



## ARBORICULTURAL DEVELOPMENT IMPACT ASSESSMENT REPORT

### Broken Hill Key Worker Accommodation

6th of June 2024

**Prepared for**  
Health Infrastructure

#### Prepared by

Birds Tree Consultancy

Glenn Bird Grad Cert Arboriculture Uni Melb (AQF8) Dip. Hort (Arboriculture) (AQF5)

PO Box 6048 DURAL NSW 2158

PH 0438 892 634

glenn@birdstrees.com.au

www.birdstrees.com.au

ABN 31 105 006 657



## Executive Summary

This Arboricultural Development Impact Assessment Report has been commissioned by Health Infrastructure to report on trees within the site of the proposed Broken Hill Key Worker Accommodation at Broken Hill Hospital. The subject trees are located within or adjacent to the boundaries of this site. This site is within the Broken Hill Hospital Campus which contains public health facilities, existing landscaping and car parking. The site is proposed for redevelopment including the construction of new Key Worker Accommodation residential buildings, and associated landscape works. This report has been commissioned to outline the health, condition and stability of these trees as well as their viability for retention within the scope of the proposed development. The scope of this report includes all trees within areas that may be impacted by the proposed development.

Civil and stormwater drawings were not provided and this assessment does not include the impact of stormwater or civil works.

The subject Trees are preserved under Section 7. of Broken Hill Development Control Plan 2016 with the exception of Trees 7, 8, 9, 10, 11, 12, 13 which are exempt.

Tree 1 has evidence of decay within the trunk which places this tree at increased risk of failure. If this tree is proposed for retention, we recommend an ISA (TRAQ) Level 3 Risk Assessment be conducted including internal diagnostic testing to determine the viability of these trees to be retained.

Trees 3, 6, 7, 8, 9, 12 and 13 are encroached by the proposed construction and required earthworks by a major encroachment as defined by *AS4970-2009 Protection of Trees on Development Sites*. These trees will not be viable to be retained and will be required to be removed due to the proposed development.

All other trees are viable to be retained and are to be protected as defined below.

Recommendations for tree retention or removal are summarised as follows:

Tree no.	Species	Recommendations	Comments
1.	<i>Jacaranda mimosifolia</i>	Retain	Viable to be retained and protected in accordance with 8.0.
2.	<i>Acacia melanoxydon</i>	Retain	Viable to be retained and protected in accordance with 8.0.
3.	<i>Acacia melanoxydon</i>	Remove	Not viable to be retained due to the proposed development.
4.	<i>Acacia melanoxydon</i>	Retain	Viable to be retained and protected in accordance with 8.0.
5.	<i>Brachychiton populneus</i>	Retain	Viable to be retained and protected in accordance with 8.0.
6.	<i>Eucalyptus camaldulensis</i>	Remove	Not viable to be retained due to the proposed development.

7.	<i>Eucalyptus camaldulensis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
8.	<i>Callistemon viminalis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
9.	<i>Callistemon viminalis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
10.	<i>Callistemon viminalis</i>	Retain	Viable to be retained and protected in accordance with 8.0. Exempt from Broken Hill DCP.
11.	<i>Callistemon viminalis</i>	Retain	Viable to be retained and protected in accordance with 8.0. Exempt from Broken Hill DCP.
12.	<i>Callistemon viminalis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
13.	<i>Eucalyptus camaldulensis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.

