

# **ADVANCED TREESCAPE CONSULTING**

## **AQF5 ARBORICULTURIST & HORTICULTURIST**

☎ 02 4340 2964    📞 0408 439 186    📧 [advancedtreescape@bigpond.com](mailto:advancedtreescape@bigpond.com)

📮 PO Box 7192 KARIONG NSW 2250

ABN: 30 138 200 388



# **ARBORICULTURAL IMPACT ASSESSMENT**

**252-254 New South Head Road  
DOUBLE BAY NSW 2028**

**requested by  
Penoh Capital Land Pty Ltd**

**prepared by  
Russell Kingdom  
Qualified AQF5 Arboriculturist**

11/03/2020

**Principal: Russell Kingdom**

Fully Insured: Public Liability \$20M, Professional Indemnity \$5M & Personal Accident.

Advanced Treescape Consulting is committed to providing a safe working environment for its employees in accordance with The Occupational Health & Safety Act NSW 2000.



# TABLE OF CONTENTS

Table of Contents .....	2
Table of Figures .....	3
1.0 Proposal .....	4
2.0 Scope of Report .....	4
3.0 Site Inspection .....	4
3.1 Site Assessment .....	5
4.0 Method of Assessment .....	5
5.0 Assessment of VTA, Impact & Tree Protection Measures required by Proposed Plans .....	6
Tree Schedule .....	6
5.1 Discussion .....	10
5.2 Tree Significance (Appendix 4) .....	11
5.3 Sustainable Retention Index Value (SRIV) .....	11
Table 1.0 Tree Retention Value - Priority Matrix .....	11
Summary of Trees & SRIV Recommendations .....	11
5.4 Gradient of Impacts .....	11
6.0 Tree Protection Plan .....	12
a) Project Arborist (AQF5) .....	12
b) Induction for Tree Protection .....	12
c) Identify Further Potential Impacts on Trees by Proposed Plans .....	12
d) Tree Protection Zones using AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009) .....	12
e) Tree Protection Works .....	13
f) Tree Works .....	13
g) Tree Protection Schedule .....	13
7.0 Tree Protection Stages .....	13
a) Works Prior to Demolition .....	13
b) Works During Demolition .....	14
c) Excavation/Earthworks .....	14
d) Construction Works .....	14
e) Landscaping Phase .....	14
8.0 Conclusions .....	14
9.0 Recommendations .....	15
Appendix 1: Site Plan with Trees and Proposed Development .....	16
Appendix 1a: Site Plan with Trees and Proposed Development (Level 1) .....	17
Appendix 1a: Site Plan with Trees and Proposed Development (Level 2) .....	18
Appendix 1b: Site Plan with Trees and Proposed Development (Level 3) .....	19
Appendix 1c: Site Plan with Trees and Proposed Development (Level 4) .....	20
Appendix 1d: Site Plan with Trees and Proposed Development (Level 5) .....	21
Appendix 1e: Site Plan with Trees and Proposed Development (Level 6) .....	22
Appendix 1f: Site Plan with Trees and Proposed Development (Level 7) .....	23
Appendix 1g: Site Plan with Trees and Proposed Development (Roof Level) .....	24
Appendix 1h: Site Plan with Trees and Proposed Development (Roof) .....	25
Appendix 1i: Site Plan with Trees and Proposed Development (Landscape) .....	26
Appendix 1j: Site Plan with Trees and Proposed Development (Street Elevation) .....	27
Appendix 1k: Site Plan with Trees and Proposed Development (Section) .....	28
Appendix 1L: Site Survey with Trees and Existing Development .....	29
Appendix 1m: Site Survey with Trees and Existing Development Showing Trees to be Relocated .....	30
Appendix 2: Photographs .....	31
Appendix 3: Notes on Tree Assessment .....	34
Appendix 4: Significance of a Tree, Assessment Rating System (STARS) (IACA) .....	36
Table 1.0 Tree Retention Value - Priority Matrix .....	37
Appendix 4a: Levels of Visual Assessment .....	38
Appendix 4b: Visual Tree Assessment .....	39
Appendix 5: Extract from AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009), Section 3: Determining the Tree Protection Zones of the Selected Trees, 3.1 Tree Protection Zone (TPZ) .....	40
Appendix 6: Extract from AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009), Section 3: Determining the Protection Zones of the Selected Trees, 3.3.5 Structural Root Zone (SRZ) .....	41
Table 2.0 TPZ and SRZ Table .....	42
Appendix 7: Tree Protection Zones – Standard Procedure .....	43
Appendix 8: Tree Protection on Construction Sites .....	46
Appendix 9: SULE (Safe & Useful Life Expectancy) .....	51
Appendix 10: Glossary .....	52
Glossary Bibliography .....	61
Appendix 11: Curriculum Vitae .....	62
Conference Attendance & Training .....	62
Industry Background .....	63
Business Achievement .....	63
Memberships .....	63
Disclaimer .....	64
Works Cited in This Report .....	65

