



PRELIMINARY ARBORIST REPORT

FOR

PROPOSED DEVELOPMENT OF

HILLSBOROUGH INDOOR STADIUM

WITHIN

LOTS

11 & 12 DP 879281 and 6, 7 & 8 DP 9594

HILLSBOROUGH ROAD,

HILLSBOROUGH

Prepared for: Basketball Association Newcastle Ltd
C/- Catalyst Project Consulting Pty Ltd

9 October 2020
Rev: 2
AEP Ref: 2078.02

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1.0 Introduction

A Development Application is being sought for a proposed new indoor facility and access located at 62 & 62a Hillsborough Road, Hillsborough and 109-117 Waratah Avenue, Charlestown NSW within lands identified as Lots 11 & 12 DP 879281, Hillsborough and Lots 6, 7 & 8 DP 9594, Charlestown. The new indoor facility, Hillsborough Indoor Stadium, comprises 10 full size courts, including show court seating for 4000 people. At the request of Catalyst Project Consulting Pty Ltd on behalf of Basketball Association Newcastle Ltd (the client), Anderson Environment & Planning (AEP) have undertaken necessary investigations to prepare an Arborist Assessment Report of the trees located in the along the proposed access and carpark facility.

This report and its recommendations are based upon a physical site inspection undertaken on 17 August 2020 by an Arborist and Senior Ecologist. Photographs included in this report (**Appendix A**) were taken at the time of the inspection on the same day.

2.0 Site Description and Locality

- **Location** – 62 & 62a Hillsborough Road, Hillsborough and 109-117 Waratah Avenue, Charlestown NSW.
- **Local Government Area (LGA)** – Lake Macquarie City Council LGA.
- **Title** – the site comprises Lots 11 & 12 DP 879281 and Lots 6, 7 & 8 DP 9594.
- **Subject Site** – The proposed development will cover a footprint of approximately 3.48ha.
- **Study Area** – includes the Subject Site and nearby surrounds where survey work was targeted, and comprises approx. 6.81ha.
- **Zoning** – As per LMCC LEP 2014, the site is zoned RE1 – ‘Public Recreation’ and E2 – ‘Environmental Conservation’.
- **Current Land Use** – The site contains existing open space managed as a public reserve, remnant native vegetation, Winding Creek and adjoining tributary and scattered trees. It is bounded by Newcastle Inner City Bypass to the west, Hillsborough Road and Hillsborough Public School to the north, Waratah Road to the east, and land zoned E2 – ‘Environmental Conservation’ to the south. A residential dwelling is located on the south eastern boundary of the site, with driveway access to Waratah Road.
- **Surrounding Land Use** – The surrounding area has a range of zonings. To the immediate west is Newcastle Inner City Bypass and lots zoned E2, RE1, RU4 – ‘Primary Production Small Lots’, and RE2 – ‘Private Recreation’. To the north is the junction of Hillsborough Road and Newcastle Inner City Bypass followed by lots zoned RE1 and R2 – ‘Low Density Residential’ and Hillsborough Public School. To the east is the suburb of Charlestown predominantly zoned R2 and patches of E3 – ‘Environmental Management’ and RE1



zoning. To the immediate south is vegetated land zoned E2, as well as lots zoned R2 and RE2.

3.0 Proposed Development

The proposed development is a new indoor facility, Hillsborough Indoor Stadium, comprising 10 full size basketball courts, including a show court with the capacity for 4000 people. There are two proposed accessways to the proposed development one is located to the north via Newcastle Inner City Bypass Link and the other access is proposed off Waratah Avenue South of Hillsborough Public School. Works are to primarily occur within existing clearings however, approximately 0.67ha of remnant native vegetation is expected to be removed.

This report has reviewed the proposed access off Hillsborough Road, as detailed design plans have not been undertaken a preliminary assessment has been undertaken to guide the design.

Figure 1 depicts the land subject to the development assessment and **Figure 2** depicts the proposed development.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Site Boundary
-  Cadastre



AEP

Title: Figure 1 - Location Map

Date: Feb 2020




Location: Hillsborough Road, Hillsborough

Client: Catalyst Project Consulting

AEP Ref: 2078

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Lot Boundary
-  Road area
-  Trees of interest



AEP

Tilte: Figure 2 - Proposed Development

Date: Aug 2020

Location: Hillsborough Road, Hillsborough

Client: Catalyst Project Consulting

AEP Ref: 2078.02

4.0 Methodology

The site survey was undertaken on the Subject Site by David Cummings (AQF 5 Arborist). Trees surveyed included all trees provided on the survey plan shown in **(Figure 2)**. Each tree was distinguished by the reference number provided on the survey plans. Trees were identified to species based on guidance from regional identification guides (Fairley and Moore 1989, Robinson 2003), and descriptions and records provided by the Royal Botanic Gardens (Plantnet 2016).

