

Arboricultural Impact Assessment



Prepared 21st April 2021

Site Location

Chelmsford Avenue
Epping NSW 2121

Client

Schools Infrastructure

DISCLAIMER

The author and Tree & Landscape Consultants take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modification/s to its growing environment either above or below ground contrary to our advice.

Peter Richards

Tree & Landscape Consultants

Contents

	Page
Summary	4
1. Introduction	5
2. Methodology	6
3. Tree Assessments	8
4. Recommendations	22

Tables

1. <i>Tree Assessments</i>	8
----------------------------	---

Appendices

Appendix A	Sustainable Retention Index Value (S.R.I.V.)© Version 4 (IACA 20010)
Appendix B	Definitions & Terminology
Appendix C	Tree Location Plan- (Prepared by Arboreport)
Appendix D	Tree Protection Plan
Appendix E	Site Works & Stormwater Plan 1
Appendix F	Extract from Australian Standard AS4970 2009 Determining Tree Protection Zones
Appendix G	Extract from Australian Standard AS4970 2009 Determining Structural Root Zones
Appendix H	Significance Rating Criteria
Appendix I	References

SUMMARY

This report considers 174 trees located within and adjacent to the land (see Appendix C – Tree Locations).

Removal

Trees 1,4-8,11,13,18,21,24-37,39,40,42A,43A ,43-47,49,52-54,60,61,65,108A, 109,111,112,116,126,128-133,140-144,146-147,149-153 & 169 are either smaller specimens or are located within the proposed developable areas and are to be removed and replaced with alternate landscape as part of final works in accordance with landscape documentation prepared as part of the proposal.

Retention

Trees: 2,3, 9, 10, 12, 14, 15, 16, 17, 19, 20, 22, 23, 38, 41, 42, 50, 51, 55, 56, 57, 58, 59, 62, 63, 64, 66, 67, 68, 69, 70, 71-108, 110, 113-115, 117-125, 127, 134-139, 145, 154-159, 160-168 & 170 are to be retained subject to prescribed works and protection measures being introduced as per the recommendations and Tree Protection Plan (Appendix D) of this report.:



TREE & LANDSCAPE CONSULTANTS

Site Analysis, Arboricultural Assessments

INSTITUTE OF AUSTRALIAN
CONSULTING ARBORICULTURISTS



MANAGING URBAN TREES ®

Peter A Richards

Dip. Hort. (Arboriculture)

Assoc. Dip.Hort. (Park Management)

Member IACA, Member LGTRA, Member ISA

P.O Box 50

Padstow 2211 N.S.W.

Mobile

0418 277 379

Email

talc2@optusnet.com.au

21st April 2021

Schools Infrastructure

C/o Hansen Yuncken

458-468 Wattle Street

Ultimo NSW 2007

Our reference: 5174

Arboricultural Impact Assessment:

Chelmsford Avenue

Epping NSW 2121

1. INTRODUCTION

This report has been prepared by Tree & Landscape Consultants for Schools Infrastructure. The site was inspected by the author and the subject trees and their general growing environment evaluated on the 13th April 2021 and has relied in part upon initial assessment undertaken by Arboreport Vegetation Management Consultants.

The site is subject to a Development to demolish existing structures and construct a new school titled "New Epping South Public School". The Tree Locations are provided in Appendix C- Tree Location Plan prepared by Arboreport as part of Preliminary Advice dated 17-4-20 and Tree Protection Plan (Appendix D) are to be included into and used in conjunction with the approval for *the site*.

The aims and objectives of this report are to detail and comply with the tree protection requirements specified in AS4970 (2009) *Protection of trees on development sites* to identify and assesses the condition of the subject tree/s; determine the impact of development on the subject tree/s; provide recommendations for retention or removal of the subject tree/s; provide specifications for protection of tree/s to be retained. The information in this report is intended to provided tree management and protection through all stages of development.

2. METHODOLOGY

- 2.1 The method of assessment of tree/s is applied from the ongoing knowledge and development of the author and considers but is not confined to:
- Tree health and subsequent stability, both long and short term
 - Sustainable Retention Index Value (S.R.I.V.)© IACA 2009)
 - Amenity values
 - Significance – Rating System for Tree Significance - IACA (2009) ©
- 2.2 This assessment is undertaken using a standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection.
- 2.3 In this report the dimensions of the tree recorded by the author for the trunk *diameter at breast height* (DBH) measurement is calculated at 1.4m above ground from the base of the tree. Where a tree is trunkless or branches at or near ground such as a mallee formed tree, an average diameter is determined by recording the radial extent of the stem mass at its narrowest and widest dimensions, adding the two dimensions together and dividing them by 2 to record an average.
- 2.4 Crown spreads are expressed as length by breadth measurements to accurately record their dimensions. Where appropriate, *crown spread orientation* is described along the length of the crown spread e.g. North/South, or as *radial* if the crown is distributed at an approximately even radius from the trunk e.g. 6x6m.
- 2.5 The Australian Standard AS 4970-2009 “Protection of trees on development sites, where applicable is applied to trees to be retained in this report as a point of reference and guide for the recommended minimum clearances from the centre of tree trunks to development works and is applied as a generalised benchmark and the distances may be increased or decreased by the author as a result of other factors providing mitigating circumstances or constraints as indicated by but not restricted to the following:
- *Tolerance of individual species to disturbance,*
 - *Geology e.g. physical barriers in soil, floaters, bedrock to surface*
 - *Topography e.g. slope, drainage,*
 - *Soil e.g. depth, drainage, fertility, structure,*
 - *Microclimate e.g. due to landform, exposure to dominant wind,*
 - *Engineering e.g. techniques to ameliorate impact on trees such as structural soil, lateral boring,*
 - *Construction e.g. techniques to ameliorate impact on trees such as pier and beam, bridge footings, suspended slabs*
 - *Arboriculture e.g. exploration trenches to map location of roots,*
 - *Physical limitations - existing modifications to the environment and any impact to tree/s by development e.g. property boundaries, road reserves, previous impact by excavation in other directions, soil level changes by cutting or filling, existing landscaping works within close proximity, modified drainage patterns.*
- 2.6 **Pruning/Removal Guidelines**
- Any pruning recommended in this report is to be to the Australian Standard® AS4373 ‘Pruning of amenity trees’, and conducted in accordance with the

NSW Work Cover Authority Code of Practice for the Amenity Tree Industry, 1998

- All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO), or applicable consent conditions.
- Tree maintenance work is specialised and in order to be undertaken safely and to ensure the works carried out are not detrimental to the survival of the tree or surrounding vegetation, all works should be undertaken by a qualified Arboriculturist with appropriate competencies recognised within the Australian Qualification Framework, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.
- Any pruning near electricity wires should be undertaken in accordance with relative Electrical Safety Rules and be performed by persons individually authorised by Energy Australia

