Appendix **Two** – EPCAD

Vegetation Assessment Report –
Lots 1, 101 and Part Lot 3

COOLBELLUP HOTEL REDEVELOPMENT

Existing Vegetation Assessment

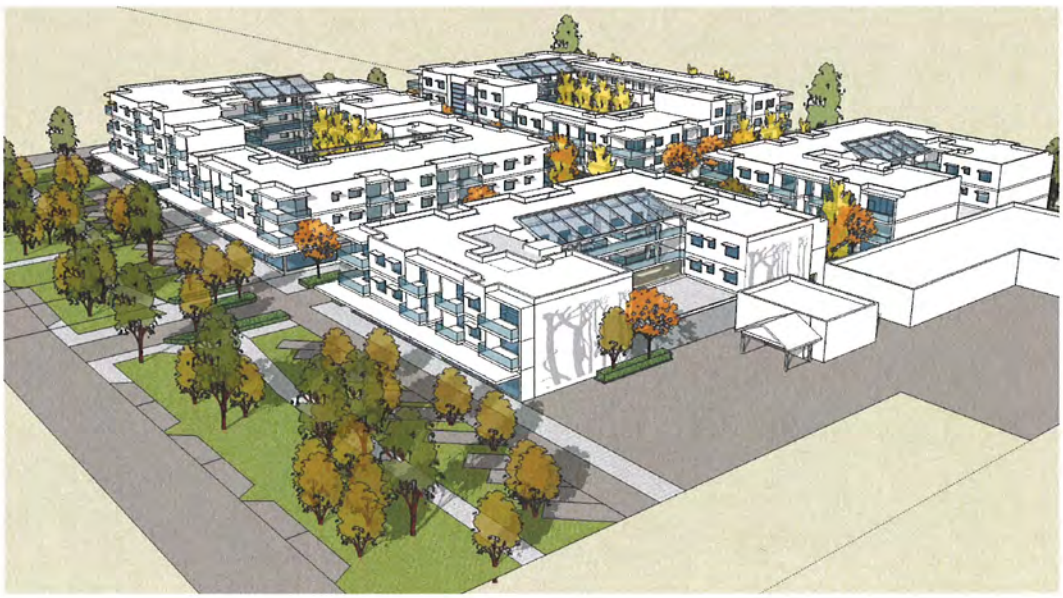

Image: Zuideveld Marchant Hur Architects

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PREPARED FOR DEVELOPMENT PLANNING STRATEGIES

PREPARED BY EPCAD

July 2012

CONTENTS

1.0 INTRODUCTION

This report has been prepared to provide an overview of the proposed landscape design and incorporation of existing vegetation as part of the Coolbellup Hotel Redevelopment.

EPCAD in conjunction with Arborcentre undertook a site and data assessment of the existing vegetation throughout Lot 1 Waverley Road (the proposed development site) with the aim of retaining existing vegetation within the proposed development where possible.

Appendix 1 discusses specific trees considered worthwhile for retention. Measured data, specifications and comments made during the site investigation for each tree or significant grouping of plants is provided. Recommendations and measures for protection of trees proposed to be retained are provided.

2.0 LANDSCAPE PLAN

Key features of the proposed landscape design include a 'green fringe' surrounding the development along the North, East and Western boundaries of the site. Also, a North-South pedestrian boulevard and East-West shared use corridor separate the four main buildings that comprise the development proposal.

The densely planted fringe surrounding the site forms a landscape buffer between the proposed development and existing residences along Coolbellup Avenue and Waverley Road. The fringe design incorporates existing trees throughout a wide grassed verge along Coolbellup Avenue, a row of Sugar Gums (Eucalyptus cladocalyx) to the South-East corner of the site and selected specimen trees along the Waverley Road boundary which includes a historic Jarrah (Eucalyptus marginata) specimen of cultural significance (Ref: Coolbellup Wardang (crow) tree (Site ID 21787) on DIA website). Existing trees will be supplemented with additional native trees to give structure and formality to the overall fringe planting design.

Water Sensitive Design Principles will be adopted with the use of selective native shrub planting. The shrub planting will further enhance the fringe landscape buffer and formalise pedestrian routes whilst creating a habitat for local birds.