TABLE OF FIGURES

Figure 1: Tree 1. .... 31

Figure 2: Tree 2. .... 31

Figure 3: Tree 3. .... 31

Figure 4: Tree 4. .... 31

Figure 5: Tree 4 - showing split. .... 31

Figure 6: Tree 5 & 6. .... 31

Figure 7: Base of Tree 8..... 31

Figure 8: Crown of Tree 8..... 31

Figure 9: Tree 9. .... 32

Figure 10: Tree 10. .... 32

Figure 11: Showing the crown of Tree 10. .... 32

Figure 12: Tree 11 & 10. .... 32

Figure 13: Tree 11. .... 32

Figure 14: Tree 11. .... 32

Figure 15: Tree 12. .... 32

Figure 16: Tree 13. .... 33

Figure 17: Tree 13. .... 33

Figure 18: Tree 13. .... 33

Figure 19: Tree 13. .... 33

Figure 20: Tree 14. .... 33

Figure 21: Tree 14. .... 33

Figure 22: Tree 14. .... 33

Figure 23: Tree 15. .... 33

## 1.0 Proposal

Penoh Capital Land Pty Ltd has commissioned Advanced Treescape Consulting to prepare an Arboricultural Impact Assessment at 252-254 New South Head Road, Double Bay. This site is in the Woollahra Municipal Council Local Government Area where there is a Tree Preservation Order in force.

It is proposed to demolish the existing building and construct an 8-story residential development.

The subject site was inspected on 19/09/2019. The plans supplied are from Antoniades Architects, Drawing No. AA.RES.1904, pages 2 through to 14, dated 14/02/2020 and Cibar Land Surveyors, Drawing No. 19133\_LD, Revision 1, dated 30/09/2019. The site plan in Appendix 1 illustrates the location of all surveyed trees.

This assessment has been carried out by Russell Kingdom: Diploma in Arboriculture (AQF5), Graduate Diploma of Horticulture (AQF8) - Australian Qualification Framework (AQF) (Department of Education and Training, Australian Government) (see Appendix 11).

## 2.0 Scope of Report

- Assess the trees on site.
- Assess the impact of the proposed development on the trees.
- Identify trees to be retained and those that require removal to facilitate the proposed development plans.
- Make recommendations to ensure the impact on the retained trees is acceptable and complies with AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009).

## 3.0 Site Inspection

The property faces south and is a residential developed block. The land slopes steeply from south to north.

The site is extremely steep, sloping at the front and there is approximately a 6m difference between the footpath height and the height of the land, 6m in from the front boundary.

Located on the boundary is a large *Jacaranda mimosifolia* (Jacaranda) that is highly visible from New South Head Road. Towards the rear of the site there are *Celtis sinensis* (Chinese Hackberry) trees - which are listed as an exempt species in Woollahra Municipal Council's Tree Preservation Order.

There are several trees located in adjoining properties.

The soil texture was observed to be clay-based *Gymea* soils<sup>1</sup>. *Gymea soil limitations* are localised steep slopes, high soil erosion hazard, rock outcrop, shallow highly permeable soil and very low soil fertility.

Drainage characteristics are considered to be good.

---

<sup>1</sup> (Chapman, et al., 2002)

## 3.1 Site Assessment

- The microclimate is considered good as all trees appear to have reached their genetic potential.
- There are no re-reflected heat load issues.
- There are no sunlight level issues.
- There is no irrigation visible on the site.
- The site is exposed to all winds.

## 4.0 Method of Assessment

An **objective visual inspection** was made from the ground of the health and condition of the trees based on the Levels of Visual Assessment method (Appendix 4a) – ‘Level 2: Basic Assessment Process’ (Dunster, et al., 2013) as well as the *Visual Tree Assessment* (VTA) technique described by Mattheck and Breloer (Mattheck, et al., 1994) (Appendix 4b). The Tree Schedule (provided in ‘5.0 Assessment of VTA, Recommendations of Impact & Tree Protection Measures required by Proposed Plans’) was based upon:

- Estimation of tree heights by Silva Clino Master/Heightmeter™ plus visual estimates of canopy spreads.
- Distances of trees, etc. are measured using a Leica Disto™ D2 Laser Distance Meter.
- All photographs that appear in this report are unaltered originals which were taken during site inspection (see Appendix 2).
- Hazard ratings for all trees (see Tree Schedule in clause 5.0 ‘Assessment of VTA, Impact & Tree Protection Measures’) refer to Failure Potential, Size of Defective Part & Target Rating = Hazard Rating is out of 12.
- Significance Rating.
- Calculation of Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) using AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009) (see Appendix 5 and 6).
- Any additions, mark-ups and/or calculations to plans included in this report have been made using Bluebeam® Revu®<sup>2</sup>.
- The application of TPZs and SRZs using AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009) (see Appendix 7 and 8).
- Glossary (see Appendix 10).
- Trees were numbered with aluminium tags for easy identification.

