

Arboricultural Impact Assessment



Figure 1 Trees 7 – 10 *Eucalyptus moluccana* adjacent to the site entry

Site Address: 10 Lomas Lane Nulkaba, NSW

Client: St Philips Christian College

Date: December 2024 (Amendment)

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1.0 Summary

Accurate Tree Assessment has been commissioned by St Philips Christian College (the client) to provide an assessment of development impact for twenty-seven (27) trees located on the property at 10 Lomas Lane Nulkaba, NSW in conjunction with the State Significant Development Application (SSD) for proposed alterations and additions to the School's Cessnock Campus.

The property is zoned SP2 Educational Establishment; the property is mainly cleared with areas of lawn, gardens and hardstand making up the landscape. Native vegetation which includes the subject trees is subject to the provisions of the Local Land Services Amendment Act 2016.

Conclusions

The proposed construction of the bus turning area necessitates the removal of five (5) remnant native trees.

The proposed construction of the library/chapel building necessitates the removal of four (4) planted native trees.

The removal of nine (9) native trees will cause a minor environmental and landscape amenity impact that can be offset by replacement planting.

The retention of eighteen (18) trees will require the implementation of protection measure meeting the provisions of the Australian Standard AS4970-2009, Protection of Trees on Development Sites.

Recommendations

That Trees 7-9, 11, 12 and 24-27 are approved for removal to facilitate the proposed development in its current form subject to the provision of compensatory replacement planting of endemic native trees within the boundary of the subject site.

That all tree work is carried out by a suitably qualified and insured contracting arborist, in accordance with the Safework NSW Draft Code of Practice for Tree Works and Australian Standard AS4373-2007, "Pruning of Amenity Trees".

That trees 1 to 6, 10, 13 to 23 are retained and protected by the installation of protective fencing and armouring of the trunks as detailed in Section 4 of AS4970-2009, Protection of Trees on Development Sites as detailed at sections 9.0, 9.1 and appendices 12.3a – 12.3.b of this report

That all tree protection measures are implemented prior to the commencement of works and maintained in serviceable condition for the duration of the project.

2.0 Disclaimer

This report is to be read and considered in its entirety. The subject trees were inspected from the ground using Visual Tree Assessment methodology. No aerial investigations, underground or internal investigations were undertaken. It is the responsibility of the client to implement all recommendations contained in this report.

The assessment is made having regard for the prevailing site conditions; and does not account for the effects that extreme weather events may have on trees.

Information contained in this report reflects the condition of the trees at the time of the inspection. As trees are living organisms their condition will change over time, there is no guarantee that problems or deficiencies of the subject trees may not arise in the future. It must be accepted that living near trees involves some level of risk.

This report is for the use of the client, their contractors, and Cessnock City Council to assist in determining the tree management measures to be undertaken in conjunction with the proposed development. Distribution to other parties is not permitted except with the express permission of the author, Ian Hills.

3.0 Brief

Accurate Tree Assessment has been commissioned by St Philips Christian College (the client) to provide an assessment of development impact for twenty-seven (27) trees located around the entrance to the property at 10 Lomas Lane Nulkaba, NSW in conjunction with the State Significant Development Application (SSD) for proposed alterations and additions to the School's Cessnock Campus.

4.0 Method

A site inspection was carried out on 15 October 2021; the assessment of the trees was made using Visual Tree Assessment (VTA) procedure (Matheny & Clark, 1994), (Mattheck & Breloer, 2004) having regard for the provisions of AS4970-2009, *'Protection of Trees on Development Sites'*.

Tree height was determined using a Nikon Forestry Pro™ hypsometer. Tree canopy spread was estimated. The DBH was determined using a standard arboricultural diameter tape.

Trees have been tagged and allocated a number which is marked on the survey plan provided and will be used as reference throughout this report.

4.1. Documents

The following document(s) have been reviewed in the preparation of this assessment:

- Survey Plan prepared by Marshall Scott, Ref. No. 22972, DWG 22972-DET.DWG, dated 23 July 2021 (Appendix 12.2)

5.0 Site Conditions

The property is zoned SP2 Educational Establishment; the property is mainly cleared with areas of lawn, gardens and hardstand making up the landscape. The subject trees are remnant native species and are protected under the NSW Biodiversity Conservation Act 2016 (BCA) and the provisions of the Local Land Services Amendment Act 2016. (LLS)

The development site is approximately 9ha and has a Northerly aspect.

According to data from the Office of Environment and Heritage the soil landscape is mapped as Branxton (SI5601bx), which has the following characteristics:

“This landscape covers undulating low hills and rises with many small creek flats, extending over a large area between Singleton and Cessnock. The main soils are Yellow Podzolic Soils on mid-slopes with Red Podzolic Soils on crests. Yellow Soloths occur on lower slopes and in drainage lines. Alluvial Soils occur in some creeks with Siliceous Sands on flats within large valleys. Some acid topsoil problems are encountered in the area. (NSW Environment and Heritage, 2021)

The natural soil profile has been disturbed by construction and is likely to contain proprietary soil mixes associated with landscaping of the site

According to climate data from the weather station at Cessnock Airport, which is approximately 2 kilometres from the site, the district experiences frequent occurrences of winds over 40km/h with North-westerly winds prevailing (Willy Weather, 2021), the subject trees are exposed to winds from all directions.



