TREE WISE MEN®
AUSTRALIA PTY LTD

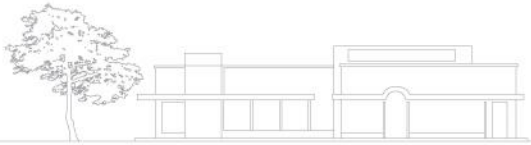
Preliminary Arboricultural Advice
In Relation to Trees On and Adjacent to the Site
At
15 Close Street
Canterbury

Prepared for:

Olsson and Associates Architects
Level 5
68-72 Wentworth Avenue
SURRY HILLS NSW 2010

Ref: 2320Audit

May 2014



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1. EXECUTIVE SUMMARY

1.1 THE PROPOSED MASTERPLAN

1.1.1 This Preliminary Arboricultural Advice was prepared for Olsson & Associates Architects in relation to the proposed Masterplan for potential redevelopment of the site at 15 Close Street, Canterbury (the subject site).

1.1.2 This assessment complies with *2.3.2 Preliminary tree assessment* and *2.3.3 Preliminary arboricultural report* of *AS4970-2009*, Protection of trees on development sites.

1.1.3 The majority of trees on the site are located around the boundaries, providing privacy screening of existing developments and the adjoining railway line, as well as shade and streetscape amenity. As a result of their location around the fringes of the site, it should be possible to retain many of the ©Retention Value A and B trees within the context of a development Masterplan. Layout of the future development should aim to retain the screening and landscape value currently provided by the trees by considering the Tree Protection Zones (indicated on *Attachment C – Arboricultural Implications Plan*) during detailed site design.

1.2 TREE RETENTION VALUES

1.2.1 Sixty three (63) trees were assessed on and adjacent to the subject site.

1.2.2 Nine (9) trees were assessed to be ©Retention Value A trees which should be prioritised for retention (**Trees 15, 17, 18, 19, 25, 60, 61 and 62**) or transplantation (**Tree 26**).

1.2.3 Thirty (30) ©Retention Value B trees should be considered for retention (**Trees 9, 10, 11, 12, 16, 20, 21, 22, 23, 24, 33, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 55, 56, 58 and 59**).

1.2.4 Two (2) ©Retention Value B trees should be considered for removal (**Trees 27 and 28**) as they are located in close proximity to a neighbouring building and are of species which will potentially become problematic in future.

1.2.5 Eleven (11) ©Retention Value C trees (**Trees 1, 2, 3, 4, 13, 14, 30, 32, 35, 40 and 54**) should not constrain development but may be able to be retained if clear of construction. However Trees 1, 2, 3, 4, 13 and 14 will require additional consideration if proposed for removal as they are Council verge trees.

1.2.6 Eleven (11) ©Retention Value D trees do not warrant retention (**Trees 5, 6, 7, 8, 29, 31, 34, 47, 49, 57 and 63**). However Trees 5, 6, 7, and 8 will require additional consideration if proposed for removal as they are Council verge trees.

2. BACKGROUND

2.1 INTRODUCTION

2.1.1 Tree Wise Men® Australia Pty Ltd was commissioned by Olsson & Associates Architects to prepare this Preliminary Arboricultural Advice for the proposed Masterplan for potential redevelopment options for 15 Close Street, Canterbury (the subject site). An assessment was sought on the retention values of the trees on and adjacent to the site to assist in prioritising trees to be retained within the proposal.

2.1.2 The retention or removal of trees has not currently been detailed within the Masterplan (*Urban Design Study and Options*, prepared by Olsson & Associates Architects, dated May, 2013).

2.2 THE SUBJECT SITE

2.2.1 The subject site is a Council owned bowling club consisting of a two storey brick building, three bowling greens, a carpark, trees and landscaped areas (ref *Bowdens Groups, Plan Showing Detail Survey of Lot 1 in DP818683 Showing Trees, Contours & Approximate Boundary Locations Only*, *dated 10.04.14*). It is proposed to change the zoning of the site to reflect the surrounding Town Centre zoning, which would allow mixed use development on the site. Some of the subject trees are located within the Council verge and some are located on a neighbouring property.

2.2.2 The pre development Soil Landscape[1] for the subject site is Gymea (*gy*), which consists of undulating to rolling rises and low hills on Hawkesbury Sandstone. Site soils are likely to have been significantly altered due to previous site development. No remnant specimens were observed within the subject site.

