Arborist Report

Client: Hunter New England Local Health District

Address: 1a (Lot 10) Dudley Road

Charlestown N.S.W 2290

Bradley Magus

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1.0 Executive Summary

- It is recommended that Hunter New England Local Health District embark on a management program for fifty five (55) trees before commencement of the proposed building/constructions works as follows:

- It is recommended that Trees 1 – 26. 26a, 27 – 33, 33a, 34a, 35 – 40, 43, 44 & 48 - 53 (50 in total) be removed immediately (before commencement of building works) by a qualified arborist (minimum certificate 2 in arboriculture). It is recommended that professional indemnity and public liability insurances be current and sighted before commencement of works begin. The level of cover has to be one in agreement between Hunter New England Local Health District and the arborist.

- It is recommended that Tree 41, 42 & 45 - 47 (5 in total) be retained and incorporated into the development. It is recommended that no excavation works occur within five (5) metres of Trees 41, 42 & 45 – 47.

- It is recommended that the soil changes be kept to a minimum within the TPZ of Trees 41, 42 & 45 - 47 (5 in total) and be raised by no more than 200mm outside of the SRZ.

- It is recommended that protection measures be put in place that aid in the preservation of Trees 41, 42 & 45 - 47 (5 in total). It is recommended that 1.8 metre inter locking chain wire fencing be installed before commencement of building works on site as indicated in figure 6. Protection fencing is to be installed 3 metres from the trunk on the eastern side in the direction of the proposed car park and five metres to all other sides. It is recommended that all tree protection measures be put in place before the commencement of all civil works on site. Tree protection measures are to be undertaken prior to commencement of works and to be in place for the duration of works and/or to the release of the occupation certificate.

- The native bushland to the south eastern & western sectors of the site will not be affected by the proposed development. Due to the amount of trees it would be impractical to provide fencing around every individual tree. Therefore cordoning off the area to the west in a continuous line 2 metres from retained trees or where practical to form a continuous barrier is the preferred option of the arborist. This will allow the remnant vegetation to the west & south west to be closed off and minimise impact to the trees. The south eastern remnant tract of vegetation is to be enclosed with 1.8 metre chain wire protection fencing extending around the cluster with a distance of 3 metres from all retained trees to form an enclosed space.

- It is recommended that all civil contractors that enter the site are made aware of the importance of preserving Trees 41, 42 & 45 – 47 & all other trees that come under the requirements of LMCTPO and understand the tree protection measures that are put in place to preserve Trees 41, 42 & 45 - 47.

- All stockpile sites to be maintained a minimum 4 metres away from the trunk of Trees 41, 42 & 45 - 47 and all other trees that come under the requirements of Lake Macquarie Councils' Tree Preservation order.

- It is recommended that all parking of vehicles including heavy machinery be kept a minimum 4 metres from Trees 41, 42 & 45 - 47 & all other trees that come under the requirements of Lake Macquarie Tree Preservation Order (LMTPO) during construction works.

- This report is not for publication to the internet and submission of this report in the submission phase set out by Council is to be taken down upon completion of the development application.

2.0 Arborist Details

Bradley Magus **Contact Details:** P.O Box 333 Newcastle 2300 Ph: 0425 203 049 Email: abacustrees@gmail.com or bradmagus1@bigpond.com Web: www.abacustreeservices.com	**Qualifications** 1. Diploma Horticulture (1993) 2. Bachelor of Horticulture Science (1996) 3. Masters Land Economics (2002) 4. Diploma Horticulture (Arboriculture) (AQF 5) 2007 (Dux) 5. International Society of Arboriculture Certified Arborist (2007) 6. QTRA Assessor – 2011 & 2013

2.1 Introduction

Abacus Tree Services was commissioned by Hunter New England Local Health District to assist in the preparation of an arborist report. An assessment was made on fifty five (55) trees located within the confines of 1a (Lot 10) Dudley Road, Charlestown. There is in total fifty five (55) trees located at 1a Dudley Road, Charlestown that were assessed as per the applicant's instructions.

The purpose of this report is to provide information and guidance to the applicant (Hunter New England Local Health District) in relation to fifty five (55) trees only. The information in this report is to be used in correlation with other reports identified by Lake Macquarie Council and will provide Lake Macquarie Council with a framework for determining the development application (D.A).

This report and its recommendations are based upon a physical site inspection undertaken on the 16 December 2015.

The photographs included in this report were taken at the time of the inspection on the 16 December 2015.

2.2 Aims of this report/Procedure

The aim of this report is to assess the health and condition of fifty five (55) trees. The condition of the trees was assessed from ground level using the VTA (Visual Tree Assessment) method as outlined by Mattheck & Breloer (1999). The following criteria will be assessed within this report –

- An assessment of the dimensions (age, class, height and Diameter at Breast Height (D.B.H)
- An assessment of the health and condition of the trees;
- An assessment of the Useful Life Expectancy (U.L.E)
- Compilation of an appropriate report detailing the results of the above assessments
- Trees earmarked for retention to be assessed as per Australian Standards 4970-2009, Hazard Rating, Recommendations for each tree

The (U.L.E) method of tree assessment, as outlined by Jeremy Barrell (1999) has been adopted within this report. U.L.E categories give an indication of the useful life expectancy anticipated for the tree that has been adopted for this report. Several factors are considered in determining this rating such as species, location, age, condition and health of the tree. The five U.L.E categories are outlined in detail within Appendix 2.

3.0 Disclaimer

This assessment has been prepared for the exclusive use of the applicant (Hunter New England Local Health District), for the preparation of a development application submission. Information in this report relates to fifty five (55) trees within the premises of 1a Dudley Road, Charlestown only and should not be used in conjunction with any other property.

This assessment was carried out from the ground, and covers what was reasonably able to be assessed and available to the assessor at the time of the inspection. The assessor carried out no aerial inspections. Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of the inspection; furthermore the inspection was limited to a visual examination of the subject trees without dissection, excavation, probing or coring. Trees are living things and there condition will change over time. Therefore there is no guarantee that problems or deficiencies of the subject tree may not arise in the future.

