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tree care and consultancy

Arboricultural Audit of Existing Trees

At

Former Orange Drive-In Theatre
(Lot 1 DP 549856)
Forest Road
Orange NSW

Prepared for:

Savage Property Enterprises Pty Ltd
26-32, Pirrama Road
PYRMONT NSW 2009

Ref: 1845Audit

October 07

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ATTACHMENTS

1. BACKGROUND

1.1 INTRODUCTION

1.1.1 This Arboricultural Audit of exiting trees was prepared for Savage Property Enterprises Pty Ltd in relation to trees located at or adjacent to the former Drive-In Cinema on Forest Road, Orange (the subject site).

1.1.2 The purpose of this Report is to provide an initial, predevelopment arboricultural assessment of the subject site trees in terms of their condition and significance to the landscape character of the site. Primary and Critical Root Zones (PRZ and CRZ) have been provided. Construction (cut, compacted fill or trenching) is to be restricted within PRZ offsets to ensure tree retention (see CRZ/PRZ ruling, Attachment E).

1.1.3 This Report acknowledges the Planning Outcomes *PO 2.3-1 Vegetation Management* of Orange City Council's Development Control Plan 2004.

1.2 THE SUBJECT SITE

1.2.1 The subject site was located on the western side of Forest Road with T. S + Crown Reserve adjoining to the north and west. The existing development surrounding the site is indicated on Detail Survey Dwg. No. 20470 20.04.04 prepared by Carpenter, Collins and Associates.

1.2.2 The subject site had a gently undulating grade characterised by a change in grade from a high point of approximately 913.0 metres (southern boundary) to a low point of approximately 908.0 metres (western boundary). For the purposes of this Report the Forest Road frontage is referred to as the eastern frontage.

1.2.3 There were two vehicular entrances in the NE and SE corners fronting Forest Road. The central portion of the site contained the bitumen paving, kerb edging, redundant amenities and kiosk buildings.

1.3 THE SUBJECT TREES

1.3.1 The general findings and data collected for each of the subject trees are contained in Tree Schedule (Attachment A).

1.3.2 The subject trees were planted exotics and Australian natives with Tree 87 (Apple Box, *Eucalyptus bridgesiana*) being the most significant of the assessed trees. The tree population assessed varied in species, age, vigour and condition. Trees 1-17 and Tree 87 had the most influence on the streetscape of the site being located along the Forest Road frontage.

1.3.3 The subject trees were generally located along or towards the perimeter of the subject site. Many of the non-indigenous species were planted in rows. Trees 26 to 56 were a mix of native and exotic plantings located within a fenced windbreak on the adjoining property to the north. The dominant species was Monterey Pine, *Pinus radiata*. There was active Monterey Pine seedling spread beyond the planting.

1.3.4 Trees 58 to 67 and Tree 87 are likely to be representative of remnant vegetation retained as part of former development of the site.

2. METHODOLOGY

2.1 DATA COLLECTION

2.1.1 In preparation of this Report a ground level, visual tree assessment (VTA) was undertaken on 9th October, 2007. No aerial (climbing) inspections, woody tissue testing or tree root mapping were undertaken as part of this assessment.

2.1.2 The terms, Diameter at Breast Height (DBH), Primary Root Zone (PRZ), Critical Root Zone (CRZ), ©Significance Rating and Safe Useful Life Expectancy (SULE) have been used throughout this Report. Attachment C provides a detailed explanation of each.

2.1.3 Tree heights were estimated. Trunk diameter at breast height (DBH) was estimated at 1.4 metres above ground level and rounded to the nearest 0.1 metre. Critical Root Zones (CRZ) and Primary Root Zones (PRZ) were also rounded to the nearest 0.5 metre. The vigour of the trees was rated Good, Fair or Poor and a Safe Useful Life Expectancy (SULE) estimated. Using the Tree Wise Men® Australia Pty Ltd (TWM) system of ©Significance Rating all subject trees were also allocated a Significance Rating (see **3.2.1** Table 1).

2.1.4 All tree offsets mentioned in this Report are to centre of trunk unless otherwise stated.

2.2 IDENTIFICATION OF SUBJECT TREES

2.2.1 The eighty seven (87) subject trees are those indicated on the Tree Plan (adapted Detail Survey of Orange Drive-In Theatre, 20470, Carpenter, Collins and Associates, 20-04-04). Trees 26-56 were located on the adjoining property to the north. Tree 87 was located on Forest Road verge. The following trees have been manually plotted on the Tree Plan having been omitted from the Detail Survey: Trees 1, 26-56, 68, 70-73, 75-77, 79-82, 84 and 85.

2.2.2 The subject trees were numbered and labelled on site with white plastic tags as per the Tree Schedule (Attachment A) and Tree Plan (Attachment F).

2.3 SITE PHOTOGRAPHS

2.3.1 The Site Photographs (Attachment B) were taken by the author at the site inspection of 9th October, 2007.

2.3.2 All photographs were taken using a digital camera at a focal length of 28mm (35mm SLR equivalent) and there was no image enhancement either within the camera or on the computer.

2.4 PLANS REFERENCED

The conclusions and recommendations in this Report are based on the existing vigour and condition of the trees irrespective of proposed development. The generic PRZ/CRZ offsets, SULE and ©Significance Ratings should be used to guide the development layout and tree retention. The following plan showing existing site features has been used to guide this assessment and been used as a base map for the Tree Plan (Attachment F):

- Detail Survey of Orange Drive-In Theatre; lot DP 549856, Forest Road, Orange, 20470, Carpenter, Collins and Associates, 20/04/04.

3. SUMMARY AND CONCLUSIONS

3.1 IN SUMMARY

3.1.1 The most notable feature of the site was the formal plantings of perimeter trees in row formations and the open space within the interior of the site.

3.1.2 The most significant tree in terms of landscape character is Tree 87, Apple Box, *Eucalyptus bridgesiana* located on the Forest Road verge. All efforts should be made to retain this tree as part of the site development. The other trees (Trees 1-17) could be incorporated into the proposed landscaping given their long SULE.

3.1.3 The majority of the subject trees were located along or toward the site perimeter, with Trees 26-56 being located on the adjoining property to the north. As the interior of the site was clear of vegetation there are numerous opportunities to develop the site without impacting on existing trees.