3. Tree Assessments

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition C = Good F = Fair P = Poor D = Dec	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N, S, E, W = North, South, East, West	Trunk Diameter (At an appropriate location)	Height (m)	Spread (m)	Tree Vigour L = Low C = Good A = Average	Trunk Lean X = Significant Safety Concern L = Lean A = Acceptable M = Moderate	SRIV (Age, Vigour, Condition, Trunk Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s-being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 *Protection of Trees on Development Sites* (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
1	Callistemon viminalis Bottlebrush	M	F	No	No	Sy	460	9	7	G	A	MGVF9	2.5	5.4	3
	Comments: Multi trunk specimen														
2	Auranticarpa rhombifolia Diamond Pittosporum	M	F	No	No	Sy	210	6	3	G	X	MGVF9	1.8	2.16	3
	Comments: Tree exhibits poor form.														
3	Jacaranda mimosifolia Jacaranda	M	F	No	No	Sy	500	10	8	G	A	MGVF9	2.6	10.8	3
	Comments: Buttress root to the north														
4	Cupressus sempervirens Cupressus	M	F	No	No	Sy	200	8	2	G	X	MGVF9	3.6	14.4	3
	Comments: Tree provides screenage														
5	Cupressus sempervirens Cupressus	M	F	No	No	Sy	330	9	2	G	X	MGVF9	2.5	5.4	3
	Comments: Tree provides screenage														
6	Cupressus sempervirens Cupressus	M	F	No	No	Sy	180	8	2	L	X	MLVF4	3.6	14.4	3
	Comments: Major deadwood present														
7	Cupressus sempervirens Cupressus	M	F	No	No	Sy	600	10	4	G	X	MGVF9	3.2	10.8	3
	Comments: Tree provides screenage														
8	Cedrus deodara Deodar Cedar	M	F	No	No	Sy	1200	13	12	G	X	MGVF9	2.1	3.48	3
	Comments: Multi-trunked specimen														
9	Gleditsia tracanthos Honey Locust	M	F	No	No	Sy	450	12	9	A	A	#N/A	2.1	3.6	3
	Comments: Dead wood present														
10	Photinia robusta Photinia/ Chinese Hawthorn	M	F	No	No	Sy	900	9	10	G	A	MGVF9	2.5	5.4	3
	Comments: Tree provides screenage														
11	Acmena smithii Lillypilly	M	F	No	No	Sy	450	14	7	G	X	MGVF9	3.4	12	3
	Comments: Canopy asymmetrical to North West														
12	Jacaranda mimosifolia Jacaranda	M	F	No	No	Sy	300	12	8	G	A	MGVF9	2.1	3.6	3
	Comments: Dual leader specimen														
13	Jacaranda mimosifolia Jacaranda	M	F	No	No	Sy	290	14	6	G	A	MGVF9	3.4	12	3
	Comments: Tree general appeared free of insect predation and disease.														
14	Ficus benjamina Weeping Fig	M	F	No	No	Sy	1000	15	12	G	A	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
15	Ficus benjamina Weeping Fig	M	F	No	No	Sy	600	7	8	G	A	MGVF9	2.8	7.2	3
	Comments: Broad spreading canopy appearing structurally sound.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N, S, E, W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
16	Ficus benjamina Weeping Fig	M	F	No	No	Sy	1000	12	8	G	A	MGVF9	2.1	3.6	3
	Comments: Broad spreading canopy appearing structurally sound.														
17	Archontophoenix alexandrae Alexandra Plam	M	F	No	No	Sy	320	12	2	G	X	MGVF9	2.1	3.6	2
	Comments: Tree general appeared free of insect predation and disease.														
18	Archontophoenix alexandrae Alexandra Plam	M	F	No	No	Sy	270	10	2	G	X	MGVF9	3.2	10.8	3
	Comments: Tree general appeared free of insect predation and disease.														
19	Archontophoenix alexandrae Alexandra Plam	M	F	No	No	Sy	180	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
20	Archontophoenix alexandrae Alexandra Plam	M	F	No	No	Sy	180	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
21	Ficus benjamina Weeping Fig	M	F	No	No	Sy	300	6	5	G	A	MGVF9	1.7	2.16	3
	Comments: Canopy asymmetrical to North														
22	Citharexylum spinosum Fiddlewood	M	F	No	No	Sy	460	14	7	G	A	MGVF9	3.4	12	2
	Comments: Dual leader specimen appearing structurally sound.														
23	Eucalyptus saligna Sydney Blue Gum	M	G	No	No	Sy	900	25	10	G	X	MGVG10	2.3	4.44	1
	Comments: Tree general appeared free of insect predation and disease.														
24	Schinus areira Peppercom Tree	M	F	No	No	Sy	210	6	3	G	A	MGVF9	1.7	2.16	3
	Comments: Dual leader specimen appearing structurally sound.														
25	Harpullia pendula Tulip Wood	M	F	No	No	Sy	370	6	6	G	A	MGVF9	1.7	2.16	3
	Comments: Multi-leader specimen at the height of 1m														
26	Pistacea sinensis Chinese Pistachio	M	F	No	No	Sy	470	6	5	G	A	MGVF9	1.7	2.16	3
	Comments: Multi-leader specimen at the height of 1m														
27	Stenocarpus sinuatus Queensland Firewheel Tree	M	F	No	No	Sy	710	9	7	G	X	MGVF9	2.5	5.4	3
	Comments: Major deadwood present in trunk at a height of 2m														
28	Jacaranda mimosifolia Jacaranda	M	F	No	No	Sy	650	17	10	G	A	MGVF9	2.2	3.84	2
	Comments: Tree general appeared free of insect predation and disease.														
29	Stenocarpus sinuatus Queensland Firewheel Tree	M	F	No	No	Sy	800	14	6	G	X	MGVF9	3.4	12	3
	Comments: Multi-leader specimen at the height of 1.6m														
30	Melaleuca quinquenervia Broad-leafed Paperbark	M	P	No	No	Sy	1790	16	12	G	X	MGVP6	3.4	12	2
	Comments: Multi-leader specimen at the height of 1m														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
31	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	400	15	6	G	X	MGVF9	2.8	7.2	3
	Comments: Multi-leader specimen at the height of 3m														
32	Syzygium australe Bush Cherry	M	F	No	No	Sy	330	7	3	G	A	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
33	Livistona australis 0	M	F	No	No	Sy	480	15	2	G	X	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
34	Archontophoenix alexandrae Alexandra Palm	M	F	No	No	Sy	200	8	2	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
35	Phoenix canariensis Canary Island Date palm	M	F	No	No	Sy	500	8	4	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
36	Lophostemon confertus Brush Box/ Brisbane Box	M	F	No	No	Sy	540	9	8	G	X	MGVF9	2.5	5.4	3
	Comments: Multi-leader specimen at the height of 2m														
37	Arbutus unedo Strawberry Tree	M	F	No	No	Sy	230	8	5	G	A	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
38	Syzygium australe Bush Cherry	M	F	No	No	Sy	300	6	3	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
39	Syagrus romanzoffiana Cocos Palm	M	F	No	No	Sy	300	7	5	G	X	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
40	Archontophoenix cunninghamii Bangalow Palm	M	F	No	No	Sy	230	7	2	G	X	MGVF9	2.8	7.2	3
	Comments: Palm appearing free of insect predation or disease.														
41	Cupressus glabra Cypress	M	F	No	No	Sy	550	13	5	G	X	MGVF9	2.1	3.48	3
	Comments: Tree general appeared free of insect predation and disease.														
42	Cupressus glabra Cypress	M	F	No	No	Sy	140	10	3	G	X	MGVF9	3.2	10.8	3
	Comments: Stand of 7 trees														
43	Allocasuarina littoralis Black Sheoak	M	F	No	No	Sy	300	10	6	G	X	MGVF9	3.2	10.8	3
	Comments: Tree general appeared free of insect predation and disease.														
44	Corymbia maculata Spotted Gum	M	F	No	No	Sy	730	27	10	G	X	MGVF9	2.9	8.52	2
	Comments: Previous partial lopping.														
45	Corymbia citriodora Lemon Scented Gum	M	F	No	No	Sy	460	22	10	G	X	MGVF9	2.5	5.52	2
	Comments: Stand of 5 trees														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N, S, E, W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
46	Corymbia citriodora Lemon Scented Gum	M	F	No	No	Sy	600	22	10	G	X	MGVF9	2.5	5.52	2
	Comments: Stand of 5 trees														
47	Corymbia citriodora Lemon Scented Gum	M	F	No	No	Sy	590	22	10	G	X	MGVF9	2.5	5.52	2
	Comments: Stand of 5 trees														
48	Corymbia citriodora Lemon Scented Gum	M	F	No	No	Sy	490	22	10	G	X	MGVF9	2.5	5.52	2
	Comments: Stand of 5 trees. Branch failure on western side of crown at a height of 5m														
49	Corymbia citriodora Lemon Scented Gum	M	F	No	No	Sy	470	22	10	G	X	MGVF9	2.5	5.52	2
	Comments: Stand of 5 trees														
50	Casuarina cunninghamiana River she-oak	M	F	No	No	Sy	300	18	6	G	X	MGVF9	2	3.24	3
	Comments: Stand of 8 trees														
51	Casuarina cunninghamiana River she-oak	M	F	No	No	Sy	100	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Stand of 8 trees														
52	Cupressus sempervirens Cupressus	M	F	No	No	Sy	140	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Multi-leader specimen at the height of 1m														
53	Cupressus sempervirens Cupressus	M	F	No	No	Sy	300	8	2	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
54	Cupressus sempervirens Cupressus	M	P	No	No	Sy	250	8	4	L	X	MLVP2	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
55	Leptospermum petersonii Lemon Scented Tea Tree	M	F	No	No	Sy	200	7	4	G	A	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
56	Casuarina cunninghamiana River she-oak	M	F	No	No	Sy	250	13	3	G	X	MGVF9	2.1	3.48	3
	Comments: Canopy asymmetrical to East														
57	Melia azederach White Cedar	M	F	No	No	Sy	300	7	6	G	A	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
58	Melaleuca linarifolia Snow in Summer	M	F	No	No	Sy	200	7	4	G	A	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
59	Corymbia maculata Spotted Gum	M	F	No	No	Sy	480	21	10	G	X	MGVF9	2.1	3.6	2
	Comments: Canopy asymmetrical to North East														
60	Cupressus sempervirens Cupressus	M	F	No	No	Sy	300	6	4	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
61	Acmena smithii Lillypilly	M	F	No	No	Sy	200	6	4	G	A	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
62	Eucalyptus scoparia Wallangarra White Gum	M	F	No	No	Sy	580	19	8	G	X	MGVF9	1.7	2.16	2
	Comments: Multi-leader specimen at the height of 1.3m														
63	Eucalyptus scoparia Wallangarra White Gum	M	F	No	No	Sy	190	13	4	G	X	MGVF9	2.1	3.48	3
	Comments: Tree general appeared free of insect predation and disease.														
64	Eucalyptus bicostata Southern Gum	M	F	No	No	Sy	430	20	6	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
65	Calodendron capense Cape Chestnut	M	F	No	No	Sy	380	8	6	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
66	Eucalyptus punctata Grey Gum	M	F	No	No	Sy	440	10	4	G	X	MGVF9	3.2	10.8	3
	Comments: Tree general appeared free of insect predation and disease.														
67	Hymenosporum flavum Native Frangipani	M	F	No	No	Sy	230	7	4	G	A	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
68	Corymbia maculata Spotted Gum	M	F	No	No	Sy	460	17	4	G	X	MGVF9	2.2	3.84	2
	Comments: Tree general appeared free of insect predation and disease.														
69	Eucalyptus bicostata Southern Blue Gum	M	F	No	No	Sy	520	20	6	G	X	MGVF9	1.7	2.16	3
	Comments: Canopy asymmetrical to North														
70	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	700	18	9	G	X	MGVF9	2	3.24	1
	Comments: Dual leader specimen at the height of 700mm. Base of trunk decayed														
71	Corymbia maculata Spotted Gum	M	F	No	No	Sy	450	18	6	G	X	MGVF9	2	3.24	2
	Comments: Tree general appeared free of insect predation and disease.														
72	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	330	16	6	G	X	MGVF9	3.4	12	2
	Comments: Tree general appeared free of insect predation and disease.														
73	Eucalyptus paniculata Grey Ironbark	M	F	No	No	Sy	450	16	6	G	X	MGVF9	3.4	12	2
	Comments: Dual leader specimen from base														
74	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	530	18	8	G	X	MGVF9	2	3.24	1
	Comments: Minor borer activity at base of trunk														
75	Eucalyptus punctata Grey Gum	M	F	No	No	Sy	480	17	8	G	X	MGVF9	2.2	3.84	2
	Comments: Cankers around base of trunk to the height of 2m														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
76	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	820	24	10	G	X	MGVF9	1.8	2.52	1
	Comments: Tree general appeared free of insect predation and disease.														
77	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	380	9	7	G	X	MGVF9	2.5	5.4	2
	Comments: Tree general appeared free of insect predation and disease.														
78	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	430	22	4	G	X	MGVF9	2.5	5.52	1
	Comments: Canopy asymmetrical to East. Deadwood present														
79	Eucalyptus paniculata Grey Ironbark	M	F	No	No	Sy	900	24	13	G	X	MGVF9	1.8	2.52	2
	Comments: Major dead wood present. Decay at base of trunk														
80	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	1190	24	12	G	X	MGVF9	1.8	2.52	1
	Comments: Basal canker southern aspect. Smaller deadwood.														
81	Eucalyptus saligna Sydney Blue Gum	M	P	No	No	Sy	1270	24	10	G	X	MGVP6	1.8	2.52	1
	Comments: Smaller deadwood and epicormic growth. Canopy thinning.														
82	Sapium sebifera Chinese Tallow Tree	M	F	No	No	Sy	250	6	3	G	A	MGVF9	1.7	2.16	3
	Comments: Tree appeared free of insect predation and disease.														
