



**GLENICE BUCK DESIGNS PTY LTD**

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4 Longford St Roseville NSW 2069 M 0417 077 386 E [gbdesigns@tpg.com.au](mailto:gbdesigns@tpg.com.au) ABN: 46 107 705 288  
[www.glenicebuckdesigns.com.au](http://www.glenicebuckdesigns.com.au)

# Arboricultural Impact Assessment

**PREPARED FOR**

Somewhere Landscape Architects

**SITE**

Chatswood Golf Course

128 Beaconsfield Rd, Chatswood NSW 2067

**PREPARED BY**

Glenice Buck

*Assoc Dip Applied Science (Landscape), Dip Horticulture (Arboriculture)  
Member of Institute of Australian Consulting Arboriculturists  
(IACA) ACM: 0452012*

**ON**

7th June 2017

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## 1.0 INTRODUCTION

This report was commissioned by Ms Alex Dalglish from Somewhere Landscape Architects the Landscape Architect for the proposed development at Chatswood Golf Course at 128 Beaconsfield Rd, Chatswood(the site). We have been asked to prepare an Arboricultural Impact Assessment for the site in relation to the proposed development works for the property. (Refer to Appendix 3 for tree locations and numbers).

This report shall reflect the expert opinion of Glenice Buck Designs. Glenice Buck Designs is acting independently of and not as the advocate for the owner of the subject trees. Glenice Buck Designs shall not receive any commission to prune or remove the tree which is the subject of this report. In preparing this report the author is aware of and has taken into account the objectives of Willoughby Council's Tree Preservation Order, *Australian Standard 4970 - 2009 Protection of Trees on Development Sites* and *Australian Standard 4373 - 2007 Pruning of Amenity Trees*.

The subject trees and the site were inspected on 23rd February 2017 . The purpose of this report is to identify the existing trees, inspect existing site conditions and assess the proposed development plans. We will then determine the best possible tree management techniques to ensure the long term stability and viability of the subject tree from pre - construction, during construction and post construction.

All Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However Glenice Buck Designs Pty Limited can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

- ☐ Information contained in this report covers only the tree that was examined and reflects the condition of the tree at the time of inspection: and
- ☐ The inspection was limited to visual examination of the subject tree without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.

## 2.0 METHODOLOGY

### 2.1 General Assessment

The subject trees were visually inspected from ground level. This report is limited to the methods of assessment listed below (refer to Appendix 1 – Tree Inspection Sheet).

- Tree Species (botanical and common name)
- Tree height and age was estimated;
- Canopy spread was estimated;
- Diameter at Breast Height (DBH) was measured 1.4 metres above ground level;
- Health and vigour, including foliage size, colour, condition, extension growth, presence of disease or pest infestation, canopy density, branch structure, scar tissue, the presence of deadwood, dieback, epicormic growth as indicators;
- Condition, using visible evidence of structural defects, instability, evidence of previous pruning and physical damage as indicators;
- Suitability of the tree to the site and its existing location;
- The surface cover, soil level and drainage patterns were all noted.
- A data collection sheet was used to record information (Refer to Figure One and Appendix 1)
- The photographs included in this report were taken at the time of inspection;
- Notes were also taken on the obstructions to each tree, surrounding services, use of the land underneath the tree(s) and possible targets in this area.
- The comments and recommendations in this report are based on findings from the site inspection;
- Council's planning instruments and other applicable documentation were sourced and have been used for assessment purposes;
- A list of literature used in the preparation of this report is provided in the references section.

There were no root excavations, aerial surveys or internal inspections of the wood (for decay) completed.

### 2.2 IACA Significance of a Tree, Assessment Rating System

The value of the tree for retention has been determined using the IACA Significance of a Tree, Assessment Rating System (STARS) (IACA 2010), from the Institute of Australian Consulting Arboriculturists, Australia, (Refer Appendix 2). This system looks at the life expectancy of the tree and the landscape significance of the tree. These two factors are then compared to give the tree a retention value. The tree's retention value is classed at High, Moderate or Low. The trees with the higher value we see to have a longer life expectancy and high landscape significance.

The remaining life expectancy of the tree is classed as;

Long – Greater than 40 years

Medium – 15 – 40 years

Short – 1 – 15 years

Imminent Hazard (structurally unstable) or Dead

The landscape significance rating takes into account the amenity, ecological and heritage values. A rating is given to the tree of high, medium or low.

#### 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 Council's 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 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.

A high retention value means that we would recommend that the tree be maintained and protected. These trees are considered important for retention and should be retained or protected. Design modification or re-location of building/s should be considered to accommodate the setbacks prescribed by the Australian Standard AS 4970 Protection of Trees on Development Sites. Tree sensitive construction measures must be implemented e.g. pier and beam footings etc, if works are to proceed with the tree protection zone.

A moderate retention value means that these trees may be retained and protected. These are considered less critical however their retention should remain a priority with removal only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.

A low retention value (considered for removal) means that the trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

A very low retention value means the trees are considered hazardous, or in irreversible decline or are weeds and should be removed irrespective of development.

### **2.3 Impact Assessment**

The proposed following plans were examined and assessed

- \* The planning overview from Smyth Levy and Associates
- \* The architectural plans from Marchese and partners dated May 2017
- \* The landscape plan from Somewhere Landscape Architects
- \* The Flora and Fauna Survey from Travers Bushfire & Ecology dated March 2017

Notes were taken on the impact that these proposed works will have on the existing trees.

An Impact Assessment was completed on the trees (Figure Forty Eight) . This included determining for the subject trees;

- \* Construction tolerance – This has been divided into three categories.

H – High  
M – Medium  
P- Poor

As there is very little documentation available on the construction tolerance of trees under Australian conditions these categories were given to each tree based on our previous knowledge and experience.

- \* The Tree Protection Zones (TPZ). The TPZ is a determined area around the trees that are to be maintained.

The TPZ specify a radial distance from the centre of the trunk of the tree which should be protected throughout the development process. The aim of protecting this area is to minimize any incursions to the root system of the tree and/or the trees canopy. This will ensure the long term health and maintain the stability of the tree to be retained. The TPZ is calculated by multiplying the diameter at breast height (DBH) x 12. This formula is in accordance with the Australian Standard 4970-2009- Protection of Trees on Development Sites.

\*The Structural Root Zones (SRZ)

The SRZ is the area which must be maintained to provide the tree with anchorage and stability. It is a radial distance measured from the centre of the trunk of the tree which is to be maintained.

This is calculated when there is a major encroachment into the TPZ. SRZ is calculated by;  
 $SRZ = (D \times 50)^{0.42} \times 0.64$  where D = Trunk diameter in metres. This is measured above the root buttress. This formula is in accordance with the Australian Standard 4970 - 2009- Protection of Trees on Development Sites.

\* Percentage Incursion to TPZ and SRZ

This has been calculated by dividing the area of incursion by the TPZ.

It is generally accepted that a 10% incursion on one side of the TPZ is allowable. However anything above this is considered to have an adverse impact on the tree's health and stability. Any incursion into the TPZ will need to be compensated for on the other sides of the tree.

