

Proposed Blessed Carlo College, MOAMA.

Arborist Report

A Report to;



Clarke
Hopkins
Clarke

Prepared by;



MARK D. MCCRONE
LANDSCAPE
ARCHITECT



04 0790 7958

larch_therock@bigpond.com

September 2021
(Updated October 2022),
Ref 21/413B.

Trees on (& surrounding) the Site of the Proposed Blessed Carlo College, Lignum & Kiely Roads, Moama.

1 Introduction

Mark D. McCrone, consulting Arborist and Landscape Architect, has been engaged by Ms. Michaela Coe, Senior Architect, Clarke Hopkins Clarke, to undertake an inspection of extant trees on and surrounding the proposed Blessed Carlo College development site, corner of Lignum and Kiely Roads, Moama. This inspection's observations and recommendations regarding the subject trees are recorded and discussed in the following report.

2 Report Background, Purpose and Scope

As part of the State Significant Development Application (SSDA) documentation for the proposed Blessed Carlo College proponents have undertaken an assessment of trees on and surrounding the development site. The tree assessment included all trees on the development site as well as trees in the adjacent public road reserves (Lignum and Kiely Roads) which may be impacted by the proposed development works. The subject trees were inspected and photographed, and information on them recorded, on 31 August 2021.

The tree assessment 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 applicable local government provisions regarding tree removals.

The development site's location is shown in Exhibit 1. An enlarged aerial photograph of the subject property, and the trees' position relative to it, is shown in Exhibit 2. A Detail Survey of the development site, mapping existing trees, is included as Appendix A. This Detail Survey plan also shows the extent of existing canopy cover on the development site. Appendix B maps proposed tree removals, and also includes a Table listing the number, condition and detailed justification for these tree removals. A curriculum vitae of this report's author is also included (as Appendix C).

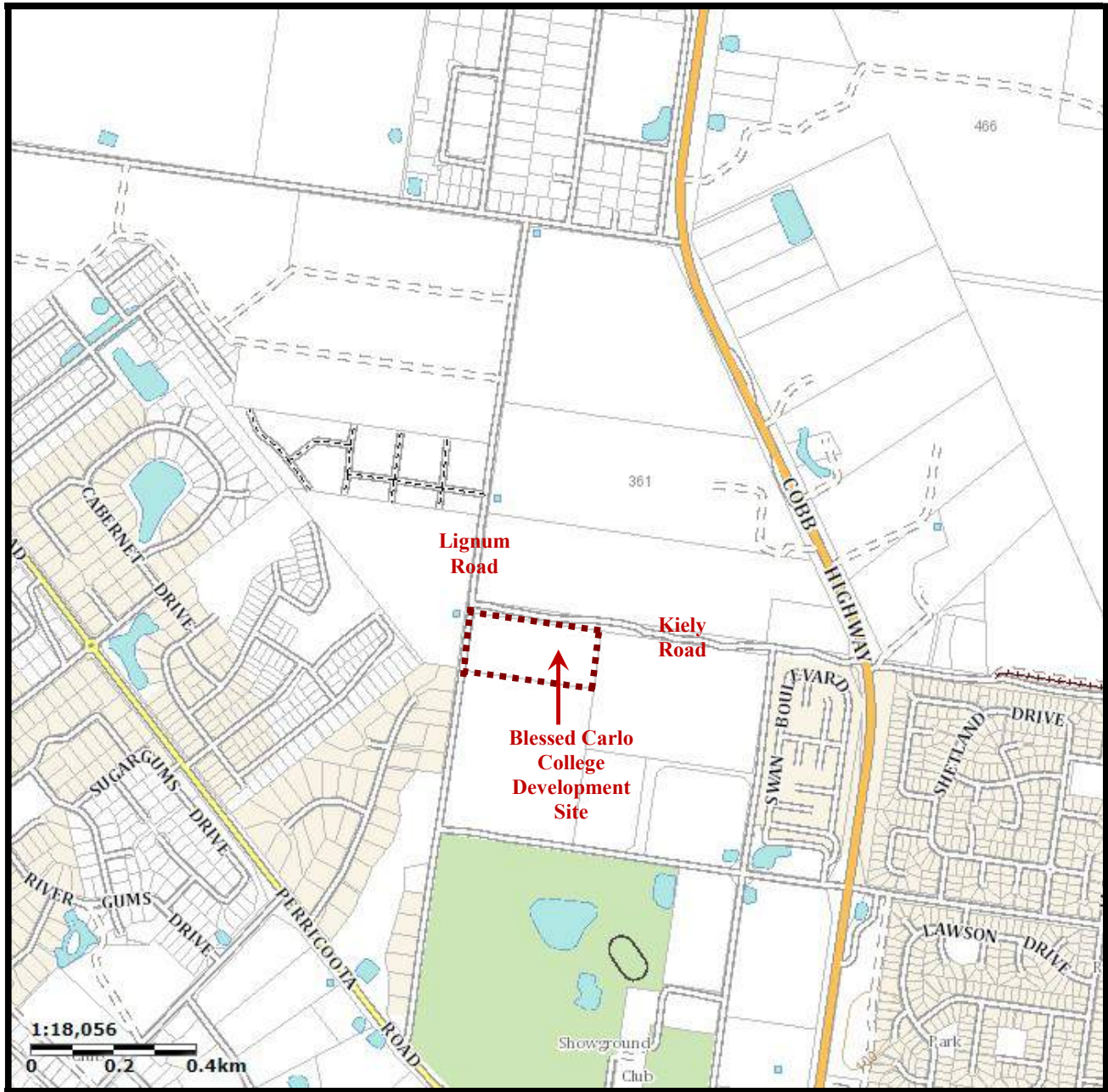


Exhibit 1 – Locality Plan; proposed Blessed Carlo College, Moama.

