

Arboricultural Impact Assessment Report

Prepared for
Penrith City Council

Property
9A Dilga Street
Erskine Park

Date
December 2021



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1 Introduction

- 1.1 The following Arboricultural Impact Assessment Report was commissioned by Penrith City Council. The report is an assessment of seventeen trees within 9A Dilga Crescent, Erskine Park.
- 1.2 The aim is to determine the tree's landscape significance, condition and vigour and provide appropriate development setbacks in accordance with AS4970-2009 whilst considering the relevant tree and vegetation legislation.
- 1.3 The proposal entails subdivision of the open space into three lots, two of which are planned for residential development.
- 1.4 The seventeen trees appear to be remnant of the original vegetation. However, the land is not identified as being of biodiversity significance. Eight of the trees exhibit poor vigour are in irreversible decline and assessed with short useful life expectancies. There is unlikely to be any impact, or it is feasible the residential layout can be designed to accommodate five trees of high retention value and two trees of low retention value. The proposed subdivision, lot distribution, proposed regrading and likely building footprints is a major TPZ encroachment and will require the removal of four trees of high retention value and six trees of low retention value.

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 current age, condition, vitality and life span of the species (refer Appendix B).
- 2.3 A Significance of a Tree Assessment Rating System (STARS) was determined. A STARS rating establishes the contribution of a tree 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 tree age were estimated. Diameter at Breast Height (DBH) and Diameter Above Root Buttress (DRB) were estimated.
- 2.6 The comments and recommendations in this report are based on findings from site inspections in October 2015 and 27 October 2021.
- 2.7 To maintain continuity tree numbers correspond to the Preliminary Arboricultural Assessment Report dated 10 November 2015 by Glenyss Laws.
- 2.8 A list of literature used in the preparation of this report is provided in the bibliography section.

2.9 Plans and documents sighted in the preparation of the report include:

- Plan of Detail and Levels dated 28/7/20 Version A by Richard Hogan and Company.
- Engineering Plans Sheet No DA101 Issue A dated 14/12/21 b J Wyndham Prince
- Flora and Fauna Assessment – Dilga Crescent, Erskine Park, dated 15/12/21 prepared by Eco Logical Australia.

3 Observations

3.1 The Site

3.1.1 The subject site is identified as Lot 148, DP 703879, 9A Dilga Cres, Erskine Park. The site is located on the northern side of Dilga Cres and is bounded by residential properties to the east and west and Erskine Park Rd to the north (refer Figure 1).

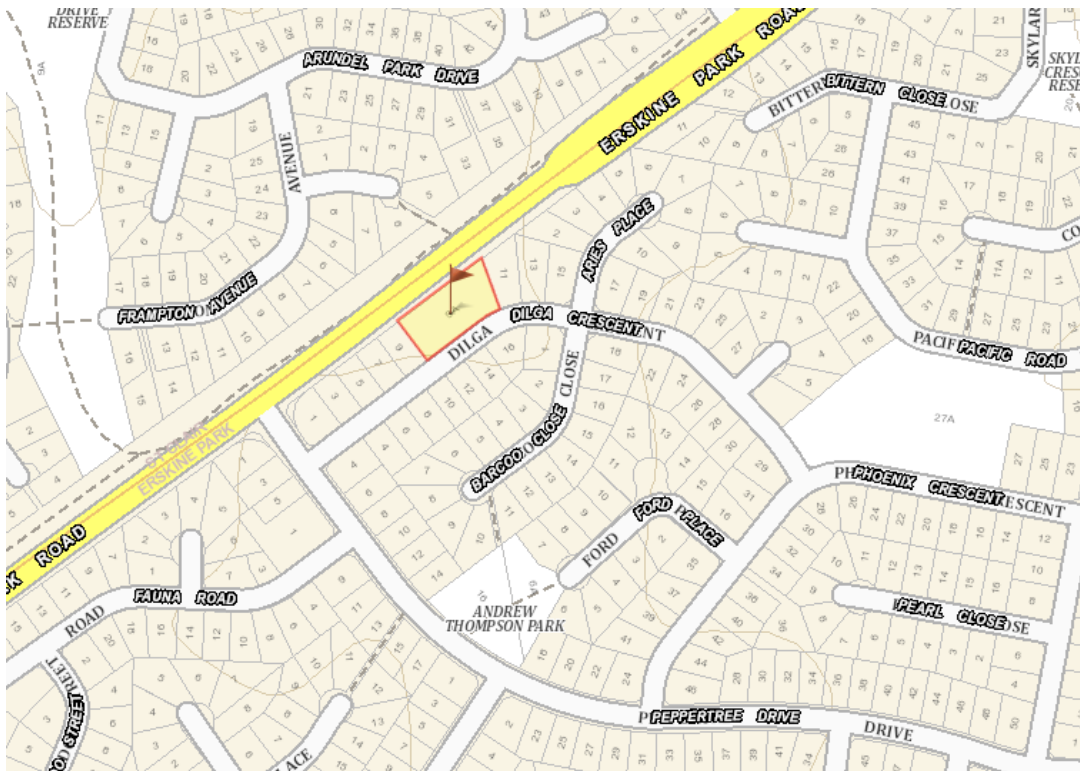


Figure 1. Location Dilga Reserve, Erskine Park (Source NSW Six Maps <https://maps.six.nsw.gov.au/>)

3.2 The Trees

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

3.2.2 Trees 1 – 4 assessed in the 2015 Preliminary Report were not evaluated as these trees are setback > 15m to the proposed subdivision boundary and therefore no impacts within the root zone of these trees is expected.