4.1 Visual Tree Assessment

A visual tree assessment to evaluate the health and condition of these trees in relation to the impacts of the proposed development was undertaken from ground level following the methodology described by Mattheck and Breloer (1994). Tree height was estimated following the guidance outlined in the Private Native Forestry Code of Practice (DECC 2007). The DBH (Diameter at Breast Height) and Diameter Above Buttress (DAB) was determine using a DBH tape and methods of calculation outlined in AS 4970-2009 *Protection of trees on development Sites* (AS 4970 – 2009) (Standards Australia 2009).

4.2 SULE

The SULE method (Safe Useful Life Expectancy) estimates the suitability of the tree in the urban landscape based on the species and age of the subject tree (Barrell 1996). The following ranges have been allocated to each tree:

- Greater than 40 years (Long);
- Between 15 and 40 years (Moderate);
- Between 5 and 15 years (Short);
- Dead, dying, suppressed, defective or damaged (Remove); and
- Less than 5m in height or 15years of age (Young or small tree).

4.3 Tree Retention Value

To determine tree retention value a Landscape Significance Rating (LSR) was assigned to each tree. The LSR value provides consideration of the trees amenity, environmental and heritage values (See Appendix 4). Trees are then assigned one of the following LSR categories:

- Significant (1);
- Very High (2);
- High (3);
- Moderate (4);
- Low (5);
- Very Low (6); and
- Insignificant 7).

Once the landscape significance value has been determined the following assessment matrix that utilises estimated life expectancy and landscape significance (**Table 1**) was applied to each tree.

4.4 Limitations

This report utilises a rapid assessment of tree health and condition to inform retention value. Should a detailed assessment of tree structural health and condition be required a tree risk assessment report should be commissioned.

This assessment of tree health and condition is based on non-destructive visual observations from ground level. Thus, it is not possible to identify all structural faults at high levels in the tree, internal structural faults or within the root system. Should a detailed assessment for structural faults be required a tree risk assessment report should be commissioned.

Weather conditions such as extreme wind, storm activity, lightning as well as other events or disturbances independent of the proposed activities are unpredictable. Unforeseeable damage to trees may occur as a result of unpredictable or unplanned weather events or disturbances.

Tree identifications are based on identifying features (fruit, inflorescence, etc.) found and made at ground level from within the subject site during August.

Survey of trees on adjacent properties was limited to assessment made from the subject site. Subsequently measurements were estimated, and species identification may vary following closer inspection.

Impact assessment was based on very limited design detail confined to identification of the proposal footprint at the time of preparation of this report.

Table 1: Tree Condition Assessment matrix adopted from Morton (2006).

	Landscape significance rating						
Estimated Life Expectancy	1	2	3	4	5	6	7
Greater than 40 Years	High						
15 to 40 Years			Moderate				
5 to 15 Years				Low			
Less than 5 Years					Very low		
Dead or Hazardous							

5.0 Tree Assessment

A total of twenty-three (23) trees were assessed with observations and management recommendations for all trees which are located within close proximity to the proposed development (**Table 2**). Tree assessments were undertaken using the guidelines of *Australian Standards AS 4970 – 2009* to ensure the safe retention of trees on development sites.

5.1 Results

All assessed trees have been assigned a unique number and identified in **Figures 3 to 6**. Of the 23 trees assessed only six were located within the Subject Site, and the remainder (17) were located within the school grounds. Trees were in general native or locally indigenous and mature plantings.







Encroachment in the TPZ of 12 trees to be retained and subsequently may be potentially impacted by this proposal. The amount of encroachment is predicted to potentially exceed 10% of 10 of these trees and their viability will need to be demonstrated during construction works for them to be retained. This is likely to require a combination of further root investigations, consideration of minor modifications to the alignment, implementation of tree sensitive construction measures, and soft engineering methods such as hand digging.