\*Impact Category

0% of root zone impacted – no impact of significance

0 to 10% of root zone impacted – low level of impact

10 to 15% of root zone impacted – low to moderate level of impact

15 to 20% of root zone impacted – moderate level of impact

20 to 25% of root zone impacted – moderate to high level of impact

25 to 35% of root zone impacted – high level of impact

>35% of root zone impacted – significant level of impact

No plans have been supplied for the installation of services and or hydraulics/storm water

### **3.0 OBSERVATIONS**

#### **3.1. The Site**

The area in which this development is to take place is within the two levels of existing car park area of the Golf Club. This area sits next to and above the existing club house. This area of the golf course is accessed via Beaconsfield Rd. There is a 5 - 20 metre strip of land which runs along the eastern boundary of the site adjacent to the paling fences of the neighbouring residence . This strip of land consists of rocky outcrops, exposed bedrock, mature trees and shrubs , weeds and some grass area. The upper level car park runs parallel to this area. The car park is a fairly flat bitumen area. There are access roads at each end of the upper car park taking visitors to the lower level car park. The land which divides the upper level car park from lower level car park is steeply sloping. It consists of garden areas and rocky outcrops. This is planted out with a mixture of shrubs and trees. There are three sets of pedestrian pathways and stairs which take visitors between the two levels. At the northern end of the car park there is a narrow road which branches off from the main access road down to a maintenance shed and the golf course. This land is steeply sloping.

#### **3.2 The Trees**

The main characteristics of the trees are set out in the Data Collection Sheet below with photos following. Refer to Appendix 1 also. Due to the challenging levels of the site some of the trees which are located on the steep embankment have not been accurately surveyed. We have grouped these together in numbered groups (refer to appendix 4) and have listed out the main species in each group with images included.



## Figure One

### Tree Inspection Schedule - Data Collection Sheet

Tree No.	Species	Remnant/ Planted/ Selfsown	Age Class Y/S/M/O	Tree Height (m)	Average Crown Spread (m)	DBH (cm)	DGL (cm)	Crown Class D/C/ I/S	Crown Condition 0,1,2,3,4	Canopy above (m)	Notes/comments
1	<i>Acacia spp</i>	Planted	semi Mature	7	N= 1 S= 1 E = 1 W = 1	12	15	D	4	6	No signs of pests or diseases. Good health and condition. Good vigour.
2	<i>Eucalyptus spp</i>	Planted	Mature	10	N= 4 S= 4 E = 4 W = 4	53	80	D	3	8	No signs of pests or diseases. Fair health and condition. Good vigour. Growing directly over rock shelf Marked on survey as 1 tree actually 3 individual trees but will treat as one.
3	<i>Eucalyptus spp</i>	Planted	Mature	12	N= 5 S= 5 E = 3 W = 4	43 Multi stem	70	C	4	10	No signs of pests or diseases. Fair health and condition. Good vigour. 5 Trunks growing on rocks above car park level
4	<i>Eucalyptus spp</i>	Planted	Semi Mature	7	N= 1 S= 1 E = 1 W = 1	10	15	C	3	5	Sapling - young tree
5	<i>Eucalyptus spp</i>	Planted	Mature	15	N= 2 S= 2 E = 2 W = 2	40	60	D	2	7	The trunk has a column of decay more than half of the trunk. A large amount of deadwood. Leaning in southerley direction - growing on steep slope Poor form and habit - Remove
6	<i>Eucalyptus spp</i>	Planted	Mature	17	N= 4 S= 5 E = 4 W = 4	55	65	D	4	7	No signs of pests or diseases. Good health, condition and vigour Has a nest box on trunk
7	<i>Eucalyptus spp</i>	Planted	Mature	-	-	-	-	-	3	-	A decaying tree trunk remains - 600 mm above ground level with 4 suckers shooting from it - Remove
8	<i>Grevillea robusta</i>	Planted	Mature	12	N= 2 S= 2 E = 1 W = 2	40	50	D	3	11	No signs of pests or diseases. Fair health and condition. Good vigour. Growing hard up against neighbours fence.
9	<i>Eucalyptus spp</i>	Planted	Semi Mature	6	N= 1 S= 1 E = 1 W = 1	10	15	C	3	5	No signs of pests or diseases. Low health and condition. Low vigour.
10	<i>Corymbia maculata</i>	Planted	Mature	10	N= 2 S= 2 E = 2 W = 2	30	40	D	4	8	No signs of pests or diseases. Very good health and condition. Slight north west lean
11	<i>Eucalyptus spp</i>	Planted	Mature	10	N= 5 S= 5 E = 5 W = 5	75 Multi stem	90	D	4	9	No signs of pests or diseases. Good health, condition, vigour. Growing on a rocky outcrop - at top of embankment
11	<i>Angophora costata</i>	Planted	Semi Mature		N= 1 S= 1 E = 1 W = 1						

Figure One Continued

Tree No.	Species	Remnant/ Planted/ Self-sown	Age Class Y/S/M/O	Tree Height (m)	Average Crown Spread (m)	DBH (cm)	DGL (cm)	Crown Class D/C/ I/S	Crown Condition 0,1,2,3,4	Can- opy above (m)	Notes/comments
12	<i>Lophostemon confertus</i>	Planted	Mature	9	N= 5 S= 6 E= 6 W= 6	45	50	D	4	7	No signs of pests or diseases. Good health, condition and vigour. Growing in rock - on embankment
13	<i>Grevillea robusta</i>	Planted	Mature	20	N= 5 S= 4 E= 4 W= 4	55	60	D	2-3	15	No signs of pests or diseases. Fair health and condition. Low vigour. Growing within a stone planter close to the road
14	<i>Melaleuca quinquenervia</i>	Planted	Mature	11	N= 4 S= 4 E= 3 W= 4	65 Multi stem	70	D	4	8	No signs of pests or diseases. Good health and condition. Good vigour. Growing on edge of car park and start of slope
15	<i>Melaleuca quinquenervia</i>	Planted	Mature	12	N= 4 S= 4 E= 3 W= 4	80 Multi Stem	90	D	4	9	No signs of pests or diseases. Good health and condition. Good vigour. Growing on edge of car park and start of slope
16	<i>Grevillea robusta</i>	Planted	Mature	15	N= 5 S= 5 E= 5 W= 5	Ap- prox 60	Ap- prox 60	D	3	12	The tree trunk and part of canopy is covered in ivy - this needs to be removed. Poor health and condition
17	<i>Eucalyptus spp</i>	Planted	Mature	13	N= 3 S= 4 E= 4 W= 3	60	70	C	4	6	No signs of pests or diseases. Fair health and condition. Good vigour.
18	<i>Eucalyptus spp</i>	Planted	Mature	13	N= 3 S= 4 E= 4 W= 3	60	70	C	4	6	No signs of pests or diseases. Fair health and condition. Good vigour.
19	<i>Pinus spp</i>	Planted	Mature	9	N= 3 S= 4 E= 4 W= 3	45	60	C	4	7	No signs of pests or diseases. Good health and condition. Good vigour.
20	<i>Jacaranda mimosifolia</i>	Planted	Mature	11	N= 8 S= 8 E= 6 W= 6	50	61	D	4	8	No signs of pests or diseases. Good health and condition. Good vigour. Good form and habit - has a elkhorn growing in it.
21	<i>Liquidamber styraciflua</i>	Planted	Mature	18	N= 5 S= 5 E= 5 W= 5	50	60	C	4	13	No signs of pests or diseases. Good health and condition. Good vigour.
22	<i>Robinia</i>	Planted	Semi Mature	8	N= 1 S= 1 E= 1 W= 1	20	30	C	4	4	No signs of pests or diseases. Fair health and condition. Good vigour atleast 5 of same species suckering in this area
23	<i>Lophostemon confertus</i>	Planted	Mature	18	N= 5 S= 4 E= 4 W= 4	Aprox 60	70	D	4	14	Surrounded by thick undergrowth Canopy seems to be in good condition and health
24	<i>Corymbia maculata</i>	Planted	Mature	20	N= 5 S= 5 E= 5 W= 6	60	70	D	4	12	Surrounded by thick undergrowth Canopy seems to be in good condition and health
25	<i>Eucalyptus spp</i>	Planted	-	-	-	-	-	-	-	-	DEAD - REMOVE STUMP
26	<i>Jacaranda mimosifolia</i>	Planted	Mature	8	N= 3 S= 3 E= 3 W= 3	Ap- prox 40	35	C	3	6	Surrounded by thick undergrowth Canopy seems to be in good condition and health Poor form and habit
27	<i>Eucalyptus botryoides</i>	Planted	Mature	14	N= 1 S= 1 E= 1 W= 1	50	60	C	4	12	No signs of pests or diseases. Good health and condition. Good vigour.
28	<i>Eucalyptus botryoides</i>	Planted	Mature	14	N= 1 S= 1 E= 1 W= 1	42 multi	62	C	4	12	No signs of pests or diseases. Good health and condition. Good vigour.
29	<i>Eucalyptus botryoides</i>	Planted	Mature	15	N= 1 S= 1 E= 1 W= 1	61	71	C	4	14	No signs of pests or diseases. Good health and condition. Good vigour.