3.2.3 Several trees have been removed since the 2015 site inspection including Trees 5, 13, 17 and four trees belonging to the cluster of trees identified as Tree 22.

4 Discussion

4.1 Tree Protection, Ecological and Heritage Significance

4.1.1 Tree Management Controls for Penrith City Council applies under DCP 2014 and SEPP 2017 – Vegetation in Non-Rural Areas and State Environmental Planning Policy No 19—Bushland in Urban Areas. The Tree Management Controls protect:

- Any native tree (both living and dead) or other vegetation that is on land zoned E2 Environmental Conservation in the Penrith LEP 2010 Land Zoning Map, or on natural resources sensitive land identified in the Penrith LEP 2010 Natural Resources Sensitivity Land Map.
- In all areas, any native vegetation community including remnant native vegetation.
- In all areas, any tree or other vegetation whether native or introduced having a height of 3.5 metres or more or a trunk diameter exceeding 100mm at 1.4m above ground level.
- Any tree or other vegetation that is, or forms part of, a heritage item or is within a heritage conservation area.
- Any tree or other vegetation that is culturally, socially or biologically significant or a unique specimen and has been formally recognised by an appropriate government authority (e.g. a significant tree or vegetation register).

4.1.2 The land does not fall within a Heritage Conservation Area nor is the property listed as an item of heritage under Sheet HER 020 of LEP 2010.

4.1.3 The property is not identified as being of sensitive land within Council's LEP 2010 Natural Resources Sensitivity Land Map, Sheet NRL020. Nor is the property identified as being of biodiversity significance within the NSW Department of Planning, Industry and Environment Biodiversity Values Map (refer Figure 2).

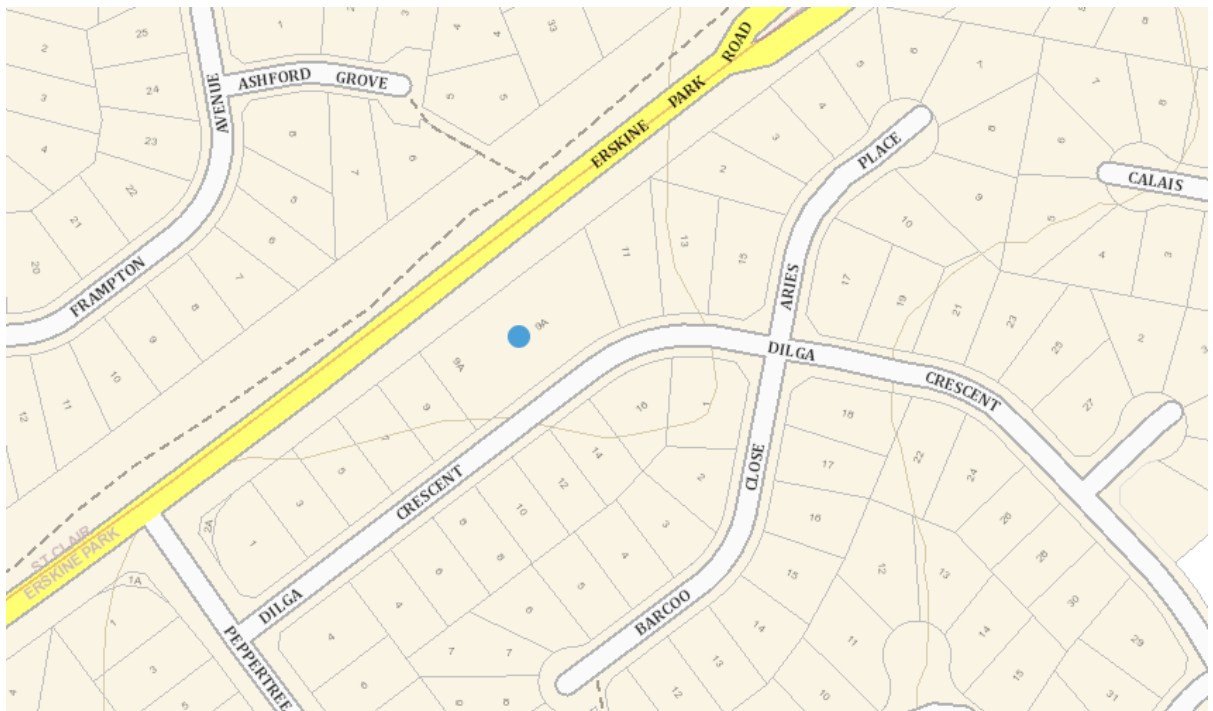


Figure 2. NSW Biodiversity Map (Source NSW Department of Planning Industry and Environment <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap> accessed 18/11/21).