Source; <https://six.lands.nsw.gov.au>

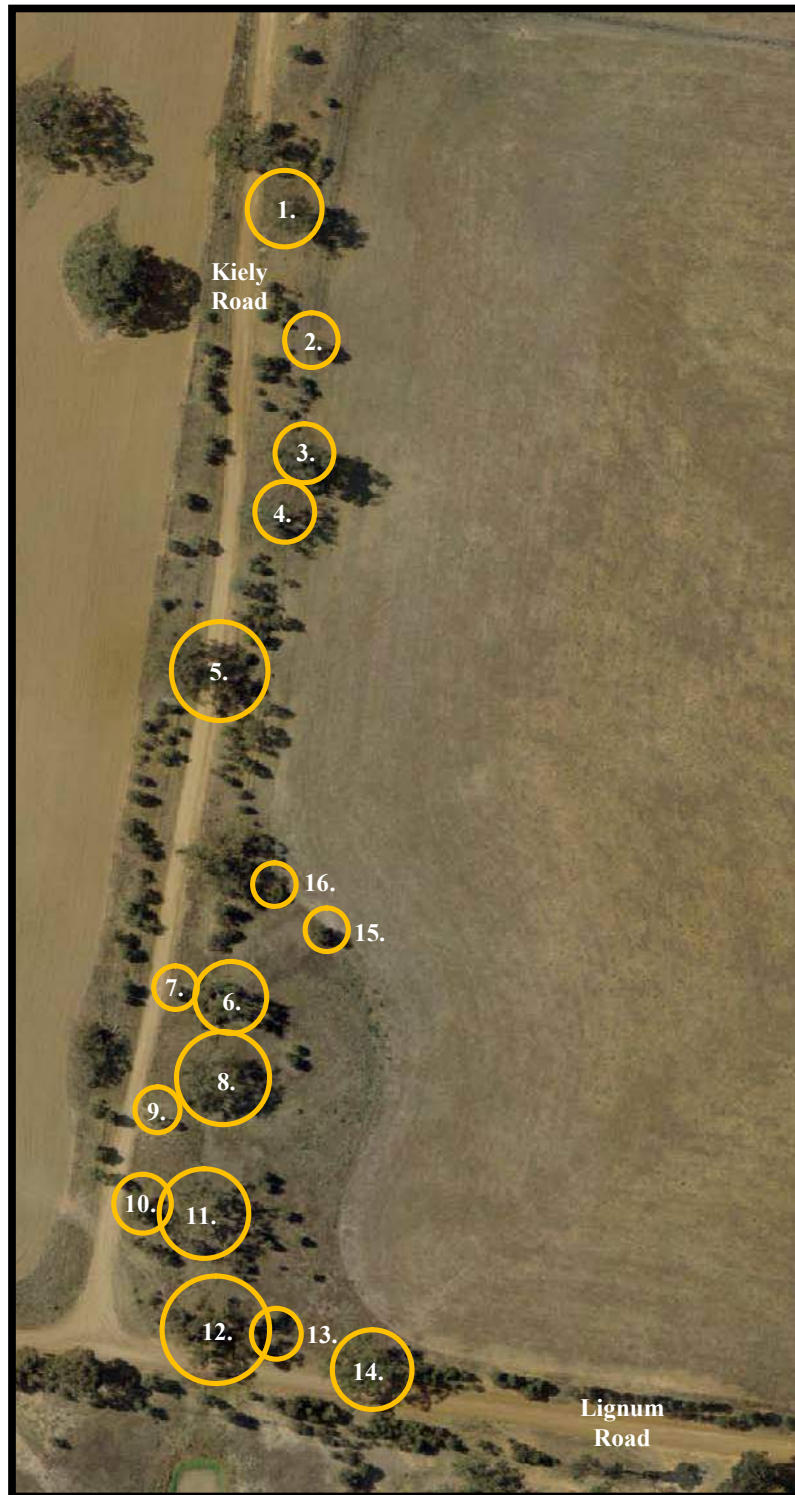


Exhibit 2 – Existing individual trees on and surrounding the development site highlighted **Yellow** and numbered with the identifying numbers used in this report (see Section 4).

Source; <https://portal.spatial.nsw.gov.au>

3 Tree Recording & Condition Description

The recording and assessment of the trees of the Blessed Carlo College development site involved sixteen individual trees and nine copses of juvenile trees. The locations of these trees are shown on the plans included as Exhibit 2 and Appendix A of this report.

Recording for individual trees involved the following. Each tree was identified to species – all are *Eucalyptus microcarpa* (Grey Box) – their DBH was measured and any detectable “defects” were noted. Tree heights have been estimated using a Sunto Clinometer. 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 most trees’ current physical form was also undertaken and is presented in Section 4. Tree copses are described generically based on the number of stems in the copse and the approximate physical proportions of the trees in the copse.