3.1 Site Map

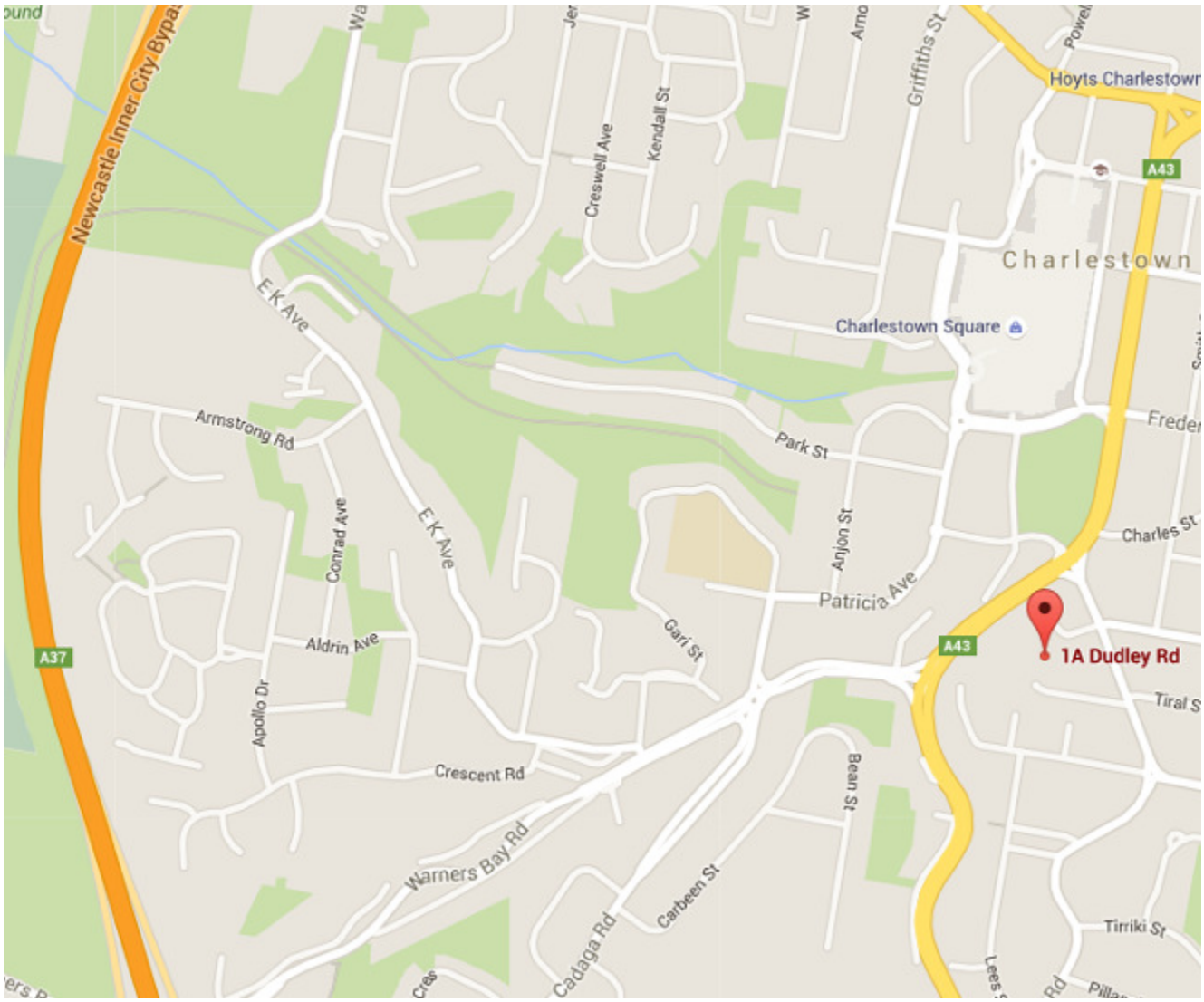


Figure 1
Location: All trees are located within 1a Dudley Road, Charlestown
Source: www.googlemaps.com.au

3.2 Site Description

Trees 1 – 55 are located wholly within 1a Dudley Road, Charlestown. The site is located in the municipality of Lake Macquarie Council. The species on site come under the requirements set out in Lake Macquarie Council's Tree Preservation Order pursuant to Lake Macquarie Local Environmental Plan (LMEP (2014). Section 5.9 & 5.9AA of LMEP highlight the definitions of a tree.

The site is set on a flat block with the immediate area being dominated by a mixture of commercial & residential houses. The nearest major arterial roads are Newcastle Inner City Bypass to the west & Pacific Highway to the west. The trees are located within the subject property identified as 1a Dudley Road, Charlestown within close proximity to the subject property & proposed development.

Figure 2 – Location of subject property identified as 1a Dudley Road, Charlestown. This photograph is taken at the front of the subject property overlooking the trees and the location in relation to Dudley Road.

Figure 3 – showing the main entrance off Dudley Road & the red arrow pointing to the internal access road that will be utilised to access the proposed car park.

3.4 Soil Considerations

From a visual observation there has been minimal soil disturbance in the last few years within the subject property. There is minor drill pits that have been undertaken towards the edge of the proposed development. These holes are less than 300mm in diameter and represent less than 1% of the overall TPZ. The drill pits constitute a minor encroachment into the TPZ. From a visual observation there has been no recent excavation works in and around Trees 1 – 53 (55 in total). The trees are situated within a combination of native and non-native grasses within an undulating site. There was no debris present or within the Structural Root Zone (S.R.Z) at the time of inspection. A root investigation would need to be undertaken if any roots have been damaged or diseased.

4.0 Tree Schedule

Species & dimension requirements on Pages 9 - 11. This page intentionally left blank.

Tree No	Scientific Name	Common Name	DBH (MM)	Height (M)	AGE CLASS	Vigour	SPREAD N.E.S.W.	ULE	Comments
1	Eucalyptus globoidea	White Stringybark	375	9	M	G	6,4,2,3	2a	LCR = 95 – 100%, no major pests or diseases. Tree 1 is located in proposed building footprint
2	Eucalyptus haemastoma	Scribbly Gum	330	9	M	G	1,2,2,4	2a	LCR = 95 – 100%, no major pests or diseases. Tree 2 is within the proposed building footprint.
3	Angophora costata	Red Gum	455	13	M	G	6,5,4,2	2a	LCR = 95 – 100%, no major pests or diseases. Tree 3 is within the proposed building footprint.
4	Angophora costata	Red Gum	320	13	M	G	2,4,3,3	2a	Minor mechanical damage to the trunk to SW. LCR = 95 – 100%, no major pests or diseases. Tree 4 is within the proposed building footprint.
5	Angophora costata	Red Gum	295	13	M	G	5,2,3,3	2a	LCR = 95 – 100%, no major pests or diseases. Tree 5 is within the proposed building footprint.
6	Eucalyptus racemosa	Scribbly Gum	430	13	M	G	3,2,2,4	2a	LCR = 95 – 100%, no major pests or diseases. Tree 6 is within five metres to the proposed building footprint. Species will be within the APZ. Canopy would be on the edge of the proposed building.
7	Corymbia gummifera	Bloodwood	495	15	M	G	3,4,3,6	2a	LCR = 95 – 100%, no major pests or diseases. Tree 3 is within the proposed building footprint. Tree 7 is located an estimated 12 metres to proposed building & an estimated 5.5 metres to the proposed building roofline.
8	Eucalyptus racemosa	Scribbly Gum	330,295 195	12	M	G	7,5,4,1	2a	Trifurcated at 1.4 metres, LDW in all four quadrants, LCR = 95 – 100%. Estimated at 12 metres to the proposed building. Canopy is estimated at 3 metres to the proposed building.
9	Eucalyptus globoidea	White Stringybark	390	10	M	G	5,5,3,3	3a	LCR = 90 – 95%, Decay in trunk noted. 5 metres to the proposed building, canopy would be on the edge of the building.
10	Eucalyptus globoidea	White Stringybark	390,315	9	M	A	4,7,5,3	2d	MDW in all four quadrants, LCR = 65 – 70%. Located 10.5 metres to proposed building footprint. Canopy is estimated at 3 metres to the proposed building.
11	Eucalyptus globoidea	White Stringybark	345	8	M	G	4,3,2,2	2a	LDW to S, LCR = 75 – 80%. Located in proposed building footprint.
12	Eucalyptus globoidea	White Stringybark	385	12	M	G	4,2,3,5	2a	LCR = 95 – 100%, No major pests or diseases. Located in proposed building footprint.
13	Eucalyptus globoidea	White Stringybark	570	12	M	G	3,3,3,4	2a	LCR = 95 – 100%, no major pests or diseases. Tree 13 is located in proposed building footprint
14	Eucalyptus globoidea	White Stringybark	495	11	M	G	7,6,4,1	2a	LCR = 95 – 100%, no major pests or diseases. Tree 14 is located in proposed building footprint

15	Eucalyptus resinifera	Red Mahogany	595,190	14	M	A	6,5,5,4	3a	Bifurcated at 1.4 metres above ground level. Active termites noted, LCR = 75 – 80%, Estimated at 4.5 metres to the proposed building.
16	Eucalyptus resinifera	Red Mahogany	490	15	M	G	8,6,2,2	3a	Tropism to E, LCR = 95 – 100%, no major pests or diseases. Tree 16 is located 5 metres to the proposed building & situated on the edge of the swale-bio retention pond.
17	Eucalyptus globoidea	White Stringybark	465	11	M	A	6,4,2,1	3a	LCR = 85 – 90%, No immediate works. Tree 17 is located 10 metres to the proposed building & within the swale-bio retention pond.
18	Eucalyptus globoidea	White Stringybark	345, 410	11	M	G	8,7,1,2	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in between car park & the proposed building. Located an estimated 14 metres to the proposed building& within three metres of bio retention pond.
19	Eucalyptus resinifera	Red Mahogany	465	15	M	G	2,6,5,7	2a	LCR = 95 – 100%, no major pests or diseases. Located an estimated 8 metres to the proposed building. Located in between the proposed car park and building.
20	Eucalyptus resinifera	Red Mahogany	370	10	M	A	10,1,0,6	3a	Minor tropism to N, LCR = 75 – 80%. located in proposed car park
21	Eucalyptus resinifera	Red Mahogany	720	16	M	G	10,7,5,10	2d	Minor pin hole borer, LCR = 90 – 95%, MDW in all fou r quadrants. Located in proposed car park.
22	Eucalyptus resinifera	Red Mahogany	475	15	M	G	7,4,2,4	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in proposed car park area.
23	Eucalyptus resinifera	Red Mahogany	445	14	M	G	5,4,2,5	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in proposed car park area.
24	Eucalyptus racemosa	Scribbly Gum	440	13	M	A	4,3,4,2	2d	LDW in all four quadrants, LCR = 70 – 75%, Located in proposed car park area.
25	Eucalyptus resinifera	Red Mahogany	355	13	M	A	2,2,1,3	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in proposed car park area.
26	Eucalyptus resinifera	Red Mahogany	395	16	M	G	5,1,0,3	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in proposed car park area.
26a	Eucalyptus resinifera	Red Mahogany	325	15	M	G	3,1,0,2	2a	LDW to NW (x2), LCR = 85 – 90%, no major pests or diseases noted. Located in proposed car park area.
27	Eucalyptus botryoides	Bangalay	445	15	M	G	4,3,1,3	3a	LDW to N + NW, Decay in trunk to S from ground level to 1 metre. Located on the edge of the proposed car park area.
28	Eucalyptus resinifera	Red Mahogany	350	15	M	G	3,3,2,3	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in proposed car park area.