4.2 Tree Retention Value and Landscape Significance

4.2.1 A tree's significance and retention value can be determined 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, street trees and trees on adjoining properties are given a high priority for retention in the design process.

Trees 7, 8, 11, 12, 18, 19, 20, 22a & 22c fall in this category

4.2.3 Trees of high landscape significance with a short ULE should not be given importance for preservation, as these trees are considered to be short term prospects only and are best replaced with advanced good quality stock.

Trees 6, 9, 10, 12, 14, 15, 16, 21 & 22b

4.3 AS4970-2009 Protection of trees on development sites

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 1.4 metres above ground level x 12 (refer Table 1 for calculated TPZ's). **The TPZ is a radial distance measured from the centre of the tree's trunk to the edge of proposed works.** The TPZ is an exclusion zone where construction, trenching, soil level changes and use of machinery is avoided. Under AS4970 the minimum TPZ that can be applied is 2m and the maximum is 15m.

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 AS4970-2009 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 AS4970-2009 a minor encroachment of 10% of the area is allowable, provided this is compensated for elsewhere and adjacent to the TPZ (refer Appendix E). Should more than a 10% encroachment occur then the Project Arborist must demonstrate the trees longevity and viability can be maintained.

4.3.5 Under Clause 3.3.4 of AS4970 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
- or tree sensitive design construction such as pier and beam, suspended slab systems or discontinuous footings which may minimise the impact upon a tree's root system.

Tree No	DBH (cm)	DRB (cm)	TPZ Radius (m)	TPZ Area (m ²)	SRZ Radius (m)
6	33	40	4.0	49	2.3
7	48	55	5.8	104	2.6
8	41	52	4.9	76	2.6
9	36	45	4.3	59	2.4
10	34	45	4.1	52	2.4
11	61	72	7.3	168	2.9
12	48	59	5.8	104	2.7
14	47	60	5.6	100	2.7
15	58	52	7.0	152	2.6
16	22	29	2.6	22	2.0
18	45	54	5.4	92	2.6
19	50	59	6.0	113	2.7
20	42	50	5.0	80	2.5
21	39	54	4.7	69	2.6
22a	32	39	3.8	46	2.3
22b	27	37	3.2	33	2.2
22c	39	42	4.7	69	2.3

Table 1. Tree Protection and Structural Root Zones

4.4 Proposed Subdivision Impacts

4.4.1 Tree 6, works within the 4.0m TPZ include:

- Proposed stormwater pit offset ~3.9m to the north

The stormwater pit accounts for < 0.5m² or < 1% of the TPZ, this minor and acceptable encroachment under clause 3.3.2 of AS4970.

4.4.2 Tree 7 works within the 5.8m TPZ include:

- Proposed stormwater line and pit offset ~3.1m to the north.

The stormwater covers an area of ~ 9.6m² or 9.2% of the TPZ, this minor and acceptable encroachment under clause 3.3.2 of AS4970.

4.4.3 Tree 8, no encroachment of the 4.9m TPZ is proposed.

4.4.4 Tree 9, works within the 4.3m TPZ and 2.4m SRZ include:

- Regrading of the site up to 0.5m of fill offset ~1.7m

Raising soil levels suffocates a tree's root system and can be fatal if a substantial part of the root system is buried. In addition, *Eucalyptus species* have a poor tolerance to soil fill (Leake undated). The proposal accounts for ~ 11m² or 18.6% and is a major TPZ/SRZ encroachment. Tree 9 is in irreversible decline and recommended for removal.

4.4.5 Tree 10, works within the 4.1m TPZ and 2.4m SRZ include:

- Regrading with up to 0.5m of fill offset ~0.5m

Eucalyptus species have a poor tolerance to soil fill (Leake undated). The proposal accounts for ~21.m or 41.5% of the TPZ. Tree 10 is in irreversible decline and recommended for removal.

4.4.6 Tree 11, works within the 7.3m include:

- Regrading with up to 0.5m of fill offset ~ 5.8m

The proposal accounts for ~4.5m² or 2.7% of the TPZ. The proposal is in keeping with a minor and acceptable encroachment under clause 3.3.2 of AS4970.

4.4.7 Given their location within proposed Lots 1 & 2, Trees 12, 14, 15, 16, 18, 19, 20 & 21 will fall within the footprint of the proposed regrading and any future building footprint will constitute a major TPZ/SRZ encroachment.

4.4.8 Without a proposed building footprint or design guidelines it is difficult to determine the future residential layout. However, it is considered with good design and adequate setbacks it is feasible to retain Trees 22a, 22b and 22c.

