



TREETALK

ARBORICULTURAL CONSULTING

ABN 36 323 568 677

Arboricultural Impact Assessment

Uniting St Columba's Lane Cove

7, 9, 11 & 13 Fig Tree Street, 1 Charlish Lane
and 106, 108, 110 & 112 Centennial Avenue
Lane Cove

Project No 5247/2020

August 2020

DA134/2020

Prepared for

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Table of Contents

1.0 Summary	3
2.0 The Site and Tree Location	4
3.0 Background	4
4.0 Method.....	5
5.0 Findings and Discussion.....	6
6.0 Retention or Removal	7
7.0 Possible Impact upon Retained Trees.....	11
7.0 Possible Impact upon Trees (continued)	12
8.1 Standard Protection for Retained Trees	13
8.2 Standard Tree Protection at Work Phases.....	14
9.0 Conclusion	15
10.0 Recommendations.....	15
Glossary	16
Bibliography	17
Useful References	17
Limitations.....	18

Appendices

<i>Appendix A – Plans:</i>	<i>1 Tree Location Plan</i>
	<i>2 Plan of Proposed Works</i>
	<i>3 Plan of Proposed Works</i>
	<i>4 Indicative Tree Protection Diagram</i>
<i>Appendix B –</i>	<i>Informative Diagrams</i>
<i>Appendix C –</i>	<i>Tree Protection Measures</i>
<i>Appendix D –</i>	<i>Pruning and Safe Tree Work</i>
<i>Appendix ES -</i>	<i>Specific Tree Protection Management</i>
<i>Appendix E –</i>	<i>Tree Protection Calculations</i>
<i>Appendix F –</i>	<i>Tree Data Schedule</i>

Arboricultural Impact Assessment: St Columba's Uniting Lane Cove

(Including 7, 9, 11 & 13 Fig Tree Street, 1 Charlish Lane and 106, 108, 110 & 112 Centennial Ave, Lane Cove)

1.0 Summary

Extension works to St Columba's Uniting, Lane Cove will impact on trees within its current location, and on the expanded site which includes 106, 108, 110 & 112 Centennial Avenue, 7, 9, 11 & 13 Fig Tree Street and 1 Charlish Lane, Lane Cove. The extent and degree of impact on the trees is the subject of this report.

Twenty-two trees are proposed for removal due to the planned works including two street trees.

Additionally, six trees are recommended for removal for reasons other than the proposed works: (Trees 6, 17 have no future, Tree 11 & 26 are dead, and trees 32 and 33 are undesirable species to be replaced with more appropriate trees).

Most site trees and street trees are well outside works areas, and specific protection measures are provided for twenty-nine trees near works, including four street trees. Two of the trees requiring specific protection must have a closer inspection of landscaping work and further consideration.

The results of the Arboricultural Impact Assessment (AIA) performed on the trees is provided in the *Tree Data Schedule* Appendix F. This table and Plan No A1, have been colour coded indicating trees proposed for removal and those being retained. Additional detail, including the reasons for tree removal, is provided in Table 1 *Tree Outcome* in Section 6 of the report.

AS4970 Tree Protection calculations are provided in Appendix E with additional information in Tables Appendices EM and ES. General tree protection measures are provided in Sections 8 and Appendices C.

Tree reference numbers are provided on the Plan in Appendix A1 - *Tree Mark-up Plan* which includes an overview of the works proposed.

2.0 The Site and Tree Location

The site includes the Uniting St Columba's complex on the corner of Fig Tree Street and Centennial Avenue, with additional land (currently single residential properties) 7, 9, 11 & 13 Fig Tree Street, 106, 108, 110 & 112 Centennial Avenue, and 1 Charlish Lane, Lane Cove.



Image 1: Aerial view of site with approximate boundaries

3.0 Background

TreeTalk Arboricultural Consulting has been engaged by Uniting Care – Ageing, to consider trees that could be impacted upon by the works proposed. The facility is to be extended to the east, demolishing houses on several properties along Fig Tree Street, Churlish Lane and others along Centennial Avenue. The new section of the aged care home will include excavation for underground parking, upper levels and landscaping.

The initial tree data was collected in 2018 and the options for tree retention and removals have evolved over the period of the designing processes. The final plans considered are copied into Appendices A2 and A3. The impact on the existing trees is evident in the plans of proposed works plans Appendix A2 and A3.

This report aims satisfy the requirements of the consenting authority, by providing arboricultural data on the trees including their species, dimensions, health, structural condition and viability. Also, to provide information on constraints, setbacks and tree protection measures necessary, as provided in AS4970 - *Protection of Trees on Development Sites*.

4.0 Method

Consulting Arborist Sue Wylie and assistant initially visited the site on October 6, 2018, to assess the trees and consider the likely impact by the works proposed. A more recent site visit was undertaken in July 2020 to consider some of the proposed impacts.

The trees were assessed using the Visual Tree Assessment (VTA) method as described in Mattheck & Breloer (1994)¹, using non-invasive tools such as binoculars and acoustic mallet. Neither internal probing of living tissue nor aerial inspection by climbing was undertaken.

The VTA was performed from the ground considering overall *Health* and vitality, including percentage of canopy, epicormic growth, deadwood and predation by pests and diseases, and *Structural condition*, considering faults such as, poor branch attachment and mechanical (abiotic) or biological (biotic) damage.

Health and *Condition* was rated as *Good*, *Fair* or *Poor* (see glossary), based on assessment at the time of inspection. Any indicators or evidence of concerns found to be outside normal tree development are noted. Tree height was estimated and where relevant the orientation of the canopy is given. The trunk diameter was measured or estimated at breast height - 1.4 metres (DBH) and/or above root buttress (arb).

The Tree Protection Zone (TPZ)² and Structural Root Zone (SRZ)³ measurements have been arrived at using widely recognised methods as detailed in *Australian Standard AS 4970– 2009* (see Appendix B2).

Modified tree protection measures have been arrived at by considering works within TPZ and providing details of tree and soil management required.

1 Mattheck, Claus; Breloer, Helge (1994) *The Body Language of Trees: A Handbook for Failure Analysis - Research for Amenity Trees No 4*, Pub. Forestry Commission, London.

2 Tree Protection Zone: TPZ = an area around a tree with radius of 12 x DBH.

3 Structural Root Zone: SRZ = $64(D \times 50)^{0.42}$. As per Australian Standard AS 4970 – 2009, *Protection of Trees on Development Sites*.

5.0 Findings and Discussion

The boundaries have been modified over the designing process and this has impacted further on some significant trees due to extensive excavation required for basement parking. The aim is to protect trees where possible while meeting the design requirements for a facility of this scale and intention.

Details of tree species, dimensions, health and structural condition are provided in Appendix F - *Tree Data Schedule*. Colour coding of trees in this schedule are: Green = Retain and protect. Red = proposed for removal.

Site Trees

Fig Tree Street

Most larger trees are in the rear of the blocks of land, and these are now central to the new facility. Where possible trees near the street frontage have been retained, with the exception of those impacted upon by new crossovers and main entrance areas.

Note: Regardless of works, four site trees are recommended for removal due their limited future (Tree #6, #11 #17 and #26). Also, Trees #32 and #33 in the courtyard area, are to be replaced as they are undesirable species.

Centennial Avenue

A number of medium trees in the front gardens along Centennial Avenue are in raised gardens and this will complicate the retention of these in the proposed landscaping and levels. This applies to Trees #34, #38, #39 and #40. Detail of planned works are provided in Appendix A3 and arboricultural supervision or further advice will be required.

Adjacent Trees

Fig Tree Street:

The Council street trees along Fig Tree Street are generally good health and condition and can be retained with the exception of new entry crossovers, trees #E and #G, and these trees will be replaced (see separate landscaping plan). All new access to the site will be along the quieter street and new driveway cross over access will require careful management of Trees #C, #D, #F and #H.

Centennial Avenue:

The Council street trees along Centennial Avenue, are in moderate health with growing conditions having limited available soil and management difficulties along this busy roadway.

6.0 Retention or Removal

The following table describes reasons for removal and **concerns that must be accommodated** for retained trees. Green = **Retain and protect**. Red = **proposed for removal**.

Twenty-one trees are proposed for removal due to the planned works – (Trees 1, 2, 3, 28, 29, 35, 36, 37, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62 and street trees E and G).

Six trees have been proposed for removal for reasons other than the proposed works: Trees 6, 17 has no future in this location, Tree 11 & 26 are dead and trees 32 and 33 are undesirable species to be relaxed.

Table 1 Tree Outcome

Tree No.	Species	Location/Intrusions/Concern	Remove or Retain
1	Jacaranda	Building envelope	Remove
2	Grey Ironbark	Building envelope	Remove
3	Grey Ironbark	Building envelope	Remove
4	Red Mahogany	Walkway area & stairs within TPZ. 6.8% intrusion, manage levels and pit	Retain and Protect
5	Sydney Blue Gum	Boundary fencing	Retain and Protect
6	Sydney Red Gum	Poor location, no future. Not related to proposed works Tree should be removed regardless of current project.	Remove removed regardless of current project.
7	Box Elder		Retain and Protect
8	Sydney Red Gum	Boundary fencing	Retain and Protect
9	Sydney Red Gum	Boundary fencing	Retain and Protect
10	Cypress Pine	No new works nearby	Retain and Protect
11	Cypress	Dead	Remove
12	Cypress Pine	No new works nearby	Retain and Protect
13	Cypress Pine	No new works nearby	Retain and Protect
14	10x Forest Oak	No new works nearby	Retain and Protect
15	She-oak	Near new works. Isolate.	Retain and Protect
16	Sydney Blue Gum	No new works nearby	Retain and Protect
17	She-oak	Poor health, no future. Tree should be removed regardless of current project.	Remove regardless of current project.

6.0 Retention or Removal

Table 1 Tree Outcome (continued)

Tree No.	Species	Location/Intrusions/Concern	Remove or Retain
18	6 x Prickly Paperbark	Can be isolated from new works	Retain and Protect
19	Grey Gum	Can be isolated from new works	Retain and Protect
20	Rough Bark Gum	Can be isolated from new works	Retain and Protect
21	Rough Bark Gum	Can be isolated from new works	Retain and Protect
22	Rough Bark Gum	Near new works & boundary fencing & <u>Excavation</u>	Retain and Protect
23	Sydney Blue Gum	New works boundary fencing & Excavation	Retain and Protect
24	7 x Prickly Paperbark	New works boundary fencing & Excavation	Retain and Protect
25	8 x Prickly Paperbark	palisade fencing – manage footings New works boundary fencing & Excavation	Retain and Protect
26	Coral tree	Dead	Remove
27	Sydney Blue Gum	Careful management required at all stages. New impact on TPZ is about 10%. Demolition of existing building, and new structures must be managed.	Retain and Protect
28	Blueberry Ash	Within building envelope	Remove
29	Windmill Palm	Within building envelope	Remove
30	Rough Bark Gum	palisade fencing – manage footings Boundary and internal fencing levels	Retain and Protect
31	Cheese Tree	Boundary and internal fencing levels with SRZ	Retain and Protect
32	Coral tree	Courtyard, undesirable species.	Remove
33	4 x Cocos Palm	Courtyard, undesirable species.	Remove
34	Jacaranda	Paths within SRZ, terrace within TPZ	Retain and Protect
35	Cypress	Within building envelope	Remove
36	Jacaranda	Within building envelope	Remove
37	Brush Cherry	Within building envelope	Remove

Green: retain and protect

Red: proposed for removal

Blue: concern that must be accommodated

6.0 Retention or Removal

Table 1 Tree Outcome (continued)

Tree No.	Species	Location/Intrusions/Concern	Remove or Retain
38	Crepe Myrtle	Boundary fencing, paths & feature within SRZ,	Retain and Protect
39	Jacaranda	Further management of tree, Boundary fencing/retaining wall & landscaping wall within SRZ.	Retain and Protect
40	Crepe Myrtle	No level changes. Manage Boundary fence footings	Retain and Protect
41	Moreton Bay Fig	Courtyard, Landscape batter, Manage Boundary fence footings	Retain and Protect
42	Broad-leafed Paperbark	Manage Boundary fence footings	Retain and Protect
42a	Species & data	Retaining wall, pit, fencing	Retain and Protect
43	Pittosporum	Manage Boundary fence footings	Retain and Protect
52	Silky Oak	Excavation at edge of SRZ New boundary fencing & Fill	Remove
53	Grevillea	Within building envelope	Remove
54	NSW Christmas Bush	Within building envelope	Remove
55	Camellia	Within building envelope	Remove
56	Spotted Gum	Extensive excavation within SRZ	Remove
57	Jacaranda	New access road over/within SRZ	Remove
58	Orchid tree	Within building envelope	Remove
59	Acer sp.	Within building envelope	Remove
60	Melaleuca sp.	New access road within SRZ & intrusion into 40% of TPZ	Remove
61	Cypress Pine	New access road within SRZ	Remove
62	Crepe Myrtle	Pit within TPZ	Remove