Figure 2 Site location (Barr Planning, 2022)

6.0 Tree Assessment

No	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	HEIGHT (M)	SPREAD (M)	Vigour	Age Class	SULE	Comments
1	Grey Box	<i>Eucalyptus moluccana</i>	0.66	7.92	2.85	20	18	g	m	2a	Minor deadwood noted, canopy bias to South, co-dominant trunks from 3 metres, reaction wood below union
2	Grey Box	<i>Eucalyptus moluccana</i>	0.53	6.36	2.80	20	12	av	m	2a	Minor deadwood noted suppressed by nearby trees
3	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.35	4.2	2.25	12	8	av	sm	3a	Minor deadwood noted suppressed by nearby trees
4	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.36	4.32	2.25	14	8	g	sm	2a	Minor deadwood noted suppressed by nearby trees
5	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.42	5.04	2.47	18	14	g	m	2a	Minor deadwood noted, canopy bias to North. Superficial wound on trunk at 1 metre
6	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.4	4.8	2.43	15	11	g	m	2a	Minor deadwood noted, canopy bias to North.
7	Grey Box	<i>Eucalyptus moluccana</i>	0.56	6.72	2.81	20	11	g	m	2a	Minor deadwood noted, canopy bias to South
8	Grey Box	<i>Eucalyptus moluccana</i>	0.38	4.56	2.43	18	10	g	m	2a	Minor deadwood noted, otherwise appears structurally sound
9	Grey Box	<i>Eucalyptus moluccana</i>	0.5	6	2.74	18	9	av	m	3a	Sparse canopy, wound seam at base
10	Grey Box	<i>Eucalyptus moluccana</i>	0.31	3.72	2.37	12	5	av	sm	2a	Minor deadwood noted suppressed by nearby trees
11	Grey Box	<i>Eucalyptus moluccana</i>	0.15	2	1.61	8	2	g	j	2a	Appears structurally sound
12	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.38	4.56	2.37	16	9	g	m	2a	Minor deadwood noted, otherwise appears structurally sound
13	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.68	8.16	2.67	16	11	av	m	3a	Minor deadwood noted, included fork union at 1.5 metres
14	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.2	2.4	1.85	10	2	av	sm	2a	Minor deadwood noted suppressed by nearby trees

No	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	HEIGHT (M)	SPREAD (M)	Vigour	Age Class	SULE	Comments
15	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.56	6.72	2.78	18	16	g	m	2a	Minor deadwood noted, canopy bias to North.
16	Forest Red Gum	<i>Eucalyptus tereticornis</i>	.48, .12	5.88	2.63	16	12	g	m	2a	Minor deadwood noted, otherwise appears structurally sound
17	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.25	3	2.00	9	1	p	om	4a	Damaged, entire canopy comprised of epicormic growth
18	Grey Box	<i>Eucalyptus moluccana</i>	0.1	2	1.68	5	1	g	j	1a	Appears structurally sound
19	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0	3.12	2.13	14	9	av	m	2a	Sparse canopy, minor deadwood noted
20	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.31	3.72	2.37	16	9	g	m	2a	Minor deadwood noted, canopy bias to South
21	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.2	2.4	1.94	9	4	g	sm	2a	Minor deadwood noted, otherwise appears structurally sound
22	Forest Red Gum	<i>Eucalyptus tereticornis</i>	0.1	2	1.50	3	1	g	j	1a	Appears structurally sound
23	Forest Red Gum	<i>Eucalyptus tereticornis</i>	.33, .37	6	2.59	12	9	g	m	1a	Co-dominant trunks from base, no included bark, appears structurally sound
24	Grey Gum	<i>Eucalyptus punctata</i>	0.2	2.4	1.7	5.4	4	g	sm	1a	Appears structurally sound, co-dominant leaders
25	Prickly-leaved Paperbark	<i>Melaleuca stypheliodes</i>	0.1	2	1.5	3.6	3	g	sm	5a	Appears structurally sound
26	Prickly-leaved Paperbark	<i>Melaleuca stypheliodes</i>	0.1	2	1.5	3.2	2	g	sm	5a	Appears structurally sound
27	Coast Banksia	<i>Banksia integrifolia</i>	0.12	2	1.5	3	3	g	sm	5a	Appears structurally sound, minor asymmetry

DBH – Trunk diameter at 1.4 metres

Vigour - P = Poor, F = Fair, Av = Average, G = Good

Age class – J = Juvenile, SM = Semi-mature M = Mature, OM = Over mature

TPZ = Tree Protection Zone (calculated in accordance with AS4970)

SRZ = Structural Root Zone (calculated in accordance with AS4970)