5 Conclusions/Recommendations

5.1 Seventeen (17) trees within 9A Dilga Crescent, Erskine Park were assessed. The proposal seeks to subdivide the land to create three lots, two of which will be residential.

5.2 The sixteen trees appear to be remnant of the original vegetation. However, the property is not identified as being of biodiversity significance within the NSW Department of Planning, Industry and Environment Biodiversity Values Map. Seven of the trees exhibit poor vigour, are in irreversible decline and assessed with short useful life expectancies.

5.3 Trees 1 – 4 were not assessed as they will not be impacted on by the residential development.

5.4 There is unlikely to be any impact, or it is feasible the residential layout can be designed to accommodate the TPZ's of seven (7) trees, including five (5) trees of high retention value and two (2) trees of low retention value (refer Table 2).

High Retention	Less Critical for Retention	Low Retention
7, 8, 11, 22a & 22C	-	6 & 22b

Table 2. Trees which may be retained dependent upon residential layout

5.5 The proposed engineering design, site regrading and the location of trees in relation to Lots 1 & 2 will constitute a major TPZ/SRZ encroachment upon ten (10) trees, this includes four (4) trees of high retention value and six (6) trees of low retention value.

High Retention	Less Critical for Retention	Low Retention
12, 18, 19 & 20	-	9, 10, 14, 15, 16 & 21

Table 3. Trees which will require removal.

- 5.6 Appropriate setbacks to guide the underground services, building and driveway layout is provided in Table 1 to guide future residential development for retained trees.
- 5.7 The retained trees shall be protected in accordance with the following Arboricultural Method Statement and Tree Management Plan.

6 Arboricultural Method Statement

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 A pre-commencement site meeting shall take place between the Project Manager and the Project Arborist, the meeting is to take place before any development activity to determine specific arboricultural inspections and required tree protection.
- 6.1.3 Development Stage is subject to site monitoring by the Project Arborist at intervals as agreed at the pre-commencement site meeting. 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.
- 6.1.4 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.
- 6.1.5 Any breaches to the Arboricultural Method Statement shall be reported immediately.
- 6.1.6 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 Site 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	The Site 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 Site 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 Site 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 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 Tree Protection shall consist of a 1.8m high chain link temporary fencing erected at the distances nominated in Appendix F - Tree Protection Plan.
- 6.2.3 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.
- 6.2.4 Once erected, the TPF shall be regarded as sacrosanct and shall not be removed or altered without prior agreement of the project arborist.
- 6.2.5 Attention shall be given to ensuring the TPZ remains rigid and complete and excludes all construction activity and storage of materials.
- 6.2.6 If works occur within the TPZ the Project Arborist shall determine if appropriate ground protection is required. 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 F.
- 6.2.7 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 fences 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.

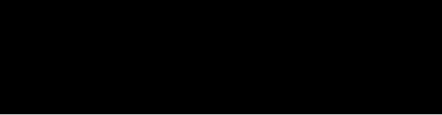
6.7 Soft and Hard Landscaping

- 6.7.1 Installation of soft or hard landscaping including paving, turf or plant material within the TPZ shall be undertaken by hand.
- 6.7.2 Planting holes are to be hand dug with a shovel or garden trowel.

6.8 Breach of tree protection

- 6.8.1 Any above or below ground damage (including soil compaction) to a protected tree shall be reported to the Project Arborist immediately.
- 6.8.2 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 arborist report should be directed to the undersigned.



Glenyss Laws

Graduate Certificate in Arboriculture, The University of Melbourne (AQF Level 8)
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ISA Tree Risk Assessment Qualified Assessor (2014)
Member I.A.C.A., A.I.H & I.S.A
Qualified and Practicing Arborist/Horticulturist.
Since 1997

Assumptions/Disclaimer

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However, Glenyss Laws – Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

- 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.
- Any tree, whether it has a visible weakness or not, will fail if the forces applied exceed the strength of the tree or its parts.



BIBLIOGRAPHY/REFERENCES

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Standards Australia (2007), AS4970-2009 Protection of trees on development sites.