29	Eucalyptus globoidea	White Stringybark	285	10	M	A	4,3,3,4	2a	LCR = 95 – 100%, no major pests or diseases noted. Located in proposed car park area.
30	Eucalyptus resinifera	Red Mahogany	480	15	M	G	4,4,3,3	2a	LCR = 95 – 100%, no major pests or diseases noted. Located within an estimated 1 metre to the proposed car park area.
31	Angophora costata	Red Gum	390	10	M	G	4,6,6,2	2a	LCR = 95 – 100%, no major pests or diseases noted. Located within 1 metre to the proposed car park area.
32	Eucalyptus resinifera	Red Mahogany	550	11	M	G	7,2,8,4	2a	MDW in all four quadrants. Tree 32 located to the west of the proposed car park area. Tree 32 is located 8.51 metres to the existing building & therefore is exempt in accordance with RFS 10:50 code.
33	Angophora costata	Red Gum	330	8	SM	G	2,7,7,0	2a	Tropism to NE, intermediate species, not growing true to form. Located 9.70 metres to the existing building & therefore exempt in accordance with the RFS 10:50 code.
33a	Eucalyptus resinifera	Red Mahogany	730	12	M	G	4,3,3,3	2a	Canopy is located on the edge of the existing building line. LCR = 95 – 100%. Located 5.35 metres to the existing building & therefore exempt in accordance with the RFS 10:50 code.
34a	Corymbia gummifera	Bloodwood	400	13	M	G	5,2,0,6	2a	MDW in all four quadrants, LCR = 80 – 85%, no major pests or diseases. Tree 34a is located on the edge of the proposed car park & will require removal in order to construct the car park.
35	Eucalyptus racemosa	Scribbly Gum	310	15	M	G	4,3,2,2	2a	MDW in all four quadrants, LCR = 95 – 100%, no major pests or diseases. Located in proposed car park area.
36	Eucalyptus resinifera	Red Mahogany	565,335, 285	12	M	G	6,2,8,5	2a	LCR = 95 – 100%, LDW estimated at 330mm at 1.3 metres above ground level to N (5 metres long), LDW in all four quadrants. Tree 36 is located in the proposed car park area.
37	Eucalyptus globoidea	White Stringybark	315	11	M	G	1,3,6,3	2a	LCR = 95 – 100%. Tree 36 will be located in the proposed battered area to the south of the proposed car park.
38	Eucalyptus resinifera	Red Mahogany	580,105	15	M	G	4,5,2,5	2a	LCR = 95 – 100%, no major pests or diseases. Located on the edge of the proposed car park area.
39	Eucalyptus resinifera	Red Mahogany	560,210	16	M	G	6,6,4,5	2a	LDW + MDW in all four quadrants. LCR = 95 – 100%, Bifurcated at 1.4 metres above ground level. No major pests or diseases, Located within 1 metre of the proposed car park area.
40	Corymbia gummifera	Bloodwood	310	13	M	G	3,4,3,0	2a	No major DW & or pests or diseases. Located on the edge of the battered zone associated with the car park.
41	Corymbia gummifera	Bloodwood	340	14	M	G	4,2,7,3	2a	Located 5 metres to the proposed car park & 2 metres to the associated battered area. LCR = 95 – 100%, No major DW or pests & diseases.

42	Eucalyptus globoidea	White Stringybark	475	13	M	G	6,1,4,8	2a	LDW to W & MDW in all four quadrants. LCR = 95 – 100%. Located more than 10 metres to Wansey Accommodation & outside of 10 metres to the proposed building. Potential to be retained.
43	Eucalyptus globoidea	White Stringybark	460,240	16	M	G	8,3,2,4	2a	LCR = 95 – 100%, Bifurcated at 1.4 metres (no inclusions) Minor tropism to N, MDW in all four quadrants. Located on the edge of the proposed car park.
44	Eucalyptus resinifera	Red Mahogany	530	14	M	G	10,4,6,4	2a	LCR = 90 – 95%, minor included fork union at 3.5 metres above ground level, Located 1 metre to battered area associated with the proposed car park.
45	Eucalyptus resinifera	Red Mahogany	400	15	M	G	7,0,3,5	2a	LCR = 95 – 100%, No LDW or pests or diseases. Located 2 metres to battered area associated with the proposed car park.
46	Angophora costata	Red Gum	335	14	M	G	3,3,5,5	2a	LCR = 95 – 100%, no major pests or diseases. Located an estimated 4 metres to the proposed battered area and a minimum 8 metres to the proposed car park. This species has the potential to be retained.
47	Eucalyptus resinifera	Red Mahogany	470	14	M	G	8,3,0,6	2a	LCR = 95 – 100%, no major pests or diseases. Estimated at 4.5 metres to battered area & a minimum 8.5 metres to proposed car park. Potential to be retained.
48	Corymbia gummifera	Bloodwood	300	14	M	G	6,2,2,5	2a	LCR = 95 – 100%, No major pests or diseases. Located within the concrete path.
49	Eucalyptus resinifera	Red Mahogany	310	15	M	G	4,5,1,0	2a	LCR = 95 – 100%, No major pests or diseases. Located within the concrete path.
50	Eucalyptus globoidea	White Stringybark	320	12	M	G	2,2,6,4	3d	Extensive epicormic growth, poor form and condition. Tree 50 is located an estimated 8 metres to the proposed facility entryway.
51	Eucalyptus resinifera	Red Mahogany	360	15	M	G	3,5,2,4	2a	No immediate works, No major pests or diseases, LCR = 95 – 100%. No major DW. Tree 51 would be located within 10 metres of an approved structure (Proposed facility).
52	Eucalyptus resinifera	Red Mahogany	350,190	13	M	G	7,5,1,2	2a	LCR = 95 – 100%, No major pests or diseases. Tree 52 is located 6 metres to the proposed facility & 3 metres to the entryway.
53	Eucalyptus globoidea	White Stringybark	645	14	M	G	7,4,6,10	2a	LCR = 95 – 100%, No major pests or diseases. Tree 53 would be located 6 metres to the entryway of the proposed facility.

Key:

Age class: Young = Y, Semi mature = SM, Mature = M, Over mature = OM
DBH = Diameter at Breast Height LCR = Live Crown Ratio
Vigour = Excellent = E, Good = G, Fair = f, Poor = P
LDW = large deadwood over 40mm, MDW = Minor deadwood less than 40mm
N= north, E = east, W = west, S = south MS = multiple Stems
ULE = Useful Life Expectancy (See appendix 2 for guidelines)

4.1 Trees & Impact on Development

Trees are living organisms and their root systems play an integral role in stability and providing nutrient storage as well as water uptake. The majority of tree roots for Dicotyledons occur within the first metre of the soil. Therefore construction works can have a profound effect on their health and longevity as well as their structural stability. Tree distances from excavation works must be taken into consideration at the planning stage to ensure that the tree is not damaged.

