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Preliminary Arborist's Report

Site:

Dudley Rd and Kopa St, Whitebridge

Prepared for:

SNL Building

Prepared By

John Atkins

Ref No: C134

Date: 5th August 2013

Contents

1. Summary	3
2. Introduction	4
2.1. Disclaimer	4
2.2. Brief	4
2.3. Methodology	4
3. Site Details.....	5
3.1. Site location.....	5
3.2. Site Description	5
4. Tree Assessment Survey.....	6
4.1. Tree location plans	6
4.2. Tree Survey schedule	12
4.3. Retention Value Assessment, Structural Root Zone, Tree Protection Zone and Canopy area dimensions.....	19
5. Retention Value Groups.....	Error! Bookmark not defined.
6. Recommendations.....	29
References	31
Appendix1. Determining the retention value of trees	32
Appendix 2 Structural Root Zone and Tree Protection Zone Dimensions and details	38
Structural root zone (SRZ)	38
Tree Protection Zone (TPZ) Calculations	39

1. Summary

The site consists of a large cleared zone between Dudley Rd on the southern side, Kopa St to the North, the Fernleigh Track zone to the east and residential lots on the western side.

There are few trees on the site, mostly in the eastern corner between the end of Kopa St and the Fernleigh Track entrance.

Adjacent to the eastern side of the site is a dense corridor of trees along the verge of the Fernleigh track.

To the west, residential lots and the rear of the commercial buildings contain some trees within 1 – 2 metres of the boundary fences.

40 trees were surveyed within the site and in close proximity to the site boundaries. See section 4 for more details.

Of those 40 trees, 10 were found to have High retention value (Trees 8, 12, 15, 17, 19, 20, 27, 29, 30 and 35). High retention value trees are considered to have long sustainable lives and high landscape values. These trees are more desirable to be retained and the Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) dimensions listed in section 4.3 should be used as guides for areas where development should be avoided.

A further 10 trees had Moderate Retention values (Trees 2, 3, 4, 13, 16, 18, 22, 24, 26, 32). These trees have lower sustainability or are less significant in the landscape. SRZ and TPZ dimensions are still critical however the design of any development may consider these trees less essential.

All the remaining trees had Low to Very low Retention Value. These trees are either insignificant in the landscape, or have low sustainability due to poor structure or health. However some trees are located in adjacent properties. The Low retention value trees should be considered as a minimal design constraint. Very Low Retention Value trees could be removed if within the site boundaries.

These details are intended to provide initial arboricultural advice for further engineering and architectural design.

2. Introduction

2.1. Disclaimer

This report has been prepared for the exclusive use of the client and Treeology Pty Ltd accepts no responsibility for its use by other persons. The client acknowledges that this report, and any opinions, advice or recommendations expressed or given in it, are based on the information supplied by the client and on the data obtained by inspections, measurements and analysis carried out or obtained by Treeology Pty Ltd. This report does not identify all structural defects of trees inspected and no responsibility is accepted for faults not identified or predicted.

It is not possible to accurately identify all structural defects at high levels in trees or internal structural faults that cannot be seen by the naked eye. Due to the nature of tree growth, the location of roots is unpredictable. The accurate detection of all structural defects in trees and their root systems is difficult to predict. Conditions such as extreme wind, storm activity, lightning and other events are unpredictable. Unforeseeable damage to trees may occur due to these unpredictable events.

The client should rely on the contents of this report, only to the extent that some structural faults have been observed, but not all. No responsibility for damage to persons or property is accepted for damage by trees referred to in this report due to unforeseen or extreme environmental events.

2.2. Brief

The purpose of this report is to assess the condition of all trees present on site and provide advice on the suitability for retention of those trees. The Newcastle City Council Urban Forest Technical manual has been used to develop criteria for the retention values of the trees. Recommendations on tree retention have been stated.

2.3. Methodology

Treeology has performed an on-site inspection on 27th July 2013. Visual Tree Assessment methodology as described by Mattheck and Breloer (1994, pp 145 – 146) was used on all trees. Height dimensions were measured using a digital clinometer and Diameter at Breast Height (DBH) dimensions were measured using a diameter tape measure. Canopy spread was measured by pacing out distances. Age was estimated by experience of the species. Sustainability was based on current age, estimated life span and by estimation of the difference between the two. Observations were made from ground level without aids and later using a digital camera.

3. Site Details

3.1. Site location



Figure 1 shows the aerial view of the site at and the layout of the individual lots within the site.