Figure One Continued

Tree No.	Species	Remnant/ Planted/ Self-sown	Age Class Y/S/M/O	Tree Height (m)	Average Crown Spread (m)	DBH (cm)	DGL (cm)	Crown Class D/C/ I/S	Crown Condition 0,1,2,3,4	Can- opy above (m)	Notes/comments
30	<i>Eucalyptus spp</i>	Planted	Mature	11	N= 2 S= 2 E = 1 W = 1	32	40	C	4	9	No signs of pests or diseases. Fair health and condition. Good vigour.
31	<i>Eucalyptus spp</i>	Planted	Mature	10	N= 2 S= 2 E = 2 W = 2	22 multi	38	C	4	9.5	No signs of pests or diseases. Fair health and condition. Good vigour. Multi stemmed - 2 main trunks
32	<i>Jacaranda mimosifolia</i>	Planted	Semi Mature	10	N= 2 S= 1 E = 2 W = 2	22 multi	40	C	4	8	No signs of pests or diseases. Fair health and condition. Good vigour. Multi stemmed - 2 main trunks
33	<i>Jacaranda mimosifolia</i>	Planted	Semi Mature	12	N= 1 S= 2 E = 1 W = 1	22 multi	45	C	4	10	No signs of pests or diseases. Fair health and condition. Good vigour. Multi stemmed - 2 main trunks
34	<i>Eucalyptus spp</i>	Planted	Mature	12	N= 1 S= 1 E = 1 W = 1	35	40	C	2	3	Fair health and condition. Fair vigour. This tree is growing on a westerly lean - not in good form
35	<i>Eucalyptus spp</i>	Planted	-	-	-	-	-	-	-	-	DEAD
36	<i>Jacaranda mimosifolia</i>	Planted	Mature	8	N= 2 S= 2 E = 2 W = 2	Ap- prox 27	Ap- prox 29	C	3	7	No signs of pests or diseases. Fair health and condition. Fair vigour. Growing closer to and through dead Tree 35
37	<i>Eucalyptus spp</i>	-	-	-	-	-	-	-	-	-	DEAD
38	<i>Eucalyptus spp</i>	-	-	-	-	-	-	-	-	-	DEAD
39	<i>Eucalyptus spp</i>	-	-	-	-	-	-	-	-	-	DEAD
40	<i>Eucalyptus spp</i>	-	-	-	-	-	-	-	-	-	DEAD
41	<i>Glochidion ferdinandi</i>	Planted	Mature	7	N= 4 S= 3 E = 3 W = 3	Ap- prox 45	Ap- prox 50	C	4	7	No signs of pests or diseases. Fair health and condition. Good vigour.
42	<i>Glochidion ferdinandi</i>	Planted	Mature	8	N= 4 S= 3 E = 2 W = 3	Ap- prox 45	Ap- prox 45	C	4	7	No signs of pests or diseases. Fair health and condition. Good vigour.
43	<i>Araucaria spp</i>	Planted	Mature	16	6-8 m	50	60	C	4	12	No signs of pests or diseases. Fair health and condition. Good vigour. Undergrowth too thick so all measuremnts are approximate
44	<i>Glochidion ferdinandi</i>	Planted	Mature	10	8 m	45	50	C	4	8	No signs of pests or diseases. Fair health and condition. Good vigour. Undergrowth too thick so all measuremnts are approximate
45	<i>Pinus spp</i>	Planted	Mature	14	8m	50	55	C	4	12	No signs of pests or diseases. Fair health and condition. Good vigour. Undergrowth too thick so all measuremnts are approximate
46	<i>Pinus spp</i>	Planted	Mature	13	8m	50	60	C	4	15	No signs of pests or diseases. Fair health and condition. Good vigour. Undergrowth too thick so all measuremnts are approximate
47	<i>Glochidion ferdinandi</i>	Planted	Mature	10	9m	Ap- prox 45	50	C	4	8	Could not gain access to this area Undergrowth too thick so all measuremnts are approximate

Figure One Continued

Tree No.	Species	Remnant/ Planted/ Self-sown	Age Class Y/S/ M/O	Tree Height (m)	Average Crown Spread (m)	DBH (cm)	DGL (cm)	Crown Class D/C/ I/S	Crown Condition 0,1,2,3,4	Canopy above (m)	Notes/comments
48	<i>Glochidion ferdinandi</i>	Planted	Mature	8	6m	Ap- prox 45	Ap- prox 50	C	4	6	No signs of pests or diseases. Fair health and condition. Good vigour.  Undergrowth too thick so all measurements are approximate
49	<i>Liquidamber styraciflua</i>	Planted	Mature	20	8m	Ap- prox 50	Ap- prox 55	D	4	17	No signs of pests or diseases. Fair health and condition. Good vigour.
50	<i>Glochidion ferdinandi</i>	Planted	Mature	8	7m	Ap- prox 40	Ap- prox 45	C	4	6	No signs of pests or diseases. Fair health and condition. Good vigour. Undergrowth too thick so all measurements are approximate

For the purpose of this report we have identified and assessed the plantings within the steeply sloping garden areas (mainly between the two existing garden areas. These areas have not yet been surveyed however we have assessed them as there are some prominent trees within these areas.

Group 1 - 3 Subject trees - medium - high retention value

*Corymbia maculata*, *Melaleuca* spp and *Jacaranda* spp- all are in good health with no signs of pests or diseases.

Group 2

3 Subject trees - medium - high retention value

*Lagerstroemia indica*, *Jacaranda* spp and *Brachychiton acerifolius* - all are in good health with no signs of pests or diseases.

Group 3

3 Subject trees - low to medium retention value

*Jacaranda* spp - all are in good health with no signs of pests or diseases. Only semi mature trees.

Group 4

4 Subject trees - all are *Grevillea robusta* however 3 are dead and one is alive

The one which is alive has a low to medium retention value

Group 5

Bank plantings of shrubs including *Xylosma*

Also a *Grevillea robusta* and *Glochidion ferdinandi*

Group 6

9 Subject trees - medium retention value

2 x *Jacaranda* spp, 1 x *Brachychiton acerifolius*, 2 x *Howea forsteriana*, 1 x *Grevillea robusta*, 1 x *Cupressus* spp, 1 x *Schinus*

1 x *Pittosporum* - all are in good health with no signs of pests or diseases

Group 7

9 Subject trees - medium retention value

1 x *Acer negundo*, 1 x *Jacaranda* spp, 1 x *Acmena Smithii*, 2 x *Xylosma*, 3 x *Callistemon* spp and 1 x *Schefflera actinophylla* - all are in good health with no signs of pests or diseases

Group 8

1 subject tree

*Melaleuca quinquenervia* - High retention value - in good health and condition 12 metres in height with a DBH of approximately 90 cm and DGL = 1 metre. This tree has 8 stems

Group 9

1 subject tree

*Persea* spp - Medium to high retention value - in good health and condition 10 metres in height with a DBH of approximately 40 cm and DGL = 50cm.