There are several main factors that occur at the construction phase that can have a negative impact on the trees health and stability. These practices can include but are not limited to –

- Parking of vehicles and heavy machinery within the drip line of the tree.
- Stockpiling of materials within the drip line of the tree.
- Excavating within the drip line and damaging the structural root system.
- Raising soil levels in and around the base of the tree therefore reducing the trees ability for gaseous exchange.
- Damage to the tree due to heavy machinery and equipment resulting in large bark tears or loss of branches and scaffolds.

To reduce the effects of construction it is imperative to provide an area underneath the tree where no works are undertaken. The area where supervised works are undertaken is referred to as the structural root zone (SRZ). The S.R.Z is an area where no to minimal activities listed above should occur. All trees require a S.R.Z and will vary from species to species but for the purposes of this report the Australian Standards 4970 has now been adopted.

In conclusion the Australian Standards like similar methods for protecting trees is only a guide. To ensure the health and longevity of trees within construction sites it is imperative to provide a large protection zone taking into consideration that the tree will also grow over time. The greater area that can be put aside where no works occur will aid in the preservation of the tree. The activities listed above should be kept to a minimum and encroachment within the SRZ will require the supervision by a qualified AQF 5 arborist. These impacts will be taken into consideration in the discussion & recommendations section of this report.

5.0 Discussion & Compliance to Australian Standards 4970 – 2009, 4373 – 2007 & Rural Fire Service (RFS) 10:50 Code

The table below represents the S.R.Z (Structural Root Zone) and TPZ (Tree Protection Zone) figures based on Australian Standards 4970 - 2009.

Tree No	SRZ (metres)	TPZ (metres)
15	2.83	7.44
16	2.64	5.88
18	2.73	6.48
19	2.63	5.58
27	2.34	5.34
30	2.52	5.76
31	2.39	4.68
37	2.31	3.78
38	2.98	6.96
39	2.93	7.20
40	2.19	3.72

Abacus Tree Services has been approached by Hunter New England Local Health District to undertake an arborist (assessment) report on trees that come under the requirements of Lake Macquarie Council's Tree Preservation Order (LMCTPO) & trees that will be affected by the proposed development. There are fifty five (55) trees that have been assessed within the subject property identified as 1a Dudley Road, Charlestown. The applicant proposes to erect/construct a new proposed facility (Charlestown Community Mental Health Facility) & car park and associated hardstand areas within the subject property identified in figures 7 & 8. (Appendix 1). All trees have been tagged for identification purposes.

Abacus Tree Services has outlined the trees within the proposed development and assessed trees that are within close proximity to the development. Site plan provided by Rodd & Hay Associates Pty Ltd Architects has been used to ascertain proposed distances to buildings, carpark and associated hardstand areas (Drawing No 7756 – 03). The site itself is a tract of remnant vegetation with a previously cleared understorey. There is evidence of native and non-native species of trees within the subject property. The dominant non-native species has been identified as Cinnamomum camphora.

The site is bushfire prone & therefore I have applied the Rural Fire Service (RFS) 10:50 code to the site in relation to the proposed development. The RFS website shows the entire site as coming under the requirements of RFS 10:50 Code (Figure 9). The trees form a continuous canopy within the subject property. This is the limit of the scope of works and all work pertaining to bushfire requirements must be assessed by a BPAD Assessor. Trees 1 – 5 are located within the proposed facility as outlined in figures 7 & 8. In order for the development to proceed in its current format will require the removal of Trees 1 – 5.

Tree 6 is located outside of the proposed facility & associated hardstand areas. This species will be located 6 metres to the proposed development once completed. This species would be within 10 metres to the proposed facility. Section 7.3 of the RFS 10:50 code highlights that the clearing distance for removing trees is set at 10 metres from an external wall of a building of a high risk facility. Tree 6 is also within the IPZ (Inner Protection Zone) that forms a continuous canopy. There is the strong potential that this species will require removal to conform to Australian Standards 3959:2009 & RFS 10:50 Code. .

Figure 4 – showing the north western part of the site & the location of the proposed facility. This will require the removal of Trees 1 – 6 & 12 – 14 that will be within the proposed facility & will therefore require removal to construct the dwelling.

The proposed facility will fall under the category of High-Risk Facility in accordance with the RFS 10:50 Code (Appendix A). Appendix A of the RFS 10:50 code highlights that a high risk facility can include educational purposes or any other health-related use. Section 7.3 of the RFS 10:50 code also highlights that irrespective of the location of the tree trunk, any branches within 10 metres of a residence may be pruned. Pruning the tree in compliance with the 10:50 code would remove an estimated 45 – 50% of the canopy. Tree 6 would be exempt in accordance with the RFS 10:50 code once the building was completed due to being within 6 metres to the proposed facility.

Tree 7 is located an estimated 12 metres to the proposed facility (building). Tree 7 is located 7.6 metres to the internal stairs that is attached to the proposed facility. This species would be within 10 metres to the proposed facility & therefore would be exempt once the building was completed. To comply with section 7.3 in relation to pruning works would remove a potential 30 – 35% of the canopy. This would also have to be undertaken on a regular basis due to the proximity to the building. The amount of pruning works required sits outside the framework of Australian Standards 4373 – 2007. This is considered a large scale pruning event. Tree 7 also forms a continuous canopy to the west & is within the inner protection zone (IPZ).

Tree 8 is situated 11.5 metres to the proposed facility. Tree 8 will be located 8.3 metres to the internal stairs that is attached to the proposed facility. This species would be within 10 metres to the proposed facility & therefore would be exempt once the building was completed. An estimated 55 – 60% of the canopy would require removal in order to comply with section 7.3 of the RFS 10:50 code. The amount of pruning works required sits outside the framework of Australian Standards 4373 – 2007. This is considered a large scale pruning event. Tree 8 also forms a continuous canopy to the west & is within the inner protection zone (IPZ).

Tree 9 is located an estimated 7.5 metres to the building & 5.6 metres to the undercover awning attached to the proposed development. This species would be within 10 metres to the proposed facility & therefore would be exempt once the building was completed.

Tree 10 is located an estimated 11.4 metres to the proposed facility & 9.5 metres to the undercover awning attached to the proposed facility. This species would be within 10 metres to the proposed facility & therefore would be exempt once the building was completed. Tree 10 is also located within the IPZ and therefore may require removal in order to break up the continuous canopy. Trees 11 – 14 are all within the proposed facility as outlined in figures 6 & 7. In order for the development to proceed in its current format will require the removal of Trees 11 – 14.

Trees 15 & 16 will be located an estimated 3 & 5 metres to the proposed facility. Tree 15 has been given an SRZ and TPZ of 2.83 & 7.44 metres. The proposed building will be an encroachment into the TPZ on one side by 59.68%. The overall loss of TPZ has been calculated at 25.04% and/or 43.55m2. This is a large loss of TPZ and the strong potential for loss of TPZ on the northern root plate. The proposed canopy would also be touching against the roofline. This species would require removal in order to construct the dwelling. Tree 16 has been given an SRZ and TPZ of 2.64 & 5.88 metres. The proposed facility would see an overall loss of TPZ of 3.4%. The proposed facility would be within 10 metres to an approved structure and therefore would be exempt in accordance with the RFS 10:50 code once the proposed facility was approved. The proposed easement (Bio retention pond) to the south of Tree 16 is located 1.8 metres away. This has the potential for deep excavation works. The proposed easement as indicated on the site plan will be an encroachment on one side by 69.39%. This is a large encroachment on one side of the tree. This species due to the location to the building and being within 10 metres to the proposed facility may require removal.

Tree 17 will be located an estimated 9.7 metres to the proposed facility. This species complies with Australian Standards 4970 – 2009. This species will be located within 10 metres to the proposed facility & therefore has the potential to be exempt once the building is approved.

Tree 18 will be located an estimated 14 metres to the proposed dwelling & an estimated 4 metres to the proposed car park. Tree 18 has been given an SRZ and TPZ of 2.73 & 6.48 metres. This is an overall loss of 13.36% in accordance with Australian Standards (AS) 4970 – 2009. AS4970 – 2009 outlines that greater than 10% has the potential for the arborist to consider alternative methods or redesign. Therefore the proposed car park would have a moderate effect on the health and condition of Tree 18. This species would be a standalone tree as the surrounding trees would be removed. It may be beneficial to remove the tree and replace with smaller native trees. If required to be retained by LMC will need protection fencing in accordance with Australian Standards 4970 – 2009.

