ARBORICULTURAL ASSESSMENT REPORT

Address: Lake Cathie Public School, 1240 Ocean Dr, Bonny Hills NSW 2445
Inspection Date: 18.9.2018 Report Valid Until: 18.9.2019

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<table>
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<tr>
<th>Name</th>
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<tr>
<td>Prepared By</td>
<td>18/9/2018</td>
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<tr>
<td>Troy Roberts</td>
<td>(M.N.C.T.S)</td>
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Disclaimer

This report was prepared in accordance with the scope of works set out in correspondence between the client and Mid North Coast Tree Services Pty Ltd. To the best of Mid North Coast Tree Services Pty Ltd knowledge, the report presented herein accurately reflects the Client’s intentions when the report was printed. However, it is recognised that conditions of approval at time of consent, post development application modification of the proposals design, and the influence of unanticipated future events may modify the outcomes described in this report.

Mid North Coast Tree Services Pty Ltd used information and documentation provided by external persons, companies and authority. Whilst checks were completed by Mid North Coast Tree Services Pty Ltd to ensure that this information and/or documentation was accurate, it has been taken in good faith and has not been independently verified. It is therefore advised that all information and conclusions presented in this report apply to the subject land at the time of assessment, and the subject proposal only.

Trees are living organisms and therefore possess natural variability. This cannot be controlled, however trees can be managed. An Arborist cannot guarantee that a tree will be safe under all circumstances, nor predict the exact time when a tree or part of a tree will fail. To live or work near a tree involves some degree of risk and this evaluation does not preclude all the possibilities of failure.

The findings within this report are based on the tree’s condition when the inspection was completed (18.9.18). Time and severe weather conditions can greatly change the health and structure of a tree. Thus no responsibility is taken for any adverse damage or injury sustained as a result of tree/tree part failure after this date.
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1. EXECUTIVE SUMMARY

In summary it can be confirmed that 22 endemic and exotic trees were assessed for this report. All vegetation was in a juvenile stage and had all been planted within the last 3 years. The vegetation ranged from 1-5meters in height & a diameter at breast height of up to 100mm. 7 out of the 22 trees are listed in Port Macquarie Hastings Council’s Local Environmental Plan as ‘Koala Food Trees’. 1 of the 7 is recommended for removal. Due to their size and location the client wishes to attempt a transplant of 9 of the trees to a location designated within the school ground.

The client wishes to transplant 9 of the trees onsite to a location within the school grounds. Transplanting can be a costly operation and the survival rate can not be guaranteed. If transplanting is the preferred option then MNCTS recommends that the trees are removed by a tree spade. A project arborist must be onsite during transplanting activities and before and after care must be managed by a project arborist. In the case that any of the Koala browse species die within 1 year of transplanting they must be replaced as per PMHC Local Environmental Plan with 2 x Koala browse species, preferably Eucalyptus robusta (Swamp Mahogany) as this species is more suitable in a school ground environment.

M.N.C.T.S understands the importance of Koala habitat retention and the recommendations listed are derived purely from an arboricultural perspective. The client MUST re-plant 2 x Koala browse species (Eucalyptus microcorys – Tallowwood) within the large property to compensate for the loss of 1 x Koala browse species. Consulting Arborist MUST be consulted beforehand in regards to the position of the new planting.
2. INTRODUCTION

Mid North Coast Tree Services (M.N.C.T.S) has been engaged by Andrew Hannah-Davies of Shac to carry out a tree assessment report for 22 trees which will be impacted on by the proposed development.

Figure 1: Proposed DA Lake Cathie Public School
Figure 1: Trees affected by proposed DA at Lake Cathie Public School
3. BACKGROUND

3.1 Proposed Development

The proposed development is for the construction of 1 x large sports hall & multiple classrooms. Majority of the trees assessed are a range of endemic vegetation. A total of 7 koala food trees were assessed.

3.2 Site Location

The subject site is situated at Lake Cathie Public School, 1240 Ocean Drive, Bonny Hills NSW 2445.

Figure 3 - Site location – Six Maps

3.3 Site Conditions

The site is set within a rural setting and generally cleared of trees with open pasture land with numerous established replantings of predominantly endemic species. There is a small regrowth of swamp sclerophyll forest on coastal floodplains endangered ecological community (EEC) to the south western corner of the boundary.

The subject site has a slight sloping aspect from north to the south. The site is generally cleared with trees to the east and a small area of swamp forest to the west which forms part of the swamp sclerophyll forest on coastal floodplains (EEC). The ground cover consists of slashed exotic pasture grasses.
4. METHODOLOGIES

4.1 Methods

Numerous methodologies were used to assess the subject trees. These are listed and described below.

**Visual Tree Assessment (VTA)**
A Visual Tree Assessment (VTA) was used as the main methodology for assessing the health and vigour of the subject trees.

A Visual Tree Assessment (VTA) is an internationally accepted and widely recognised system that identifies symptoms that a tree produces in reaction to an area of biomechanical stress. It is a visual assessment of a tree from the ground which was developed by Mattheck and Breloer to aid the diagnosis of potential defects through visual signs and the application of mechanical criteria (Lonsdale 2001, p324).