It should be noted that this objective assessment and related VTA assessments are based upon health and condition that were observed at the time of inspection.

The recommendations of this report regarding retention, works or removal are based upon Safe & Useful Life Expectancy (SULE – see Appendix 9) and hazard ratings being applied.

This information has guided the conclusions in this report.

---

<sup>2</sup> <http://www.bluebeam.com>

## 5.0 Assessment of VTA, Impact & Tree Protection Measures required by Proposed Plans

Accepted tree management practices recommend removal of trees where SULE ratings are 3 (or listed as dead), and/or where hazard ratings are high [where ratings adapted from Matheny and Clark range from low=3 to dangerous=12] (Matheny, et al., 1994). A detailed explanation of SULE ratings is provided in Appendix 9. Height/Diameter Ratio should not exceed 1:30 (Mattheck, et al., 1994).

The trees contained within the Tree Schedule (see below) range from having short to long SULEs. These trees also have a broad range of hazard ratings which limits the retention of such trees within development sites.

Appendix 3 provides explanations of abbreviations and assessment criteria.

**Tree Protection Zones for each of the trees that are assessed to be retained and protected are highlighted in yellow in the Tree Schedule below. It should be noted that distance stated is a radius, not a diameter. AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009) states that an intrusion of the TPZ of less than 10% is considered minor. No above-ground intrusion into the TPZ is to exceed 20% of total TPZ area (e.g. cantilevered building, balcony etc.).**

### Tree Schedule

ABBREVIATIONS: m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-quad-dominant trunk, Multi-5+ trunks/leaders, J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, REC-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, VTA-visual tree assessment, Hazard Rating-3=low hazard ~ 12=dangerous, N/A-not applicable, SULE-safe & useful life expectancy, SRIV-Sustainable Retention Index Value.																				
TREE NO.	SPECIES	HEIGHT (m)	DBH (mm)	DGL (mm)	RADIUS OF FULL TPZ (m)	RADIUS OF FULL SRZ (m)	HEALTH/VIGOUR	STRUCTURAL CONDITION	CANOPY SPREAD (m)				AGE CLASS	VTA	HAZARD RATING (3 - 12)	SIGNIFICANCE RATING	SULE	SRIV	(1) COMMENT ON TREE ASSESSMENT (2) ASSESSMENT OF IMPACT (3) TREE PROTECTION MEASURES	REC
									N	S	E	W								
1	Jacaranda mimosifolia (Jacaranda)	16	650	750	7.8	2.9	F	G	10	8	6	8	VM	Pass	5	High	2B	High	1. This tree has a restricted root plate. There are terraces to the north Terrace 1 800mm; Terrace 2 740mm and two more terraces 5m to bottom terrace (east of handrail 1.8m). 2. This tree has a full TPZ of 119.13m <sup>2</sup> (7.8m'). There is an intrusion from the existing residential unit building at No. 256 New South Head Road of 3.47m <sup>2</sup> (1.82%) and from the proposed development of 33.4m <sup>2</sup> (17.47%). The land to the north slopes steeply from 1m from the trunk and is below the level of the tree. This intrusion will have less impact on this tree compared to a flat site. There are retaining walls between this tree and the proposed development. This is a moderate, acceptable level of impact. Retain and protect. 3. TPZ fencing is required as per Appendix 8. The size of the TPZ is shown in this table (radius of full TPZ) and highlighted in yellow.	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-quad-dominant trunk, Multi-5+ trunks/leaders, J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, REC-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, VTA-visual tree assessment, **Hazard Rating-3**=low hazard ~ **12**=dangerous, **N/A**-not applicable, **SULE**-safe & useful life expectancy, **SRIV**-Sustainable Retention Index Value.