Tree 19 is situated on the edge of the proposed bio retention pond (easement). The species has a SRZ and TPZ of 2.63 & 5.58 metres. This species is not fully mature and has the potential to have a SRZ and TPZ of 3 & 9 metres when fully mature. Moving the bio retention pond has been considered however to get it outside of the required TPZ distance of Tree 19 in accordance with Australian Standards 4970 – 2009 would see it too close to the proposed car park or facility. Tree 19 would require removal in order to construct the bio retention pond in its current location.

Trees 20 – 26 & 26a are within the proposed car park area and therefore will require removal in order to construct the car park. Tree 27 is located an estimated 0.5 metres to the proposed car park. Tree 27 has been given an SRZ and TPZ of 2.34 & 5.34 metres. This is an overall loss of TPZ of 44.05%. This is a major encroachment into the TPZ and overall loss of TPZ. This sits outside the acceptable limit of AS4970 – 2009 and therefore in order to construct the proposed car park in its current location will require the removal of Tree 27.

Tree 28 & 29 are within the proposed car park area and therefore will require removal in order to construct the car park. Trees 30 & 31 are both within 1 metre to the proposed driveway and car park. Tree 30 has been given an SRZ and TPZ of 2.52 & 5.76 metres. The overall loss of TPZ has been calculated at 39%. This is a major encroachment into the TPZ and overall loss of TPZ. This sits outside the acceptable limit and therefore in order to construct the proposed car park in its current location will require the removal of Tree 30. Tree 31 has been given an SRZ and TPZ of 2.39 & 4.68 metres. The overall loss of TPZ has been calculated at 36.50%. This is a major encroachment into the TPZ and overall loss of TPZ. This sits outside the acceptable limit of AS4970 – 2009 and therefore in order to construct the proposed car park in its current location will require the removal of Tree 31.

Trees 32, 33 & 33a will be located 3, 4 & 1 metres to the proposed driveway. Trees 32, 33 & 33a are located 6, 8 & 5.35 metres to the existing building (Wansey Accommodation). The trees are exempt in accordance with RFS 10:50 code and therefore can be removed in compliance with the code. Tree 34 is located 7 metres to the existing dwelling (Wansey Accommodation) and therefore is exempt in accordance with RFS 10:50 code and therefore can be removed in compliance with the code.

Tree 34a is located on the edge of the proposed car park. 50% of the root plate would require removal in order to construct the driveway. This is a major encroachment into the TPZ and overall loss of TPZ. This sits outside the acceptable limit of AS4970 – 2009 and therefore in order to construct the proposed car park in its current location will require the removal of Tree 34a.

Trees 35 & 36 are located inside the proposed car park and therefore will require removal in order to construct the car park. Trees 37 & 38 are located within 1 metre to the proposed car park. Tree 37 has been given an SRZ and TPZ of 2.31 & 3.78 metres. Tree 37 will have an overall loss (TPZ) of 33.36%. This is a major encroachment into the TPZ and overall loss of TPZ. This sits outside the acceptable limit and therefore in order to construct the proposed car park in its current location will require the removal of Tree 37. Tree 38 has been given an SRZ and TPZ of 2.98 & 6.96 metres. The overall loss of TPZ has been calculated at 40.88%. This species will require removal in order to construct the driveway in its current location.

Tree 39 is located 0.4 metres to the proposed path & car park. Tree 39 has been given an SRZ & TPZ of 2.98 & 7.20 metres. The proposed path and car park will remove 46.47% of available TPZ. This species will require removal in order to construct the driveway in its current location.

Tree 40 is located 2.2 metres to the proposed path and 4.0 metres to the car park. The SRZ and TPZ has been calculated at 2.19 & 3.72 metres. The overall loss of TPZ due to the location of the path and carpark equates to 14.68%. This is outside of the acceptable limit of 10% in accordance with AS4970 - 2009. This species has the potential for extensive future growth and may be beneficial to remove.

Tree 41 is located 4.6 metres to the proposed concrete path. This species falls outside of the RFS 10:50 code. This species would also have to comply with the bushfire report. Tree 41 also complies with Australian Standards 4970 – 2009. Tree 41 has the potential to be retained and incorporated into the development as long as it complies with the bushfire report. Tree 41 if retained would benefit from pruning all accessible deadwood in accordance with Australian Standards 4373 – 2007. Tree 41 forms a continuous canopy and potentially could be a species that can be selectively removed to reduce the available canopy cover on site. If required to be retained by LMC will need protection fencing in accordance with Australian Standards 4970 – 2009.

Tree 42 is located an estimated 6 metres to the proposed path. The species falls outside of the RFS 10:50 code. Tree 42 also complies with Australian Standards 4970 – 2009. Tree 42 has the potential to be retained and incorporated into the development as long as it complies with the bushfire report. Tree 42 forms a continuous canopy and potentially could be a species that can be selectively removed to reduce the available canopy cover on site. If required to be retained by LMC will need protection fencing in accordance with Australian Standards 4970 – 2009.

Tree 43 is located on the edge of the proposed car park on the north western corner. Tree 43 would require an estimated 55 – 60% of its root plate removed due to the proposed car park and hardstand areas. This is a major encroachment into the TPZ. Tree 43 would require removal in order for the development to proceed in its current location.

Trees 44 – 47 are all located outside of 10 metres to the proposed facility and therefore do not come under the requirements of RFS 10:50 code. Trees 44 – 47 would have to also comply with the bushfire report and recommended asset protection zone (APZ). Tree 44 is the closest tree to the proposed footpath & car park. This species will have an estimated 55 – 60% of its canopy over the car park & two (2) disabled car parking spaces. Trees 45 – 47 have no estimated canopy over the car park and proposed footpath. It may be beneficial to remove Tree 44 and if feasible to retain Trees 45 – 47 due to the spatial separation to the development. Trees 44 - 47 form a continuous canopy and potentially could be a species that can be selectively removed to reduce the available canopy cover on site. If required to be retained by LMC will need protection fencing in accordance with Australian Standards 4970 – 2009.

Trees 48 & 49 will be located within the proposed concrete footpath and therefore in order to construct the hardstand area will require the removal of Trees 48 & 49. Trees 48 & 49 are also located within the IPZ to the proposed facility.

Trees 50 – 53 are all located within 10 metres to the proposed building. Tree 50 is located an estimated 7.3 metres to the proposed building with an estimated 45 – 50% canopy over the proposed footpath. Tree 51 is an estimated 7 metres to the proposed building and will have an estimated 45 – 50% of its canopy over the proposed footpath. Tree 52 is located on the edge of the concrete path with part of the trunk located inside the proposed path. This species will require removal in order to construct the concrete path. Tree 52 is located an estimated 6 metres to the proposed building & 2.8 metres to the entryway and undercover area attached to the proposed building.

6.0 Conclusions

- Trees 1 - 26, 26a, 27 – 33, 33a, 34a, 35 – 53 (55 in total) are located within the subject property identified as 1a Dudley Road, Charlestown. Fifty five (55) trees in total have been assessed due to the proximity to the proposed facility, carpark & associated hardstand areas.

- Trees 1 – 5 & 11 – 14 (9 in total) are located within the proposed building footprint and therefore will require removal in order to construct the development. Trees 20 – 26, 26a, 28, 29, 35, 36, 43, 48 & 49 (13 in total) are located within the proposed car park/footpath and therefore would require removal in order to construct the hardstand area.

- There are several trees that have been considered for removal due to their location in relation to the proposed building. Section 7.3 of the RFS 10:50 code highlights tree removal that is allowed in accordance with the code. This would result in several trees requiring major pruning works to achieve a spatial separation to the building of 10 metres. This includes Trees 6, 15 – 17, 19, 49 & 50 – 53.

- The subject property identified as 1a Dudley Road, Charlestown is located in a Rural Fire Service (RFS) 10:50 area. In accordance the RFS 10:50 mapping tool highlights that the entire site is classed as meeting the requirements of the RFS 10:50 rule. The search was undertaken on the 5 January 2016. Rules and regulations in relation to the RFS 10:50 can change and it is therefore up to the applicant to ensure they comply with the 10:50 code and any updates that may occur. Therefore once the development is completed there are several trees that would be exempt. This included Trees 6 – 10, 15 – 17, 49 & 50 – 53.

