# WAGGA WAGGA HOSPITAL CARPARKS

# Tree Survey

A Report to;





on behalf of;



Prepared by;





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03 November 2020, Ref 20/387C.



# Trees on the Sites of Proposed Carparks, Wagga Wagga Health Services

#### 1 Introduction

Mark D. McCrone, consulting Landscape Architect, has been engaged by Ms. Tara Kennedy, Savills Project Management (on behalf NSW Health Infrastructure) to undertake an audit of extant trees on and surrounding the sites of three proposed carparks on the Wagga Wagga Health Services property. This audit's results and recommendations regarding the subject trees are recorded and discussed in the following report.

#### 2 Report Background, Purpose and Scope

As part of the development application documentation for the three proposed carparks on the Wagga Wagga Health Services property the proponents have undertaken a survey of all trees on (and surrounding) the development sites. The tree survey was to include all trees illustrated on Detail Survey plans prepared by Rivland Surveyors in September 2020.

The Wagga Wagga Development Control Plan requires that "an application is required to remove a tree on private property in urban areas... for ...any living tree with a height equal to or exceeding 8m". Those trees where this provision is applicable, and their removal is required to implement the proposed development, are highlighted in Tables 2 & 3. There are three trees affected by this provision.

The subject trees were inspected and photographed, and information on them recorded, on 12 October 2020.

The tree survey will provide;

- a recording of the trees' species, diameter at breast height (DBH) and height;
- a description of the trees' current condition & vigour, and their crown & structural viability (identifying any existing hazards); and
- an appraisal of the trees to facilitate any works required to comply with the provisions of the Wagga Wagga Development Control Plan, 2010 (Section 5 - Natural Resource and Landscape Management, Sub-section 5.2 - Preservation of trees) and of the Wagga Wagga City Council Street Tree Policy (POL 048), 2018.

The development site's location, and the three proposed car park projects within it, is shown in Exhibit 1. Survey Plans for the three car park project sites are included as Exhibits 2 to 4.

Tree Survey Report



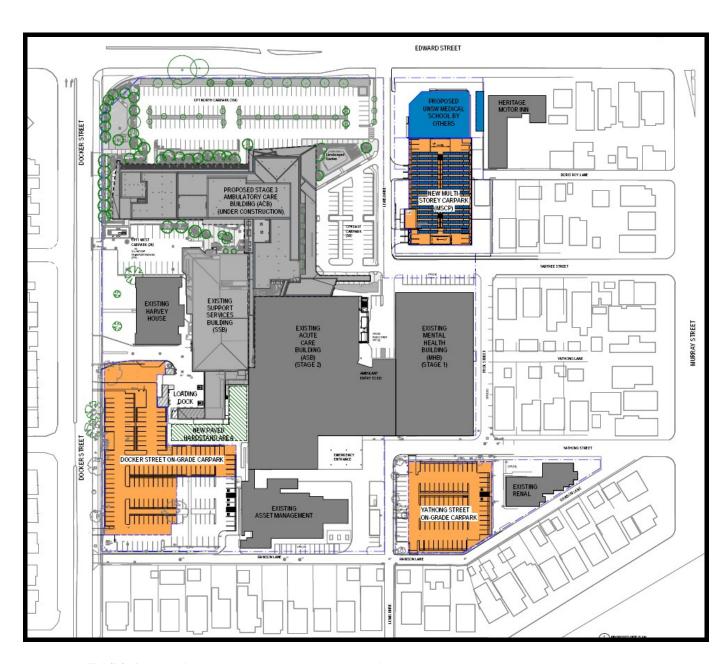
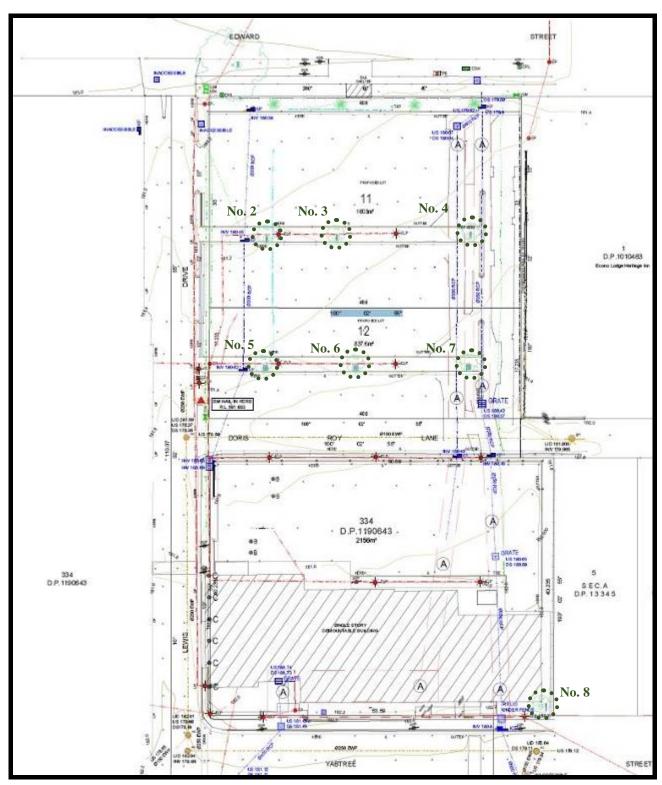


Exhibit 1 – Locality Plan; Wagga Wagga Health Services carparks.