A “Tree Condition” rating (outlined below) was also attributed to the individual 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. Although a “Tree Condition” has been attributed to the tree copses recorded (see Table 2), this is indicative only, as some copses number between 40 and 100 stems. 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

Tree Reference No. (Refer Exhibit 2 & Appendix A)	Scientific Name	Common Name	Height (m)	DBH (cm)	Trunk Diameter Above Root Buttress (cm)	Tree Protection Zone (TPZ) - metres Refer to Appendix A	Structural Root Zone (SRZ) - metres Refer to Appendix A	Condition (Refer to Section 3)	Tree Portrait Exhibit No. (Refer to Section 4)
1	<i>Eucalyptus microcarpa</i>	Grey Box	19	75	122	9	3.60	Fair	3
2	<i>Eucalyptus microcarpa</i>	Grey Box	14	46	49	5.52	2.45	Poor	4
3	<i>Eucalyptus microcarpa</i>	Grey Box	20	87	122	10.44	3.60	Good	6
4	<i>Eucalyptus microcarpa</i>	Grey Box	19	77	115	9.24	3.51	Poor	7
5	<i>Eucalyptus microcarpa</i>	Grey Box	15	65	146	7.8	3.88	Good	8
6	<i>Eucalyptus microcarpa</i>	Grey Box	14	100	150	12	3.92	Fair	9
7	<i>Eucalyptus microcarpa</i>	Grey Box	11	22		2.64	NA	Good	10
8	<i>Eucalyptus microcarpa</i>	Grey Box	17	78	140	9.36	3.81	Fair	11
9	<i>Eucalyptus microcarpa</i>	Grey Box	13	24		2.88	NA	Good	NA
10	<i>Eucalyptus microcarpa</i>	Grey Box	14	37		4.44	NA	Good	NA
11	<i>Eucalyptus microcarpa</i>	Grey Box	20	95	146	11.4	3.88	Poor	12
12	<i>Eucalyptus microcarpa</i>	Grey Box	18	183	213	15	4.55	Fair	13
13	<i>Eucalyptus microcarpa</i>	Grey Box	15	58	95	6.96	3.24	Poor	15
14	<i>Eucalyptus microcarpa</i>	Grey Box	22	123	163	14.76	4.06	Fair	16
15	<i>Eucalyptus microcarpa</i>	Grey Box	20	54		6.48	NA	Fair	17
16	<i>Eucalyptus microcarpa</i>	Grey Box	15	34		4.08	NA	Good	18

Table 1 – Species & physical condition of the individual trees on and surrounding the development site. The tree numbering used to identify the trees in the above Table is as shown on the plans included as Exhibit 2 & Appendix A.

Tree Copse Reference No. (Refer Appendix A)	Scientific Name	Common Name	Number of Stems (Estimated)	Height (m) [Range]	DBH (cm) [Range]	Condition (Refer to Section 3)	Tree Portrait Exhibit No. (Refer to Section 4)
1	<i>Eucalyptus microcarpa</i>	Grey Box	6	5 - 12	12 - 25	Fair	18
2	<i>Eucalyptus microcarpa</i>	Grey Box	40	2 - 12	<10 - 20	Fair - Good	19
3	<i>Eucalyptus microcarpa</i>	Grey Box	100	3 - 10	to 12	Poor - Good	20
4	<i>Eucalyptus microcarpa</i>	Grey Box	20	3 - 15	<10 - 15	Fair - Good	NA
5	<i>Eucalyptus microcarpa</i>	Grey Box	3	5 - 8	<10	Fair	NA
6	<i>Eucalyptus microcarpa</i>	Grey Box	20	5 - 12	to 12	Poor - Good	NA
7	<i>Eucalyptus microcarpa</i>	Grey Box	25	5 - 15	10 - 25	Poor - Good	21
8	<i>Eucalyptus microcarpa</i>	Grey Box	6	10 - 15	10 - 25	Fair	NA
9	<i>Eucalyptus microcarpa</i>	Grey Box	50	3 - 12	10 - 25	Poor - Good	22

Table 2 – Species & physical condition of the tree copses on and surrounding the development site. The height and DBH range for these trees were estimated (not measured) in the field. The numbering used to identify the copses in the above Table is as shown on the plan included as Appendix A.

4.1 – Tree No. 1



Exhibit 3 – Tree 1 is a large mature tree in Fair condition. Dead leaders and laterals, up to 250mm in diameter are evident in the tree's crown.

4.2 – Tree No. 2



Exhibit 4 – Tree 2 is a young tree, the stem of which bifurcates approximately 1.5m from the ground (see Exhibit 5). The tree is in good health however this structural fault attributes to its Poor condition rating.



Exhibit 5 – The stem bifurcation on Tree 2. There is an “active” crack at this point (inset) and this junction will eventually fail, causing half the tree’s crown to come down. The tree is not suitable for retention because of this structural fault.

4.3 – Tree No. 3



Exhibit 6 – Tree 3 is in good health. Despite the presence of deadwood (up to 75mm diameter) it exhibits strong vigour and is rated as in Good condition.

4.4 – Tree No. 4



Exhibit 7 – Tree 4 is a specimen at (or approaching) its “over mature” growth phase, with a sparse crown and small diameter deadwood at the perimeter of its canopy. The tree is rated as in Poor condition because of its declining vigour.

4.5 – Tree No. 5



Exhibit 8 – Tree 5’s “spreading” habit is the result of its branching to form three leaders from about 1.5m. The tree is structurally sound and in reasonable health. There is (small diameter) deadwood and hangers present in the crown and burls evident on some of the lateral branches. Despite of this the tree is still rated as in Good condition.