Green: retain and protect

Red: proposed for removal

Blue: concern that must be accommodated

6.0 Retention or Removal

Table 1 Tree Outcome (*Adjacent Trees*)

Tree No.	Species	Location/Intrusions/Concern	Remove or Retain
(A)	Broad-leafed Paperbark	Outside area of works	Retain and Protect
(B)	Broad-leafed Paperbark	Outside area of works	Retain and Protect
C	White cedar	New driveway within TPZ, outside SRZ Manage works & lay back	Retain and Protect
D	Weeping Bottlebrush	New driveway at 2.7m	Retain and Protect
E	Broad-leafed Paperbark	New driveway w/i SRZ	Remove
F	Broad-leafed Paperbark	New pedestrian entrance	Retain and Protect
G	Broad-leafed Paperbark	New driveway over tree	Remove
H	Broad-leafed Paperbark	New driveway w/i TPZ outside SRZ Manage works & lay back	Retain and Protect
I	Broad-leafed Paperbark	Manage Boundary fence footings	Retain and Protect
J	Broad-leafed Paperbark	Manage Boundary fence footings	Retain and Protect
K	Broad-leafed Paperbark	Manage Boundary fence footings	Retain and Protect
L	Broad-leafed Paperbark	Manage Boundary fence footings	Retain and Protect
M	Broad-leafed Paperbark	Manage Boundary fence footings	Retain and Protect
(N)	Broad-leafed Paperbark	Outside area of works	Retain and Protect
(O)	Sydney Red Gum	Outside area of works	Retain and Protect
(P)	Sydney Red Gum	Outside area of works	Retain and Protect
(Q)	Broad-leafed Paperbark	Outside area of works	Retain and Protect
(R)	Sydney Red Gum	Outside area of works	Retain and Protect
(S)	River Peppermint	Outside area of works	Retain and Protect
T	Gum tree	Manage Boundary fence footings	Retain and Protect
(U)	Weeping Lilly Pilly	Outside area of works	Retain and Protect
(V)	Jacaranda	Boundary fencing near SRZ. Mostly outside area of works	Retain and Protect
(W)	Gum tree	Outside area of works	Retain and Protect

Green: retain and protect

Red: proposed for removal

Blue: concern that must be accommodated

7.0 Possible Impact upon Retained Trees

Tree protection calculations as per AS4970, are provided in Appendix E for trees proposed for retention.

Works within 10% of the TPZ area are considered minor and acceptable (in AS4970). Works in an area greater than 10% are considered a major intrusion and must be carefully considered and specifically discussed by your project arborist. Detail of arboricultural management is provided in Table 3 Appendix ES *Specific Tree Management*.

Most works have been considered so that there are no below-ground works within the SRZ (or tree stability is likely to be effected) other than fence footings which must be managed⁴ minimal works above-ground within most of the TPZ ensuring that soil levels are not changed or compacted.

The following matters should be considered within all works and works processes both above and particularly below-ground near retained trees. All tree protection must be in place and entirely outside the TPZ. Modified TPZ distances can be provided prior to the CC stage of works e.g. Trees #39 and #C.

Protection measures also applies to site access, such as entering the site near street trees, or any works likely to compact soil (i.e. trafficable areas) within the TPZ, and these must be managed and minimized e.g. mulch or rumble boards (Appendix C2).

Footings

Footings within TPZ must be by pier and beam construction within the **Modified TPZ** of retained trees with holes for piers, dug carefully using hand tools - to avoid roots 3cm or greater. There must not be any below-ground works within the SRZ. Boundary fencing is likely to be within the SRZ of Trees #38, #39, #40, #41, #42 and #43.

The project arborist should be engaged to supervise initial works (particularly pier location) around the site boundary.

Building and Works Processes

Tree Protection measures must be the first works on site and include soil surface protection i.e. mulch or retention of the existing understorey vegetation (Appendix C2).. The protection measures **must** remain in place throughout the works processes.

Where temporary access is required within the TPZ, (specific consideration is to be provided by the project arborist).

⁴ Holes to be dug using hand tools and find suitable locations that avoids roots 3cm or greater.

7.0 Possible Impact upon Trees (continued)

Engineering/Drainage/Services

All services must be entirely outside the SRZ of retained trees, and outside most of the TPZ. Engineering and drainage/services plans should be considered by your project arborist .

Note: If they are not added to the plans in Appendices A – they have not been viewed or considered.

Landscaping

Ideally landscaping will be minimised under retained trees. Installation of landscaping must be performed with care within the Modified TPZ of retained trees to ensure that large roots (3cm or greater) will not impact upon or the soil compacted. Considerations include:

- No ripping of soil within TPZ (# check this is not in landscape plan diagrams)
- Planting smaller pot size (or tube stock) where masses of existing roots occur
- Hand planting without ripping within SRZ
- Any edging, paving, retaining walls MUST be above existing grade (and no fill greater than 10cm) unless tree specific arboricultural consideration is provided.

Of note is the impact that landscaping requirements will have on levels near trees, particularly those along Centennial Avenue where retained garden beds may require modification for boundary fencing and internal pathways suitable for a residential aged care facility.

Note: The management of works near trees is provided in Table 3 Appendix ES and where necessary your project arborist must be consulted for clarification – before works begin.

8.1 Standard⁵ Protection for Retained Trees

Tree protection measures for tree/s being retained will include isolating each to the extent of TPZ/approved works **before any other works begin**. And, maintaining the soil area in its existing condition until the landscaping phase (see Appendices A4 and C1).

Both above and below-ground sections of each retained tree require protection.

Install fencing (as shown in Appendix C1) around each tree or tree group to TPZ. Where this is not possible or where works or access are required near a tree, wrap trunk and install mulch and rumble boards (Appendix C2) and isolate root zone as diagrammatically represented on plans in Appendix A4 (to distances in Table 2).

TPZ

To protect soil from compaction or contamination, storage of material must be outside the TPZ.

Where access is required within the TPZ the area should be mulched and rumble boards added (as per Appendix C2). Where there are difficulties isolating tree and tree root zones from works processes, please discuss this further with your project arborist for a tree sensitive solution.

Engineering, drainages or services works must be outside SRZ and most of TPZ. Alternatively, they must be considered by your project arborist. If these are not discussed in the report; they have not been considered.

There must not be any level changes with TPZ by an area greater than 10% (as per AS4970) unless specific arboricultural consideration is given to the works proposed.

Surfaces

Removal of surfaces, under trees being retained, must be performed with care using hand tools. Do Not mechanically scour, as this will detrimentally impact on roots, which are near the surface.

Installation of surfacing – paving/roadways/driveways and all associated works **must be above existing grade** - and performed with consideration of tree roots below. Allowance must be made for the depth of these new surfaces, **the base/framework /bottom of which must be above existing grade**.

SRZ

Any works within SRZ requires that specific and detailed arboricultural assessment be undertaken.

Where access is required within the SRZ the trunk must be isolated/wrapped, the area mulched, and rumble boards added as per Appendix C2.

Footings for works or boundary fencing within TPZ - **must be of pier and beam construction** - NOT strip footings – with exploratory investigation for a suitable location of piers that avoids roots $\geq 3\text{cm}$ in diameter.

⁵ Standard Tree protection measures apply to all retained trees and modifications or detailed discussion are given in the previous section

8.2 Standard Tree Protection at Work Phases

Site preparation

To ensure that adequate tree protection is in place, it is important that protection measures are the first works on site. Retained trees must be fenced to the extent of the TPZ or to specific distances given in the report (see Table 2).

Where access is required within the TPZ, wrap the trunk and protect soil within TPZ with geotextile fabric, mulch and rumble boards where fencing is not possible (this must be specifically discussed).

- Consider branches that may interfere with works process and manage or prune (See Appendix D).
- Consider where materials are to be stored and keep this outside tree protection zones.
- Protect retained tree from works processes run-off, and particularly slurry or materials that can change soil chemistry, as this is detrimental to, particularly, native trees.
- DO NOT CHANGE SOIL LEVELS within TPZ without arboricultural advice (Tree roots are usually located in the top 30cm of soil and reductions in soil level can remove most of a tree's roots. Additionally, and increases in soil can reduce available air to roots and cause them to decline, increase maintenance costs or die).

Table 2: Tree Protection at Stages of Works

Works Phase	Protection Required	Solution
Site Preparation	Protect Tree canopy, trunk and roots with clear separation from work processes.	Install tree isolation fencing as per distances given in Table 2. (Protect soil where staged works are proposed within the SRZ). Install soil surface and run-off protection for TPZ.
Pruning	Canopy.	Prune as/if discussed in report before tree is damaged by works. (See report for specification and Appendix D for method) Note that approval may be required.
Site Works	Protect tree canopy, trunk and roots. Maintain soil in current condition. Protect soil and roots run off.	Maintain soil surface protection and retain fencing. All contractors must be made aware of the importance of retaining tree protection measures and avoiding damage to vegetation being retained.
Services	Maintain soil in current condition.	Install all services outside tree protection area. No excavation below existing grade without specific arboricultural advice being provided.
Landscaping	Soil and tree roots zone. Cut and Fill.	No significant level changes No reduction in soil level within SRZ No fill over 10cm unless it is with structural soils).

Do not perform works within SRZ without your arborist on site & specific information provided.

9.0 Conclusion

This report addresses all trees on and near the project site that may be impacted upon by extensions to Uniting St Columba's in Lane Cove.

Twenty-one trees are proposed for removal due to the planned works - Trees 1, 2, 3, 28, 29, 35, 36, 37, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62 and street trees E and G. Six trees have been proposed for removal for reasons other than the proposed works: Trees 6, 17 has no future in this location, Tree 11 & 26 are dead and trees 32 and 33 are undesirable species.

A total of twenty-seven trees are proposed for removal including 1, 2, 3, (6), (11), (17), (26), 28, 29, (32), (33), 35, 36, 37, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62 and street trees E and G.

The works impact on trees being retained has been considered and tree protection measures as per AS4970 *Protection of Trees on Development Sites* are provided for the trees near the works. Tree protection calculations for retained trees (as per AS4970) are provided in Appendix E, and standard tree protection measures are provided in section 8 of the report.

Detailed protection measures of possible impacts that require consideration are provided in Section 7 of the report and Table 3 *Specific Tree Management* and protection measures required for 19 trees (is provided in see Table Appendix ES page 32.) for Trees 4, 23, 24, 25, 27, 30, 31, 34, 38, 39, 40, 41, 42, 42a, 43 including, street trees C, D, F and H.

10.0 Recommendations

To minimise the impact upon the retained trees, works must be performed to distances provided in Appendix E and Sections 7 and 8 of this report.

Where any plan variations are proposed, within the TPZ of retained trees, your project arborist (AQF 5) should be consulted.

The site manager and contractors must be advised of the Tree protection requirements, and a copy of this report available on-site at all times.

Please contact me directly on 0417 022 692, if any sections of this report require clarification.



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Australian Qualification Framework (AQF5)

Age of Tree:**Young:** Less than 1/3 life expectancy**Semi-mature:** 1/3 to 2/3 life expectancy**Mature:** Older than 2/3 life expectancy**Over-Mature /Senescent:** Older than 2/3 life expectancy and showing signs of irreversible decline**Condition of tree:****Good:** Tree is generally healthy and free from obvious signs of structural weakness or significant adverse effects of pests and diseases.**Fair:** Tree is generally vigorous although has some indication of being affected by the early stages of disease, structural faults or environmental or mechanical damage. Appropriate tree maintenance can usually improve their overall health and halt decline.**Poor:** Tree in decline and is not likely to improve with reasonable maintenance practices or has a structural fault such as *bark inclusion*.**Dead:** Tree no longer capable of sustained growth.**Co-dominant stems:** Co-dominant stems typically lack the overlapping tissue present in a collar. Trees with this defect can be subject to internal splitting or cracking (a structural weakness).**Crown Class:** Dominant. Co-dominant. Intermediate. Suppressed.**Diameter at breast height (DBH):** The nominal trunk diameter at 1.4 metres above ground level**D = Ø arb** = Trunk diameter, measured above the root buttress**Development Works:** Includes any physical activity in relation to land that is specified by the determining authority.**Included bark:** Bark that becomes imbedded in a union between branches, a branch and stem, or co-dominant stems. A potential weak point.**Project Arborist:** The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.**Structural root zone (SRZ):** 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 a much larger area. Arboricultural advice should be sought for any works (particularly below ground) within the SRZ.**Tree:** Long-lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority).**Tree Protection Zone (TPZ):** A specified area above and below-ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development. Any works proposed within 10 times trunk diameter of a tree should be considered by your project arborist. A work method statement can be provided to ensure that tree/asset is not damaged. Compaction on works sites causes slow decline in the green asset and ongoing costs of maintenance.**TMO/TPO Tree Management Order/ Tree Preservation Order** – Legislation (usually part of Local Environment Plan (LEP) directing management of trees and vegetation).**Topping/Lopping** No matter what the name, topping disfigures trees and is detrimental to tree structure, health, and value. Trees are topped because they grow too large for the places where they were planted, or people become afraid of their large size. Trees are also topped because proper tree pruning methods are not used. <https://extension.psu.edu/dont-top-trees>**ULE:** Useful Life Expectancy (after Barrell) ULE Long Medium Short Remove Weedy species**Vigour:** Ability of a tree to sustain its life processes. The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'.⁶ Australian Standard 4970-2009: *Protection of trees on development sites* Licensed to Ms. Sue Wylie⁶ Harris, Clark Matheny (2004)

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Useful References

Planting

[http://hort.ifas.ufl.edu/woody/documents/RPG%20Tree%20Planting%20Cue%20Card\[1\].pdf](http://hort.ifas.ufl.edu/woody/documents/RPG%20Tree%20Planting%20Cue%20Card[1].pdf)

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/horticulture-care/how-plant-trees>

www.treesaregood.org/portals/0/docs/treecare/WhyToppingHurts.pdf

Tree Benefits

<http://www.mortonarb.org/trees-plants/benefits-trees/sources-benefits-trees>

www.treesaregood.com/treeowner/treeownerinformation.aspx

www.treesaregood.com/treecare/resources/WhyToppingHurts.pdf

www.treesaregood.com/treecare/resources/New_TreePlanting.pdf

<http://www.naturewithin.info/>

www.greenhealth.washington.edu

http://www.isa-arbor.sk/dokumenty/Tree_stability_%20Engels_Peter%20Sterken.pdf

<http://hort.ifas.ufl.edu/woody/>

Weeds

www.environment.nsw.gov.au/cpp/WeedRemovalFactsheets.htm

Limitations

Trees are dynamic living structures, growing and adapting to conditions around them. A Tree's condition will change and vary over time depending on weather, environmental factors and mechanical or human interaction.