Source; Jacobs Architects

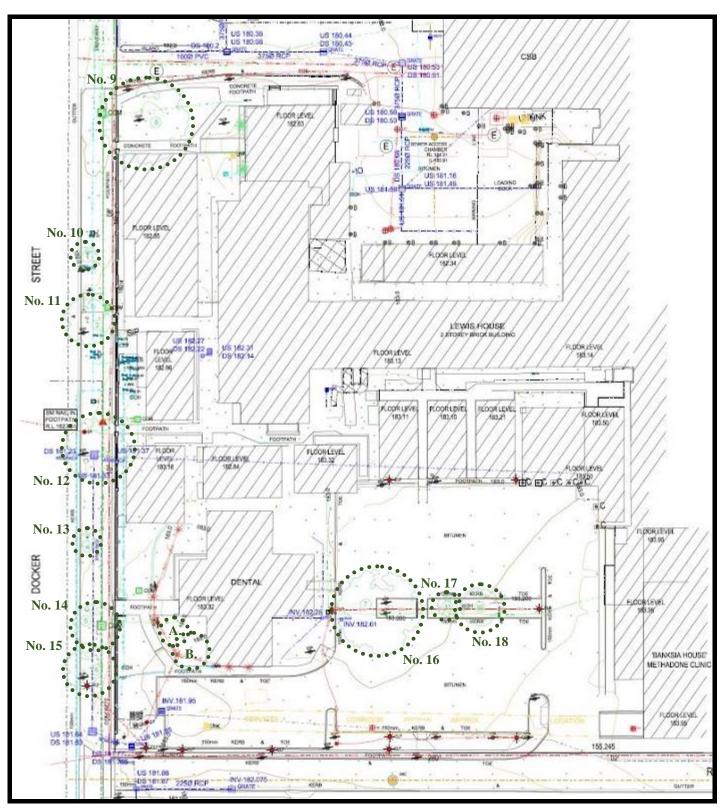




**Exhibit 2** – Wagga Wagga Health Services Detail Survey; Multi-storey Carpark site. Existing trees potentially impacted by works highlighted & numbered (refer to Section 4.1)

Source; Rivland Surveyors

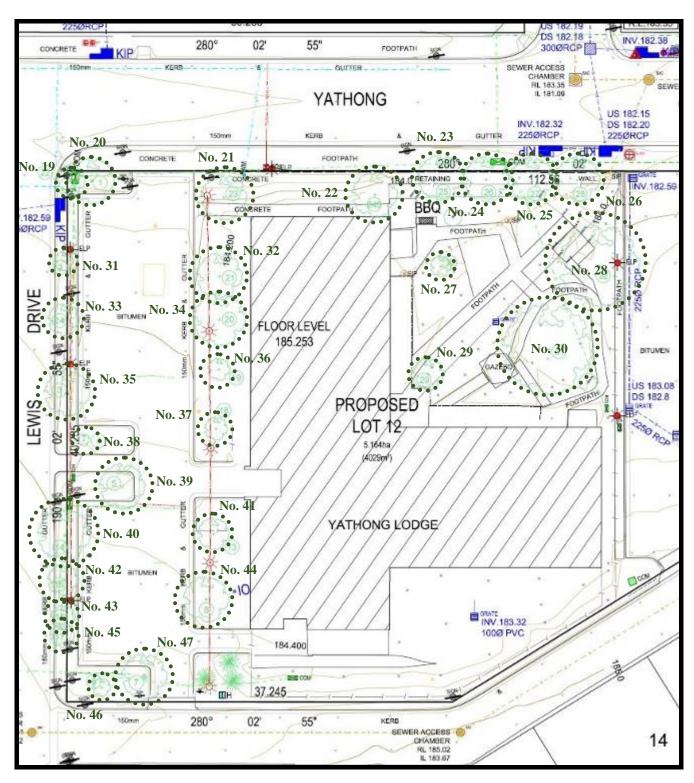




**Exhibit 3** – Wagga Wagga Health Services Detail Survey; Docker Street On-grade Carpark site. Existing trees potentially impacted by works highlighted & numbered (refer to Section 4.2)

Source; Rivland Surveyors





**Exhibit 4** – Wagga Wagga Health Services Detail Survey; Yathong Street On-grade Carpark site. Existing trees potentially impacted by works highlighted & numbered (refer to Section 4.3)

Source; Rivland Surveyors



#### 3 Tree Recording & Condition Description

The recording and assessment of the trees of the Wagga Wagga Health Services property involved a total of forty-eight living specimens. The locations of these trees are shown on the detailed survey plans included as Exhibits 2 to 4 of this report.

Individual recording for each tree involved the following. Each tree was identified to species, their DBH was measured and any detectable "defects" were noted. Estimated tree heights have been taken from tables included on the Rivland Surveyors survey plans. Any tree defects were established by an "on ground" inspection for symptoms and decay; neither excavation for root crown investigation, nor an aerial inspection of the trees' canopy, was conducted. A visual recording (via photography) of all trees' current physical form was also undertaken and is presented in Section 4.

A "Tree Condition" rating (outlined below) was also attributed to the trees. It should be emphasised that this rating relates to the tree's condition at the time of assessment. The rating is a product of both the tree (its health) and the surrounding conditions. Changes to either the tree or its environment may result in a change to the Tree Condition

The following "Tree Condition" categories were utilized to describe the general condition of trees on the development site;

**Good** – a tree of good habit, a form not severely restricted for space and light, physically free from the adverse effects of predation by pests or disease, obvious instability or structural weaknesses, and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it do not alter greatly.

**Fair** – a tree of good habit or misshapen, a form not severely restricted for space and light, has some physical indication of decline due to the early effects of predation by pests or disease, or has suffered physical injury that may be contributing to instability or structural weaknesses. Such a tree may recover with remedial works where appropriate, or may stabilize or improve over time, or in response to the implementation of beneficial changes to its local environment.

**Poor** – a tree of good habit or misshapen, a form that may be severely restricted for space and light, exhibits symptoms of advanced and irreversible decline due to the effects of predation by pests or disease, or has suffered physical injury that has lead to instability or structural weaknesses. Such a tree may decline further to death regardless of remedial works. Physical deterioration is characterised by a proportionate increase in susceptibility to, and predation by, pests & disease against which the tree cannot sustain its dynamic mass.



# 4 Description of the trees' current condition

#### 4.1 – Trees on the Proposed Multi-storey Car Park Site

Tree Reference No. (Refer Exhibit 2)	Scientific	Common Name	Height (m)	<b>DBH</b> (ст)	Condition (Refer to Section 3)
2	Pyrus calleryana Cleveland Select	Ornamental Pear	6	<10	Good
3	Pyrus calleryana Cleveland Select	Ornamental Pear	6	<10	Good
4	Pyrus calleryana Cleveland Select	Ornamental Pear	2	<10	Good
5	Pyrus calleryana Cleveland Select	Ornamental Pear	6	<10	Good
6	Pyrus calleryana Cleveland Select	Ornamental Pear	6	<10	Good
7	Pyrus calleryana Cleveland Select	Ornamental Pear	2	<10	Good
8	Alnus jorullensis	Evergreen Alder	7		Poor

**Table 1** – Species & physical condition of the trees of the proposed multi-storey car park site. The tree numbering used to identify the trees in the above Table is as shown in on the plan included as Exhibit 2.