4.6 – Tree No. 6



Exhibit 9 – Tree 6 is a “veteran” specimen that has entered the “retrenchment” phase of its life cycle – the process whereby a tree whose crown is declining forms a smaller, lower crown. The tree’s main leaders are senescent and water shoots are emerging from the base. There are also three or four lesions, some with active decay, on the tree’s barrel. Rated in Fair condition.

4.7 – Tree No. 7



Exhibit 10 – Tree 7 is a young tree in good health and vigour with no structural faults.
Condition rating Good.

4.8 – Tree No. 8



Exhibit 11 – Tree 8 is a mature tree with impressive stature. The tree's root crown has been partially exposed, most probably by run off from Kiely Road being directed toward the adjacent earth dam. Deadwood is evident in the crown, some of it high up, but it is mostly of < 50mm in diameter. Rated in Fair condition.

4.9 – Tree No. 11



Exhibit 12 – Tree 11 is another specimen in its “over mature” growth phase, with a sparse crown and small diameter deadwood at the perimeter of its canopy. There is evidence of (recent) trenching to the north-east of the tree’s base. It is rated as in Poor condition because of its declining vigour.

4.10 – Tree No. 12



Exhibit 13 – Tree 12 is massive veteran tree with a stem DBH close to 2 metres. The central and southern leaders of the tree are dead and broken, the start of the “retrenchment” phase. Deadwood up to 300mm in diameter is present in the tree’s crown. Two (small) basal openings are also evident. Recent trenching has also disturbed the tree’s root plate (south of the stem). Tree condition Fair.



Exhibit 14 – The barrel and three leaders of Tree 12. The basal openings are arrowed.

4.11 – Tree No. 13



Exhibit 15 – The form and vigour of Tree 13 has been suppressed by the neighbouring Tree 12. It has a limited crown based on two leaders, one of which (the western) has wounding at the junction. A basal cavity is evident (on the western side) and its root plate has also been disturbed by recent trenching (between Trees 12 and 13). Condition rating Poor.

4.12 – Tree No. 14



Exhibit 16 – Tree 14 is another large veteran tree with an impressive stature. There is evidence of limb failures (up to 250mm diameter) and deadwood (to 75mm diameter) in the crown. The tree has been recently pruned (for road corridor clearance) and its (western) root crown has been impacted by roadworks. Rated in Fair condition.

4.13 – Tree No. 15



Exhibit 17 – Tree 15 is a young tree in good health and vigour. Its stem bifurcates at about 1.2m, but the junction appears sound. Condition rating Fair.

4.14 – Tree No. 16



Exhibit 17 – Tree 16 is another young tree in good health and vigour with no structural faults. Condition rating Good.

4.15 – Tree Copse 1



Exhibit 18 – Tree Copse 1; on the Kiely Road reserve at the north east end of the development site. Six stems up to 25cm DBH and 12m high.

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4.16 – Tree Copse 2



Exhibit 19 – Tree Copse 2; also on Kiely Road reserve. Approximately 40 stems, <20cm DBH and 12m high.

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4.17 – Tree Copse 3



Exhibit 20 – Tree Copse 3; Kiely Road reserve. In excess of 100 stems, most <10cm DBH and up to 10m high.

4.18 – Tree Copse 7



Exhibit 21 – Tree copse 7 is in the north-west corner of the property. Approximately 25 stems with DBH up to 25cm (although most <15cm). Some specimens (on south east edge of copse) may warrant retention, should the site's development layout accommodate it.