SULE = Safe Useful Life Expectancy (Barrel, J. 1993-5) Appendix 12.1

7.0 Tree Retention Value

No.	Species	Health and Vigour	Condition	Suitability	Sustainability	Landscape rating	Retention Value	Encroachment level*	Proposal
1	<i>Eucalyptus moluccana</i>	Good	Good	High	15-40 years	2	High	*12% TPZ	Retention
2	<i>Eucalyptus moluccana</i>	Average	Good	High	15-40 years	2	High	*25% TPZ *2% SRZ	Retention
3	<i>Eucalyptus tereticornis</i>	Average	Good	High	5-15 years	3	Moderate	*14% TPZ	Retention
4	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	*15% TPZ/SRZ	Retention
5	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	*31% TPZ *13%SRZ	Retention
6	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	10% TPZ	Retention
7	<i>Eucalyptus moluccana</i>	Good	Good	High	15-40 years	2	High	50% TPZ 50% SRZ	Removal
8	<i>Eucalyptus moluccana</i>	Good	Good	High	15-40 years	2	High	60% TPZ/SRZ	Removal
9	<i>Eucalyptus moluccana</i>	Average	Good	High	5-15 years	3	Moderate	100% TPZ/SRZ	Removal
10	<i>Eucalyptus moluccana</i>	Average	Good	High	15-40 years	2	High	10% TPZ	Retention
11	<i>Eucalyptus moluccana</i>	Good	Good	High	15-40 years	2	High	100% TPZ/SRZ	Removal
12	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	57% TPZ/SRZ	Removal
13	<i>Eucalyptus tereticornis</i>	Average	Good	High	5-15 years	3	Moderate	10% TPZ	Retention
14	<i>Eucalyptus tereticornis</i>	Average	Good	High	15-40 years	2	High	10% TPZ	Retention
15	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	11% TPZ	Retention
16	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	18% TPZ	Retention
17	<i>Eucalyptus tereticornis</i>	Poor	Poor	High	< 5years	4	Very low	10% TPZ	Retention

No.	Species	Health and Vigour	Condition	Suitability	Sustainability	Landscape rating	Retention Value	Encroachment level*	Proposal
18	<i>Eucalyptus moluccana</i>	Good	Good	High	40+ years	2	High	Nil	Retention
19	<i>Eucalyptus tereticornis</i>	Average	Good	High	15-40 years	2	High	Nil	Retention
20	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	Nil	Retention
21	<i>Eucalyptus tereticornis</i>	Good	Good	High	15-40 years	2	High	*26% TPZ 18% SRZ	Retention
22	<i>Eucalyptus tereticornis</i>	Good	Good	High	40+ years	2	High	*19% TPZ SRZ 10%	Retention
23	<i>Eucalyptus tereticornis</i>	Good	Good	High	40+ years	1	High	*29% TPZ 6%SRZ	Retention
24	<i>Eucalyptus punctata</i>	Good	Good	High	40+ years	4	Moderate	100% TPZ/SRZ	Removal
25	<i>Melaleuca stypheliodes</i>	Good	Good	High	15-40 years	4	Moderate	100% TPZ/SRZ	Removal
26	<i>Melaleuca stypheliodes</i>	Good	Good	High	15-40 years	4	Moderate	100% TPZ/SRZ	Removal
27	<i>Banksia integrifolia</i>	Good	Good	High	15-40 years	4	Moderate	100% TPZ/SRZ	Removal

Health and Vigour – based on production of new growth and wound occlusion Av = Average, P = Poor, F = Fair.

Condition – based on structural faults or diseases or provides comparison to an archetypal example of the species.

Suitability - High = adequate space to accommodate future growth and good growing conditions, Medium = inadequate growth and good growing conditions, Low = inadequate space and poor growing conditions.

Retention Value – combines Landscape significance and sustainability to rank the trees value (Refer Appendix 12.5)

***existing encroachment**

8.0 Development impact

All parts of a tree may be damaged by construction activities, and the effects of damage are often cumulative meaning that seemingly minor damage to the tree can have adverse effects that may not become apparent until well after the project has been completed.

Crown damage often occurs when machinery impacts branches of the tree resulting in a loss of foliage. As the foliage is where the tree produces the sugars required for healthy growth it therefore stands to reason that any loss of foliage will affect the tree's ability to function normally.

In addition, when branches are torn or improperly pruned the tree's ability to recover is affected and pathogens that cause wood decay or disease have an increased opportunity to penetrate the trees' natural defenses.

Trunk damage is usually caused by mechanical impact, and again wounding predisposes the tree to infection by pathogens.

Root damage is the most common cause of damage to trees on development sites, and often has the most serious effects as it commonly goes unnoticed for some time. Damage can be caused by mechanical factors such as tearing during excavation, as well as factors such as chemical contamination, changes in hydrology and altering gaseous exchange rates by filling, and compaction during movement of equipment.

Australian Standard 4970, *Protection of Trees on Development Sites* was adopted in 2009 to provide Arborists and the construction industry with a guide to assist in the preservation of retained trees on all types of development sites.

To assist professionals working to protect trees the Standard proposes the following:

"Tree Protection Zone - A specified area above and below ground level at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

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

This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be much larger." (Ref. AS4970-2009)

Minor encroachment of the TPZ is sometimes unavoidable and at levels less than 10% of the total TPZ area can be tolerated if there is scope to increase the area of the TPZ contiguously about the unaffected perimeter. Where encroachment exceeds 10% further investigation will be required to determine the measures required to offset the incursion. Encroachment of the SRZ is not recommended as tree health and condition will almost certainly be adversely affected.

9.0 Discussion

The impact of the proposed development on the twenty-seven (27) trees the subject of this report is assessed in conjunction with the site plan provided, that details demolition construction of a new bus turning area from Lomas Lane.

Trees 1-2 *Eucalyptus moluccana* and 3-5 *Eucalyptus tereticornis* are located West of the existing pedestrian entrance in an area of garden that is proposed for retention in conjunction with the proposed development. The trees are subject to existing encroachments from the compacted gravel path ranging from 12% to 31 % of the TPZ's and 0% to 13 % of the SRZ's.

The trees are set back from the proposed road works and are unlikely to be adversely affected by impacts caused by the construction. If the pedestrian walkway is to be removed, consideration should be given to the use of tree sensitive work methods to protect tree roots which are likely to be located just beneath the surface. For example, breaking up of the surface is to be carried out using small capacity equipment under close supervision rather than ripping with a grader or dozer.