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	STARS	ULE	Root Zone/ Defects/ Services	Comments
6	<i>Eucalyptus moluccana</i> (Grey Box)	O	330	400	19	3	1	C	1	3	Gr,C/-/-	
7	<i>Eucalyptus moluccana</i> (Grey Box)	M	480	550	19	12	3	D	1	2	Gr,C/F/-	2 x 1 st order eastern branch failures.
8	<i>Eucalyptus moluccana</i> (Grey Box)	M	410	520	21	12	3	C	1	2	Gr, C/W/-	Wound in lower trunk to west measures 70cm x 6cm wound wood development is excellent.
9	<i>Eucalyptus moluccana</i> (Grey Box)	O	360	450	24	7	1	C	1	3	Gr, C/B, W/-	Wound in lower trunk covers ~50% of trunk circumference.
10	<i>Eucalyptus moluccana</i> (Grey Box)	O	340	450	22	3	1	C	1	4	Gr, C/W/-	Wound in lower trunk to west measures 60cm x 3cm with excellent development of wound wood. High volumes of deadwood < 150mm in diameter. Canopy comprised of epicormic growth. Tree in irreversible decline consider removal.
11	<i>Eucalyptus moluccana</i> (Grey Box)	M	610	720	24	14	3	C	1	2	Gr,C/-/-	
12	<i>Eucalyptus moluccana</i> (Grey Box)	M	480	590	22	9	3	C	1	2	Gr, C/-/-	Canopy holds high volumes of deadwood < 100mm in diameter.
13	Removed											Removed since 28/7/20 Survey by Richard Hogan and Company
14	<i>Eucalyptus moluccana</i> (Grey Box)	O	470	600	16	9	2	C	1	3	Gr, C/W/-	Soil movement and cracking within root zone likely due to removal of nearby tree coupled with increased wind loading. Specimen may be prone to failure in inclement weather conditions, consider tree removal.
15	<i>Eucalyptus moluccana</i> (Grey Box)	O	240 & 280	520	15	9	2	C	1	3	Gr, C/-/-	Borer infestation in lower trunk with associated decay measuring 1.2m x 15cm

Tree No	Tree Species	Age class	DBH (mm)	DRB (mm)	Tree height (m)	Crown diameter (m)	Crown condition	Crown class	STARS	ULE	Root Zone/ Defects/ Services	Comments
16	<i>Eucalyptus moluccana</i> (Grey Box)	O	220	290	15	2	2	C	1	4	Gr, C/W/-	Wound to north in lower trunk 35cm x 5cm – average wound wood development. Complete dieback of leader.
17	Removed											Removed since 28/7/20 Survey by Richard Hogan and Company
18	<i>Eucalyptus fibrosa</i> (Red Ironbark)	M	450	540	15	9	3	C	1	2	Gr, C/-/-	Forms co-dominant leaders at 2m, union appears sound.
19	<i>Eucalyptus tereticornis</i> (Grey Gum)	M	500	590	22	12	3	C	1	2	Gr, C/D/-	
20	<i>Eucalyptus moluccana</i> (Grey Box)	M	420	500	22	7	3	C	1	2	Gr, C/-/-	Holds medium volumes of deadwood < 100mm in diameter.
21	<i>Eucalyptus moluccana</i> (Grey Box)	M	390	540	17	10	2	C	1	3	Gr,C/W/-	Small wound in basal region with good wound wood development.
22a	<i>Eucalyptus moluccana</i> (Grey Box)	M	320	390	18	9	3	C	1	2	Gr, C/-/-	
22b	<i>Eucalyptus moluccana</i> (Grey Box)	O	270	370	15	5	2	S	1	3	Gr, C/-/-	
22c	<i>Eucalyptus moluccana</i> (Grey Box)	M	390	420	15	6	3	C	1	2	Gr, C/-/-	

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 if all design options have been exhausted & 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 Spread:	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 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					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
<u>Legend for Matrix Assessment</u>						
	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.					
	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.					
	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.					
	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