83	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	800	20	7	G	X	MGVF9	1.7	2.16	1
	Comments: Some borer predation. Tree appeared structurally sound.														
84	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	630	16	8	G	X	MGVF9	3.4	12	1
	Comments: Tree general appeared free of insect predation and disease.														
85	Corymbia maculata Spotted Gum	M	F	No	No	Sy	590	16	5	G	X	MGVF9	3.4	12	1
	Comments: Tree general appeared free of insect predation and disease.														
86	Corymbia maculata Spotted Gum	M	F	No	No	Sy	610	16	7	G	X	MGVF9	3.4	12	1
	Comments: Tree general appeared free of insect predation and disease.														
87	Angophora costata Smooth Barked Apple	M	F	No	No	Sy	770	16	8	G	X	MGVF9	3.4	12	2
	Comments: Dual leader at 2.5 meters.														
88	Corymbia citriodora Lemon Scented Gum	M	F	No	No	Sy	580	16	7	G	X	MGVF9	3.4	12	2
	Comments: Dual leader specimen dividing at 2 metres from ground.														
89	Grevillea robusta Silky Oak	M	P	No	No	Sy	490	14	6	L	X	MLVP2	3.4	12	3
	Comments: Extensive dieback evident.														
90	Callistemon salignus White Bottlebrush	M	F	No	No	Sy	340	6	4	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
91	Eucalyptus botryoides Bangalay	M	F	No	No	Sy	310	6	4	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
92	Callistemon salignus White Bottlebrush	M	F	No	No	Sy	200	6	3	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
93	Melaleuca bracteata "Revolutio" Melaleuca	M	F	No	No	Sy	330	6	4	G	A	MGVF9	1.7	2.16	3
	Comments: Multi leader specimen dividing at 1.5 metres from ground.														
94	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	920	26	10	G	X	MGVF9	2.5	5.64	1
	Comments: Multi leader specimen dividing at 1.5 metres from ground. Trunk wound occluding northern aspect.														
95	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	740	26	8	G	X	MGVF9	2.5	5.64	1
	Comments: Deadwood to 150mm diameter.														
96	Eucalyptus sp Gum	M	F	No	No	Sy	500	12	3	G	X	MGVF9	2.1	3.6	3
	Comments: Tree general appeared free of insect predation and disease.														
97	Cupressus leylandii Cypress	M	F	No	No	Sy	500	12	3	G	X	MGVF9	2.1	3.6	3
	Comments: Tree general appeared free of insect predation and disease.														
98	Eucalyptus cinerea Argyle Apple	M	F	No	No	Sy	150	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
99	Eucalyptus robusta Swamp Mahogany	M	F	No	No	Sy	800	16	8	G	X	MGVF9	3.4	12	2
	Comments: Tree general appeared free of insect predation and disease.														
100	Eucalyptus robusta Swamp Mahogany	M	F	No	No	Sy	530	19	9	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
101	Melaleuca quinquenervia Broad-leaved Paperbark	M	F	No	No	Sy	400	16	4	G	X	MGVF9	3.4	12	3
	Comments: Tree general appeared free of insect predation and disease.														
102	Eucalyptus robusta Swamp Mahogany	M	F	No	No	Sy	400	16	5	G	X	MGVF9	3.4	12	2
	Comments: Tree general appeared free of insect predation and disease.														
103	Eucalyptus robusta Swamp Mahogany	M	F	No	No	Sy	470	19	5	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
104	Eucalyptus saligna Sydney Blue Gum	M	P	No	No	Sy	800	22	8	G	X	MGVP6	2.5	5.52	1
	Comments: Failure of superior branching evident.														
105	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	530	20	6	G	X	MGVF9	1.7	2.16	1
	Comments: Tree general appeared free of insect predation and disease.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N, S, E, W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
106	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	530	20	6	G	X	MGVF9	1.7	2.16	1
	Comments: Tree general appeared free of insect predation and disease.														
107	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	980	22	6	G	X	MGVF9	2.5	5.52	1
	Comments: Tree general appeared free of insect predation and disease.														
108	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	890	22	6	G	X	MGVF9	2.5	5.52	2
	Comments: Tree general appeared free of insect predation and disease.														
109	Casuarina cunninghamiana River she-oak	M	F	No	No	A/E	430	19	6	G	X	MGVF9	1.7	2.16	3
	Comments: Crown asymmetrical to east.														
110	Elaeocarpus eumundii Quandong	M	F	No	No	Sy	110	6	4	G	A	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
111	Paulownia tomentosa Princess Tree	M	P	No	No	Sy	200	6	4	L	A	MLVP2	1.7	2.16	3
	Comments: Extensive dieback evident.														
112	Metasequoia glyptostroboides Dawn Redwood	M	F	No	No	Sy	370	8	5	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
113	Ficus microcarpa var. 'Hillii' Hills Weeping Fig	M	F	No	No	Sy	650	9	8	G	X	MGVF9	2.5	5.4	3
	Comments: Tree general appeared free of insect predation and disease.														
114	Melaleuca quinquenervia Broad-leafed Paperbark	M	F	No	No	Sy	450	8	4	G	X	MGVF9	3.6	14.4	3
	Comments: Multi leader specimen at 1.5 metres from ground.														
115	Melaleuca quinquenervia Broad-leafed Paperbark	M	F	No	No	Sy	480	8	7	G	X	MGVF9	3.6	14.4	3
	Comments: Multi leader specimen at 1 metre from ground.														
116	Nyssa sylvatica Tupello	M	P	No	No	Sy	310	6	6	G	X	MGVP6	1.7	2.16	3
	Comments: Dieback and epicormic growth present.														
117	Betula pendula Silver Birch	M	F	No	No	Sy	370	7	4	G	X	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
118	Salix tortuosa Tortured Willow	M	P	No	No	Sy	380	6	4	L	X	MLVP2	1.7	2.16	3
	Comments: Extensive dieback evident.														
119	Corymbia maculata Spotted Gum	M	F	No	No	A/W	610	14	6	G	X	MGVF9	3.4	12	2
	Comments: Crown asymmetrical to the west														
120	Grevillea robusta Silky Oak	M	F	No	No	Sy	290	12	4	G	X	MGVF9	2.1	3.6	3
	Comments: Tree general appeared free of insect predation and disease.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
121	Grevillea robusta Silky Oak	M	F	No	No	Sy	560	12	4	G	X	MGVF9	2.1	3.6	3
	Comments: Tree general appeared free of insect predation and disease.														
122	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	890	25	12	G	X	MGVF9	2.3	4.44	1
	Comments: Tree general appeared free of insect predation and disease.														
123	Lagunaria patersonii Norfolk Island Hibiscus	M	F	No	No	Sy	270	7	3	A	X	MGVF9	2.8	7.2	3
	Comments: Tree general appeared free of insect predation and disease.														
124	Eucalyptus saligna Sydney Blue Gum	M	P	No	No	Sy	1340	24	12	G	X	MGVP6	1.8	2.52	1
	Comments: Branch failures evident southern aspect. Deadwood present. Epicormic growth present.														
125	Ulmus capinifolia "Variegata" Elm	M	F	No	No	Sy	470	19	7	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
126	Waterhousia floribunda Waterhousia	M	F	No	No	Sy	370	6	4	G	X	MGVF9	1.7	2.16	3
	Comments: Multi leader specimen at 1 metre from ground.														
127	Cupressus sempervirens Cupressus	M	F	No	No	Sy	240	8	4	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
128	Ulmus parvifolia Chinese Elm	M	F	No	No	Sy	100	5	3	G	X	MGVF9	2.2	3.96	3
	Comments: Tree general appeared free of insect predation and disease.														
129	Gleditsia tracanthos Honey Locust	M	F	No	No	Sy	340	8	6	G	X	MGVF9	3.6	14.4	3
	Comments: Tree general appeared free of insect predation and disease.														
130	Quercus robur English Oak	M	F	No	No	Sy	300	9	4	G	X	MGVF9	2.5	5.4	3
	Comments: Tree general appeared free of insect predation and disease.														
131	Ulmus capinifolia "Variegata" Elm	M	F	No	No	Sy	400	9	7	G	X	MGVF9	2.5	5.4	3
	Comments: Tree general appeared free of insect predation and disease.														
132	Cupressus leylandii Cypress	M	F	No	No	Sy	270	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Stand of smaller trees approx. 15 specimens.														
133	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	420	6	4	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
134	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	380	6	4	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
135	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	350	6	4	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
136	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	300	6	4	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
137	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	350	6	4	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
138	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	300	6	4	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
139	Brachychiton acerifolium Illawarra Flame Tree	M	F	No	No	Sy	350	6	4	G	X	MGVF9	1.7	2.16	2
	Comments: Tree general appeared free of insect predation and disease.														
140	Cedrus deodara Deodar Cedar	M	F	No	No	Sy	250	11	4	G	X	MGVF9	2.5	5.4	3
	Comments: Tree general appeared free of insect predation and disease.														
141	Cupressus torulosa Cypress	M	F	No	No	Sy	550	12	6	G	X	MGVF9	2.1	3.6	3
	Comments: Tree general appeared free of insect predation and disease.														
142	Casuarina glauca She-Oak	M	F	No	No	Sy	240	14	3	G	X	MGVF9	3.4	12	2
	Comments: Stand of 14 smaller trees.														
143	Casuarina glauca She-Oak	M	F	No	No	Sy	240	10	3	G	X	MGVF9	3.2	10.8	2
	Comments: Stand of 14 smaller trees.														
144	Eucalyptus saligna Sydney Blue Gum	M	P	No	No	Sy	0	16	10	G	X	MGVP6	3.4	12	3
	Comments: Extensive dieback evident. Some basal decay														
145	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	820	22	18	L	X	MLVF4	2.5	5.52	1
	Comments: Dieback of superior leaders.														
146	Angophora floribunda Rough-barked Apple	M	F	No	No	Sy	570	14	5	G	X	MGVF9	3.4	12	2
	Comments: Dual leader specimen. Deadwood throughout crown.														
147	Gleditsia tracanthos Honey Locust	M	F	No	No	Sy	430	6	4	G	X	MGVF9	1.7	2.16	3
	Comments: Multi leader specimen at 1 metre from ground.														
148	Casuarina glauca She-Oak	M	F	No	No	Sy	320	5	4	G	X	MGVF9	2.2	3.96	3
	Comments: Tree general appeared free of insect predation and disease.														
149	Gleditsia tracanthos Honey Locust	M	F	No	No	A/W	380	5	4	G	X	MGVF9	2.2	3.96	2
	Comments: Crown asymmetrical to the west.														
150	Callistemon salignus White Bottlebrush	M	F	No	No	Sy	370	9	5	G	X	MGVF9	2.5	5.4	2
	Comments: Multi leader specimen at 3 metre from ground.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
151	Callistemon viminalis Bottlebrush	M	F	No	No	Sy	310	6	5	G	X	MGVF9	1.7	2.16	2
	Comments: Dual leader specimen.														
152	Cupressus macrocarpa Golden Cypress	M	F	No	No	Sy	510	12	4	G	X	MGVF9	2.1	3.6	3
	Comments: Crown spreading.														
153	Jacaranda mimosifolia Jacaranda	M	F	No	No	Sy	420	5	5	G	X	MGVF9	2.2	3.96	3
	Comments: Dual leader specimen.														
154	Eucalyptus pilularis Blackbutt	M	F	No	No	A/E	480	16	10	G	X	MGVF9	3.4	12	2
	Comments: Multi leader specimen at 3 metres from ground.														
155	Eucalyptus robusta Swamp Mahogany	M	F	No	No	Sy	810	15	11	G	X	MGVF9	2.8	7.2	2
	Comments: Multi leader specimen at 3 metres from ground. Surface root present.														
156	Eucalyptus sideroxylon Mugga Ironbark	M	F	No	No	Sy	320	12	5	G	X	MGVF9	2.1	3.6	2
	Comments: Branch failures mid crown.														
157	Eucalyptus sideroxylon Mugga Ironbark	M	F	No	No	Sy	330	17	5	G	X	MGVF9	2.2	3.84	2
	Comments: Smaller deadwood present.														
158	Eucalyptus sideroxylon Mugga Ironbark	M	F	No	No	Sy	420	17	5	G	X	MGVF9	2.2	3.84	2
	Comments: Smaller deadwood and epicormic growth present.														
159	Eucalyptus amplifolia Cabbage Gum	M	F	No	No	Sy	400	16	4	G	X	MGVF9	3.4	12	2
	Comments: Tree general appeared free of insect predation and disease.														
160	Eucalyptus amplifolia Cabbage Gum	M	F	No	No	Sy	230	11	3	G	X	MGVF9	2.5	5.4	2
	Comments: Tree general appeared free of insect predation and disease.														
161	Eucalyptus punctata Grey Gum	M	F	No	No	Sy	480	16	8	G	X	MGVF9	3.4	12	2
	Comments: Tree general appeared free of insect predation and disease.														
162	Eucalyptus paniculata Grey Ironbark	M	F	No	No	Sy	260	11	3	G	X	MGVF9	2.5	5.4	3
	Comments: Tree general appeared free of insect predation and disease.														
163	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	430	9	7	G	X	MGVF9	2.5	5.4	1
	Comments: Tree general appeared free of insect predation and disease.														
164	Eucalyptus paniculata Grey Ironbark	M	F	No	No	Sy	120	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
165	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	590	18	12	G	X	MGVF9	2	3.24	1
	Comments: Tree general appeared free of insect predation and disease.														