3.1.4 On the eastern side of Forest Road, opposite the subject site was a double row of planted trees. The front row of trees was made up of Pin Oaks, *Quercus palustris* and the eastern-most row of trees consisted of Cottonwoods, *Populus deltoides* with an occasional Lombardy Poplar, *Populus nigra 'Italica'*.

3.1.5 There is an opportunity to enhance the existing landscape amenity and biodiversity with the implementation of a complying Landscape Plan incorporating retention of existing trees, new screen plantings and appropriate replacement trees if trees are required to be removed.

3.2 THE SIGNIFICANCE OF SUBJECT TREES

3.2.1 Using the TWM® system of ©Significance Rating the subject trees were rated as outlined in the Table following.

Table 1: ©Significance Rating the Subject Trees

©Sig Rating 1 (Tree Number)	©Sig Rating 2 (Tree Number)	©Sig Rating 3 (Tree Number)	©Sig Rating 4 (Tree Number)	©Sig Rating 5 (Tree Number)
87	58, 67	24, 25, 28, 30, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 59, 60, 61, 62, 63, 65, 66, 86	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 29, 31, 32, 33, 57, 64, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 84	-
Total: 1	**Total: 2**	**Total: 35**	**Total: 49**	**Total: 0**

4. RECOMMENDATIONS –FUTURE SITE WORKS

4.1 ARBORIST INVOLVEMENT

4.1.1 The information provided in this report should be used to guide the layout of any future development of the site. Should a Development Application (DA) be required for future development, an Arboricultural Impact Assessment (AIA) will be required to accompany the DA. This report is not suitable to accompany a DA in that it does not assess the impact of a particular development.

4.1.2 The Arboricultural Impact Assessment should be prepared by an Arborist experienced in tree protection on construction sites. This report should provide specific comment on the proposed design, including design modifications and tree protection measures to enable tree retention.

4.2 TREE RETENTION

4.2.1 Trees to be retained as part of any future development should be guided by the SULE, ©Significance Ratings (**3.2.1**) and PRZ/CRZ offsets (as defined in the tree schedule).

4.2.2 The subject trees were located along or towards the perimeter of the subject site. There is an opportunity to develop the interior of the subject site whilst retaining the majority or possibly all of the subject trees.

4.2.3 Trees 26-56 located on the adjoining property will need to have construction restricted with CRZ offsets if they are to be retained.

4.3 TREE TRANSPLANTING

4.3.1 Trees 18 and 19 (Cypress Pine, *Cupressus sp.*) are able to be transplanted being free standing well formed specimens. This option could be considered as these trees were located towards the interior of the site and may be within construction footprints and would otherwise have to be removed. There are numerous opportunities to relocate these trees on site.

4.4 TREE REMOVAL

4.4.1 Trees approved for removal should be removed as per the method outlined in Attachment D, TWMP2 to ensure the protection of above and below ground sections of retained trees.

4.4.2 Those trees with Short SULEs and ©SIG Ratings of 4 could be considered for removal if their positions are limiting to design opportunities.

4.4.3 No trees currently require removal due to imminent hazard potential. All trees were given Long (40 years +), Medium (15-40 years) or Short (5-15 years) SULE ratings based on current landscape usage and current vigour and condition.

4.5 LANDSCAPE PLAN/PREFERRED LANDSCAPE TREATMENT

4.5.1 The Landscape Plan for the site should complement the long-term needs of the retained trees. All efforts should be made to maintain existing soil grade, moisture and aeration levels around retained trees. Non permeable surfaces are not recommended within a tree's PRZ as they can have detrimental impacts on tree health though disruptions to soil moisture and gaseous exchange within the rootzone. If extensive paved areas are necessary around trees, they should be constructed of permeable material. Non permeable paving should be constructed at or above existing grade with captured runoff allowed to infiltrate on site wherever possible.

4.5.2 Trees should be retained in groups wherever possible to reduce 'edge effects' and likelihood of increased storm related damage. Proposed landscaping should consider Planning Outcomes detailed at 2.3-1 of the Orange City Council's Development Control Plan 2004.

4.6 FUTURE CONSTRUCTION AND TREE IMPACT

4.6.1 Elevated, lightweight construction should be used wherever possible on the site where structures are proposed within PRZs of retained trees. Elevated construction will minimise potential impacts on retained trees adjacent and predominantly downslope of the works. Potential for future root damage to on ground structures can also be avoided.

4.6.2 Hand excavation to a minimum of 1 metre below grade (or to bedrock) should be undertaken in the location of proposed piers with CRZ offsets, to ensure no major structural roots (>50mm diameter) are cut.

4.6.3 Proposed construction (cut, compacted fill or machine trenching) activities can occur within a tree's PRZ only on one side (tangent) but must be outside the CRZ (refer to Attachment E). If construction is to occur to the CRZ on one tangent, all other construction is to be beyond the PRZ to ensure tree retention in the long term. Allowance needs to be made to existing constraints to root spread e.g. concrete kerb and gutters traversing the site is likely to have confined root spread.