**Tree Hazard Evaluation**
Hazard Tree evaluation is the systematic process of assessing the potential for a tree or one of its parts to fail and injure people or damage property. The primary goal of hazard evaluation is to identify potentially hazardous trees or tree parts so they can be treated before failure occurs. All hazards cannot be eliminated. However, by evaluating trees and rating the hazards associated with them, the arborist can prioritise and schedule abatement treatments to reduce the level of risk.

**ULE (Useful Life Expectancy)**
Each tree can be assigned a ULE (Useful Life Expectancy) value as developed by Barrell (1996). The objective of a ULE assessment is to assign a relative value to individual trees within a group for the purpose of informing future management options. In summary, ULE is the life expectancy of each tree modified by economic considerations, impacts on trees with a longer ULE and the retention of the amenity of the wider landscape.

The Useful Life Expectancy (ULE) methodology can be used to categorise trees as follows:
- Long (Greater than 40 years): = L
- Medium (Between 15 and 40 years): = M
- Short (Between 5 and 15 years): = S
- Removal (no remaining ULE): = R
- Small, young or regularly pruned. = SY

4.2 Materials and Tools

Various materials and tools were used to carry out the tree assessments. These included a biotic and abiotic data collection sheet for the subject tree in order to easily collect and recall all required and relevant data whilst in the field.

In addition to this the following tools were used to assist and record the data collected:
- Cannon 60d & fish lens for photographs
- 8 metre metric tape measure
- 5 metre metric diameter tape
- Iphone for compass
- Microsoft surface tablet for data collection
5. OBSERVATIONS

A comprehensive VTA inspection and data gathering was conducted by Troy Roberts of Mid North Coast Tree Services (MNCTS) who holds an AQF 5 in Arboriculture. Site inspections were completed on 18/9/18.

5.1. Summary of Tree Assessment

The summary sheet below was prepared noting details of each tree upon the site. More detail including photographs can be found in Part 6 Discussion & Analysis.

Tree Data Summary Sheet – Definitions

- **SPECIES:** Botanical Name and Common Name. U = unidentified; *identification not confirmed
- **DBH:** diameter of trunk at 1400mm above ground level and measure in millimetres (mm)
- **~HGT:** approximate height of tree measured in metres (m)
- **~CANOPY:** approximate spread of canopy measured in metres (m)
- **~ AGE:** J = Juvenile < 2 years; S = Semi mature; M = mature; OM = over mature
- **VITALITY:** is an overall measure of the rate of shoot production, shoot extension or diameter growth (Lonsdale 2001, p324). It can also be described as the ability to resist strain (genetic feature) = Poor, Declining, Good

**DEVELOPMENT IMPACT & COMMENTS:** The overall impact of the proposed development & comments

<table>
<thead>
<tr>
<th>TREE NO.</th>
<th>SPECIES</th>
<th>DBH (mm)</th>
<th>~HGT (m)</th>
<th>~AGE</th>
<th>VITALITY</th>
<th>DEVELOPMENT IMPACT &amp; COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>9 x Melaleuca styphelioides (Prickly Paper-Bark)</td>
<td>Less than 100mm</td>
<td>1 - 3</td>
<td>Juvenile</td>
<td>Good</td>
<td>Located in centre of roundabout; removal &amp; stump grind</td>
</tr>
<tr>
<td>T2</td>
<td>Magnolia grandifolia (Southern magnolia)</td>
<td>Less than 100mm</td>
<td>3.5</td>
<td>Juvenile</td>
<td>Good</td>
<td>Transplant to new location within school grounds</td>
</tr>
<tr>
<td>T3,4</td>
<td>2 x Ornamental Pear species</td>
<td>Less than 100mm</td>
<td>4 - 4.5</td>
<td>Juvenile</td>
<td>Good</td>
<td>Remove &amp; stump grind</td>
</tr>
<tr>
<td>T5,6,7</td>
<td>3 x Tristaniopsis laurina (Water Gum)</td>
<td>Less than 100mm</td>
<td>3 - 4</td>
<td>Juvenile</td>
<td>Good</td>
<td>Within footprint of proposed development. Transplant to new location within school grounds</td>
</tr>
<tr>
<td>T8,9,10 ,11</td>
<td>4 x Eucalyptus tereticornis (Forest Red Gum)</td>
<td>100mm</td>
<td>4 - 5m</td>
<td>Juvenile</td>
<td>Good</td>
<td>Within footprint of proposed development. Transplant to new location within school grounds</td>
</tr>
<tr>
<td>T12</td>
<td>Eucalyptus tereticornis (Forest Red Gum)</td>
<td>100mm</td>
<td>5m</td>
<td>Juvenile</td>
<td>Good</td>
<td>Within footprint of proposed development. Removal &amp; stump grind</td>
</tr>
</tbody>
</table>
6. DISCUSSION AND ANALYSIS