Assessment is limited to the conditions at the time of the inspection and only trees discussed in the report have been assessed. Plans used to assess likely impact are those appended (Appendix A).

Ongoing monitoring of all nearby trees is advised and where significant changes are observed, further advice should be requested. Unusual developments or sudden changes in a tree's condition should be addressed immediately.

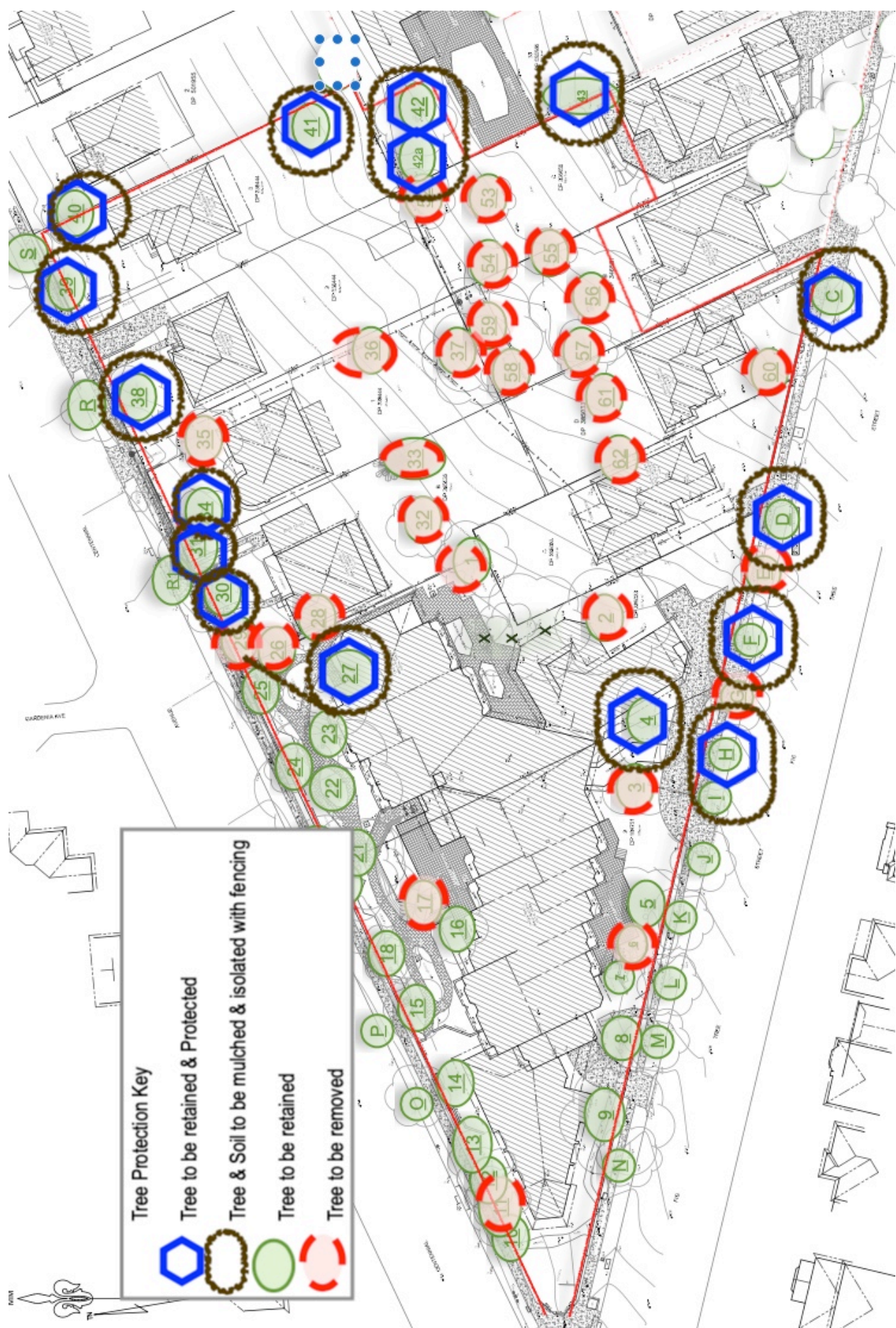
There should be **NO changes within the Structural Root Zone (SRZ)** of a tree without specific arboricultural advice and supervision being provided from an experienced AQF Level 5 arborist.

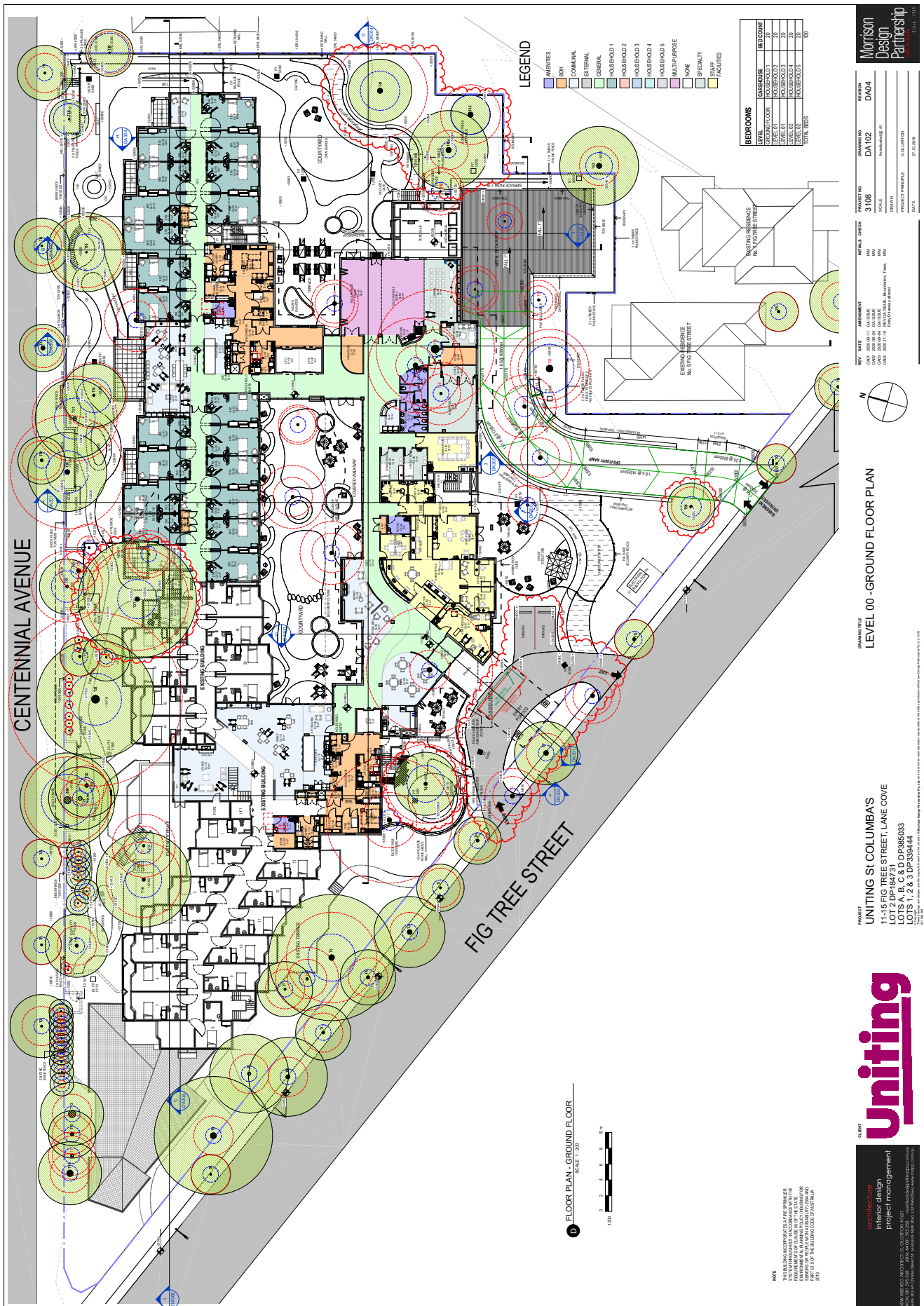
This also applies to underground utilities and services such as plumbing/gas/drainage and can also apply to landscaping works such as paving below existing grade and fill greater than 10cm above grade.

Photographs are inserted as a guide to matters discussed however these could be misleading and may exaggerate or minimise the elements under discussion. The text should be the main guide to the importance of images and diagrammatic representation on plans.

This report is primarily about tree protection measures as they relate to the works proposed (as given in the attached plans) and does not necessarily address tree maintenance or tree management works required.

The report is to be considered in its entirety and where unclear clarification should be sought.