Group 10

1 subject tree

*Acmena smithii* - Medium to high retention value - in good health and condition 10 metres in height with a DBH of approximately 40 cm and DGL = 50cm.

Group 11 - *Grevillea Robusta* - LOW retention value termite attacking trunk - REMOVE - as discussed on site



Figure Two - Tree 1 viewed from southern side



Figure Three - Trees 2 - viewed from western side. This image also shows the thick undergrowth of casuarinas (Shrublike) growing around the base of this tree.



Figure Four - Tree 3 - viewed from western side



Figure Five - Tree 4 - viewed from western side.





Figure Six - Tree 5 viewed from western side, showing the overall trunk of the tree which has a decay column visible.



Figure Seven - Tree 6 viewed from western side, showing the overall height and canopy spread. There is also a nest box in this tree



Figure Eight - Tree 7 - viewed from western side. Shows overall height and spread of the canopy which is formed by suckers. The tree has been cut off at base and is reshooting.



Figure Nine - Tree 8 in background and Tree 9 in foreground - viewed from western side. Shows overall height and spread of the canopy.





Figure Ten - Tree 10 viewed from western side.  
This tree is growing on a northwesterly lean



Figure Eleven - Tree 11 viewed from eastern side. This tree has 3 main trunks which start almost at ground level. This tree is growing at the top of the bank on the very edge of the car park area.



Figure Twelve - Tree 12 viewed from eastern side.  
This tree is growing approximately 500mm from top of the bank



Figure Thirteen - Tree 13 - viewed from eastern side. Difficult to photograph due to the surrounding vegetation.





Figure Fourteen - Trees 14 and 15 - viewed from northern side.



Figure Fifteen- This image shows the base of the trunk of Tree 14 - viewed from southern side.



Figure Sixteen - Tree - This image shows the base of the trunk of Tree 15 - viewed from northern side.



Figure Seventeen - This image shows Tree 16 viewed from western side. There is a large amount of ivy growing through canopy. This Ivy needs to be removed.





Figure Eighteen - Trees 17 and 18- viewed from southern side.



Figure Nineteen- Tree 19 - viewed from northern side. Shows overall height and spread of the canopy.



Figure Twenty - Tree 20 - viewed from western side. Shows overall height and spread of the canopy.



Figure Twenty-One - Tree 21 - viewed from western side. Shows overall height and spread of the canopy.





Figure Twenty-Two - Tree 22- viewed from western side. Shows overall height and spread of the canopy as well as the surrounding suckering Robinias



Figure Twenty-Three - Tree 23 - viewed from eastern side. Shows overall height and spread of the canopy.



Figure Twenty-Four - Tree 24 - viewed from western side. Shows overall height and spread of the canopy.



Figure Twenty-Five - Tree 25 and 26 - viewed from western side. Tree 25 is dead.





Figure Twenty-Six - Tree 27 - viewed from eastern side.



Figure Twenty-Seven - Tree 28 - viewed from eastern side



Figure Twenty-Eight - Trees 29, 30 and 31 - viewed from north eastern side.



Figure Twenty-Nine - Trees 32, 33 and 34 - viewed from southern side.





Figure Thirty - Tree s 35 (dead) and 36 - viewed from western side. Shows overall height and spread of the canopy.



Figure Thirty One - Trees 26, 41, 42, 43, 45 and 46 all - viewed from southern side. Shows overall height and spread of the canopy.



Figure Thirty - Two - Trees 46, 47 and 48 - viewed from western side. Shows overall height and spread of the canopy.



Figure Thirty- Three - Trees 49 and 50 viewed from western side





Figure Thirty - Four- Group 1 Viewed from western side.



Figure Thirty - Five- Group 2 viewed from eastern side.



Figure Thirty - Six - Group 3 - viewed from western side.

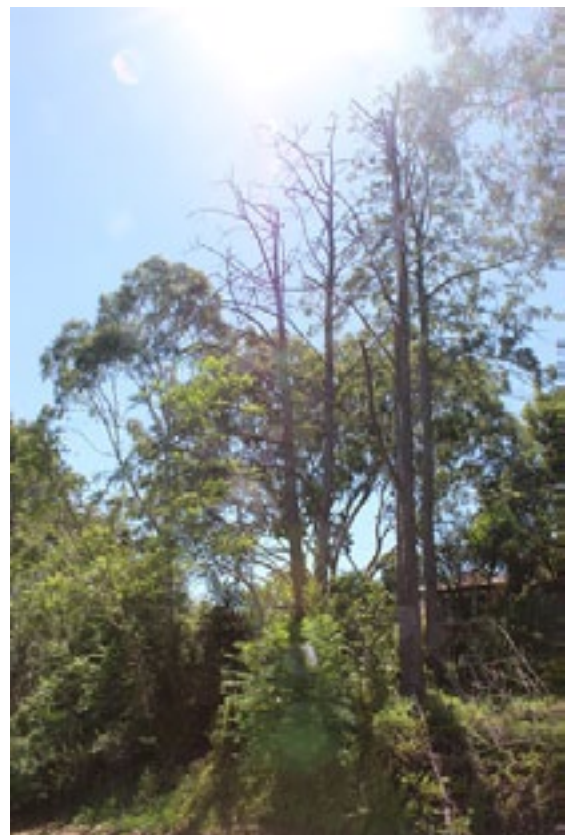


Figure Thirty - Seven - Group 4 viewed from western side



Figure Thirty - Eight- Group 5 viewed from southern side



Figure Thirty - Nine - Group 6 viewed from southern side - looking up the bank



Figure Forty - Group 6 viewed from northern side - from upper car park - looking across at the top of the bank





Figure Forty - One - Group 6 viewed from northern side - from upper car park - looking across at the top of the bank



Figure Forty- Two- Group 7 viewed from western side



Figure Forty - Three - Group 8 viewed from eastern side



Figure Forty - Four - Group 9 - viewed from eastern side



Figure Forty - Five - Group 10 viewed from northern side





Figure Forty - Six- Group 11 viewed from southern side - this tree is dying and there are signs of termite.



Figure Forty - Seven - A close of the termites nest in Group 11

### 3.3 The Impact

Figure Forty Eight - Impact Assessment Schedule

Tree No.	Construction Tolerance	TPZ (mR)	SRZ (mR)	% Incursion to root zone and or canopy	Retention Value	Likely Impact HS/S/M/L	Recommendation
1	P	2	1.5	100% Incursion to TPZ and SRZ	Low - medium	Very High Impact	Remove
2	P	6.3	3	40% Incursion to TPZ 21% Incursion to SRZ	Medium - high	High Impact	Remove
3	P	5.1	2.8	0% Incursion to TPZ and SRZ	Medium - high	No Impact	This tree should be retained and protected
4	H	2	1.5	0% Incursion to TPZ and SRZ-	Medium	No Impact	This tree should be retained and protected
5	P	4.8	2.7	0% Incursion to TPZ and SRZ	Low	No Impact	Remove
6	P	6.6	2.8	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value.
7	P	-	-	0% Incursion to TPZ and SRZ	Low	No Impact	REMOVE - suckering tree
8	P	4.8	2.5	0% Incursion to TPZ and SRZ	Medium	No Impact	It should be protected and retained
9	P	2	1.5	0% Incursion to TPZ and SRZ	Medium	No Impact	It should be protected and retained
10	P	3.6	2.3	0% Incursion to TPZ and SRZ	High	No Impact	It should be retained and protected
11	P	9	3.2	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value however it may be difficult to retain due to its location growing on the steep embankment
12	P	5.4	2.5	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value however it may be difficult to retain due to its location growing on the embankment
13	P	6.6	2.7	100% Incursion to TPZ and SRZ	Medium	Very High Impact	This tree has a moderate retention value
14	P	7.8	2.8	100% Incursion to TPZ and SRZ 100%	High	Very High Impact	This tree has a high retention value however it may be difficult to retain due to its location growing on the embankment
15	P	9.6	3.2	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value, however it may be difficult to retain due to its location growing on the embankment
16	P	7.2	2.7	100% Incursion to TPZ and SRZ	Low	Very High Impact	Ivy covered trunk - compromises the structural stability of tree - REMOVE Tree
17	P	7.2	2.8	100% Incursion to TPZ and SRZ	Medium	Very High Impact	This tree has a moderate retention value