TREE NO.	SPECIES	HEIGHT (m)	DBH (mm)	DGL (mm)	RADIUS OF FULL TPZ (m)	RADIUS OF FULL SRZ (m)	HEALTH/VIGOUR	STRUCTURAL CONDITION	CANOPY SPREAD (m) N S E W	AGE CLASS	VTA	HAZARD RATING (3 - 12)	SIGNIFICANCE RATING	SULE	SRIV	(1) COMMENT ON TREE ASSESSMENT (2) ASSESSMENT OF IMPACT (3) TREE PROTECTION MEASURES	REC
2	<i>Cotoneaster glaucophyllus</i> (Grey-leaved Cotoneaster)	5	210	300	2.5	2.0	VP	F	- 3 1 2	VM	Fail	4	Low	3B	Low	1. This tree has only 20% canopy cover and is declining. It fails the VTA and is not suitable to be considered for retention. 2. This tree is located within the proposed building footprint. Removal is required to facilitate the proposed development plans. 3. N/A.	R
3	<i>Murraya paniculata</i> (Orange Jessamine)	6	200	350	2.4	2.1	F	P	2 1 2 2	VM	Fail	4	Low	3B	Low	1. This shrub has been severely lopped. It fails the VTA and is not suitable to be considered for retention. 2. Removal is recommended. 3. N/A.	R
4	<i>Camellia sasanqua</i> (Sasanqua)	4	CD 60 50 (100)	100	2.0	1.5	G	VP	1 radial	M	Fail	4	Low	3B	Priority for Removal	1. This tree is split in the main fork union at 150mm above ground. It fails the VTA and is not suitable to be considered for retention. 2. Removal is recommended. 3. N/A.	R
5	<i>Livistona australis</i> (Cabbage-tree Palm)	20	460	620	3.0**	N/A	G	G	2 radial	VM	Pass	4	Medium	2B	Medium	1. This palm is growing on top of the bank, 1.1m to edge of the site. 2. This palm is located within the proposed building footprint. This palm is to be relocated to the rear of the site (see Appendix 1m). 3. N/A.	T
6	<i>L. australis</i> (Cabbage-tree Palm)	20	550	650	3.0**	N/A	G	G	2 radial	VM	Pass	4	Medium	2B	Medium	1. This palm has a vine growing up its trunk. It is located 1.45m from the handrail at edge of site. 2. This palm is located within the proposed building footprint. This palm is to be relocated to the rear of the site (see Appendix 1m). 3. N/A.	T
7	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	5	160	300	3.0**	N/A	G	G	2 radial	YM	Pass	4	Medium	2B	Medium	1. This palm is in the adjacent site, 1.53m from the retaining wall at the edge of site. This palm passes the VTA and is suitable to be considered for retention. 2. The full TPZ of this palm will not be impacted by the proposed development. Retain and protect. 3. TPZ fencing is not required as the site boundary fence will provide adequate protection.	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-quad-dominant trunk, Multi-5+ trunks/leaders, J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, REC-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, VTA-visual tree assessment, Hazard Rating-3=low hazard ~ 12=dangerous, N/A-not applicable, SULE-safe & useful life expectancy, SRIV-Sustainable Retention Index Value.

TREE NO.	SPECIES	HEIGHT (m)	DBH (mm)	DGL (mm)	RADIUS OF FULL TPZ (m)	RADIUS OF FULL SRZ (m)	HEALTH/VIGOUR	STRUCTURAL CONDITION	CANOPY SPREAD (m) N S E W	AGE CLASS	VTA	HAZARD RATING (3 - 12)	SIGNIFICANCE RATING	SULE	SRIV	(1) COMMENT ON TREE ASSESSMENT (2) ASSESSMENT OF IMPACT (3) TREE PROTECTION MEASURES	REC
8	<i>Persea americana</i> (Avocado)	10	290	440	3.5	2.3	G	G	2 3 1 4	M	Pass	5	Low	2B	Low	1. This fruit tree is in the adjacent site, 350mm from the boundary fence and 300mm from the retaining wall on the site. The ground level next door is 500mm above site. This tree passes the VTA and is suitable to be considered for retention. 2. The full TPZ of this tree will not be impacted by the proposed development. Retain and protect. 3. TPZ fencing is not required as the site boundary fence will provide adequate protection.	S
9	<i>P. americana</i> (Avocado)	10	CD 2x280 (400)	460	4.8	2.4	G	F	4 3 4 6	M	Pass	5	Low	2B	Low	1. This fruit tree is in the adjacent site 1.4m to the boundary. It has inclusive main fork union. This tree passes the VTA and is suitable to be considered for retention. 2. The full TPZ of this tree will not be impacted by the proposed development. Retain and protect. 3. TPZ fencing is not required as the site boundary fence will provide adequate protection.	S
10	<i>Celtis sinensis</i> (Chinese Hackberry)	16	360	480	4.3	2.4	G	P	6 8 4 8	M	Fail	8	Low	2B	Low	1. This tree is 1.9m from the boundary fence and a 1m high retaining wall. There are visible surface roots and it has a tropism to the east and west. This tree fails the VTA and is not suitable to be considered for retention. 2. Removal is recommended. 3. N/A.	R
11	<i>C. sinensis</i> (Chinese Hackberry)	18	380	510	4.6	2.6	G	F	8 1 6 6	M	Pass	5	Low	2B	Low	1. This tree is 1.5m - centre of trunk (COT) from the building. It has visible surface roots. 2. This tree is located within the proposed building footprint. Removal is required to facilitate the proposed development plans. 3. N/A.	R
12	<i>C. sinensis</i> (Chinese Hackberry)	16	270	540	3.2	2.6	G	F	8 1 6 2	M	Pass	5	Low	2B	Low	1. This tree (COT) is 1.8m from the building and 600-800mm from the retaining wall. Its crown has been reduced. 2. This tree is located within the proposed building footprint. Removal is required to facilitate the proposed development plans. 3. N/A.	R



