-lapping vascular tissues from both the branch and the trunk. Typically enlarged at the base of the branch.

Broad-leaved – trees whose foliage is flat and broad.

Buttress root – roots at the trunk base that help support the tree and equalize mechanical stress.

Cambium – thin layer(s) of meristematic cells that give rise (outward) to the phloem and (inward) to the xylem, increasing steam and root diameter.

Central leader – the main stem, trunk, or bole.

Clay – (1) soil particles with a typical grain size less than 0.002 millimetre (USDA classification) and less than 0.005 AASHTO Classification. (2) A soil predominantly composed of such particles.

Compaction – compression of the soil that breaks down soil aggregates and reduces soil volume and total pore space, especially macrospore space.

Compartmentalization – natural defence process in trees by which chemical and physical boundaries are created that act to limit the spread of disease and decay organisms.

Compost – (1) (noun) organic matter that has been intentionally subjected to decay processes and is more or less decomposed. (2) (verb) To subject organic matter to decay and decomposition processes.

Compression – action of forces to squeeze, crush, or push together any material(s) or substance(s). Contrast with tension.

Coppicing – to cut back (a tree or shrub) to ground level periodically to stimulate growth.

Cork cambium – meristematic tissue from which the corky, protective outer layer of bark is formed.

Crown (or canopy) – the leaves and branches of a tree.

Deciduous – Trees that lose their leaves each year.

Decurrent – trees that lack a central leader; the crown is composed of a number of equal-sized branches.

Dripline – the edge of the canopy

D.C.P. – Development Control Plan

Epicormic branches – shoot arising from a latent or adventitious bud (growth point).

Evergreen – trees that maintain foliage throughout the year.

Expanding clay – clay that tends to expand when wet and then, when drying, contracts more than other particles in the soil.

Field capacity – maximum soil moisture content following the drainage of water due to the force of gravity.

Gap-graded – soil with some particles coarse and some fine but without any significant amount of intermediate-sized fine and very fine sand particles.

Girdling root – root that encircles all or part of the trunk of a tree or other roots and constricts the vascular tissue and inhibits secondary growth and the movement of water.

Heart rot – any of several types of fungal decay of tree heartwood, often beginning with infected wounds in the living portions of wood tissue.

Heartwood – wood that is altered (inward) from sapwood and provides chemical defence against decay-causing organisms and continues to provide structural strength to the trunk. Trees may or may not have heartwood.

Hyphae – long, root-like, filamentous cells of a fungus.

Inclusion - A narrow or appressed junction between two or more branches where bark formation continues to develop, gradually pushing the adjacent limb out from the primary one causing severe stress on the internal wood structure.

Infiltration – movement of water penetrating the soil surface and into the soil. Contrast with percolation.

Lateral roots – roots that branch from larger primary roots.

Loam – soil texture classification containing some proportion of each of the tree major soil particle types (sand, silt, and clay). Has good qualities for plant growth.

Multi-trunked – tree with more than one trunk arising at or near the ground.

Percolation – movement of water through the soil. Contrast with infiltration.

Phloem – plant vascular tissue that transports sugar and growth regulators. Situated on the inside of the bark, just outside the cambium. Is bidirectional (transports up and down). Contrast with xylem.

Pollarding – specialty pruning technique in which a tree with a large-maturing form is kept relatively short. Starting on a young tree, pruning cuts are made at the same point in the tree, resulting in the development of callus knobs at the cut height. Requires regular (usually annual) removal of the sprouts arising from the cuts.

Psyllid – tiny sap sucking insects which attack mostly native plants such as lily pilly.

Reaction wood – wood formed in leaning or crooked trunks and stems as a means of counteracting the effects of gravity.

Root crown – the point at which the trunk and buttress roots meet.

Root plate – area under the ground around the base of the tree where the roots taper away from the trunk (see zone of rapid taper). The area of the primary roots that structurally support the forces on the tree.

R.L – Reduced level.

Scaffold branches – the major structural support branches that attach to the trunk.

Sapwood – outer wood (xylem) that is active in longitudinal transport of water and minerals.