During removal of the path (if applicable) the trunks of trees are to be protected by armouring whereby timber slats are attached around the trunks over a layer of padding to create a protective shell in accordance with the provisions of Section 4 of AS4970 as detailed at appendix 12.3.b.

Prior to the commencement of the proposed road works an exclusion zone is to be established around the trees using temporary fencing panels to protect them from mechanical impacts, as well as restricting the storage of materials and equipment. The fencing is to be installed at the perimeter of the combined TPZ in accordance with the provisions of Section 4 of AS4970 as detailed at appendix 12.3.a.

To improve the viability of retained trees the design will utilise semi-permeable pavement to maintain water percolation and gaseous exchange to and from the roots.

Trees 6, 13 and 14 *Eucalyptus tereticornis* are located to the East and West of the proposed road works and will be subject to minor encroachments of approximately 10 of the TPZ's. This is considered to be a minor level of encroachment and the trees are therefore proposed to for retention in conjunction with the development.

Trees 7, 8, 9, 11 *Eucalyptus moluccana* and 12 *Eucalyptus tereticornis* are located within the plan area of the proposed roadway and cannot be retained in conjunction with the current design which takes advantage of existing gates and compacted gravel roadways. These trees are also proposed for removal to allow the development to proceed as planned.

The proposed removal of five (5) established native trees will have a minor environmental and landscape amenity impact which can be offset by the planting of additional trees in suitable positions within the boundary of the subject site. Preference should be given to the planting of the same endemic species as those proposed for removal which are sourced from natural provenance. There are many trees on the site from which seed could be collected and raised to maturity for future use on the site.

Trees 15 to 20 are set back from the edge of the proposed roadway, only the larger Trees 15 and 16 *Eucalyptus tereticornis* are subject to encroachment which is calculated at 11% and 18% respectively and can be managed by the implementation of protection measures meeting the requirements of AS4970.

As with the retained trees noted above protective fencing will be installed to create an exclusion zone round the whole group to restrict access and provide a buffer between the trees and the work area.

Trees 21 to 23 *Eucalyptus tereticornis* are located close to the edge of the existing roadway which will be retained, so no increase in the level of encroachment is expected. The trunks of the trees are to be protected by armouring as detailed above and at appendix 12.3.b.

Minor pruning of branches may be required to provide construction clearance and is preferable to tearing or breaking of branches, minor pruning (less than 10% of branches) is unlikely to have any adverse effects on the viability of the trees.

Pruning is to be carried out in accordance with the provisions of AS4373-2007, Pruning of Amenity Trees by a suitably qualified and insured contracting arborist.

Trees 24 *Eucalyptus punctata*, 25-26 *Melaleuca styphelioides* and 27 *Banksia integrifolia* are juvenile trees assessed with moderate retention value that have been planted in a raised garden bed adjacent to the student' carpark.

The trees are located within the plan area of the proposed library/chapel building and cannot be retained in conjunction with the current design. These trees are also proposed for removal to allow the development to proceed as planned.

The proposed removal of four (4) juvenile native trees will have a minor environmental and landscape amenity impact which can be offset by the planting of additional trees in suitable positions within the boundary of the subject site.

9.1 Tree Protection

General conditions relating to the protection of retained trees includes, but is not limited to the following activities:

Site establishment

- trees have been identified by tagging and/or numbering on the contract plan.
- protective fencing is erected at the perimeter of the respective TPZ, the fenced areas are to be included on the landscape plan and marked as a "no go zone"
- staff are to be made aware of tree protection measures during induction to the site
- the area of the TPZ should be mulched using 100mm depth of organic material, mulch must be kept clear of the base of tree trunks
- fencing is to include signage clearly denoting the TPZ as a "no go zone"

During construction

- tree protection measures are to be maintained in serviceable condition
- no storage of equipment or materials is permitted within the TPZ, no cement wasting, or other pollutants must be allowed to enter the TPZ
- damage to any part of a protected tree is to be reported to the certifying arborist for assessment and remediation
- if services must pass through an established TPZ excavation is to be carried out by hand
- no roots are to be severed within an established TPZ, except under the supervision of an AQF5 arborist

Post construction

- protective fencing is to be removed from site
- at 6-month intervals (for up to 18 months following completion) retained trees are to be inspected by the certifying arborist for signs of decline.
- steps can be taken to improve growing conditions if required such as decompaction of soil, introduction of irrigation
- general maintenance pruning can be undertaken (in accordance with AS4373-2007) to remove deadwood or other defective branches up to 10% of the total canopy area of retained trees if required

10.0 Conclusions

The proposed construction of the bus turning area necessitates the removal of five (5) remnant native trees.

The proposed construction of the library/chapel building necessitates the removal of four (4) planted native trees.

The removal of nine (9) native trees will cause a minor environmental and landscape amenity impact that can be offset by replacement planting.

The retention of eighteen (18) trees will require the implementation of protection measure meeting the provisions of the Australian Standard AS4970-2009, Protection of Trees on Development Sites.

11.0 Recommendations

That Trees 7-9, 11, 12 and 24-27 are approved for removal to facilitate the proposed development in its current form subject to the provision of compensatory replacement planting of endemic native trees within the boundary of the subject site.

That all tree work is carried out by a suitably qualified and insured contracting arborist, in accordance with the Safework NSW Draft Code of Practice for Tree Works and Australian Standard AS4373-2007, "Pruning of Amenity Trees".

