PEAKE ARBORICULTURE

ARBORICULTURAL IMPACT ASSESSMENT

SP65120

9-11 Nelson Street

Chatswood, NSW 2067

Prepared on: 14/12/2020 (Revised 01/03/2021)

Prepared for: Urbis

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EXECUTIVE SUMMARY

This Arboricultural Impact Assessment (AIA) was requested by Andrew Hobbs – Senior Consultant – Urbis on the 19th of December 2020. This AIA is to address the potential impacts upon surrounding trees from the planning proposal for SP 65120 9-11 Nelson St Chatswood, NSW 2067 (the subject site)

Eighty-Six (86) trees were assessed, located within and adjacent to the subject site. Tree locations, TPZ's and SRZ's can be found on the attached Tree Detail Overlay.

Following an assessment of construction impacts from the current concept scheme (available in section 6 of this report) it is concluded and recommended that;

Removal of the following trees will be required to facilitate the proposed development.

High Retention Value	Medium Retention Value	Low-Medium Retention Value	Low Retention Value	Exempt Trees
NA	T60, T62, T66	T16-T58, T69-71, T84-T86	NA	T1-T4, T74-T83

Replacement of the canopy and soft landscaping is proposed to be a minimum of 20% of the site including ground level and podium landscaping, green roofs and green walls with all roofs up to 30 metres from ground level to be green roofs. Willoughby City Councils Vegetation Management Guidelines (Willoughby City Council, 2020) offers suitable replacement species for a designated area within the Street Tree Master Plan. The subject site falls within Precinct 3 – West-Central Medium to High Density Residential. Replacement Species can be found at https://www.willoughby.nsw.gov.au/Residents/Trees/Tree-Species-Selection. It is recommended that suitable replacement species as specified by Willoughby City Council are used wherever possible.

Street Trees along Gordon Avenue and Trees within the Gordon Avenue Pocket Park are predominantly proposed for retention. Existing structures on the boundary of the subject site are expected to have limited root growth within the subject site. (TPZ encroachment considerations have been made in accordance with the guidelines provided in section 3.3.4 (f) & (g) of AS4970 – 2009 Protection of trees on development sites (Consideration of topography and existing structures/obstacles that affect root growth).

Trees 5-14, 15, 59, 61, 63, 64, 65, 67, 68, 72 & 73 are to be retained and protected. Tree Protection Measures and Site Arborist (AQF5) supervision will be required for works within Tree Protection Zones during demolition and construction to ensure the successful retention of these trees.

This AIA has been prepared based upon the current concept scheme for 9-11 Nelson St Chatswood, NSW 2067. Detailed construction methodology was not available for review during the preparation of this report. Impacts from the proposed development have been determined based on the limited information available. Further Arboricultural Assessment and the recommendation of specific tree protection measures will be required as part of the development application prior to construction.

CONTENTS

1 INTRODUCTION

1.1 This Arboricultural Impact Assessment (AIA) was requested by Andrew Hobbs – Senior Consultant – Urbis on the 19th of December 2020. This AIA is to address the potential impacts upon surrounding trees from the planning proposal for SP 65120 9-11 Nelson St Chatswood, NSW 2067 (the subject site). The subject site can be seen in figure 1 below.

Figure 1: The subject site, site boundary shown in red. (Nearmap, 2020)

2 RELEVANT DEVELOPMENT CONTROLS

2.1 The subject site is identified as SP 65120 and is located at 9-11 Nelson St Chatswood, NSW 2067 within the local government area of Willoughby City Council (NSW Government, n.d.)

2.2 Section C9 of Willoughby City Council's Development Control Plan (Willoughby City Council, 2020) has been considered in the preparation of this assessment, in particular the definition of protected vegetation, being;

i. the tree has the following dimensions:
a. a height exceeding 4 metres, or
b. a trunk girth (circumference) exceeding 600 millimetres measured at 1.4 metres above ground level, or
c. a crown spread exceeding 3 metres

ii. the tree is a locally indigenous species that is representative of the original vegetation of the area

iii. any vegetation that is located within a defined wildlife corridor or has known wildlife habitat value

iv. the tree is visually prominent from the street or surrounding properties and makes a positive contribution to the visual character of the locality

2.3 The Willoughby Natural Heritage Register Data sheets for Chatswood and Chatswood West (available at https://www.willoughby.nsw.gov.au/Environment/Bushland-and-Wildlife/Natural-Heritage-Register) contained no listings for Nelson Street Chatswood.

2.4 State Environmental Planning Policy (Vegetation in Non–Rural Areas) 2017 (NSW Government, 2017) has been considered in the preparation of this report. The aims of the policy are to;

- *"(a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and*
- *(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation."*

3 METHOD

3.1 The trees and site were visually assessed from ground level, using methods developed by the Visual Tree Assessment (VTA) process (Claus Mattheck, 2006). No detailed inspections as described in the VTA process have been undertaken. The genus and species of the trees were recorded as well as the dimensions for diameter at breast height (DBH), diameter above buttress (DAB) and canopy width (when the measurement of a DBH and DAB has not been practical, such as in the case of low branching or mallee trees, a DBH and DAB measurement has been allocated based on tree size). Height and age of the trees were estimated as well as the percentage of deadwood, the tree was given a Health / Vigour rating and signs and symptoms of pests and diseases were looked for. Structural defects and comments were recorded.

3.2 Calculations have been made using guidelines supplied in AS4970-2009 Protection of Trees on Development Sites (Standards Australia, 2009) for the;

- Tree Protection Zone (TPZ),
- Structural Root Zone (SRZ),
- Live Crown Ratio (LCR),
- Live Crown Size (LCS),
- Height/Diameter ratio (H/D).

3.3 The trees have been allocated a landscape significance rating of Low, Medium or High using the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010). Stars assessment criteria includes:

- Condition and Vigour
- Form, species specific
- Provenance, age and botanical significance
- Heritage and Ecological significance
- Size, shape, and local amenity value
- Restrictions to tree growth

Appendix A contains the assessment criteria in full.

3.4 The trees have been given a Useful Life Expectancy (ULE) rating, categorised as either;

- Long – 40+ years
- Medium – 15-40 years
- Short – 5-15 years
- Consider for removal - <5 years

4 OBSERVATIONS

4.1 Listed in Table 1 below are observations from the subject trees relating to;

- Health and vigour. (Dead, Senescent, Poor, Fair, Good, Excellent)
- Structure / Form. (Poor, Fair, Good, Excellent)
- Structural defects and comments.
- Any signs/symptoms of pest and disease attack.
- Previous pruning or wounds.