# Contents

<b>Executive Summary .....</b>	<b>2</b>
<b>Contents .....</b>	<b>4</b>
<b>1.0 Scope of Works.....</b>	<b>5</b>
<b>2.0 Site Analysis .....</b>	<b>5</b>
2.1 Site.....	5
2.2 Documentation.....	5
2.3 Topography.....	5
2.4 Identification.....	5
2.5 Soils .....	5
<b>3.0 Existing Trees .....</b>	<b>6</b>
<b>4.0 Landscape Significance of Trees.....</b>	<b>6</b>
4.1 Landscape Significance.....	9
4.2 Methodology of Determining Landscape Significance .....	9
4.3 Landscape Significance of Subject Trees .....	9
<b>5.0 Subject Tree Retention Value.....</b>	<b>9</b>
5.1 Tree Retention Value Methodology .....	9
5.2 Retention Value of Subject Trees .....	10
<b>6.0 Impact of Development .....</b>	<b>10</b>
6.1 Tree Protection Zone .....	10
6.2 Structural Root Zone .....	10
6.3 Development Impact.....	11
<b>7.0 Recommendations .....</b>	<b>13</b>
<b>8.0 Pre-Construction Tree Protection Measures .....</b>	<b>14</b>
8.1 General .....	14
8.2 Identification.....	14
8.3 Site Arborist .....	14
8.4 Protective Fence.....	14
8.5 Mulching .....	14
<b>8.6 Signage.....</b>	<b>15</b>
8.7 Trunk and Branch Protection.....	15
<b>9.0 Site Management Issues .....</b>	<b>16</b>
9.1 Soil Compaction.....	16
9.2 Site Access .....	16
9.3 Excavation within Tree Protection Area .....	16
9.4 Possible Contamination / Storage of Materials .....	16
<b>10.0 Tree Protection Measures During Construction .....</b>	<b>16</b>
10.1 Maintenance of Pre-Construction Tree Protection Measures .....	16
10.2 Possible Contaminants.....	16
10.3 Physical Damage.....	16
10.4 Compaction.....	16
10.5 Trenching.....	17
10.6 Irrigation/Watering .....	17
10.7 Site Sheds / Amenities/ Storage.....	17
<b>11.0 Environmental / Heritage/ Legislative Considerations .....</b>	<b>17</b>
<b>12.0 References .....</b>	<b>17</b>
<b>13.0 Disclaimer.....</b>	<b>17</b>
<b>Appendix A Landscape Significance.....</b>	<b>18</b>
<b>Appendix B Tree Retention Values.....</b>	<b>20</b>
<b>Appendix C - Tree Inspection Data.....</b>	<b>21</b>
<b>Appendix D - Tree Location Plan – Retention Value Plan .....</b>	<b>22</b>

## 1.0 Scope of Works

This Arboricultural Development Impact Assessment Report has been commissioned by Health Infrastructure to report on trees within the site of the proposed Broken Hill Key Worker Accommodation at Broken Hill Hospital. It has been commissioned to outline the health, condition and stability of these trees as well as their viability for retention within the scope of the proposed development. The scope of this report includes all trees within areas that may be impacted by the proposed development.

On the 12th of January 2023, Glenn Bird of Birds Tree Consultancy attended site and inspected the subject trees from the ground. There was no aerial inspection carried out. A Visual Tree Assessment was undertaken in accordance with Visual Tree Assessment (VTA) guidelines (Mattheck and Breloer, 1994). Tree heights were measured using a Nikon Forestry 550 Heightmeter.

## 2.0 Site Analysis

### 2.1 Site

The subject site is the area proposed Broken Hill Key Worker Accommodation, within the Broken Hill Hospital campus. The subject trees are located within or adjacent to the boundaries of this site. The site is proposed for redevelopment including the construction of new Key Worker Accommodation residential buildings, and associated landscape works.

### Documentation

2.2 This Development Impact Assessment Report has been compiled based on the following documentation provided:

1. Kearney Architecture Site Plan A004 Rev L Dated 06/06/24

### 2.3 Topography

The site slopes moderately from the highest point at the northern boundary to the lowest point at the southern boundary. Refer to detailed survey for detailed levels.

### 2.4 Identification

Trees are as identified in the attached inspection forms in Appendix C and shown in Tree location Plan A01 in Appendix D.

### 2.5 Soils

Soil material and horizons were not tested for this report.



## 3.0 Existing Trees

The following trees were inspected from the ground and the following items identified. Please refer also to the attached inspection data in Appendix C.