That trees 1 to 6, 10, 13 to 23 are retained and protected by the installation of protective fencing and armouring of the trunks as detailed in Section 4 of AS4970-2009, Protection of Trees on Development Sites as detailed at sections 9.0, 9.1 and appendices 12.3a – 12.3.b of this report

That all tree protection measures are implemented prior to the commencement of works and maintained in serviceable condition for the duration of the project.



Ian Hills - Principal Arborist
Accurate Tree Assessment





Figure 3 Trees 6 – 7 will be subject to encroachment from construction of the proposed roadway



Figure 4 Trees 8- 10 will be subject to encroachment from construction of the proposed roadway



Figure 5 Trees 11 - 14 will be subject to encroachment from construction of the proposed roadway



Figure 6 Trees 16 – 20 will be retained in conjunction with the proposed development



Figure 7 Trees 21-22 *Eucalyptus tereticornis* are proposed for retention



Figure 8 Tree 23 *Eucalyptus tereticornis* is proposed for retention



Figure 9 Trees 24 *Eucalyptus punctata*, 25-26 *Melaleuca styphelioides*



Figure 10 Tree 27 *Banksia integrifolia*

12.0 Appendices

12.1. Safe Useful Life Expectancy Categories

1: Long SULE: Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.

- (a) Structurally sound trees located in positions that can accommodate future growth.
- (b) Trees that could be made suitable for retention in the long term by remedial tree care.
- (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

2: Medium SULE: Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.

- (a) Trees that may only live between 15 and 40 more years.
- (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: Short SULE: Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.

- (a) Trees that may only live between 5 and 15 more years.
- (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

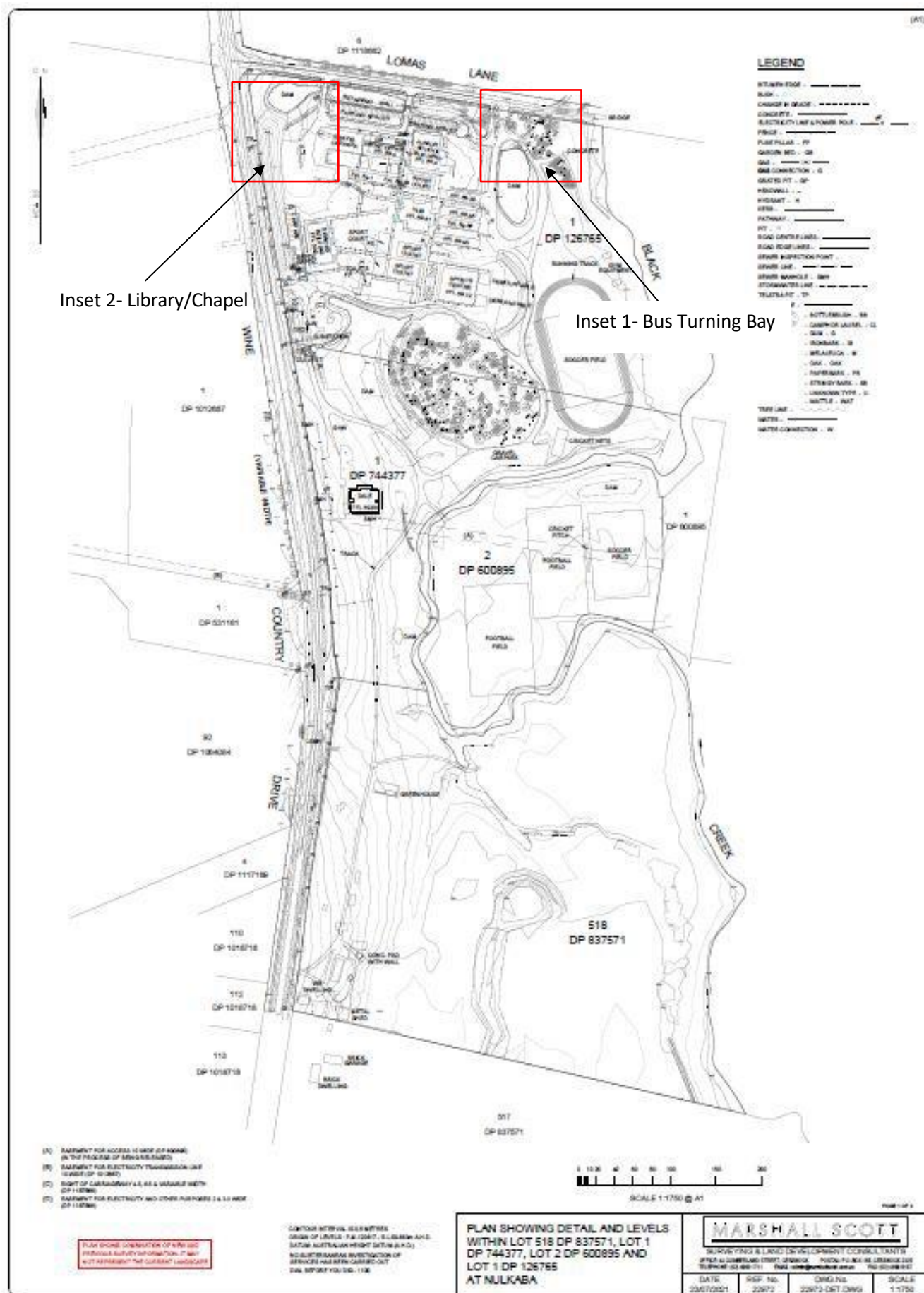
4: Remove: Trees that should be removed within the next 5 years.