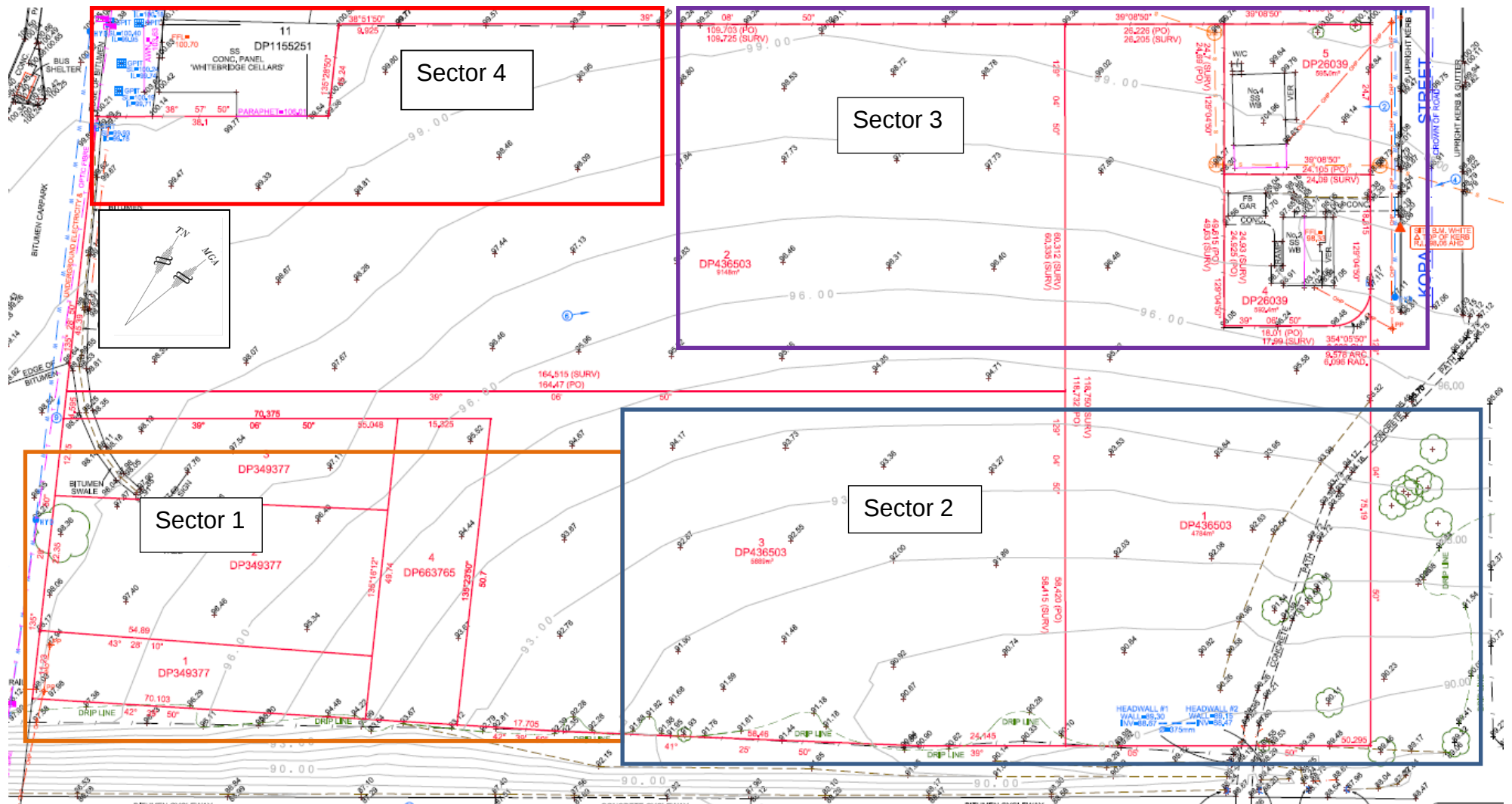
3.2. Site Description

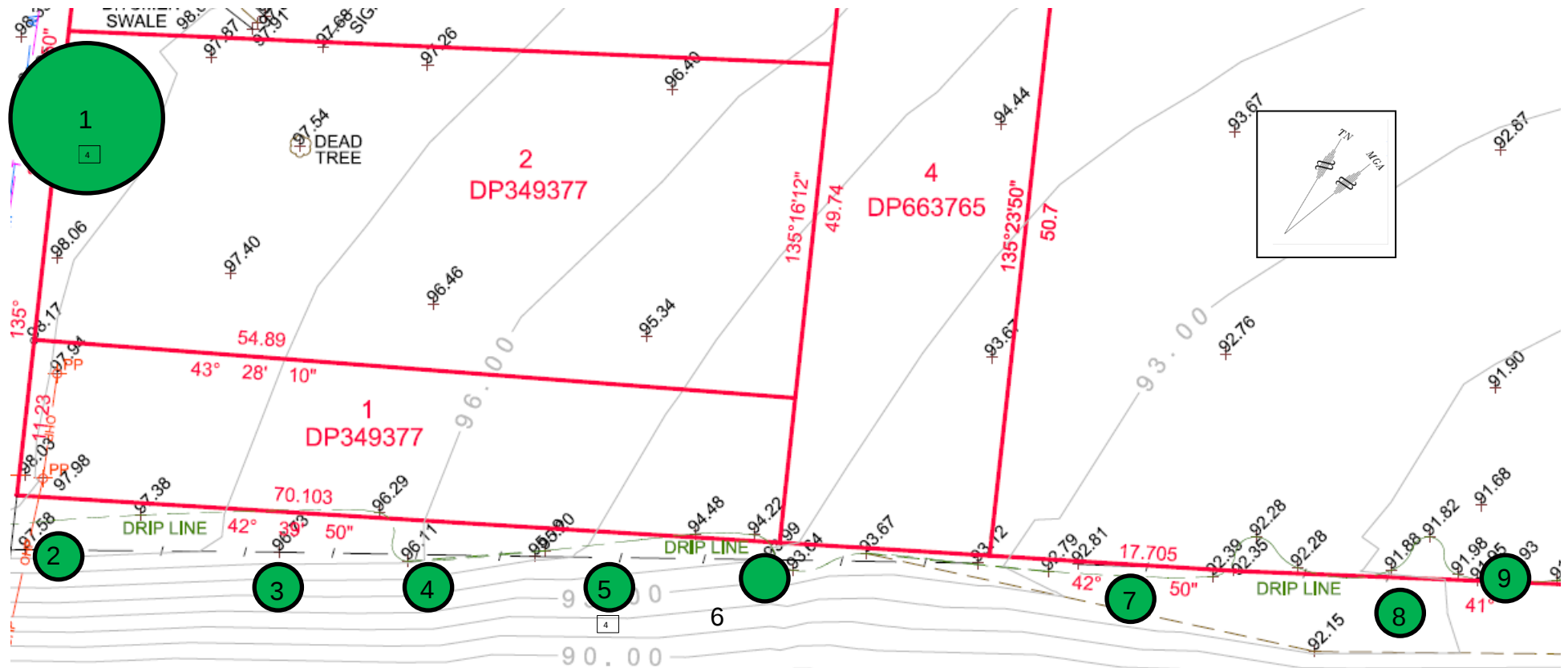
4. Tree Assessment Survey

4.1. Tree location plans

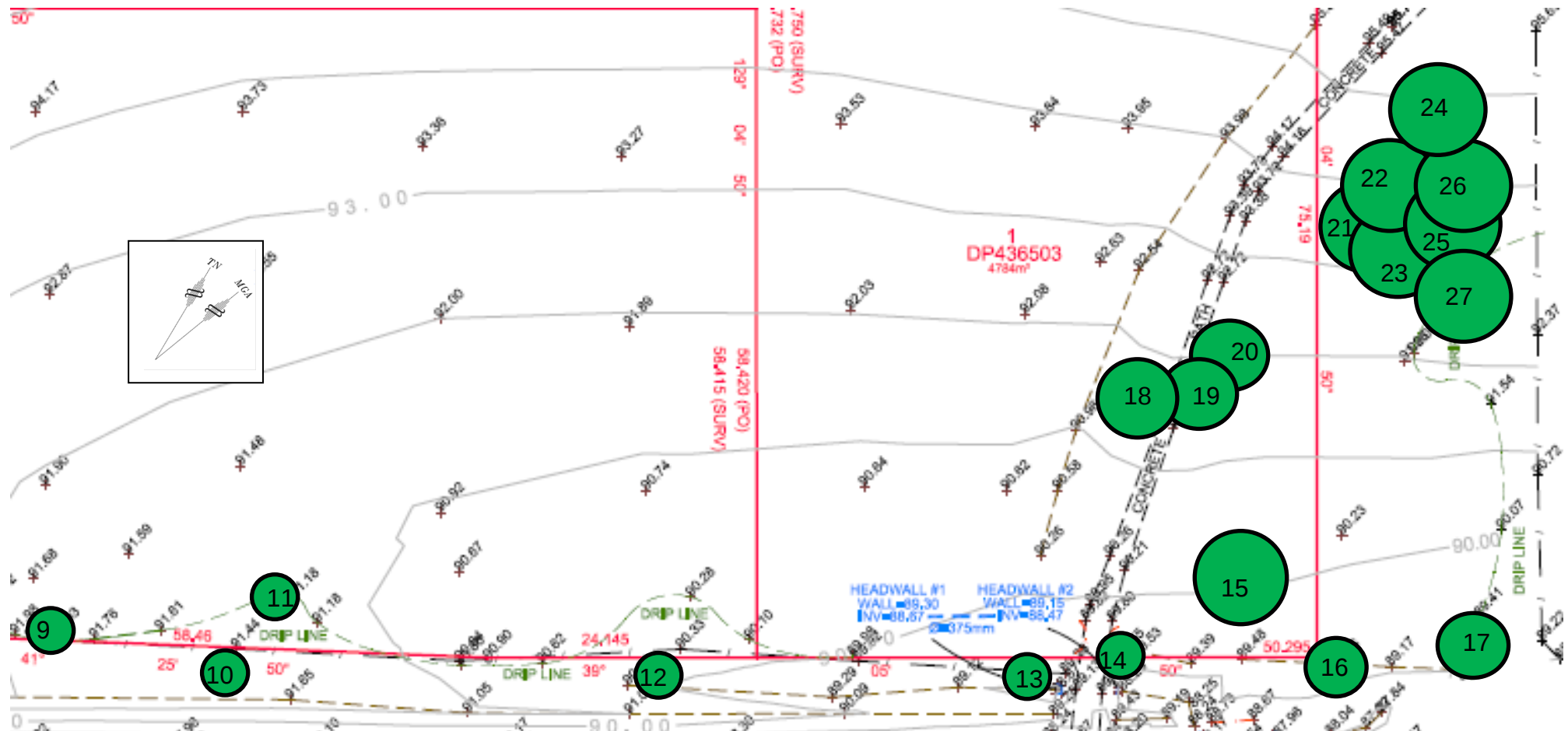
The size of the site makes the presentation in report format difficult to present.

On the following pages the initial survey plan has been divided into 4 sectors. On following pages, more detailed plans show the position of the trees on the site for each sector.