### 3.1. Tree 1. *Jacaranda mimosifolia*

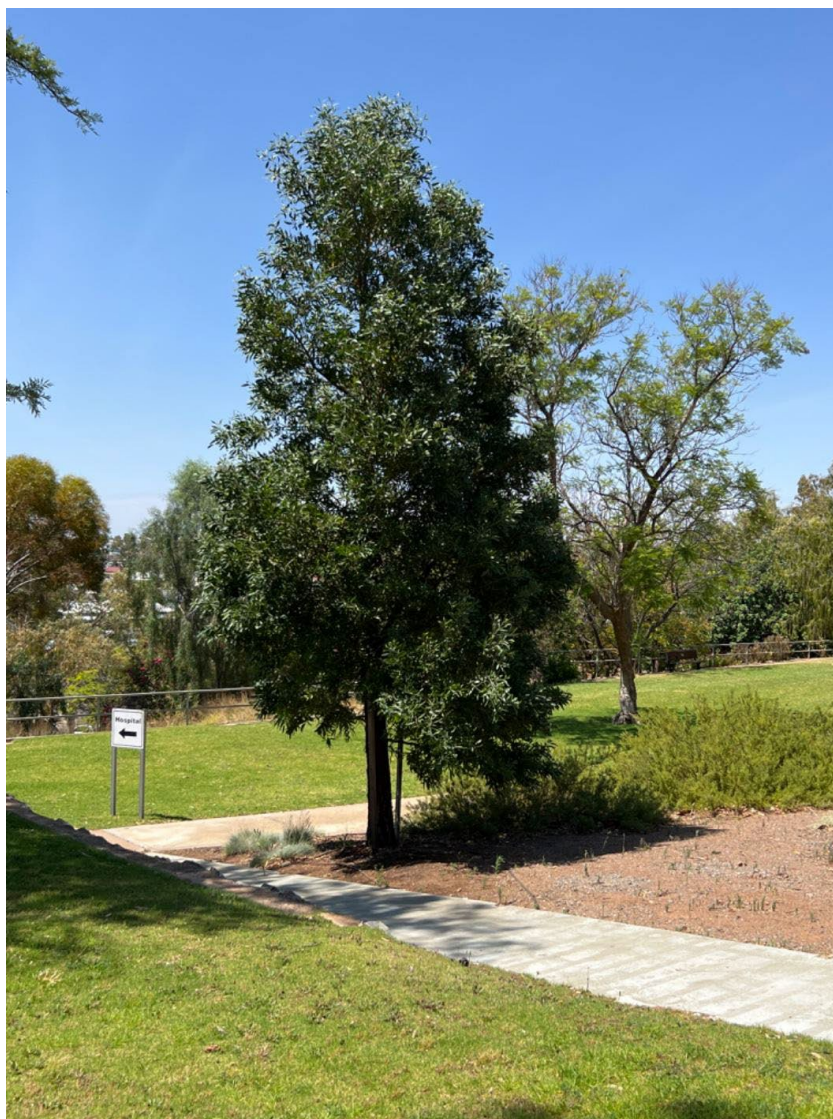
This mature tree is approximately 12m tall with a canopy spread of 8m. It has multiple co-dominant trunks from the base with an aggregate diameter at breast height (DBH) of 396mm. This tree is in fair health and condition with a thinning canopy, moderate deadwood minimal epicormic growth and minor apical dieback. There is evidence of basal decay.



Figure 1 - Evidence of decay at base of Tree 1

### 3.2. Tree 2. *Acacia melanoxylon*

This mature tree is approximately 8m tall with a canopy spread of 4m. It has a single trunk with a DBH of 240mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.



**Figure 2 - Tree 2**

- 3.3. Tree 3. *Acacia melanoxylon***  
 This mature tree is approximately 7m tall with a canopy spread of 3m. It has a single trunk with a DBH of 230mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.4. Tree 4. *Acacia melanoxylon***  
 This mature tree is approximately 9m tall with a canopy spread of 4m. It has a single trunk with a DBH of 280mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.5. Tree 5. *Brachychiton populneus***  
 This mature tree is approximately 9m tall with a canopy spread of 4m. It has a single trunk with a DBH of 310mm. This tree is in fair health and condition with a thinning canopy, moderate deadwood minimal epicormic growth and minor apical dieback.



- 3.6. Tree 6. *Eucalyptus camaldulensis***  
This semi-mature tree is approximately 5m tall with a canopy spread of 2m. It has a single trunk with a DBH of 110mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.7. Tree 7. *Eucalyptus camaldulensis***  
This semi-mature tree is approximately 3m tall with a canopy spread of 1m. It has a single trunk with a DBH of 80mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.8. Tree 8. *Callistemon viminalis***  
This mature tree is approximately 2m tall with a canopy spread of 2m. It has multiple co-dominant trunks from the base with an aggregate DBH of 69.3mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.9. Tree 9. *Callistemon viminalis***  
This mature tree is approximately 2m tall with a canopy spread of 3m. It has multiple co-dominant trunks from the base with an aggregate DBH of 69.3mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.10. Tree 10. *Callistemon viminalis***  
This mature tree is approximately 3m tall with a canopy spread of 3m. It has multiple co-dominant trunks from the base with an aggregate DBH of 58.3mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.11. Tree 11. *Callistemon viminalis***  
This mature tree is approximately 3m tall with a canopy spread of 3m. It has a single trunk with a DBH of 58.3mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.12. Tree 12. *Callistemon viminalis***  
This mature tree is approximately 3m tall with a canopy spread of 3m. It has a single trunk with a DBH of 58.3mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.
- 3.13. Tree 13. *Eucalyptus camaldulensis***  
This semi-mature tree is approximately 4m tall with a canopy spread of 1m. It has a single trunk with a DBH of 10mm. This tree is in good health and condition, with minimal deadwood and epicormic growth.