The central pedestrian boulevard is a key feature within the proposed development. The boulevard provides a pedestrian link through the site as well as a shared space for residents to enjoy. Raised grass platforms with specimen trees are terraced along the boulevard, creating a series of attractive and welcoming spaces. The specimen trees will provide summer shade and reinforce the lineal landscape within the development area.

Artists impression of pedestrian boulevard looking north

Legend

- Existing Trees
- Proposed Trees
- Feature Paving
- Shrubs
- Turf Lawn
- Decorative Gravel

1. Central pedestrian boulevard
2. Central ‘car crossing’, gives priority to pedestrians
3. Raised and terraced grassed platforms, create a range of spaces along the boulevard for gathering, sitting and playing
4. Feature paving
5. Decorative crushed gravel surfacing enhances the residential character and provides spaces for informal bocce/petanque games
6. Decorative gravel below balcony’s
7. Shrub planting creates a green ‘setting’ for the new buildings
8. Fixed hammocks provide an attractive feature to lure residents out into the shared space
9. Bike Rack
10. ‘Sculptural’ Seating provides an element of interest, creating a more vibrant public realm
11. Services exit with retaining walls
12. Bollards
13. Cafe/bar alfresco

0 5 10 15 30M

Coolbellup Hotel Redevelopment

Landscape Concept Plan 1:250 @ A1

APRIL 2012

EPCAD

3.0 SPECIES SELECTION

A combination of native and introduced species has been considered within specific areas of the development.

The selected species will complement the existing vegetation to be retained, provide shelter, summer shade and enhance the streetscape and the proposed development.

TABLE 1: Recommended Tree Species

Botanical Name	Common Name	Native/Exotic	Location
Agonis flexuosa	Peppermint Tree	Native	All
Angophora costata	Smooth Bark Apple	Native	Fringe
Brachychiton acerifolius	Illawarra flame	Native	All
Callistemon spp.	Bottlebrush	Native	All
Corymbia ficifolia	Red Flowering Gum	Native	Fringe
Erythrina indica	Flame tree	Exotic	Pedestrian Boulevard
Eucalyptus caesia	Silver Princess	Native	Pedestrian Boulevard
Eucalyptus leucoxylon "Rosea"	Red Flowering Yellow Gum	Native	Fringe
Eucalyptus sideoxylon "Rosea"	Red Ironbark	Native	Fringe
Jacaranda mimosaefolia	Jacaranda	Exotic	Pedestrian Boulevard
Melaleuca quinquinervia	Broad Leafed Paperbark	Native	Fringe
Platanus orientalis digitata	Cut Leaf Plane Tree	Exotic	Pedestrian Boulevard
Plumeria spp.	Frangipani	Exotic	Pedestrian Boulevard
Ulmus parvifolia.	Chinese Elm	Exotic	Pedestrian Boulevard
Xanthorroea preissii	Grass Tree	Native	Pedestrian Boulevard