2.2.3 The site rises gently from the Close Street road reserve to the railway easement on the northern boundary.

2.3 THE SUBJECT TREES

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

2.3.2 The sixty three (63) subject trees were a mix of planted native and exotic species, with several trees along the Close Street frontage being the most significant of the assessed trees (Trees 15, 17, 18, 19, 25, 60, 61 and 62). Additionally Tree 26, located in the centre of the site, has also been assessed as being significant given it is a rare and unusual specimen. Some of the assessed trees were located on neighbouring property (Trees 15 and 16).

2.3.3 With the exception of Trees 29, 30 and 31, all assessed trees were protected under the Canterbury Development Control Plan 2012 Part 6.7[2] .

[1] **Murphy, C.L,** 1993. *Soil Landscapes of the Gosford – Lake Macquarie 1:100,000 Sheet.* Department of Conservation and Land Management.

2 http://www.canterbury.nsw.gov.au/files/74a24053-d36f-4cd7-98e0-a26100c56ec4/CDCP_P67_tree_preservation_V7F.pdf

2.3.4 Not all assessed trees were high quality trees. Some trees for example Trees 5, 6, 7, 8, 34, 47, 49, 57 and 63 were low quality trees with ©Retention Value D[3]. Generally low quality trees (i.e. ©Retention Value C or D) do not warrant special tree protection consideration and are removed and replaced. Attention should be focused on high value trees, as these have the greatest landscape and ecological value. Tree ownership also needs to be considered.

[3] Refer to Attachment B for explanation of ©Retention Index.

3. METHODOLOGY

3.1 DATA COLLECTION

3.1.1 In preparation of this document a ground level, visual tree assessment (VTA)[4] was undertaken on 7th May, 2014. No aerial (climbing) inspections, woody tissue testing or tree root mapping were undertaken as part of this assessment.

3.1.2 Tree heights were estimated. Trunk diameter at breast height (DBH) was estimated at 1.4 metres above ground level and rounded to the nearest 0.1 metre. Structural Root Zones (SRZ) and Tree Protection Zones (TPZ) were also rounded to the nearest 0.1 metre.

3.1.3 All tree offsets mentioned in this document are to centre of trunk unless otherwise stated.

3.2 IDENTIFICATION OF SUBJECT TREES

3.2.1 The sixty three (63) subject trees are those indicated on the attached Arboricultural Implications Plan (2320AIP 09.05.14).

3.2.2 The subject trees were numbered and labelled on site with white plastic tags as per the Tree Schedule (Attachment A) to assist identification by others during the Masterplan assessment.

3.3 DOCUMENTS AND PLANS REFERENCED

3.3.1 The following plans have been reviewed:

- Urban Design Study and Options, 15 Close Street, Canterbury, Olsson & Associates Architects, dated May 2013
- Plan Showing Detail Survey of Lot 1 in DP818683 Showing Trees, Contours & Approximate Boundary Locations Only, Bowdens Group, dated 10.04.14

3.4 AUSTRALIAN STANDARD AS4970-2009 (GENERIC)

3.4.1 The Australian Standard *AS4970–2009 Protection of trees on development sites* has been used as a benchmark in the preparation of this report and the terminology and assessment methodology have been adopted from this document. This Preliminary Arboricultural Advice complies with *2.3.2 Preliminary tree assessment* and *2.3.3 Preliminary arboricultural report* of *AS4970-2009*.

3.4.2 For the purposes of this Preliminary Aboricultural Advice for the Masterplan, the only trees recommended for removal are the ©Retention Value "D" trees.

3.4.3 Recommendations have been based on tree ©Retention Value, Vigour, Condition, SULE and potential construction offsets (refer to Attachment B). Trees with ©Retention Value "A" should be given greater priority for retention than trees with ©Retention Value "C". Trees with Long (40 years +) SULE should be given greater priority for retention than trees with Short (5-15 years) SULE (refer to Attachment B).

[4] VTA – Visual Tree Assessment, undertaken by tree professionals, is a recognised (International Society of Arboriculture, Journal of Arboriculture, Vol. 22 No. 6, Nov. 1996) systematic method of identifying tree characteristics and hazard potential. VTA is also an assessment method described by Claus Mattheck in *The Body Language of Trees – A handbook for failure analysis*. The Stationery Office, London (1994)

3.4.4 Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) are as per *Section 3* of AS 4970-2009 and are defined at Attachment B of this report.

3.4.5 "Construction" for the purpose of this Preliminary Arboricultural Advice means excavation (greater than 100mm), compacted fill or machine trenching[5]. "Excavation" includes cut batters, boxing–out for the various pavement types, trenching for utilities and footings for retaining walls.