ATTACHMENT A: TREE SCHEDULE

Tree Schedule - Lot 1 DP 549856, Forest Road, Orange

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
1	Photinia, *Photinia robusta* (Group of 31)	Multi	3 to 4	2 to 3	M	G	G	1.5	2.0	L				4		*Not on survey. Row on Forest Rd frontage.*
2	Cypress Pine, *Cupressus sp.*	0.3	6	2	SM	G	G	1.5	3.0	L				4		*Part of row of five trees.*
3	Cypress Pine, *Cupressus sp.*	0.3	6	2	SM	G	G	1.5	3.0	L				4		*Part of row of five trees.*
4	Cypress Pine, *Cupressus sp.*	0.3	6	2	SM	G	G	1.5	3.0	L				4		*Part of row of five trees.*
5	Cypress Pine, *Cupressus sp.*	0.3	6	2	SM	G	G	1.5	3.0	L				4		*Part of row of five trees.*
6	Cypress Pine, *Cupressus sp.*	0.3	4	2	SM	G	G	1.5	3.0	L				4		*Part of row of five trees.*
7	Lombardy Poplar, *Populus nigra 'Italica'*	0.2, 0.1	8	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
8	Lombardy Poplar, *Populus nigra 'Italica'*	Multi	9	2	SM	G	G	2.0	4.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
9	Lombardy Poplar, *Populus nigra 'Italica'*	0.3	9	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
10	Lombardy Poplar, *Populus nigra 'Italica'*	0.2, 0.1	9	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
11	Lombardy Poplar, *Populus nigra 'Italica'*	0.3	10	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
12	Lombardy Poplar, *Populus nigra 'Italica'*	0.2	6	1	SM	G	G	1.5	2.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
13	Lombardy Poplar, *Populus nigra 'Italica'*	0.2, 0.1	10	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
14	Lombardy Poplar, *Populus nigra 'Italica'*	0.2	9	1	SM	G	G	1.5	2.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
15	Lombardy Poplar, *Populus nigra 'Italica'*	0.3	11	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
16	Lombardy Poplar, *Populus nigra 'Italica'*	0.3	11	1	SM	G	G	1.5	3.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
17	Lombardy Poplar, *Populus nigra 'Italica'*	0.3, 0.2	10	2	SM	G	G	2.0	4.0	L				4		*Part of row of eleven trees of the same species on Forest Rd frontage.*
18	Cypress Pine, *Cupressus sp.*	0.2, 0.1	4	2	SM	G	G	1.5	3.0	L				4		
19	Cypress Pine, *Cupressus sp.*	0.2	4	2	SM	G	G	1.5	2.0	L				4		
20	Lombardy Poplar, *Populus nigra 'Italica'*	0.2	10	1	SM	G	G	1.5	2.0	L				4		*Part of row of Poplars on Northern Boundary.*
21	Lombardy Poplar, *Populus nigra 'Italica'*	0.2	10	1	SM	G	G	1.5	2.0	L				4		
22	Lombardy Poplar, *Populus nigra 'Italica'*	0.4, 0.3	13	2	M	G	G	2.5	5.0	L				4		
23	Lombardy Poplar, *Populus nigra 'Italica'*	0.3, 0.1	11	1	M	G	G	2.0	4.0	L				4		
24	Lombardy Poplar, *Populus nigra 'Italica'*	0.5	14	2	M	G	G	2.5	5.0	L			3			
25	Lombardy Poplar, *Populus nigra 'Italica'*	0.4, 0.3	14	2	M	G	G	2.5	5.0	L			3			
26	Blakely's Red Gum, *Eucalyptus blakelyi.*	0.3	7	3	SM	G	G	1.5	3.0	L				4		*On adjoining property to N. Eastern-most in row.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
27	Apple Box, *Eucalyptus bridgesiana*	0.3	10	4	SM	G	G	1.5	3.0	L				4		*On adjoining property to N. Canopy skew to S.*
28	Monterey Pine, *Pinus radiata*	0.8	13	6	M	G	G	4.0	8.0	L			3			*On adjoining property to N. x2 Pines to 7m, 4m E*
29	Monterey Pine, *Pinus radiata*	0.4	13	4	M	G	G	2.0	4.0	L				4		*On adjoining property to N. x2 Pines to 5m, 2m S*
30	Blakely's Red Gum, *Eucalyptus blakelyi.*	0.6	15	6	M	G	G	3.0	6.0	L			3			*On adjoining property to N. Several Eucalyptus saplings <5m.*
31	Monterey Pine, *Pinus radiata*	0.4	11	3	SM	G	G	2.0	4.0	L				4		*On adjoining property to N.*
32	Monterey Pine, *Pinus radiata*	0.5	13	4	M	G	F	2.5	5.0	L				4		*On adjoining property to N. Canopy Skew to E.*
33	Monterey Pine, *Pinus radiata*	0.5	14	5	M	G	F	2.5	5.0	L				4		*On adjoining property to N. Several Pines to 7m within 5m.*
34	Monterey Pine, *Pinus radiata*	0.4, 0.5, 0.5	15	6	M	G	F	4.0	8.0	L			3			*On adjoining property to N.*
35	Monterey Pine, *Pinus radiata*	0.4	16	5	SM	G	G	2.0	4.0	L			3			*On adjoining property to N. Upright form. Several Pines to 7m within 5m.*
36	Monterey Pine, *Pinus radiata*	0.7, 0.4	16	6	M	F	F	4.5	9.0	L			3			*On adjoining property to N.*
37	Monterey Pine, *Pinus radiata*	1.0	16	6	M	G	F	5.0	10.0	L			3			*On adjoining property to N. Twin trunks from 2m.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
38	Monterey Pine, *Pinus radiata*	0.6	17	6	M	G	G	3.0	6.0	L			3			*On adjoining property to N. Adjacent to entrance gate.*
39	Blakely's Red Gum, *Eucalyptus blakelyi*.	0.5, 0.1	18	3	SM	G	G	2.5	5.0	L			3			*On adjoining property to N.*
40	Monterey Pine, *Pinus radiata*	0.5	16	4	M	G	G	2.5	5.0	L			3			*On adjoining property to N.*
41	Monterey Pine, *Pinus radiata*	0.8	19	6	M	G	G	4.0	8.0	L			3			*On adjoining property to N. Twin trunks from 6m.*
42	Monterey Pine, *Pinus radiata*	0.7	16	6	M	G	G	3.5	7.0	L			3			*On adjoining property to N. x4 Pines 6m within 5m.*
43	Monterey Pine, *Pinus radiata*	0.8	19	7	M	G	G	4.0	8.0	L			3			*On adjoining property to N. x2 Pines to 8m within 5m.*
44	Monterey Pine, *Pinus radiata*	0.9	17	6	M	G	G	4.5	9.0	L			3			*On adjoining property to N.*
45	Monterey Pine, *Pinus radiata*	1.3	15	7	M	G	G	6.5	13.0	L			3			*On adjoining property to N.*
46	Monterey Pine, *Pinus radiata*	0.8	13	6	M	G	G	4.0	8.0	L			3			*On adjoining property to N.*
47	Monterey Pine, *Pinus radiata*	0.7	15	6	M	G	G	3.5	7.0	L			3			*On adjoining property to N. x2 Pines to 5m, 4m E.*
48	Monterey Pine, *Pinus radiata*	0.8	17	6	M	G	G	4.0	8.0	L			3			*On adjoining property to N.*
49	Monterey Pine, *Pinus radiata*	0.6	16	6	M	G	G	3.0	6.0	L			3			*On adjoining property to N.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
50	Monterey Pine, *Pinus radiata*	1.0	17	7	M	G	G	5.0	10.0	L			3			*On adjoining property to N. Hawthorn saplings adjacent.*
51	Monterey Pine, *Pinus radiata*	0.6	17	6	M	G	F	3.0	6.0	L			3			*On adjoining property to N.*
52	Monterey Pine, *Pinus radiata*	0.8	18	7	M	G	G	4.0	8.0	L			3			*On adjoining property to N.*
53	Monterey Pine, *Pinus radiata*	0.8	19	7	M	G	G	4.0	8.0	L			3			*On adjoining property to N. Twin trunks from 6m.*
54	Monterey Pine, *Pinus radiata*	0.6	19	5	M	F	F	3.0	6.0	L			3			*On adjoining property to N. Blackberry adjacent. Twin trunks from 5m.*
55	Monterey Pine, *Pinus radiata*	0.5	18	4	M	F	F	2.5	5.0	L			3			*On adjoining property to N.*
56	Monterey Pine, *Pinus radiata*	0.8	16	6	M	F	G	4.0	8.0	L			3			*On adjoining property to N. Numerous seeds within 5m. Western-most in row.*
57	Cottonwood, *Populus deltoides*	0.2, 0.2	6	3	SM	G	G	1.5	3.0	L				4		
58	Blakely's Red Gum, *Eucalyptus blakelyi.*	1.3	17	8	OM	G	G	6.5	13.0	S		2				*Deadwood to 150mm diameter. x2 scaffold limb failure. Co-dominant failure in past, S side.*
59	Apple Box, *Eucalyptus bridgesiana*	0.4	10	4	SM	G	G	2.0	4.0	L			3			*Adjacent Western boundary.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
60	Apple Box, *Eucalyptus bridgesiana*	0.3, 0.2	9	5	SM	G	G	2.0	4.0	L			3			*Adjacent Western boundary.*
61	Apple Box, *Eucalyptus bridgesiana*	0.3	10	4	SM	G	G	1.5	3.0	L			3			*Adjacent Western boundary.*
62	Apple Box, *Eucalyptus bridgesiana*	0.3, 0.2	9	4	SM	G	G	2.0	4.0	L			3			*Adjacent Western boundary.*
63	Apple Box, *Eucalyptus bridgesiana*	0.3, 0.1	8	4	SM	G	G	2.0	3.5	L			3			*Adjacent Western boundary.*
64	Weeping Willow, *Salix babylonica*	Multi	7	6	M	F	F	3.0	6.0	S				4		*Adjacent Western boundary.*
65	Weeping Willow, *Salix babylonica*	Multi	10	10	OM	G	P	4.0	8.0	S			3			*CRZ/PRZ taken from centre point of grove.*
66	Apple Box, *Eucalyptus bridgesiana*	0.9	12	6	M	G	G	4.5	9.0	L			3			*Deadwood to 200mm diameter.*
67	Blakely's Red Gum, *Eucalyptus blakelyi.*	1.0	15	8	M	G	G	5.0	10.0	L		2				
68	Golden Cypress, *Cupressus macrocarpa CV*	Multi	5	6	OM	F	P	2.0	4.0	S				4		
69	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	6	OM	F	P	2.0	4.0	S				4		