- (a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- (b) Dangerous trees because of instability or recent loss of adjacent trees.
- (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- (d) Damaged trees that are clearly not safe to retain.
- (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (f) Trees that are damaging or may cause damage to existing structures within 5 years.
- (g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
- (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment could be retained subject to regular review.

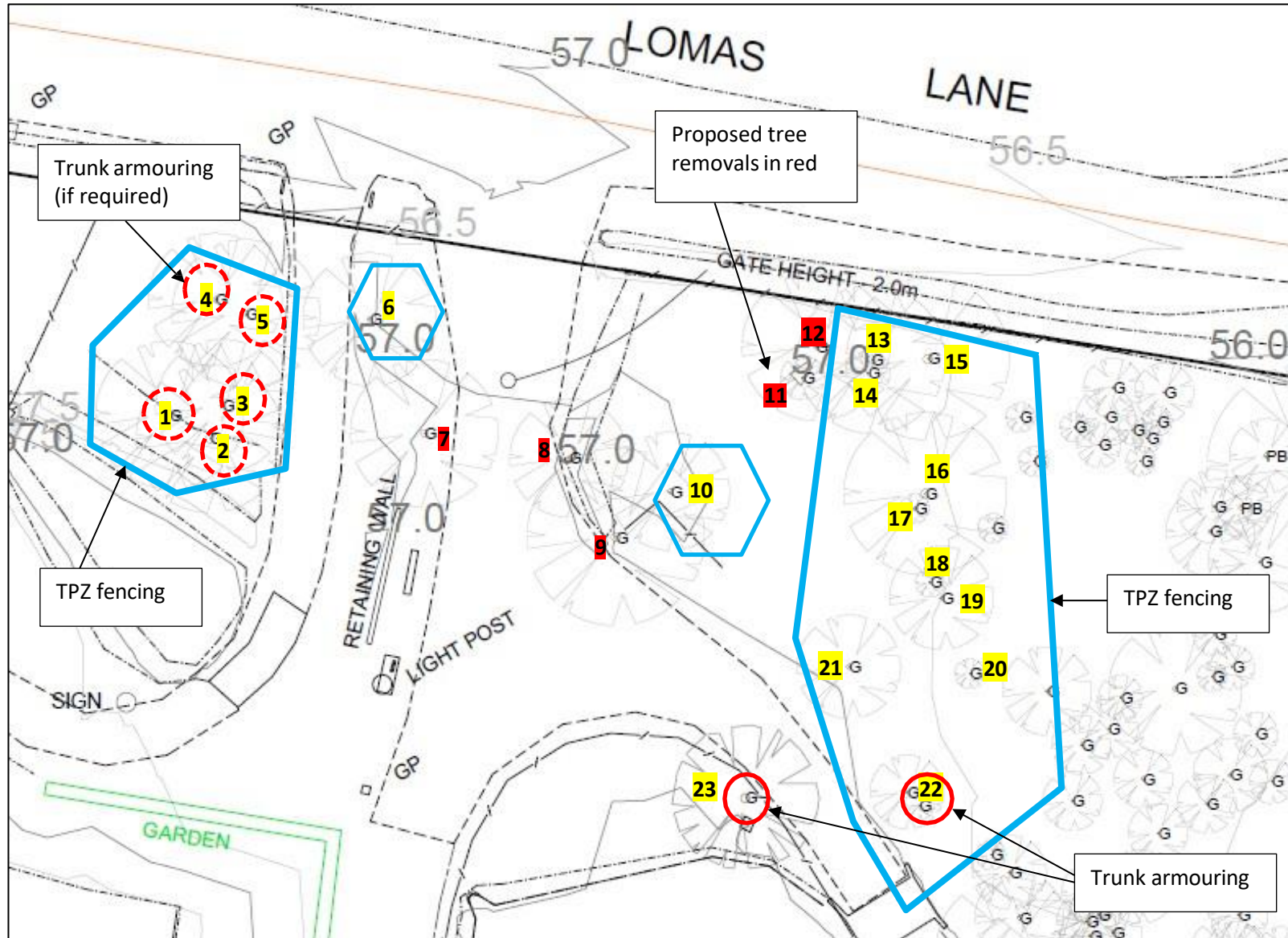
5: Small, young, or regularly pruned: Trees that can be reliably moved or replaced.