Tree Assessments – Cont.

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Condition G = Good F = Fair P = Poor D = Dead	Pest & Diseases	Branch Bark Included	Canopy Orientation Sy = Symmetrical N,S,E,W = North South East West	Trunk Diameter (1.4m above ground in mm)	Height (m)	Spread (m)	Tree Vigour L = Low G = Good A = Abnormal	Trunk Lean X = Straight or Slightly Leaning A = Acaulescent M = Moderate	SRIV (Age, Vigour, Condition, Index Rating)	Calculated Structural Root Zone (SRZ) (radius in meters-s being Radius=(Dx50)0.42 x0.64)	Distance of Tree Protection Zone (TPZ) (radius in meters Australian Standard AS 4970-2009 "Protection of Trees on Development Sites" (TPZ=DBH x 12)	Significance (See Appendix G- Rating System)
166	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	460	20	8	G	X	MGVF9	1.7	2.16	1
	Comments: Tree general appeared free of insect predation and disease.														
167	Eucalyptus paniculata Grey Ironbark	M	F	No	No	Sy	190	6	2	G	X	MGVF9	1.7	2.16	3
	Comments: Tree general appeared free of insect predation and disease.														
168	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	1300	19	12	G	X	MGVF9	1.7	2.16	1
	Comments: Dieback of superior leaders 6 and 12 metres from ground. Cavity present southern trunk.														
169	Eucalyptus saligna Sydney Blue Gum	M	F	No	No	Sy	230	6	4	G	X	MGVF9	1.7	2.16	1
	Comments: Tree appeared free of insect predation or disease.														
170	Eucalyptus saligna Sydney Blue Gum	M	P	No	No	Sy	980	18	8	G	X	MGVP6	2	3.24	1
	Comments: Dieback of superior leaders. Basal decay evident														
42A	Cupressus arizonica Cypress	M	F	No	No	Sy	87	9	3	G	X	MGVF9	2.5	5.4	3
	Comments: Stand of 7 smaller trees.														
43A	Allocasuarina littoralis She-Oak	M	F	No	No	Sy	100	9	2	G	X	MGVF9	2.5	5.4	3
	Comments: Stand of several smaller trees.														
108A	Syzygium australe Lillypilly	M	F	No	No	Sy	200	12	3	G	X	MGVF9	2.1	3.6	3
	Comments: Stand of several smaller trees.														
132A	Cupressus leylandii Cypress	M	F	No	No	Sy	50	5	1	G	X	MGVF9	2.2	3.96	3
	Comments: Stand of several smaller trees.														

Observations

Tree Significance

- 3.2 Determined by using the Tree Significance - Assessment Criteria of the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010), Appendix H. See section 3.1 for ratings.

Discussion

- 3.3 AS4970 (2009) section 3 requires a radial Tree Protection Zone (TPZ) setback of 12 x DBH from center of trunk (COT) but allows for a 10% reduction of area equal to a reduction of 30% of radius on one side only as per AS4970 (2009) section 3, 3.3.3 which requires the Project Arborist to demonstrate that where a retained tree is subject to a major encroachment (>10% of area of TPZ) it can be protected to remain viable. The table within section 3.1 identifies TPZ & SRZ setbacks for all trees as reference.

Of the 174 trees assessed 108 are to be retained and protected. Trees to be removed are mostly of lower significance rating or are not considered retainable due to the siting of the proposed school and associated features. Trees to be retained are to be subject to construction constraints as follows and as detailed with Appendix D "Site Plan/Tree Protection Plan". Further trees may be retainable once clearing commences as the site is currently heavily overgrown and difficult to access in some areas. Retention of further trees may mitigate the need to remove plantings close to boundaries required for safety reasons with regards to children scaling trees close to boundary fencing.

Batters and subsequent increase of soil levels at the extremities of the TPZs of trees 100,101,102,103,112 & 116 should be kept to a minimum or excluded if any encroachment is to occur. Also, the proposed turning circle at the entry from Second Avenue will need to be modified to reduce encroachment into the TPZs of trees 168 & 170. The turning circle should occupy the area of the existing sealed road reserve so as to mimic existing sealed ground conditions on the northern side of the trees. The road extension along Grimes Lane is to mimic gutter areas adjoining the street trees within Chelmsford Avenue so as to minimise excavation and potential root disturbance.

Subgrade material beneath car parking, driveway, roadway extension and kiss and drop footpath should be structural and inert so as to minimise impacts upon the trees and to provide continued air transfer with all initial site ground preparation is to be undertaken utilizing hand tools within prescribed TPZs. Construction levels should mimic existing ground contours so as to minimize the need for excavation and potential root severance. All services and pits within TPZs are to be installed through use of lateral underground boring or were achievable through use of hand excavation under supervision of the project Arborist.

The current design has been arrived at with an emphasis to the retention of landscape items identified within the Ecological Australia Biodiversity Constraints report prepared by May 2020. Whilst the study indicates that the site does not contain components representing all structural layers of this community individual specimens are present two smaller trees identified with the plant community "*Blue Gum High Forest- Eucalypts saligna* (Sydney Blue Gum) numbered 144 & 169 will require removal to allow for the proposed carpark and driveway. Removal of tree 169 will also allow for greater clearance from adjoining trees 168 & 170 which are larger specimens of *Sydney Blue Gum*.

Trees 2,3, 9, 10, 12, 14, 15, 16, 17, 19, 20, 22, 23, 38, 41, 42, 50, 51, 55, 56, 57, 58, 59, 62, 63, 64, 66, 67, 68, 69, 70, 71-108, 110, 113-115, 117-125, 127, 134-139, 145, 148, 154-159, 160-168 & 170 are to be retained subject to the following construction constraints being implemented:

3.4 Trunk Protection (All street trees)

Extract from AS4970-2009- 4.5.2 Trunk and branch protection

Where necessary, install protection to the trunk and branches of the trees. The materials and positioning of protection are to be specified by the project arborist. A minimum height of 2 m is recommended. Do not attach temporary powerlines, stays, guys and the like to the tree. Do not drive nails into the trunks or branches.

Response: Trunk protection (Armouring) is to be established as per AS4970-2009 section 4.5.2 for these trees. See also Appendix D "Tree Protection Plan".

3.5 Tree Protection Zone Fencing (Trees Internal to the site)

Extract from AS4970-2009 Section 4.3 PROTECTIVE FENCING

Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ should be secured to restrict access. AS 4687 specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing.

Response: All trees internal to the site to be retained and protected within Tree Protection Zones as per AS4070 section 4.3 - See also Appendix D "Tree Protection Plan". TPZ signage to be attached to fencing- See drawing 4 Pge 3 of 3.

3.6 Ground Protection within TPZs- (All Trees to be retained)

Extract from AS4970-2009- 4.5.3 Ground protection.

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.

Response: Any site movement required within prescribed TPZs is to be subject to ground protection as per AS4970. See also Appendix D "Tree Protection Plan".

3.7 Root Protection - (All Trees to be retained)

Extract from AS4970-2009- 4.5.4 Root protection during works within the TPZ

Some approved works within the TPZ, such as regrading, installation of piers or landscaping may have the potential to damage roots. If the grade is to be raised the material should be coarser or more porous than the underlying material. Depth and compaction should be minimized. Manual excavation should be carried out under the supervision of the project arborist to identify roots critical to tree stability. Relocation or redesign of works may be required. Where the project arborist identifies roots to be pruned within or at the outer edge of that, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints. It is not acceptable for roots within the TPZ be 'pruned' with machinery such as backhoes or excavators. Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over exposed roots and excavated soil profile, extending to the full depth of the root zone. Root protection sheeting should be

pegged in place and kept moist during the period that the root zone is exposed. Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems. Seek advice from the project arborist.

Response: (All trees to be retained): Any initial excavation within and near to prescribed TPZ should be undertaken utilising hand tools to depths of 700mm. Below these depths mechanical means could be utilised. Any roots encountered 30mm or less should be clean cut with final cuts to undamaged woody tissue. Any roots encountered 30mm or greater should be retained and the project Arborist contacted to undertake an inspection as to appropriate tree management. All trees to be removed should be undertaken utilising ground area outside of the TPZs of trees to be retained.

Trees 76,78,80,81,145,159,160,161,162,163,164,165,166,168 & 170. Subgrade material beneath car parking, driveway, roadway and kiss and drop footpath is to be structural and inert so as to provide continued air transfer. All initial site ground preparation is to be undertaken utilizing hand tools within prescribed TPZs. Construction is to mimic existing ground contours or be constructed above so as to minimize the need for excavation and potential root severance.

All Trees: All services and pits within TPZ are to be installed through use of lateral underground boring or were achievable through use of hand excavation under supervision of the project Arborist.

3.8 Maintaining the TPZs - (All Trees internal to the site)

Extract from AS4970-2009- Section 4.6 Maintaining the TPZ

AS4970-4.6.1 Mulching

The area within the TPZ should be mulched. The mulch must be maintained to a depth of 50–100 mm using material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g. garden beds or turf) mulch may not be required.

Response: Mulching is required as per AS4970 upon all bare ground areas within prescribed TPZs.

AS4970-4.6.2 Watering

Soil moisture levels should be regularly monitored by the project arborist. Temporary irrigation or watering may be required within the TPZ. An above-ground irrigation system should be installed and maintained by a competent individual.

Response: Some type of irrigation system needs to be in place during building works either temporary or permanent to be approved by the project arborist

AS4970-4.6.3 Weed removal

All weeds should be removed by hand without soil disturbance or should be controlled.

Response: All weed material is to be removed from within TPZs.

3.9 Inspection Schedule - (All Trees)

An inspection schedule should be adopted as follows:

- *Inspection of Tree Protection Zone (TPZ) measures prior to commencement of any site works.*
- *Bi-monthly inspections to certify TPZ measures.*
- *Site inspections during any works within and adjacent to TPZs.*
- *A final inspection at the completion of works.*

4.0 RECOMMENDATIONS

- 4.1 Trees 2,3,9, 10, 12, 14, 15, 16, 17, 19, 20, 22, 23, 38, 41, 42, 50, 51, 55, 56, 57, 58, 59, 62, 63, 64, 66, 67, 68, 69, 70, 71-108, 110, 113-115, 117-125, 127, 134-139, 145,148, 154-159, 160-168 & 170 are to be retained and protected within Tree Protection Zone/s. These are to be maintained and special protection works undertaken as detailed in sections 3.3 to 3.9 of this report and as detailed within Appendix D – Tree Protection Plan

- 4.2 Where Tree Protection Zone works are to be modified or relocated this must be undertaken in consultation with the Project Arborist to ensure that tree protection is maintained.
- 4.3 Trees 1, 3-8, 11, 13, 18, 21, 24-37, 39, 40, 43-49, 52-54, 60, 61, 65, 109, 111, 112, 116, 126, 128-133, 140-144, 146, 147, 149-153, & 169 are to be removed. Removal works should be undertaken utilising ground area outside of the TPZs of trees to be retained and undertaken in accordance with section 2.6 of this report "Pruning /Removal Standards".
- 4.4 That an inspection schedule be introduced as follows:
- Initial certification of the establishment of Tree Protection Zone fencing and associated protection measures adjacent to be undertaken prior to the start of any site works.
 - Final inspection of the trees when all site works are completed.
 - That bi-monthly inspections be undertaken, and certification reports provided regarding ongoing tree management for the duration of site works indicating compliance with report recommendations and to outline any remedial requirements.
 - During any works within and adjacent to TPZs.



Peter Richards
Tree & Landscape Consultants

Appendix A

Matrix - Sustainable Retention Index Value (S.R.I.V.)©

Developed by IACA – Institute of Australian Consulting Arboriculturists www.iaca.org.au
Version 4, 2010

To be used with the values defined in the Glossary.
An Index value as indicated where ten (10) is the highest value.

Age Class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
Young (Y)	<p>Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.</p>	<p>Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.</p>	<p>Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.</p>	<p>May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.</p>	<p>May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.</p>	<p>Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.</p>
	YGVG - 9	YGVF - 8	YGVP - 5	YLVG - 4	YLVF - 3	YLVP - 1
	<p>Index Value 9 Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.</p>	<p>Index Value 8 Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.</p>	<p>Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.</p>	<p>Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.</p>	<p>Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.</p>	<p>Index Value 1 Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.</p>
Mature (M)	<p>MGVG - 10 Index Value 10 Retention potential - Medium - Long Term.</p>	<p>MGVF - 9 Index Value 9 Retention potential - Medium Term. Potential for longer with improved growing conditions.</p>	<p>MGVP - 6 Index Value 6 Retention potential - Short Term. Potential for longer with improved growing conditions.</p>	<p>MLVG - 5 Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions.</p>	<p>MLVF - 4 Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions.</p>	<p>MLVP - 2 Index Value 2 Retention potential - Likely to be removed immediately or retained for Short Term.</p>
	OGVG - 6	OGVF - 5	OGVP - 4	OLVG - 3	OLVF - 2	OLVP - 0
	<p>Index Value 6 Retention potential - Medium - Long Term.</p>	<p>Index Value 5 Retention potential - Medium Term.</p>	<p>Index Value 4 Retention potential - Short Term.</p>	<p>Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions.</p>	<p>Index Value 2 Retention potential - Short Term.</p>	<p>Index Value 0 Retention potential - Likely to be removed immediately or retained for Short Term.</p>



Appendix B Definitions & Terminology

From
Dictionary for Managing Trees in Urban Environments
Institute of Australian Consulting Arboriculturists (IACA) 2009.