## 4.0 Landscape Significance of Trees

### 4.1 Landscape Significance

The significance of a tree within the landscape is a factor of the health and condition of the tree, vitality, the form of the tree, environmental, cultural, amenity and heritage value.

### 4.2 Methodology of Determining Landscape Significance

For the purpose of this report, the Significance of a Tree, Assessment Rating System (STARS) as developed by the Institute of Australian Consulting Arborists (IACA) has been implemented. Please refer to Appendix A for greater detail of this assessment system. This system defines Landscape Significance for individual trees as High, Medium or Low Significance.

### 4.3 Landscape Significance of Subject Trees

Based on our assessment of the subject trees and implementation of the IACA Significance of a Tree, Assessment Rating System, the Landscape Significance of the Subject Trees was determined as shown in Table 1.

Tree no.	Species	Landscape Significance
1.	<i>Jacaranda mimosifolia</i>	Medium
2.	<i>Acacia melanoxylon</i>	High
3.	<i>Acacia melanoxylon</i>	High
4.	<i>Acacia melanoxylon</i>	High
5.	<i>Brachychiton populneus</i>	Medium
6.	<i>Eucalyptus camaldulensis</i>	High
7.	<i>Eucalyptus camaldulensis</i>	Low
8.	<i>Callistemon viminalis</i>	Low
9.	<i>Callistemon viminalis</i>	Low
10.	<i>Callistemon viminalis</i>	Low
11.	<i>Callistemon viminalis</i>	Low
12.	<i>Callistemon viminalis</i>	Low
13.	<i>Eucalyptus camaldulensis</i>	Low

Table 1 - Landscape Significance

## 5.0 Subject Tree Retention Value

### 5.1 Tree Retention Value Methodology

For the purpose of this report, the Tree Retention Values have been assessed by incorporating Landscape Significance Values as determined in 4.0 with the Useful Life Expectancy of the subject trees and assessing the retention values based on the Tree Retention Value Priority Matrix as developed by the Institute of Australian Consulting Arborists (IACA). Please refer to Appendix B for greater detail on this Tree

Retention Value Priority Matrix. This matrix defines Landscape Significance for individual trees as High, Medium or Low Retention Value as well as Priority for Removal.

## 5.2 Retention Value of Subject Trees

Based on our assessment of the subject trees and implementation of the IACA Tree Retention Value Priority Matrix, the Retention Values of the Subject Trees were determined as shown in Table 2.

Tree no.	Species	Retention Value
1.	<i>Jacaranda mimosifolia</i>	Medium
2.	<i>Acacia melanoxylon</i>	High
3.	<i>Acacia melanoxylon</i>	High
4.	<i>Acacia melanoxylon</i>	High
5.	<i>Brachychiton populneus</i>	Medium
6.	<i>Eucalyptus camaldulensis</i>	High
7.	<i>Eucalyptus camaldulensis</i>	Medium
8.	<i>Callistemon viminalis</i>	Medium
9.	<i>Callistemon viminalis</i>	Medium
10.	<i>Callistemon viminalis</i>	Medium
11.	<i>Callistemon viminalis</i>	Medium
12.	<i>Callistemon viminalis</i>	Medium
13.	<i>Eucalyptus camaldulensis</i>	Medium

**Table 2 – Tree Retention Value**

## 6.0 Impact of Development

### 6.1 Tree Protection Zone

Tree Protection Zones (TPZs) have been defined for the subject trees in order to define the encroachment of the proposed development in accordance with AS4970-2009. The TPZs required have been taken as a circular area with a radius 12 x the diameter at breast height of the tree. This requirement is in line with Australian Standard AS 4970-2009 Protection of Trees on Development Sites. This standard defines a maximum of 10% encroachment to be minimal encroachment. Any encroachment over 10% requires the site arborist to give consideration as to the viability of the tree due to the proposed development.

### 6.2 Structural Root Zone

Structural Root Zone (SRZs) are defined by AS4970-2009 as the area of root development required for the structural stability of the tree. The SRZ is required to be assessed only when an encroachment greater than 10% is considered.