- There are several other trees that are not within the building and/or proposed car park area however will be affected by the development and therefore will not comply with Australian Standards 4970 – 2009. Trees that do not comply due to their proximity to the building include 15, 16, 18, 19, 27, 30 , 31, 34a & 37 - 40

- Trees 41, 42 & 44 - 47 form a continuous canopy from the western part of the site. Trees 41, 42 & 44 - 47 could potentially be removed as these are some of the closest trees to the proposed facility after tree removal has taken place to accommodate the proposed facility & carpark. This would reduce the canopy cover.

- Trees 32, 33, 33a & 34 (4 in total) are located within 10 metres to an approved structure (Wansey Accommodation) and therefore meets the requirements of the RFS 10:50 Code. All trees were measured on the day of inspection as well as verification from the site plan (Drawing Number 7756 – 03).

- Protection fencing for Trees 41, 42 & 45 - 47 (5 in total) if required to be retained will require protection fencing in accordance with Australian Standards 4970 – 2009.

- This report is to be read in conjunction with the bushfire report. The subject site is bushfire prone land and therefore must comply with these terms as set out within the bushfire report.

7.0 Recommendations

- It is recommended that Hunter New England Local Health District embark on a management program for fifty five (55) trees before commencement of the proposed building/constructions works as follows:

- It is recommended that Trees 1 – 26. 26a, 27 – 33, 33a, 34a, 35 – 40, 43, 44 & 48 - 53 (50 in total) be removed immediately (before commencement of building works) by a qualified arborist (minimum certificate 2 in arboriculture). It is recommended that professional indemnity and public liability insurances be current and sighted before commencement of works begin. The level of cover has to be one in agreement between Hunter New England Local Health District and the arborist.

- It is recommended that Tree 41, 42 & 45 - 47 (5 in total) be retained and incorporated into the development. It is recommended that no excavation works occur within five (5) metres of Trees 41, 42 & 45 – 47.

- It is recommended that the soil changes be kept to a minimum within the TPZ of Trees 41, 42 & 45 - 47 (5 in total) and be raised by no more than 200mm outside of the SRZ.

- It is recommended that protection measures be put in place that aid in the preservation of Trees 41, 42 & 45 - 47 (5 in total). It is recommended that 1.8 metre inter locking chain wire fencing be installed before commencement of building works on site as indicated in figure 6. Protection fencing is to be installed 3 metres from the trunk on the eastern side in the direction of the proposed car park and five metres to all other sides. It is recommended that all tree protection measures be put in place before the commencement of all civil works on site. Tree protection measures are to be undertaken prior to commencement of works and to be in place for the duration of works and/or to the release of the occupation certificate.

- The native bushland to the south eastern & western sectors of the site will not be affected by the proposed development. Due to the amount of trees it would be impractical to provide fencing around every individual tree. Therefore cordoning off the area to the west in a continuous line 2 metres from retained trees or where practical to form a continuous barrier is the preferred option of the arborist. This will allow the remnant vegetation to the west & south west to be closed off and minimise impact to the trees. The south eastern remnant tract of vegetation is to be enclosed with 1.8 metre chain wire protection fencing extending around the cluster with a distance of 3 metres from all retained trees to form an enclosed space.

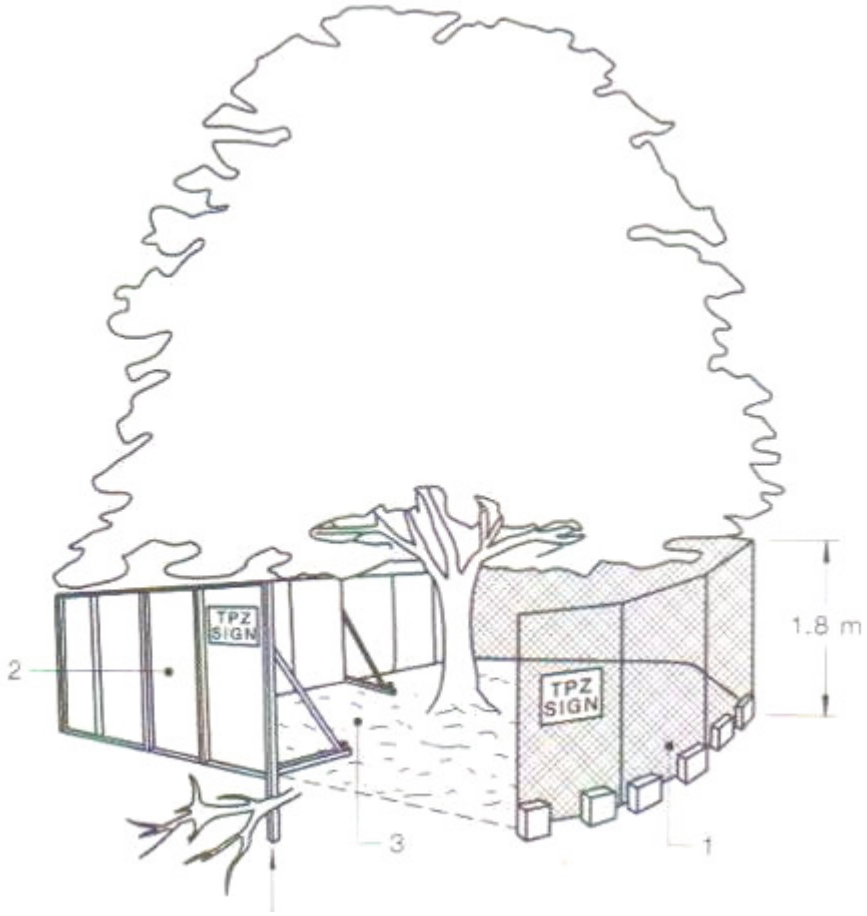
Figure 5 – An example of the continuous protection fencing that can be established along the western side of the proposed facility and car parking areas that will form a barrier to the remaining tract of vegetation.

- It is recommended that all civil contractors that enter the site are made aware of the importance of preserving Trees 41, 42 & 45 - 47 and understand the tree protection measures that are put in place to preserve Trees 41, 42 & 45 - 47.

- All stockpile sites to be maintained a minimum 4 metres away from the trunk of Trees 41, 42 & 45 - 47 and all other trees that come under the requirements of Lake Macquarie Councils' Tree Preservation order.

- It is recommended that all parking of vehicles including heavy machinery be kept a minimum 4 metres from Trees 41, 42 & 45 – 47 & all other trees that come under the requirements of LMCTPO during construction works.

- This report is not for publication to the internet and submission of this report in the submission phase set out by Council is to be taken down upon completion of the development application.



- Figure 6 – showing the proposed fencing that is to be put in place before the commencement of building works on site (Trees 41, 42 & 45 - 47 only).

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8.0 References

AS4373-2007 Pruning of Amenity Trees. Standards Australia

AS 4970 – 2009 Protection of trees on development sites

Clark R.J & Matheny N (1998) Trees & Development – A technical guide to Preservation of trees during land development: International Society of Arboriculture

Mattheck C., Breloer, (1999) The Body Language of Trees – a handbook for failure analysis 5th ed., London: The Stationery Office, U.K