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4.19 – Tree Copse 9

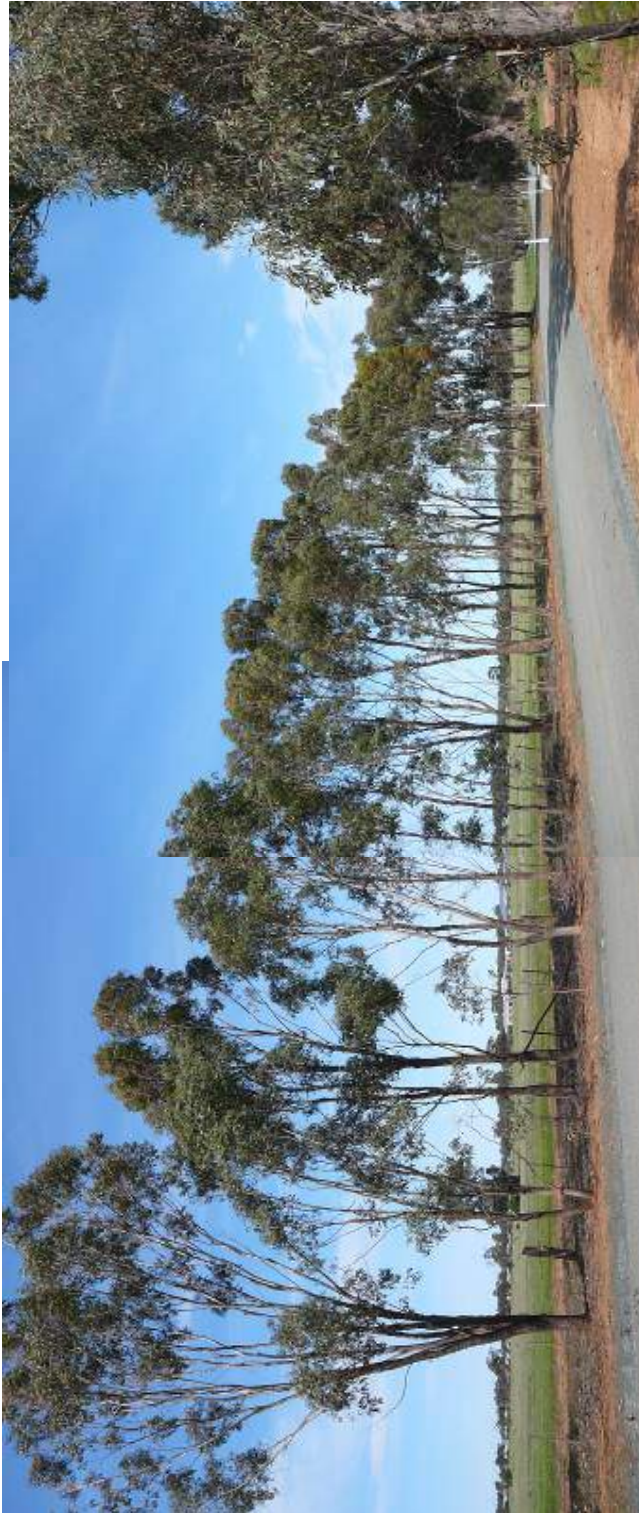


Exhibit 22 – Tree Copse 9; Lignum Road reserve at south west end of development site. Approximately 50 stems; largest 25-30cm DBH, most 12cm or less; heights up to 12m.

5 Discussion and Recommendations

5.1 – Generally

As tabulated in Table 1, six of the sixteen individual trees documented in Section 4 of this report are rated as in Good condition, and they may warrant retention in the altered post-development landscape. Six trees were rated Fair, and these may be able to be retained, subject to appropriate remedial and “crown cleaning” pruning to remove any faults, deadwood and/or structural weaknesses. The four trees rated as in Poor condition have limited value, especially in the altered landscape, and should be removed.

5.2 – AS4970-2009; *Protection of trees on development sites* provisions

5.2.1 - Tree Protection Zones (TPZs)

The tree protection zone (TPZ) is the principal means of protecting trees on development sites – the area that is to be isolated from construction disturbance, so that the tree remains viable.

The radius of the TPZ is calculated for a tree by multiplying its trunk diameter at 1.4m above ground (DBH) by twelve, with the radius measured from the centre of the stem at ground level. A TPZ should not be less than two metres nor greater than fifteen metres.

The resultant TPZs for the sixteen individual trees are listed in Table 1 and diagrammatically illustrated in Appendix A.

5.2.2 - Structural Root Zones (SRZs)

The SRZ is the area required for tree stability and only needs to be calculated when encroachment into a TPZ is proposed. AS4970-2009 determines the SRZ by application of the following formula;

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

where *D* = trunk diameter, in metres, measured above the root buttress.

The resultant SRZs for most of the individual trees are also listed in Table 1, and on the mapping in Appendix A.

5.3 – Recommendations

All trees retained on the development site 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). Applicable Tree Protection Zones (TPZ), as detailed in AS4970-2009, are shown for all the individual trees assessed on the Existing Tree Mapping included as Appendix A.

The copses of more juvenile specimens may offer opportunity for amenity to the altered landscape through retention of some of the individuals in these copses. Where this is done a copse should be thinned to favour the more vigorous and structurally sound specimens within it.

Particular attention is drawn to those trees described as large mature and/or “veteran” specimens – Tree Nos. 5, 6, 8, 12 & 14 – which may be retained in the altered post-development landscape. Any structural defect (even if it has been present in the tree for a long time) is more likely to fail when a tree enters the “over mature” phase of its life. In the circumstance of urban development around what were previously “paddock trees” this “over mature” phase may be accelerated by intensifying land use around it and

altering ground surfacing and drainage patterns. The risks presented by the trees may increase over time. An “over mature” tree has past the peak of its life cycle and has commenced to decline; it can no longer sustain the whole dynamic mass of the tree. Senescence is the final stage in the tree’s life cycle, where the likelihood of structural failures (of limbs and/or stem) further increases. Decay that may have been present in the tree for many years can result in substantial structural failure in these latter stages of the tree’s life. As noted previously, some of these issues may be addressed, in the short term, by appropriate remedial and “crown cleaning” pruning. Site planning for the school campus development should be mindful of these considerations. Should any of these trees be retained it is desirable that activities that cause people and/or vehicles to congregate in close vicinity to the trees not be proposed, and that their root plates should, as far as is practical, be left undisturbed.

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.



Mark McCrone
September 2021.

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.