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
1	*Triadica sebifera* Chinese Tallow Tree	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
2	*Triadica sebifera* Chinese Tallow Tree	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
3	*Triadica sebifera* Chinese Tallow Tree	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
4	*Triadica sebifera* Chinese Tallow Tree	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
5	*Tristaniopsis laurina* Water Gum	Fair	Good	Recent works within tpz.	None visible	None visible
6	*Tristaniopsis laurina* Water Gum	Fair	Fair	15% deadwood	None visible	None visible
7	*Tristaniopsis laurina* Water Gum	Fair	Fair	DBH recorded at .7m above ground level.	None visible	None visible
8	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	Supressed. Included bark observed	None visible	None visible
9	*Waterhousia floribunda*	Poor	Poor	Supressed	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
	Weeping Lilly Pilly					
10	*Waterhousia floribunda* Weeping Lilly Pilly	Poor	Poor	Supressed	None visible	Rubbing branch with T11
11	*Cinammomum camphora* Camphor Laurel	Fair	Fair	High volume of epicormic shoots within crown.	None visible	Pruned for building clearance.
12	*Cinammomum camphora* Camphor Laurel	Poor	Poor	Decay at base. Fungal fruiting body on lower branch	None visible	Previously Lopped
13	*Waterhousia floribunda* Weeping Lilly Pilly	Poor	Poor	Supressed	None visible	None visible
14	*Waterhousia floribunda* Weeping Lilly Pilly	Poor	Poor	Supressed	None visible	None visible
15	*Alnus jorullensis* Evergreen alder	Fair	Fair	Thinning canopy	None visible	None visible
16	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	T16-T58 planted closely together. Insufficient room for mature growth.	None visible	None visible
17	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
18	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
19	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
20	*Waterhousia floribunda*	Fair	Fair	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
	Weeping Lilly Pilly					
21	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
22	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
23	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
24	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
25	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Poor	Inclusion in main stem	None visible	None visible
26	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
27	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
28	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
29	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	Western stem lopped.
30	*Waterhousia floribunda* Weeping Lilly Pilly	Poor	Poor	Stump with epicormic growth. Exempt <4m in height.	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
31	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
32	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
33	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
34	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
35	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
36	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Poor	Rubbing stems with included bark	None visible	None visible
37	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
38	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	Stress raiser in main stem	None visible	None visible
39	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
40	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
41	*Waterhousia floribunda*	Fair	Fair	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
	Weeping Lilly Pilly					
42	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
43	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
44	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
45	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
46	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
47	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
48	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
49	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
50	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
51	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
52	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
53	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
54	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
55	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
56	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
57	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
58	*Waterhousia floribunda* Weeping Lilly Pilly	Fair	Fair	None visible	None visible	None visible
59	*Melaleuca quinquenervia* Broad-leaved Paperbark	Fair	Fair	Low voltage Aerial bundle calble through canopy.	None visible	None visible
60	*Syncarpia glomulifera* Turpentine Tree	Fair	Fair	Low voltage Aerial bundle cable through canopy.	None visible	Lopped for cable clearance,
61	*Callistemon salignus* Willow Bottlebrush	Fair	Fair	Low voltage Aerial bundle cable through canopy.	None visible	Lopped for cable clearance,
62	*Stenocarpus sinuatus*	Good	Good	Partial stem inclusion	None visible	None

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
	Queensland Firewheel Tree					
63	*Syncarpia glomulifera* Turpentine Tree	Fair	Fair	Low voltage Aerial bundle cable through canopy.	None visible	Lopped for cable clearance,
64	*Syncarpia glomulifera* Turpentine Tree	Fair	Fair	Low voltage Aerial bundle cable through canopy.	None visible	Lopped for cable clearance,
65	*Lagerstroemia indica* Crepe Myrtle	Fair	Fair	Low voltage Aerial bundle cable through canopy.	None visible	Lopped for cable clearance,
66	*Stenocarpus sinuatus* Queensland Firewheel Tree	Fair	Fair	None visible	None visible	None visible
67	*Syncarpia glomulifera* Turpentine Tree	Fair	Fair	Low voltage Aerial bundle cable through canopy.	None visible	Lopped for cable clearance,
68	*Harpullia pendula* Tulipwood	Good	Good	None visible	None visible	None visible
69	*Jacaranda mimosifolia* Jacaranda	Fair	Fair	None visible	None visible	None visible
70	*Buckinghamia celsissima* Ivory Curl Flower	Good	Good	None visible	None visible	None visible
71	*Buckinghamia celsissima* Ivory Curl Flower	Good	Good	None visible	None visible	None visible
72	*Buckinghamia celsissima* Ivory Curl Flower	Good	Poor	lopped	None visible	Previously lopped
73	*Melaleuca quinquenervia* Broad-leaved paperbark	Good	Fair	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
74	*Pittosporum undulatum* Sweet Daphne	Fair	Fair	Regrowth from old stump. Exempt <4m in height	None visible	None visible
75	*Murraya paniculata* Orange Jessamine	Good	Good	Exempt <4m in height	None visible	None visible
76	*Acer negundo* Box Elder	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
77	*Acer negundo* Box Elder	Fair	Fair	Exempt Species within Willoughby LGA	None visible	Previously lopped
78	*Murraya paniculata* x4 Orange Jessamine	Good	Good	Informal Hedge	None visible	None visible
79	*Syagrus romanzoffiana* Cocos Palm	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
80	*Syagrus romanzoffiana* Cocos Palm	Fair	Fair	Exempt Species within Willoughby LGA	None visible	None visible
81	*Acer negundo* Box Elder	Fair	Fair	Exempt Species within Willoughby LGA	None visible	Previously lopped
82	*Cordyline australis* New Zealand Cabbage Tree	Fair	Fair	Exempt <4m in height	None visible	None visible
83	*Cordyline australis* New Zealand Cabbage Tree	Fair	Fair	Exempt <4m in height	None visible	None visible
84	*Ficus* sp. Fig sp.	Fair	Fair	None visible	None visible	None visible
85	*Waterhousia floribunda* Weeping Lilly Pilly	Good	Good	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Health / Vigour	Structure / Form	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
86	*Waterhousia floribunda* *Weeping Lilly Pilly*	Good	Good	None visible	None visible	None visible
HEDGE A	*Syzygium leuhmanii* Riberry (lilly Pilly) x 13	Hedge A is comprised of 13 Lilly Pilly's with DBH's ranging from 4cm to 19cm and heights ranging from 3.5m to 8m. Canopy's are combined to the North and South with the bulk of Eastern and Western Canopies pruned.				

Table 1: Tree Observations

4.2 Listed in Table 2 below are measurements from the subject trees relating to;

- Diameter at breast height (DBH).
- Diameter above buttress (DAB).
- Canopy spread – measured to the North, East, South and West (N, E, S, W).
- Tree height.
- Lowest scaffold branch.

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
1	*Triadica sebifera*	Mature	6.5	2	4	4	4	4	27	33
2	*Triadica sebifera*	Mature	5.5	2.5	3	1	3	3	18	30
3	*Triadica sebifera*	Mature	5	2	3	1	3	3	17	25
4	*Triadica sebifera*	Mature	5	2	5	1	4	4	26	30
5	*Tristaniopsis laurina*	Mature	6.5	2.5	6	6	6	6	52	96
6	*Tristaniopsis laurina*	Mature	6	2	5	5	6	5	45	70
7	*Tristaniopsis laurina*	Mature	2.5	0.5	1	2	2	2	13	18
8	*Waterhousia floribunda*	Mature	6	2	0	5	2	2	21	25
9	*Waterhousia floribunda*	Mature	5	2	1	4	1	2	16	19

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
10	*Waterhousia floribunda*	Mature	5	2	2	1	1	3	9	15
11	*Cinammomum camphora*	Mature	18	4	5	8	7	6	93	110
12	*Cinammomum camphora*	Mature	12	2.5	9	2	4	4	108	120
13	*Waterhousia floribunda*	Mature	5.5	2	1	2	3	1	13	19
14	*Waterhousia floribunda*	Mature	5	2	3	1	2.5	1	11	17
15	*Alnus jorullensis*	Mature	11	3.5	8	5	4	4	30	40
16	*Waterhousia floribunda*	Mature	11	3.5	4	2	2	2	22	30
17	*Waterhousia floribunda*	Mature	9	3.5	1	2	1	1	12	16
18	*Waterhousia floribunda*	Mature	10	3.5	4	1	2	1	18	23
19	*Waterhousia floribunda*	Mature	9	3.5	0	2	1	2	9	14
20	*Waterhousia floribunda*	Mature	10	3.5	4	1	1	0.5	18	21
21	*Waterhousia floribunda*	Mature	10	3.5	1	2	1	2	15	19
22	*Waterhousia floribunda*	Mature	10	2	0	1	1	1	18	24
23	*Waterhousia floribunda*	Mature	10	2	5	1	2	3	19	30
24	*Waterhousia floribunda*	Mature	11	3	2	2	2	2	19	31
25	*Waterhousia floribunda*	Mature	12	2.5	3	3	2	5	25	34
26	*Waterhousia floribunda*	Mature	10	2	1	1	1	4	14	21