Condition of trees

Condition A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1st) and possibly second (2nd) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

Good Condition Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by *vigour*.

Fair Condition Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by *vigour*.

Poor Condition Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good to fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in *vigour* but may be independent of a change in *vigour*, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by *vigour*.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes

Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);

Osmosis (the ability of the root system to take up water);

Turgidity (the ability of the plant to sustain moisture pressure in its cells);

Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);

Symptoms

Permanent leaf loss;

Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);

Abscission of the *epidermis* (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site, or having been taken away from a site prior to site inspection.

Description of Tree Dimensions

Height The distance measured vertically between the horizontal plane at the lowest point at the base of a tree, which is immediately above ground, and the horizontal plane immediately above the uppermost point of a tree.

Spread The furthest expanse of the crown when measured horizontally from one side of the tree to the other, generally through the centre of the trunk. Where the crown is not circular a measurement should be an average of the narrowest and widest diameters and this is dependent upon crown form and to a lesser extent its symmetry.

Crown Cover Percent of the homogenous distribution of foliage across the entire crown based upon that expected for a specimen of that species in good condition and of normal *vigour*, depending on form in situ, e.g. this may be influenced by crown die-back, proximity to other trees or structures, moisture stress, or overshadowing.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. *Vigour* can appear to alter rapidly with change of seasons (seasonality) e.g. *dormant*, deciduous or semi-deciduous trees. *Vigour* can be categorized as *Normal Vigour*, *High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the typical growth of leaves, crown cover and crown density, branches, roots and trunk and resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

High Vigour *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the atypical growth of leaves, reduced crown cover and reduced crown density, branches, roots and trunk, and a deterioration of their functions with reduced resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last extension growth is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.

Poor Vigour See low vigour

Good Vigour See Normal Vigour

Age of Trees

Age of Trees Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown. These increments are Young, Mature and Overmature.

Young Tree aged less than 20% of life expectancy.

Mature Tree aged 20-80% of life expectancy.

Over-mature Tree aged greater than 80% of life expectancy tending to senescent with or without reduced vigour, and declining gradually or rapidly but irreversibly to death.

Sapling A young tree, early in its development with small dimensions.

Senescent Advanced old age, over-mature.

General Terms

Significant Important, weighty or more than ordinary.

Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or in situ, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, *crown form*, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as *remnant vegetation*, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting. Rating are expressed in this report as High, Medium or Low.

Substantial A tree with large dimensions or proportions in relation to its place in the landscape.

Excurent Tree where the crown is comprised of one (1) dominant first order structural branch which is usually an extension of the trunk, erect, straight and continuous, tapering gradually, with the main *axis* clear from base to apex, e.g. *Araucaria heterophylla* - Norfolk Island Pine. Note: some tree species of *typical* excurrent habit may be altered to deliquescent by physical damage of the *apical meristem*, or from top lopping, or from the propagation of inferior quality stock. However, *formative pruning* may be able to correct a *crown* to excurrent if undertaken when a tree is *young*.

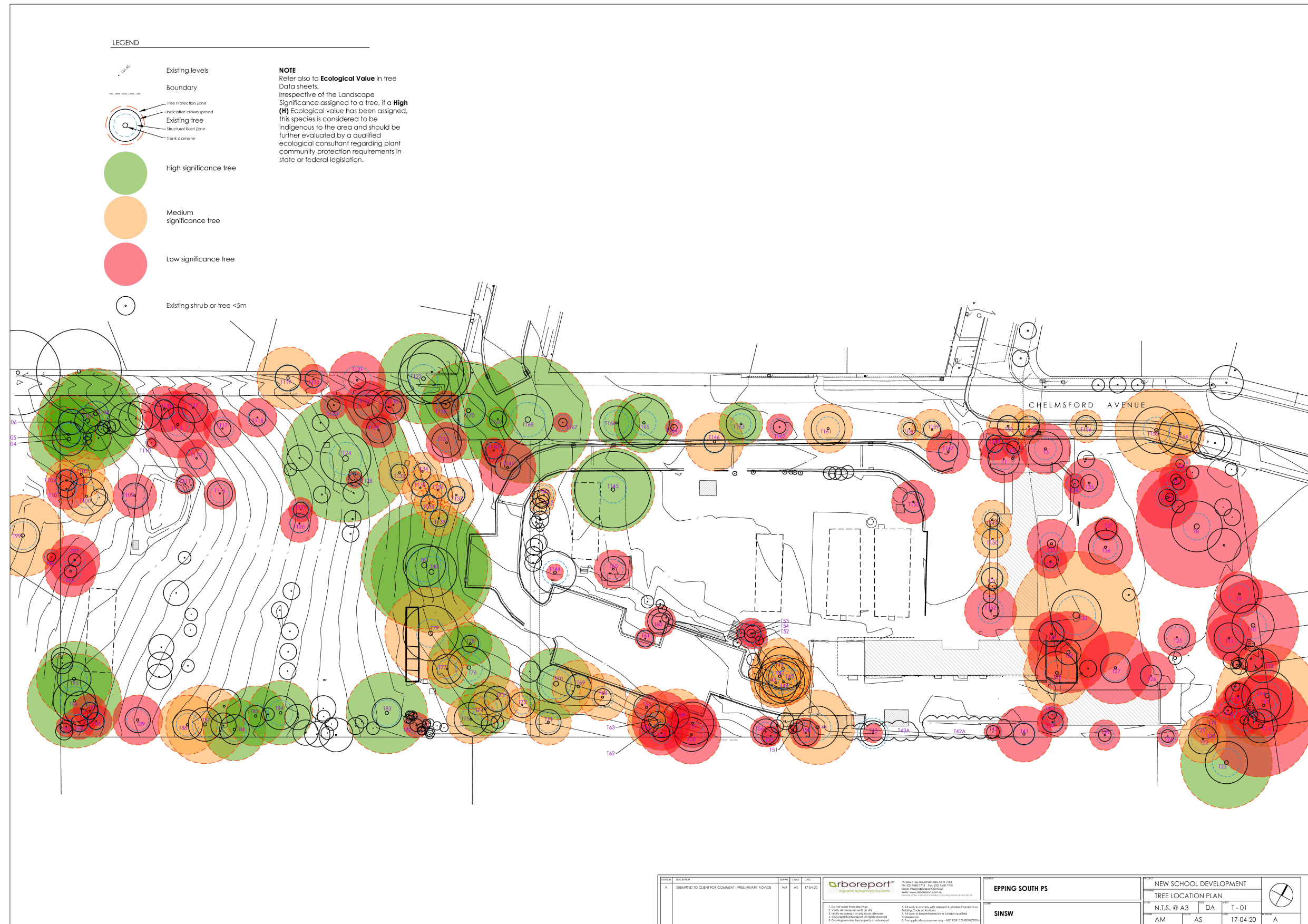
Sustainable Retention Index Value (SRIV) A visual method of rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria. SRIV© is for the professional manager of urban trees to consider the tree in situ with an assumed knowledge of the taxa and its growing environment and is based on the physical attributes of the tree and its response to its environment considering its age class, vigour class, condition class and its sustainable retention with regard to the safety of people or damage to property and the ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement. (IACA 2005)

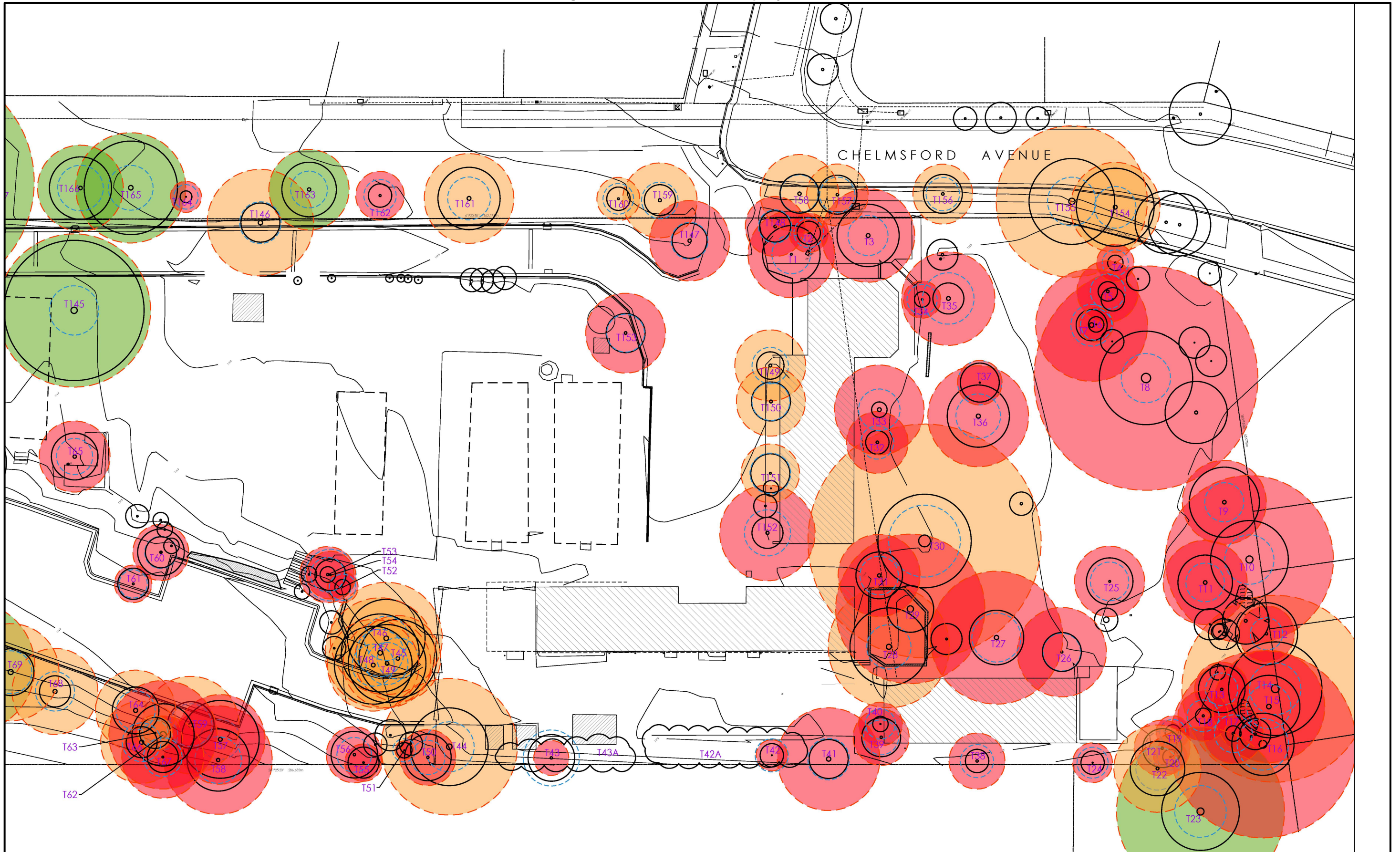
Crown Spread Orientation Direction of the *axis* of *crown spread* which can be categorized as *Orientation Radial* and *Orientation Non-radial*.