#### 4.1.1 – Tree Nos. 2 to 4



**Exhibit 5** – Tree Nos 2 to 4 are three young specimens of Ornamental Pear cultivars (*Pyrus calleryana* Cleveland Select), planted within an "island" of the existing car park in the north-east sector of the Health Services property.



#### 4.1.2 – Tree Nos. 5 to 7



**Exhibit 6** – Tree Nos 5 to 7 are three more young specimens of Ornamental Pear cultivars (*Pyrus calleryana* Cleveland Select), planted within an "island" of the existing car park in the north-east sector of the Health Services property.



#### 4.1.3 – Tree No. 8



**Exhibit 7** – Tree 8 is an Evergreen Alder (*Alnus jorullensis*). The tree has been rated as in Poor condition however, with the exception of some live shoots low on the stem, it is dead.



#### 4.2 - Trees on the Proposed Docker Street On-grade Car Park Site

Tree Reference No. (Refer Exhibit 3)	Scientific	Common Name	Height (m)	<b>DBH</b> (ст)	Condition (Refer to Section 3)
9	Liquidambar styraciflua	Liquidamber	15	49	Good
10	Ulmus glabra Lutescens	Golden Elm	6	12 (av. >5)	Poor
11	Brachychiton populneus	Kurrajong	8	38	Good
12	Brachychiton populneus	Kurrajong	8	58	Good
13	Ulmus glabra Lutescens	Golden Elm	10	<10 (>5 stems)	Fair
14	Brachychiton populneus	Kurrajong	8	47	Good
15	Fraxinus excelsior	Common Ash	7	30	Poor
16	Fraxinus Raywood	Claret Ash	15	35 (av. of 4)	Poor
17	Fraxinus Raywood	Claret Ash	4	<10 (5 stems)	Good
18	Fraxinus Raywood	Claret Ash	6	17	Good
<b>A.</b>	Trachycarpus fortunei	Windmill Palm	4	30	Good
B.	Trachycarpus fortunei	Windmill Palm	6	35	Good

**Table 2** – Species & physical condition of the trees of the proposed Docker Street on-grade car park site. The tree numbering used to identify the trees in the above Table is as shown in on the plan included as Exhibit 3. Trees recommended to be retained are shown Green and removals (as per DCP provisions) Red. Trees A. & B. (Yellow) are proposed to be relocated (within the property) by Wagga Wagga Health Services Grounds Maintenance, subject to appropriate demolition scheduling.



# 4.2.1 – Tree No. 9



**Exhibit 8** – Tree 9 is a fine specimen of Liquidamber (*Liquidambar styraciflua*). Despite its "atypical" form for the species, with 3 dominant leaders, the tree is in Good condition.

#### 4.2.2 - Tree No. 10



**Exhibit 9** – Tree 10 is a Golden Elm (*Ulmus glabra* Lutescens) with a very heavy scale infestation in its crown, leading to its low vigour and attributing to its Poor condition rating.



#### 4.2.3 – Tree No. 11



 $\textbf{Exhibit 10} - \textbf{Tree 11 is a Kurrajong} \ (\textit{Brachychiton populneus}) \ of \ good \ health \ and \ vigour.$ 



# 4.2.4 – Tree No. 12



Exhibit 11 – Tree 12 is another Kurrajong (*Brachychiton populneus*) of good health and vigour.



**Exhibit 12** – Tree 13 is another Golden Elm (*Ulmus glabra* Lutescens) that has been compromised by multiple poor pruning of its lower branches. It is rated as in Fair condition.



# 4.2.6 – Tree No. 14



Exhibit 13 – Tree 14 is another Kurrajong (Brachychiton populneus) of good health and vigour.



#### 4.2.7 – Tree No. 15



**Exhibit 14** – Tree 15 is an Ash tree (*Fraxinus excelsior*) in Poor condition, lacking vigour, with the majority of its live tissue being epicormic shoots.



#### 4.2.8 – Tree No. 16



**Exhibit 15** – Tree 16 is a large specimen of Claret Ash (*Fraxinus* Raywood) of reasonable health and vigour. The tree has some deadwood high in its crown and has had multiple pruning of its leaders that has created a "lion's tail" formation in the tree (see Section 5 and Exhibit 43).



# 4.2.9 – Tree Nos. 17 and 18



**Exhibit 16** – Tree Nos. 17 and 18 are young specimens of Claret Ash (*Fraxinus* Raywood) of good form, health and vigour.



#### 4.3 - Trees on the Proposed Yathong Street On-grade Car Park Site

Tree Reference No. (Refer Exhibit 4)	Scientific Name	Common Name	Height (m)	<b>DBH</b> (сm)	Condition (Refer to Section 3)
19	Juniperus chinensis cv.	Chinese Juniper	4	14	Good
20	Ulmus glabra Lutescens	Golden Elm	4	<10 (>5 stems)	Fair
21	Juniperus chinensis cv.	Chinese Juniper	7	22	Good
22	Platycladus orientalis cv.	Oriental Arbor-vitae	3	<10 (>5 stems)	Good
23	Pyrus calleryana cv.	Ornamental Pear	5	14	Good
24	Pyrus calleryana cv.	Ornamental Pear	6	16	Good
25	Pyrus calleryana cv.	Ornamental Pear	6	15	Good
26	Pyrus calleryana cv.	Ornamental Pear	6	16	Good
27	Betula pendula	Silver Birch	3	<10	Good
28	Liquidambar styraciflua	Liquidamber	7	25	Fair
29	Lagerstroemia indica cv.	Crepe-myrtle	4	<10	Good
30	Liquidambar styraciflua	Liquidamber	8	23 (av. of 2)	Good
31	Ulmus parvifolia	Chinese Elm	5	10 (av. >5)	Fair
32	Callistemon viminalis cv.	Bottlebrush	7	10 (av. of 4)	Fair
33	Juniperus chinensis cv.	Chinese Juniper	4	13 (av. of 2)	Poor
34	Juniperus chinensis cv.	Chinese Juniper	8	28	Good
35	Ulmus parvifolia	Chinese Elm	5	14 (av. of 3)	Fair
36	Platycladus orientalis cv.	Oriental Arbor-vitae	5	14 (av. of 2)	Fair
37	Platycladus orientalis cv.	Oriental Arbor-vitae	5	18	Fair
38	Callistemon viminalis cv.	Bottlebrush	5	<10 (5 stems)	Good
39	Ulmus parvifolia	Chinese Elm	8	19 (av. of 3)	Good
40	Juniperus chinensis cv.	Chinese Juniper	6	13 (av. >5)	Fair
41	Platycladus orientalis cv.	Oriental Arbor-vitae	4	<10 (>5 stems)	Fair
42	Ulmus glabra Lutescens	Golden Elm	4	<10 (>5 stems)	Fair
43	Platycladus orientalis cv.	Oriental Arbor-vitae	4	11 (av. of 2)	Fair
44	Platycladus orientalis cv.	Oriental Arbor-vitae	5	23	Fair
45	Callistemon viminalis cv.	Bottlebrush	4	<10 (>5 stems)	Fair
46	Ulmus glabra Lutescens	Golden Elm	4	<10 (>5 stems)	Poor
47	Platycladus orientalis cv.	Oriental Arbor-vitae	5	14 (av. of 2)	Fair