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
70	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	5	OM	F	P	2.0	4.0	S				4		
71	Golden Cypress, *Cupressus macrocarpa CV*	Multi	7	5	M	F	P	2.0	4.0	S				4		
72	Golden Cypress, *Cupressus macrocarpa CV*	Multi	7	6	M	G	F	2.0	4.0	S				4		
73	Golden Cypress, *Cupressus macrocarpa CV*	Multi	7	5	M	G	G	2.0	4.0	S				4		
74	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	5	M	G	G	2.0	4.0	M				4		
75	Golden Cypress, *Cupressus macrocarpa CV*	Multi	5	5	M	G	G	2.0	4.0	M				4		*Adjacent to "Speed Limit 10" sign.*
76	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	5	M	G	G	2.0	4.0	M				4		
77	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	5	M	G	G	2.0	4.0	M				4		
78	Golden Cypress, *Cupressus macrocarpa CV*	Multi	5	4	M	F	F	2.0	4.0	S				4		

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY SPREAD RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	CRZ RADIUS (m)	PRZ RADIUS (m)	SULE	©SIG RATING					COMMENTS
											1	2	3	4	5	
79	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	5	M	F	F	2.0	4.0	S				4		
80	Golden Cypress, *Cupressus macrocarpa CV*	Multi	5	5	M	F	F	2.0	4.0	S				4		
81	Golden Cypress, *Cupressus macrocarpa CV*	Multi	5	5	M	F	F	2.0	4.0	S				4		
82	Golden Cypress, *Cupressus macrocarpa CV*	Multi	4	5	M	G	P	2.0	4.0	S				4		
83	Golden Cypress, *Cupressus macrocarpa CV*	Multi	4	6	M	G	P	2.0	4.0	S				4		
84	Golden Cypress, *Cupressus macrocarpa CV*	Multi	6	6	M	G	F	2.0	4.0	S				4		
85	Golden Cypress, *Cupressus macrocarpa CV*	Multi	4	5	M	G	F	2.0	4.0	S				4		
86	Lombardy Poplar, *Populus nigra 'Italica'*	Multi	18	3	M	G	G	3.5	7.0	L			3			
87	Apple Box, *Eucalyptus bridgesiana*	1.5	16	8	M	G	G	7.5	15.0	L	1					*Verge tree. Canopy skew to E over road.*
87											**1**	**2**	**35**	**49**	**0**	

COMMON NAME/GENUS SPECIES CULTIVAR - Common names can vary with selected texts. Where species is unknown, "*spp*." indicated after genus. Where cultivar is unknown "*cv*" indicated after species. The number in brackets e.g.(x9) after the species indicates the number of trees in this tree group.

DBH - Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape used which assumes a circular cross section.

Multiple measurements indicate multiple trunks. More than three trunks are indicated as "multi". Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated.

CANOPY SPREAD RADIUS – Average canopy diameter (widest and narrowest ÷ 2). Circular canopy depictions on Tree Plan / Survey are indicative only. Refer to Comments column for detail of heavily skewed canopy spread.

AGE CLASS -Immature (IM), Semi-mature (SM), Mature (M), Over-mature (OM). Assessment of the tree's current Age. A **Mature (M)** tree has reached a near stable size (biomass) above and below ground. Trees can have a Mature Age Class for >90% of life span. **Over-mature (OM)** trees show symptoms of irreversible decline and decreasing biomass.