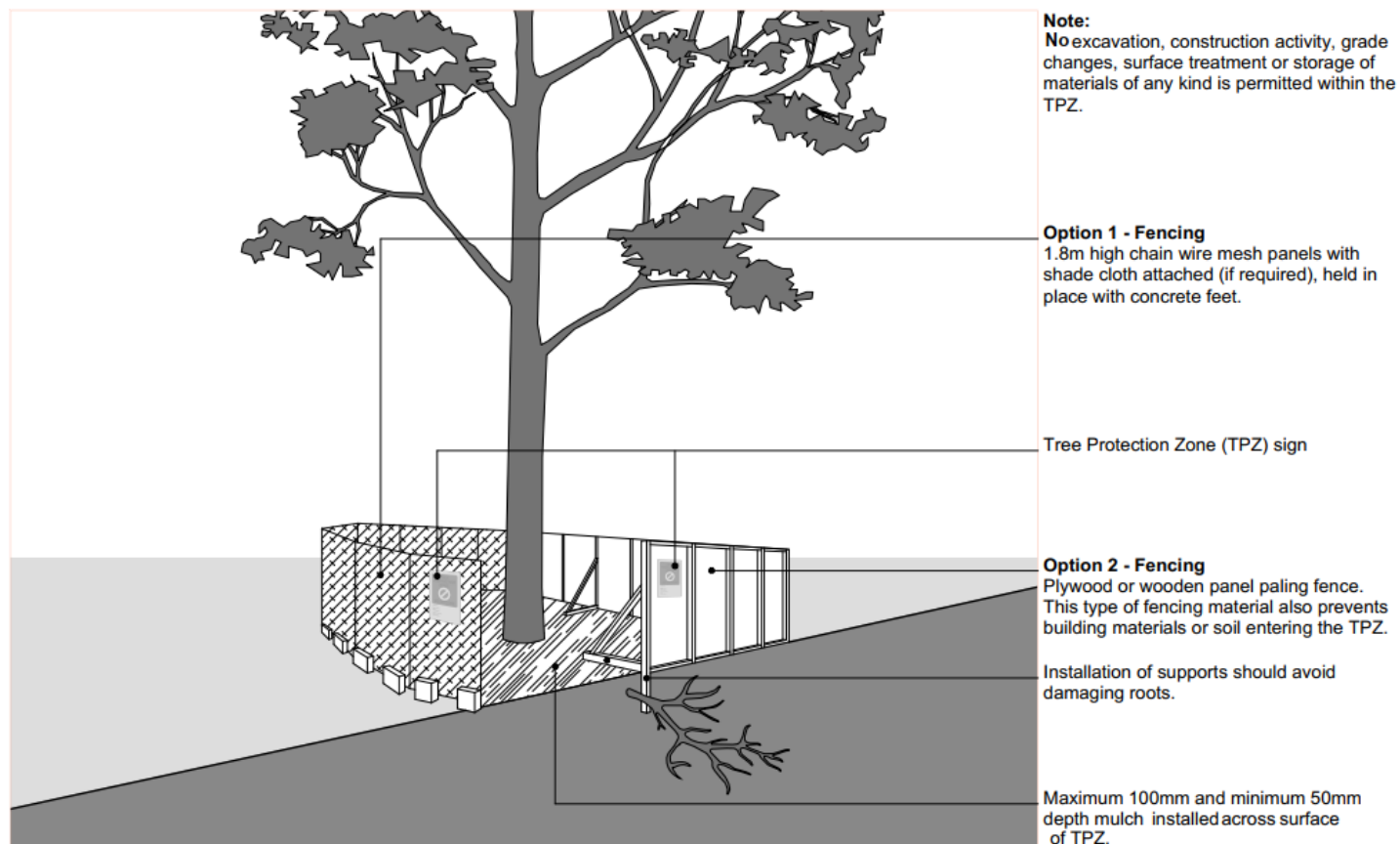


Figure 3. Tree 9 Significant borer damage encompassing 50% of trunk circumference