**Table 3** – Species & physical condition of the trees of the proposed Yathong Street on-grade car park site. The tree numbering used to identify the trees in the above Table is as shown in on the plan included as Exhibit 4. Trees recommended to be retained are shown Green and removals (as per DCP provisions) Red.



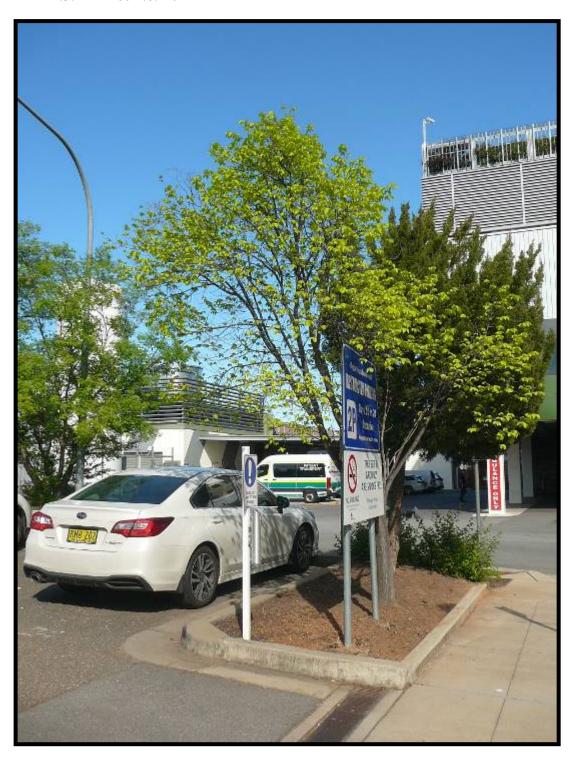
# 4.3.1 – Tree No. 19



**Exhibit 17** – Tree 19 is a Chinese Juniper (*Juniperus chinensis* cv) within the perimeter "island" of the existing car park of Yathong Lodge.



#### 4.3.2 – Tree No. 20



**Exhibit 18** – The crown of Tree 20 has, like other Golden Elms on the site, heavy scale infestation and has been misshaped due to suppression by the adjacent Tree 19, attributing to its Fair condition rating.

#### 4.3.3 - Tree No. 21



**Exhibit 19** – Tree 21 is another specimen of Chinese Juniper (*Juniperus chinensis* cv) of good form, health and vigour. Sections of the garden bed surrounding Yathong Lodge is densely planted with trees and woody shrubs, as illustrated in this picture.



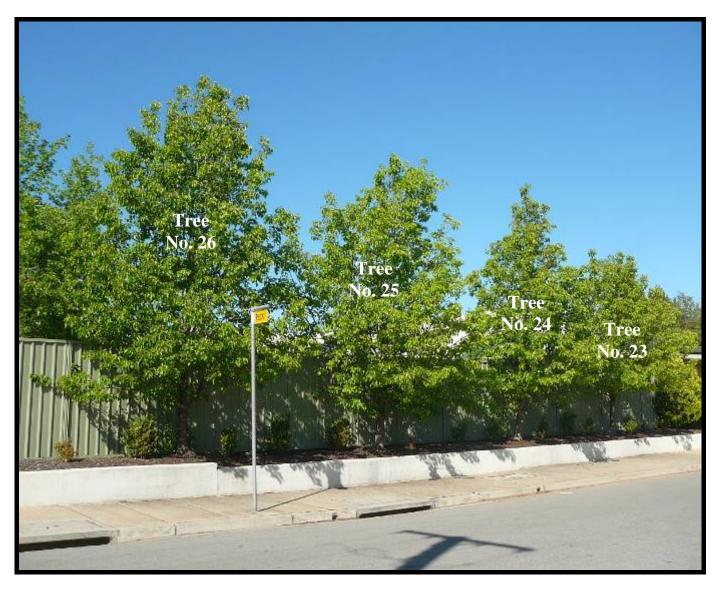
# 4.3.4 – Tree No. 22



**Exhibit 20** – Tree 22 is specimen of Oriental Arbor-vitae (*Platycladus orientalis* cv.) with a compact, rounded form.



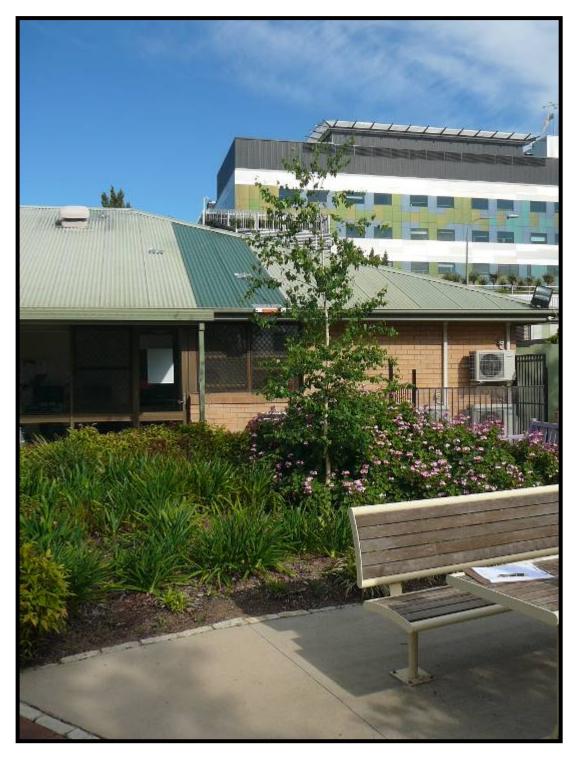
#### 4.3.5 – Tree Nos. 23 to 26



**Exhibit 21** – Tree Numbers 23 to 26 are all young healthy specimens of Ornamental Pear cultivars (*Pyrus calleryana* cv.).