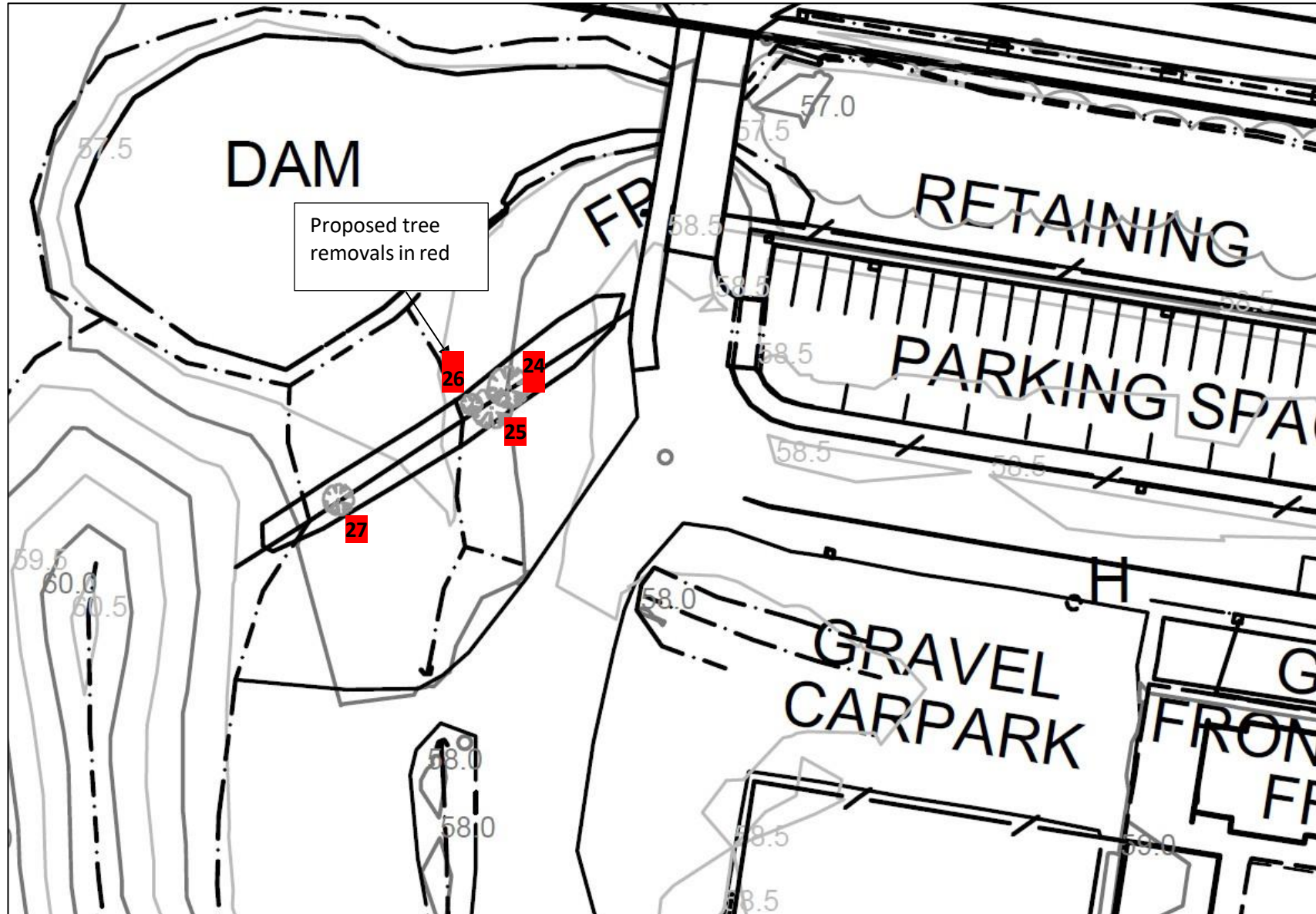
- (a) Small trees less than 5m in height.
- (b) Young trees less than 15 years old but over 5m in height.
- (c) Formal hedges and trees intended for regular pruning to artificially control growth.

12.2 Survey Plan

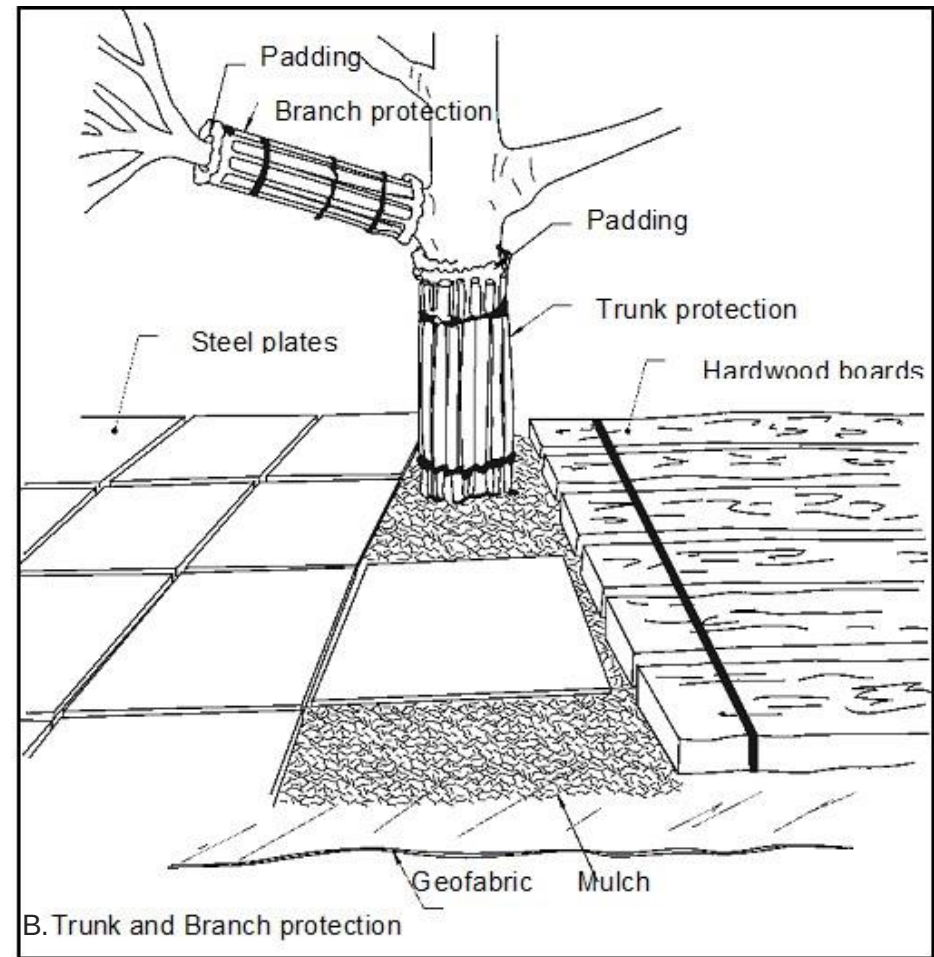
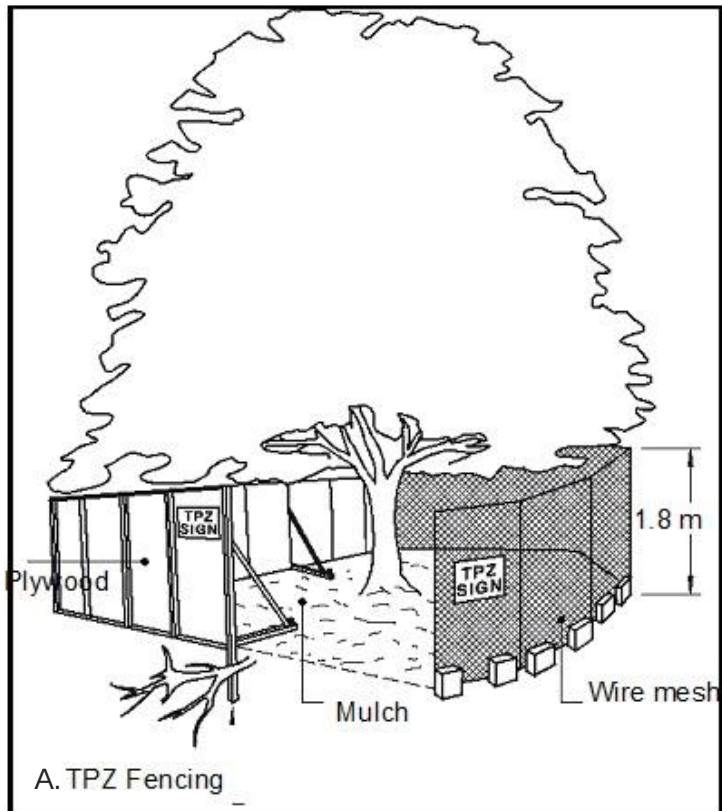