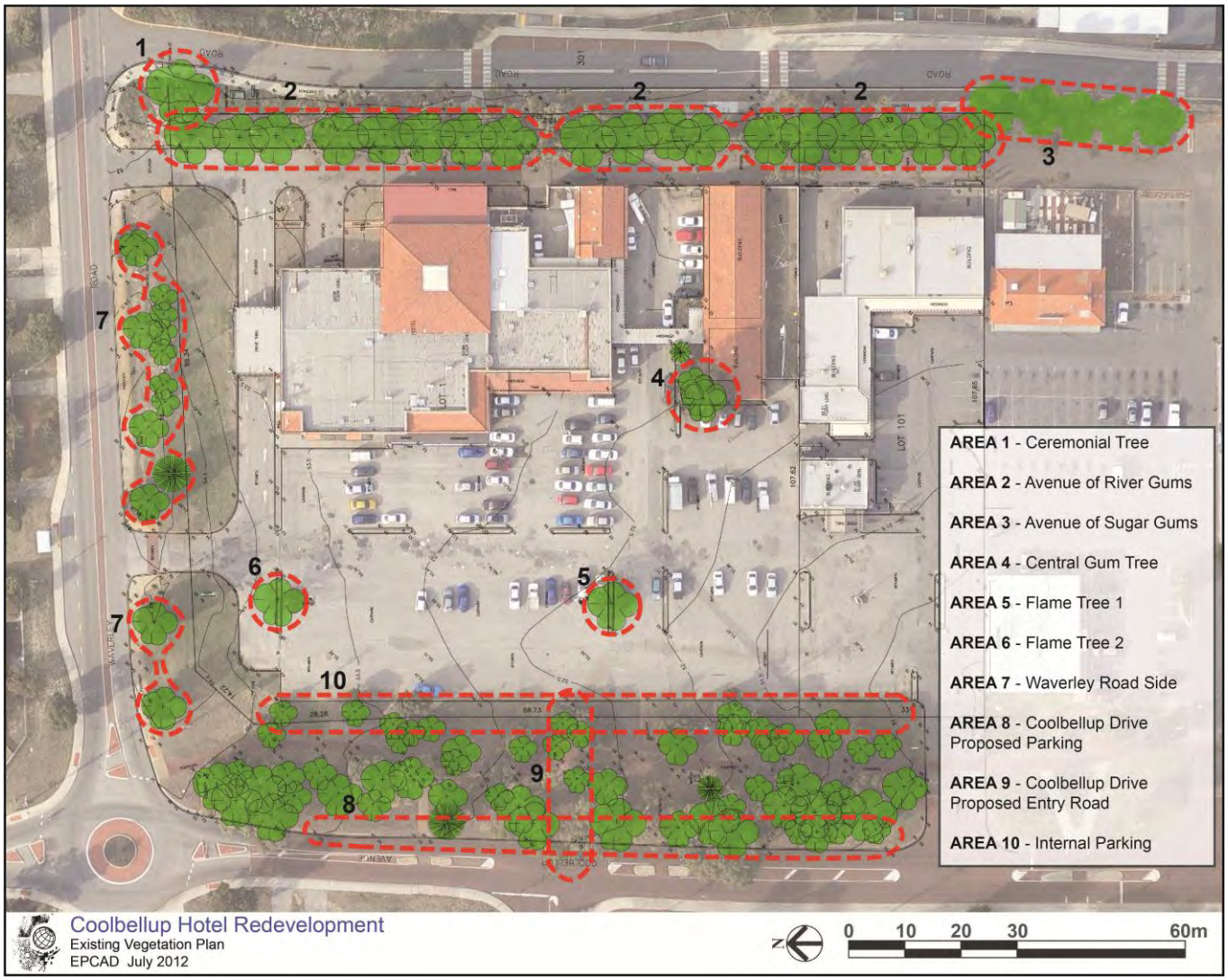
APPENDIX 1: TREE ASSESSMENT REPORT

PURPOSE OF REPORT:

To provide an overview of worthwhile trees on the Coolbellup Hotel site in light of the proposed development and recommendations for their retention on site.

Map 1

Existing Vegetation Plan



AREA 1: Ceremonial Tree (NE corner)

Image: Ceremonial Tree

Common Name: Jarrah

Species: Eucalyptus marginata

Estimated Size: 8m in height x 5m spread

DBH (Diameter Breast Height): 1.2m

Bole (Footprint): 2.1m diameter

Tree Health: Poor

Tree Structure: Severely compromised

Site Inspection: 3rd July 2012

Comments

- Recognised as a 'Ceremonial Tree'
- The specimen has been radically reduced by lopping to provide clearance to adjacent power lines (HV & LV on both its Western and Northern sides).
- The regrowth has superficial attachment that will require on-going foliage load management to ensure tree safety.
- The tree's root zone are has been compromised as a result of soil level changes and excavations in proximity to the tree over many decades.
- Retention of the tree as a worthwhile living specimen will require the establishment of a Tree Preservation Zone (TPZ), and the management of activities within the TPZ throughout the site development phases **(Refer Attachment 1. – Tree Preservation of the 'Ceremonial Tree').**

AREA 2: Avenue of 17 x River Gums (Eastern Boundary)

Species: Eucalyptus camaldulensis x

Estimated Size: 24m in height x 15m spread

DBH (Diameter Breast Height): 850mm (average)

Bole (Footprint): 1m diameter

Tree Health: Average

Tree Structure: Compromised

Site Inspection: 3rd July 2012

Image: Avenue of River Gums looking South

AREA 2: Avenue of 17 x River Gums (Eastern Boundary) - continued

Comments

The avenue of trees have all been severely pruned over the years with the canopies arising from lopped unions ranging from 4m to 10m above ground level.