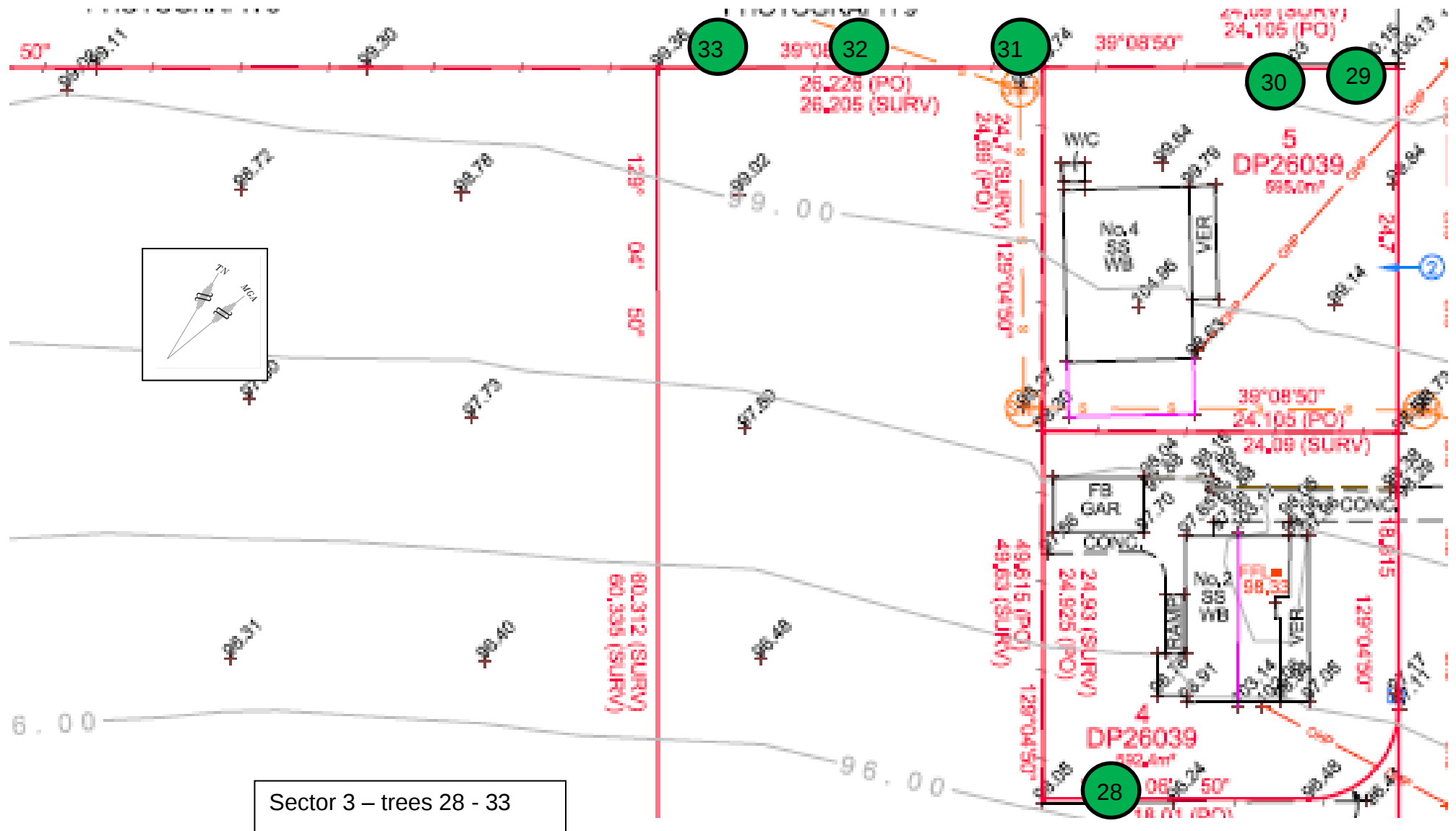


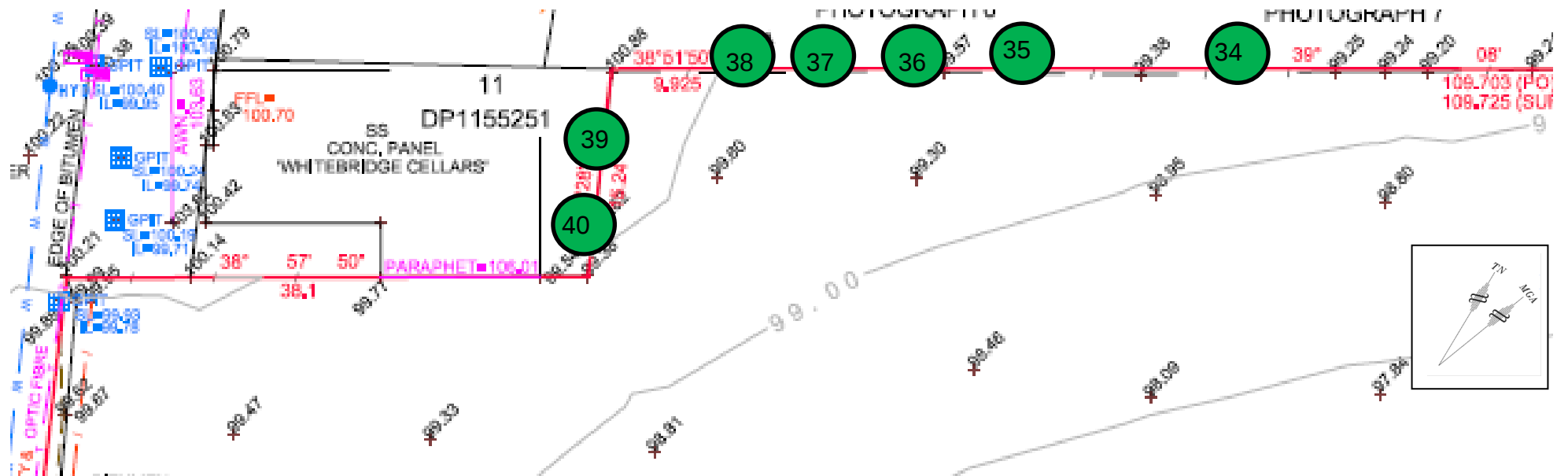


Sector 1 – trees 1 - 9



Sector 2 – trees 9 - 27





Sector 4 – trees 34 - 40

4.2. Tree Survey schedule

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
1	Cinnamomum camphora Camphor Laurel	Greater than 40 years	Mature	10	675	5	5	6	6	Good	Good	
2	Eucalyptus racemosa Scribbly Gum	Greater than 40 years	Mature	11	450	5	3	5	4	Good	Moderate	2.5 metres from boundary
3	Angophora costata Smooth barked Apple Gum	15 - 40 years	Semi- mature	11	300	4	4	4	3	Good	Good	1 metre from boundary
4	Eucalyptus piperita Sydney peppermint	15 - 40 years	Mature	12	500	6	3	2	6	Good	Moderate	leans to NW low branch extends over fence Pruning required
5	Allocasuarina torulosa Forest Oak	5 - 15 years	Semi- mature	5	170	2	2	2	2	Moderate	Moderate	1.3 m from fence
6	Allocasuarina torulosa Forest Oak	5 - 15 years	Mature	6	280	5	2	3	4	Good	Poor	2 m from fence large wounds on trunk

No	Botanic NameCommon Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
7	Allocasuarina torulosa Forest Oak	5 - 15 years	Over- mature	6	300	2	0	1	6	Poor	Poor	extensive mistletoe throughout severe lean lots of die back - removal recommended
8	Angophora costata Smooth barked Apple Gum	Greater than 40 years	Semi- mature	10	280	2	2	2	2	Good	Good	1 metre from boundary
9	Allocasuarina torulosa Forest Oak	5 - 15 years	Mature	6	270	3	1	2	3	Moderate	Poor	severe asymmetry included bark from previous failure mistletoe throughout
10	Allocasuarina torulosa Forest Oak	less than 5 years	Over- mature	8	400	5	1	4	5	Moderate	Poor	previous failures with cracks present less than 1 m from fence severe inclusions mistletoe present
11	Melaleuca styphelioides Prickly Paperbark	15 - 40 years	Mature	3	200	2	1	2	1	Moderate	Good	some mistletoe present
12	Angophora costata Smooth barked Apple Gum	15 - 40 years	Mature	14	520	5	3	4	5	Good	Moderate	moderate severity basal inclusion present 0.8 m from fence

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
13	Eucalyptus racemosa Scribbly Gum	Greater than 40 years	Semi- mature	9	210	2	2	2	1	Good	Good	right against fence
14	Eucalyptus racemosa Scribbly Gum	less than 5 years	Semi- mature	9	310	2	3	2	2	Good	Poor	severe cracking at bark inclusion removal recommended
15	Eucalyptus racemosa Scribbly Gum	15 - 40 years	Mature	13	770	6	5	5	5	Good	Moderate	Basal swelling & flight hole presence indicate termite colonisation numerous small previous failures low severity inclusion at 1st order branch fork
16	Eucalyptus racemosa Scribbly Gum	Greater than 40 years	Semi- mature	6	300	4	4	3	3	Good	Moderate	basal inclusion between leaders of low severity western trunk has severe borer damage
17	Eucalyptus globoidea White stringybark	Greater than 40 years	Semi- mature	7	280	4	4	3	3	Good	Good	