# 4.3.6 – Tree No. 27



**Exhibit 22** – Tree 27 is a recently planted specimen of Silver Birch (*Betula pendula*) of good form, health and vigour.



#### 4.3.7 – Tree No. 28



**Exhibit 23** – Tree 28 is mature specimen of Liquidamber (*Liquidambar styraciflua*). The tree has suffered storm damage in the past which has seen the removal of its dominant apical leader.



# 4.3.8 – Tree No. 29



**Exhibit 24** – Tree 29, a Crepe-myrtle (*Lagerstroemia indica* cv.) in Good condition.



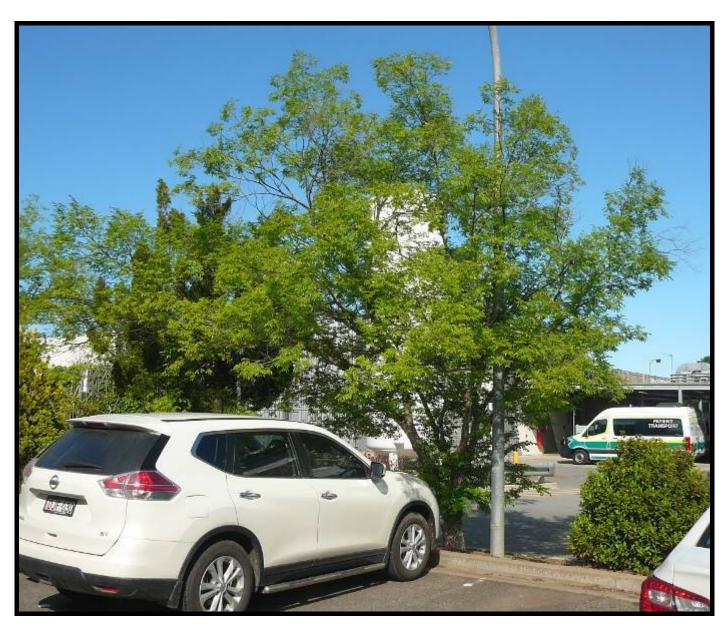
# 4.3.9 – Tree No. 30



Exhibit 25 – Tree 30 is fine specimen of Liquidamber (Liquidambar styraciflua) in Good condition.



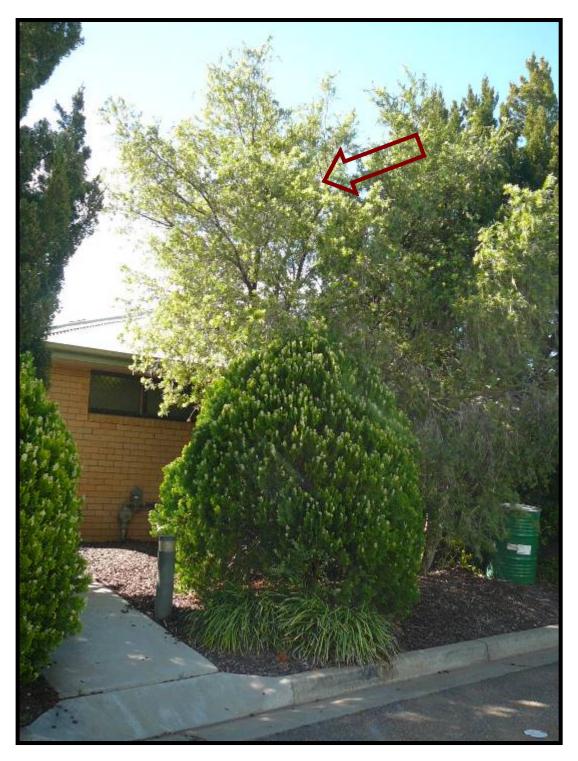
#### 4.3.9 - Tree No. 31



**Exhibit 26** – Tree 31 is a low branching specimen of Chinese Elm (*Ulmus parvifolia*) within the perimeter "island" of the existing car park of Yathong Lodge. The tree's "sub-optimal" form limits its usefulness in the altered landscape as its low branching, which encroaches on adjacent roadways and the car park, would be difficult to remedy with pruning.

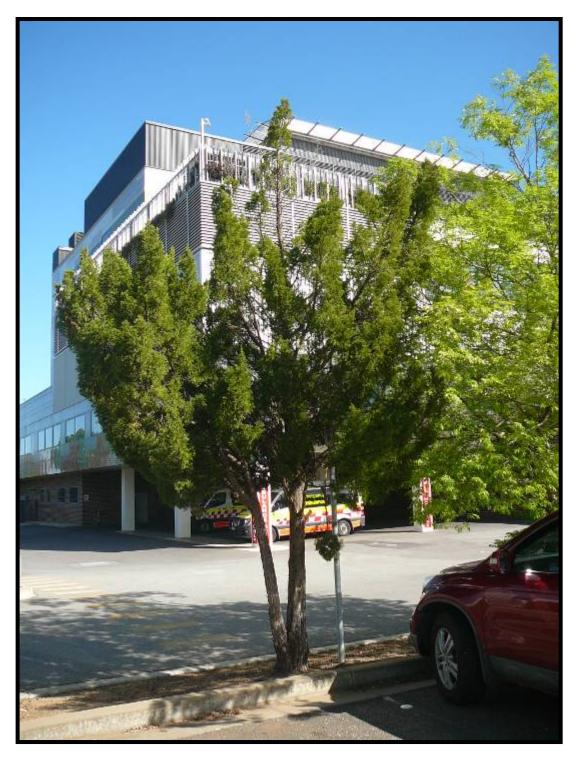


#### 4.3.10 – Tree No. 32



**Exhibit 27** – Tree 32 (arrowed) is a Weeping Bottlebrush (*Callistemon viminalis* cv.) whose form has been suppressed by adjacent planting in the garden beds surrounding Yathong Lodge.