The trunks of all but 2 of the trees are located on the proposed building alignment and will not survive the development.

The ninth and tenth specimens from the Waverley Rd end, are located either side of a proposed driveway. The proximity of the trees to excavations that will be required to match up with road levels will likely destabilise the trees as well as challenge their capacity to cope with the inevitable root loss. These specimens have grown reliant on the neighbouring trees for wind protection; their retention without the protection afforded by the neighbouring trees would present inherent structural issues that would require ongoing management. Replacing these trees with new plantings would result in a better outcome.

Image: Two River Gums specimens located either side of proposed driveway

Image: Avenue of River Gums looking North

AREA 3: Sugar Gums at the Southern end of the Avenue of 17 x River Gums

Species: Eucalyptus cladocalyx

Comments

The re-working of the service road that passes by these Sugar gums will require further arboricultural input as part of the road design drawings so that the undulations adjacent the trees are addressed without compromising the trees and that the potential for future road disturbance is ameliorated.

Image: Avenue of Sugar Gums

AREA 4: Central Gum Tree

Species: Eucalyptus camaldulensis x

Estimated Size: 23m in height x 20m spread

DBH (Diameter Breast Height): Multiple stems 200mm to 300mm arising off old stump (Coppice)

Bole (Footprint): 1.7m diameter

Tree Health: Average

Tree Structure: Compromised

Site Inspection: 3rd July 2012

Comments

Being coppice regrowth, the tree presents a safety risk that will likely be exacerbated by unavoidable root loss caused by the proposal to contain this specimen within a new planting bed in association with the footprint of the new building. Replanting with a new specimen would achieve a better outcome for the development.

Image: Central Gum Tree

AREA 5: Flame Tree 1

Species: Erythrina indica x

Estimated Size: 8m in height x 10m spread

DBH (Diameter Breast Height): 800mm at 500mm above ground

Bole (Footprint): 1m diameter

Tree Health: Poor

Tree Structure: Compromised

Site Inspection: 3rd July 2012

Comments

There is potential for this tree to be kept within the proposed new driveway; subject to finished levels and road construction criteria. However, it is not a good specimen of the species and is in poor condition.

Image: Flame Tree 1

AREA 6: Flame Tree 2

Species: Erythrina indica x

Estimated Size: 7m in height x 8m spread

DBH (Diameter Breast Height): 700mm at 500mm above ground

Bole (Footprint): 800mm diameter

Tree Health: Poor

Tree Structure: Severely Compromised

Site Inspection: 3rd July 2012

Comments

A very poor specimen of the species that is structurally compromised by past topping and not worth transplanting. Its survival in this environmental extreme is testament to the species resilience.

Image: Flame Tree 2

AREA 7: Waverley Road Side

The proposal to incorporate the 4 x Angophora costata's into a car bay sized nib and install a footpath on the other side of the trees (as indicated in red) will likely see the trees die within a few years or at best, cause them to underperform and become a blight on the streetscape.

Given the maturity of these 4 Angophora's it will be necessary to increase the nib size to at least 2 car bays (preferably 3) and divert the footpath to provide a minimum 1.5m radius between the edge of foot path and the tree trunk. Further, there will need to be a root pruning protocol and a watering regime to coincide with the works being done. Additional arboricultural input required for this to be incorporated into the construction details once the final levels have been determined for the road/parking design.