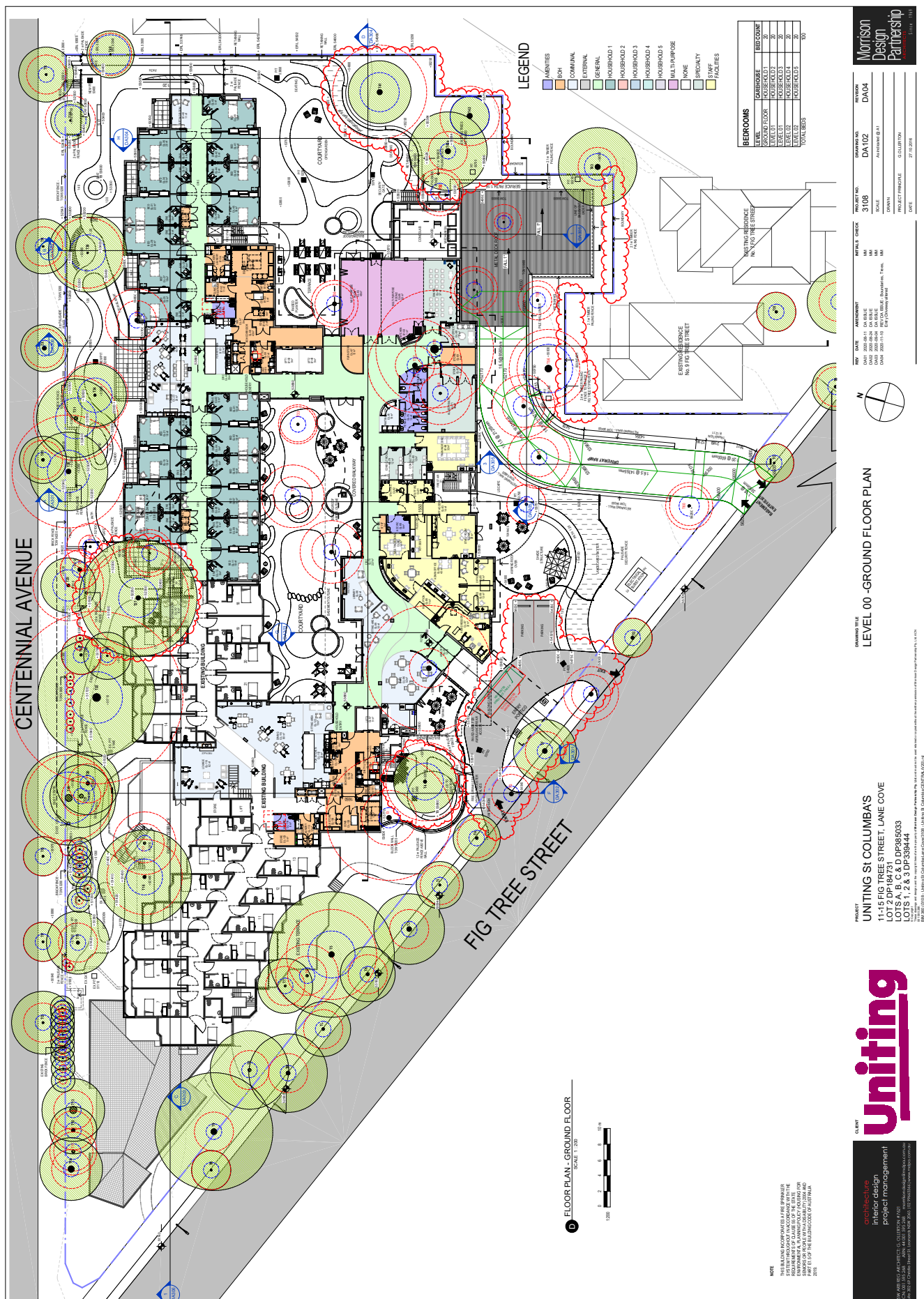


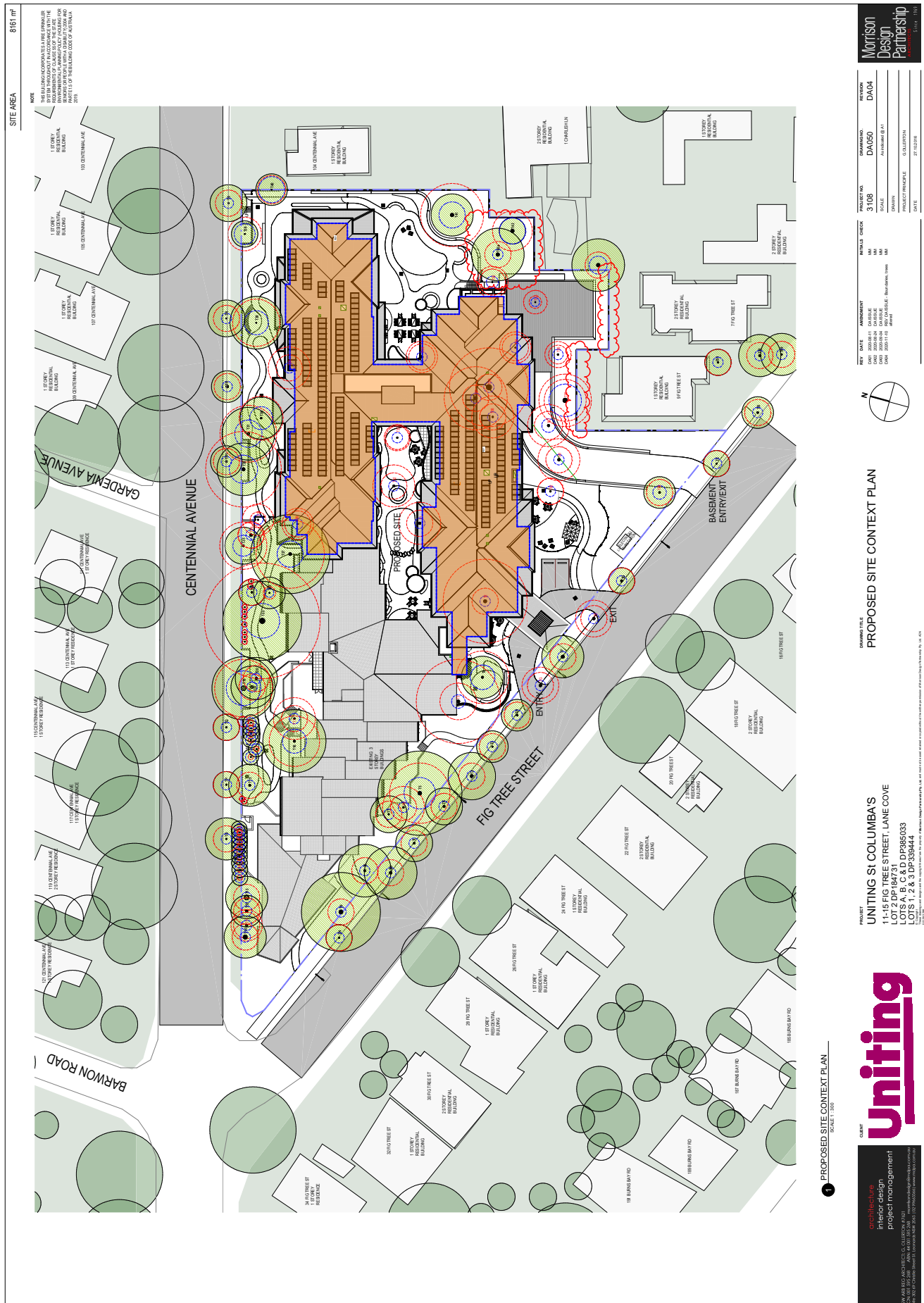


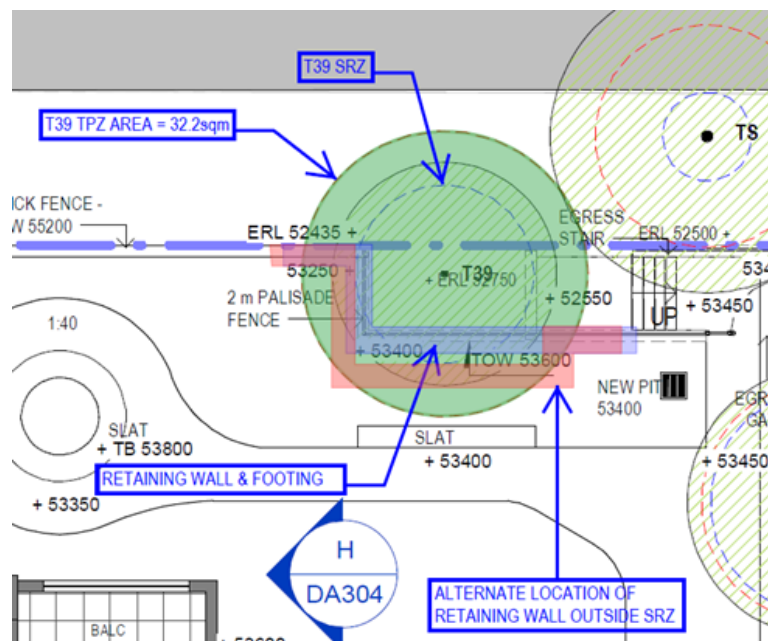
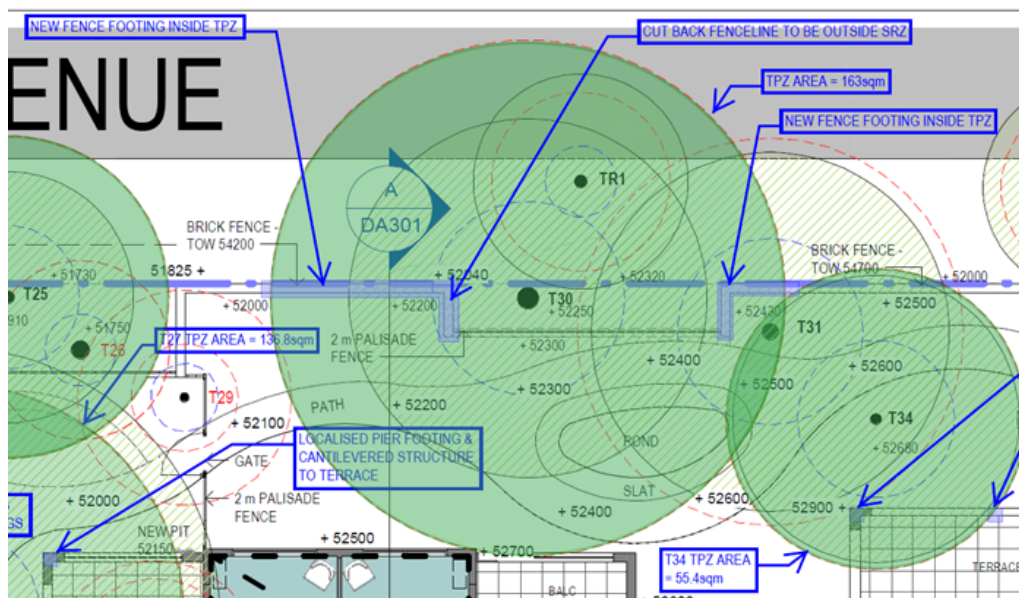
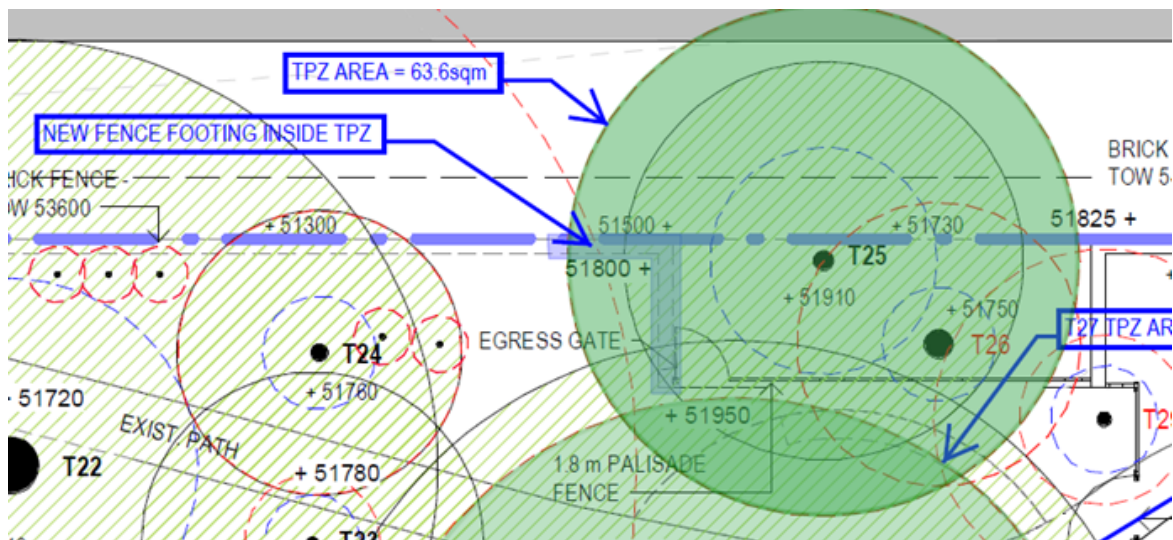
Appendix A2