12.3 Inset 1 Bus Turning Circle





12.5 Tree, Trunk and Branch Protection Methods (Source AS4970-2009)



12.6 Calculating Tree retention Value

	Landscape Significance Rating						
Tree Sustainability	1	2	3	4	5	6	7
Greater than 40 years	High Retention Value						
15 to 40 years			Moderate				
5 to 15 years				Low			
Less than 5 years					Very Low Retention Value		
Dead or Hazardous							

(Source NUFTM) Modified by A Morton from Couston and Howden (2001) Tree retention values table Footprint Green Pty Ltd Australia)

12.7 References

Mattheck C., Breloer, (1999) *The Body Language of Trees – a handbook for failure analysis* 5th ed., London: The Stationery Office, U.K

Barrell, J. (1993-95) 'Pre-planning Tree Surveys Safe Useful Life Expectancy (SULE) is the Natural Progression' *Arboricultural Journal* Vol. 17, PP 33 - 46, Academic Publishers, Great Britain.

Draper, DB and Richards, PA (2009) 'Dictionary for Managing Trees in Urban Environments' Institute of Australian Consulting Arborists, CSIRO Publishing.

Standards Australia. 2009 'Australian Standard 4970-2009 Protection of Trees on Development Sites' Standards Australia GPO Box 476 Sydney NSW 2001, Australia.

Standards Australia. 2007 'Australian Standard 4373-2007 'Pruning of Amenity Trees'', Standards Australia GPO Box 476 Sydney NSW 2001, Australia.

Safework NSW, 2021. 'Amenity Tree Industry Code of Practice- 1998'. Safework NSW 92-100 Donnison Street Gosford NSW 2250 Australia.

NSW Government, 2022, Local Land Services Act 2016, No. 64 [online] Available at: <https://legislation.nsw.gov.au/view/html/inforce/current/act-2016-064#sch.1> [accessed 15 September 2022]

NSW Office of Environment and Heritage, eSpadev2 2022 [Online]
Available at: <https://www.environment.nsw.gov.au/Salis5app/resources/spade/reports/SI5601bx.pdf> [accessed 15 September 2022]

Willy Weather, 2022. 5-year Average wind conditions [Online] Available at: <https://wind.willyweather.com.au/nsw/hunter/nulkaba.html> [accessed 15 September 2022]

Treetec Professional Tree Services 2022 [Online] TPZ/SRZ Calculator - Incursion calculations
Available at: http://www.treetec.net.au/TPZ_SRZ_DBH_calculator.php [accessed 15 September 2022]

12.8 Qualifications – Ian Hills

Associate Diploma Horticulture	Ryde TAFE 1984
AQF3 Horticulture (Arboriculture)	Ourimbah TAFE 1998
AQF5 Diploma Horticulture (Arboriculture)	Kurri Kurri TAFE 2009 (Dux) Cert No. 5934155
QTRA Registered User 2083	December 2013
QTRA Advanced User 4469	March 2018
Working with Children Check Number	WWC1780469E
National Coordinated Criminal History Check Certificate	CAD5579CB8
QTRA Advanced User 4469	March 2020