3.4.6 Trees within proposed construction footprints will be recommended for removal (**Rm**).

3.4.7 Where construction is proposed within Structural Root Zone (SRZ) offsets, those trees will similarly be recommended for removal (**Rm**). Fully elevated, pier and beam type construction or hand dug services trenches (or horizontal boring) is however possible within a SRZ.

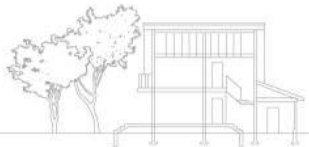
3.4.8 Trees with greater than 25% of the Tree Protection Zone (TPZ) impacted by construction will be recommended for removal (**Rm**). There are however different types of construction incursions proposed (e.g. fill, cut, services, pavement type, retaining walls) with varying tree impacts likely. Existing constraints to root development also vary the TPZ. Compacted fill can be equally as damaging to tree longevity: root development is restricted within heavily compacted soils.

3.4.9 Trees to be retained with construction impacting less than 25% of the TPZ area will be rated as Retain Plus (**R+**). Specific construction monitoring will be required for the Retain Plus (**R+**) trees (refer to Recommendations).

3.4.10 TPZ encroachments of >10% are defined (3.3.3 of AS4970) as '*major*'. This does not mean that the tree will be fatally injured, but that '*the project arborist must demonstrate that the tree(s) would remain viable'.*

3.4.11 Where construction is proposed beyond the TPZ, those trees are rated as Retain (**R**) with no specific tree protection design or tree protection monitoring required.

[5] "Construction" is equivalent to "works" as defined at 1.4.9 of AS4970-2009.



4. SUMMARY AND CONCLUSIONS

4.1 SUMMARY

4.1.1 The majority of trees on the site are located around the boundaries, providing privacy screening of existing developments and the adjoining railway line, as well as shade and streetscape amenity. As a result of their location around the fringes of the site, it should be possible to retain many of the ©Retention Value A and B trees within the context of the currently proposed Masterplan layout. Future development should aim to retain the screening and landscape value currently provided by the trees.

4.2 THE ©RETENTION VALUE OF SUBJECT TREES

4.2.1 Using the TWM ©Retention Index, the subject trees were given a ®Retention Value as outlined in Table 1 following.

4.2.2 Priority should be given to the retention of the higher quality ©Retention Value A and B trees.

Table 1: ©Retention Value of the Subject Trees

©Retention Value A (Tree Number)	©Retention Value B (Tree Number)	©Retention Value C (Tree Number)	©Retention Value D (Tree Number)
15, 17, 18, 19, 25, 26, 60, 61, 62	9, 10, 11, 12, 16, 20, 21, 22, 23, 24, 27, 28, 33, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 55, 56, 58, 59	1, 2, 3, 4, 13, 14, 30, 32, 35, 40, 54	5, 6, 7, 8, 29, 31, 34, 47, 49, 57, 63
Total: 9	**Total: 32**	**Total: 11**	**Total: 11**

4.3 TREE RETENTION

4.3.1 **Of the sixty three (63) subject trees, the following twelve (12) are located outside the site: Trees 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15 and 16.**

These trees can be retained by having setbacks from any proposed development outside of the TPZ of each tree (as indicated on the attached Arboricultural Implications Plan, Attachment C). These trees contribute to the streetscape amenity along Close Street and privacy screening for existing neighbouring developments.

4.3.2 The nine (9) ©Retention Value A trees (**Trees 15, 17, 18, 19, 25, 26, 60, 61 and 62**) should be prioritised for retention (or transplant where applicable) within the proposed Masterplan layout. Arboricultural input will be required during detail design to enable retention within the site redevelopment.

4.3.3 The row of nine (9) trees consisting of **Trees 17, 18, 19, 20, 21, 22, 23, 24 and 25** should be prioritised for retention by allowing a sufficient setback from the development, in coordination with detailed Arboricultural advice (Arboricultural Impact Assessment).

This group contains four (4) ©Retention Value A trees and five ©Retention Value B trees, and should be prioritised for retention, as the row as a whole is significant in the streetscape. These trees have been planted closely and have codominant crowns. Removal of some of the trees in the row while retaining the others is not recommended, as the remaining amenity of the trees would be reduced.

4.3.4 The following twenty (20) ©Retention Value B trees should be considered for retention (or transplanted where applicable) within the proposed Masterplan layout: **Trees 33, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 48, 50, 51, 52, 53, 55, 56, 58 and 59**.