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
27	*Waterhousia floribunda*	Mature	10	2.5	1	1	1	4	15	22
28	*Waterhousia floribunda*	Mature	10	3	3	1	2	2	18	24
29	*Waterhousia floribunda*	Mature	10	2	2	1	1	3	18	22
30	*Waterhousia floribunda*	Mature	1	0	0	0	0	0	14	18
31	*Waterhousia floribunda*	Mature	11	2	3	1	4	1	19	25
32	*Waterhousia floribunda*	Mature	11	2.5	3	2	3	1	20	26
33	*Waterhousia floribunda*	Mature	8	2.5	1	1	0	3	10	11
34	*Waterhousia floribunda*	Mature	11	2.5	2	2	1	4	20	27
35	*Waterhousia floribunda*	Mature	11	3	3	0	3	0	12	17
36	*Waterhousia floribunda*	Mature	11	2.5	3	1	2	4	21	28
37	*Waterhousia floribunda*	Mature	11	2	4	2	5	2	18	24
38	*Waterhousia floribunda*	Mature	11	4	0	3	2	2	19	24
39	*Waterhousia floribunda*	Mature	11	2	1	3	4	4	19	31
40	*Waterhousia floribunda*	Mature	11	4	2	1	5	5	21	28
41	*Waterhousia floribunda*	Mature	10	4	1	1	3	0	14	19
42	*Waterhousia floribunda*	Mature	10	7	1	1	1	4	18	21

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
43	*Waterhousia floribunda*	Mature	9	4	1	1	1	4	13	16
44	*Waterhousia floribunda*	Mature	11	6	2	1	4	0	17	25
45	*Waterhousia floribunda*	Mature	11	3	4	1	3	1	22	38
46	*Waterhousia floribunda*	Mature	11	4	2	1	2	4	21	29
47	*Waterhousia floribunda*	Mature	10	5	2	1	4	0	15	20
48	*Waterhousia floribunda*	Mature	11	3	5	2	5	5	33	33
49	*Waterhousia floribunda*	Mature	11	2	5	2	5	5	42	40
50	*Waterhousia floribunda*	Mature	9	2	3	2	4	5	16	22
51	*Waterhousia floribunda*	Mature	10	4	2	2	2	1	15	21
52	*Waterhousia floribunda*	Mature	6	2	1	0.5	1	1	7	8
53	*Waterhousia floribunda*	Mature	9	1.5	1	2	3	1	13	21
54	*Waterhousia floribunda*	Mature	9	3	1	1	0	3	10	15
55	*Waterhousia floribunda*	Mature	9	3.5	1	1	2	4	10	14
56	*Waterhousia floribunda*	Mature	8	2	1	1	3	0	10	15
57	*Waterhousia floribunda*	Mature	9	3	2	1	3	4	15	20
58	*Waterhousia floribunda*	Mature	11	4	5	2	4	5	27	39

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
59	*Melaleuca quinquenervia*	Mature	8	3	4	4	4	5	60	90
60	*Syncarpia glomulifera*	Mature	10	2	5	4	4	4	50	57
61	*Callistemon salignus*	Mature	5	2.5	4	4	3	5	38	48
62	*Stenocarpus sinuatus*	Mature	7	2.5	2	2	2	2	19	22
63	*Syncarpia glomulifera*	Mature	5	2	4	3	3	3	30	39
64	*Syncarpia glomulifera*	Mature	7	2	5	3	3	4	31	49
65	*Lagerstroemia indica*	Mature	5	2	4	5	4	2	27	30
66	*Stenocarpus sinuatus*	Mature	7	3	2	2	2	2	16	24
67	*Syncarpia glomulifera*	Mature	7	3	6	7	4	5	45	60
68	*Harpullia pendula*	Mature	7	2	4	5	6	3	35	38
69	*Jacaranda mimosifolia*	Mature	6	3	3	5	4	4	25	40
70	*Buckinghamia celsissima*	Mature	5	1.5	2	2	2	2	13	17
71	*Buckinghamia celsissima*	Mature	6	2	3	3	2	2	17	25
72	*Buckinghamia celsissima*	Mature	5	1	0	4	1	4	23	30
73	*Melaleuca quinquenervia*	Mature	5	1.5	1	3	3	1	15	19
74	*Pittosporum undulatum*	Mature	3.5	1	1.5	1.5	1.5	1.5	13	20
75	*Murraya paniculata*	Mature	3	0.5	2	2	2	2	10	16
76	*Acer negundo*	Mature	5	1.5	3	3	3	2	18	22
77	*Acer negundo*	Mature	5	1.5	4	3	3	3	20	35

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
78	*Murraya paniculata* x4	Mature	4	0.5	4	4	4	4	10	15
79	*Syagrus romanzoffiana*	Mature	5	4	2.5	2.5	2.5	2.5	22	NA
80	*Syagrus romanzoffiana*	Mature	5	4	2.5	2.5	2.5	2.5	28	NA
81	*Acer negundo*	Mature	5	0.5	4	4	5	5	32	34
82	*Cordyline australis*	Mature	3.5	3	0.5	0.5	0.5	0.5	10	NA
83	*Cordyline australis*	Mature	3.5	3	0.5	0.5	0.5	0.5	10	NA
84	*Ficus* sp.	Mature	6	3	1	2	2	0	10	15
85	*Waterhousia floribunda*	Mature	6	0.5	2	1	3	3	17	23
86	*Waterhousia floribunda*	Mature	5.5	0.5	1	1	1	2	8	14

Table 2: Tree Measurements

4.3 Listed in Table 3 Below are calculations from the subject trees relating to:

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Live Crown Ratio (LCR)
- Live Crown Size (LCS)
- Height/Diameter ratio (H/D)

Tree Number	Species	TPZ (m)	SRZ (m)	H over D ratio	Live Crown Size (m2)	Live Crown Ratio (%)
1	*Triadica sebifera*	3.24	2.08	24	36	69%
2	*Triadica sebifera*	2.16	2.00	31	15	55%
3	*Triadica sebifera*	2.04	1.85	29	15	60%
4	*Triadica sebifera*	3.07	2.00	20	21	60%
5	*Tristaniopsis laurina*	6.27	3.25	12	48	62%
6	*Tristaniopsis laurina*	5.46	2.85	13	42	67%
7	*Tristaniopsis laurina*	2.00	1.61	19	7	80%
8	*Waterhousia floribunda*	2.46	1.85	29	18	67%
9	*Waterhousia floribunda*	2.00	1.65	31	12	60%
10	*Waterhousia floribunda*	2.00	1.50	56	11	60%
11	*Cinammomum camphora*	11.13	3.44	19	182	78%
12	*Cinammomum camphora*	12.95	3.57	11	90	79%
13	*Waterhousia floribunda*	2.00	1.65	42	12	64%

Tree Number	Species	TPZ (m)	SRZ (m)	H over D ratio	Live Crown Size (m2)	Live Crown Ratio (%)
14	*Waterhousia floribunda*	2.00	1.57	45	11	60%
15	*Alnus jorullensis*	3.60	2.25	37	79	68%
16	*Waterhousia floribunda*	2.64	2.00	50	38	68%
17	*Waterhousia floribunda*	2.00	1.53	75	14	61%
18	*Waterhousia floribunda*	2.16	1.79	56	26	65%
19	*Waterhousia floribunda*	2.00	1.50	100	14	61%
20	*Waterhousia floribunda*	2.16	1.72	56	21	65%
21	*Waterhousia floribunda*	2.00	1.65	67	20	65%
22	*Waterhousia floribunda*	2.16	1.82	56	12	80%
23	*Waterhousia floribunda*	2.28	2.00	53	44	80%
24	*Waterhousia floribunda*	2.28	2.02	58	32	73%
25	*Waterhousia floribunda*	3.00	2.10	48	62	79%
26	*Waterhousia floribunda*	2.00	1.72	71	28	80%
27	*Waterhousia floribunda*	2.00	1.75	67	26	75%
28	*Waterhousia floribunda*	2.16	1.82	56	28	70%
29	*Waterhousia floribunda*	2.16	1.75	56	28	80%