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References

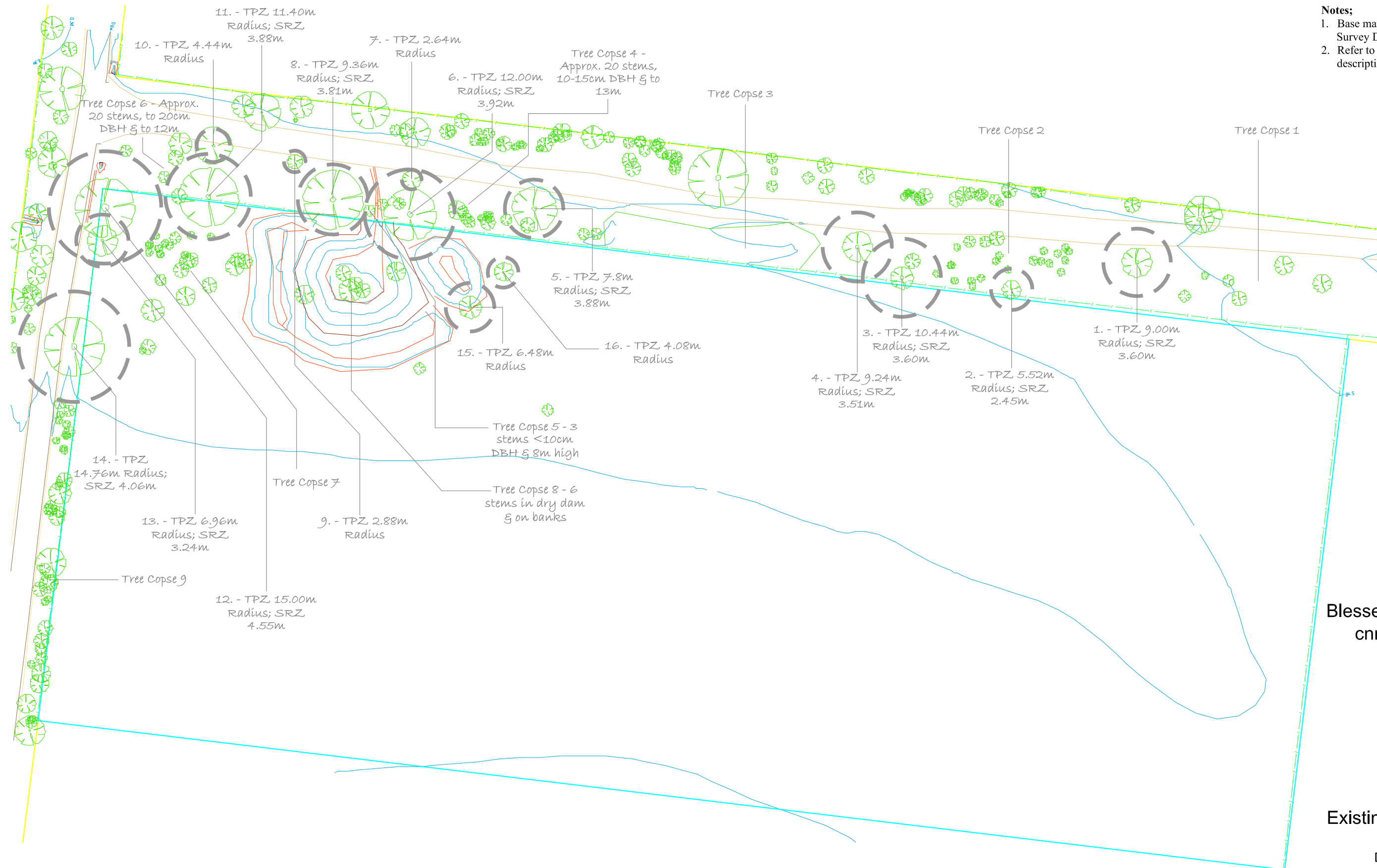
Standards Australia, 2007. *Pruning of amenity trees:*
AS 4373 – 2007. SA: Sydney.

Standards Australia, 2009. *Protection of trees on*
development sites: AS4970-2009. SA: Sydney.

Appendix

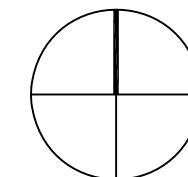
A

Existing Tree Mapping



Notes;

1. Base mapping from North East Survey Design Detail Survey
2. Refer to Report (Section 4) for descriptions of the numbered trees



Blessed Carlo College
cnr Lignum & Kiely
Roads, Moama

Existing Tree Mapping

Scale 1:1,000 (@A3)

Dwg. No. 21/413/TL-01

September 2021

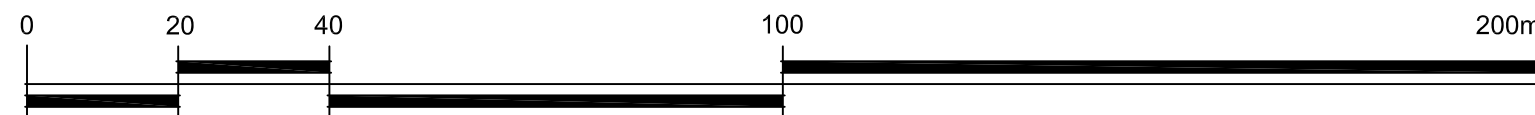
Prepared by;



MARK D. MCCRONE
LANDSCAPE
ARCHITECT

P.O.Box 1053,
Wagga Wagga,
NSW, 2650
p. 04 0790 7958
e. larch_therock@bigpond.com