Tree no.	Species	TPZ Radius (m)	Encroachment (%)	SRZ Radius (m)
1.	<i>Jacaranda mimosifolia</i>	4.75	0	2.39
2.	<i>Acacia melanoxylon</i>	2.88	0	1.94
3.	<i>Acacia melanoxylon</i>	2.76	100	1.91
4.	<i>Acacia melanoxylon</i>	3.36	0	2.08
5.	<i>Brachychiton populneus</i>	3.72	0	2.18
6.	<i>Eucalyptus camaldulensis</i>	2	100	1.49
7.	<i>Eucalyptus camaldulensis</i>	2	100	1.4
8.	<i>Callistemon viminalis</i>	2	100	1.36
9.	<i>Callistemon viminalis</i>	2	100	1.36
10.	<i>Callistemon viminalis</i>	2	0	1.36
11.	<i>Callistemon viminalis</i>	2	0	1.36
12.	<i>Callistemon viminalis</i>	2	100	1.36
13.	<i>Eucalyptus camaldulensis</i>	2	100	1.49

## 6.3 Development Impact

### 6.3.1. Tree 1. *Jacaranda mimosifolia*

The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

### 6.3.2. Tree 2. *Acacia melanoxylon*

The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

### 6.3.3. Tree 3. *Acacia melanoxylon*

The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

### 6.3.4. Tree 4. *Acacia melanoxylon*

The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

- 6.3.5. Tree 5. *Brachychiton populneus***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.
- 6.3.6. Tree 6. *Eucalyptus camaldulensis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.
- 6.3.7. Tree 7. *Eucalyptus camaldulensis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.
- 6.3.8. Tree 8. *Callistemon viminalis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.
- 6.3.9. Tree 9. *Callistemon viminalis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.
- 6.3.10. Tree 10. *Callistemon viminalis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.
- 6.3.11. Tree 11. *Callistemon viminalis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.
- 6.3.12. Tree 12. *Callistemon viminalis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.
- 6.3.13. Tree 13. *Eucalyptus camaldulensis***  
The Tree Protection Zone (TPZ) of this tree in accordance with AS 4970-2009 *Protection of Trees on Development Sites* will be totally



encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

## 7.0 Recommendations

The subject Trees are preserved under Section 7. of Broken Hill Development Control Plan 2016 with the exception of Trees 7, 8, 9, 10, 11, 12, 13 which are exempt.

Tree 1 has evidence of decay within the trunk which places this tree at increased risk of failure. If this is proposed for retention, we recommend an ISA (TRAQ) Level 3 Risk Assessment be conducted including internal diagnostic testing to determine the viability of these trees to be retained.

Trees 3, 6, 7, 8, 9, 12 and 13 are encroached by the proposed construction and required earthworks by a major encroachment as defined by *AS4970-2009 Protection of Trees on Development Sites*. These trees will not be viable to be retained and will be required to be removed due to the proposed development.

All other trees are viable to be retained and are to be protected as defined below.

Recommendations for tree retention or removal are summarised as follows:

Tree no.	Species	Recommendations	Comments
1.	<i>Jacaranda mimosifolia</i>	Retain	Viable to be retained and protected in accordance with 8.0.
2.	<i>Acacia melanoxylon</i>	Retain	Viable to be retained and protected in accordance with 8.0.
3.	<i>Acacia melanoxylon</i>	Remove	Not viable to be retained due to the proposed development.
4.	<i>Acacia melanoxylon</i>	Retain	Viable to be retained and protected in accordance with 8.0.
5.	<i>Brachychiton populneus</i>	Retain	Viable to be retained and protected in accordance with 8.0.
6.	<i>Eucalyptus camaldulensis</i>	Remove	Not viable to be retained due to the proposed development.
7.	<i>Eucalyptus camaldulensis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
8.	<i>Callistemon viminalis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
9.	<i>Callistemon viminalis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
10.	<i>Callistemon viminalis</i>	Retain	Viable to be retained and protected in accordance with

			8.0. Exempt from Broken Hill DCP.
11.	<i>Callistemon viminalis</i>	Retain	Viable to be retained and protected in accordance with 8.0. Exempt from Broken Hill DCP.
12.	<i>Callistemon viminalis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.
13.	<i>Eucalyptus camaldulensis</i>	Remove	Not viable to be retained due to the proposed development. Exempt from Broken Hill DCP.