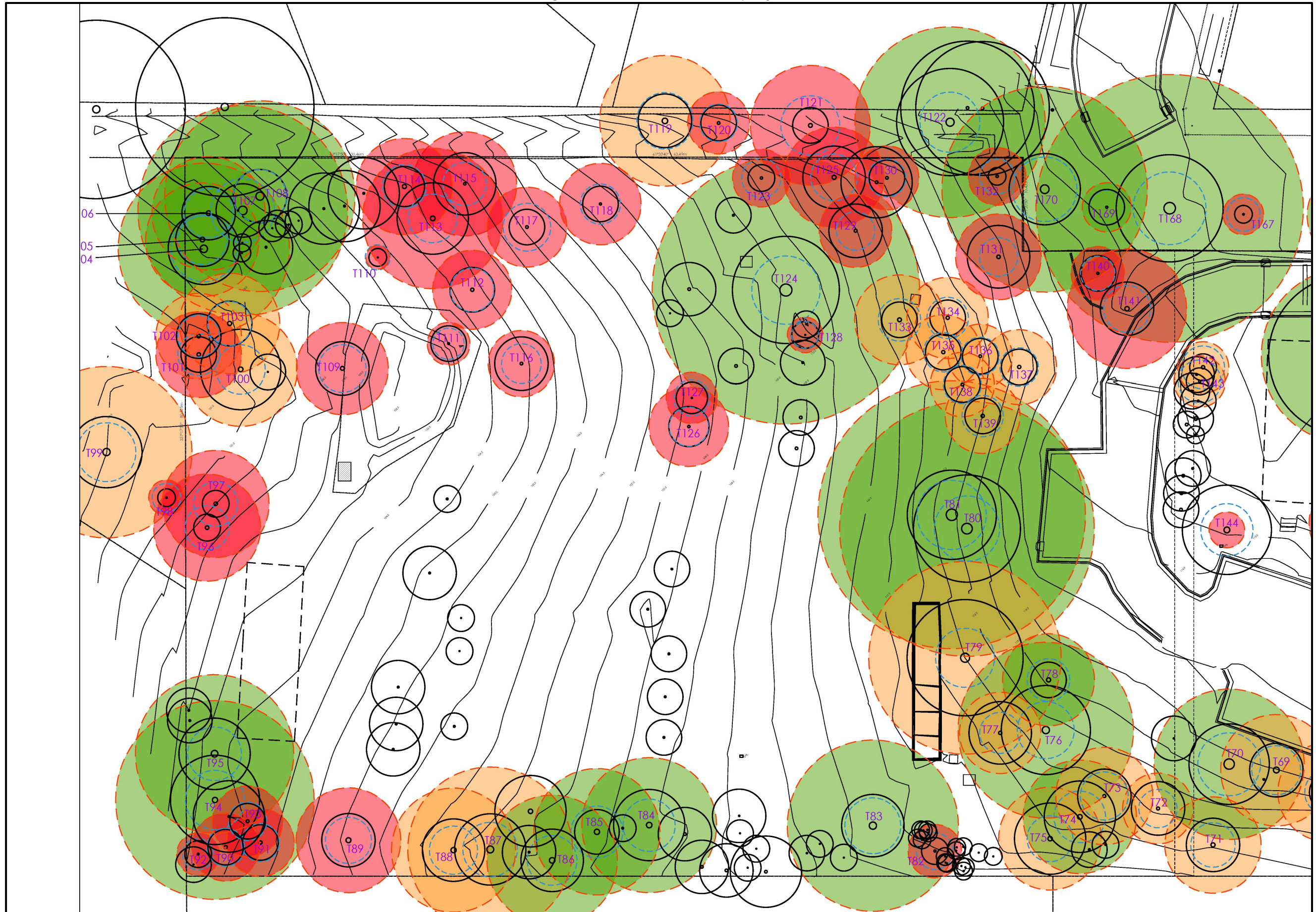
Diameter at Breast Height (DBH) Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

Structural Root Zone (SRZ) The minimal area around the base of a tree, generally circular, required for its *stability* in the ground. The section of *root plate* within this area and subsequent soil cohesion necessary to hold the tree upright against *wind throw*, therefore the entire depth of the *root zone* must be included.

Appendix C Tree Location Plan - Pge 1 of 3 (Prepared by Arboreport)







Appendix D Tree Protection Plan Pge 1 of 5

TPZ Setbacks

Tree No.	Calculated Structural Road Zone (SRZ) (m)	Distance of Tree Protection Zone (TPZ) (m)
2	1.8	2.2
3	2.6	6
9	2.5	5.4
10	3.2	10.8
12	2.1	3.8
14	3.4	12
15	2.8	7.2
16	3.4	12
17	2.2	3.84
19	1.7	2.16
20	1.7	2.16
22	2.5	5.52
23	3.2	10.8
38	2.1	3.8
41	2.7	6.8
42	1.6	1.68
50	2.1	3.8
51	1.5	1.5
55	1.8	2.4
56	2	3
57	2.1	3.8
58	1.8	2.4
59	2.5	5.76
62	2.7	6.96
63	1.8	2.28
64	2.4	5.16
66	2.4	5.28
67	1.9	2.76
68	2.5	5.52
69	2.6	6.24
70	2.3	5.4
71	2.5	6.4
72	2.2	3.96
73	2.5	6.4
74	2.6	6.36
76	2.5	5.76
78	3.1	7.84
77	2.3	4.92
78	2.4	5.16
79	3.2	10.8
80	3.6	14.36
81	3.7	15
82	2	3
83	3.1	7.8
84	2.8	7.56
85	2.7	7.02
86	2.8	7.32
87	3	7.24
88	2.7	6.96
89	2.5	6.88
90	2.2	4.08
91	2.1	3.72
92	1.8	2.4
93	2.2	3.96
94	3.3	11.04
95	3	8.88
96	2.6	6
97	2.6	6
98	1.8	1.8
99	3.1	7.8
100	2.6	6.36
101	2.3	4.8
102	2.3	4.8
103	2.5	6.84
104	3.1	7.8
105	2.6	6.36
106	2.6	6.36
107	3.4	11.76
108	3.2	10.8
110	1.5	1.5
113	2.8	7.8
114	2.5	6.4
118	2.5	6.76
117	2.3	4.44
118	2.3	4.92
119	2.8	7.32
120	2.1	3.48
121	2.7	6.72
122	3.2	10.8
123	2	3.24
124	3.8	15
125	2.5	6.84
127	1.9	2.96
134	2.3	4.92
135	2.2	4.2
136	2.1	3.6
137	2.2	4.2
138	2.1	3.6
139	2.2	4.2
145	3.1	7.84
148	2.2	4.84
154	2.5	6.76
155	3.1	7.72
156	2.2	3.84
157	2.2	3.96
158	2.4	5.84
159	2.3	4.8
160	1.9	2.76
161	2.5	6.76
162	2	3.12
163	2.4	5.76
164	1.5	1.5
165	2.7	7.08
166	2.5	6.52
167	1.8	2.28
168	3.6	15
169	1.9	2.76
170	3.4	11.76

Construction Constraints

All trees internal to the site to be retained and protected within Tree Protection Zones as per AS4970 section 4.3 - See also drawing 3 page 3 of 3. TPZ signage to be attached to fencing - See drawing 3 page 5 of 5 below.

All Trees: Any site movement required within prescribed TPZs is to be subject to ground protection as per AS4970 section 4.5.3 See also drawing 2 page 4 of 5 below.

Street Trees: Trunk protection (Armoring) is to be established as per AS4970-2009 section 4.5.2 for these trees. See also drawing 2 page 4 of 5 below.

Trees 76, 78, 80, 81, 145, 159, 160, 161, 162, 163, 164, 165, 166, 168, & 170: Subgrade material beneath car parking, driveway, roadway and kiss and drop footpath is to be structural and inert so as to provide continued air transfer. All initial site ground preparation is to be undertaken utilizing hand tools within prescribed TPZs. Construction is to mimic existing ground contours so as to minimize the need for excavation and potential root severance.

Root Protection: Any initial excavation within and near to prescribed TPZ should be undertaken utilising hand tools to depths of 700mm below these depths mechanical means could be utilised. Any roots encountered 30mm or less should be clean cut with final cuts to undamaged woody tissue. Any roots encountered 30mm or greater should be retained and the project arborist contacted to undertake an inspection as to appropriate tree management. All trees to be removed should be undertaken utilising ground area outside of the TPZs of trees to be retained.

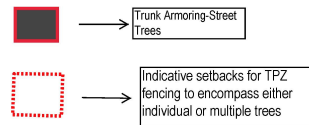
General: The area within the TPZs should be mulched. The mulch must be maintained to a depth of 50-100mm using material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g. garden beds or turf) mulch may not be required. All disturbed ground areas with TPZs are to be subject to mulching as per AS4970 section 4.6.1, 4.6.2 Watering. Some type of irrigation system needs to be in place during building works either temporary or permanent to be approved by the project arborist as per section 4.6.2-AS4970. All weed material is to be removed from with TPZs.

All Trees: All services and pits within TPZ are to be installed through use of lateral underground boring or were achievable through use of hand excavation under supervision of the project Arborist.

Inspection Schedule - (All Trees)

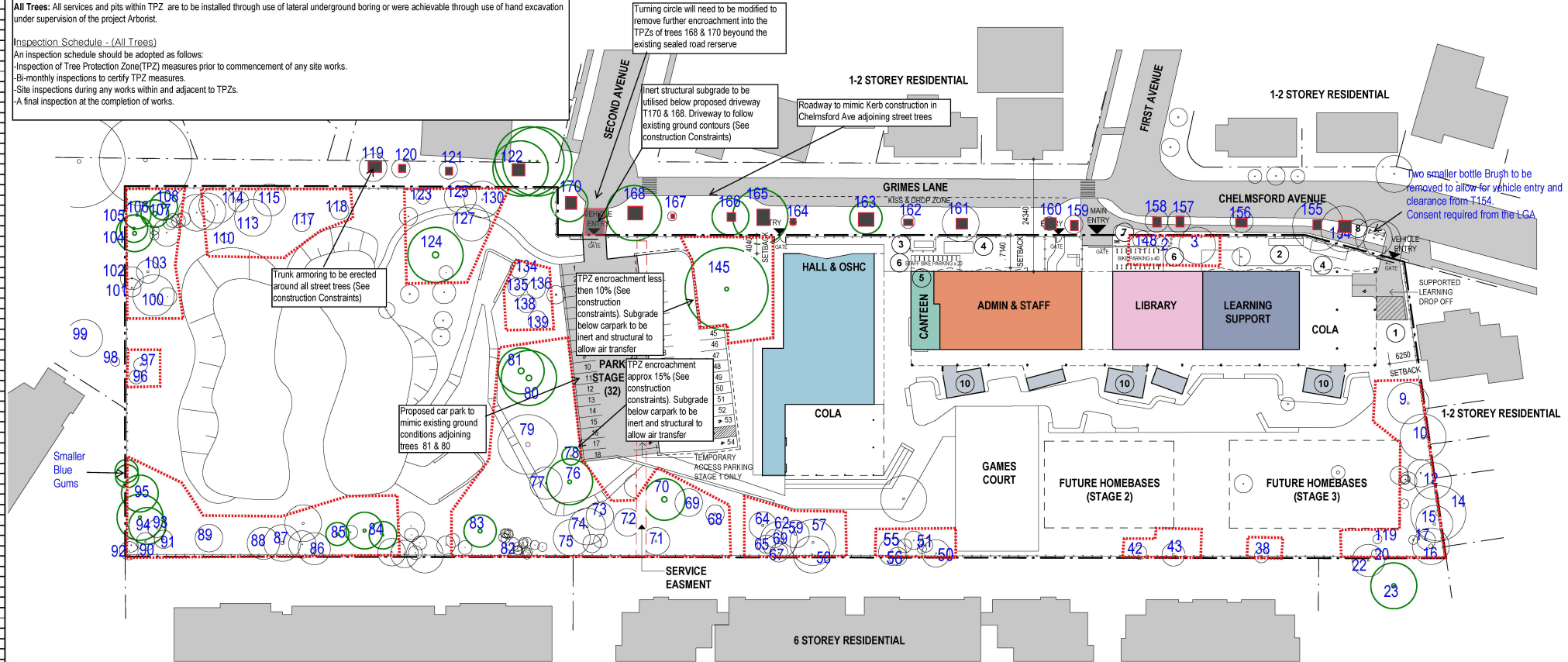
An inspection schedule should be adopted as follows:

- Inspection of Tree Protection Zone (TPZ) measures prior to commencement of any site works.
- Bi-monthly inspections to certify TPZ measures.
- Site inspections during any works within and adjacent to TPZs.
- A final inspection at the completion of works.