Table 2: Tree Condition and Health Retention Status

Tree ID	Scientific Name	Common Name	DBH (m)	DAB (m)	Canopy Spread Average (m)	Height (m)	SULE	Age Class	Condition	Retention Value	TPZ (m)	SRZ (m)	Encroachment into TPZ (%)	Potential Impact (Y / N)	Comments
1	<i>Eucalyptus botryoides</i>	Bangalay	0.5	0.5	12	15	2a	YM	Good	High	6	2.5	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the Boundary. DBH record it just below junction of three main leaders at approximately 0.8 m.
2	<i>Cinnamomum camphora</i>	Camphor laurel	0.28	0.85	6	10	3a	M	Good to Fair	Low	3.4	3.1	50	Y	<ul style="list-style-type: none"> Located 1 m from edge of the school road.
3	<i>Callistemon sp.</i>	Bottlebrush	0.1	0.12	2	4	2a	M	Good	Low	2	1.5	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds Assessed from the Boundary
4	<i>Eucalyptus botryoides</i>	Bangalay	0.5	0.55	8	15	3a	M	Good	Moderate	6	2.6	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
5	<i>Eucalyptus botryoides</i>	Bangalay	0.65	0.75	20	17	2a	M	Good	High	7.8	2.9	0	N	<ul style="list-style-type: none"> Located 3m inside the school grounds. Assessed from the boundary.
6	<i>Glochidion ferdinandi</i>	Cheese Tree	0.14	0.16	5	4	2a	J	Good	Low	2	1.5	0	N	<ul style="list-style-type: none"> Located on the boundary with the adjacent school.
7	<i>Eucalyptus botryoides</i>	Bangalay	0.15*	0.8	3	6	4a	M	Fair	Low	9.6	3	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary. Has been previously cut down and remining current growth is epicormic regrowth only. Note TPZ was calculated based on a DAB as this was considered the most conservative approach.
8	<i>Eucalyptus botryoides</i>	Bangalay	1.0	1.2	20	20	2a	M	Fair	High	12	3.6	1	Y	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
9	<i>Eucalyptus botryoides</i>	Bangalay	0.55	0.6	10	20	3a	M	Good	Moderate	6.6	2.7	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
10	<i>Eucalyptus botryoides</i>	Bangalay	1.2	1.3	30	20	2a	YM	Good	High	14.4	3.7	36	Y	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
11	<i>Eucalyptus botryoides</i>	Bangalay	0.55	0.6	20	18	2a	YM	Good	High	6.6	2.7	12	Y	<ul style="list-style-type: none"> Located 3.5m inside school grounds. Assessed from the boundary.
12	<i>Cinnamomum camphora</i>	Camphor laurel	0.65	0.75	15	18	2a	M	Fair	Low	7.8	2.9	47	Y	<ul style="list-style-type: none"> Located 0.5m inside school grounds. Assessed from the boundary. DBH recorded at 1m below the division of the two main leaders.
13	<i>Eucalyptus botryoides</i>	Bangalay	1	1.1	20	19	2a	YM	Excellent	High	12	3.4	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
14	<i>Angophora costata</i>	Smooth- barked Apple	0.6	0.7	20	18	2a	SM	Excellent	High	7.2	2.8	0	N	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
15	<i>Eucalyptus microcorys</i>	Tallowwood	0.6	0.7	20	15	2a	M	Fair	High	7.2	2.8	19	Y	<ul style="list-style-type: none"> Located 3.5m inside school grounds. Assessed from the boundary.
16	<i>Pittosporum undulatum</i>	Native Daphane	0.17	0.2	4	4	2a	SM	Good	Low	2	1.7	50	Y	<ul style="list-style-type: none"> Located within Subject Site.
17	<i>Eucalyptus grandis</i>	Flooded Gum	0.6	0.7	15	17	2a	SM	Excellent	High	7.2	2.8	10	Y	<ul style="list-style-type: none"> Located 3m inside school grounds. Assessed from the boundary.
18	<i>Eucalyptus grandis</i>	Flooded Gum	0.19	0.2	4	12	5b	SM	Excellent	Moderate	2.3	1.7	13	Y	<ul style="list-style-type: none"> Located within Subject Site.
19	<i>Eucalyptus grandis</i>	Flooded Gum	0.21	0.23	5	12	2a	M	Fair	Moderate	2.5	1.8	40	Y	<ul style="list-style-type: none"> Located within Subject Site.
20	<i>Eucalyptus grandis</i>	Flooded Gum	0.2	0.23	5	12	5b	YM	Good	Moderate	2.4	1.8	69	Y	<ul style="list-style-type: none"> Located within Subject Site.
21	<i>Eucalyptus grandis</i>	Flooded Gum	0.25	0.27	6	12	2a	YM	Good	Moderate	3	1.9	50*	Y	<ul style="list-style-type: none"> Located within Subject Site.
22	<i>Grevillea sp.</i>	Grevillea	0.35	0.4	4	5	2a	YM	Excellent	Low	4.2	2.3	0	N	<ul style="list-style-type: none"> Located 4m inside school grounds. Assessed from the boundary.
23	<i>Leptospermum sp</i>	Tea tree	0.13	0.3	5	4	3a	YM	Good	Low	2	2	0	N	<ul style="list-style-type: none"> Located 2m inside school grounds. Assessed from the boundary.