**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-quad-dominant trunk, Multi-5+ trunks/leaders, J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, REC-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, VTA-visual tree assessment, **Hazard Rating-3**=low hazard ~ **12**=dangerous, **N/A**-not applicable, **SULE**-safe & useful life expectancy, **SRIV**-Sustainable Retention Index Value.

TREE NO.	SPECIES	HEIGHT (m)	DBH (mm)	DGL (mm)	RADIUS OF FULL TPZ (m)	RADIUS OF FULL SRZ (m)	HEALTH/VIGOUR	STRUCTURAL CONDITION	CANOPY SPREAD (m) N S E W	AGE CLASS	VTA	HAZARD RATING (3 - 12)	SIGNIFICANCE RATING	SULE	SRIV	(1) COMMENT ON TREE ASSESSMENT (2) ASSESSMENT OF IMPACT (3) TREE PROTECTION MEASURES	REC
13	<i>Howea forsteriana</i> (Kentia Palm)	12	140	200	3.0**	N/A	G	F	2 radial	M	Pass	4	Low	2B	Low	1. This palm is very tall and thin. 2. This palm is <1.5m from the proposed development. Removal is required to facilitate the proposed development plans. 3. N/A.	R
14	<i>Olea europaea</i> (European Olive)	12	450	500	5.4	2.5	G	G	- 10 4 2	VM	Pass	6	Medium	2B	Medium	1. This tree has a tropism to the south. The building is 600mm from the trunk (COT) and 500mm to the cut. This tree is unbalanced. 2. This tree is located within the proposed building footprint. Removal is required to facilitate the proposed development plans. 3. N/A.	R
15	<i>Cinnamomum camphora</i> (Camphor Laurel)	8	CD 70 110 (100)	240	2.0	1.8	G	G	2 2 4 2	J	Pass	4	Low	2B	Low	1. This tree is listed as exempt in Woollahra Development Control Plan 2015, Chapter E3.4.1 as it is <10m in height. 2. This SRZ of this tree is located within the proposed building footprint. Removal is required to facilitate the proposed development plans. 3. N/A.	R

\*\*As stated in Section 3, clause 3.2, of AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009), “The TPZ for palms or other monocots, cycads or tree ferns should not be less than 1m outside the crown projection”.

In clause 3.35/Note 4 it states that “The RSRZ formula and graph do not apply to palms, other monocots, cycads and tree ferns”.

## 5.1 Discussion

**TREES THAT PASS THE VTA (ONSITE) & ARE TO BE RETAINED:** ..... 1.

**TREES THAT PASS THE VTA (ONSITE) & ARE TO BE RELOCATED:** ..... 5 & 6.

**TREES THAT PASS THE VTA IN THE ADJACENT SITE (TO BE RETAINED):** ..... 7, 8 & 9.

**TREES THAT FAIL THE VTA & ARE RECOMMENDED FOR REMOVAL:** ..... 3, 4 & 10.

**TREES THAT REQUIRE REMOVAL TO FACILITATE THE PROPOSED DEVELOPMENT PLANS:** .....  
..... 2, 11, 12, 13, 14 & 15.

There is a tree shown on the site survey that has known been removed (S.E.S tape) - See Appendix 1L: Site Survey and Existing Trees.

Tree 1 is the most prominent tree located on the site. The existing landscaping surrounding the tree is located within its SRZ. Also, with the TPZ of this tree are retaining walls and small garden beds. The proposed plans will have a 17.47% intrusion into the TPZ, but the difference in levels from the trunk of the tree at ground level and the position of the location of the ground floor and basement levels is at least 6m below the level of this tree. Due to the extensive landscaping it's considered that this is a moderate level of intrusion. This will be an acceptable impact on this tree and not impact its long-term viability through the proposed works. Landscaping works within the TPZ of this tree should be supervised by the project arborist as care needs to be taken to ensure that no tree roots are impacted by the proposed landscaping works.