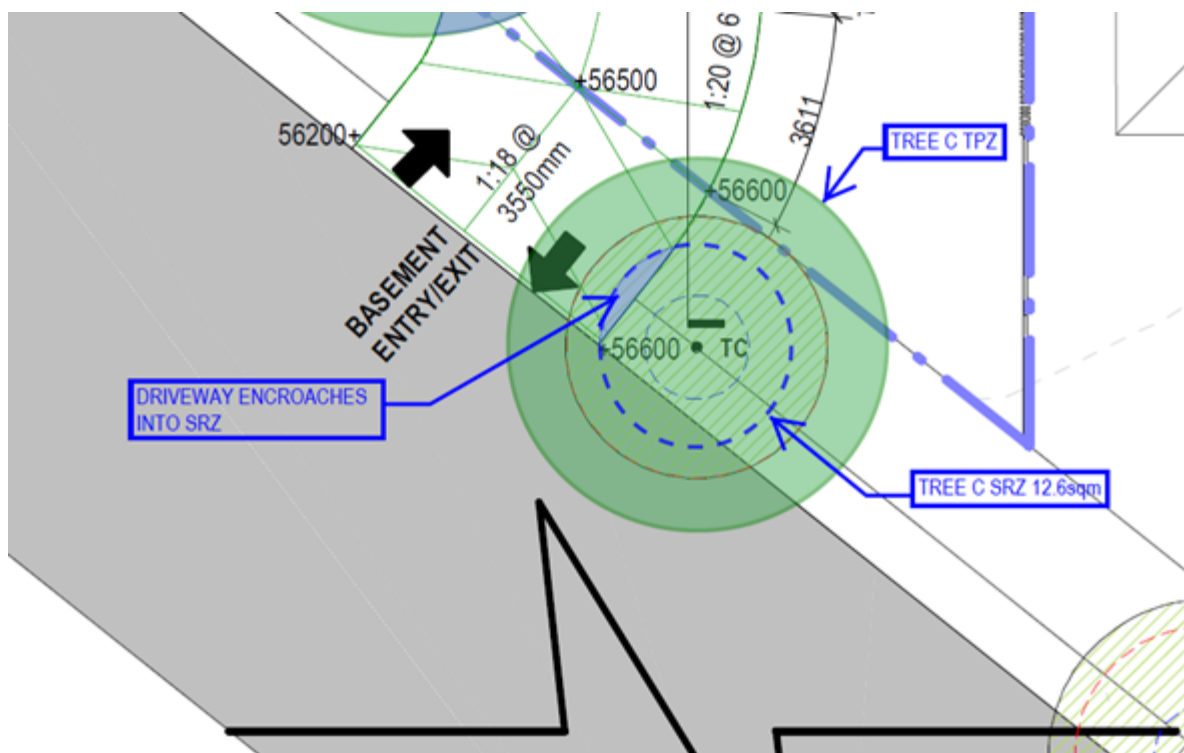
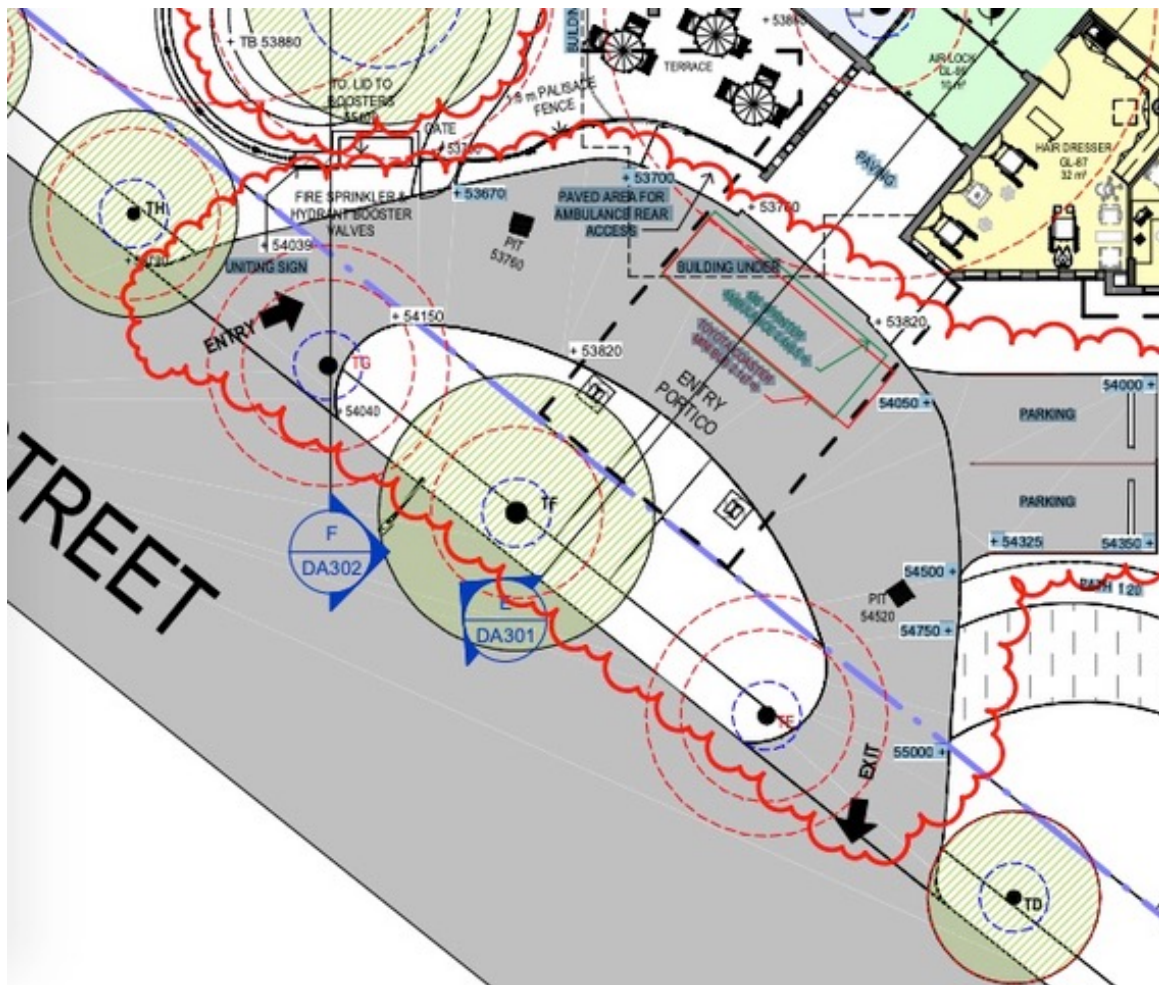
Ground Floor Plan

by Morrison Design Partnership Architects, Project No: 3108, Dwg No: DA 102IRev: DA04, Dated 2020-11-10





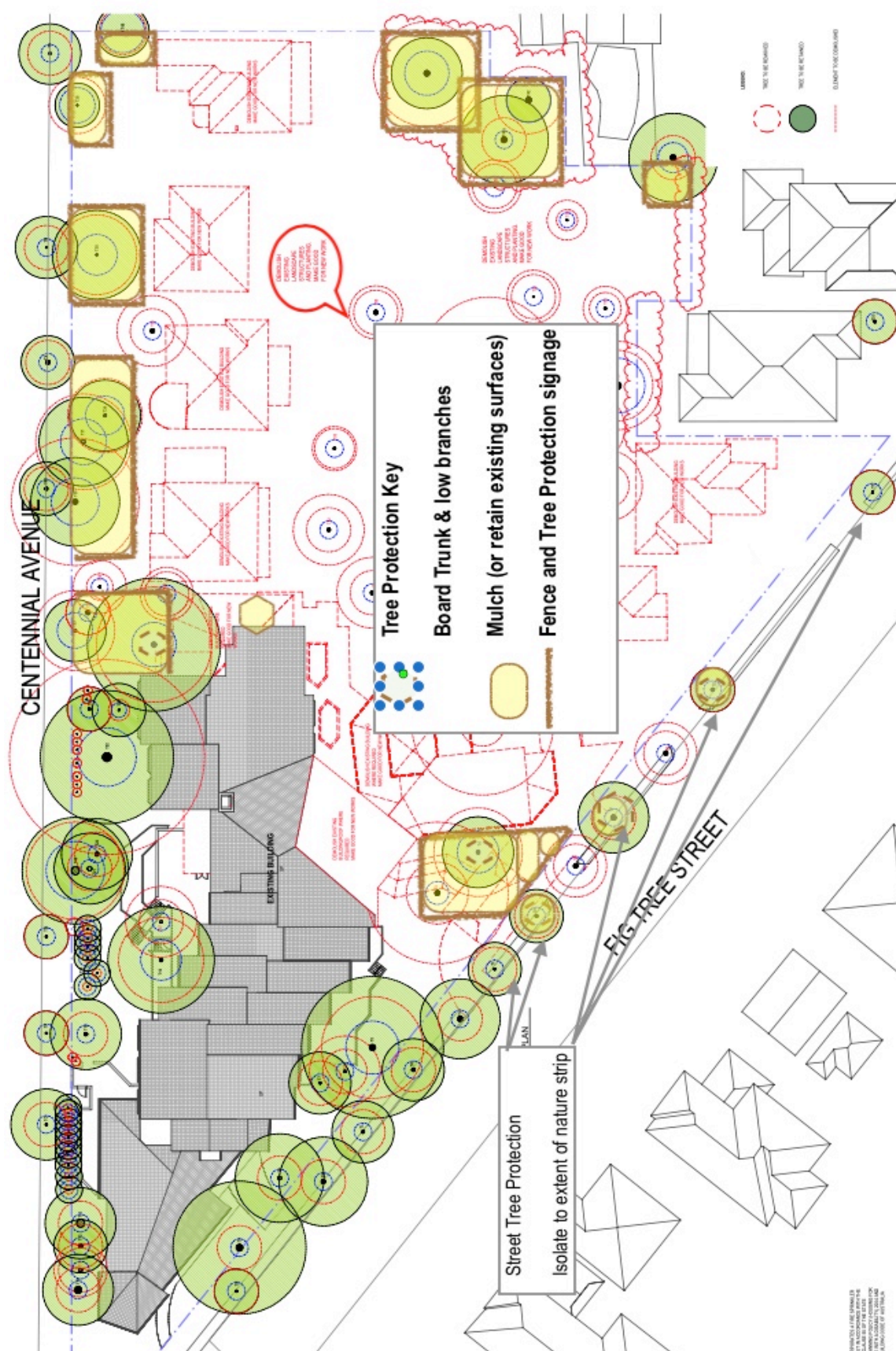


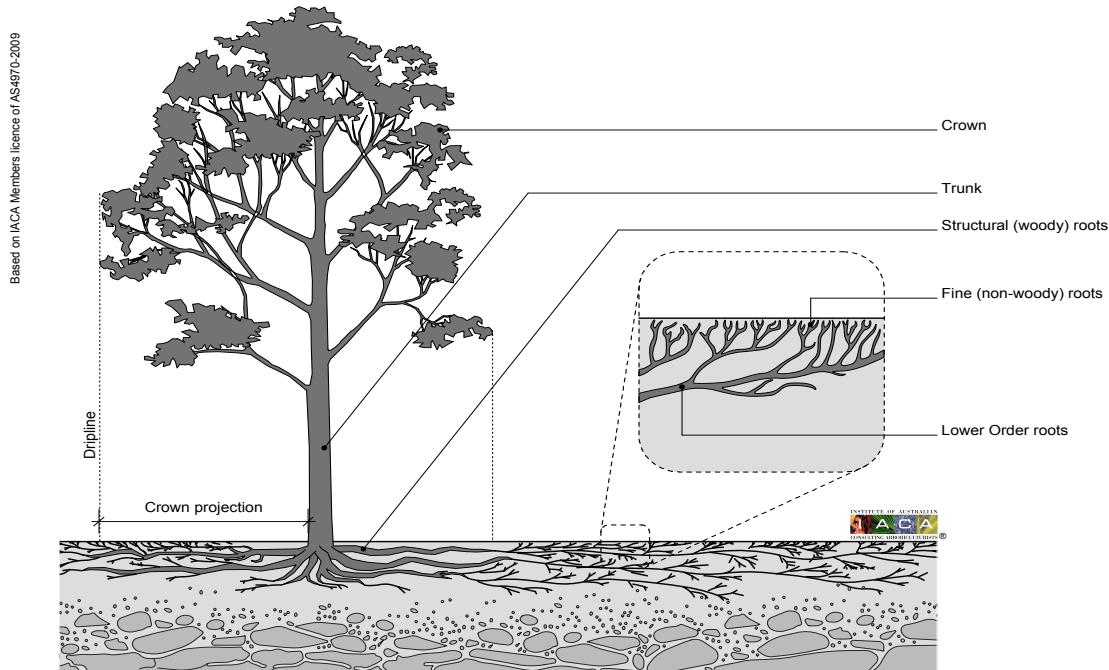


Appendix A4

Tree Protection Plan

Over plan by Morrison Design Partnership Architects, Project No:3108, Dwg No: DA061/Rev: DA03, Dated 2020-11-10



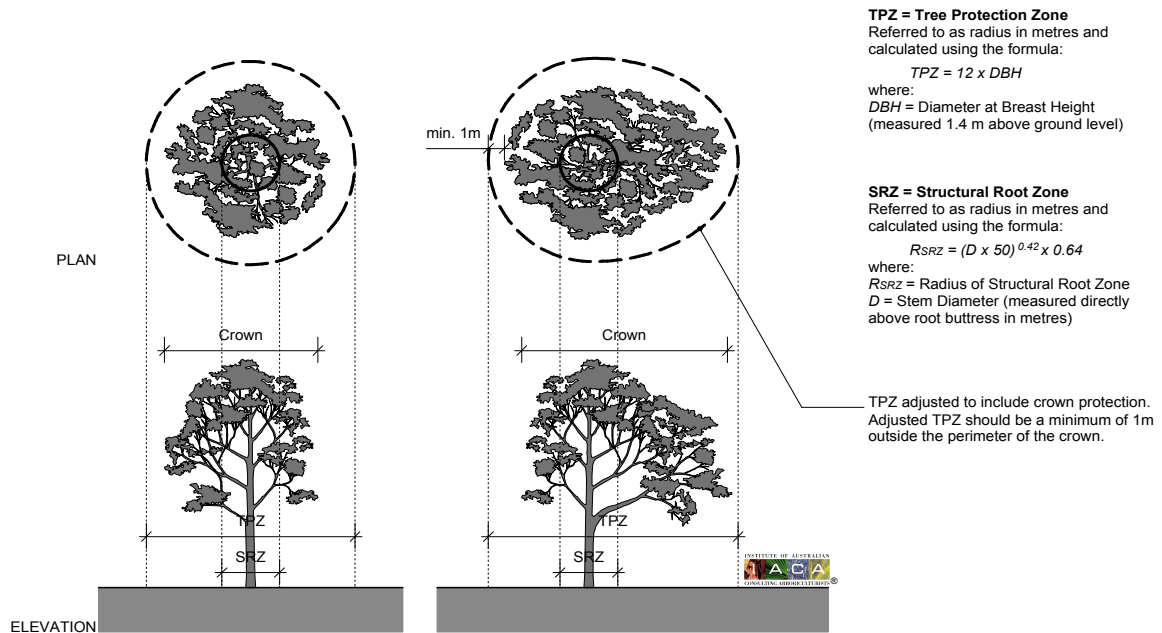


Structure of a Tree in a Typical Growing Environment

Scale 1:200 @ A4
Copyright © 2010 IACA

- Most tree roots are in the top 30cm of soil and are easily damaged by compaction and the loss of air spaces necessary for healthy survival. Soil compaction is a common cause of tree decline on development sites.
- Protection of tree roots requires that all activity be managed (and preferably eliminated within the Tree Protection Zone) with fencing (i.e. 12 times trunk diameter or as otherwise specified in the report).
- Roots fall into two main categories:
 - **Structural woody/Critical roots (SRZ):** These roots are instrumental in tree anchorage and structural support, nutrient storage and nutrient transport.
 - **The fine/smaller non-woody roots (TPZ)** are important in water and nutrient absorption as well as other functions important to tree health and survival.
- During site works demolition teams, builders and other workers on site will gravitate towards these green shady “different” areas, unaware of the damage they can cause, by compacting or contaminating the soil.
- Damaged trees are a liability and ongoing expense.
- Existing vegetation, particularly trees, are valuable assets that can continue to contribute to the property value long after new works have been completed.
- If well managed and protected trees provide an amenity to the immediate area and an environmental benefit to the wider community.