Tree 43 has been assessed as a ©Retention Value B tree. This tree is within retained soil and has a retaining wall 1 metre to the south of its base. Removal of this wall could potentially destabilise the tree.

4.3.5 Three (3) ©Retention Value C trees (**Trees 32, 40 and 54**) within the site should not constrain any proposed development, however they may be retained if the proposed development will not significantly impact them.

4.3.6 Canopy Pruning

Tree 12 will require canopy pruning if this tree is to be retained. The tree has a bark inclusion at 4 metres above ground. Council approval will need to be sought for any crown pruning of the subject trees.

Canopy pruning is to comply with Australian Standard *AS4373-2007*: *Pruning of amenity trees.*

4.4 TRANSPLANTABLE TREES

4.4.1 **Trees 26, 35 and 45** are of species which are tolerant of transplanting.

These trees should be considered for transplanting to be replanted into the landscape on site if they are proposed to be removed from their current positions. They are suitable for retention in situ if they do not require removal/transplant.

Tree 26 (Dragon Tree, *Dracaena draco*) is considered to be significant in the landscape due to its form, size and condition and should be prioritised for transplanting. A Transplant Method Statement will be required to be prepared to optimise the trees' ongoing viability.

4.5 TREE REMOVAL

4.5.1 Of the sixty three (63) subject trees, eleven (11) have been assessed as ©Retention Value D trees (**Trees 5, 6, 7, 8, 29, 31, 34, 47, 49, 57 and 63**).

These trees are poor specimens which do not warrant retention. Trees 5, 6, 7 and 8 will require additional consideration, as they are located within the Council verge.

4.5.2 **Tree 30** is an exempt species (Cocos Palm, *Syagrus romanzoffianum*) and as such does not require Council consent to prune or remove.

4.5.3 **Trees 27 and 28** (Port Jackson Fig, *Ficus rubiginosa*, and Weeping Fig, *Ficus benjamina*) are located close to the wall of a neighbouring building. These trees have the potential to be very large trees, and may become problematic in their current location. These trees should be considered for removal within any proposed site redevelopment.