Trees located on the site that will be required to be removed facilitate the proposed plans are Tree 2, 11, 12, 13, 14 & 15. All other trees on the site have been identified as having low significance and should be replaced with more suitable species in the landscape plan.

Tree 5 & 6 have been assessed to be of medium significance and are located within the proposed building footprint. It is recommended that both of these palm trees are relocated to the rear of the site and transplanted.

Tree 7, 8 & 9 are located in the adjoining property to the west of the site. The proposed plans will have an acceptable impact on each of these trees and will not affect their long-term viability.

## 5.2 Tree Significance (Appendix 4)

- Tree 1 listed in this report is of **high** significance.
- Tree 5, 6 & 7 listed in this report are of **medium** significance.
- Tree 2, 3, 4, 8, 9, 10, 11, 12, 13 & 15 listed in this report are of **low** significance.

## 5.3 Sustainable Retention Index Value (SRIV)

**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						
		<b>Priority for Retention (High)</b> - These trees are considered important for retention and should be retained and protected. Design modification or relocation of building/s should be considered to accommodate the setbacks as detailed in Table 2. Special construction works must be implemented e.g. pier and beam, etc if works are to proceed within the Tree Protection Zone.				
		<b>Consider for Retention (Medium)</b> - These trees may be retained and protected. These are considered less critical; however, their retention should remain a priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.				
		<b>Consider for Removal (Low)</b> - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.				
		<b>Priority for Removal</b> - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.				

### SUMMARY OF TREES & SRIV RECOMMENDATIONS

- Tree 1 listed in this report has a **High** SRIV rating (Priority for Retention).
- Tree 5, 6 & 7 listed in this report have a **Medium** SRIV rating (Consider for Retention).
- Tree 2, 3, 8, 9, 10, 11, 12, 13 & 15 listed in this report have a **Low** SRIV rating (Consider for Removal).
- Tree 4 listed in this report has a **Priority for Removal**.

## 5.4 Gradient of Impacts<sup>3</sup>

0% of TPZ impacted – no impact of significance

0 to 10% of TPZ impacted – low level of impact

10 to 15% of TPZ impacted – low to moderate level of impact

**15 to 20% of TPZ impacted – moderate level of impact - Tree 1 (17.47%)**

20 to 25% of TPZ impacted – moderate to high level of impact

25 to 35% of TPZ impacted – high level of impact

>35% of TPZ impacted – significant level of impact

<sup>3</sup> Used with permission of Landscape Matrix.

# 6.0 Tree Protection Plan

## *for 252-254 New South Head Road, DOUBLE BAY NSW 2028*

### **a) Project Arborist (AQF5)**

A project arborist (AQF5) is to be engaged to supervise implementation of works for the duration of construction.

### **b) Induction for Tree Protection**

All workers entering the site involved in construction must be advised of the tree protection measures and specifications outlined within this report during the site induction. This is to be verbally acknowledged and signed off before the commencement of works.

### **c) Identify Further Potential Impacts on Trees by Proposed Plans**

- No fill soils be used in any TPZ unless approved by Woollahra Municipal Council.
- Soil cuts are not permitted in any TPZ unless approved by Woollahra Municipal Council.
- Services should not be in or run through any TPZ unless approved by Woollahra Municipal Council.
- Site Office/Toilet, etc., are not to be located within any TPZ unless approved by Woollahra Municipal Council.
- All materials must not be stored in any TPZ unless approved by Woollahra Municipal Council.
- Aeration of the soil is managed by the TPZ fencing and ground protection measures. Refer to AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009).
- An area is to be set aside for tradespeople to wash down equipment away from any TPZ. The location of the wash down point should be approved by the project arborist unless approved by Woollahra Municipal Council.