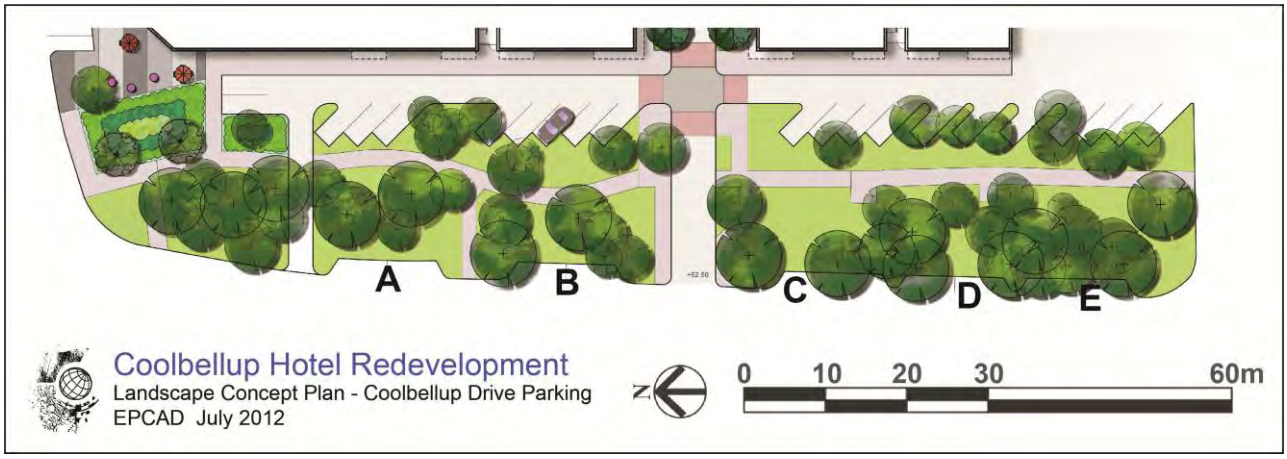
Comments

- Similar consideration will need to be afforded the Rottnest Island Pine (Calitris preissii).
- The Angophora that is second from the East end is in very poor condition and is not worthwhile retaining. Better to replace it with a new specimen.

Image: Waverley Road verge looking West.
Note: Footpath and nib outline indicative only.

Image: Waverley Road verge looking East with Rottnest Island Pine (*Calistris preissii* in foreground)

AREA 8: Coolbellup Drive – Proposed Parking



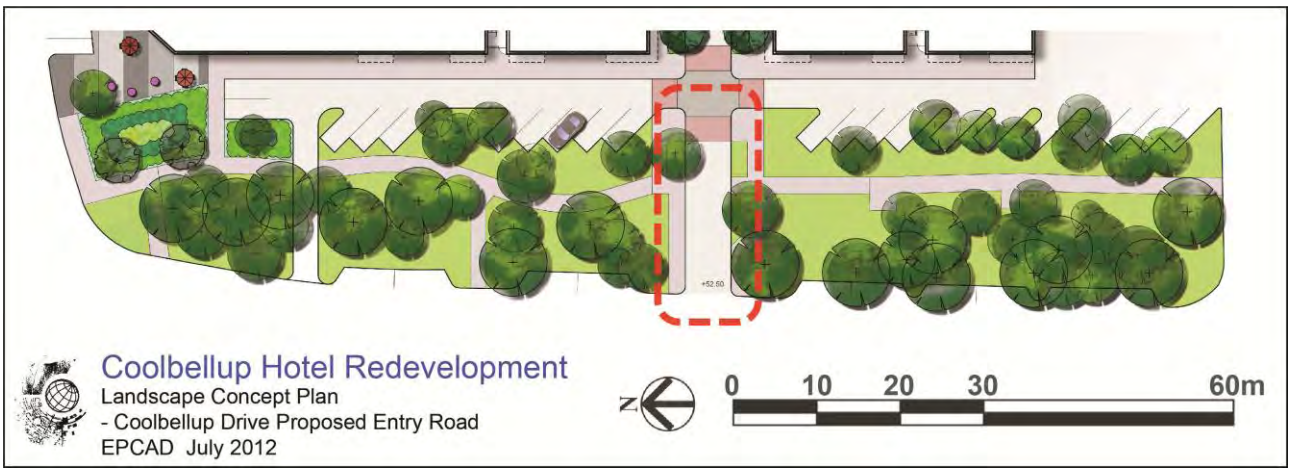
Parking bays A – E will require root pruning to precede any boxing out for the construction of the bays and a tree watering regime implemented as directed by the Arboriculturist. Suggest that such detail is incorporated into the specification documentation.

Comments

- All of the trees are in reasonable health and appear to be structurally typical for the species.
- Re-routing of the main path and the introduction of new footpaths will also require root pruning operations to precede any boxing out works for the construction of the paths and a tree watering regime implemented as directed by the Arboriculturist.

Image: Coolbellup Drive looking South.