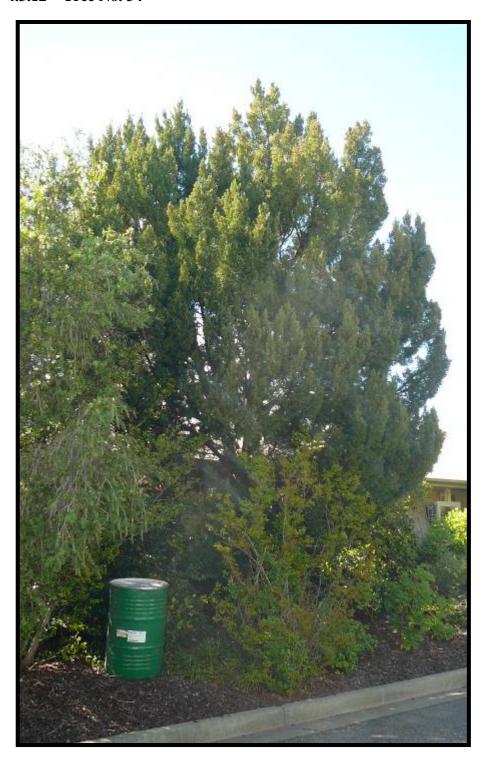
#### 4.3.11 – Tree No. 33



**Exhibit 28** – Tree 33 is another is a Chinese Juniper (*Juniperus chinensis* cv) within the perimeter "island" of the existing car park of Yathong Lodge. The tree's low vigour and senescent apex attribute to its Fair condition rating.



#### 4.3.12 – Tree No. 34



**Exhibit 29** – Tree 34 is another specimen of Chinese Juniper (*Juniperus chinensis* cv) of good form, health and vigour, within the garden beds surrounding Yathong Lodge.

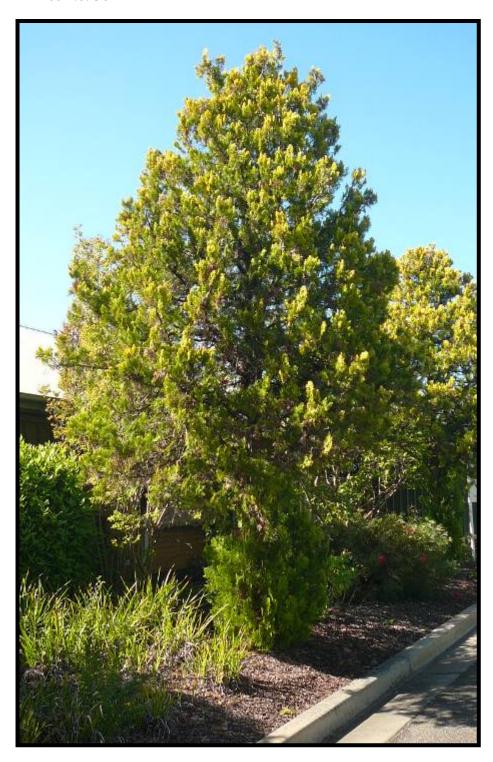


#### 4.3.13 – Tree No. 35



**Exhibit 30** – Tree 35 is another specimen of Chinese Elm (*Ulmus parvifolia*) within the perimeter "island" of the existing car park of Yathong Lodge. This tree also has a "sub-optimal" form with bifurcated codominant leaders low on its stem. This growth habit will probably lead to a major failure in the future and thus limits the tree's usefulness in the altered landscape.

# 4.3.14 – Tree No. 36

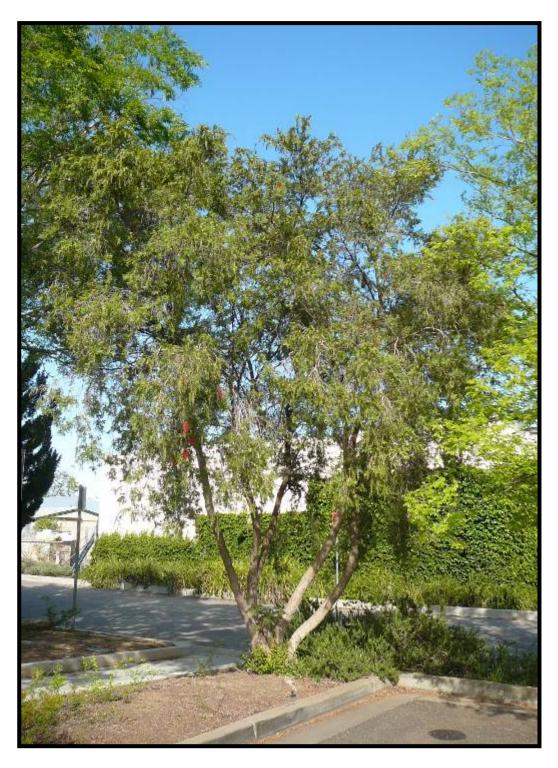


# 4.3.15 – Tree No. 37



**Exhibit 32** – Tree 37, another upright form of Oriental Arbor-vitae (*Platycladus orientalis* cv.) in Fair condition.

### 4.3.16 - Tree No. 38



**Exhibit 33** – Tree 38, another Weeping Bottlebrush (*Callistemon viminalis* cv.), with a multi-stem form typical of the species. The tree is rated in Good condition.



# 4.3.17 – Tree No. 39



**Exhibit 34** – Tree 39, a fine specimen of Chinese Elm (*Ulmus parvifolia*) in Good condition. This tree should be retained in the altered configuration of the proposed on-grade car park.

#### 4.3.18 - Tree No. 40



**Exhibit 35** – Tree 40 is another is a Chinese Juniper (*Juniperus chinensis* cv.) within the perimeter "island" of the existing car park of Yathong Lodge. The tree's dual stem attribute to its Fair condition rating.