Based on IACA Members licence of AS4970:2009



Indicative Tree Protection Zone (TPZ)

Scale 1:500 @ A4

Copyright © 2010 IACA

The theoretical Tree Protection Zones (TPZ) of trees being retained, are given in the appended Tree Protection Calculations section of the report (Appendix E).

Works within the area of small roots Tree Protection Zone (TPZ)

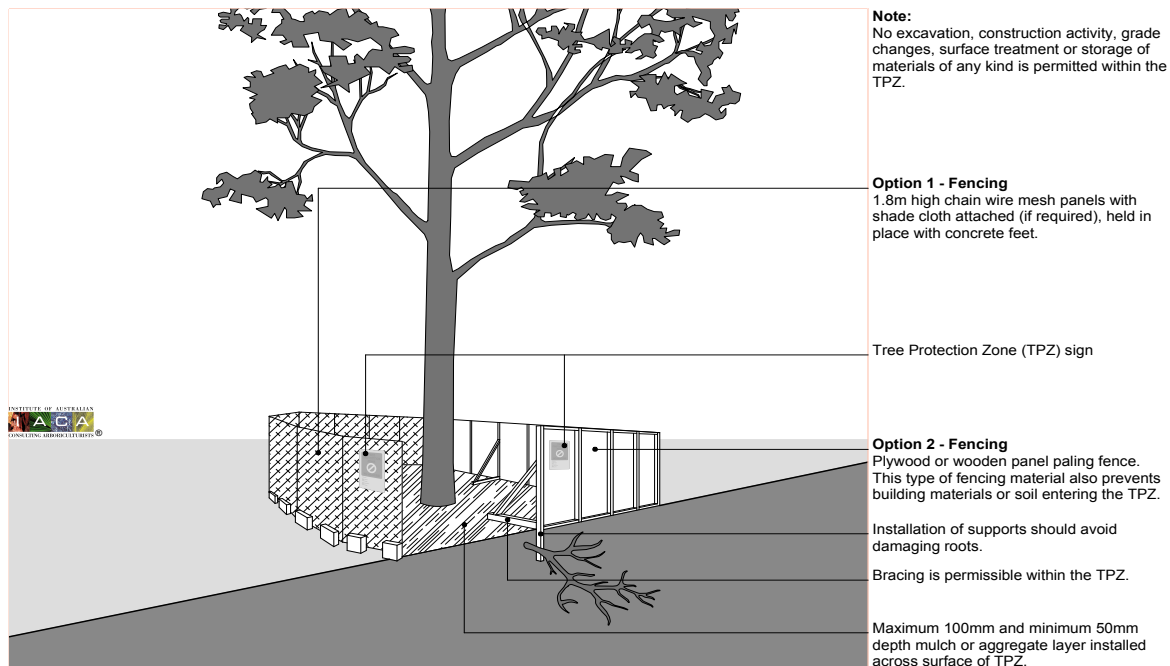
- Minimising soil compaction, by isolating most of the TPZ from works is important in the early stages of site works. Heavy equipment (such as those used in the demolition and the site preparation process) passing over the roots (or materials stockpiling) is detrimental to both the tree as well as the soil proposed for future plant growth (later landscaping).
- If works are proposed within the TPZ by and area of greater than 10%,

Works within Structural Root Zone SRZ

- Where works are required near large roots i.e. those within the SRZ, it is essential to avoid damaging these roots that are providing tree anchorage. Failure to do so is likely to create a dangerous tree that could fall.
- All works within SRZ should be above ground and to specific arboricultural specifications (provided by your AQF Level 5 arborist and preferably with them on site).
- Consideration may be required such as root mapping (careful exploratory digging using hand tools) to locate any large roots - 3cm or greater in diameter) and to find suitable locations. Piers for pier and beam construction are the only work possible.
- Piers must avoid roots with 20 – 30mm plus diameters.

“The Tree Protection Zone is the area around the tree or group of trees in which no grading or construction activity may occur. This area should be large enough to retain sufficient root or crown area to maintain tree health and stability.”⁷

* The acronym SULE was originally devised by Jeremy Barrell and although superseded is still acknowledged by the NSW Land & Environment Court as a tree rating. * * The original category of Safe is considered inappropriate and is no longer used.



Tree Protection Fencing

Not to Scale

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Tree Protection should be the first works on site: Protecting trees and vegetation being retained by isolating it with fencing is easier and far less expensive than later replacement or re-establishment.

Exclusion of Activity Inside the TPZ

- Each tree to be retained should be fenced off to the extent of the Tree Protection Zone excluding all activity unless otherwise indicated in the report. The fencing is to exclude storage of materials, site sheds, machinery, run off (e.g. concrete, or chemical treatments), the movement of pedestrian or vehicular traffic, the temporary, location of services, e.g. trenches, pits or canals.
- No works should be performed within the fenced area without specific consideration given. This includes mechanical scouring of existing vegetation and changes of soil levels (either the addition or removal).
- Where access is required adjacent to a tree e.g. along a driveway trunks and branches will require protection (see Appendix C2).

FENCING

- For large significant trees** fencing should be 1.8m in height of cyclone chainmesh Hire from - temporary fencing companies or similar. Other vegetation can be isolated using star pickets and orange parra-webbing. Available at local hardware outlets

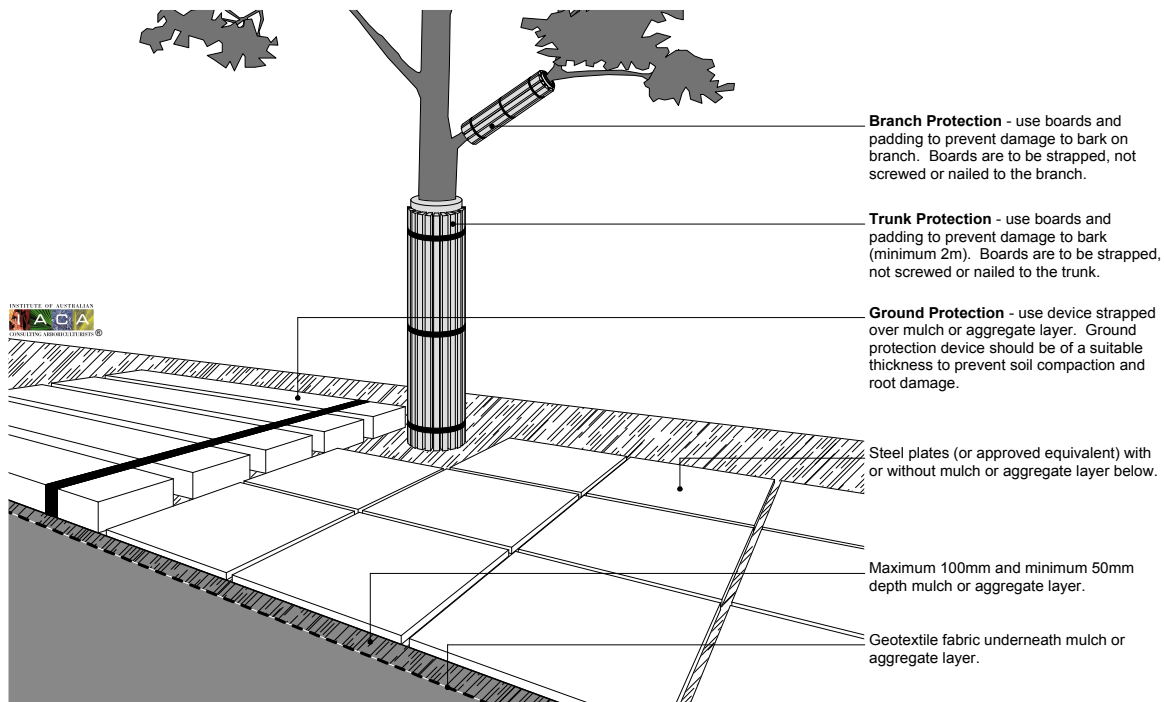
Site Signage on the fencing reminds workers of specific reasons for the fencing – for example:

'This fencing is not to be moved'.

'This Tree Protection Zone is to isolate vegetation from the building process'.

No equipment or materials are to enter or be stored within the fenced area and no chemicals or run off enter this protected zone.

Should fencing need to be moved for any reason first contact ...Site Manager on 9999 9999 or Arborist on 0417 022 692'.



Examples of Branch, Trunk and Ground Protection

Not to Scale

Copyright © 2010 IACA

WORKS CLOSE TO A TREE

Trunk Protection

Where a tree trunk is likely to be knocked (e.g. site access along a driveway) it must be protected from possible damage.

Protection material may be hessian, carpet, underfelt (or similar breathable material) with timber planks attached with wire or rope, encircling the materials (not into trunk).

Protection material should cover from the base of the tree to 2m (or to a level that is likely to be damaged by passing equipment) branch protection may be required.

Where access or works within TPZ are required soil surface protection must be installed i.e. a platform (constructed of steel material or timber/rumble boards capable of supporting and distributing the weight over a layer of mulch) and geotextile fabric (see diagram above).

Branch & Foliage Protection

To accommodate works some pruning might be required.

All pruning should be performed by a Qualified Tree Surgeon to ensure pruning is to AS 4373- 1996 'Australian Standards for Pruning Amenity Trees, see Appendix D). (If greater than 10% council approval may be necessary).

MULCH

Mulch is a blanket of insulating material that helps maintain soil moisture reduces the effects of temperature fluctuation and assists in weed reduction. Organic mulch is preferable as it also improves soil condition. Mulch such as Eucalyptus Wood mulch is ideal for use on development sites and should be placed to a depth of 70-100mm within the Tree Protection Zone or drip zone. The area immediately around the trunk should be kept clear of mulch to ensure no moisture builds up at the base of the trunk. It is also a barrier used in exceptional circumstances to assist with reducing soil compaction with vehicular access.

As poor pruning practices can create dangerous trees, introduce disease and cause trees to decline in health, all tree works recommended in this report should comply with the **Australian Standard for Pruning of Amenity Trees AS4373-2007**, and be performed by a suitably qualified and experienced tree surgeon, preferably with membership of a recognised organisation egg Arboriculture Australia (AA), Tree Contractors Association (TCA).

Tree works by unqualified, inexperienced or well-meaning cutters who do not perform works to AS 4373 can lead to many long-term and detrimental effects on the tree.

Tree Safety concerns include:

- Topping, lopping and structural root removals (roots >3cm in diameter) are inappropriate tree works, likely to create hazardous trees.
- Excessive pruning can lead to inappropriate growth such as the development of epicormic shoots. Epicormic shoots are emergency growth to provide short-term nutrient supply and are rarely strongly attached to branches or trunks. These branches are likely to fall as they become heavier.
- Removal of deadwood in Urban Trees is necessary in high traffic areas as part of the maintenance regime. Excessive deadwood production needs investigation.

Tree Health concerns include:

- Disease can be introduced onto a site or be transferred between trees by unclean equipment. **All equipment used should be cleaned before use and between trees with either 10% bleach 90% water or 70 % Metho 30% water.**
- Where a tree is suspected of being diseased the wood should be disposed of with care and not used for mulch.
- Poorly maintained equipment such as unsharpened blades, promotes jagged or poor cuts, leading to unnecessary stress and greater chance of disease entry and insect attack.
- Cutting to inappropriate points along a branch (known as lopping) encourages weakly attached regrowth that is likely to fail.
- The trees' natural defence and protection systems can be weakened by inappropriate cutting.

Considerations Before Pruning

Trees do not in themselves require pruning. A tree will naturally optimize its use of light (foliage) and space (particularly roots). When we interfere with this process by removing live foliage we interrupt or reduce the trees ability to photosynthesise and produce the sugars required for health and vigour. Where we cut branches, the tree must use stored sugars to manage the cut surface with defences to insect and disease.

Trees in the urban area require management to fit in with our requirements. Removal of deadwood as well as diseased and damaged wood are normal maintenance procedures to limit the impact on us. Removal of live wood (stored sugars) and foliage must be kept to a minimum.