Internet Sites

www.googlemaps.com.au

www.rfs.nsw.gov.au

www.lakemac.nsw.gov.au

www.olg.nsw.gov.au

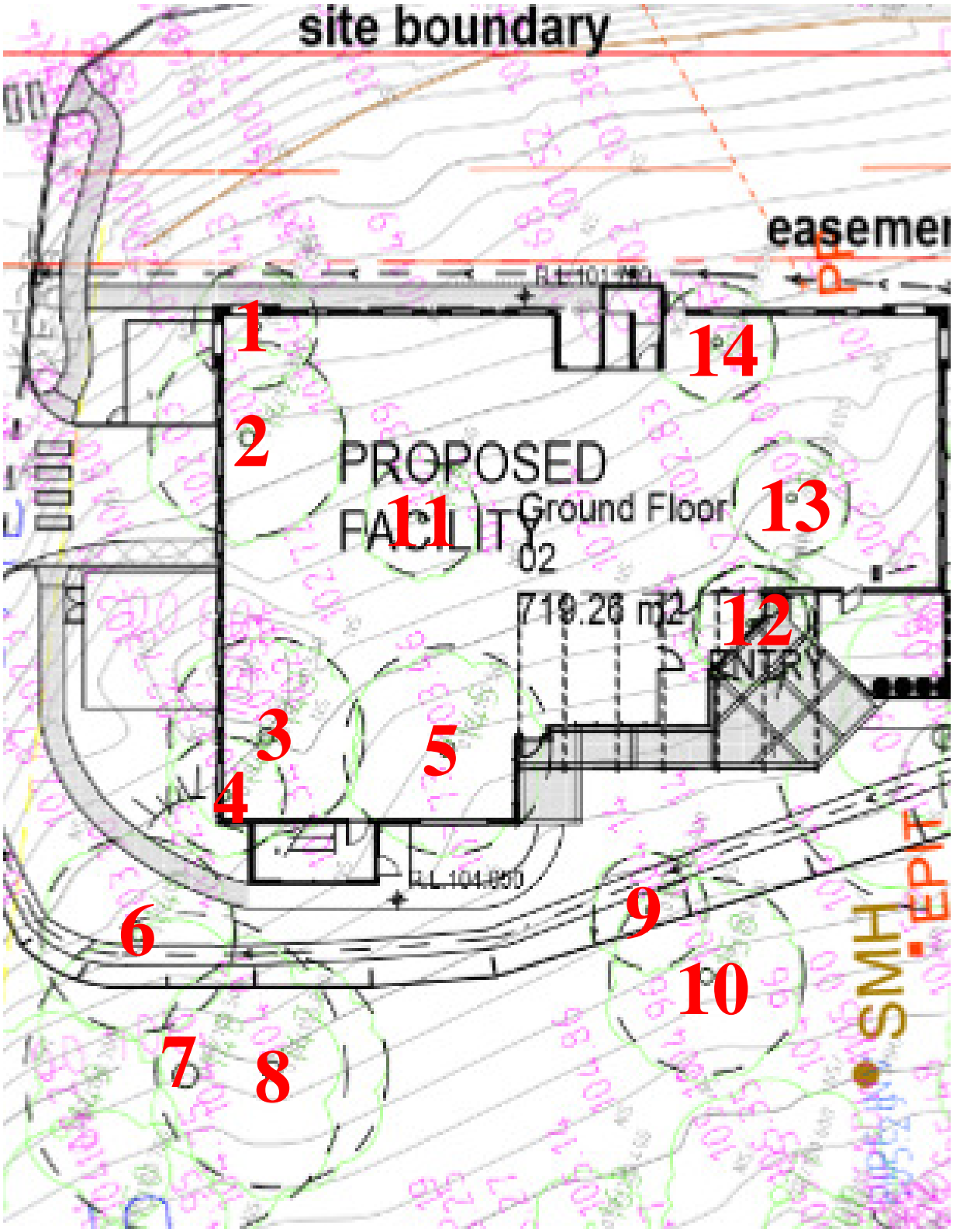


Figure 7 – showing the location of Trees 1 – 14 in relation to the proposed building

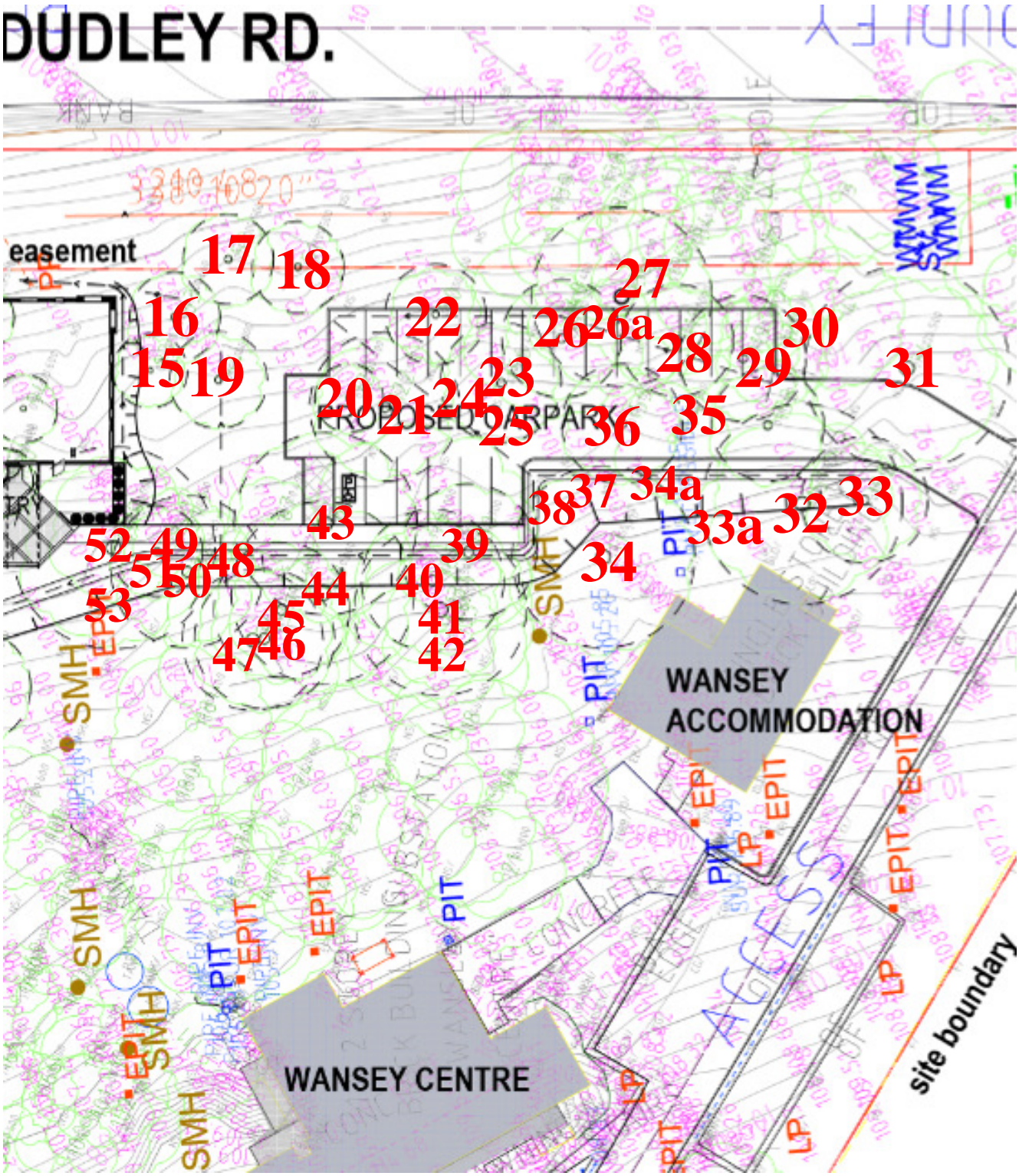
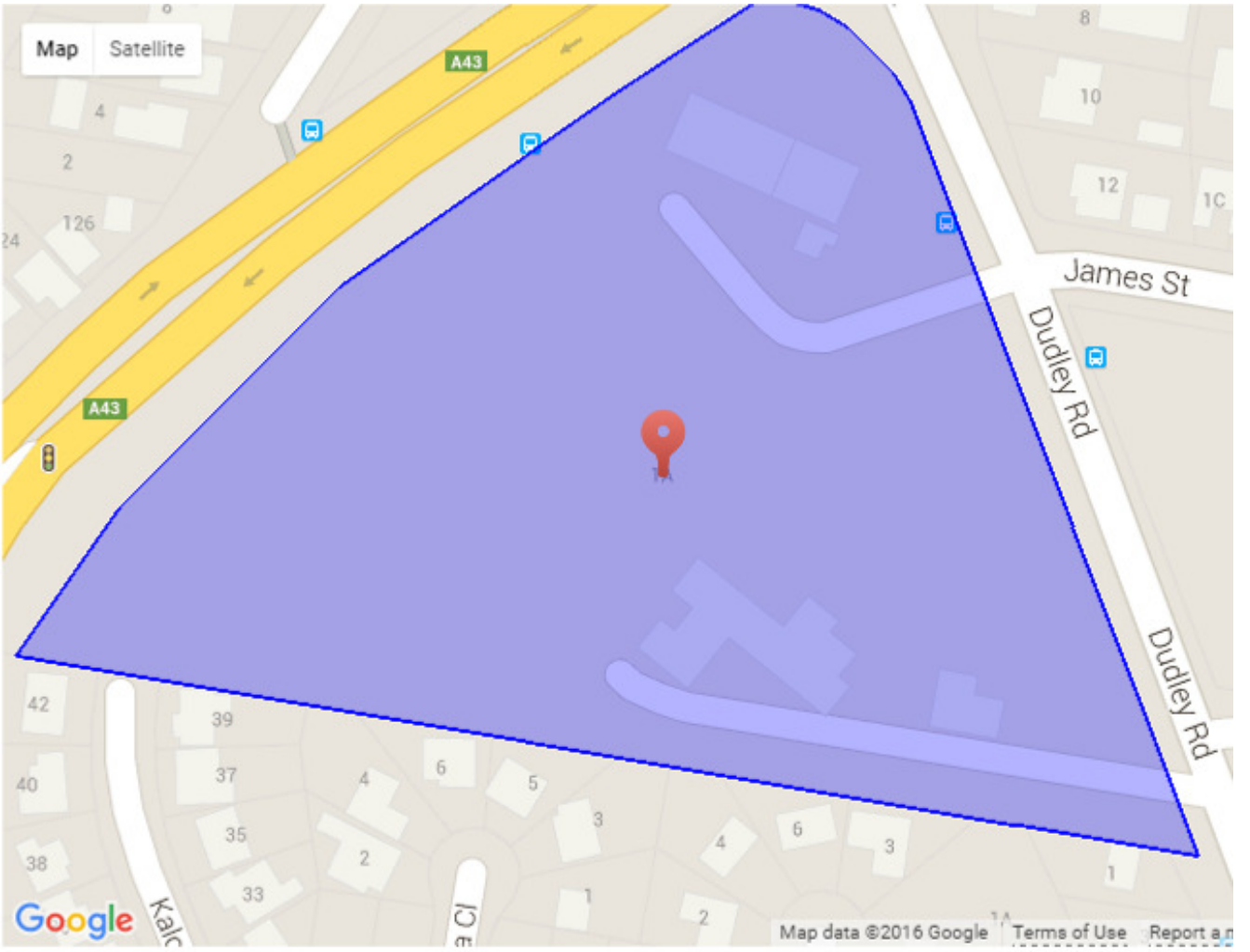