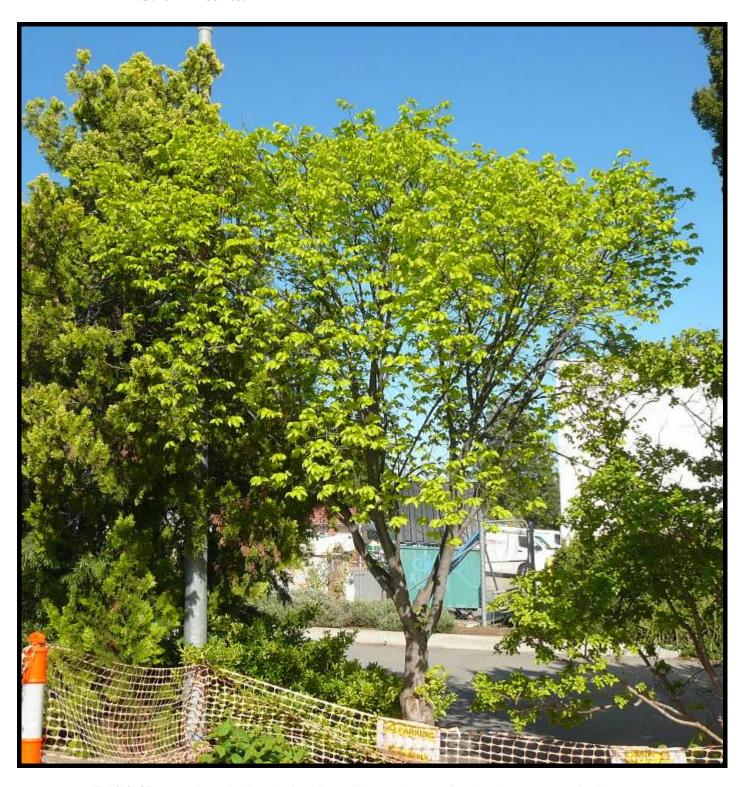
#### 4.3.19 - Tree No. 41



**Exhibit 36** – Tree 41 is another upright form of Oriental Arbor-vitae (*Platycladus orientalis* cv.). The tree has been heavily pruned for clearance from the adjacent building and its air conditioning units and is rated in Fair condition.

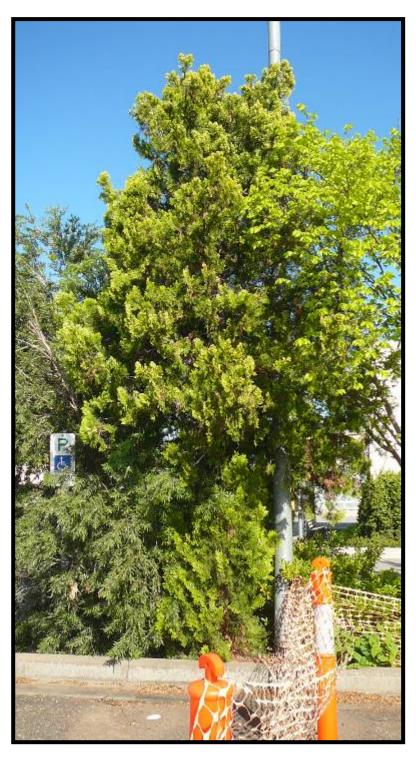


### 4.3.20 – Tree No. 42



**Exhibit 37** – Tree 42, a Golden Elm in Fair condition. The tree's form has been compromised by competition from neighbouring trees and is close to a car park light standard.

#### 4.3.21 - Tree No. 43



**Exhibit 38** – Tree 43 is another upright form of Oriental Arbor-vitae (*Platycladus orientalis* cv.). Like the neighbouring Tree Nos. 42 & 45, it is compromised by competition from neighbouring trees and its proximity to a car park light standard.



# 4.3.22 – Tree No. 44



**Exhibit 39** – Tree 44 is another upright form of Oriental Arbor-vitae ( $Platycladus\ orientalis\ cv.$ ) in Fair condition.



### 4.3.23 – Tree No. 45

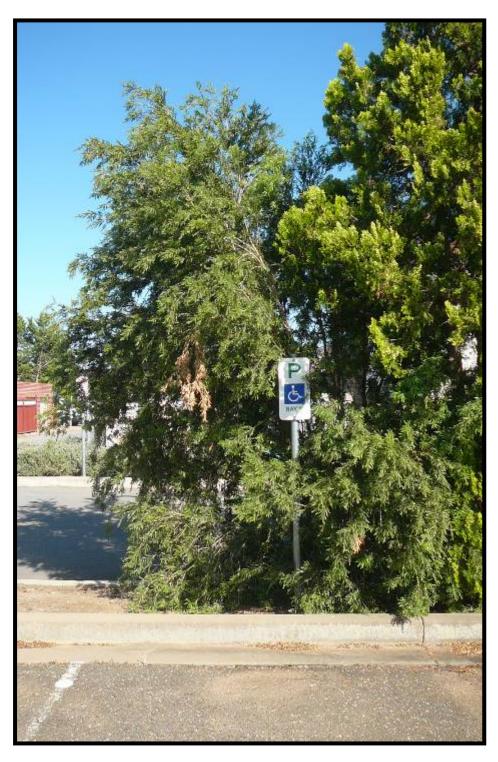
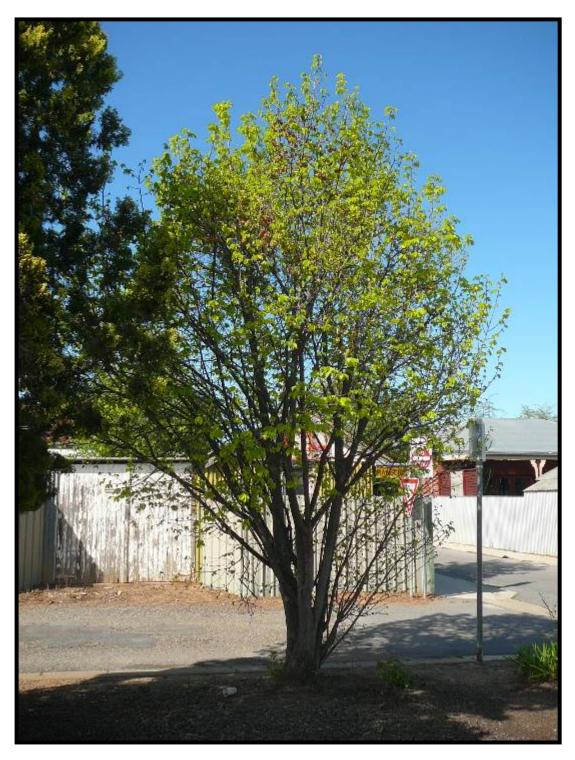


Exhibit 40 - Tree 45, another Weeping Bottlebrush ( Callistemon viminalis cv.) compromised by competition from neighbouring trees which is rated as Fair condition.