Tree No.	Construction Tolerance	TPZ (mR)	SRZ (mR)	% Incursion to root zone and or canopy	Retention Value	Likely Impact HS/S/M/L	Recommendation
18	P	7.2	2.8	100% Incursion to TPZ and SRZ	Medium	Very High Impact	This tree has a moderate retention value
19	P	5.4	2.7	100% Incursion to TPZ and SRZ	Medium - High	Very High Impact	This tree has a moderate to high retention value
20	P	6	2.7	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value. However it may be difficult to retain due to its location growing on the embankment
21	H	6	2.7	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
22	P	2.4	2	0% Incursion to TPZ and SRZ	Low	No Impact	This tree has a low retention value. It can be removed.
23	P	7.2	2.8	30% Incursion to TPZ 6% Incursion to SRZ	High	High Impact to TPZ and SRZ	This tree has a high retention value however it may be difficult to retain due to its location growing on the lower embankment
24	P	7.2	2.8	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value
25	P	-	-	100% Incursion to TPZ and SRZ	low	Very High Impact REMOVE	REMOVE stump
26	P	4.8	2.1	100% Incursion to TPZ and SRZ	Medium	Very High Impact	This tree has a moderate retention value
27	P	6	2.7	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
28	P	5.1	2.7	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
29	P	7.4	2.85	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
30	P	3.9	2.3	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
31	P	2.7	2.25	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
32	P	2.7	2.3	100% Incursion to TPZ and SRZ	Low	Very High Impact	This tree has a low retention value. This tree should be removed
33	P	2.7	2.4	100% Incursion to TPZ and SRZ	Low	Very High Impact	This tree has a low retention value. This tree should be removed
34	P	4.2	2.3	100% Incursion to TPZ and SRZ REMOVE	Low REMOVE	Very High Impact	Poor health - remove

Tree No.	Construction Tolerance	TPZ (mR)	SRZ (mR)	% Incursion to root zone and or canopy	Retention Value	Likely Impact HS/S/M/L	Recommendation
35	P	-	-	100% Incursion to TPZ and SRZ	Low	REMOVE	REMOVE DEAD
36	P	3.3	1.95	0% Incursion to TPZ and SRZ	Medium	No Impact	This tree has a moderate retention value
37	P	-	-	REMOVE	low	REMOVE	REMOVE DEAD
38	H	-	-	REMOVE	low	REMOVE	REMOVE DEAD
39	P	-	-	REMOVE	low	REMOVE	REMOVE DEAD
40	P	-	-	REMOVE	low	REMOVE	REMOVE DEAD
41	P	5.4	2.5	30% Incursion to TPZ 20% Incursion to SRZ	Medium - High	High Impact to TPZ and SRZ	This tree has a medium high retention value.
42	P	5.4	2.5	100% Incursion to TPZ and SRZ	Medium - High	Very High Impact	This tree has a moderate high retention value.
43	P	6	2.7	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value.
44	P	5.4	2.5	100% Incursion to TPZ and SRZ	Medium - High	Very High Impact	This tree has a medium to high retention value.
45	P	6	2.5	100% Incursion to TPZ and SRZ	High	Very High Impact	This tree has a high retention value.
46	P	6	2.7	29% Incursion to TPZ 24% Incursion to SRZ	High	High Impact to TPZ and SRZ	This tree has a high retention value. It should be retained and protected
47	P	5.4	2.5	0.9% Incursion to TPZ 0% Incursion to SRZ	High	Very Low Impact to TPZ and SRZ	This tree has a high retention value. It should be retained and protected
48	P	5.4	2.5	0% Incursion to TPZ and SRZ	High	No Impact	Neighbouring tree - setback must be adhered to This tree has a high retention value. It should be retained and protected
49	P	6	2.6	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected
50	p	4.8	2.4	0% Incursion to TPZ and SRZ	High	No Impact	This tree has a high retention value. It should be retained and protected

Calculations as discussed in Methodology

Construction tolerance – This has been divided into three categories.

H – High

M – Medium

P- Poor

TPZ- Tree Protection Zone

SRZ – Structural Root Zone

#### Groups of Trees

As previously mentioned there were a few trees that were not included on the original survey these were mainly missed due to the steepness of the site. For the purpose of this report we have grouped the trees into numbered trees.

After assessing the proposed development Groups 1, 2 and 5 - 11 will all have 100 % incursion to their TPZ either due to the proposed location of the buildings or due to the steepness of the site. Any changes of grade within their TPZ will prevent them from remaining structurally stable due to the steepness of the existing embankment. . Group 3 and 4 will not be affected by the proposed development.

Figure Forty- Nine - Summary Table for Tree Retention Values

<b>Retention Value</b>	<b>Tree Number</b>	<b>Total Number of Trees Removed</b>	<b>Total Number of Trees Retained</b>
Low - Dead	7, 37, 38, 39, 40	5 (ALL DEAD)	0
Low	5, 16, 22, 25, 32, 33, 34, 35	6	2
Low - Medium	1	1	0
Medium	4, 8, 9, 13, 17, 18, 26, 36	4	4
Medium - High	2, 3, 19, 41, 42, 44	5	1
High	6, 10, 11, 12, 14, 15, 20, 21, 23, 24, 27, 28, 29, 30, 31, 43, 45, 46, 47, 48, 49, 50	12	10
<b>TOTALS</b>	<b>45 Trees Total (plus 5 dead trees)</b>	<b>28 (plus 5 trees which are already dead)</b>	<b>17</b>

## 4. DISCUSSION

It is proposed to build a seniors housing development over the land to the east, north and south of the existing club house. This area at present consists of a bitumen car park area, access roads between these parking areas and a steep embankment consisting of many shrubs and trees. The majority of site is sloping.

The proposed development will be comprised of five (5) buildings spread out across the total site with new landscaped gardens in between each building. There will be new driveways, car parking underneath the buildings and ramps installed across the site. There will also be 58 new parking spots above ground.

All of the subject trees show varying levels of vigour and growth. The health varies between all trees. We have given a high retention value to those trees that are in good health, are mature in size and improve the aesthetic of the site and have the potential to continue to do this. These trees also provide a habitat for the local fauna.

Trees 1 - 10, 21 and 22 are all growing along the eastern boundary of the site. These trees should be retained to provide a buffer between the properties and screening.

Trees 11- 16 and Tree 20 are all growing on the steep embankment between the two car park areas. Tree 11,12,14,15 and 20 have all been given high retention values. Tree 16 has a low retention value and Tree 13 has a medium retention value.

Trees 17, 18 and 19 all have medium - high retention values.

Trees 23 and 24 have a high retention value. Tree 25, 32 - 35 have low retention values.

Trees 13, 26, 36, 41, 42 and 44 have a medium retention value

Trees 27 - 31, 43, 45 - 50 all have of these trees have high retention values.

Trees 7, 25 and 37-40 have a low retention value.