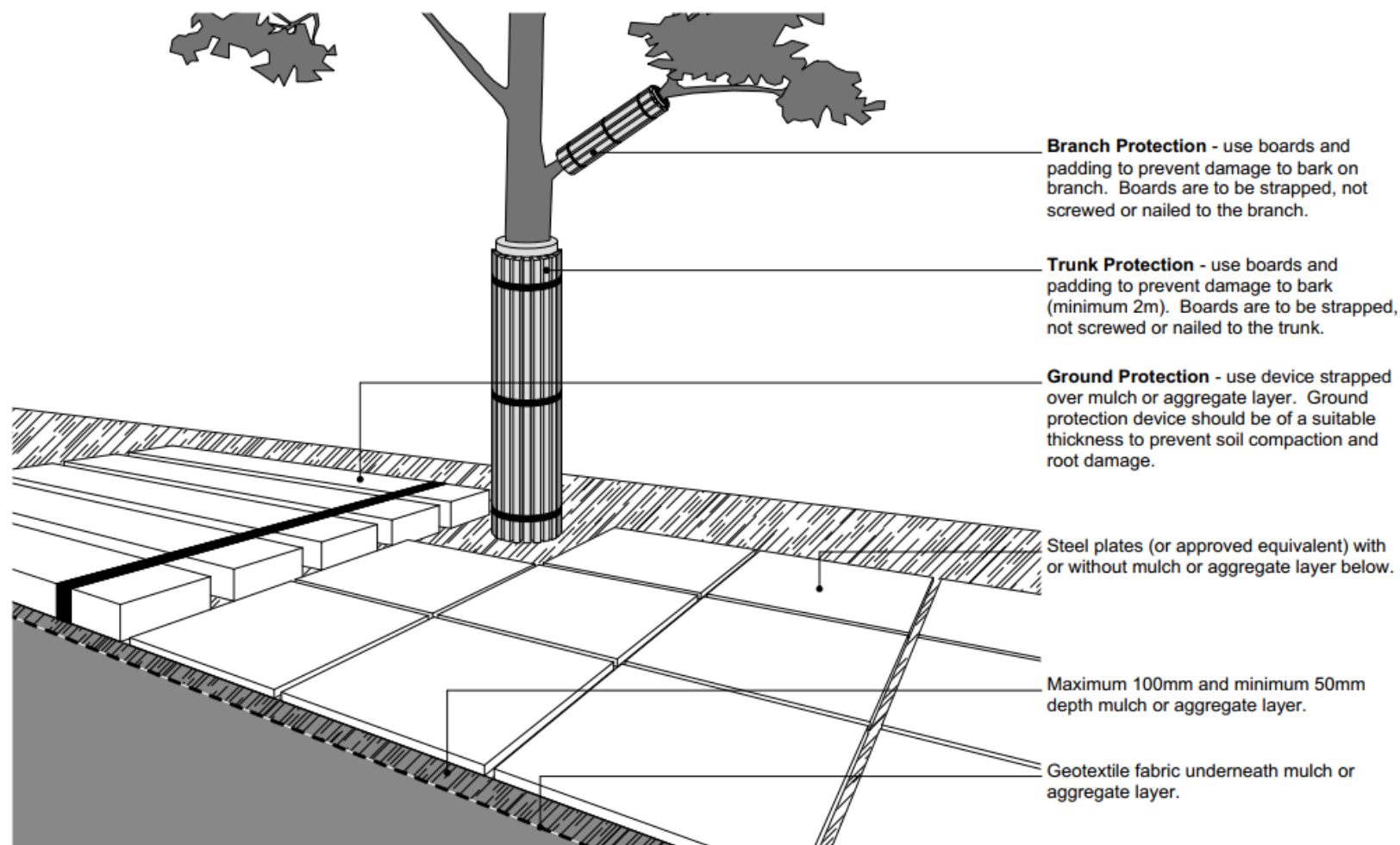


Figure 4. Subject trees

APPENDIX E Examples of Tree Protection Measures

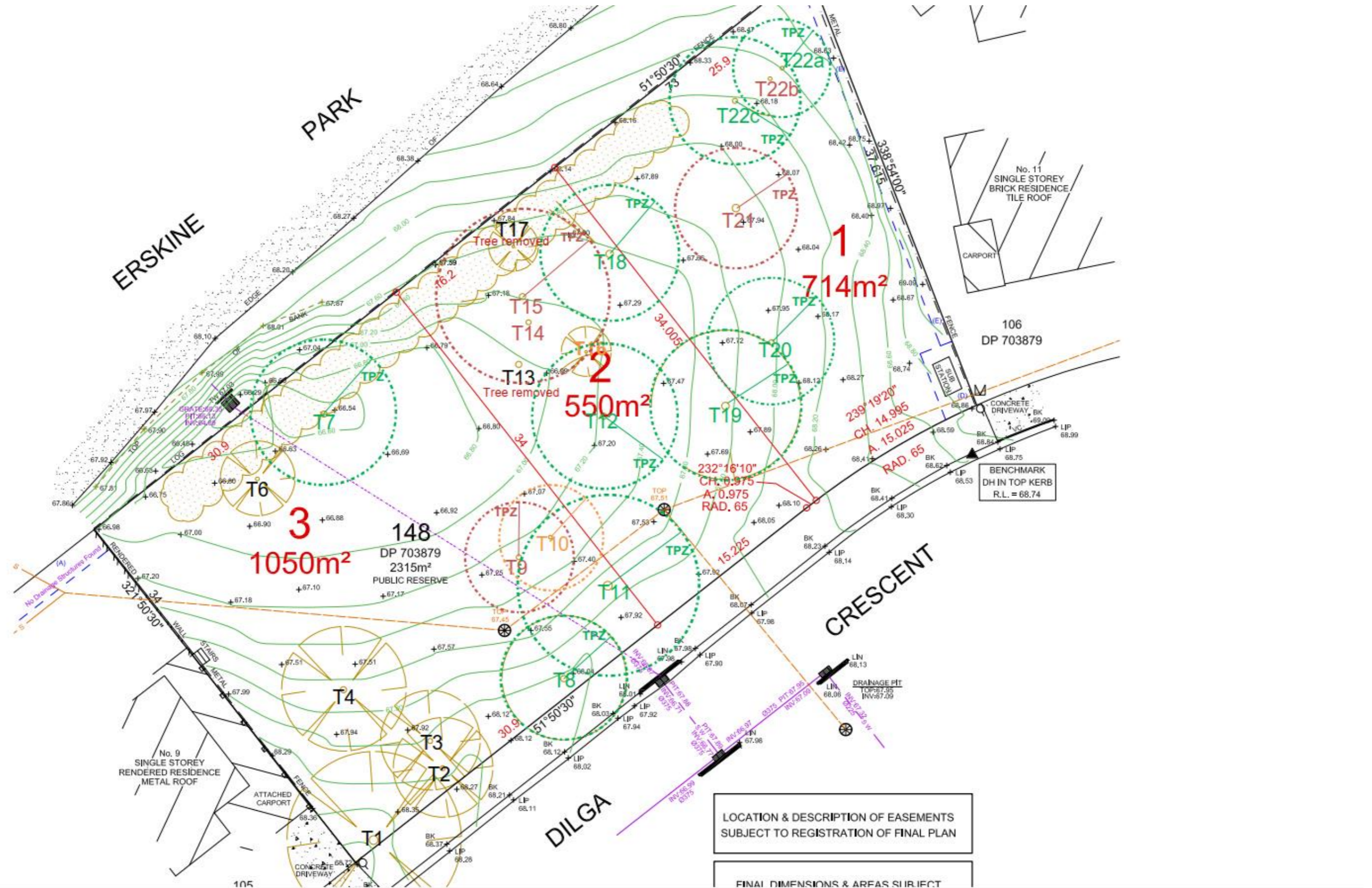


Tree Protection Fencing



Examples of Branch, Trunk and Ground Protection

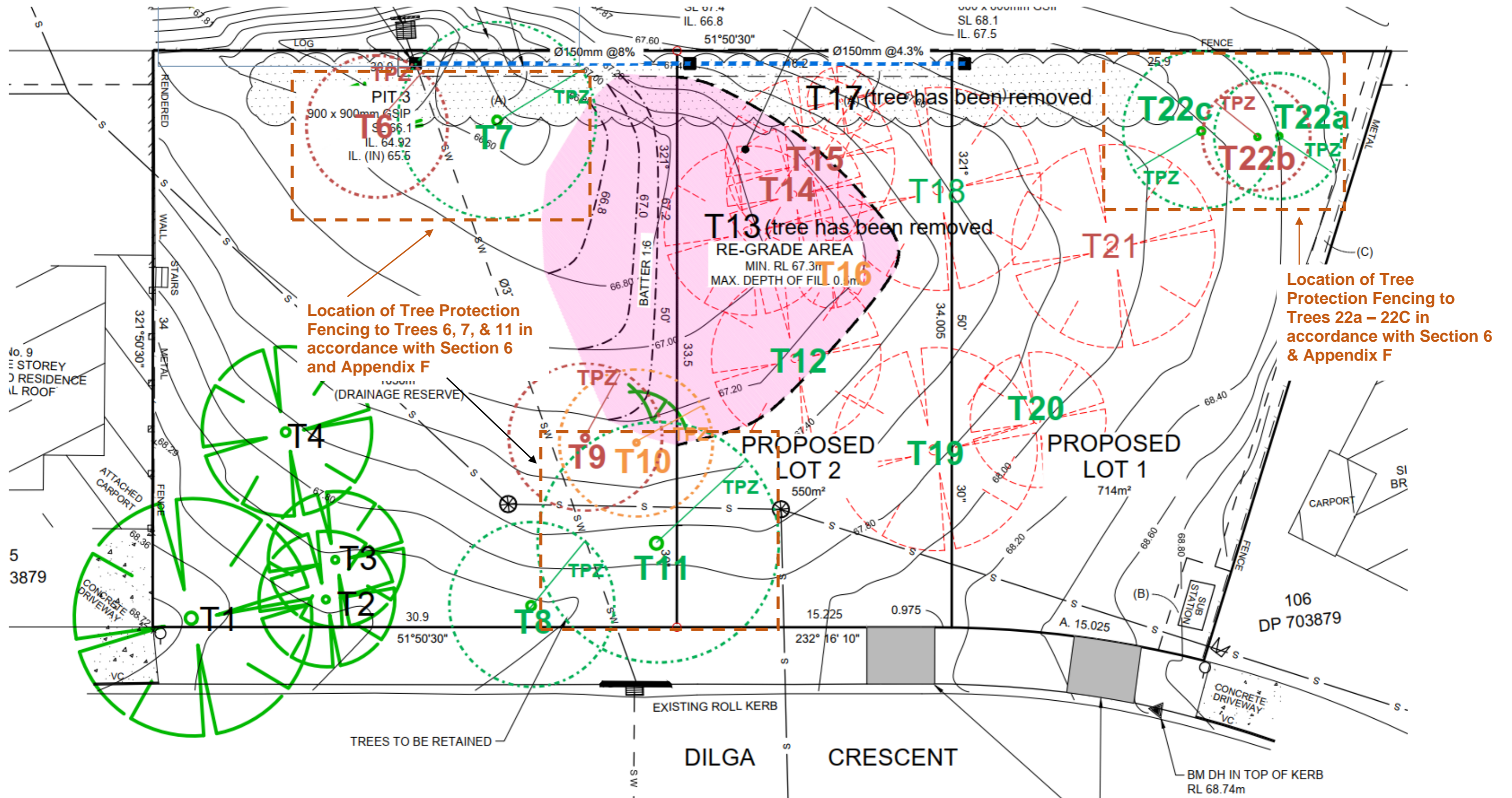
APPENDIX F
Subdivision Plan and Tree Protection Zones



Plan of Detail and Levels 28/7/20 Version A by Richard Hogan and Company.

Prepared by Glenyss Laws
Consulting Arborist

Engineering and Tree Protection Plan



Location of Tree Protection Fencing to Trees 6, 7, & 11 in accordance with Section 6 and Appendix F

Location of Tree Protection Fencing to Trees 22a – 22C in accordance with Section 6 & Appendix F

Engineering Plan Sheet No DA101 Issue A 14/12/21 J Wyndham Prince