VIGOUR - Good (G), Fair (F) or Poor (P). The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have Good Vigour but be hazardous due to Poor Condition.

CONDITION - Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazard features are considered.

SULE - Safe Useful Life Expectancy. A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England. It gives a length of time that the Arborist feels a particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection. SULE ratings are **Long** (retainable for 40 years or more with an acceptable level of risk), **Medium** (retainable for 16-39 years), **Short** (retainable for 5-15 years) and **Removal** (tree requiring immediate removal due to imminent hazard or absolute unsuitability).

CRZ Radius - Critical Root Zone. Radial offset (m) of five times (5X) trunk DBH measured from centre of trunk (for trees less than 200mm DBH a minimum CRZ of 1.5 metres). Within this offset woody roots are usually encountered, disturbance to which can cause tree instability. CRZ offsets rounded to nearest 0.5 metre. Fully elevated construction is possible within CRZ with specific rootzone assessment. Existing constraints to root spread can vary CRZ. For multi-trunked trees CRZ is calculated by adding the CRZ for the largest trunk plus half of the CRZ for the next largest trunk.

PRZ Radius - Primary Root Zone. Radial offset (m) of ten times (10X) trunk DBH measured from centre of trunk (for trees less than 200mm DBH a minimum PRZ of 2.0 metres). To satisfactorily retain the tree construction activity (both soil cut and fill) must be restricted within these offsets. Rounded to the nearest 0.5 metre. An incursion (cut, fill or trenching) on one side (one tangent) only to five times (5X) stem DBH is possible with specific root zone assessment. Existing constraints to root spread can vary PRZ. PRZ radial offsets are twice that of CRZ offsets.

SIG. RATING - ©Significance Rating Scale

A site qualitative, specific evaluation of a tree relative to the existing landuse developed by Tree Wise Men Australia Pty Ltd. The ©Significance Ratings used in this Report are:

1. Most Significant. Warrants retention and major design changes to ensure this (e.g. movement of building footprint, realignment of roadway).

2. Highly Significant. Warrants retention and minor design changes to ensure this (e.g. level changes, pavement detail).

3. Less Significant. Can be a good specimen, however if complying development is to be confined because of its retention it can be considered for removal.

4. Least Significant. Removal would not result in any loss of site amenity. Can include weed species.

5. Hazardous. Should be removed irrespective of any development.

RECOMMENDATIONS - *Retain (R)*, *Retain Plus (R+)*, *Transplant* (T) or ***Remove (Rm)***.

COMMENTS. Comments relating to the condition and hazard potential of the trees at the time of inspection and where applicable the reason for removal.

ATTACHMENT B: SITE PHOTOGRAPHS

Photo A: Subject site viewed from Forest Road, facing south west.

Photo B: Eastern boundary of the subject site, facing north.

Photo C: Northern boundary of the subject site, facing west.

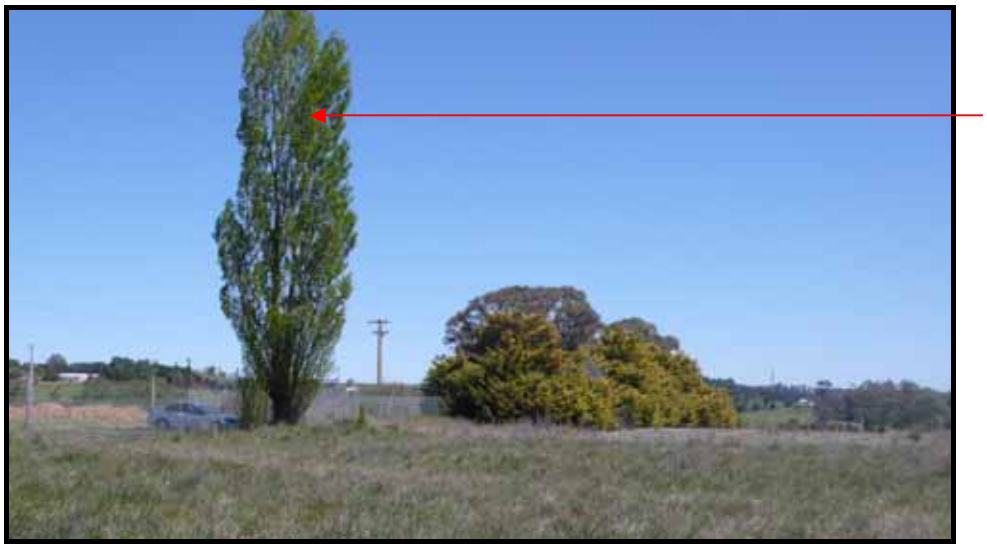


Photo D: Southern boundary of the subject site, facing south west.

ATTACHMENT C: DEFINITION OF TERMS

D1: Diameter at Breast Height (DBH)

Tree trunk diameter measured at breast height (1.4 metre above grade).

D2: Age Class

Immature (IM), Semi-mature (SM), Mature (M) or Over-mature (OM). Assessment of the tree's current Age. A Mature (M) tree has reached a near stable size (biomass) above and below ground. Trees can have a Mature Age Class for >90% of life span. Over-mature (OM) trees show symptoms of irreversible decline and decreasing biomass.

D3: Vigour

Good (G), Fair (F) or Poor (P). The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency.

D4: Condition

Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazard features.

D5: Critical Root Zone (CRZ)

Radial offset (m) of five times (5X) trunk DBH measured from centre of trunk (for trees less than 200mm DBH a minimum CRZ of 1.5 metres applies). Within this offset woody roots are usually encountered, disturbance to which can cause tree instability. Measurements rounded to nearest 0.5 metre. Fully elevated construction is possible within CRZ with specific rootzone assessment. Existing constraints to root spread can vary CRZ.

D6: Primary Root Zone (PRZ)

Radial offset (m) of ten times (10X) trunk DBH measured from centre of trunk (for trees less than 200mm DBH a minimum PRZ of 2.0 metres applies). To satisfactorily retain the tree, construction activity (both soil cut and fill) should be restricted within the PRZ. Measurements rounded to nearest 0.5 metre. An incursion (cut, fill or trenching) on one side (one tangent) only to five times (5X) stem DBH is possible with specific rootzone assessment. Existing constraints to root spread can vary PRZ.

D7: Safe Useful Life Expectancy (SULE)

A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England.