6.1 Subject trees & their current condition

<table>
<thead>
<tr>
<th>T13</th>
<th>Melaleuca quinquenervia (Broad-leaved paperbark)</th>
<th>100mm</th>
<th>5m</th>
<th>Juvenile</th>
<th>Good</th>
<th>Within footprint of proposed development. Transplant to new location within school grounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>T14</td>
<td>Eucalyptus tereticornis (Forest Red Gum)</td>
<td>100mm</td>
<td>4.5m</td>
<td>Juvenile</td>
<td>Good</td>
<td>Within footprint of proposed development. Transplant to new location within school grounds</td>
</tr>
</tbody>
</table>

Photo 1: 9 x Melaleuca styphelioides (Prickly Paper-Bark) recommended for removal
Photo 2: T2; client wishes to transplant to new location within school grounds

Photo 3: T3 & 4; ornamental pear species which are recommended for removal
Photo 4: T5,6,7,8,9,10,11; all occurring within footprint of proposed development. Clients wishes to transplant to new location within school grounds
Photo 5: T12 (Eucalyptus tereticornis - Forest Red Gum); occurring within footprint of proposed development. Removal & stump grind
Photo 6: T13 (Melaleuca quinquenervia - Broad-leaved paperbark); within footprint of proposed development. Client wishes to transplant to new location within school grounds
6.2 Impact of the Proposed Development

Vegetation within footprint of Proposed Plan

Majority of vegetation within the proposed footprint & within close proximity (within 10m of proposed plan) is recommended for transpating. Only 1 of the Koala food trees assessed is recommended for removal.

6.3 Koala Food Tree - Replanting

1 of the subject trees which will be removed (Eucalyptus tereticornis - Forest Red Gum) is listed as a ‘Koala Food Tree’ in Port Macquarie Hastings Council’s Local Environmental Plan. MNCTS understands the importance of Koala habitat retention and the recommendations listed are derived purely from an Arboricultural perspective. The client MUST replant 2 x Koala browse species (Eucalyptus robusta – Swamp Mahogany) to compensate for the loss of 1 x Koala browse species. AQF 5 Consulting Arborist MUST be consulted beforehand in regards to the position of the new plantings. This will ensure the long-term preservation and redevelopment of Koala habitat within the ‘Port Macquarie Hastings’ region.
6.4 Transplanting

The client wishes to transplant 9 of the trees onsite to a location within the school grounds. Transplanting can be a costly operation and the survival rate can not be guaranteed. MNCTS recommends that the trees are removed by a tree spade.

A tree spade consists of a number of blades that encircle the tree and dig into the ground and then lift the entire tree, including the root ball and soil out of the ground. The whole tree can then be replanted in the designated area. A project arborist must be onsite during transplanting activities and before and after care must be managed by a project arborist. Prolonged dry weather, extreme temperatures and times when high winds are predicted should be avoided to undertake the operation.

In the case that any of the trees die within 1 year of transplanting they must be replaced as per PMHC Local Environmental Plan with 2 x Koala browse species, preferably Eucalyptus robusta (Swamp Mahogany) as this species is more suitable in a school ground environment.

7. RECOMMENDATIONS

Based upon the observations and discussions, the following recommendations are made regarding the proposed development.

Summary of Recommendations

<table>
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<tr>
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<th>SPECIES</th>
<th>RECOMMENDATIONS</th>
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8. REFERENCES

LITERATURE:

Danny B Draper and Peter A Richards.

‘Forest Trees of Australia’
Published 1952 - reprinted 2002.


WEB


Port Macquarie-Hastings Council 2011 ‘Port Macquarie-Hastings Local Environmental Plan 2011’

Ace of Spades – Tree Relocators
9. ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided to the consultant/ appraiser is assumed to be correct. Any titles and ownership to any property are assumed to be good and marketable. No responsibility is assumed for matter legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other government regulations.

3. Care has been taken to obtain all information from reliable sources. All data has been verified in so far as possible; however, the consultant/ appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.

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5. Loss or alteration of any part of this report invalidates the entire report.

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9. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural report or surveys. Unless expressed otherwise:

   a. Information contained in this report conveys only those items that were examined and reflects the condition of those items at the time of inspection.

   b. The inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.

12. APPENDICES

APPENDIX A - STRUCTURAL ROOT ZONE (SRZ)

The Structural Root Zone (SRZ) is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

\[
\text{SRZ radius} = (\text{DBH} \times 50)^{0.42} \times 0.64
\]

Where

\[
\text{DBH} = \text{trunk diameter at breast height in m, measured above the root buttress}
\]

NOTE: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m (see graph below).
APPENDIX B - TREE PROTECTION ZONE (TPZ)

Australian Standard 4970 – 2009 Protection of Trees During Construction states that the method of calculating the ideal TPZ is as follows:

TPZ radial distance (m) = DBH (m) x 12

It is also noted that the TPZ can be encroached by 10 – 20% where the remainder of the TPZ remains undisturbed due to site restrictions. This formula has been applied as a guideline.

Figure 1: TPZ & SRZ from ‘AS 4970 - Protection of Trees on Development Site