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
18	Eucalyptus globoidea White stringybark	15 - 40 years	Over- mature	12	720	6	6	5	6	Good	Moderate	large amount of dead wood throughout canopy low broad form previous large failures lots of epicormic shoots over walkway
19	Eucalyptus globoidea White stringybark	Greater than 40 years	Mature	12	420	4	2	1	2	Good	Good	Nest present minor inclusion in 1st order branch fork
20	Eucalyptus racemosa Scribbly Gum	15 - 40 years	Mature	12	590	6	2	5	7	Good	Moderate	base has numerous burls & flight holes indicating termite colonisation same species failed adjacent to tree moderate asymmetry
21	Eucalyptus racemosa Scribbly Gum	5 - 15 years	Over- mature	10	560	2	4	7	5	Good	Poor	SEVERELY HOLLOW!! Test for termites
22	Eucalyptus globoidea White stringybark	Greater than 40 years	Semi- mature	10	320	0	2	4	3	Good	Good	slight asymmetry

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
23	Eucalyptus racemosa Scribbly Gum	5 - 15 years	Over- mature	8	330	4	2	1	2	Good	Poor	severe basal decay with Nectria canker present
24	Eucalyptus racemosa Scribbly Gum	15 - 40 years	Mature	8	480	7	2	0	5	Good	Poor	severe asymmetry to North cankers present on trunk at 3 m
25	Eucalyptus globoidea White stringybark	less than 5 years	Over- mature	10	450	7	1	0	7	Moderate	Poor	Root plate failure Cavity in trunk from previous failure severe asymmetry 1st order fork with severe inclusions fall to north old Nasutitermes nest
26	Pittosporum undulatumNative Daphne	15 - 40 years	Mature	5	250	3	3	1	3	Good	Good	suppressed by No 24
27	Eucalyptus globoidea White stringybark	Greater than 40 years	Mature	12	360	2	3	1	2	Moderate	Good	Crown die back on Northern side
28	Lagerstroemia indica Crepe Myrtle	Greater than 40 years	Semi- mature	4	300	2	1	1	2	Good	Moderate	

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
29	Syzygium paniculatum Brush Cherry	Greater than 40 years	Mature	8	430	4	4	4	4	Good	Good	right on boundary fence
30	Syzygium paniculatum Brush Cherry	Greater than 40 years	Mature	8	400	4	3	3	4	Good	Good	Prunus next to trunk ivy over trunk next to fence
31	Morus nigra Mulberry	15 - 40 years	Mature	5	500	4	3	4	3	Moderate	Moderate	1 m over boundary fence in adjoining property heavily lopped
32	Cupressocyparis x leylandii Leyland Cypress	Greater than 40 years	Semi- mature	4	150	1	1	1	1	Good	Good	Less than 1 m from fence on adjoining property
33	Callistemon viminalis Bottlebrush	15 - 40 years	Mature	5	300	0	0	2	2	Moderate	Poor	heavily lopped 1.5 m in adjoining property
34	Eucalyptus racemosa Scribbly Gum	15 - 40 years	Mature	8	450	5	5	2	3	Good	Poor	Basal wound crack at lowest fork 1.5 m from fence in adjoining property
35	Angophora costata Smooth barked Apple Gum	Greater than 40 years	Semi- mature	12	450	3	4	4	5	Good	Good	1.5 m from fence in adjoining property

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread (m)				Structure	Health	Comments
						North	East	South	West			
36	Callistemon viminalis Bottlebrush	15 - 40 years	Mature	5	300	1	1	2	2	Good	Moderate	lopped - less than 1 metre from fence in adjoining property
37	Callistemon viminalis Bottlebrush	15 - 40 years	Mature	5	300	2	2	2	2	Good	Good	lopped - less than 1 metre from fence in adjoining property
38	Cinnamomum camphora Camphor Laurel	15 - 40 years	Mature	7	500	4	3	5	6	Moderate	Moderate	2 metres into adjoining property
39	Liquidambar styraciflua Liquidamber	15 - 40 years	Semi- mature	10	350	2	1	2	4	Moderate	Moderate	1 m from fence in adjoining property Recommend removal prior to construction
40	Eucalyptus nicholii Black Peppermint	15 - 40 years	Mature	8	700	6	2	2	5	Moderate	Poor	Severe lean seems to have limited root space low branches will require removal recommend removal prior to construction

4.3. Retention Value Assessment, Structural Root Zone, Tree Protection Zone and Canopy area dimensions

See Appendix 2 for details of SRZ and TPZ formulas.

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
1	Cinnamomum camphora Camphor Laurel	Greater than 40 years	95	Very Low	Very Low	675	2.81	8.1
2	Eucalyptus racemosa Scribbly Gum	Greater than 40 years	57	Moderate	Moderate	450	1.23	5.4
3	Angophora costata Smooth barked Apple Gum	15 - 40 years	44	Moderate	Moderate	300	2.00	3.6
4	Eucalyptus piperita Sydney peppermint	15 - 40 years	57	Low	Moderate	500	2.47	6
5	Allocasuarina torulosa Forest Oak	5 - 15 years	13	Low	Low	170	1.57	2.04
6	Allocasuarina torulosa Forest Oak	5 - 15 years	38	Low	Low	280	1.94	3.36

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
7	Allocasuarina torulosa Forest Oak	5 - 15 years	16	Low	Low	300	2.00	3.6
8	Angophora costata Smooth barked Apple Gum	Greater than 40 years	13	Moderate	High	280	1.94	3.36
9	Allocasuarina torulosa Forest Oak	5 - 15 years	16	Low	Low	270	0.53	3.24
10	Allocasuarina torulosa Forest Oak	less than 5 years	44	Low	Low	400	2.25	4.8
11	Melaleuca styphelioides Prickly Paperbark	15 - 40 years	7	Low	Low	200	1.68	2.4
12	Angophora costata Smooth barked Apple Gum	15 - 40 years	57	Moderate	High	520	2.51	6.24
13	Eucalyptus racemosa Scribbly Gum	Greater than 40 years	10	Moderate	Moderate	210	1.72	2.52
14	Eucalyptus racemosa Scribbly Gum	less than 5 years	16	Low	Low	310	2.02	3.72