Tree Number	Species	TPZ (m)	SRZ (m)	H over D ratio	Live Crown Size (m2)	Live Crown Ratio (%)
30	*Waterhousia floribunda*	2.00	1.61	7	0	100%
31	*Waterhousia floribunda*	2.28	1.85	58	41	82%
32	*Waterhousia floribunda*	2.40	1.88	55	38	77%
33	*Waterhousia floribunda*	2.00	1.50	80	14	69%
34	*Waterhousia floribunda*	2.40	1.91	55	38	77%
35	*Waterhousia floribunda*	2.00	1.57	92	24	73%
36	*Waterhousia floribunda*	2.52	1.94	52	43	77%
37	*Waterhousia floribunda*	2.16	1.82	61	59	82%
38	*Waterhousia floribunda*	2.28	1.82	58	25	64%
39	*Waterhousia floribunda*	2.28	2.02	58	54	82%
40	*Waterhousia floribunda*	2.52	1.94	52	46	64%
41	*Waterhousia floribunda*	2.00	1.65	71	15	60%
42	*Waterhousia floribunda*	2.16	1.72	56	11	30%
43	*Waterhousia floribunda*	2.00	1.53	69	18	56%
44	*Waterhousia floribunda*	2.04	1.85	65	18	45%
45	*Waterhousia floribunda*	2.64	2.20	50	36	73%

Tree Number	Species	TPZ (m)	SRZ (m)	H over D ratio	Live Crown Size (m2)	Live Crown Ratio (%)
46	*Waterhousia floribunda*	2.52	1.97	52	32	64%
47	*Waterhousia floribunda*	2.00	1.68	67	18	50%
48	*Waterhousia floribunda*	3.96	2.08	33	68	73%
49	*Waterhousia floribunda*	5.04	2.25	26	77	82%
50	*Waterhousia floribunda*	2.00	1.75	56	49	78%
51	*Waterhousia floribunda*	2.00	1.72	67	21	60%
52	*Waterhousia floribunda*	2.00	1.50	86	7	67%
53	*Waterhousia floribunda*	2.00	1.72	69	26	83%
54	*Waterhousia floribunda*	2.00	1.50	90	15	67%
55	*Waterhousia floribunda*	2.00	1.50	90	22	61%
56	*Waterhousia floribunda*	2.00	1.50	80	15	75%
57	*Waterhousia floribunda*	2.00	1.68	60	30	67%
58	*Waterhousia floribunda*	3.24	2.23	41	56	64%
59	*Melaleuca quinquenervia*	7.20	3.17	13	43	63%
60	*Syncarpia glomulifera*	6.00	2.61	20	68	80%
61	*Callistemon salignus*	4.56	2.43	13	20	50%

Tree Number	Species	TPZ (m)	SRZ (m)	H over D ratio	Live Crown Size (m2)	Live Crown Ratio (%)
62	*Stenocarpus sinuatus*	2.28	1.75	37	18	64%
63	*Syncarpia glomulifera*	3.60	2.23	17	20	60%
64	*Syncarpia glomulifera*	3.72	2.45	23	38	71%
65	*Lagerstroemia indica*	3.26	2.00	18	23	60%
66	*Stenocarpus sinuatus*	2.00	1.82	44	16	57%
67	*Syncarpia glomulifera*	5.40	2.67	16	44	57%
68	*Harpullia pendula*	4.20	2.20	20	45	71%
69	*Jacaranda mimosifolia*	3.00	2.25	24	24	50%
70	*Buckinghamia celsissima*	2.00	1.57	38	14	70%
71	*Buckinghamia celsissima*	2.04	1.85	35	20	67%
72	*Buckinghamia celsissima*	2.74	2.00	22	18	80%
73	*Melaleuca quinquenervia*	2.00	1.65	33	14	70%
74	*Pittosporum undulatum*	2.00	1.68	28	8	71%
75	*Murraya paniculata*	2.00	1.53	29	10	83%
76	*Acer negundo*	2.16	1.75	28	19	70%
77	*Acer negundo*	2.40	2.13	25	23	70%

Tree Number	Species	TPZ (m)	SRZ (m)	H over D ratio	Live Crown Size (m2)	Live Crown Ratio (%)
78	*Murraya paniculata* x4	2.00	1.50	40	28	88%
79	*Syagrus romanzoffiana*	3.5	NA	23	5	20%
80	*Syagrus romanzoffiana*	3.5	NA	18	5	20%
81	*Acer negundo*	3.84	2.10	16	41	90%
82	*Cordyline australis*	2.00	NA	35	1	14%
83	*Cordyline australis*	2.00	NA	35	1	14%
84	*Ficus* sp.	2.00	1.50	60	8	50%
85	*Waterhousia floribunda*	2.06	1.79	35	25	92%
86	*Waterhousia floribunda*	2.00	1.50	69	13	91%

Table 3: Calculations from the subject trees

5 TREE RETENTION VALUES

5.1 Trees have been allocated a retention value using the priority Matrix in the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010). The Matrix uses the Landscape Significance rating combined with the Useful Life Expectancy (ULE) to determine a retention value of either;

- Priority for Retention (High) – All measures must be taken to retain and protect these trees. If the guidelines set out in AS4970-2009 Protection of trees on development sites cannot be used to protect the trees, design modification or re-location of the proposed development should be considered.
- Consider for Retention (Medium) – Retention of these trees should remain a priority. If the trees are adversely affecting the proposed development and all protection measures have been considered but are not viable, removal can be considered.
- Consider for Removal (Low) – Retention of these trees is not important. No modification to design should be considered for their retention.
- Priority for Removal – Trees in an irreversible decline, weed species or hazardous trees. These trees should be removed.

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	*Triadica sebifera*	Low	Medium (15-40)	Low (Exempt)
2	*Triadica sebifera*	Low	Medium (15-40)	Low (Exempt)
3	*Triadica sebifera*	Low	Medium (15-40)	Low (Exempt)
4	*Triadica sebifera*	Low	Medium (15-40)	Low (Exempt)
5	*Tristaniopsis laurina*	Medium	Medium (15-40)	Medium
6	*Tristaniopsis laurina*	Medium	Medium (15-40)	Medium
7	*Tristaniopsis laurina*	Low	Medium (15-40)	Low-Medium

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
8	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
9	*Waterhousia floribunda*	Low	Short (5-15)	Low
10	*Waterhousia floribunda*	Low	Short (5-15)	Low
11	*Cinammomum camphora*	Medium	Medium (15-40)	Medium
12	*Cinammomum camphora*	Low	Short (5-15)	Low
13	*Waterhousia floribunda*	Low	Short (5-15)	Low
14	*Waterhousia floribunda*	Low	Short (5-15)	Low
15	*Alnus Jorullensis*	Low	Medium (15-40)	Low-Medium
16	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
17	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
18	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
19	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
20	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
21	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
22	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
23	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
24	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
25	*Waterhousia floribunda*	Low	Short (5-15)	Low-Medium
26	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
27	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
28	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
29	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
30	*Waterhousia floribunda*	Low	Short (5-15)	Low
31	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
32	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
33	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
34	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
35	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
36	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
37	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
38	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
39	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
40	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
41	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
42	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
43	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
44	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
45	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
46	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
47	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
48	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
49	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
50	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
51	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
52	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
53	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
54	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
55	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
56	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
57	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
58	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
59	*Melaleuca quinquenervia*	Medium	Medium (15-40)	Medium
60	*Syncarpia glomulifera*	Medium	Medium (15-40)	Medium
61	*Callistemon salignus*	Medium	Medium (15-40)	Medium
62	*Stenocarpus sinuatus*	Medium	Medium (15-40)	Medium
63	*Syncarpia glomulifera*	Medium	Medium (15-40)	Medium
64	*Syncarpia glomulifera*	Medium	Medium (15-40)	Medium
65	*Lagerstroemia indica*	Medium	Medium (15-40)	Medium
66	*Stenocarpus sinuatus*	Medium	Medium (15-40)	Medium
67	*Syncarpia glomulifera*	Medium	Medium (15-40)	Medium
68	*Harpullia pendula*	Medium	Medium (15-40)	Medium
69	*Jacaranda mimosifolia*	Low	Medium (15-40)	Low-Medium
70	*Buckinghamia celsissima*	Low	Medium (15-40)	Low-Medium
71	*Buckinghamia celsissima*	Low	Medium (15-40)	Low-Medium
72	*Buckinghamia celsissima*	Low	Short (5-15)	Low
73	*Melaleuca quinquenervia*	Low	Medium (15-40)	Low-Medium
74	*Pittosporum undulatum*	Low	Short (5-15)	Low (exempt)
75	*Murraya paniculata*	Low	Short (5-15)	Low (exempt)