It gives a length of time that the Arborist feels a particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection and under existing landuse. SULE ratings are Long (retainable for 40 years or more with an acceptable level of risk), Medium (retainable for 16-39 years), Short (retainable for 5-15 years) and Removal (tree requiring immediate removal due to imminent hazard or absolute unsuitability). To have a SULE rating of Long high use areas beneath the trees, we have assumed a high level of tree maintenance to achieve the acceptable risk level.

D8: ©Significance Rating Scale

Tree Wise Men Australia Pty Ltd have developed a qualitative, five (5) point, site specific tree evaluation whereby individual trees are assessed relative to the existing landuse. The variables used in determining Significance include the following:

- Species (indigenous or exotic, rare or threatened)
- Location (on or off site)
- Vigour (Good, Fair, Poor)
- Form (suppressed or regular)
- Prominence in the landscape (prominent/not prominent from the public domain)
- Safe Useful Life Expectancy (SULE: Short, Medium, Long, Remove)
- Amenity value (high or low)
- Structural soundness (sound or unsound)
- Classification by Council Tree Preservation Order

The five (5) points of significance used in this Report are as follows:

1. **Most Significant.** Warrants retention and major design changes to ensure this (e.g. movement of building footprint, realignment of roadway).
2. **Highly Significant.** Warrants retention and minor design changes to ensure this (e.g. level changes, pavement detail).
3. **Less Significant.** Can be a good specimen, however if otherwise complying development is to be confined because of its retention it can be considered for removal.
4. **Least Significant.** Removal would not result in any loss of site amenity. Can include weed species.
5. **Hazardous.** Must be removed irrespective of any development.

ATTACHMENT D: TREE PROTECTION REQUIREMENTS (GENERIC)

TREE WISE MEN®
AUSTRALIA PTY LTD
ACN 002 982 247 ABN 15 002 982 247
tree care and consultancy

TREE PROTECTION REQUIREMENTS GENERIC

The following generic tree protection requirements (TWMP1-TWMP10) should be implemented to minimise the impact of the proposed redevelopment on the retained trees. These requirements shall be implemented during the construction period in the event that no tree–specific requirements are detailed.

TWMP1: Arborist Involvement

An Arborist experienced in tree protection on construction sites shall be engaged prior to the commencement of work on the site. The Arborist's tasks will be to monitor and report regularly to the PCA and the Applicant on the condition of the retained trees. The site Arborist shall be present to supervise any excavation, trenching or tunnelling within the PRZ of any retained trees.

The schedule of works for the development shall acknowledge the role of the site Arborist and the need to protect the retained trees. Sufficient notice shall be given to the Arborist where his/her attendance is required. Should the proposed design change from that reviewed, additional arboricultural assessment will be required.

TWMP2: Tree Pruning and Removal

All tree pruning (including root pruning) and tree removal shall be carried out by a qualified and experienced Arborist to Australian Standard AS4373-2007, "Pruning of Amenity Trees" and the WorkCover Code of Practice for the Amenity Tree Industry, 1998.

Stump grinding (rather than complete "grubbing") of rootballs shall be performed when those stumps are within the PRZ of retained trees. This will minimise unnecessary root damage. Unnecessary damage often occurs to retained trees when undertaken by earthmoving machinery.

TWMP3: Tree Protection Fencing

The retained trees shall be protected by means of fencing prior to commencement of demolition (including tree removal) or bulk earthworks.

It should be constructed from 1.8 metre high chain link wire or welded mesh suspended by galvanised steel pipe or equivalent and enclose the PRZ or the equivalent area allowing for building alignments.

The location of the fence should be determined at a site meeting between the Civil Contractor and the site Arborist to prevent the need to move the fencing during construction. The area enclosed shall be mulched (TWMP5) and irrigated (TWMP6) and kept free from all building materials, contaminants and other debris and shall not be used for storage of any building materials. If scaffolding is required within a tree protection zone the ground is to be mulched

TWMP4: Mulching

If construction is proposed within PRZ offsets mulching is required. Mulch to a depth of 100 millimetres using composted green waste mulch. The mulch should be free of weed seeds and other contaminants. Should constant access be required within the trees' PRZs, outside the protective fencing, heavier mulch should be spread to a depth no greater than 100 millimetres to reduce soil compaction.

TWMP5: Temporary Irrigation

Where construction related activity or root cutting is proposed within the PRZ of retained trees, temporary irrigation or water cart access shall be provided to the remaining unimpacted PRZ areas to maintain adequate soil moisture levels. Delivery volumes are to allow for mulch layer and recent rainfall.

TWMP6: Bulk Earthworks

To prevent unnecessary root damage walk machinery within defined haul routes beyond PRZs wherever possible. The excavation shall be carried out under the supervision of the site Arborist. All roots within PRZ of retained trees are to be hand cut prior to machine cutting.

Immediately following excavation the face of the cut within the PRZ shall be draped and maintained moist until backfilled. This should be done using a 10mm thick jute matting pinned at ground level and allowed to cover the full depth of the rootzone excavation.

There is to be no soil battering or unnecessary over excavation within PRZ offsets.

TWMP7: Prevention of Soil Compaction

During the construction period there may be considerable traffic movement associated with general building activities. The resultant soil compaction and possible contamination of the soil can have an equally detrimental impact on the tree as does the severing and exposing of the roots during excavation.

Specific access tracks for machinery should be determined through consultation between the Civil Contractor and the site Arborist. Should heavy vehicle movement be required within a retained tree's PRZ, a track should be formed at grade using large diameter (up to 100mm) recycled railway ballast (true basalt) over a geofabric or a corduroy of heavy timbers.

TWMP8: Trunk Protection

Lengths of timber (75mm x 50mm x 2000mm) shall be used to protect a tree's trunk if construction or traffic is proposed within its CRZ and the tree cannot be fenced. The lengths of timber should be fastened around the trunk at 200 millimetre centres with hoop iron strapping or similar

TWMP9: Prevention of Soil Inversion

Care shall be taken to avoid inversion of the soil layers on the site and particularly within PRZs, as clays placed over coarse textured soils will reduce water infiltration, creating a perched water table. Decline and/or death of underlying tree roots are expected due to moisture stress.