Soil – surface layers of sand, silt, clay, and organic material on the surface of the earth that support plants. More generally, the material between the rocky parts of the planet and the atmosphere composed of fine – to coarse-grained mineral material.

Soil amendment – item added to the soil to improve certain aspects of the soil's condition.

Suckers – shoot arising from the roots.

S.R.Z. – Structural Root Zone

Taper – the change in diameter associated with height or length; related to strength.

Tap root – central, vertical root growing directly below the main stem or trunk that may or may not persist into plant maturity; rarely exists in nursery-produced plants.

Tension – in mechanics, the action of forces to stretch or pull apart any material or substance.

Trunk flare or root flare – transition zone from trunk to roots, above the ground where the trunk expands begins to expand to the form root structures that support the tree.

T.P.Z - Tree Protection Zone.

Xylem – main water – and mineral-conducting (unidirectional, up only) tissue in trees and other plants. Provides structural support. Arises (inward) from the cambium and becomes wood after lignifying. Contract with phloem.

Zone of rapid taper – area around the base of the tree under the ground where the roots taper away from the trunk. The taper reflects the stresses within the root generated by wind and gravity.

18 Expert Witness Code of Conduct

Uniform Civil Procedure Rules 2005

Schedule 7 Expert witness code of conduct
(Rule 31.23)
(cf SCR Schedule K)

18.1 Application of code

This code of conduct applies to any expert witness engaged or appointed:

- to provide an expert's report for use as evidence in proceedings or proposed proceedings, or
- to give opinion evidence in proceedings or proposed proceedings

18.2 General duty to the court

1) An expert witness has an overriding duty to assist the court impartially on matters relevant to the expert witness's area of expertise.

2) An expert witness's paramount duty is to the court and not to any party to the proceedings (including the person retaining the expert witness).

3) An expert witness is not an advocate for a party.

18.3 Duty to comply with court's directions.

- An expert witness must abide by any direction of the court.

18.4 Duty to work co-operatively with other expert witnesses

An expert witness, when complying with any direction of the court to confer with another expert witness or to prepare a parties' expert's report with another expert witness in relation to any issue:

- must exercise his or her independent, professional judgement in relation to that issue, and
- must endeavour to reach agreement with the other expert witness on that issue, and
- must not act on any instruction or request to withhold or avoid agreement with the other expert witness.

18.5 Experts' reports

1) An expert's report must (in the body of the report or in the annexure to it) include the following:

- the expert's qualifications as an expert on the issue the subject of the report,
- the facts, and assumptions of fact, on which the opinions in the report are based (a letter of instructions may be annexed),
- the expert's reasons for each opinion expressed,
- if applicable, that a particular issue falls outside the expert's field of expertise,
- any literature or other materials used in support of the opinions,
- any examinations, tests or other investigations on which the expert has relied, including details of the qualifications of the person who carried them out,
- in the case of a report that is lengthy or complex, a brief summary of the report (to be located at the beginning of the report).

2) If an expert witness who prepares an expert's report believes that it may be incomplete or inaccurate without some qualification, the qualification must be stated in the report.

3) If an expert witness considers that his or her opinion is not a concluded opinion because of insufficient research or insufficient data or for any other reason, this must be stated when the opinion is expressed.

4) If an expert witness changes his or her opinion on a material matter after providing an expert's report to the party engaging him or her (or that party's legal representative), the expert witness must forthwith provide the engaging party (or that party's legal representative) with a supplementary report to that effect containing such of the information referred to in subclause (1) as is appropriate.

18.6 Experts' conference

1) Without limiting clause 3, an expert witness must abide by any direction of the court:

- to confer with any other expert witness, or
- to endeavour to reach agreement on any matters in issue, or
- to prepare a joint report, specifying matters agreed and matters not agreed and reasons for any disagreement, or
- to base any joint report on specified facts or assumptions of fact.

2) An expert witness must exercise his or her independent, professional judgement in relation to such a conference and joint report, and must not act on any instruction or request to withhold or avoid agreement.