Attachment A: Tree Schedule

Preliminary Tree Schedule - 15 Close Street, Canterbury

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	SULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS
1	New Zealand Cabbage Tree, *Cordyline australis*	0.1	4	2	SM	G	G	1.5	2.0	M	4	C		*Verge tree.*
2	Weeping Bottlebrush, *Callistemon viminalis*	0.3	6	3	SM	G	F	2.1	3.6	M	4	C		*Verge tree.*
3	Weeping Bottlebrush, *Callistemon viminalis*	0.1, 0.1, 0.2	4	2	SM	G	F	2.0	2.4	M	4	C		*Verge tree. Cluster of 3 stems.*
4	Orange Jessamine, *Murraya paniculata*	0.1, 0.1, 0.1	4	2	SM	G	G	1.5	2.4	M	4	C		*Verge tree.*
5	Swamp Sheoak, *Casuarina glauca*	0.3 @ 1m	10	2	SM	G	F	2.0	3.6	S	4	D	Rm	*Verge tree. Poor specimen does not warrant retention. Council consent required.*
6	Weeping Bottlebrush, *Callistemon viminalis*	0.3	6	2	M	G	G	2.1	3.6	S	4	D	Rm	*Verge tree. Poor specimen does not warrant retention. Council consent required.*
7	Weeping Bottlebrush, *Callistemon viminalis*	0.2, 0.3	7	2	OM	P	P	2.3	4.8	R	4	D	Rm	*Verge tree. Poor specimen does not warrant retention. Council consent required.*
8	Weeping Bottlebrush, *Callistemon viminalis*	0.2, 0.2	6	2	M	F	F	2.1	3.6	S	4	D	Rm	*Verge tree. Poor specimen does not warrant retention. Council consent required.*
9	Swamp Sheoak, *Casuarina glauca* (x11)	0.2 to 0.4	12 to 16	3	M	G	F	2.3	4.8	M	3	B		*Verge tree. Group of 11 trees at close spacing. Suppressed individuals within group.*
10	Chinese Elm, *Ulmus parvifolia*	0.2, 0.3, 0.4	15	6	M	G	F	2.6	6.0	M	3	B		*Verge tree. Canopy skew to S. Bark inclusion W side.*
11	Grey Ironbark, *Eucalyptus paniculata*	0.4	17	4	M	F	F	2.3	4.8	L	3	B		*Verge tree.*
12	Grey Ironbark, *Eucalyptus paniculata*	0.6	22	6	M	G	F	2.8	7.2	S	2	B		*Verge tree. Inclusion at 4m. Crown pruning required if retained.*
13	Native Daphne, *Pittosporum undulatum*	0.2	4	2	SM	G	G	1.8	2.4	L	4	C		*Verge tree.*
14	Illawarra Flame Tree, *Brachychiton acerifolius*	0.1	5	2	IM	G	G	1.5	2.0	M	4	C		*Verge tree.*
15	Brush Box, *Lophostemon confertus*	0.5	13	5	SM	G	G	2.6	6.0	L	2	A		*Verge tree.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	SULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS
16	Northern Arbor Vitae, *Thuja occidentalis* (x5)	0.2 @ grade	4 to 6	2	SM	G	G	1.7	2.4	M	3	B		*Verge tree. Group of 5 trees. On drainage easement to E.*
17	Brush Box, *Lophostemon confertus*	0.9 @ 0.5m	16	6	M	G	F	3.2	10.8	L	2	A		*Previously lopped at 1.5m a.g. Bitumen carpark 2m to N.*
18	Brush Box, *Lophostemon confertus*	0.7 @ 1.0m	10	6	M	G	F	2.8	8.4	L	2	A		*Previously lopped at 1.5m a.g. Bitumen carpark 2m to N.*
19	Brush Box, *Lophostemon confertus*	0.8 @ 1.0m	16	6	M	G	F	3.0	9.6	L	2	A		*Previously lopped at 1.5m a.g. Bitumen carpark 2m to N.*
20	Brush Box, *Lophostemon confertus*	0.7 @ 1.0m	15	6	M	G	F	2.8	8.4	L	3	B		*Previously lopped at 1.5m a.g. Bitumen carpark 2m to N. Suppressed upright form.*
21	Brush Box, *Lophostemon confertus*	0.7 @ 1.0m	15	6	M	G	F	2.8	8.4	L	3	B		*Previously lopped at 1.5m a.g. Bitumen carpark 2m to N.*
22	Brush Box, *Lophostemon confertus*	0.6 @ 1.0m	15	5	M	G	F	2.8	7.2	L	3	B		*Previously lopped at 1.5m a.g. Bitumen carpark 2m to N.*
23	Brush Box, *Lophostemon confertus*	0.6 @ 1.0m	16	6	M	G	F	2.8	7.2	L	3	B		*Previously lopped at 1.5m. Bitumen carpark 2m to N.*
24	Brush Box, *Lophostemon confertus*	0.6 @ 1.0m	15	6	M	G	F	2.8	7.2	L	3	B		*Previously lopped at 1.5m. Bitumen carpark 2m to N.*
25	Brush Box, *Lophostemon confertus*	0.6 @ 1.0m	15	6	M	G	F	2.8	7.2	L	2	A		*Previously lopped at 1.5m. Bitumen carpark 2m to N.*
26	Dragon Tree, *Dracena draco*	0.4 @ 1.0m	4	5	M	G	G	2.3	4.8	L	2	A		*Rare/unusual specimen. Transplantable.*
27	Port Jackson Fig, *Ficus rubiginosa*	0.2	6	4	SM	G	P	1.8	2.4	M	3	B		*Crown skew to SW.*
28	Weeping Fig, *Ficus benjamina*	0.6	11	6	SM	G	F	2.8	7.2	M	3	B		*Limbs in contact with roof of adjoining building.*
29	Mulberry, *Morus nigra*	0.3 @ 0.5m	8	5	SM	G	F	2.0	3.6	S	4	D	Rm	*TPO Exempt species.*
30	Cocos Palm, *Syagrus romanzoffianum*	0.3	10	3	SM	G	G	1.5	2.0	M	4	C		*TPO Exempt species.*
31	Cotoneaster, *Cotoneaster sp.* (x3)	0.3 @ grade	4-6	4	M	F	P	2.0	3.6	S	4	D	Rm	*Group of 3 trees. TPO exempt species.*
32	New Zealand Cabbage Tree, *Cordyline australis*	0.2	6	2	M	G	G	1.8	2.4	M	4	C		
33	Jacaranda, *Jacaranda mimosifolia*	0.4	8	5	SM	G	F	2.3	4.8	M	3	B		*Canopy skew to W.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	SULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS
34	New Zealand Cabbage Tree, *Cordyline australis*	0.2	5	1	SM	F	P	1.5	2.0	S	4	D	Rm	
35	Pygmy Date Palm, *Phoenix roebelenii*	0.2	4	1	M	G	G	1.5	2.0	M	4	C		*Transplantable.*
36	Native Daphne, *Pittosporum undulatum*	0.3, 0.3	7	4	M	G	F	2.3	4.8	M	3	B		
37	Bhutan Cypress, *Cupressus torulosa*	0.5 @ grade	10	2	M	G	F	2.5	6.0	M	3	B		
38	Bhutan Cypress, *Cupressus torulosa*	0.4 @ grade	11	2	M	G	F	2.3	4.8	M	3	B		
39	Bhutan Cypress, *Cupressus torulosa*	0.5 @ grade	10	2	M	G	F	2.5	6.0	M	3	B		
40	Native Daphne, *Pittosporum undulatum*	0.1, 0.1, 0.1	5	2	SM	G	F	1.8	2.4	M	4	C		
41	Bhutan Cypress, *Cupressus torulosa*	0.6 @ grade	12	2	M	G	F	2.7	7.2	M	3	B		
42	Bhutan Cypress, *Cupressus torulosa*	0.5 @ grade	11	2	M	G	F	2.5	6.0	M	3	B		*Low pruning over public footpath to N.*
43	Bhutan Cypress, *Cupressus torulosa*	0.6 @ grade	12	2	M	G	F	2.7	7.2	M	3	B		*Low pruning over public footpath to N. Retaining wall 1.0m to S.*
44	Bhutan Cypress, *Cupressus torulosa*	0.6 @ grade	12	2	M	G	F	2.7	7.2	M	3	B		
45	Dragon Tree, *Dracena draco*	0.3	4	2	SM	G	F	2.1	3.6	M	3	B		*Transplantable.*
46	Bhutan Cypress, *Cupressus torulosa*	0.6 @ grade	12	2	M	G	G	2.7	7.2	M	3	B		
47	Native Daphne, *Pittosporum undulatum*	0.4 @ grade	4	2	SM	F	P	2.3	4.8	S	4	D	Rm	
48	Bhutan Cypress, *Cupressus torulosa*	0.5	10	2	M	G	G	2.6	6.0	M	3	B		
49	Weeping Bottlebrush, *Callistemon viminalis*	0.3 @ grade	5	2	M	F	F	2.0	3.6	S	4	D	Rm	
50	Northern Arbor Vitae, *Thuja occidentalis*	0.2 @ grade	5	2	SM	G	G	1.7	2.4	M	3	B		