The groups of trees as marked on the Survey Plan (Appendix 4) include trees of varying retention values. Trees which are located in groups 1, 2, 5 - 11 will be impacted by the proposed development. Trees in groups 3 and 4 will not be impacted by the proposed development

The site is difficult to develop due to the varying levels across the block and the necessity of levelling areas for access pathways and ramps. The proposed development will have a high impact on many of the subject trees. They are Trees 1-2, 11-20, 23- 26, 32-35, 41-46. These trees will not be able to remain on the site if the proposed development proceeds. Tree 47 will be impacted on a low level however this tree could be retained and protected throughout the development. It may require some canopy pruning. Trees 3 - 10, 21, 22, 27-31, 36, 48-50 will not be affected by the development. Trees 7, 25, 35, 37 - 40 are either dead diseased or dying and will require removal prior to any building works commencing.

In summary we have assessed forty- five (45) trees in detail and also we have identified an additional five (5) trees which are dead. Of the forty - five (45) trees it is proposed to protect and retain seventeen (17) of these trees on site and to remove twenty - eight (28) trees. It is important to note that the fauna and flora survey from Travers Bushfire & Ecology observed that on site there were "*No threatened flora species have been observed or considered likely to occur in a natural state*" and "*No hollow-bearing trees, nor any drainages or important Koala feed trees occur within the proposed development areas*". This is an important fact. The proposed landscape plan allows for large areas of open garden which will be able to support the growth of many replacement indigenous species.

## 5. CONCLUSION AND RECOMMENDATIONS

There are no strong arboricultural reasons to remove Trees 1-2, 11-20, 23- 26, 32-35, 41-46 however due to the site levels and the requirement for access to all areas of the site these trees will need to be removed if the proposed development is to proceed. We would recommend that Trees 7, 25, 35 and 37 - 40 be removed as they have low retention values and or are dead.

Trees 3 - 10, 21, 22, 27-31, 36, 47, 48-50 should be able to be retained and protected throughout the development process. Tree 47 may require some reduction pruning on the northern side of its canopy to make way for the walls of proposed new buildings.

In total five (5) trees will need to be removed as they are dead. There are forty - five (45) trees which were surveyed - it is proposed to remove twenty eight (28) of these trees and retain and protect seventeen (17) of these trees. Also there are no strong reasons to remove the trees located within the groups on the embankment however they will need to be removed as they are not sustainable in this location due to the fact that with any changes in the grade around their TPZ will be a threat to their structural stability. We would recommend that where trees are removed they are replaced by suitable species preferably those which are indigenous to the local area.

Please refer to the correct management procedures below.

Listed below we have outlined the correct management procedures for the subject trees;

### 5.1.0 Activities to be avoided within TPZ of trees to be retained.

The following activities should be avoided within the TPZ;

Removal of any plant material with machinery

Ripping or cultivation of soil

Storage of any spoil, soil or any such materials

Ripping or cultivation of the soil

Placement of site shed or temporary services

Soil disturbance or movement of natural features (such as rocks)

Disposal of waste materials and chemicals such as cement, paint, solvents, fuel, oil and other toxic liquids. This includes washing down tools and brushes

Changes in soil level

Movement and storage of plant, equipment and vehicles

Attachment of signage to trees

Any physical damage to the trunk or root system

Lighting of fires

### 5.2.0 Tree Protection

Throughout the construction process we recommend that the subject trees on site have the following tree protection measure taken. The trees to be retained on site will require a range of protection measures to protect them prior to and during the construction process. These should be installed prior to any work commencing on site.

#### 5.2.1 Tree Protection Fencing

The trees to be retained shall be protected by tree protection fencing. This fence is to be constructed with at least chain wire panels to a height of 1800mm, supported by steel stakes (as required) and fastened together so there is no movement sideways. Ideally these panels should be locked into 200mm x 100mm concrete blocks which will prevent movement and reduce the likelihood of the fencing being disturbed.

The protection fencing is to be placed around the perimeter of the TPZ. The fence shall be erected prior to any work commencing on site and shall be maintained in good condition for the entire construction period.

Wood chip mulch shall be spread across the total area of the TPZ to a depth of 50mm.

Mulch shall be spread by hand to avoid any compaction and soil disturbance within the TPZ.

Appropriate signage shall be installed on the fencing to prevent unauthorized movement of fencing and or entry into the TPZ.

#### 5.2.2 Trunk and branch protection

Where tree protection fencing cannot be installed due to its closeness to the proposed works, trunk protection shall be installed around the tree to avoid damage. As a minimum, the trunk protection shall consist of two metre lengths of hardwood timbers (100 x 50mm) spaced at 100-150mm centres tied together with 2mm galvanized wire. These shall be strapped around the tree trunk and/or branches to form a protective barrier from mechanical injury.

At no time should these materials be fixed to the tree in a manner which would damage the bark of the tree. The trunk and branch protection shall be erected prior to any work commencing on site and shall be maintained in good condition for the entire construction period.

#### 5.2.3 Crown protection

Additional crown protection may be required where the radius of the TPZ is less than the radius of the canopy. Tree protection fencing may need to be moved further out to encompass the drip line of the tree's canopy. This shall be done by the site arborist.

#### 5.3.0 Tree Damage

If the trees to be protected on the site are damaged in any way throughout the development period the site arborist shall be engaged to inspect the level of damage. The site arborist will provide advice on any remedial action to take place to prevent or reduce any further impact on the tree. This action shall be implemented as soon as practicable and certified by the site arborist.

#### 5.4.0 Tree and Root Pruning

All pruning work required shall be carried out in accordance with the Australian Standard No 4373 – 2007- Pruning of Amenity Trees. Prior to any pruning of the site's trees being done, written approval from council will be required under the Tree Preservation Order. All pruning to be carried out by a qualified and experienced arborist with a minimum AQF 4 qualification in accordance with the NSW Work Cover Code of Practice for the Amenity Tree Industry (1998). All care shall be taken when operating any equipment near the trees to avoid damage to the tree's canopy (foliage and branches). Under no circumstances shall branches be torn-off by construction equipment. Where there is potential risk that the tree canopy may be damaged by construction activity, the advice of the site arborist must be sought. If the tree is pruned without prior permission from the Willoughby Council, fines will apply. Where root pruning is necessary, roots shall be severed with a sharp, clean pruning instrument. The severed roots should be kept moist by covering them with a hessian material or mulch, for the duration of the construction period.

#### 5.6.0 Tree removal

The approval of the Willoughby Council shall be obtained prior to the removal of any tree.

All tree work to be carried out by a qualified and experience arborist or tree surgeon in accordance with the NSW Work Cover Code of Practice for the Amenity Tree Industry (1998).

All care should be taken to avoid the damage to other trees while removal is taking place. Stumps of trees to be removed shall be grounded out using a stump grinder without damaging the root systems of other trees.

Where tree stumps are located in close proximity to trees that are to be retained, stumps should be cut off at ground level, leaving root systems intact. This applies to those stumps found within TPZ of trees to be retained.

If any trees are removed without prior permission from Willoughby Council, fines will apply.



### **5.7.0 Signage**

Signs identifying the TPZ should be attached to the tree protection fencing. The signage should be easily read, clear to understand and made from durable material which will last for the duration of the development. The signage shall remain in place until final completion.

### **5.8.0 Maintenance of the trees to be protected**

The tree to be protected shall have a maintenance program implemented for the period of development. This shall include watering and fertilising as required. This shall be prepared by the site arborist and it should be carried out by he/she or a qualified horticulturist. If any trees are removed without prior permission from Sutherland Shire Council, fines will apply.

#### **5.8.1 Tree Watering**

The trees to be maintained on site should be well watered prior to the commencement of works and throughout the development period.

This will ensure the tree is not in any stress from drought. The site arborist shall implement a watering program depending on the season and amount of rain fall.

### **5.9.0 Site Induction**

All persons working on the site or accessing the site shall participate in a site induction. This is to inform all persons of the site access, the correct procedure when working around the tree protection zones, what the outcomes will be if any or all of the trees to be protected on site are damaged

### **6.0.0 Post Construction Measures**

#### **6.1.0 Maintenance**

The maintenance program shall be continued after final completion. Monthly checks shall be completed for the first 12 months and then 3 monthly checks for the following year. The signs of any stress in the tree will need to be noted and the site arborist will need to be consulted.