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
76	*Acer negundo*	Low	Short (5-15)	Low (exempt)
77	*Acer negundo*	Low	Short (5-15)	Low (exempt)
78	*Murraya paniculata* x4	Low	Short (5-15)	Low (exempt)
79	*Syagrus romanzoffiana*	Low	Medium (15-40)	Low (exempt)
80	*Syagrus romanzoffiana*	Low	Medium (15-40)	Low (exempt)
81	*Acer negundo*	Low	Medium (15-40)	Low (exempt)
82	*Cordyline australis*	Low	Medium (15-40)	Low (exempt)
83	*Cordyline australis*	Low	Medium (15-40)	Low (exempt)
84	*Ficus* sp.	Low	Medium (15-40)	Low-Medium
85	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium
86	*Waterhousia floribunda*	Low	Medium (15-40)	Low-Medium

Table 4: Tree Retention Values

6 PLANNING PROPOSAL IMPACTS

6.1 A draft Urban Context Report prepared by Urbis (December 2020) details the planning proposal for re-development of the subject site. Removal of trees 1-4, 16-58, 62, 66 & 74-86 within the subject site would be required to facilitate the current concept scheme. Trees 8-14 within the subject site are to be retained. Existing encroachments within the TPZ's and SRZ's of trees 8-14 are greater than proposed encroachments from the planning proposal. No detrimental impacts to trees 8-14 are expected from the current concept scheme.

6.2 Replacement of the canopy and soft landscaping is proposed to be a minimum of 20% of the site including ground level and podium landscaping, green roofs and green walls with all roofs up to 30 metres from ground level to be green roofs.

6.3 A Landscape Ground Floor Area Diagram prepared by PBD Architects (19/02/2021), proposes changes to site access on Gordon Avenue which would require the removal of a Council tree identified within this report as T60 to facilitate the current concept scheme. Trees 69, 70 & 71 within the Gordon Avenue Pocket Park would also be required to be removed under the current concept scheme

6.4 Street Trees along Gordon Avenue and Trees within the Gordon Avenue Pocket Park are predominantly proposed for retention. Figure 2 below shows an excerpt of the site survey with tree details overlayed. TPZ's are shown in Blue, SRZ's are shown in Orange.

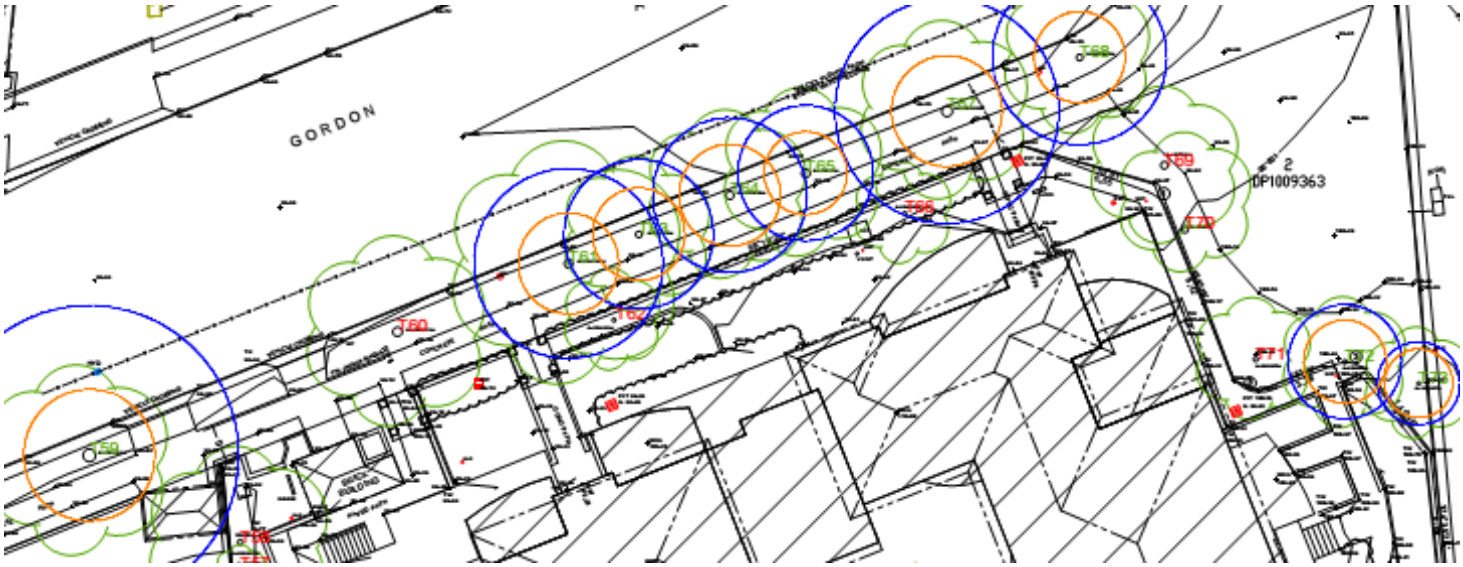

Figure 2: Gordon Avenue Tree details

6.5 Proposed encroachments to the TPZ's of trees 59, 61, 63, 64, 65 & 67 range from minor (<5%) to major (30%). An existing brick wall (likely to have a concrete footing) is located along the boundary of the subject site. In accordance with the guidelines provided in section 3.3.4 (f) & (g) of AS4970 – 2009 Protection of trees on development sites (Consideration of topography and existing structures/obstacles that affect root growth), it is expected that root growth from street trees is limited within the subject site and that their long-term retention is viable throughout and beyond the proposed development.

6.6 Trees 5,6, 7 and 15 are located on council land and an adjoining property. The current concept scheme utilises the existing crossover and driveway location within the TPZ and SRZ of T6 and as such, no detrimental impacts are expected (a detailed review of the construction methodology for the proposed driveway will be required at the DA stage). T7 will have no encroachment from the current concept scheme. Encroachments to the TPZ's of trees 5 and 15 (and SRZ of T15) will be major. With Arboricultural supervision (management of any roots encountered) the removal and replacement of structures within the subject site can be achieved without detrimental impact to trees 5 and 15.

7 DOCUMENTS USED IN THE PREPARATION OF THIS REPORT

7.1 Listed in table 6 below are documents used in the preparation of this report.

Document type	Source/ Author	Title	Date	Summary
Survey Plan	Project Surveyors	Site Survey Sheets 1-6	1/09/2020	Details and Levels over SP 65120 9-11 Nelson St Chatswood, NSW 2067
Report	Urbis	Urban Context Report	December 2020	Draft Urban Context report for SP 65120 9-11 Nelson St Chatswood, NSW 2067
Plan Set	PBD Architects	Drawings PP101, PP101a, PP101b, PP102, PP110	19/02/2021	Plans detailing the mixed-use planning proposal at 9-11 Nelson St Chatswood, NSW 2067
Plan Set	PBD Architects	Preliminary Ground Floor Plan	12/11/2020	Plan showing arrangement of the proposed Ground Floor at 9-11 Nelson St Chatswood, NSW 2067
Plan Set	Urbis	Landscape Design Draft	14/12/2020	Plan showing proposed Landscaping at 9-11 Nelson St Chatswood, NSW 2067
Plan Overlay	Peake Arboriculture	Tree Location, TPZ & SRZ Plan.	14/12/2020	Plan showing tree locations, tree protection zones and structural root zones at 9-11 Nelson St Chatswood, NSW 2067

Table 5: Documents used in the preparation of this report.