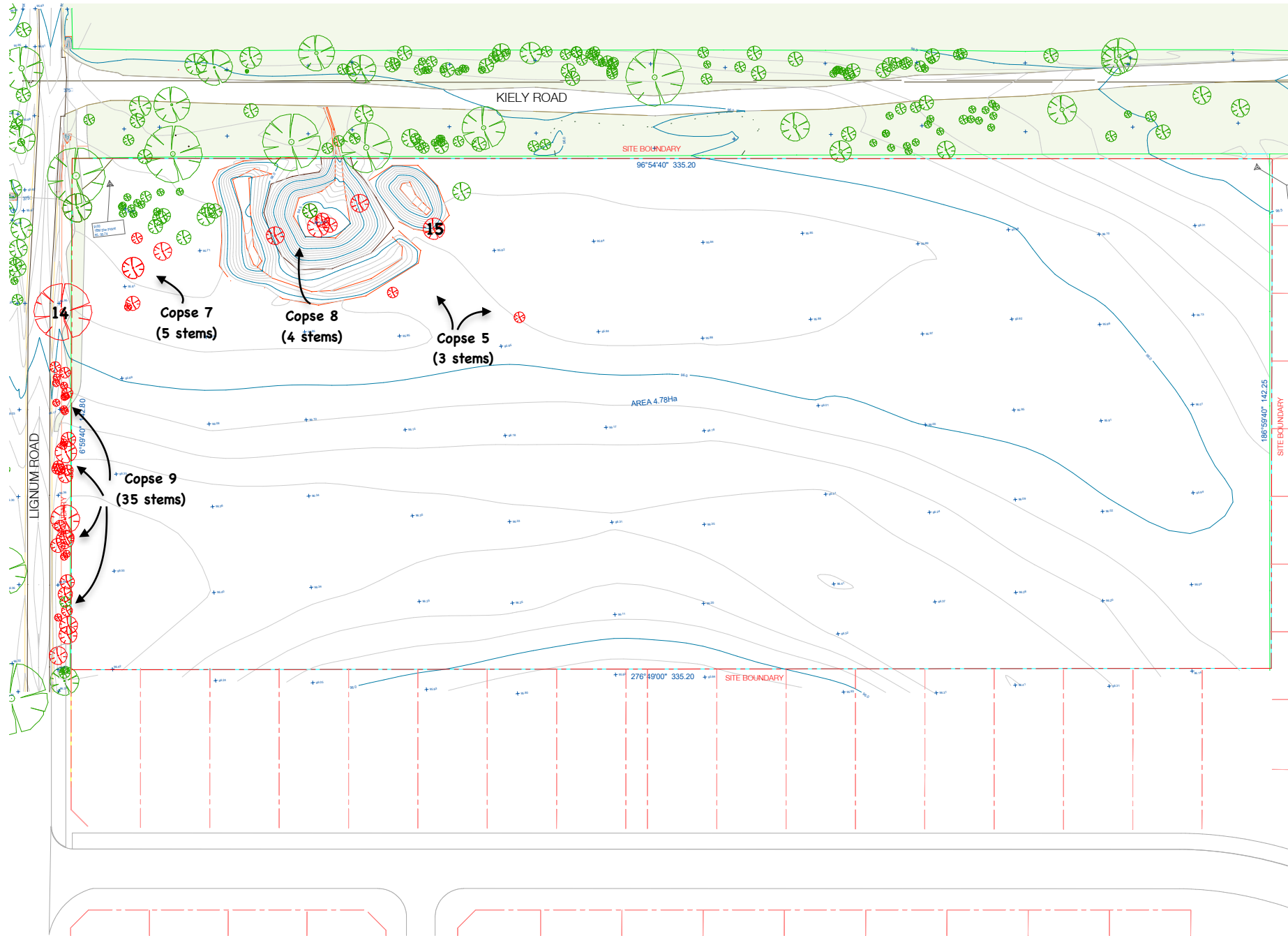
ABN : 35 336 150 981



Appendix

B

Proposed Tree Removals



Revision/Issue	Date
1 Preliminary Issue	14.12.2021
2 Preliminary Issue	12.01.2022
3 ISSUE SUBMITTED	10.08.2022

Use figured dimensions in preference to scale.
Verify dimensions at job before shop fabrication.
Read drawing in conjunction with specification.
© ClarkeHopkinsClarke

NSW Nominated Architect: Jordan Curran (19239)

- LEGEND**
- EXISTING TREE TO REMAIN
 - EXISTING TREE TO BE REMOVED
 - SITE BOUNDARY

ClarkeHopkinsClarke

Melbourne
L5 Melbourne Connect
700 Swanston Street
Carlton Victoria 3053
Telephone (03) 9419 4360
Email: studio@chc.com.au
www.chc.com.au

Sydney
3/78 Campbell Street
Surry Hills NSW 2010
Telephone (02) 9221 9200
Email: studio@chc.com.au
www.chc.com.au