SITE SERVICES:

NUMBER	DESCRIPTION
1	
2	PUMPS
3	SUBSTATION
4	PLANT WITH SCREEN
5	MAIN SWITCHBOARD ROOM
6	BICYCLE PARKING
7	MAIN SCHOOL SIGN
8	FUTURE ELECTRONIC SCHOOL SIGN
10	STAIRS



AMENDMENTS

REV	BY	DATE	DESCRIPTION
RO		10/03/2021	ISSUE TO CLIENT FOR INFORMATION
RO		06/04/2021	ISSUE FOR INFORMATION
HE		12/04/2021	ISSUE FOR INFORMATION
HE		12/04/2021	ISSUE FOR CLIENT SIGN

LEGEND

- EXISTING SIGNIFICANT TREE
- EXISTING TREE
- PROPOSED 2.150m FENCE



SITE PLAN

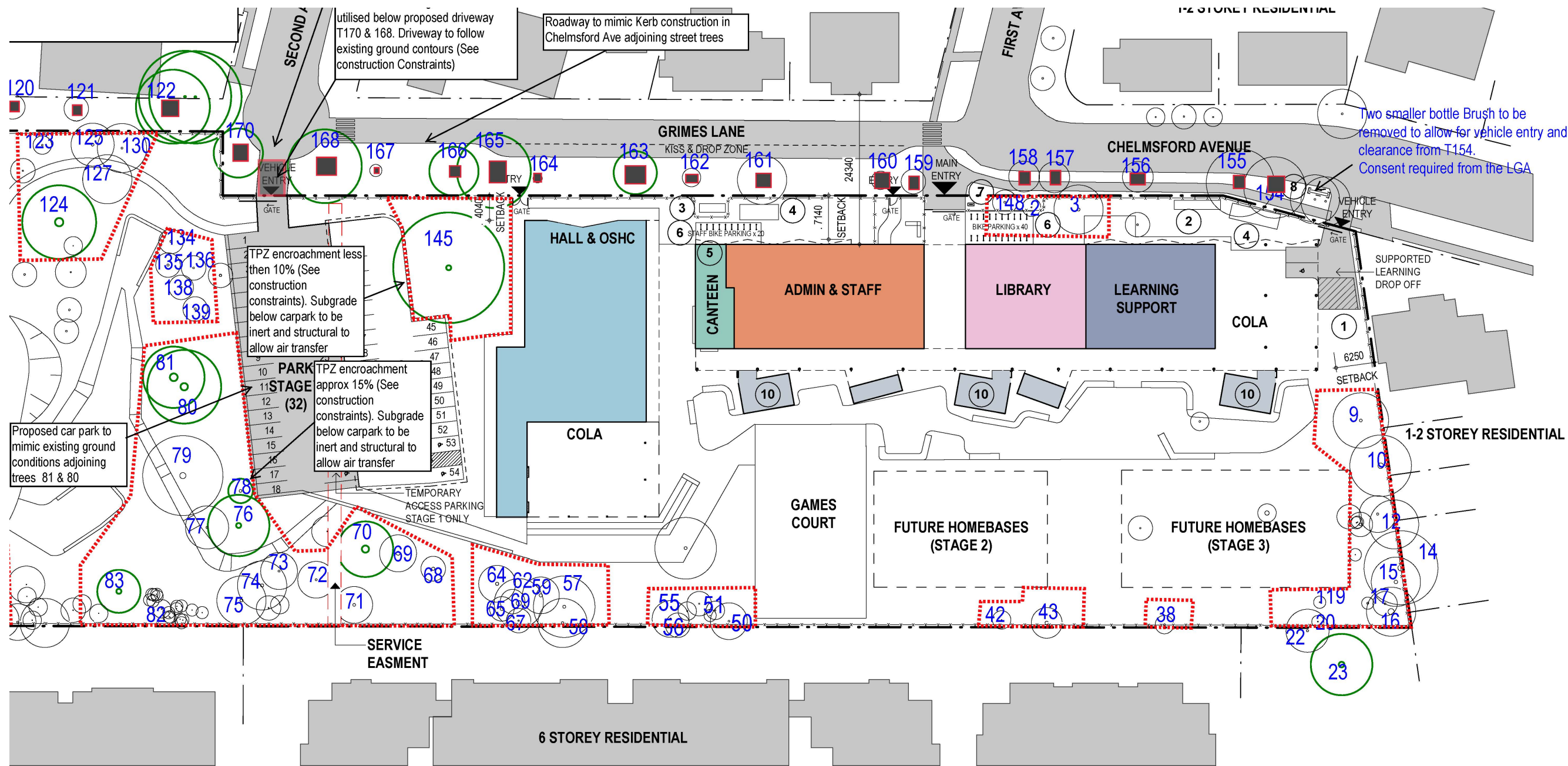
NEW PRIMARY SCHOOL IN EPPING
CHELMSFORD AVE. EPPING

SCALE 1:500 @ A1
20 APRIL 2021

PROJECT: EPPS - SSDA - 001
SERIES NUMBER: A

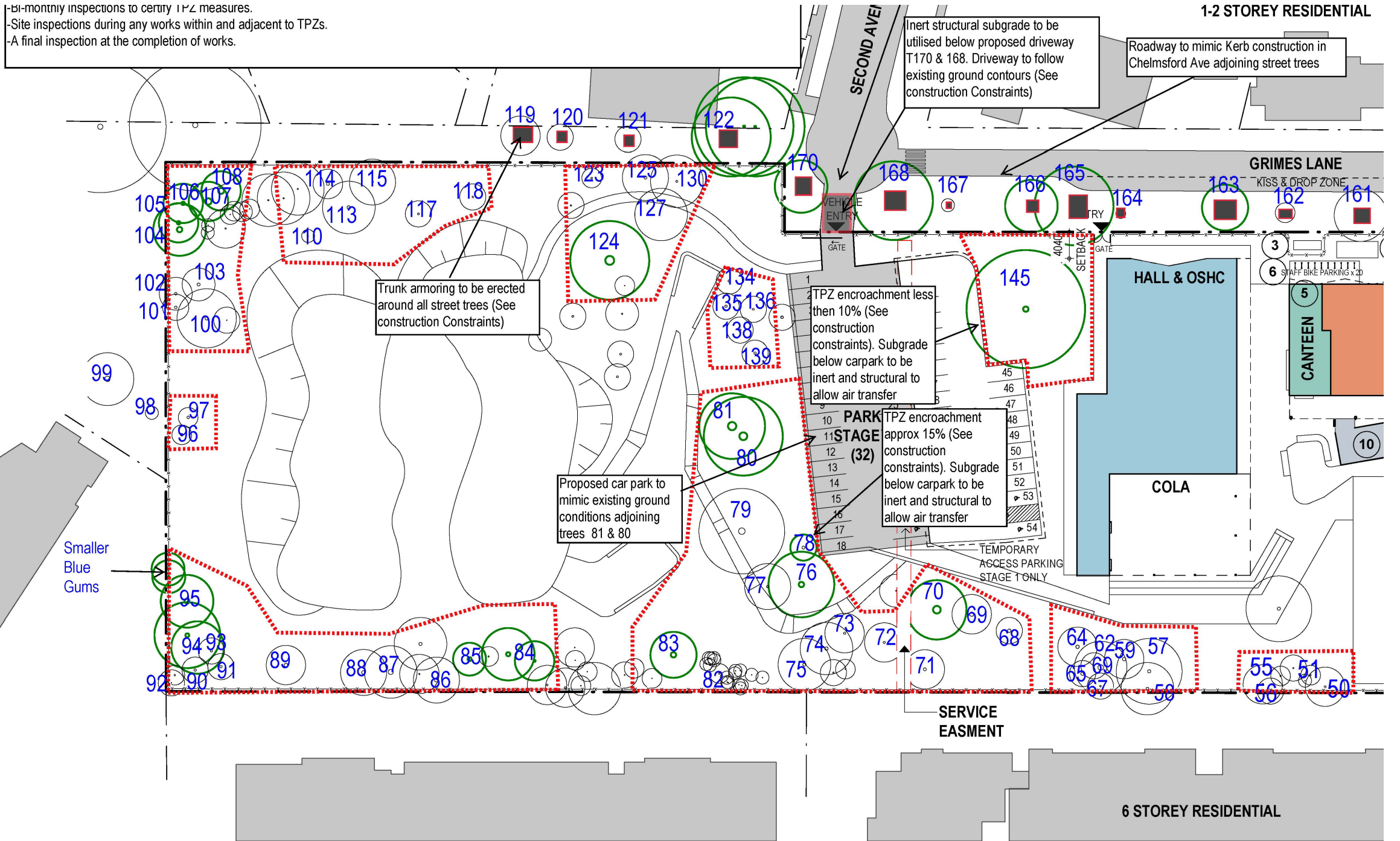
PRELIMINARY

NOTE:
REFER TO LANDSCAPE ARCHITECT DRAWINGS FOR MORE INFORMATION REGARDING LANDSCAPE

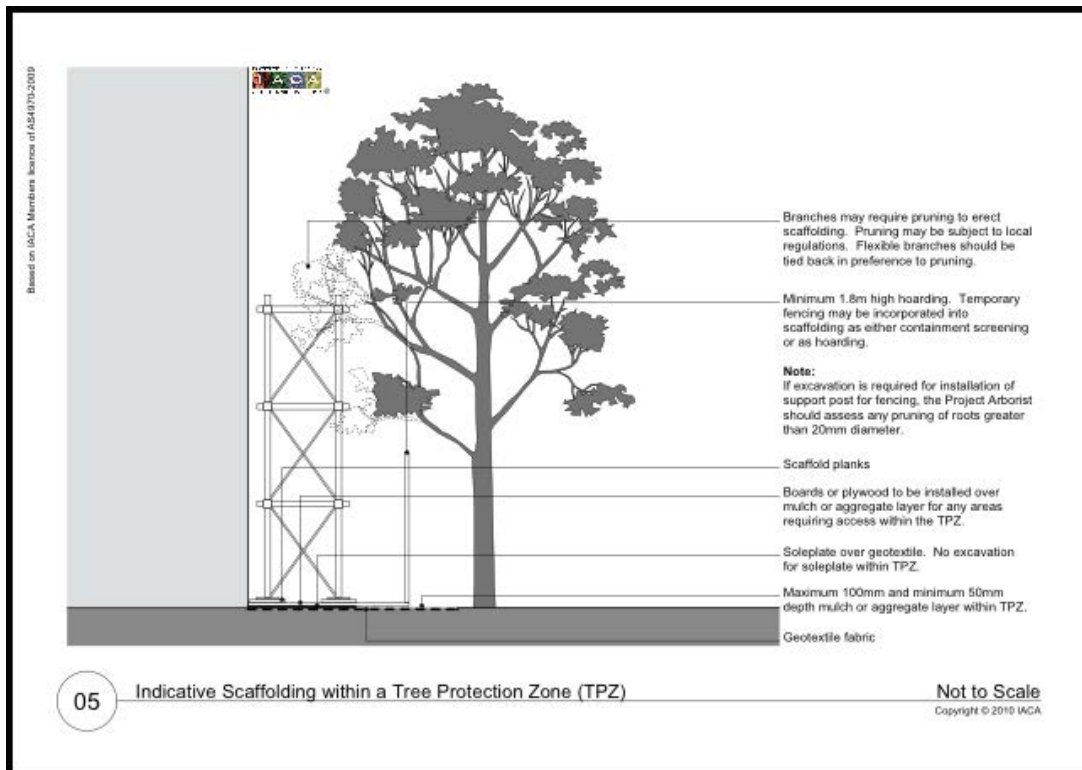


66	2.4	5.25
67	1.9	2.76
68	2.5	5.52
69	2.6	6.24
70	2.9	8.4
71	2.5	5.4
72	2.2	3.96
73	2.5	5.4
74	2.6	6.36
75	2.5	5.76
76	3.1	9.84
77	2.3	4.56
78	2.4	5.16
79	3.2	10.8
80	3.6	14.28
81	3.7	15
82	2	3
83	3.1	9.6
84	2.6	7.56
85	2.7	7.08
86	2.8	7.32
87	3	9.24
88	2.7	6.36
89	2.5	5.88
90	2.2	4.08
91	2.1	3.72
92	1.8	2.4
93	2.2	3.96
94	3.3	11.04
95	3	8.88
96	2.6	6
97	2.6	6
98	1.6	1.8
99	3.1	9.6
100	2.6	6.36
101	2.3	4.8
102	2.3	4.8
103	2.5	5.64
104	3.1	9.6
105	2.6	6.36
106	2.6	6.36
107	3.4	11.76
108	3.2	10.68
110	1.5	1.5
113	2.8	7.8
114	2.5	5.4
115	2.5	5.76
117	2.3	4.44
118	2.3	4.56
119	2.6	7.32
120	2.1	3.48
121	2.7	6.72
122	3.2	10.68
123	2	3.24
124	3.8	15
125	2.5	5.64
127	1.9	2.88
134	2.3	4.56
135	2.2	4.2
136	2.1	3.6
137	2.2	4.2
138	2.1	3.6

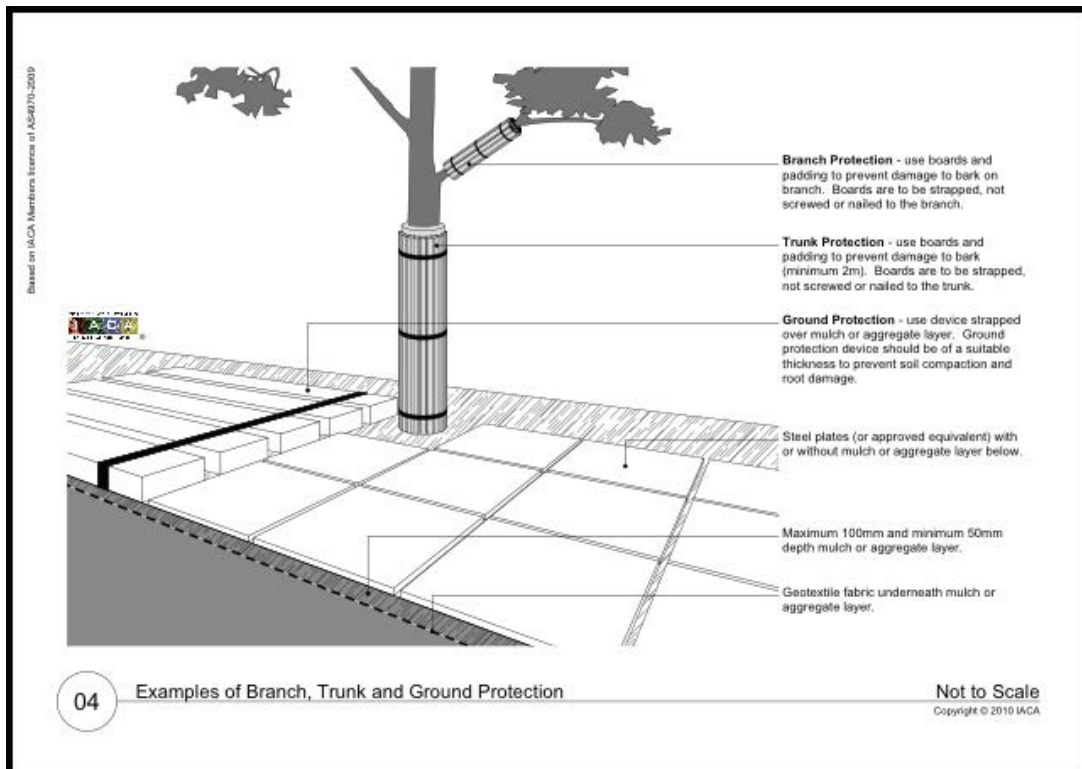
-Bi-monthly inspections to certify TPZ measures.
 -Site inspections during any works within and adjacent to TPZs.
 -A final inspection at the completion of works.



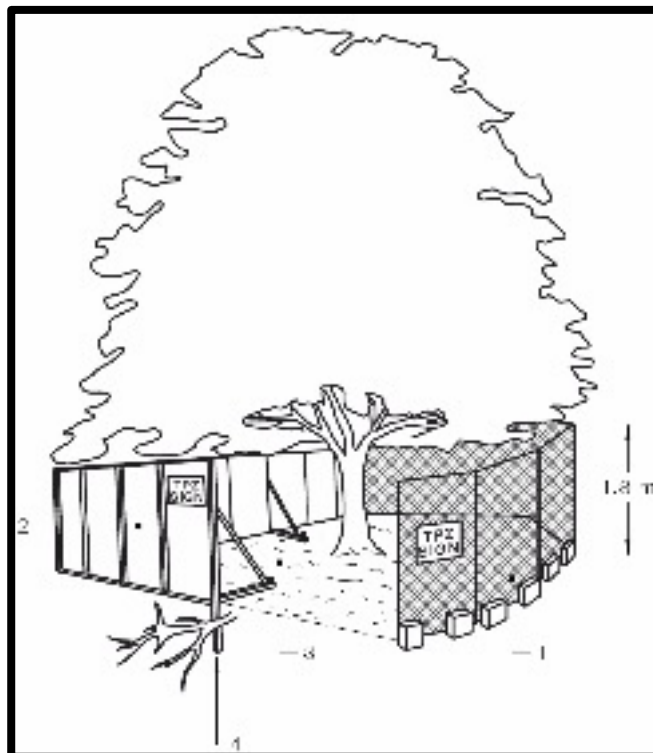
Drawing #1 - Scaffolding Within a TPZ



Drawing #2 - Branch, Trunk and Ground Protection



Drawing #3 - Example of TPZ Fencing



Drawing #4 - Example of TPZ Signage



Appendix E

Service and Pit Locations



Appendix E -Cont.



Appendix F

Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the tree protection zones of the selected trees

3.1 Tree protection zone (TPZ)

“The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The TPZ incorporates the structural root zone (SRZ) (refer to Clause 3.3.5).”

3.2 Determining the TPZ

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

$$\text{TPZ} = \text{DBH} \times 12$$

where

DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

Appendix G

Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the protection zones of the selected trees

3.3.5 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 a major encroachment into a TPZ is proposed. Root investigation may provide more information on the extent of these roots."