From AS4373 - *The tree should not be adversely affected by pruning.*

Prior to pruning being prescribed or undertaken a thorough inspection of the tree should be carried out by a person competent in arboricultural assessment (minimum AQF Level 3). This should include an assessment of the tree's health, growth habit, structure, stability and growing environment. The need for pruning should be determined. If pruning is required, then the current and subsequent pruning requirements should be specified. Clause 7 covers types of pruning.

Good tree management: Pruning is creating minimal adverse effects on the tree.

Pruning is defined as considered cutting to branch collars (the location of many tree defences) without damaging the collar (egg flush cutting).

Poor Inappropriate Tree works include: Indiscriminate cutting often leading to poorly attached re-growth that is likely to fail.

Egg Lopping – Random cutting at a point between branch unions (i.e. not to branch collars). This practice usually damages a tree reducing strength condition and vigour and promoting premature decline and exposure to pests and diseases.

Topping - Height reduction, Removal of the upper part of a tree reducing its height by Lopping and **Flush cutting** – removal of or damage to branch collar.

For your protection **Choose a Professional Tree surgeon who:**

- Conducts their business according to The Code of Practice for The Amenity Tree Industry.
- Performs works to Australian Standard for Pruning of Amenity Trees, 4373–1996
- Carries CURRENT Public Liability Insurance – Check currency certificate.
- Is a member of a recognised, professional organisation such as: Tree Contractors Association (TCA) or Arboriculture Australia (AA). Membership of these organisations requires that works be performed to appropriate standards. These members are monitored for compliance.

About the **Code of Practice for the Amenity Tree Industry 1998**

'This code has been developed as TREE WORK IS HAZARDOUS. The industry is full of hazards ranging from the tree itself, to the weather, the terrain and difficult sites in which tree work is carried out. Each year, many people in the tree industry are killed or injured. Apart from the enormous impact of injury on individuals and their families, accidents cost the community a significant amount of money. The relatively high incidence of injuries is reflected in the high rates for workers' compensation insurance premiums. When injuries are analysed, the overwhelming majority could have been prevented by following the simple safety procedures outlined in this Code of Practice'. (Quote from the code)

This code provides practical guidance on safety requirements for the amenity tree industry. It is intended as a guide to the public and private sectors in meeting their requirements under the Occupational Health and Safety Act 1983. This code applies to the amenity tree industry for pruning, trimming, repairing, maintaining, transplanting and removing trees and for wood chipping, stump grinding and for equipment used in such operations.

About the **Australian Standard: Pruning of Amenity⁸ Trees 4373–2007**

This document outlines 'best practice' methods of tree work, written for compliance by arborists. Your chosen tree contractor must be familiar with and perform all works according to the standard.

⁸ The AS4373 is for Amenity trees and does not relate to trees in Commercial production.

Tree No.	Species	Location/Intrusions/Concern	Additional Protection Required
4	Gum	Walkway area & stairs within TPZ. Minor intrusion, manage levels and pit location	Staged protection required
25	8 x Paperbark	Manage boundary fencing footings	Staged protection required
27	Gum	Careful management required at all stages. New impact on TPZ is about 10%. Demolition of existing building,	Staged protection required
30	Gum	Manage boundary fencing footings	Hand dig piers
31	Cheese Tree	Boundary and internal fencing levels with SRZ Manage boundary fencing footings	Hand dig piers
34	Jacaranda	Paths within SRZ manage levels, terrace within TPZ	Hand dig piers
38	Crepe Myrtle	Boundary fencing, paths & feature within SRZ, Manage boundary fencing footings	Staged protection required
39	Jacaranda	Boundary fencing & landscaping wall within SRZ, Manage boundary fencing footings	Staged protection required
40	Crepe Myrtle	Manage boundary fencing footings	Hand dig piers
41	Fig	Courtyard, Landscape batter, boundary fencing	Hand dig piers
42	Paperbark	Manage boundary fencing footings	Hand dig piers
42a	Species	Retaining wall, pit, fencing	Manage landscaping
43	Pittosporum	Manage boundary fencing footings	Hand dig piers
C	White cedar	New driveway within 1.5m	Manage driveway works
D	Bottlebrush	Access driveway within 2.7m	Manage driveway works
F	Paperbark	Works processes	Manage driveway works
H	Paperbark	New driveway within TPZ /Outside SRZ	Manage driveway works

Site preparation - Tree protection fencing must be installed to the extent of the TPZ, prior to other preparation works. This includes removal of trees and vegetation to ensure workers are aware of the requirement to avoid damage to adjacent trees.

The area within the TPZ

Removal of nominated trees and vegetation

Tree protection must be in place before nearby vegetation is removed to ensure that the above and below ground section of a retained tree is not adversely impacted upon, this includes compaction of the soil or damage to the above ground parts of retained trees.

Where a tree to be retained is within the TPZ

Landscaping- Landscaping will be performed within the TPZ.

There must not be any level changes without specific arboricultural advice being provided.

There must not be any level changes within the SRZ.

Boundary fencing within the TPZ of retained trees will require arboricultural advice.

Stage 1: Prior to any other works.

Wrap trunks of trees identified as requiring this. T4, T27, Street Trees C, D, F, H.

Fence to extent of TPZ. Where building demolition is required within TPZ, ensure soil is protected.

Where works are planned within TPZ, protect soil with mulch or rumble boards to the extent of works.

Stage 2: Prior to building works

Move tree protection fencing out to the extent of TPZ or approved works.

Boundary Fencing

New fencing must be installed entirely above existing ground level (not strip footings) . Pier holes within TPZ, must be carefully dug using hand tools to avoid roots 3cm or greater, preferably with project arborist on site.

Stage 3: Landscaping works

Tree protection fencing must be removed to perform landscaping works.

Changes to the growing conditions within the TPZ, will require that consideration of soil, particularly levels for large structural roots, and small water mineral supplying roots are not adversely impacted upon.

No Fill over 10cm unless specifically discussed with project arborist. (will reduce important root access to air and must be managed).

No level reduction (even minor) unless specifically discussed with project arborist.

(will remove roots with are close to the surface and providing structural support to the tree).

No machinery or compaction causing activities within TPZ. Compaction will remove important air in the soil and cause roots to die

will be important All landscaping is ideally at existing grade within a trees TPZ. Where this is not the case, changes must be specifically discussed with the project arborist.

New boundary palisade fencing will require that footings are managed o avoid tree roots 3cm or greater.

Changes to existing walls will require specific arboricultural consideration.

New soil surfaces should be entirely above existing grade or specifically considered by the project arborist for sections within TPZ.

Appendix EM

Modified Specific Tree Management Distances Table

Tree No.	Species	SRZ Radius	Impact on SRZ	TPZ Radius	New Impact on TPZ	Modified Tree Protection Distance on one side only	Works nearby requiring additional /Tree Protection Measures
4	Red Mahogany	2.6m	No	5.3m	Minor %	Staged protection required Wrap trunk and protect soil prior to	Removal of adjacent tree. Demolition of nearby building
25	8 x Prickly Paperbark	10-35cm	Fencing	2.0m	Manage	<u>See detail in Appendix A3</u>	Boundary fencing, manage works
27	Sydney Blue Gum	2.8m	Yes	6.6m	Minor	Staged protection required Wrap trunk and protect soil prior to	High impact by works processes.
30	Eucalypt	2.7m	Yes	7.2m	Landscaping		Boundary fencing
31	Cheese Tree	2.6m	Yes	5.4m	Landscaping		Boundary fencing
34	Jacaranda	2.2m	No change	4.2m	Minor	Demolition of nearby building	# New terrace outside SRZ, within 2.5m
38	Crepe Myrtle	2.3m	Fencing	4.5m	Minor	<u>See detail in Appendix A3</u>	Boundary fencing, manage works
39	Jacaranda	2.0m	Fencing	3.2m	Landscaping	<u>See detail in Appendix A3</u>	Boundary fencing, manage works
40	Crepe Myrtle	2.5m	Landscaping	2.7m	Landscaping		Boundary fencing, Landscaping.
41	Moreton Bay Fig	2.7m	No	6.0m	Landscaping		Boundary fencing, Landscaping.
42	Paperbark	2.5m	No	7.8m	Landscaping		Boundary fencing, Landscaping.
42a	Species					Tree removal nearby	Landscaping.
43	Pittosporum	2.3m	No	4.8m	Minor		Boundary fencing Landscaping.
Street Trees							
C	White cedar	2.0m	No	3.6m	Minor		New driveway within 1.5m
D	Bottlebrush	2.5m	No	4.8m	Minor		Access driveway within 2.7m
F	Paperbark	2.7m	No	6.0m	Minor		Works processes
H	Paperbark	2.2m	No	4.2m	Minor		New driveway layback within TPZ /Outside SRZ

Appendix E

Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Impact on SRZ	TPZ Radius	Impact on TPZ	Works nearby/Tree Protection Measures
4	Red Mahogany	44cm	88m ²	2.6m	No	5.28m	Minor	Maintain levels within TPZ. Ensure pit is outside SRZ
5	Sydney Blue Gum	60cm/70cm	163m ²	3.0m	No change	7.2m	No change	Outside area of works
7	Box Elder	25cm	28m ²	1.9m	No change	3.0m	No change	Outside area of works
8	Sydney Red Gum	55cm	137m ²	2.6m	No change	6.6m	No change	Outside area of works
9	Sydney Red Gum	85cm	327m ²	3.0m	No change	10m	No change	Outside area of works
10	Cypress Pine	120cm	651m ²	3.6m	No change	14m	No change	Outside area of works
12	Cypress Pine	40cm/45cm	72m ²	2.4	No change	4.8m	No change	Outside area of works
13	Cypress Pine	80cm/90cm	189m ²	3.2m	No change	9.6m	No change	Outside area of works
14	10x Forest Oak	10 - 25cm	28m ²	1.9m	No change	3.0m	No change	Outside area of works
15	She-oak	35cm/40cm	55m ²	2.3m	No change	4.2m	No change	Outside area of works
16	Sydney Blue Gum	40cm	72m ²	2.3m	No change	4.8m	No change	Outside area of works
18	6 x Prickly Paperbark	15cm-30cm	41m ²	2.0m	No change	3.6m	No change	Outside area of works
19	Grey Gum	100cm	452m ²	3.3m	No change	12m	No change	Outside area of works
20	Rough Bark Gum	45cm	92m ²	2.4m	No change	5.4m	No change	Outside area of works

Appendix E

Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Impact on SRZ	TPZ Radius	Impact on TPZ	Works nearby/Tree Protection Measures
21	Rough Bark Gum	50cm	113m ²	2.5m	No change	6.0m	No change	Outside area of works
22	Rough Bark Gum	90cm/ 100cm	366m ²	3.3m	No change	11m	No change	Outside area of works
23	Sydney Blue Gum	20cm	18m ²	1.7m	No change	2.4m	No change	Outside area of works
24	7 x Prickly Paperbark	10cm-30cm	41m ²	2.0m	No change	3.6m	No change	Outside area of works
25	8 x Prickly Paperbark	10cm-35cm	55m ²	2.0m	Manage	4.5m	Minor	New boundary fencing within SRZ. Manage footings
27	Sydney Blue Gum	55cm	137m ²	2.8m	Yes	6.6m	High - Above ground works	High impact by works processes.
30	Eucalypt	60cm	163m ²	2.7m	No change	7.2m	High	New boundary fencing within SRZ. Manage footings
31	Cheese Tree	45cm	92m ²	2.6m	No change	5.4m	High	Boundary fencing Within SRZ
34	Jacaranda	35cm	55m ²	2.2m	No change	4.2m	Minor	# New terrace outside SRZ, within 2.5m
38	Crepe Myrtle	40cm	64m ²	2.3m	No	4.5m	Minor	Landscaping.
39	Jacaranda	30cm	32m ²	2.0m	Landscaping	3.2m	Landscaping	Boundary fencing
40	Crepe Myrtle	10-20cm	23m ²	2.5m	Landscaping	2.7m	Landscaping	Boundary fencing
41	Moreton Bay Fig	50cm	113m ²	2.7m	No	6.0m	Landscaping	
42	Broad-leafed Paperbark	65cm	191m ²	2.5m	No	7.8m	Landscaping	Boundary fencing

Appendix E

Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Impact on SRZ	TPZ Radius	Impact on TPZ	Works nearby/Tree Protection Measures
42a	Broad-leafed Paperbark	65cm	m ²		No		Minor	
43	Pittosporum	40cm	72m ²	2.3m	No	4.8m	Minor	Boundary fencing
Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Impact on SRZ	TPZ Radius	Impact on TPZ	Works nearby/Tree Protection Measures
C	White cedar	(30cm)	41m ²	2.0m	No	3.6m	Minor	New driveway within 1.5m
D	Weeping Bottlebrush	40cm	72m ²	2.5m	No	4.8m	Minor	Access driveway within 2.7m
F	Broad-leafed Paperbark	50cm	113m ²	2.7m	No	6.0m	Minor	Works processes
H	Broad-leafed Paperbark	35cm	55m ²	2.2m	No	4.2m	Minor	New driveway within TPZ /Outside SRZ

No Change to street trees - I, J, K, L, M and N along Fig Tree Street or those along Centennial Avenue.