8 CONCLUSION & RECOMMENDATIONS

8.1 This AIA has been prepared based upon the current concept scheme for 9-11 Nelson St Chatswood, NSW 2067. Detailed construction methodology was not available for review during the preparation of this report. Impacts from the proposed development have been determined based on the limited information available. Further Arboricultural Assessment and the recommendation of specific tree protection measures will be required as part of the development application prior to construction.

8.2 Removal of the following trees will be required to facilitate the proposed development.

High Retention Value	Medium Retention Value	Low-Medium Retention Value	Low Retention Value	Exempt Trees
NA	T60, T62, T66	T16 -T58, T69-T71, T84-T86	T9, T10, T12-T14	T1-T4, T74-T83

8.3 Replacement of the canopy and soft landscaping is proposed to be a minimum of 20% of the site including ground level and podium landscaping, green roofs and green walls with all roofs up to 30 metres from ground level to be green roofs. Willoughby City Councils Vegetation Management Guidelines (Willoughby City Council, 2020) offers suitable replacement species for a designated area within the Street Tree Master Plan. The subject site falls within Precinct 3 – West-Central Medium to High Density Residential. Replacement Species can be found at https://www.willoughby.nsw.gov.au/Residents/Trees/Tree-Species-Selection. It is recommended that suitable replacement species as specified by Willoughby City Council are used wherever possible.

8.4 Street Trees along Gordon Avenue and trees within the Gordon Avenue Pocket Park are predominantly proposed for retention. Existing structures on the boundary of the subject site are expected to have limited root growth within the subject site. (TPZ encroachment considerations have been made in accordance with the guidelines provided in section 3.3.4 (f) & (g) of AS4970 – 2009 Protection of trees on development sites (Consideration of topography and existing structures/obstacles that affect root growth).

8.4 Trees 5-14, 15, 59, 61, 63, 64, 65, 67, 68, 72 & 73 are to be retained and protected. Tree Protection Measures and Site Arborist (AQF5) supervision will be required for works within Tree Protection Zones during demolition and construction to ensure the successful retention of these trees.

9 REFERENCES

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10 GLOSSARY OF TERMS

Age class:

Young – planted recently.
Semi Mature – Reached less than 20% of expected life span.
Mature – Between 20-80% of expected life span.
Over Mature – Past 80% of expected life span.

Health and Vigour:

0 – Dead tree.
1 – Advanced state of decline. Significant deadwood visible. <20% live foliage cover.
2 – Declining. Dieback and deadwood visible. 20-60% live foliage cover.
3 – Low to average vigour. Dieback or visible. 60-90% live foliage cover.
4 – Good vigour. Small amount of dieback visible. 90-100% live foliage cover.
5 – Excellent vigour. No dieback or deadwood visible. 100% live foliage cover.

Crown:

Measured from the top of the tree to the lowest branch, comprising of leaves and branches.

Deadwood:

Dead branches found in a trees crown. An entirely dead branch or stem.

Dieback:

The death of portions of the crown. The death of branches or shoots from the tips inward.

Defect:

A feature of a tree that affects the health or structure in an adverse manner.

Decay:

The process of micro-organisms breaking down woody tissue.

Cavity:

A void in a woody stem, usually created by decay. This can be open or closed.

Soil Texture:

The amounts of sand, silt and clay in a soil.

Soil pH:

A figure expressing the acidity or alkalinity of a soil.

DBH:

Diameter at Breast Height refers to the tree trunk diameter measured at breast height or 1.4 metres above ground level.

DAB:

Diameter Above the Buttress refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

TPZ:

Tree Protection Zone The radius of the TPZ is calculated for each tree by multiplying the DBH x 12. To establish the TPZ this radius is measured from the centre of the stem at ground level and it is an area that is to be isolated from construction disturbance. Any encroachment into the TPZ of more than 10% is considered to be a major encroachment.

SRZ:

Structural Root Zone The radius of the SRZ is calculated using the following formula:

r (SRZ) = $(Dx50)^{0.42}$ x 0.64 where D is the DAB measured in metres. It is the area around a tree that is required for tree stability and is usually applied on constructions sites after there has been a major encroachment of the TPZ.

LCR:

Live Crown Ratio. The height of a trees crown, relative to the total height of the tree. Often used as an indicator of overall stability.

LCS:

Live Crown Size. The area of the crown as viewed from one aspect.

H/D:

Height over Diameter ratio. An indicator of failure due to slenderness. 30 is the optimum ratio. Greater than 50 is considered hazardous

11 RELEVANT APPENDICES

11.1 APPENDIX 1 – S.T.A.R.S.© (IACA 2010)

Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©

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

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

Tree Significance - Assessment Criteria

High Significance in landscape

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

Medium Significance in landscape

- The tree is in *Fair-Good condition* and *Good* or *Low vigor;*
- 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*.

Low Significance in landscape

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

Environmental Pest / Noxious Weed Species

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

Hazardous/Irreversible Decline

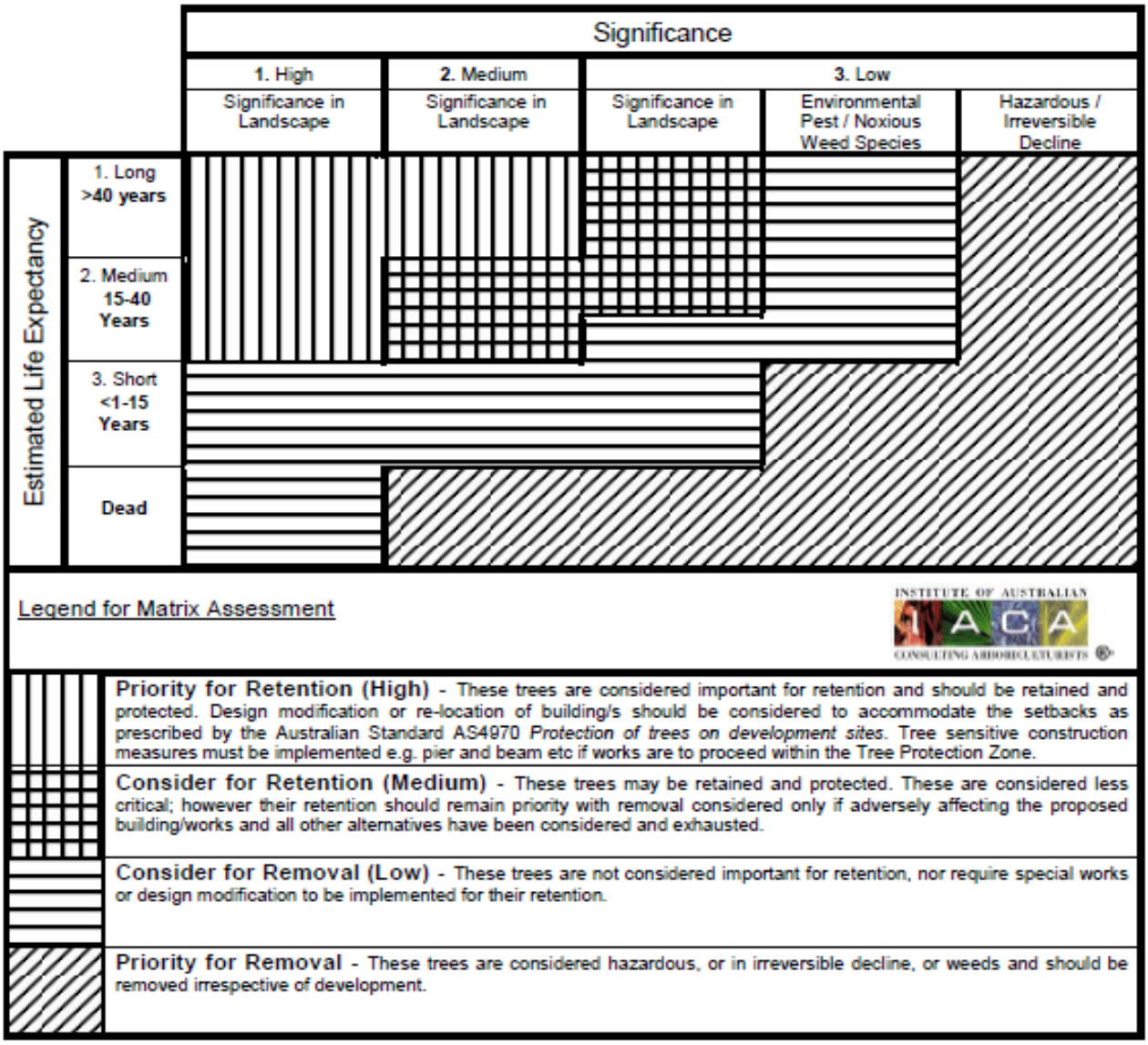
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

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

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

Institute of Australian Consulting Arboriculturists (IACA 2010), *IACA Significance of a Tree, Assessment Rating System (STARS)*, www.iaca.org.au

Table 1.0 Tree Retention Value - Priority Matrix.