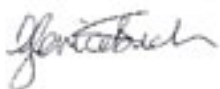
#### **6.2.0 Tree Protection Fencing**

The tree protection fencing can be removed once work is completed and no possible damage can be caused by vehicles or equipment.

#### **6.3.0 Replacement plantings**

All new trees to be planted will need to be suitable species for the site, location and able to be sustained in the long term. Ideally indigenous species should be used. Consideration needs to be taken on the choice of species so that they add to the amenity value of the park.

If you have any questions regarding this report please do not hesitate to contact the undersigned.



### **Glenice Buck**

Consulting Arborist (AQF 5)

#### **Assumptions**

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However Glenice Buck Designs Pty Limited can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

☐ Information contained in this report covers only the trees that were examined and reflects the condition of the tree at the time of inspection: and

☐ The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.

## 8.0 APPENDICES

### APPENDIX 1 - SITE INVENTORY SHEET

#### TREE INSPECTION INVENTORY SHEET & NOTES

Criterion	Code	Comment/ description
<b>Tree no:</b>		Must relate to the number on your site plan
<b>Species:</b> common Box)		may be coded - include a key to the codes; botanical names and names in key (eg. Lc = Lophostemon confertus Brush
<b>Age class:</b>	Y S M O	Recently planted Semi-mature (<20% of life expectancy) Mature (20-80% of life expectancy) Over-mature (>80% of life expectancy)
<b>Height:</b>		In metres
<b>Spread:</b>		Average diameter of canopy in metres
<b>Crown class:</b> other	D	Dominant (crown extends above general canopy; not restricted by trees)
crowded by	C	Co-dominant (crown forms the bulk of the general canopy but other trees)
quite	I	Intermediate (crown extends into dominant/codominant canopy but crowded on all sides)
	S	Supressed (crown development restricted from overgrowing trees)
<b>Crown condition:</b> overall vigour and vitality	0	Dead
	1	Severe decline (< 20% canopy; major dead wood)
	2	Declining (20-60% canopy density; twig and branch dieback)
	3	Average (60-90% canopy density; twig dieback)
	4	Good (90-100% crown cover; little on nor dieback or other problems)

## Tree Retention Value - Priority Matrix

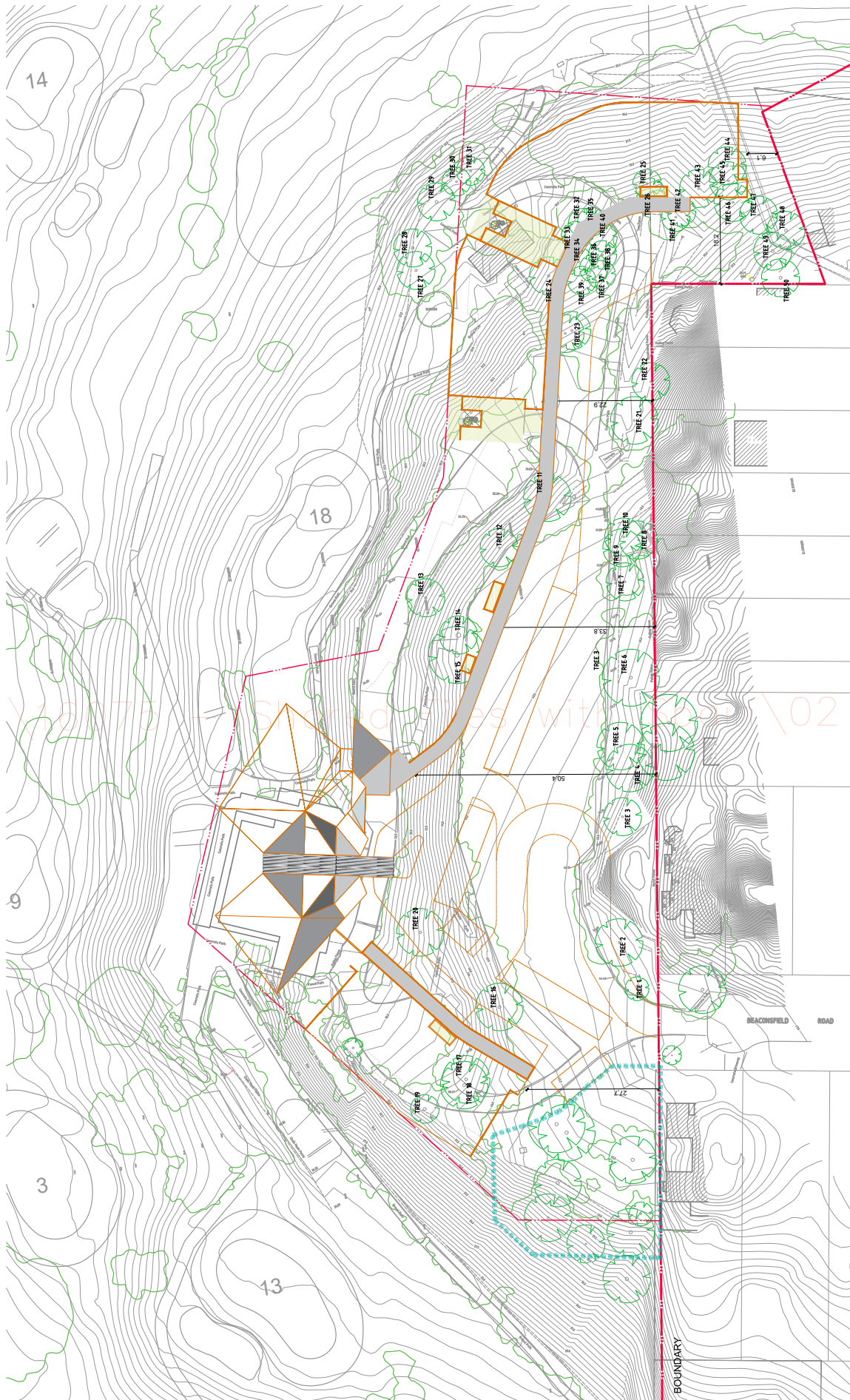
		SIGNIFICANCE				
		1. HIGH	2. MEDIUM	3. LOW		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest/Noxious Weed Species	Hazardous/ Irreversible Decline
ESTIMATED LIFE EXPECTANCY	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					

Legend for Matrix Assessment	
	Priority for Retention (High)- These trees are considered important for retention and should be retained and protected. Design modification or relocation of buildings should be considered to accommodate the setbacks prescribed by the Australian Standard AS 4970 Protection of Trees on Development Sites. Tree sensitive construction measures must be implemented eg pier and beam footings if works are to proceed with the Tree Protection Zone.
	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.
	Consider for Retention (Low)- These trees are not considered important for retention, nor require special work or design modifications to be implemented for their retention.
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