Appendix F

St Columbia's Lane Cove

Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
1	<i>Jacaranda mimosifolia</i> Jacaranda	45 + 28cm	8m	Good	Fair	Co-dom from base. Lopped. Large epi. Adjacent trees on survey have been removed.	Long	High
2	<i>Eucalyptus paniculata</i> Grey Ironbark	60cm	17 x 16m	Good	Good	High value tree.	Long	High
3	<i>Eucalyptus paniculata</i> Grey Ironbark	58cm	16 x 16m	Good	Good	High value tree.	Long	Medium (species)
4	<i>Eucalyptus resinifera</i> Red Mahogany	44cm	10 x 8m	Good	Good- Fair	Poor from, suppressed by T3.	Long	High
(5)	<i>Eucalyptus saligna</i> Sydney Blue Gum	60cm/70cm	16 x 40m	Good	Good	Located close to structure	Long	High
(6)	<i>Angophora costata</i> Sydney Red Gum	20cm	8 x 4m	Good	Fair	Suppressed by T5. Limited future due to location. Recommend removal due to location	Short	Medium (suppressed)
(7)	<i>Acer negundo</i> Box Elder	25cm	7 x 7m	Good	Good	In raised garden bed with cotoneaster	Medium	Medium (species)
(8)	<i>Angophora costata</i> Sydney Red Gum	55cm	11 x 10m	Good/Fair	Good	Tip dieback	Long	High
(9)	<i>Angophora costata</i> Sydney Red Gum	85cm	15 x 15m	Good	Good	Small Diameter D/W. New path nearby.	Long	High
(10)	<i>Cupressus sp.</i> Cypress	120cm	15 x 8m	Good	Fair/Poor	Internal deadwood Included Stems	Medium	High/ Medium
(11)	<i>Cupressus sp.</i> Cypress	Dead	----	Poor	Poor	100% dead. Remove.	Remove	N/a
(12)	<i>Cupressus sp.</i> Cypress	40cm/45cm	15 x 6m	Fair	Fair	Internal Deadwood	Medium	High

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove, . **Prominence** High/Medium/Low

Tree within building envelope Tree requiring specific and careful management near works (Outside area of works)

Appendix F

Uniting Lane Cove

Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
(13)	<i>Cupressus sp.</i> Cypress	80cm/90cm	16 x 8m	Fair	Fair	Internal deadwood Included Stems	Short	High
(14)	10x <i>Allocasuarina torulosa</i> Forest Oak	10 - 25cm	5 to 8m	Fair - Poor	Fair - Poor	Some Dead. Some Included Bark stems	Short	High
(15)	<i>Casuarina sp</i> She-oak	35cm/40cm	13 x 8m	Good -Fair	Good	Minor D/W.	Medium	High
(16)	<i>Eucalyptus saligna</i> Sydney Blue Gum	40cm	15 x 12m	Good	Good	Growing in raised garden bed, close to brick wall. Intermediate canopy	Long	High
(17)	<i>Casuarina sp</i> She-oak	30cm	15 x 8m	Fair - Poor	Good	Growing in raised garden bed. No future	Short	Low
(18)	6 x <i>Melaleuca stypheloides</i> Prickly-leafed Paperbark	15cm-30cm	6 - 8m	Good	Good	Surrounding large gas meter	Medium	Medium/ High
(19)	<i>Eucalyptus punctata</i> Grey Gum	100cm	15 x 12m	Good	Fair	Heavily growing to South. Sewer vent beside Trunk.	Long	High
(20)	<i>Eucalyptus sp.</i> Rough Bark Gum	45cm	15 x 8m	Good	Good/Fair	Growing over Centennial Ave. Large diameter deadwood	Long	High
(21)	<i>Eucalyptus sp.</i> Rough Bark Gum	50cm	14 x 8m	Good	Good	Leaning/going East over retirement village units	Long	High
(22)	<i>Eucalyptus microcorys!</i> Tallowwood	90cm/ 100cm	17 x 15m	Good	Good	No fruit for ident. Significant Tree. Large diameter deadwood to 20cm	Long	High
23	<i>Eucalyptus saligna</i> Sydney Blue Gum	20cm	8m	Good	Good	Suppressed Under T22	Long	Medium/ High
24	7 x <i>Melaleuca stypheloides</i> Prickly-leafed Paperbark	10cm-30cm	5 - 7m	Good	Fair		Long	High
25	8 x <i>Melaleuca stypheloides</i> Prickly-leafed Paperbark	10cm- 35cm	5 - 7m	Good	Good		Long	High
26	<i>Erythrina x synesis</i> Coral tree	50cm	8m	Dead	Dead		Dead	Dead
27	<i>Eucalyptus saligna</i> Sydney Blue Gum	55cm	15m	Good	Good	Trunk near building, highly prominent & healthy tr	Long	High

Tree within building envelope

Tree requiring specific and careful management near works

(Outside area of works)

Appendix F

Uniting Lane Cove

Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
28	<i>Elaeocarpus reticulatus</i> Blueberry Ash	15cm	6m	Good	Good	Suppressed Under T27 (Saligna)	Medium	Medium
29	<i>Trachycarpus fortunei</i> Chinese Windmill Palm	25cm	6m	Good	Good	In #112 Centennial Ave	Long	Medium
30	<i>Eucalyptus sp.</i> Rough Bark Gum	60cm	15 x 10m	Good	Fair	D/W Mistletoe + Epi growth. Tree in raised garden bed and any changes will destabilise tree.	Long	High
31	<i>Glochidion ferdinandii</i> Cheese Tree	45cm	8 x 10m	Fair	Good	Sparse – Seasonal!	Long	High
32	<i>Erythrina x sykesii</i> Coral tree	40cm	6m	Fair	Fair		Short	Low
33	4 x <i>Syagrus romanzoffianum</i> Cocos Palm	N/a	8m	Good	Good		Weed	Low
34	<i>Jacaranda mimosifolia</i> Jacaranda	35cm	7 x 8m	Good	Good	Minor D/W.	Long	High
35	<i>Cupressus macrocarpa</i> Golden Brunning Cypress	4 x15-30cm	7 x 6m	Good	Fair	At #108. Included Bark Trunks	Medium	Medium
36	<i>Jacaranda mimosifolia</i> Jacaranda	50cm	8m	Good	Good		Medium	Medium
37	<i>Syzygium paniculatum</i> Brush Cherry	65cm	10 x 15m	Good	Good	D/W to 100mm	Long	High
38	<i>Lagerstroemia indica</i> Crepe Myrtle	7x (10 - 20cm)	6 x 10m	Good	Fair	At #108.	Medium	Medium

Health/Structure: Good Fair Poor **Crown Class:** Dominant, Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove, . **Prominence** High/Medium/Low

Tree within building envelope Tree requiring specific and careful management near works. (Outside area of works)

Appendix F

Uniting Lane Cove

Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
39	<i>Jacaranda mimosifolia</i> Jacaranda	2x10 - 15cm	5 x 5m	Good	Good		Medium	Medium
40	<i>Lagerstroemia indica</i> Crepe Myrtle	5 x 10 -20cm	6m	Good	Good	Choked with vines	Medium	Medium
41	<i>Ficus macrophylla</i> Moreton Bay Fig	50cm	8m	Good	Good	Rear of 106	Medium	Medium
42	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	65cm	10 x 5m	Good	Good	1 Churlish. D/w to 100mm	Long	High
42a	Species							
43	<i>Pittosporum sp.</i>	7x10 - 20cm	6 x 10m	Good	Fair	Poor form. Dead stubs + D/w	Medium	Medium

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove, . **Prominence** High/Medium/Low

Tree within building envelope Tree requiring specific and careful management near works (Outside area of works)

Note: Some trees in front gardens of northern houses in Centennial Ave are in raised garden beds and may not be retainable within levels or new fencing.

Appendix F

Uniting Lane Cove

Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
52	<i>Grevillea robusta</i> Silky Oak	40cm	12m	Good	Good	Rear of #7 Viewed over fence	Medium	Low
53	<i>Grevillea</i> Cv. 'Moonlight'!	20cm	4m	Fair	Fair	Rear of #7 Viewed over fence	Short	Low
54	<i>Ceratopetalum gummiferum</i> NSW Christmas Bush	20cm	6m	Fair	Fair	Rear of #7 Viewed over fence Internal deadwood.	Short	Low
55	<i>Camellia</i> spp. Camellia	Multi- stem	4 x 5m	Good	Good		Medium	Low
56	<i>Eucalyptus maculata</i> Spotted Gum	85cm / 94cm arb	16 x 8m (street) x 7m (rear)	Good	Good	Most significant tree in street Mounding in soil at base to 1m First branch at 6m	Long	High
57	<i>Jacaranda mimosifolia</i> Jacaranda	45cm / 55cm	6 x 6m	Good	Good		Medium	Medium
58	<i>Bauhinia variegata</i> Orchid tree	-	8m	Good	Fair-Poor	Roots above ground to 1m. Co-dom at 4m	Medium	Low
59	<i>Acer</i> sp!	100cm arb	12 x 10m	Not in leaf	Good	Needs deadwood pruned out	Medium	Medium-High
60	<i>Melaleuca</i> sp.	Multi	5 x 6m	Good	Good	New driveway within SRZ	Medium	High
61	<i>Cupressus</i> sp. Cypress Pine	50cm	8m	Good	Good - Fair	Rear of #11 Figtree Rd.	Medium	Medium
62	<i>Lagerstroemia indica</i> Crepe Myrtle	Multi.	5m	Good	Good	Rear of #11 Figtree Rd.	Short	Low

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove, . **Prominence** High/Medium/Low

Tree within building envelope

A total of twenty-seven trees proposed for removal include 1, 2, 3, (6), (11), (17), (26), 28, 29, (32), (33), 35, 36, 37, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, street trees E and G.

Appendix F

Uniting Lane Cove - Adjacent Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
(A)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	35cm	6m	Good	Good	Outside area of works	Medium	High
(B)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	35cm	6m	Good	Fair	Outside area of works	Medium	High
C	<i>Melia azedarach</i> White cedar	20 + 20cm	5m	Good	Fair-Poor	Branch failures. Co'dom from base and inclusion splitting. Monitor for removal New driveway within 1.5m	Short	High
D	<i>Callistemon viminalis</i> Weeping Bottlebrush	40cm	5m	Fair	Fair	Some pervious branch failures. Access driveway within 2.7m	Short	High
E	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	50cm	7m	Fair	Fair	Multiple Co dom from 1.5m. Inclusions and tip die back	Medium	High
F	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	60cm	8m	Fair	Fair	Multiple Co dom from 1.5m. Inclusions and tip die back	Medium	High
G	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	50cm	7m	Fair	Fair	Multiple Co dom from 1.5m. Inclusions and tip die back	Medium	High
H	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	35cm	6m	Fair	Fair		Medium	High
(I)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	25cm	6m	Fair	Fair		Medium	High
(J)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	50cm/ 60cm	9mx8m	Fair	Fair	Mower root damage	Long	High

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove, . Prominence High/Medium/Low

Tree within building envelope Tree requiring specific and careful management near works. (Outside area of works)

Appendix F

Uniting Lane Cove - Adjacent Tree Data Schedule

Tree #	Genus species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	ULE L/M/S	Prominence H/M/L
(K)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	40cm	7m	Good	Good	Mower damage	Long	High
(L)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	35cm	7 x 7m	Fair	Fair	Mower root damage to structural roots	Long	Medium/ High
(M)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	50cm	10 x 10m	Fair	Fair	Included Bark stems	Long- Medium	Medium/ High
(N)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark	25cm	5 x 5m	Fair	Good	Whipper sniper damage at base. Requires mulch or groundcover under.	Long	Medium/ High
(O)	<i>Angophora costata</i> Sydney Red Gum	25cm	8 x 5m	Good	Good	Street Tree Centennial Ave near Fig Tree Street.	Long	High
(P)	<i>Angophora costata</i> Sydney Red Gum	25cm	10m	Good	Fair	Street Tree Centennial Ave - Lost leader.	Long	High
(Q)	<i>Melaleuca quinquenervia</i> Broad-leafed Paperbark					Outside #110	S	L
(R)	<i>Angophora costata</i> Sydney Red Gum	40cm	14m	Good	Good	Outside #108	Medium	High
(S)	<i>Eucalyptus elata</i> River Peppermint	80cm	12m	Fair	Fair	Outside #106	Medium	Medium

Health/Structure: Good Fair Poor **Crown Class:** Dominant. Co-dominant, Intermediate, Suppressed **ULE** Long Medium Short Remove, . **Prominence** High/Medium/Low

Tree within building envelope Tree requiring specific and careful management near works. (Outside area of works)

Comments about street trees.

All street trees in Fig tree street and Centennial Ave require soil improvement at base. To prevent whipper sipper damage and exposure to structural root damage.

A total of twenty-seven trees proposed for removal include 1, 2, 3, (6), (11), (17), (26), 28, 29, (32), (33), 35, 36, 37, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, street trees E and G.