USE OF THIS DOCUMENTAND REFERENCING The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*,Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES Australia ICOMOS Inc. 1999, *The Burra Charter –The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists(IACA), CSIRO Publishing, Collingwood, Victoria, Australia. Footprint Green Pty Ltd2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

NOTES:

- THE PURPOSE OF THIS PLAN IS FOR DESIGN ONLY. CURRENT PLANS ISSUED BY SERVICE PROVIDERS THOUGHT "DIAL BEFORE YOU DIG"ARE STILL REQUIRED. CONTRACTORS AND SUBCONTRACTORS WILL NEED TO EXERCISE THEIR OWN "DUTY OF CARE" AND SHOULD MAKE THEIR OWN DBYD ENQUIRY BEFORE EXCAVATION/CONSTRUCTION. YOU MUST ENSURE DBYD ARE CURRENT AS THEY HAVE VARYING EXPIRATION DATES, AND MAY REQUIRE RE0ISSUE OTHERWISE THE INFORMATION ON THE PLAN MAY NO LONGER BE CURRENT.

- UNKNOWN SERVICES MAY EXIST THAT COULD NOT BE ELECTRONICALLY DETECTED. THE DIAGRAMS OF THE SERVICE PROVIDER MAY NOT DEPICT ALL ASSETS WITHIN THEIR NETOWORK AND SERCICE PROVIDERS MAY SHARE CONDUITS AND/OR TRENCHES AT THE LOCATION.

- SINGLE MARKED LINES MAY REPRESENT MULTIPLE CONDUITS, PIPES END/OR CABLES AT THIS LOCATION. THE RECORDING OF DEPTHS AND POSITION OF UTILITIES CANNOT BE GUARANTEED AS CORRECT. WE RECOMMEND NON DESTRUCTIVE DIGGING/POTHOLING TO EXPOSE SERVICES FOR ACCURATE IDENTIFICATION AND DEPTH.

DETECTION PROCEDURES:

ASTREA HAVE DETECTED AND MARKED OUT EXISTING SERVICES IN THE AREA SPECIFIED BY THE CLIENT. THESE SERVICE LINES HAVE BEEN LOCATED BY ABOVE GROUND SERVICE TRACING METHODS AND HAVE NOT BEEN SIGHTED.
PROJECT SURVEYORS HAVE THEN LOCATED THE LINE MARKED BY ASTREA.
THE LOCATION OF THESE MARKED SERVICES ARE APPROXIMATE ONLY. THE POSITION OF THE MARKED SERVICE LINES HAS BEEN MADE WITH REFERENCE TO THE RELEVANT SERVICE AUTHORITY DIAGRAMS. ALL SERVICES MAY NOT HAVE BEEN SHOWN AND UTILITY DESCRIPTION HAVE BEEN TAKEN FROM UTILITY PROVIDED DIAGRAMS WHERE AVAILABLE. WE RECOMMEND NON DESTRUCTIVE DIGGING/POTHOLING TO EXPOSE MARKED SERVICES TO IDENTIFY AND SHOW EXACT DEPTH AND LOCATION OF SERVICE LINES PRIOR TO EARTHWORKS COMMENCING. UTILITES PLOTTED ON THE PLAN THAT TERMINATE IN THE SPECIFIED AREA MAY GO TO FEATURES THAT HAVE NOT BEEN SHOWN ON THE BACKGROUND DETAIL SURVEY PROVIDED BY CLIENT. THE RISKS WITH THE CLIENT AND/OR SUB CONTRACTOR AND THEIR RESPONSIBILITY TO EXERCISE CAUTION AT ALL TIMES.

ADDITIONAL INFORMATION ADDED:

IN PLACES WHERE UNDERGROUND DETECTION HAVE NOT BEEN ACHIEVED ADDITIONAL INFORMATION WAS PLOTTED FROM DOCUMENTS RECEIVED FROM CLIENT AND RECORDS OBTAINED FROM SERVICE PROVIDERS.

LOCATING QUALITY LEVELS PURSUANT TO AS5488-2013

QL-A QUALITY LEVEL A. VISUALISATION / CONFIRMATION OF A SERVICE, POSITION AND DEPTH, BY NON DESTRUCTIVE DIGGING METHODS OR POINTS OF ENTRY TO PITS OR MANHOLES.

QL-B QUALITY LEVEL B. LOCATING OF SERVICES USING RADIO DETECTION METHODS OR GROUND PENETRATION RADAR. ACCEPTABLE RANGE OF ACCURACY FOR QUALITY B IS 300mm FOR POSITION AND 500mm IN DEPTH.

QL-C QUALITY LEVEL C. SERVICES MARKED OUT USING ONLY SURFACE FEATURES THAT HAVE BEEN MEASURED IN THE FIELD. THIS INCLUDES HYDRANTS, GAS MARKERS, PITS LIDS ETC. NO INDICATION OF SERVICE LOCATION OR DEPTH CAN BE OBTAINED FROM QUALITY LEVEL C.

QL-D QUALITY LEVEL D. SERVICES MARKED UP USING DBYD PLANS ONLY. NO INDICATION OF SERVICE CONFIRMATION CAN BE GIVEN.

TREE DETAIL OVERLAY

SITE SURVEY (PROJECT SURVEYORS – 1ST SEPTEMBER 2020) WITH TREE DETAIL OVERLAY (PEAKE ARBORICULTURE 14/12/2020).

THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARBORICULTURAL IMPACT ASSESSMENT PREPARED FOR 9-11 NELSON ST CHATSWOOD, NSW 2067, BY PEAKE ARBORICULTURE (14/12/2020).

LEGEND

TREE PROTECTION ZONE | STRUCTURAL ROOT ZONE | TREE TO BE REMOVED/RETAINED

T23 / T23

PEAKE ARBORICULTURE
ABN 84145251152
Tel: 0402842164
david@peakearboriculture.com.au
peakearboriculture.com.au

NOTES :

* BOUNDARIES HAVE BEEN DEFINED BY SURVEY
* BEARINGS RELATE TO MGA NORTH ORIGINATING FROM DP1237932
* LEVEL DATUM IS AHD ORIGINATING FROM SSM 36740 RL 101.197 LOCATED AT PACIFIC HIGHWAY.
* VISIBLE, ACCESSIBLE SERVICES ONLY HAVE BEEN LOCATED. THIS PLAN DOES NOT PURPORT TO SHOW UNDERGROUND SERVICES.
* EXISTENCE OF SERVICES MUST BE VERIFIED BY CONTACTING DIAL BEFORE YOU DIG (DBYD) 1100.COM.AU CRITICAL SERVICES MUST BE EXPOSED AND LOCATED.
* NEIGHBOURING BUILDINGS, WINDOWS AND ROOF POSITIONS ARE APPROXIMATELY ONLY.
* FLOOR LEVELS GENERALLY SURVEYED AT DOOR THRESHOLDS. INTERNAL ROOMS NOT SURVEYED.
* CONTOURS SHOWN ARE INDICATIVE OF LAND FORM. SPOT LEVELS SHOULD TAKE PRECEDENCE.
* REFER TO FACE OF PLAN FOR SUBJECT TITLE NOTATIONS.
* THIS TITLEBLOCK IS AN INTEGRAL PART OF THIS DRAWING AND SHOULD NOT BE REMOVED.