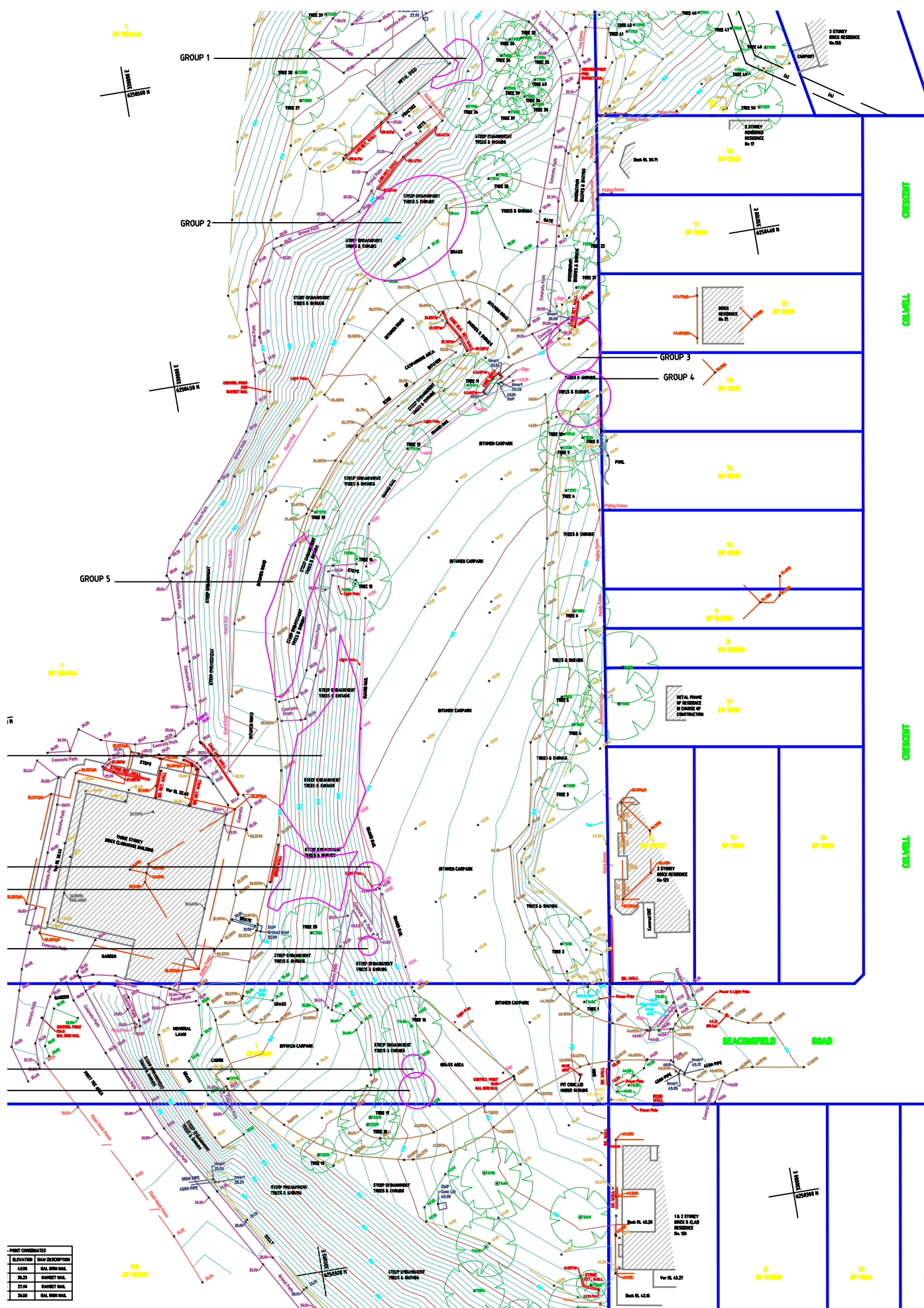
IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, [www.iaca.org.au](http://www.iaca.org.au)

**APPENDIX 3 - Site Plan showing Tree Locations and Numbers**  
**(NOT DRAWN TO SCALE - This plan has been scaled down to fit within this A4 document)**

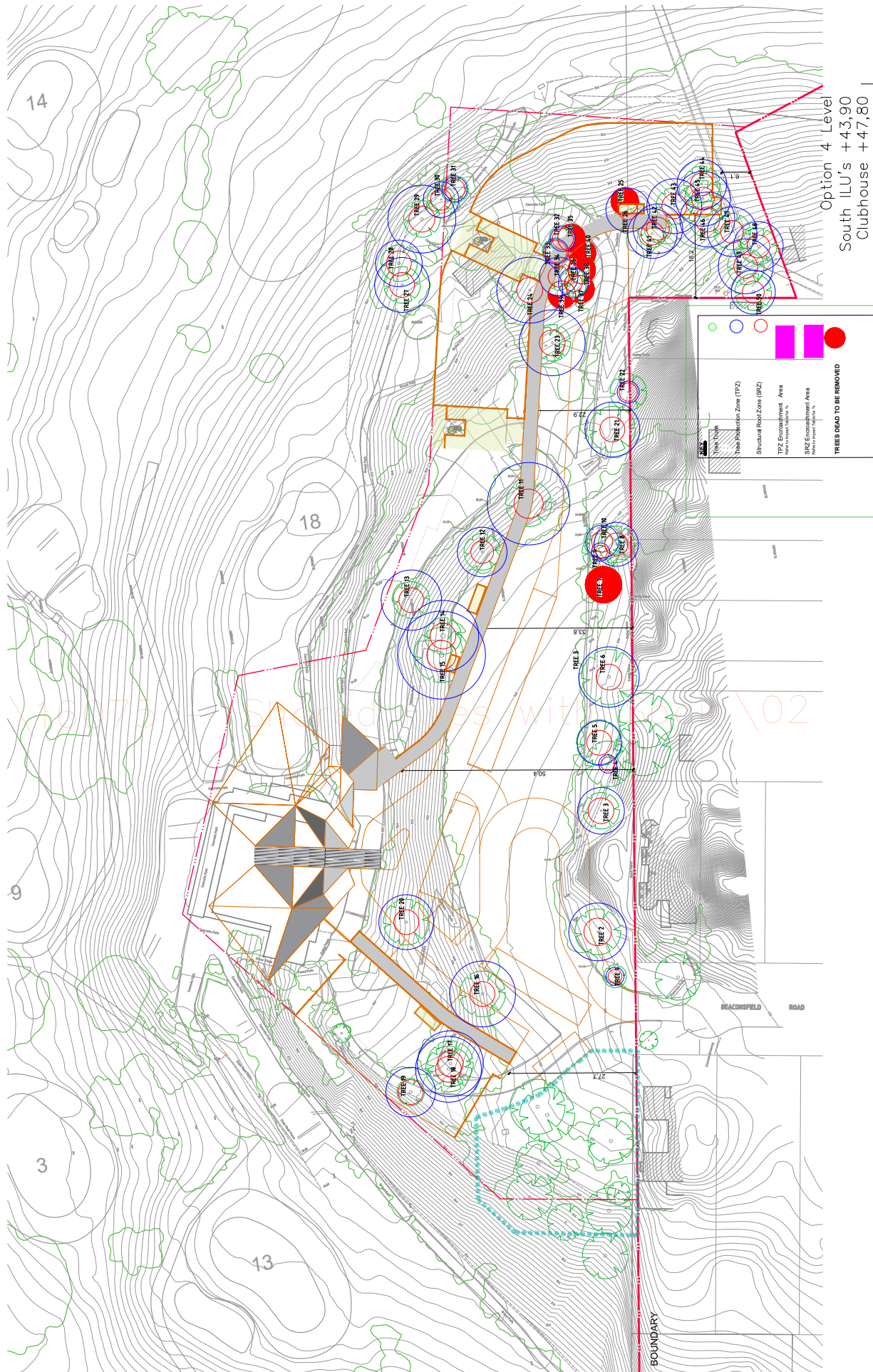




**APPENDIX 4 - Survey Plan showing groups of trees**  
**(NOT DRAWN TO SCALE - This plan has been scaled down to fit within this A4 document)**



**APPENDIX 5 - Site Plan showing TPZ and SRZ of Subject Trees  
(NOT DRAWN TO SCALE - This plan has been scaled down to fit within this A4 document)**





**KEY**

- Tree Trunk
- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- TPZ and SRZ Encroachment Area  
Reveal to impact? Value for %
- Trees to be removed.