### **d) Tree Protection Zones using AS 4970-2009 Protection of trees on development sites (Australian Standard®, 2009)**

DBH – Diameter at Breast Height (1.4 metres)

DGL – Diameter at Ground Level

TPZ = DBH (stem) x 12 (radius)

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

See Appendix 5 and Appendix 6

**Refer to the Tree Schedule in clause 5.0 'Assessment of VTA, Impact & Tree Protection Measures' required by Proposed Plans' for TPZ and SRZ details**

\* Minimum TPZ is 2 metres – Maximum TPZ is 15 metres | # Minimum SRZ is 1.5 metres

## ***e) Tree Protection Works***

- TPZ fences are to be erected around the retained tree (Tree 1) before construction commences (see Appendix 8).
- The distance from the tree trunk to the TPZ fence is specified in Tree Schedule in clause 5.0 'Assessment of VTA, Impact & Tree Protection Measures' and highlighted. N.B: This is a radius, not diameter.
- The TPZ fence is to be constructed of two (2) metres high temporary chain wire fencing. This is preferable to star pickets as it would require them to be hammered into the ground which could damage roots. This action will greatly reduce the stress on the trees. The TPZ fence should be left in place until the landscaping phase of construction begins.
- TPZ signage as per Appendix 7 to be attached to TPZ fencing.

## ***f) Tree Works***

- All tree work is to be carried out by a suitably qualified and insured Arborist (AQF3).
- Any crown reduction/management works required must comply with AS 4373-2007 Pruning of amenity trees (Australian Standard®, 2007).

## ***g) Tree Protection Schedule***

- a) Mark all trees on site for removal or retention - certification letter required.
- b) Inspect site after tree removal and certify trees identified for retention are still there - certification letter required.
- c) Inspect tree protection fencing. Ensure that all requirements of approved development application (DA) have been complied with - certification letter required.
- d) After the initial certification inspection and arboriculturist appointment letter, the site will be regularly inspected at monthly intervals unless otherwise specified in approved DA.
- e) Supervision of in-ground works as specified in the DA e.g. root cutting trenching, pipe installation etc. - certification letter required.
- f) At the completion of works all tree protection measures are to be inspected and when appropriate, authorised to be removed - certification letter required.
- g) Supervision of landscaping in-ground works within the TPZs of retained trees - certification of correct planting and landscaping procedures required.
- h) Certification of correct planting methods for replacement trees as specified in an approved landscape plan - certification for planting of replacement trees required.

# **7.0 Tree Protection Stages**

## ***a) Works Prior to Demolition***

- All trees within the site are to be marked for Removal or Protection (retention).
- TPZ fencing to be erected around retained trees as per Appendix 8 prior to any works commencing.
- TPZ fencing is to be inspected by the Project Arborist (AQF5) and a letter certifying compliance is to be sent to the Principal Certifying Authority.

### ***b) Works During Demolition***

- Tree removal works can be carried out during demolition by a suitably qualified and insured Arborist (AQF3).
- All TPZ fencing is to be retained during works.

### ***c) Excavation/Earthworks***

- There will be earthworks to level the site. Any tree roots encountered within the works area need to be correctly terminated by the Project Arborist (AQF5), which is cut by a hand saw and not smashed off with an excavator bucket. Correctly terminating a root will ensure that the tree roots do not suffer from decay.

### ***d) Construction Works***

- TPZ fencing to remain in place during construction and regularly inspected by the project arborist.

### ***e) Landscaping Phase***

- The TPZ fencing may be removed during the Landscaping Phase.
- All trees removed should, where practicable, be replaced at the landscaping phase as part of the proposed Development Application (DA).
- At the landscaping phase, the retained tree must only have tube stock plants planted with the structural root zone (SRZ). No additional (fill) soil is to be added within the TPZ of any retained tree.
- The Project Arborist (AQF5) should supervise all works within the TPZ areas of retained trees.

## **8.0 Conclusions**

The proposed development will retain one tree that is located at the front of the site. There will be an acceptable impact on this tree from the proposed development. Works within its TPZ need to be supervised by project arborist to ensure the least possible impact on the tree. This tree provides high levels of streetscape amenity.

Tree 5 & 6 are located within the proposed building footprint. It is recommended that both of these palm trees are relocated to the rear of the site and transplanted there.

All trees located in adjoining sites will not be impacted and the proposed development will not impact their long-term viability. Trees identified to be removed should be replaced in the landscape plan. This will ensure the area's amenity will be enhanced in the future.

## 9.0 Recommendations

Implement all recommendations contained in Clauses 5.0, 5.1, 6.0 & 7.0.

**Reason:** These recommendations have been developed in accordance with AS 4970-2009 (Australian Standard®, 2009) to reduce the impact of the proposed development on the retained trees.

The trees to be removed have been assessed as being unsuitable to be considered for retention or they have an unacceptable impact from the proposed development.