## 8.0 Pre-Construction Tree Protection Measures

### 8.1 General

All tree protection works shall be carried out before excavation, grading and site works commence. Tree protection works shall be inspected and approved by a Consulting Arborist meeting AQF Level 5 prior to construction works commencing.

Storage of materials, mixing of materials, vehicle parking, disposal of liquids, machinery repairs and refueling, site office and sheds, and the lighting of fires, stockpiling of soil, rubble or any debris shall not be carried out within the TPZ of existing trees. No backfilling shall occur within the TPZ of existing trees. Trees shall not be removed or lopped unless specific instruction is given in writing by the Superintendent.

### 8.2 Identification

All trees to be protected shall be clearly identified and all TPZs surveyed.

### 8.3 Site Arborist

Prior to all site works commencing, a Site Arborist is to be appointed with the responsibility of implementing all Tree Protection Measures in this report as well as compliance with AS4970-2009 Protection of Trees on Development Sites. The Site Arborist is to hold qualifications equivalent of AQF Level 5.

### 8.4 Protective Fence

Fencing is to be erected around existing trees to be retained. In addition to this protective fencing within the site, Protective Fencing is to be installed to the full extent of the TPZs within the site. This fencing is to be erected prior to any materials being brought on site or before any site, civil works or construction works commence. The fence shall enclose a sufficient area so as to prevent damage to the TPZ as defined on Appendix D Tree Protection Plan and as defined in 5.1 above. Fence to comprise 1800mm high chain wire mesh fixed to 50mm diameter Galvanised steel posts. Panels should be securely fixed top and bottom to avoid separation. No storage of building materials, tools, paint, fuel or contaminants and the like shall occur within the fenced area.

### 8.5 Mulching

Install mulch to the extent of all tree protection fencing. Use a leaf mulch conforming to AS 4454 which is free of deleterious and extraneous matter such as soil, weeds,

sticks and stones and consisting of a minimum of 90% recycled content compliant with AS 4454 (1999) and AS 4419 (1998). All trees marked as to be removed on the proposed development are to be chipped and reused for this purpose. Place mulch evenly and to a depth of 100mm.

## 8.6 Signage

Prior to works commencing, tree protection signage is to be attached to each tree protection zone, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:

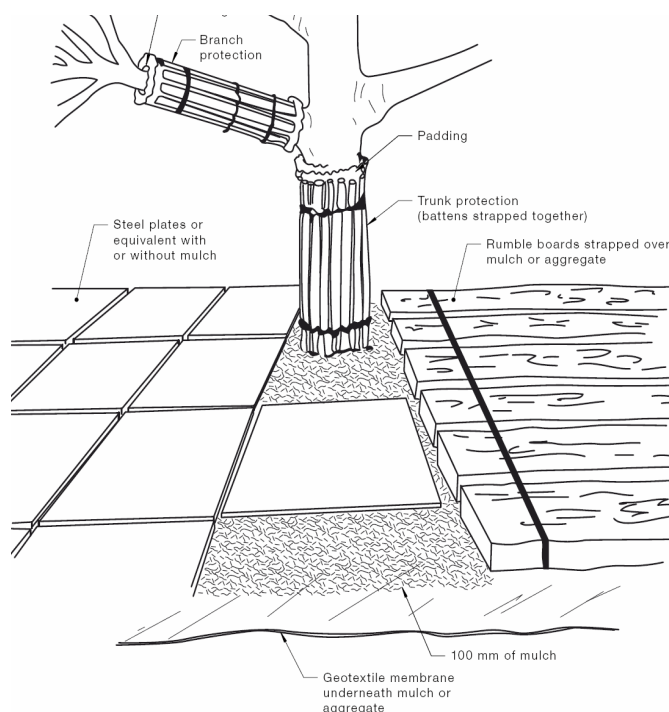
Tree protection zone.

- This fence has been installed to prevent damage to the trees and their growing environment both above and below ground and access is restricted.
- No Access within Tree Protection Zone
- The name, address, and telephone number of the developer.

The name and telephone number of the Site Arborist.

## 8.7 Trunk and Branch Protection

Where a tree is to be retained and a Tree Protection Zone cannot be adequately established due to restricted access, the trunk and branches in the lower crown will be protected by wrapping 2 layers of hessian or carpet underfelt around the trunk and branches for a minimum of 2 m or as lower branches permit, then metal strapping secures 38x50 x2000 mm timber battens together around the trunk (do not nail or screw to the trunk or branches). The number of battens to be used is as required to encircle the trunk and the battens are to extend to the base of the tree (AS4970 2009 Protection of trees on development sites, Figure 3 Examples of Trunk, Branch and ground protection).