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
15	Eucalyptus racemosa Scribbly Gum	15 - 40 years	87	High	High	770	2.97	9.24
16	Eucalyptus racemosa Scribbly Gum	Greater than 40 years	38	Moderate	Moderate	300	1.18	3.6
17	Eucalyptus globoidea White stringybark	Greater than 40 years	38	High	High	280	1.94	3.36
18	Eucalyptus globoidea White stringybark	15 - 40 years	104	Moderate	Moderate	720	2.88	8.64
19	Eucalyptus globoidea White stringybark	Greater than 40 years	16	High	High	420	2.30	5.04
20	Eucalyptus racemosa Scribbly Gum	15 - 40 years	79	Moderate	High	590	2.65	7.08
21	Eucalyptus racemosa Scribbly Gum	5 - 15 years	64	Moderate	Low	560	2.59	6.72
22	Eucalyptus globoidea White stringybark	Greater than 40 years	16	Moderate	Moderate	320	2.05	3.84

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
23	Eucalyptus racemosa Scribbly Gum	5 - 15 years	16	Low	Low	330	0.58	3.96
24	Eucalyptus racemosa Scribbly Gum	15 - 40 years	38	Moderate	Moderate	480	2.43	5.76
25	Eucalyptus globoidea White stringybark	less than 5 years	44	Low	Low	450	2.37	5.4
26	Pittosporum undulatum Native Daphne	15 - 40 years	20	Moderate	Moderate	250	1.85	3
27	Eucalyptus globoidea White stringybark	Greater than 40 years	13	High	High	360	2.15	4.32
28	Lagerstroemia indica Crepe Myrtle	Greater than 40 years	7	Low	Low	300	2.00	3.6
29	Syzygium paniculatum Brush Cherry	Greater than 40 years	50	High	High	430	2.32	5.16
30	Syzygium paniculatum Brush Cherry	Greater than 40 years	38	High	High	400	0.94	4.8

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
31	Morus nigra Mulberry	15 - 40 years	38	Low	Low	500	2.47	6
32	Cupressocyparis x leylandii Leyland Cypress	Greater than 40 years	3	Low	Moderate	150	1.49	1.8
33	Callistemon viminalis Bottlebrush	15 - 40 years	3	Low	Low	300	2.00	3.6
34	Eucalyptus racemosa Scribbly Gum	15 - 40 years	44	Low	Low	450	2.37	5.4
35	Angophora costata Smooth barked Apple Gum	Greater than 40 years	50	High	High	450	2.37	5.4
36	Callistemon viminalis Bottlebrush	15 - 40 years	7	Low	Low	300	2.00	3.6
37	Callistemon viminalis Bottlebrush	15 - 40 years	13	Low	Low	300	0.41	3.6
38	Cinnamomum camphora Camphor Laurel	15 - 40 years	64	Low	Very Low	500	2.47	6

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
39	Liquidambar styraciflua Liquidamber	15 - 40 years	16	Low	Low	350	2.13	4.2
40	Eucalyptus nicholii Black Peppermint	15 - 40 years	44	Low	Low	700	2.85	8.4

5. Retention Value Groups

5.1. Trees with High Retention Value

Tree No	Botanic Name Common Name
8	Angophora costata Smooth barked Apple Gum
12	Angophora costata Smooth barked Apple Gum
15	Eucalyptus racemosa Scribbly Gum
17	Eucalyptus globoidea White stringybark
19	Eucalyptus globoidea White stringybark
20	Eucalyptus racemosa Scribbly Gum
27	Eucalyptus globoidea White stringybark
29	Syzygium paniculatum Brush Cherry
30	Syzygium paniculatum Brush Cherry
35	Angophora costata Smooth barked Apple Gum

5.2. Trees with Moderate Retention Value

Tree No	Botanic Name Common Name
2	Eucalyptus racemosa Scribbly Gum
3	Angophora costata Smooth barked Apple Gum
4	Eucalyptus piperita Sydney peppermint
13	Eucalyptus racemosa Scribbly Gum
16	Eucalyptus racemosa Scribbly Gum
18	Eucalyptus globoidea White stringybark
22	Eucalyptus globoidea White stringybark
24	Eucalyptus racemosa Scribbly Gum
26	Pittosporum undulatum Native Daphne
32	Cuppressocyparis x leylandii Leyland Cypress

5.3. Trees with Low to Very Low Retention Value

Tree No	Botanic Name Common Name
1	Cinnamomum camphora Camphor Laurel
5	Allocasuarina torulosa Forest Oak
6	Allocasuarina torulosa Forest Oak
7	Allocasuarina torulosa Forest Oak
9	Allocasuarina torulosa Forest Oak
10	Allocasuarina torulosa Forest Oak
11	Melaleuca styphelioides Prickly Paperbark
14	Eucalyptus racemosa Scribbly Gum
21	Eucalyptus racemosa Scribbly Gum
23	Eucalyptus racemosa Scribbly Gum
25	Eucalyptus globoidea White stringybark
28	Lagerstroemia indica Crepe Myrtle
31	Morus nigra Mulberry
33	Callistemon viminalis Bottlebrush

Tree No	Botanic Name Common Name
Tree No	Botanic Name Common Name
34	Eucalyptus racemosa Scribbly Gum
36	Callistemon viminalis Bottlebrush
37	Callistemon viminalis Bottlebrush
38	Cinnamomum camphora Camphor Laurel
39	Liquidambar styraciflua Liquidamber
40	Eucalyptus nicholii Black Peppermint

6. Recommendations

- 6.1. Trees listed in section 5.1 with High Retention Value should be considered as a design constraint where practical. It is appreciated that some engineering work may require the removal of High Retention Value trees as a priority over tree retention. If trees of High retention value are to be retained, the SRZ distances should be maintained where NO excavation or soil level changes shall occur. Ideally the TPZ distances shall be maintained about the trees. If encroachment within the TPZ distances is required, some assessment of the impact on those specific trees should occur before development starts.
- 6.2. Trees with Moderate retention value should also be considered for retention rather than removal if within the site boundaries. The SRZ distances should be maintained if retained.
- 6.3. Trees 39 and 40 are located at the rear of the bottle shop and small retail shops on Dudley Rd. These trees are in a strange location at the rear of the building with no clear landscape function apparent. Any development of the site would “lock” these trees in and be difficult to remove eventually. Tree 40 will require pruning for most developments. It is recommended that these trees be removed prior to any development of the west corner.
- 6.4. The zone in the North East corner of the site has the largest group of trees of High retention value. Some trees are within the site boundary and some are just outside. The most prominent is Tree 15. If this tree is retained it may severely restrict the stormwater management of the site. If this tree were to be retained it would require a Tree Protection distance of 9.24 metres radius from the trunk in all directions to be preserved without impact. The engineering and drainage requirements can intrude within this distance but should not encroach with the SRZ distance of 3 metres.
- 6.5. Any excavation along the boundary adjoining the Fernleigh track should first be detailed. The position of trees 2 – 13 should be accurately plotted by a surveyor. Any proposed excavation for walls or drainage, sewer or other services should be at a distance of approximately 2 metres from the current boundary fence as a guide.
- 6.6. The existing trees in properties on the western are not plotted on the survey and it is recommended that their locations be identified (trees 31 – 38).
- 6.7. The dimensions of the SRZ and TPZ should be considered constraints for any engineering, excavation or construction work for trees along this boundary. No excavation should occur for 2 metres from the boundary fence in the zone near Tree 35.