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	SULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS
51	Weeping Bottlebrush, *Callistemon viminalis*	0.3	8	3	M	G	F	2.1	3.6	M	3	B		
52	Northern Arbor Vitae, *Thuja occidentalis*	0.3 @ grade	7	2	SM	G	G	2.0	3.6	M	3	B		
53	Weeping Bottlebrush, *Callistemon viminalis*	0.3	9	3	M	G	F	2.1	3.6	M	3	B		
54	Weeping Bottlebrush, *Callistemon viminalis*	0.3	10	3	M	G	P	2.1	3.6	S	3	C		*Bark wound E. side.*
55	Brush Box, *Lophostemon confertus*	0.5	11	4	SM	F	F	2.6	6.0	M	3	B		*Heavy vine growth.*
56	Brush Box, *Lophostemon confertus*	0.4	9	5	SM	F	F	2.3	4.8	M	3	B		*Heavy crown skew to NW. Bark wound E. side at 1.5m.*
57	Brush Box, *Lophostemon confertus*	0.2, 0.1	10	2	SM	F	P	1.8	2.4	S	4	D	Rm	*Poor specimen does not warrant retention.*
58	Brush Box, *Lophostemon confertus*	0.5, 0.3	14	5	M	G	F	2.8	7.2	L	3	B		
59	Brush Box, *Lophostemon confertus*	0.3	10	3	SM	F	F	2.1	3.6	M	3	B		*Heavy crown skew to W.*
60	Tallowwood, *Eucalyptus microcorys*	0.7	29	7	M	G	G	3.0	8.4	L	2	A		
61	Camphor Laurel, *Cinnamomum camphora*	1.2 @ grade	20	8	M	G	F	3.6	14.4	L	2	A		
62	Bhutan Cypress, *Cupressus torulosa*	0.6 @ grade	14	3	M	G	G	2.7	7.2	M	2	A		
63	Lemon-scented Tea Tree, *Leptospermum petersonii*	0.3	6	4	M	G	F	2.1	3.6	S	4	D	Rm	*Poor specimen does not warrant retention.*
63														

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (m)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	SULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS

©SIG. RATING	NO. OF TREES
1	0
2	10
3	32
4	21

©RETENTION INDEX	NO. OF TREES
A	9
B	32
C	11
D	11

RECOMMENDATION	NO. OF TREES
R	0
R+	0
T	0
Rm	11

Attachment B: Definition of Terms

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

DBH – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape is used which assumes a circular cross section. Multiple measurements indicate multiple trunks. More than three trunks are indicated as "multi". Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated in the Comments column.