AREA 9: Coolbellup Drive – New Entry Road

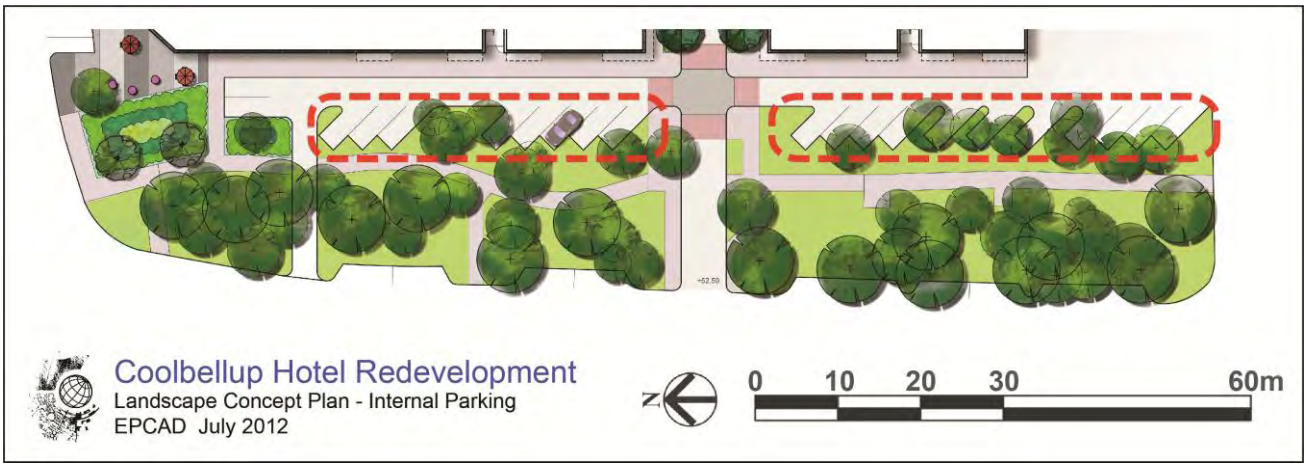


Retaining the two Eucalypts either side of the new entry road will require tree specific tree preservation measures as directed by the Arboriculturist. This will include:

- Canopy pruning,
- Root pruning,
- Watering regime,
- Tree protection measures.

Image: Looking West from Proposed Entry off Coolbellup Drive.

AREA 10: Coolbellup Drive – Parking on East Side of Verge



This strip of low growing trees are largely made up of Rottnest Island Tea Tree (Melaleuca lanceolata), some Callistomens (Callistomen viminalis) and a few Kunzeas (Kunzea spp.), that are in reasonable condition and structurally typical for the species.

A re-configuration of the parking bays would eliminate the loss of some of the more worthwhile specimens.

The retention of worthwhile specimens will require tree specific tree preservation measures being applied as directed by the Arboriculturist. This will include:

- Canopy pruning,
- Root pruning,
- Watering regime,
- Tree protection measures.

Images: Looking South along Coolbellup Drive Verge

SUMMARY OF RECOMMENDATIONS

AREA 1: Ceremonial Tree (NE corner)

- Tree to be retained.
- Tree Preservation as per Attachment 1.
- Arboriculturist to be appointed to monitor activities.

AREA 2: Avenue of 17 x River Gums (Eastern Boundary)

- Removal of all trees.
- Replanting of suitable specimens where appropriate.

AREA 3: Sugar Gums at the Southern end of the Avenue of 17 x River Gums

- Trees to be retained.
- Further Arboricultural input into the service road design drawings so that the undulations adjacent the trees are addressed without compromising the trees and the potential for future road disturbance is ameliorated.

AREA 4: Central Gum Tree

- Removal of the tree.

AREA 5: Flame Tree 1

- Poor specimen however, there is potential to retain the tree in-situ.
- Retention subject to finished levels and the practicalities associated with road and pavement construction.

AREA 6: Flame Tree 2

- Removal of the tree.

AREA 7: Waverley Road Side

- 4 of the five Angophoras are worthwhile retaining however additional space around the trees is required for this to be successfully achieved (increase the nib size to at least 2

car bays (preferably 3) and divert the footpath to provide a minimum 1.5m radius between the edge of foot path and the tree trunk).