GDA 2020

SCIMS SURVEY MARK

DIAL BEFORE YOU DIG www.1100.com.au

LEGEND

TF - TOP FENCE
PPT - PARAPET
TW - TOP WALL
TK - TOP KERB
TG - TOP GUTTER
PP - POWER POLE
SMH - SEWER MANHOLE
GASV - GAS VALVE
SIP - SEWER INSPECTION POINT
TEL - TELSTRA PIT
EOT - END OF TRACE
0.1D/3S/5H - TREE DIAMETER, SPREAD, HEIGHT
S - SILL
H - HEAD
GASM - GAS METER
WM - WATER METER
HYD - HYDRANT
RDG - RIDGE
FL - FLOOR LEVEL

REV	AMENDMENTS	DATE

SHEET 1 0F 6 - DETAIL SURVEY

CLIENT: THE OWNERS - STRATA PLAN No.65120

JOB REF. :	B04761
DRAWING No.	B04761-1
SURVEYOR:	JACOB D.
CHECKED:	NATHAN M. REGISTERED LAND SURVEYOR
DATE:	1 SEPTEMBER 2020
DATUM:	A.H.D.
ORIGIN:	SSM 36740 RL 101.197
REFERENCE SYSTEM	GDA 2020

PLAN OF: 9-11 NELSON STREET CHATSWOOD

BEING: SP65120

SHOWING: GENERAL DETAIL AND SITE LEVELS

PURPOSE: ARCHITECTURAL DESIGN COUNCIL SUBMISSION

BELLA VISTA
ABN 20 068 433 974
PO Box 7419 BAULKHAM HILLS NSW 2153
SUITE 405, LEVEL 414 LEXINGTON DRIVE, BELLA VISTA NSW 2153
PHONE : 9056 1900
email: office@projectsurveyors.com.au
www.projectsurveyors.com.au
PROJECT SURVEYORS
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A1

SP65120
4183m²

SP89243

SP76342

TWO STOREY
BRICK RESIDENTIAL
BUILDING
WITH BASEMENT PARKING
No.9-11

MULTI STOREY
BRICK & RENDERED
RESIDENTIAL BUILDING
WITH BASEMENT PARKING
No.15

MULTI STOREY
BRICK
RESIDENTIAL BUILDING
WITH BASEMENT PARKING
No.17

CONSTRUCTION SITE (INACCESSIBLE)

HEDGE A

PAVED PATH

DRIVEWAY TO BASEMENT

PATH

CONCRETE

BRICK & METAL FENCE

L&C PALING FENCE

TN1 (ASTREA REPORT)

TN3 (ASTREA REPORT)

EU2 (ASTREA REPORT)

EU3 (ASTREA REPORT)

SOUND WALL

PLAY EQUIPMENT

ACCESS PAD

GARBAGE ROOM

BRICK BUILDING

VEHICLE CROSSING

BM NAIL IN BITUMEN
RL 102.00 (A.H.D)

MGA

TN

APPROX.
1°

SCALE 1:100
0 1 2 3 4 5 6 7 8 9 10

SHEET 2 0F 6
DRAWING No.: B04761-2

A1

LEGEND

TF - TOP FENCE
PPT - PARAPET
TW - TOP WALL
TK - TOP KERB
TG - TOP GUTTER
PP - POWER POLE
SMH - SEWER MANHOLE
GASV - GAS VALVE
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TEL - TELSTRA PIT
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0.1D/3S/5H - TREE DIAMETER, SPREAD, HEIGHT

S - SILL
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WM - WATER METER
HYD - HYDRANT
RDG - RIDGE

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ABN 20 068 433 974

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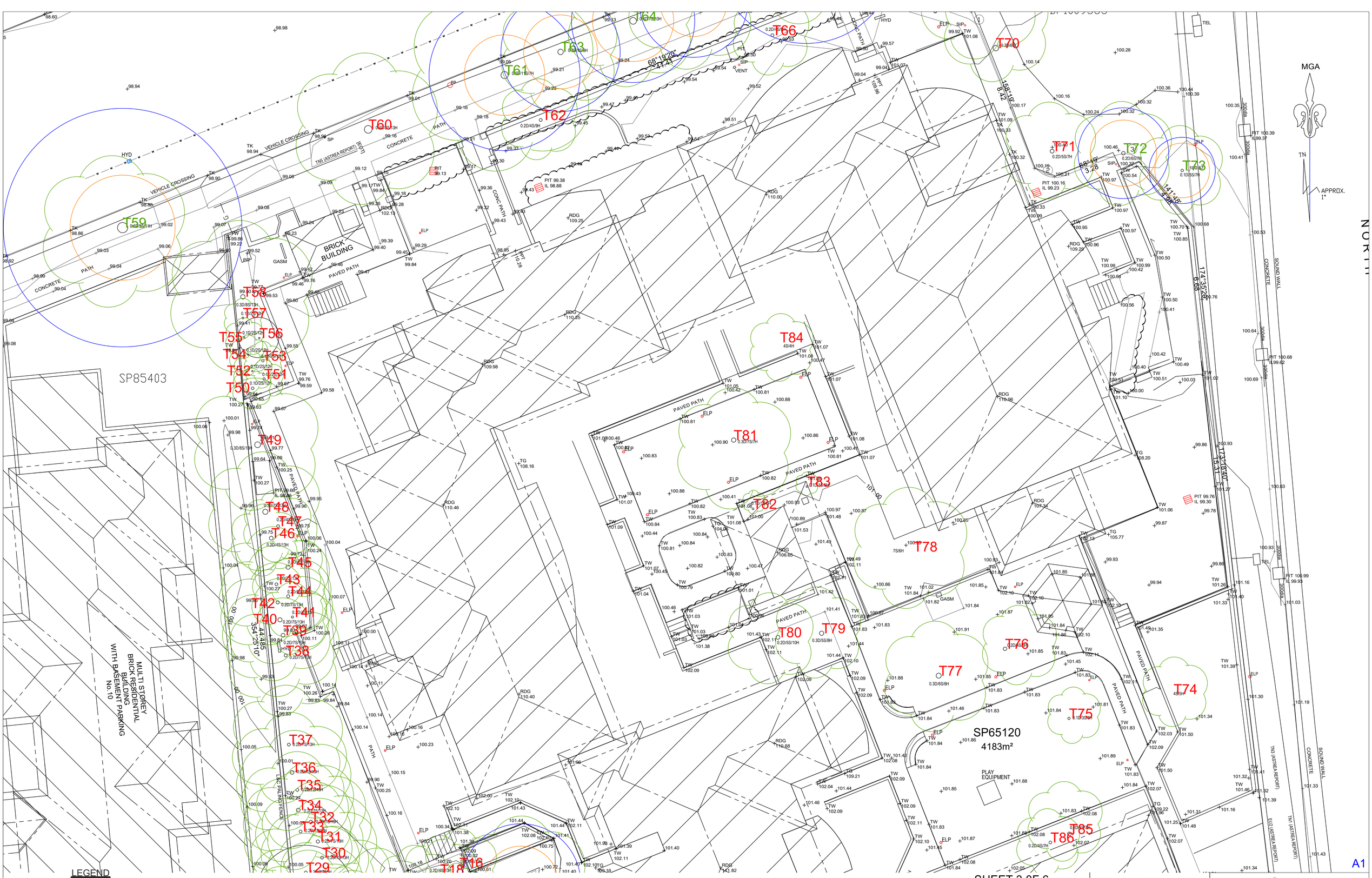

LEGEND

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S - SILL
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GASM - GAS METER
WM - WATER METER
HYD - HYDRANT
RDG - RIDGE

SCALE 1:100

0 1 2 3 4 5 6 7 8 9 10

SHEET 3 0F 6

DRAWING No.: B04761-3

A1

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WM - WATER METER
HYD - HYDRANT
RDG - RIDGE

SCALE 1:100

0 1 2 3 4 5 6 7 8 9 10

SHEET 4 OF 6

DRAWING No.: B04761-4

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