**Figure 3 - Trunk Protection**

## **9.0 Site Management Issues**

### **9.1 Soil Compaction**

Plant and pedestrian traffic during the construction period will cause significant soil compaction. This will be exacerbated by increased water expected on these soils as result of adjacent construction and weather. Compaction of the soil within the TPZ will reduce the voids between soil peds or particles therefore will reduce the gaseous exchange capacity of the root system which will slow critical metabolic processes. No pedestrian or plant access is permissible to the TPZ.

### **9.2 Site Access**

Sufficient access is required to enable efficient construction. It is essential to delineate access zones or corridors which will provide suitable access without damaging the existing trees to be retained or causing compaction to the root zone.

### **9.3 Excavation within Tree Protection Area**

No excavation is to be carried out within the TPZs of retained trees without the permission and supervision of the Site Arborist (AQF5)

### **9.4 Possible Contamination / Storage of Materials**

The construction site will require the use of many chemicals and materials that are possible contaminants which if not managed will pose a risk to the existing trees. These possible contaminants include fuels, herbicides, solvents and the like. A site-specific Environmental Management Plan shall be provided, and this specific risk identified and addressed.

## **10.0 Tree Protection Measures During Construction**

### **10.1 Maintenance of Pre-Construction Tree Protection Measures**

The Pre-Construction Tree Protection Measures identified in 5.0 above are to be maintained in good and serviceable condition throughout the construction period.

### **10.2 Possible Contaminants**

Do not store or otherwise place bulk materials and harmful materials under or near trees. Do not place spoil from excavations within the TPZs. Prevent wind-blown materials such as cement from harming trees. All possible contaminants are to be stored in a designated and appropriate area with secure chemical spill measures such as a bund in place.

### **10.3 Physical Damage**

Prevent damage to tree. Do not attach stays, guys and the like to trees. No personnel, plant, machinery or materials are to be allowed within the tree protection fencing.

### **10.4 Compaction**

No filling or compaction shall occur over tree roots zones within tree protection fenced areas. Where construction occurs close to or the TPZ of trees to be retained it shall be necessary to install protection to avoid compaction of the ground surface. This protection is to be planks supported clear of the ground fixed to scaffolding.



## **10.5 Trenching**

No Trenching should be necessary within the TPZs or within tree protection fencing. No further trenching is to be carried out without the approval of the Site Arborist. Should any further trenching be required within the TPZs identified, this work is to be carried out by hand and under the supervision of a qualified Arborist.

## **10.6 Irrigation/Watering**

Contractor is to ensure that soil moisture levels are adequately maintained. Apply water at an appropriate rate suitable for the species during periods of little or no rainfall.

## **10.7 Site Sheds / Amenities/ Storage**

Site sheds, site amenities, ablutions and site storage shall be in the area clear of all TPZ. Chemicals and potential contaminants are to be stored appropriately and this storage area is to be enclosed by a chemical spill bund to prevent the potential run off of contaminants in the event of a spillage or accident.

## **11.0 Environmental / Heritage/ Legislative Considerations**

None of the subject trees are identified as threatened species or elements of endangered ecological communities within the NSW Biodiversity Conservation Act 2016.

## **12.0 References**

Mattheck, C. Breloer, K. 1993, The Body Language of Trees: A Handbook for Failure Analysis, 12th Impression 2010 The Stationery Office.  
AS4970-2009 Protection of Trees on Development Sites: Standards Australia

## **13.0 Disclaimer**

This Appraisal has been prepared for the exclusive use of the Client and Birds Tree Consultancy.

Birds Tree Consultancy accepts no responsibility for its use by other persons. The Client acknowledges that this Appraisal, and any opinions, advice or recommendations expressed or given in it, are based on the information supplied by the Client and on the data inspections, measurements and analysis carried out or obtained Birds Tree Consultancy and referred to in the Appraisal. The Client should rely on the Appraisal, and on its contents, only to that extent.

Every effort has been made in this report to include, assess and address all defects, structural weaknesses, instabilities and the like of the subject trees. All inspections were made from ground level using only visual means and no intrusive or destructive means of inspection were used. For many structural defects such as decay and inclusions, internal inspection is required by means of Resistograph or similar. No such investigation has been made in this case. Trees are living organisms and are subject to failure through a variety of causes not able to be identified by means of this inspection and report.

### IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

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.

#### **Tree Significance - Assessment Criteria**



##### **1. High Significance in landscape**

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on 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.

##### **2. Medium Significance in landscape**

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

##### **3. Low Significance in landscape**

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


##### **Environmental Pest / Noxious Weed Species**

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
  - The tree is a declared noxious weed by legislation.
- Hazardous/Irreversible Decline**
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
  - The tree is 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.

## Appendix B Tree Retention Values

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
<b>Legend for Matrix Assessment</b> 						
		<b>Priority for Retention (High)</b> - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.				
		<b>Consider for Retention (Medium)</b> - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.				
		<b>Consider for Removal (Low)</b> - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.				
		<b>Priority for Removal</b> - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.				

### 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](http://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 Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, [www.footprintgreen.com.au](http://www.footprintgreen.com.au)



## Appendix C - Tree Inspection Data

Inspection Data

7-Dec-23

Broken Hill Hospital Key Worker Accomodation

Tree no.	Species	Common Name	Height	Spread(m )	Trunk (single, twin, multiple @)	DBH (mm)	TPZ Radius (m)	Diameter at Root Flare (DRF) (mm)	SRZ radius (m)	Trunk lean	Tree Age	Overall Health & Vigour	Crown Distributio n	Structure	Pruning History	Defects	Pest Infestation	Canopy Density	Deadwoo d	Epicormic Growth	Life expectanc y	Env. & Landcape significan ce	Retention Value	Notes
1	Jacaranda mimosifolia	Jacaranda	12	8	Multiple Stems	396	4.75	460	2.39	Nil	Mature	Fair (60-69)	Symmetrical	Good	No Evidence	Decay Evidence	No Evidence	Thinning	15%	<5%	21-40 years	Medium	Medium	Minor apical dieback Evidence of basal decay
2	Acacia melanoxylon	Blackwood	8	4	1	240	2.88	280	1.94	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	High	High	
3	Acacia melanoxylon	Blackwood	7	3	1	230	2.76	270	1.91	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	High	High	
4	Acacia melanoxylon	Blackwood	9	4	1	280	3.36	330	2.08	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	High	High	
5	Brachychiton populneus	Kurrajong	9	4	1	310	3.72	370	2.18	Nil	Mature	Fair (60-69)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Thinning	15%	<5%	21-40 years	Medium	Medium	Minor apical dieback
6	Eucalyptus camaldulensis	River Red Gum	5	2	1	110	2	150	1.49	Nil	Semi Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	40+ years	Medium	High	
7	Eucalyptus camaldulensis	River Red Gum	3	1	1	80	2	130	1.4	Nil	Semi Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	40+ years	Medium	High	
8	Callistemon viminalis	Weeping Bottlebrush	2	2	Multiple Stems	69.3	2	120	1.36	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	Medium	Medium	
9	Callistemon viminalis	Weeping Bottlebrush	2	3	Multiple Stems	69.3	2	120	1.36	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	Medium	Medium	
10	Callistemon viminalis	Weeping Bottlebrush	3	3	Multiple Stems	58.3	2	120	1.36	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	Medium	Medium	
11	Callistemon viminalis	Weeping Bottlebrush	3	3	1	58.3	2	120	1.36	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	Medium	Medium	
12	Callistemon viminalis	Weeping Bottlebrush	3	3	Multiple Stems	58.3	2	120	1.36	Nil	Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	21-40 years	Medium	Medium	
13	Eucalyptus camaldulensis	River Red Gum	4	1	1	110	2	150	1.49	Nil	Semi Mature	Good (70-79)	Symmetrical	Good	No Evidence	No Evidence	No Evidence	Normal	<5%	<5%	40+ years	Medium	High	

## Appendix D - Tree Location Plan



#### Legend

- Tree to be Retained and Protected
- Tree exempt from Broken Hill DCP 2016
- Tree Not Viable to be Retained due to Proposed Development
- Tree Protection Zone (TPZ) in accordance with AS4970-2009

## Birds Tree Consultancy

0438 892 634

glenn@birdstrees.com.au

[www.birdstrees.com.au](http://www.birdstrees.com.au)

Project: Key Worker Accommodation

Client: Health Infrastructure

DWG: A004

Plan: Tree Location Plan

Date: 06 June 2023 Scale : 1:200 @ A3