- 1 x Calitris will require similar consideration
- Further arboricultural input into the final alignments of parking bays and footpaths will be required.
- Tree preservation measures to include timely Root pruning, Canopy pruning, Watering regimes and Tree protection measures.
- Tree preservation specifications to be incorporated in the construction documentation.

AREA 8: Coolbellup Drive – Proposed Parking

- Construction detail to include the engagement of the Arboriculturist to perform &/or oversee tree preservation activities including timely root pruning, canopy pruning, watering regimes and tree protection measures.
- Tree preservation specifications to be incorporated in the construction documentation.

AREA 9: Coolbellup Drive – Proposed Entry Road

- Construction detail to include the engagement of the Arboriculturist to perform &/or oversee tree preservation activities including timely root pruning, canopy pruning, watering regimes and tree protection measures.
- Tree preservation specifications to be incorporated in the construction documentation.

AREA 10: Internal Parking – East Side of Coolbellup Drive Verge

- Construction detail to include the engagement of the Arboriculturist to perform &/or oversee tree preservation activities including timely Root pruning, Canopy pruning, Watering regimes and Tree protection measures.
- Tree preservation specifications to be incorporated in the construction documentation.

GENERAL

Appoint a certified Arboriculturist to prepare a “Tree Preservation Management Plan”.

ATTACHMENT 1: Tree Preservation of 'Ceremonial Tree'

LEGEND

- EXTENT OF FOLIAGE
- PROPOSED BUILDING FOOTPRINT
- AS4970 - 2009 TREE PRESERVATION ZONE (REFER TO ATTACHMENT 2)
- RECOMMENDED TREE PRESERVATION ZONE FOR CONSTRUCTION

Note: Proposed building encroaches into both TPZ's.

Further assessment of proposed works and methodologies will be required so that appropriate measures can be taken to offset their potential impact on the tree.

Coolbellup Hotel Redevelopment

Tree Preservation of 'Ceremonial Tree'

EPCAD, July 2012

0 10 20 30 60m

COMMENTS

1. **The area shaded red is to be treated as the Tree Preservation Zone (TPZ)**

The implications for this are as follows:

- The area is cordoned off with construction type panel fencing and labelled “TREE PRESERVATION ZONE - DO NOT ENTER WITHOUT AUTHORISATION”.
- No open trench excavation is to occur within this zone without further arboricultural input. (Note: All new below ground services (or upgrades), to be installed via boring at min 800mm depth where possible &/or measures taken to offset the potential impact of works within the Recommended Tree Preservation Zone).
- No soil level changes to occur without approval by the Arboriculturist.
- The area is to be weed controlled and mulched as directed by the Arboriculturist.
- A watering regime will form part of the remediation works that are to be identified by the Arboriculturist.
- Selective canopy pruning under the supervision of the Arboriculturist.
- All new or remediation works to footpaths, kerbs or roads to be approved by the Arboriculturist prior to commencement.

2. **The TPZ Requirements and Site Inductions**

a) The TPZ requirements are to for part of the site induction process for all people, contactors and sub-contractors that are engaged to carry out works on the project.

b) A competent Arboriculturist is to be appointed to manage the implementation of the TPZ.

ATTACHMENT 2

Refer Extract from AS 4970 – 2009

STANDARDS AUSTRALIA
Australian Standard
Protection of trees on development sites
S E C T I O N 1 S C O P E A N D G E N E R A L
1.1 SCOPE
This Standard provides guidance on the principles for protecting trees on land subject to development. It follows, in sequence, the stages of development from planning to implementation.
This Standard aims to assist those concerned with trees in relation to development. Where development is to occur, the Standard provides guidance on how to decide which trees are appropriate for retention, and on the means of protecting those trees during construction work. It does not argue for or against development, or for the removal or retention of trees nor does it consider the monetary value of trees. The Standard does not apply to the establishment of new trees.
1.2 APPLICATION
This Standard gives guidance to horticulturists, arborists, architects, builders, engineers, land managers, landscape architects, contractors, planners, determining authorities, building surveyors, certifiers, those concerned with the care and protection of trees, and all others involved in the management of trees and development.
Extract from This Standard provides guidance for arborists, architects, builders, engineers, Land managers, landscape architects and contractors, planners, building surveyors, those concerned with the care and protection of trees, and all others interested in integration between trees and construction.