CANOPY SPREAD RADIUS – Average canopy radius (widest + narrowest ÷ 2). Circular canopy depictions on Tree Plan/Survey are indicative only. Where canopy spread was significantly skewed, all four cardinal point measurements were recorded.

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

VIGOUR – Good (G), Fair (F) or Poor (P). The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have Good vigour but be hazardous due to Poor condition. A tree in Good vigour has the ability to sustain its life processes. Vigour is synonymous with health.

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

SRZ RADIUS – Structural Root Zone. The area around a tree required for tree stability. Earthworks should be prohibited within the SRZ. The area is calculated from the formula and graph at Figure 1 of *AS4970-2009.* The SRZ graph has been adapted from the work of Claus Mattheck (1994). DBH + 10% has been used for the calculation of SRZ. Where DBH is measured at grade or at a height other than 1.4m above grade, 10% has not been added.

TPZ RADIUS – Tree Protection Zone. Radial offset (m) of twelve times (12x) trunk DBH measured from centre of trunk (for trees less than 0.3 metre DBH minimum TPZ is 2.0 metres). To satisfactorily retain the tree, construction activity (both soil cut and fill) must be restricted within this offset. TPZ offsets are rounded to the nearest 0.1 metre. Existing constraints to root spread can vary. Generally an area equivalent to the TPZ should be available to the tree post development. Encroachment occupying up to 10% of the TPZ area is acceptable without detailed rootzone assessment. Encroachments greater than 10% require specific arboricultural assessment.

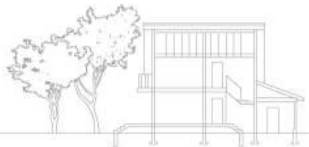
SULE – Safe Useful Life Expectancy. A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England. The SULE method used in this assessment has been adapted for simplified use within the field. It gives a length of time that the Arborist feels a particular tree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

©SIG. RATING – ©Significance Rating Scale (see notes over)

©RETENTION INDEX (see notes over)

RECOMMENDATIONS – ***Retain (R) No TPZ encroachments***, ***Retain Plus (R+) Acceptable levels of encroachments***, ***Transplant (T)*** or ***Remove (Rm)***.

COMMENTS – Comments relating to the location, surroundings and hazard potential of the trees at the time of inspection and where applicable the reason for removal.



©SIG. RATING – ©Significance Rating Scale. A site specific qualitative evaluation of a tree relative to the existing land use developed by Tree Wise Men® Australia Pty Ltd. Takes into consideration the impact of the tree on the surrounding landscape, streetscape and bushland. Rarity, habitat value, historical/cultural value and structural form of the tree are considered in this rating system. It is possible for a tree to have a Short SULE and a ©Significance Rating of 1. Likewise it is possible for a tree to be given a Long SULE and a ©Significance Rating of 4 (e.g. weed species). The ©Significance Ratings used in this Report are as outlined in Table 1.

Table 1: ©Significance Rating Characteristics

Rating	Significance	Characteristics (some or all)
©Sig. Rating 1	**Exceptional**	▪ Major contribution to site amenity ▪ Remnant specimen ▪ Heritage Listed ▪ Listed on Significant Tree Register ▪ Threatened Species ▪ Good vigour and condition ▪ Cultural significance ▪ Possible habitat tree for threatened fauna ▪ Excellent, well formed specimen ▪ Rare or unusual species ▪ Large above ground biomass ▪ Unique within the site and surrounds
©Sig. Rating 2	**High**	▪ Considerable contribution to site amenity ▪ Remnant specimen ▪ Good vigour and condition ▪ Threatened Species ▪ Cultural significance ▪ Possible habitat tree for threatened fauna ▪ Well formed specimen ▪ Rare or unusual species ▪ Large or moderate above ground biomass ▪ Other specimens with similar characteristics within the site and surrounds
©Sig. Rating 3	**Moderate**	▪ Minor contribution to site amenity ▪ Remnant or planted ▪ Fair or Poor vigour and condition ▪ Potential for growth ▪ Well formed or asymmetrical form ▪ Other specimens with similar characteristics within the site and surrounds
©Sig. Rating 4	**Low**	▪ Small/poor specimen ▪ Poor vigour and condition ▪ Inappropriate for the location ▪ Minor contribution to landscape amenity ▪ Easily replaced ▪ Weed species or TPO Exempt ▪ Hazardous ▪ Previously ©Sig. Rating 5 tree