TWMP10: Services

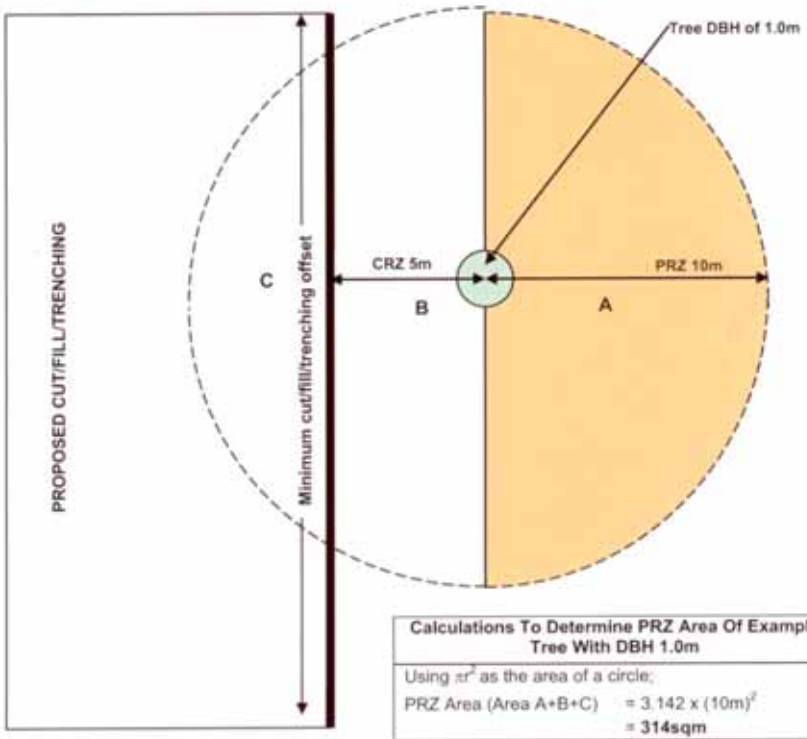
Trenching for services is to be regarded as "construction". Trenching within PRZ offsets should be avoided wherever possible to ensure <18% root loss (of PRZ) occurs on retained trees. Directional ("trenchless") boring or suspension of services should be used wherever possible. Where trenching is to occur within PRZ offsets, it is to be undertaken by hand to rock with no roots >50mm to be cut, under supervision of the Site Arborist.

ATTACHMENT E: CRZ/PRZ RULING

Application of CRZ/PRZ Rule To Maintain Existing Tree Stability, Longevity and Biomass

(Not to scale)

Assumption:	Some Basic Facts
• All PRZ/CRZ measured from centre of trunk • A circular root spread with no existing constraints • Feeder roots can occur beyond the PRZ • Cut or fill or trenching proposed **on one side only** • Average species tolerance to construction activity • Average soil depth greater than 300 millimetres • DBH 1.0m for this example	In most urban landscapes with most tree species PRZ equates to "dripline" Area B is comprised of approximately two (2) equal rectangles (5m x 10m) for ease of calculation There is a significant amount of sharing of PRZ soil volume in many mature landscapes & vegetation communities which needs to be considered when determining long term tree survival. It is generally accepted that 18-20% root loss can be tolerated by most species and that windthrow is unlikely with excavation beyond CRZ offsets.



Calculations To Determine PRZ Area Of Example Tree With DBH 1.0m	
Using πr^2 as the area of a circle;	
PRZ Area (Area A+B+C)	= 3.142 x $(10m)^2$ = **314sqm**
• Area A	=half of PRZ = 157sqm
• Area B (approx.)	= 2 x (5mx10m) = 100sqm
• Area A+B	= 157qm + 100 sqm = 257sqm = 82% of total PRZ
• Area C	= 314sqm – (Area A + B) = 314sqm – 257sqm = 57sqm = **18% of total PRZ**

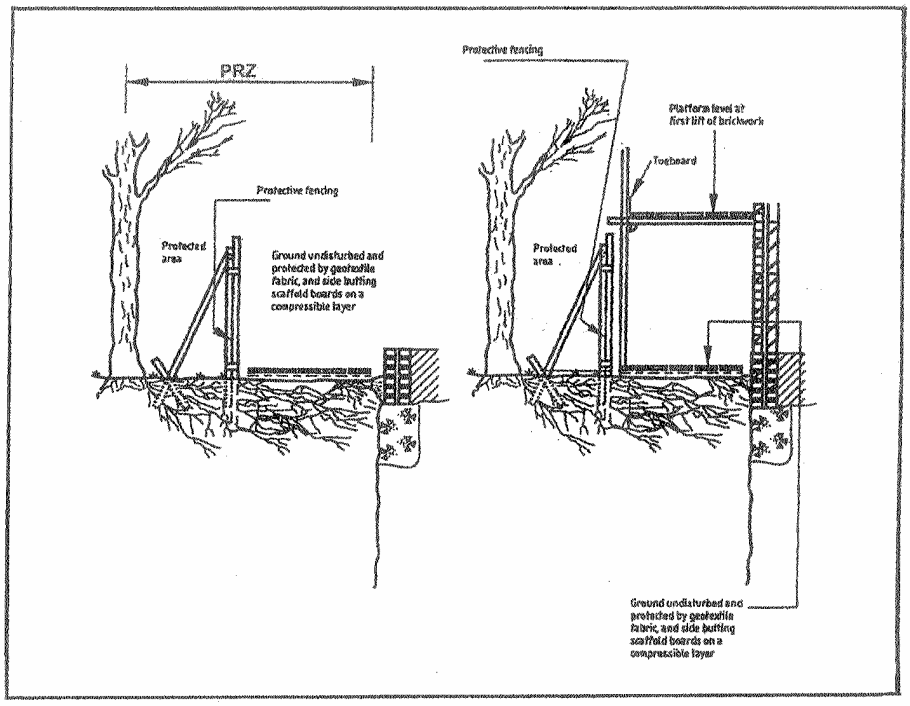
Definitions

- Diameter at Breast height (DBH) = diameter of trunk measured at 1.4 metres above ground level.
- Critical Root Zone (CRZ) = 5 x DBH (one side only)
- Primary Root Zone (PRZ) = 10 x DBH