Figure 8 - Close up of the subject property and canopy area of Trees 15 - 53. Not to scale
Source: www.googlemaps.com.au



Your 10/50 search result

You have conducted a search of the 10/50 online tool for the land identified in the map above. This search result is valid date the search was conducted.

Please retain a copy of this search result for your records as evidence the 10/50 rules were applicable to your clearing day you undertook the clearing.

The parcel of land you have selected is located in a designated 10/50 vegetation entitlement clearing area. Y read the 10/50 Code of Practice carefully to ensure that you are only clearing in accordance with the 10/50 Co more information see our frequently asked questions.

Figure 9 – showing the location of the subject property in relation to RFS 10:50 Code. The entire site is mapped as bushfire prone land as indicated above.

APPENDIX 2 U.L.E (Useful Life Expectancy) Categories and Subgroups

Useful Life Expectancy – Classification

1. Long ULE > 40 Years

a. Structurally sound and can accommodate future growth
b. Long term potential with minor remedial treatment
c. Trees of special significance which warrant extra care

2. Medium ULE of 15-40years

a. Will live between 15 – 40 years
b. Will live for more than 40 years but would be removed for safety or other reasons
c. May live for more than 40 years but will interfere with more suitable specimens and need removal eventually
d. More suitable for retention in the medium term with some remedial care

3. Short ULE of 5-15 years

a. Trees that may only live between 5 – 15 more years
b. May live for more than 15 years but would need removal for safety or other reasons
c. Will live for more than 15 years but will interfere with more suitable specimens or provide space for replacement plantings
d. Require substantial remedial care but are only suitable for short term retention

4. Remove tree within 5 years

a. Dead, dying or seriously diseased
b. Dangerous trees through instability or loss of adjacent trees
c. Structural defects such as cavities
d. Damaged that are clearly not safe to retain
e. May live for more than 5 years but will need replacement to prevent interference or make space for more suitable trees
f. May or are causing damage to structures
g. That will become dangerous

5 Trees suitable to transplant

a. Small trees can be reliably moved or replaced
b. Young trees between 5 – 15 years
c. Trees that have been regularly pruned to control growth

Key	Criteria	Comments
Tree no		
Species	Relates to the fifty five on the site plan	
Remnant /planted Self Sown	May be coded – See Key for details	
Special Significance	A – Aboriginal C- Commemorative Ha- Habitat Hi- Historic M- Memorial R- Rare U- Unique form O- Other	May require specialist knowledge
Age Class	Y- Young- Recently Planted S-Semi mature (<20% of life expectancy M- Mature (20-80% of life expectancy) O- Overmature (>80% of life expectancy)	
Height	In Metres	
Spread	Average diameter of canopy in metres	
Crown Condition	Overall vigour and vitality 0 – Dead 1 – Severe decline (<20% canopy, major deadwood 2 – Declining 20-60% canopy density, twig dieback 3- Average/low vigour (60-90% canopy density, twig dieback) 4- Good (90-100% crown cover, little or no dieback or other problems) 5- Excellent (100% crown cover, no deadwood or other problems	
Failure Potential	Identifies the most likely failure and rates the likelihood that the structural defects will result in failure within the inspection period. 1- Low – Defects are minor (eg dieback of twigs, small wounds with good wound development) 2 – Medium – Defects are present and obvious egg Cavity encompassing 10-25% of the circumference of the trunk) 3 High- Numerous and/or significant defects present (eg cavity encompassing 30-50% of the circumference of the trunk, major bark inclusions)	Requires specialist knowledge

	4- Severe- Defects are very severe (eg fruiting bodies, cavity encompassing more than 50% of the trunk)	
Size of defective part	Rates the size of the part most likely to fail. The larger the part that fails the greater the potential for damage. 1- Most likely failure less than 150mm in diameter 2- Most likely failure 150-450mm in diameter 3- Most likely failure 450-750mm in diameter 4- Most likely failure more than 750mm in diameter	
Target rating	Rates the use and occupancy that would be struck by the defective part: 1. Occasional use (jogging, cycle track 2. Intermittent use (e.g picnic area, day use parking 3. Frequent use, secondary structure (eg seasonal camping, storage facilities) 4. Constant use structures (year round use for a fifty five of hours each day, residences)	
Hazard rating	Failure potential + size of part + target rating Add each of the above sections for a fifty five out of 12	The final fifty five identifies the degree of risk. The next step is to determine a management strategy. A rating in this column does not condemn a tree but may indicate the need for more investigation and a risk management strategy.
Root Zone	C-Compaction D- Damaged/wounded roots E- Exposed roots Ga- Tree in graded bed Gi- Girdled roots Gr- Grass K-Kerb close to tree L+- Raised soil level	

	L- Lowered soil level M- Mulched Pa- Paving concrete bitumen Pr- Roots pruned O-Other	
Defects	B-Borers C-Cavity D-Decay Dw-Deadwood E-Epicormics I-Inclusions L- Lopped LDCMP- Leaf damage by chewing mouthpiece insects M- Mistletoe/parasites MBA- Multi branch attachments PD- Parrot damage PFS- Previous failure sites S-Splits/Cracks T-Termites TL- Trunk lean TW- Trunk wound O-Other	
Services/adjacent structures	Bs- Bus stop Bu- Building within 3 metres Hvo- High voltage open wire construction Hvb- High voltage bundled (ABC) Lvo- Low voltage open wire construction Lvb- Low voltage bundled (ABC) Na- No services above Nb- No services below ground Si- Signage SL- Street light T- Transmission U- Underground services O- Other	More than one of these may apply