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Legend

-  Site Boundary
-  Proposed Road
-  Tree Protection Zone (TPZ)
-  Tree with High retention value
-  Tree with Moderate retention value
-  Tree with Low retention value



0 50
metres

Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 3 - Tree Protection zones

Date: Oct 2020








Location: Hillsborough Rd, Hillsborough

Client: Catalyst Project Consulting

AEP Ref: 2078.02

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Legend

-  Site Boundary
-  Proposed Road
-  Tree Protection Zone (TPZ)
-  Structural Root Zone (SRZ)
-  Tree with High retention value
-  Tree with moderate retention value
-  Tree with Low retention value



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 3a - Tree Protection zones (North)

Date: Oct 2020

Location: Hillsborough Rd, Hillsborough

Client: Catalyst Project Consulting

AEP Ref: 2078.02


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Legend


 Site Boundary


 Proposed Road

 Tree Protection Zone (TPZ)

 Structural Root Zone (SRZ)

 Tree with High retention value

 Tree with Moderate retention value

 Tree with Low retention value



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 3b - Tree Protection zones (Middle)

Date: Oct 2020








Location: Hillsborough Rd, Hillsborough

Client: Catalyst Project Consulting

AEP Ref: 2078.02

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Legend

-  Site Boundary
-  Proposed Road
-  TPZ of tree to be removed
-  Structural Root Zone (SRZ)
-  Tree with High retention value
-  Tree with Moderate retention value
-  Tree with Low retention value



Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 3c - Tree Protection zones (South)

Date: Oct 2020

Location: Hillsborough Rd, Hillsborough

Client: Catalyst Project Consulting

AEP Ref: 2078.02

6.0 Recommendations

- It is recommended that if design cannot be modified to avoid the SRZ of Trees 2, 16, 18-21 on the subject site and Tree 12 just inside the adjacent school grounds, they should be considered for removal if the encroachment into the SRZ of these trees cannot be avoided.
 - Tree 2 and 12 are *Cinnamomum camphora* trees, which are considered undesirable trees and environmental weeds in the LGA. These trees can and should be replaced with suitable and more desirable native plantings post construction works. Given this, these trees should not be considered a design constraint.
 - Tree 16 is a low retention value tree and should not be considered a design constraint. Although given its small size it is likely that the tree can safely be retained if design can avoid disturbances within the trees SRZ.
 - Trees 18-21 are moderate retention value trees; they are also semi mature and can be replaced by semi mature plantings following construction. Given this, they should not be considered design constraints, where they can not be avoided or impacts adequately minimised.
- Major encroachment (>10%) into the TPZ of Trees 10, 11 and 15 in the adjacent school grounds is predicted. These trees are of high retention value and all attempts possible should be made to ensure they remain viable and are retained. This should include:
 - Where required, minor modification at the detailed designs stage to avoid the SRZ of these trees.
 - Where feasible opportunities are available reduce encroachment into the TPZ of these trees.
 - Where encroachment cannot be avoided further root mapping investigations should be undertaken to ensure construction works do not impact on the viability of these trees and suitable tree sensitive construction design (pier and beam, suspended slabs screw piling etc) and soft engineering practises (e.g. hand digging and suction removal of sediments) are adopted in these areas.
 - All works that encroach into TPZ of trees to be retained should be undertaken in accordance with a Tree Protection Plan prepared by an AQF 5 Arborist and supervised by the project arborist.
- A Detailed Arborist Impact Assessment supported by a root mapping investigation and including a Tree Protection Plan should be prepared by an AQF5 Arborist. This report should be prepared following completion of the detailed design and proposed construction methodology, prior to commencement of construction.

7.0 Conclusion

Preliminary assessment against the proposal footprint indicates that up to seven trees (six of which are on the subject site) of low to moderate retention value may require removal if minor design changes cannot avoid impacts within the trees SRZ, which are likely to affect the viability of these trees. The works may also result in some major encroachment into the TPZ of three high retention value trees inside the adjacent school grounds, with the adoption of minimising impacts through identification and avoidance of structural roots during detailed design works, soft engineering practises during construction, and monitoring of tree health post construction it is expected that these trees can potentially be retained.

Before commencement of construction at the site a detailed impact assessment supported by root mapping investigations including tree protection plan should be prepared.

We trust this meets your requirements. Should you require further details or clarification, please do not hesitate to contact the authors of this report (0431249360).

Yours faithfully,

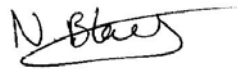
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Appendix A – Site Photos



Plate 1 – View along western of boundary fence of the school facing south.



Plate 2 – View of trees along the southern boundary of the school facing east.