 CRZPRZ2007

ATTACHMENT F: SCAFFOLDING WITHIN A PROTECTED AREA

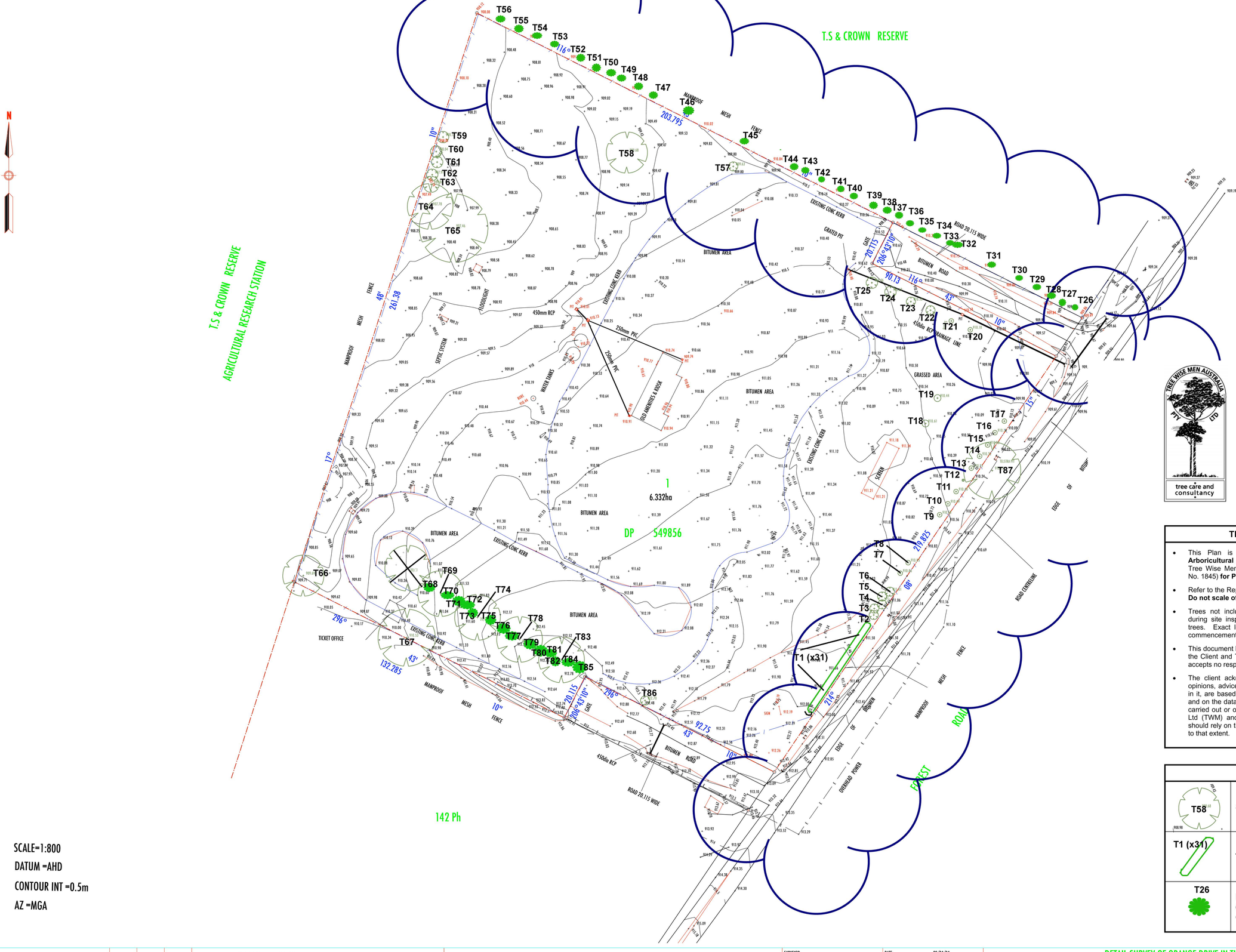
Adapted from BS5837:2005



Scaffolding within the PRZ

Tree Wise Men® Australia Pty Ltd Scaffolding 2007

ATTACHMENT G: TREE PLAN



TREE WISE MEN® AUSTRALIA PTY LTD

ACN 002 982 247 ABN 15 002 982 247

tree care and consultancy

Tree Location Plan

Tree Wise Men® Job Number: 1845
Date: October, 2007
Site: Forest Road
Orange

84 Fuller Street, Collaroy Plateau NSW 2097
Phone: (02) 9981 5219 Fax: (02) 9971 0881
Email: treewise@treewisemen.com.au

TREE PLAN NOTES

- This Plan is to be read in conjunction with the **Arboricultural Audit** and **Tree Schedule** as prepared by Tree Wise Men® Australia Pty Ltd, October, 2007 (Job No. 1845) **for Pre Development use only**.
- Refer to the Report for all measurements and dimensions. **Do not scale off this drawing**.
- Trees not included on the Survey Plan but identified during site inspection have been added to the subject trees. Exact locations to be confirmed on site before commencement of works.
- This document has been prepared for the exclusive use of the Client and Tree Wise Men® Australia Pty Ltd (TWM) accepts no responsibility for its use by other persons.
- The client acknowledges that this document, and any opinions, advice or recommendations expressed or given in it, are based on the information supplied by the Client and on the data, inspections, measurements and analysis carried out or obtained by Tree Wise Men® Australia Pty Ltd (TWM) and referred to in the Report. The Client should rely on the documentation, and on its content, only to that extent.

LEGEND

T58	Surveyed site trees
T1 (x31)	Trees identified as a Group
T26	Manually plotted site trees (exact locations to be confirmed)

REVISIONS

NO.	DESCRIPTION	DRAWN	DATE	APP.

CLIENT: ANTHONY VAVAYIS & ASSOCIATES

ADDRESS: 20/26a LIME ST, KING ST WHARF SYDNEY

CARPENTER, COLLINS & ASSOCIATES

CONSULTING SURVEYORS, ENGINEERS, SUBDIVISION DESIGN & MANAGEMENT
64 McNamara Street,
P.O. Box 685, Orange, NSW 2800
Telephone: (02) 6363 1111 Facsimile: (02) 6361 3647
email: ccs@ix.net.au

SURVEYOR:		DATE:	20/04/04
HEIGHT DATUM:	AHD	DRAWN:	JO
HORIZ. DATUM:	ASSUMED	DESIGNED:	
ORIGIN:		CHECKED:	
ROT'N ANG:		APPROVED:	
SCALE:	1:800		

DETAIL SURVEY OF ORANGE DRIVE IN THEATRE
LOT 1 DP 549856
FOREST ROAD
ORANGE

REV.

DO NOT SCALE | JOB No. 20470 | DWG No. 20470.DWG | SHEET OF 1 1 | A1