Scale: 1:300 @ A1
Date: 04/02/2022
Drawn: JL
Architect: CM

Project:
**BLESSED CARLO COLLEGE
CORNER OF LIGNUM RD &
KIELY RD, MOAMA NSW 2731**

Drawing:
**SITE PLAN - EXISTING &
DEMOLITION**

Drawing No.:
210026/DA001

Table B.1: Trees to be Removed

<i>Tree/Stems</i>	<i>No.</i>	<i>Condition</i>	<i>Justification for Removal</i>
14	1	Fair	Within road reserve, in location of proposed bus parking area, to be replace by new landscaping, tree is in fair condition. The tree is one of those described in this report's body as "large veteran tree" and activities that cause people and/or vehicles to congregate in close vicinity to the trees should not be proposed
15	1	Fair	In location of proposed new building, tree is in fair condition, removal to be compensated by additional new tree plantings and landscaping. The tree offers only minimal visual or environmental amenity.
Copse 5	3	Fair	In location of proposed new buildings, stems are in fair condition, removal to be compensated by additional new tree plantings and landscaping. Recently regenerating trees that have seeded from larger mature trees in the vicinity.
Copse 7	5	Poor - Good	In location of proposed new buildings, stems are in poor-good condition, removal to be compensated by additional new tree plantings and landscaping. Recently regenerating trees that have seeded from larger mature trees in the vicinity.
Copse 8	4	Fair	In location of proposed new buildings, stems are in fair condition, removal to be compensated by additional new tree plantings and landscaping. Recently regenerating trees that have seeded from larger mature trees in the vicinity. Positioned in (& on banks of) earth dam.
Copse 9	35	Poor - Good	Within road reserve, in location of proposed bus parking area and access driveways, stems are in poor-good condition, removal to be compensated by additional new tree plantings and landscaping. Recently regenerating trees that have seeded from larger mature trees in the vicinity.
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Appendix

C

Curriculum Vitae – Mark D. McCrone, Landscape Architect and Consulting Arborist



Mark D. McCrone

Landscape Architect & Consulting Arborist

QUALIFICATIONS

- Bachelor of Landscape Architecture
- Graduate Diploma of Vocational Education and Training
- Associate Degree of Applied Science (Amenity Horticulture) – AQF Level 6
- Department of Agriculture, Forestry and Fisheries – Registered Landcare Consultant

PROFESSIONAL AFFILIATIONS

- Registered Landscape Architect (AILA No. 426)
- Quantified Tree Risk Assessment (QTRA) – Registered User (No.7385)
- Member of the Mediterranean Garden Society
- Member of the Society for Growing Australian Plants

PROFESSIONAL EXPERIENCE

July 1994 - Present Sole Practitioner, Mark D. McCrone - Landscape Architect and Consulting Arborist.

Providing consulting services on a range of landscape design, land management, arboricultural and horticultural issues.

1994 - 2017 Lecturer in Environmental Horticulture,
Charles Sturt University, Wagga Wagga.

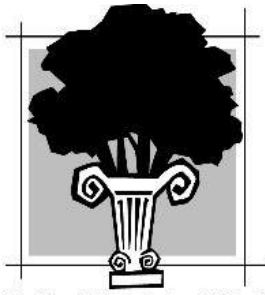
2011 - 2016 Horticulture Teacher,
NSW Department of Corrective Services.

1999 – 2016 Course Instructor – Arboriculture, and Garden and Landscape
Design Modules at (NSW) TAFE

1991 - 1994 Associate, The GeoLINK GROUP Pty. Ltd.,
Engineers, Planners & Landscape Architects.

1988 - 1991 Landscape Architect, Planners North Pty. Ltd.,
Consulting Planners & Engineers.

1985 - 1988 Landscape Architect, Margules and Partners Pty. Ltd.,
Landscape Architects, Consulting Foresters and Environmental
Consultants.



MARK D. McCRONE
LANDSCAPE
ARCHITECT

Arboriculture

Capability

Our broad experience allows us to deliver expert, accurate and timely advice, providing clients with dependable information on which to base tree management decisions.

Tree Inventories | Tree Reports & Management Plans | Diagnostic Services | Stock Quality Assessment

Representative Projects

Identify & Assess Hazardous Trees on School Campuses – Riverina

Client: Joss Facility Management (on behalf of the NSW Department of Education & Communities). Inspection of trees on the campuses of 36 schools in the northern sector of the Department's Riverina Region. The assessment identified trees that posed risk due to location and condition and provided recommendations on remedial action required.

Urban Tree Audit – Temora and Ariah Park

Client: Temora Shire Council. To enhance the streetscape of the townships within the Shire, and develop succession planting programs, a comprehensive audit of existing tree stocks was undertaken. Information was gathered, using *IntraMaps Roam; Mobile Data Collection Software*, on the location and condition of (some 4,300) street trees.

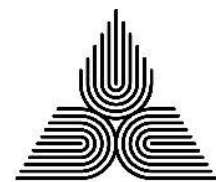
Arboricultural Advising – Hume Highway Upgrades

Client: Northern Hume & Tarcutta Hume Alliances. Project arborist for the Tarcutta Bypass project, advising on arboricultural issues relating to construction impacts on trees; tree condition reports (on significant heritage trees); and tree management strategies during the life of the Hume Highway duplication project.

Assessment of Bushfire Impact on Heritage Trees – Jephcott Arboretum, Ournie

Client: Norton Rose Australia. An assessment of the damage to trees caused by a bushfire in the historically significant arboretum. Involved over 100 trees, which date from the arboretum's establishment 150 years ago, documenting loss from fire damage & providing recommendations on remedial & recovery works within the arboretum.

Mark McCrone is a Landscape Architect who has broad experience in the many facets of the aligned professions of landscape architecture, arboriculture and horticulture. He is a Registered Quantified Tree Risk Assessment (QTRA) user & has provided arboriculture advice to a wide range of corporate and government entities including various LGAs, Transport for NSW and NSW NPWS. Mark has also written an *Assess trees* Module for the Riverina College of TAFE, provided instruction in Arboriculture in TAFE Horticulture programs, and taught Agroforestry at Charles Sturt University.



Australian Institute of
Landscape Architects

p. 04 0790 7958
e. larch_therock@bigpond.com
P.O. Box 1053, WAGGA WAGGA, NSW, 2650