**Russell Kingdom**

Arboriculturist & Horticulturist

MIACA MAIH MAA

Diploma of Arboriculture (AQF5) | Graduate Diploma of Horticulture (AQF8)

# Appendix 1: Site Plan with Trees and Proposed Development





# Appendix 1a: Site Plan with Trees and Proposed Development (Level 1)



# Appendix 1a: Site Plan with Trees and Proposed Development (Level 2)



## PLANS



**LEVEL 3**

AA.RES.1904-  
252-254 NEW SOUTH HEAD  
ROAD EDGECLIFF



Appendix 1c: Site Plan with Trees and Proposed Development (Level 4)



## PLANS



**LEVEL 5**

AA.RES.1904-  
252-254 NEW SOUTH HEAD  
ROAD EDGECLIFF

14FEB,20  
p.7

Appendix 1e: Site Plan with Trees and Proposed Development (Level 6)

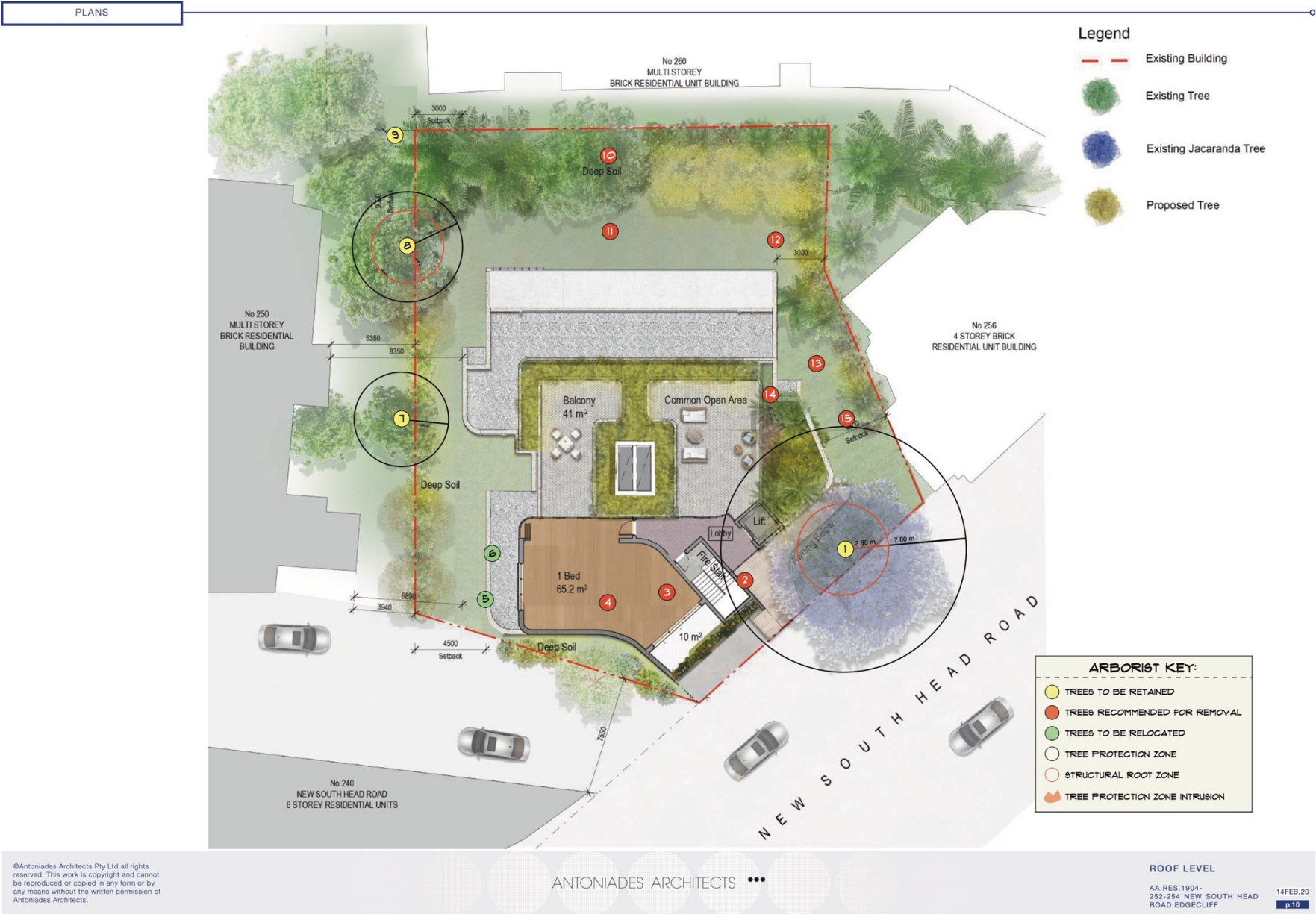




Appendix 1f: Site Plan with Trees and Proposed Development (Level 7)



# Appendix 1g: Site Plan with Trees and Proposed Development (Roof Level)





# Appendix 1h: Site Plan with Trees and Proposed Development (Roof)