### 4.3.24 – Tree No. 46



**Exhibit 41** – Tree 46 is another Golden Elm (*Ulmus glabra* Lutescens) with scale infestation of its crown and "sub-optimal" form with multiple stems and low watershoots, attributing to its Poor condition rating.



# 4.3.25 – Tree No. 47



**Exhibit 42** – Tree 47 is another upright form of Oriental Arbor-vitae (*Platycladus orientalis* cv.) in Fair condition.



#### 5 Discussion and Recommendations

There are not many trees on the three designated development sites of significant size or maturity and most are not of a sufficient stature – that being with a height equal to or exceeding eight metres – to warrant consideration under the provisions of the Wagga Wagga Development Control Plan, 2010. That acknowledged, there some "notable" specimens with good form, health and vigour whose positioning offers amenity opportunities for the altered landscape of the proposed car park facilities.

One of the larger specimens whose positioning would allow its retention, in view of the proposed works, is Tree No. 16, a Claret Ash (see Section 4.2.8). However, contemporary practice in the pruning of mature trees has highlighted the risk of what has been termed "lions-tailing". Gilman describes lions-tailing as overthinning or stripping out the interior of a tree with little or nothing being removed from the ends of limbs. Lions-tailing can cause structural weakness, unbalancing the crown and creating poor mechanical properties (Gilman, 2012). As shown in Exhibits 15 & 43 various "crown lift" pruning of Tree No. 16 has lead to its major lateral limbs having foliage (and growth) concentrated at it extremities, which compromises the safety of the tree. The removal and replacement of this tree is the most sensible management approach.

A number of the documented trees are street trees managed by Wagga Wagga City Council, viz. six trees on Docker Street. The WWCC Street Tree Policy, 2018, notes that Council will consider removing a street tree where "the tree is in a state of decline to the point that survival is unlikely". Due to their current condition it is recommended that three of the Docker Street street trees, Tree Nos. 10, 13 (both *Ulmus glabra* Lutescens') and 15 (*Fraxinus excelsior*) be removed and replaced.

The size, scenic and environmental value, and current condition warrants that due consideration should be given to the retention of the following trees within the Wagga Wagga Health Services property.

- On the Docker Street On-grade Carpark site Tree Nos. 9 (*Liquidambar styraciflua*), 17 and 18 (young *Fraxinus* Raywoods) and
- On the Yathong Street On-grade Carpark site Tree Nos. 19 (*Juniperus chinensis* cv.), 23 to 26 (*Pyrus calleryana* cvs.), 38 (*Callistemon viminalis* cv.), 39 (*Ulmus parvifolia*) and 40 (*Juniperus chinensis* cv.).

Other existing trees within the perimeter "island" on the western end of the existing car park of Yathong Lodge are not considered suitable for retention because of either poor branching habit (unable to be corrected with appropriate pruning), low health and vigour, or a species typical form that is unsuited to the tree being useful in a urban carpark landscape.

Two specimens of Windmill Palms (*Trachycarpus fortunei*) on the Docker Street On-grade Carpark site are illustrated in Exhibit 44. These are two fine specimens of a slow growing species and the transplanting of Palm species is a reasonably straightforward and achievable exercise, even with specimens of great maturity. Grounds Maintenance personnel on the Wagga Wagga Health Services site have expressed a willingness (pers. comm.) to relocate these trees within the property and it is recommended that the scheduling of demolition works during the implementation of the proposed works give due consideration to facilitating this relocation.

The project's Landscape Schematic Design, prepared by *Site Image* Landscape Architects, shows existing trees being retained where possible, and a range of new plantings of trees and complementary shrub and groundcover species to provide amenity and amelioration to the altered landscape (see Exhibit 45).







**Exhibit 43** – Tree 16. Deadwood high in the crown, and pruning that has overthinned and stripped out the interior of a tree (**Upper** image), which has prompted vigourous epicormic shoots at the base (**Lower** image) of the tree. The tree is consequently not considered suitable for retention in the altered landscape.





**Exhibit 44** – Two specimens of Windmill Palms (*Trachycarpus fortunei*) sited on the Docker Street frontage of the existing Dental Clinic. These trees could be transplanted to a suitable position within the Wagga Wagga Health Services property.

MARK D. MCCRONE LANDSCAPE ARCHITECT

20/387



Exhibit 45 – Landscape Schematic Design for the Yathong Street Carpark.

Source; Wagga Wagga Hospital Multi Storey and On Grade Carparks Landscape Schematic Design, October 2020, *Site Image* Landscape Architects

All trees retained on the development sites should be given full and adequate protection during any future construction works (in accordance with AS4970-2009; *Protection of trees on development sites*) and all necessary work undertaken on them should be carried out in accordance with AS4373-2007; *Pruning of amenity trees* and WorkCover NSW Code of Practice 'Amenity Tree Industry' (2007).



Finally, it should also be noted that trees cannot be guaranteed 'risk free'. All trees represent some degree of risk. Arboriculture is not an exacting science; rather it is an educated interpretation of the interaction of edaphic and environmental circumstances which are, of course, subject to change over time. This report documents such an interpretation of evidence available at the time of the trees' inspection.

MahAleCa

Mark McCrone 3 November 2020.

#### **6 Further Information**

Further details or clarification with respect to any matter raised by this report may be obtained from **Mark McCrone** on 04 0790 7958.

#### Mark D. McCrone, 2020.

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# References

Gilman, E.F. (2012). *An Illustrated Guide to Pruning* (3<sup>rd</sup> Ed.): Delmar: NY.

Standards Australia, 2007. *Pruning of amenity trees*: AS 4373 – 2007. SA: Sydney.

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