6.8. Trees 31 – 34 and 36 - 38 require a set-back for excavation of 1 metre from the boundary fence for any excavation.



Figure 3 shows the view of Tree 15 looking approximately South East. This tree has a High retention value. It requires a distance of 3 metres where no construction or development of any kind shall occur and a Tree Protection Zone of 9.24 metres radius from the trunk in all directions. It is located in a zone where likely stormwater management may occur.

This report has been prepared by John Atkins on 5th August 2013.



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References

- Lake Macquarie draft Tree Management Guidelines 2013.
- Mattheck, K and Breloer, H. (1994) *"The Body Language of Trees – A handbook for failure analysis"* TSO London
- Standards Australia (2009) *AS4970: Protection of Trees on Development Sites*, Standards Australia, Sydney.

Appendix 1. Determining the retention value of trees

For development sites the process to determine the suitability for retention of trees on development sites involves a number of steps. These include:

1. Site inspection of all trees and their age class
2. determination of their sustainability
3. an overall assessment of their landscape significance based on the specific criteria
4. the determination of a tree's retention value based on the assessed sustainability and the landscape significance.
5. an assessment of the impact of the proposed development on all trees but particularly the trees of high and medium retention value
6. Steps to manage trees to be retained during construction

STEP 1. – Assess the tree sustainability

Long term - Greater than 40 years with little or no remediation

Moderate term - From 15 to 40 years usually with some remedial work

Short Term - From 5 to 15 years with some remedial work, or with remedial work that is only viable for the short term

Not Sustainable - Less than 5 years of suitability to the site or with remedial work including trees unfit for retention in any development, dead trees or hazardous trees where remedial work is not an option.

The following flow chart shows the process used to determine the sustainability period of a tree. Firstly the tree is surveyed and any health, structural or site conditions are recorded.

The age of the tree in the site situation is considered based on the experience of the arborist or other sources.

Then the current age is estimated and the period where the tree is sustainable in the landscape is determined by subtracting the current age from the overall life span where viable. This process is subjective and is based directly on the observations and experience of the assessor.

Biological or Biomechanical Indicators			
Deadwood			
Dieback			
Pest Infestation	Health		
Disease			
Epicormic Growth		Health & Vigour	
Canopy Density			
Foliage Size	Vigour		
Foliage Colour			
Extension Growth			
Mechanical Injury/Fire Injury/Lightning Strike			
Soil Level Changes			
Root severance/damage	Damage		
Improper pruning			
Branch Loss/storm damage			
Included Bark			
Fractures/Cracks			
Wounds	Defects	Condition	
Decay			
Cavities			
Elite Epicormic Sprouts			
Soil Cracking			
Soil heaving/ Root plate movement			
Exposed roots	Stability		
Excessive lean			
Root severance/damage			
Soil Type/Depth			
Climate/Microclimate	Suitability to locality		
Hydrology		Suitability	
Proximity to existing structures/services, likely to or currently causing significant damage.			
Damage to structures/services	Suitability to position		
Available space for future growth			
Size relative to existing space			

SUSTAINABILITY	
Remaining Useful Life Expectancy	
(Age of the tree - normal lifespan in an urban area) - modified in consideration of health, condition & suitability	

Step 2 Criteria for assessment of Landscape Significance.

The level of landscape significance is determined using the following key criteria as a guide:

1. SIGNIFICANT

- The tree is listed as a Heritage Item under the LEP 2003 with a local, state or national level of significance;
- The tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined in LEP 2003 and has a known or documented association with that item; or
- The tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event; or
- The tree is scheduled as a Threatened Species or is a key indicator species of an Endangered Ecological Community as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999; or
- The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species; or
- The tree is a Remnant Tree, being a tree in existence prior to development of the area; or
- The tree has a very large live crown size exceeding 300m² with normal to dense foliage cover, is located in a visually prominent in the landscape, exhibits very good form and habit typical of the species and makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity; or
- The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.

2. VERY HIGH

- The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or
- exemplifies a particular era or style of landscape design associated with the original development of the site; or
- The tree is listed on Council's Significant Tree Register; or
- The tree is a locally indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value;
- The tree has a very large live crown size exceeding 200m²; a crown density exceeding 70% Crown Cover (normal - dense), is a very good representative of the species in terms of its form and

branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

3. HIGH

- The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence; or
- The tree is a locally indigenous species and representative of the original vegetation of the area; or
- The tree has a large live crown size exceeding 100m²; and the tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% Crown Cover (normal); and
- The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area.

4. MODERATE

- The tree has a medium live crown size exceeding 40m²; and
- The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% Crown Cover (thinning to normal); and
- The tree makes a fair contribution to the visual character and amenity of the area; and
- The tree is visible from surrounding properties, but is not visually prominent, view may be partially obscured by other vegetation or built forms, or
- The tree has no known or suspected historical association

5. LOW

- The tree has a small live crown size of less than 40m² and can be replaced within the short term with new tree planting; or
- The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% Crown Cover (sparse); and
- The tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area.