Determining the SRZ

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

SRZ radius expressed by the curve is calculated by the following formula,

$$R_{SRZ} = (D \times 50)^{0.42} \times 0.64$$

where

D = trunk diameter, in metres measured immediately above the root buttress.

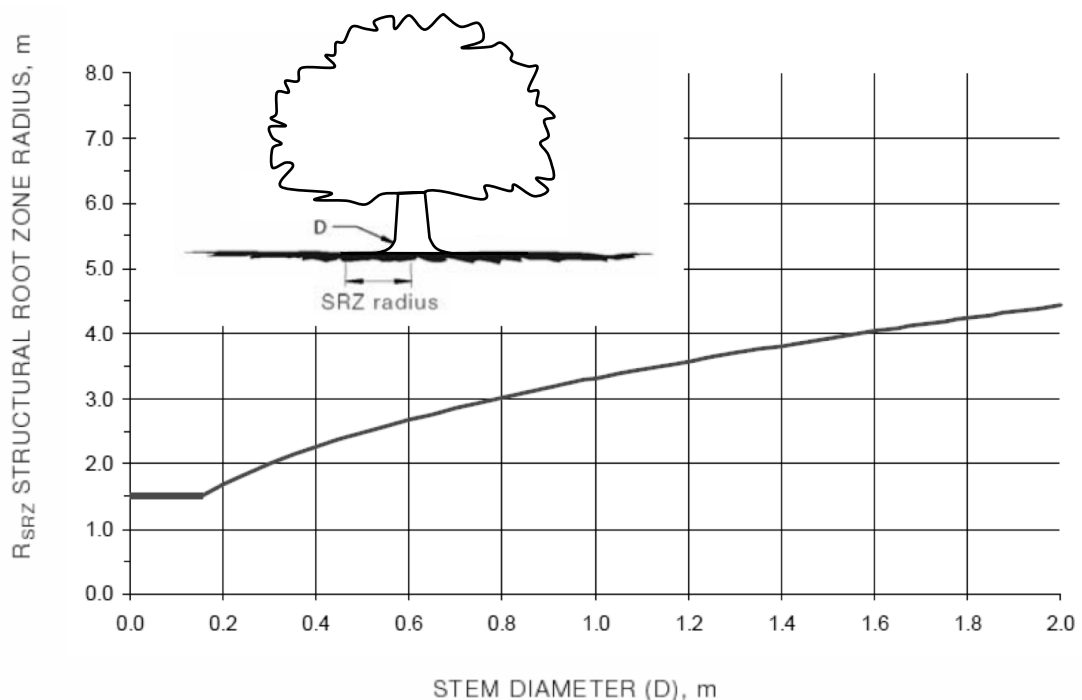


FIGURE 1 STRUCTURAL ROOT ZONE CALCULATION
(AS 4970 – 2009, Amendment No. 1 March 2010)

NOTES:

- 1 R_{SRZ} is the calculated structural root zone radius (SRZ radius).
- 2 D is the stem diameter measured immediately above root buttress.
- 3 The R_{SRZ} for trees less than 0.15 m diameter is 1.5 m.
- 4 The R_{SRZ} formula and graph do not apply to palms, other monocots, cycads and tree ferns.
- 5 This does not apply to trees with an asymmetrical root plate.

Appendix H

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010)©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria



1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to *the site* conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to *the site* conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline


- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

Table 1.0 Tree Retention Value - Priority Matrix.

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					

Legend for Matrix Assessment		<small>INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS</small>  <small>MANAGING URBAN TREES</small>
	<p>Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i>. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.</p>	
	<p>Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.</p>	
	<p>Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.</p>	
	<p>Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.</p>	

REFERENCES

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

Appendix I

References

REFERENCES

1. IACA (2009), Sustainable Retention Index Value, Institute of Australian Consulting Arboriculturists, www.iaca.org.au .
2. Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.
3. IACA, 2010, *Sustainable Retention Index Value (SRIV)*, Version 4, A visual method of objectively rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au .
4. IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au
5. Mattheck K & Breloer H 1994, *The body language of trees*. A handbook for failure analysis, Published by TSO London, UK.
6. Standards Australia 2007, *Australian Standard 4373 Pruning of amenity trees*, Standards Australia, Sydney, Australia.
7. Standards Australia 2009, *Australian Standard 4970 Protection of trees on development sites*, Standards Australia, Sydney, Australia.