©RETENTION INDEX. A site specific assessment of an individual tree's retention value developed by Tree Wise Men® Australia Pty Ltd. Incorporating SULE and ©Significance Rating each tree is allocated a retention value of A, B, C or D. The ©Retention Index values can be described as follows:

©Retention Value A	**Should be retained**	▪ Major redesign may be required (e.g. movement of building footprint, re-alignment of roadway).
©Retention Value B	**Could be retained**	▪ Minor redesign may be required (e.g. level changes, pavement detail).
©Retention Value C	**Could be removed**	▪ Should not constrain proposed development.
©Retention Value D	**Should be removed** (or permanently fenced off)	▪ Should not constrain proposed development: ○ potentially hazardous **or** ○ poor specimen **or** ○ environmental or noxious weed

<table>
<tr><th colspan="2" rowspan="2">©Retention Index</th><th colspan="4">©Significance Rating</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td rowspan="4">SULE Rating</td><td>Long
(40+ years)</td><td colspan="2" rowspan="2">A</td><td>B</td><td>C</td></tr>
<tr><td>Medium
(15-40 years)</td><td>B</td><td>C</td><td rowspan="2">D</td></tr>
<tr><td>Short
(5-15 years)</td><td colspan="3">D</td></tr>
<tr><td>Remove
(< 5 years)</td></tr>
</table>

Attachment C: Arboricultural Implications Plan (1 Sheet)

Notes:

1. This Arboricultural Implications Plan is equivalent to the ***Preliminary Tree Assessment Plan*** identified in Table 1, ***AS4970-2009*** and has been developed to assist in locating the construction footprint to minimise tree loss. Refer to Masterplan proposal by Ollson & Associates Architects.

2. As a guide for the development footprint, encroachment into TPZs by works associated with demolition and/or construction activities such as excavation or compacted fill should be ***restricted to less than 25% of TPZ area*** to enable tree retention. For encroachments greater than 25%, elevated or lightweight construction methods should be developed with arboricultural input and guidance.

3. In relation to tree retention, ©***Retention Value A*** trees should be given greatest priority to maintain existing landscape character and amenity. ©Retention Value B and C trees are of decreasing value. Some ©Retention Value D trees have been marked for removal irrespective of the proposed layout being assessed as dead, dying or dangerous.

4. The extent of TPZ shown on this plan does not reflect any confinement of roots by existing structures, buildings, walls, topography, etc.

5. This ***Arboricultural Implications Plan*** does not address impacts associated with bushfire planning, flora and fauna assessments and/or other relevant planning controls and policies.

6. Further arboricultural assessment of finalised development plans is required to prepare an ***Aboricultural Impact Assessment and Tree Protection Plan*** to accompany Development Application submission.

7. Verge trees 1 - 16 require additional consideration as they are Council owned (public) street trees.

8. The species of T26 - *Dracaena draco* (Dragon Tree) has good transplant tolerance, and as the tree is a rare/unusual specimen, it is worthy of consideration for transplant. A ***Transplant Method Statement*** should be prepared.

TREE WISE MEN®
AUSTRALIA PTY LTD

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LEGEND

Site boundary:	
Tree number with trunk as plotted on Site Survey:	T34

©Retention Index:

©Retention Value A TPZ:	
©Retention Value B TPZ:	
©Retention Value C TPZ:	
©Retention Value D TPZ:	
Transplantable tree/palm:	T
Dead, dying or dangerous trees or noxious weeds to be removed irrespective of proposed development:	

LOCATION PLAN

TITLE:	**©ARBORICULTURAL IMPLICATIONS PLAN**
CLIENT:	OLSSON & ASSOCIATES ARCHITECTS
PROJECT:	15 CLOSE STREET CANTERBURY
DRAWING NO:	2320AIP SHT 1 OF 1
DRAWN BY:	JB
BASED ON:	PLAN SHOWING DETAIL SURVEY OF LOT 1 in DP818683, BOWDENS GROUP, dated 10.04.14
DATE:	09/05/2014
REV:	REV DATE:
SCALE:	1:500@A3

0 5 10 25 meters

N