6. VERY LOW

The subject tree is listed as an Environment Weed Species or an undesirable species

7. INSIGNIFICANT

The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 or is an undesirable species as listed in Council's Urban Forest technical Manual

Step 3. Determining the Retention Value Based on Sustainability and Landscape Significance

FIGURE 2 – TREE RETENTION VALUES – ASSESSMENT METHODOLOGY

Tree Sustainability Period	Landscape Significance Rating						
	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							

Appendix 2 Structural Root Zone and Tree Protection Zone Dimensions and details

Structural root zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

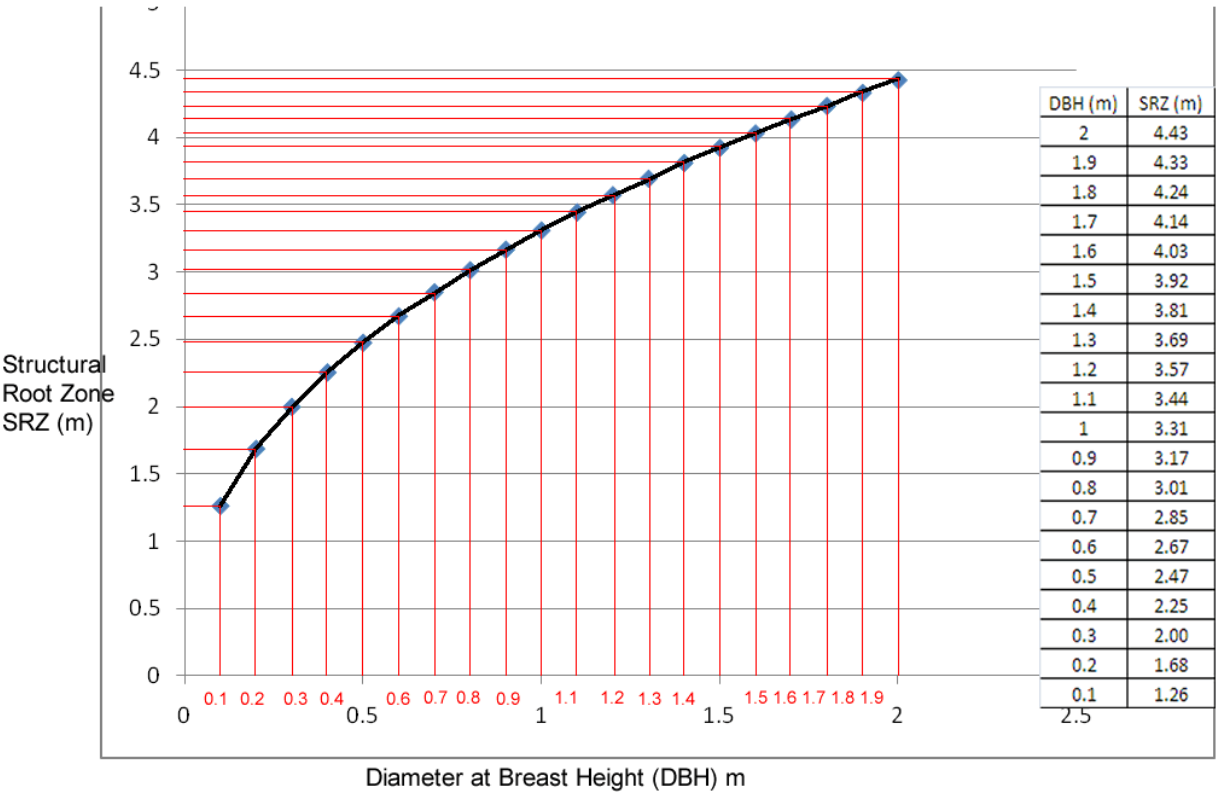
There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

$$\text{SRZ radius} = (\text{DBH} \times 50)^{0.42} \times 0.64$$

where

DBH = trunk diameter at breast height in m, measured above the root buttress

NOTE: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m (see graph below).



Tree Protection Zone (TPZ) Calculations

Australian Standard 4970 – 2009 Protection of Trees During Construction states that the method of calculating the ideal TPZ is as follows:

$$\text{TPZ radial distance (m)} = \text{DBH (m)} \times 12$$

It is also noted that the TPZ can be encroached by 10 – 20% where the remainder of the TPZ remains undisturbed due to site restrictions. This formula has been applied as a guideline.

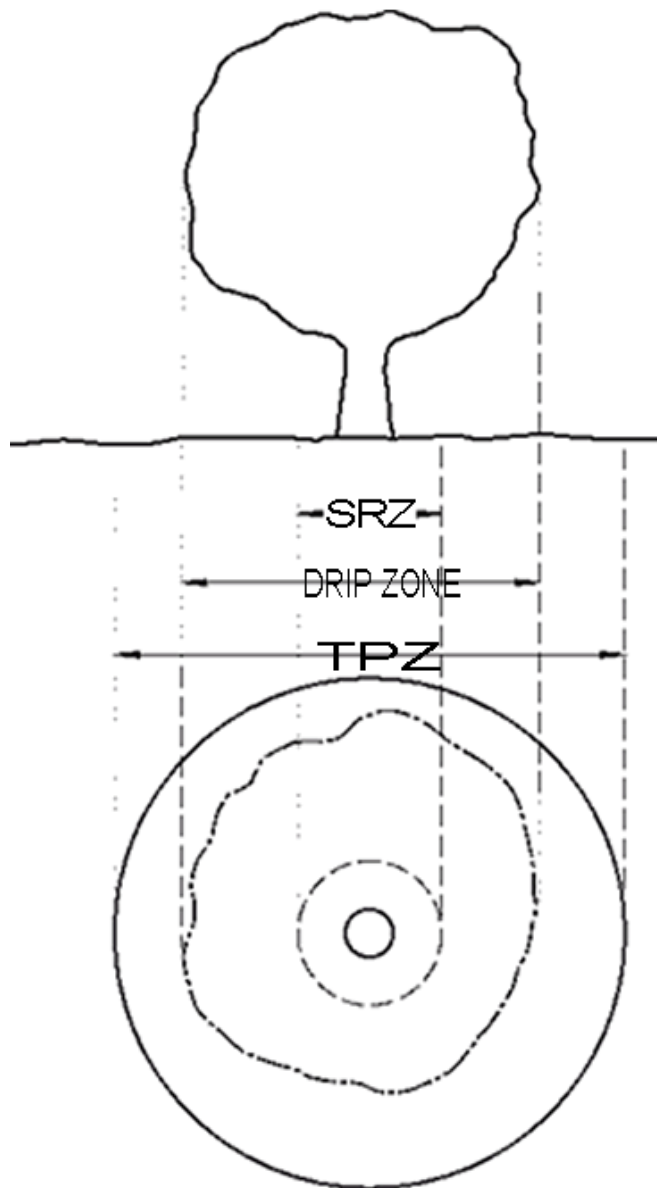


Figure 2 shows a sketch of the different dimensions related to tree preservation, SRZ, TPZ and Drip zone (the area directly under the canopy).