Ecological Assessment

New High School for Leppington and Denham Court

Department of Education

11 April 2025

ACKNOWLEDGEMENT OF COUNTRY

The Board and employees of Water Technology acknowledge and respect the Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of Country throughout Australia. We specifically acknowledge the Traditional Custodians of the land on which our offices reside and where we undertake our work.

We respect the knowledge, skills and lived experiences of Aboriginal and Torres Strait Islander Peoples, who we continue to learn from and collaborate with. We also extend our respect to all First Nations Peoples, their cultures and to their Elders, past and present.

Artwork by Maurice Goolagong 2023. This piece was commissioned by Water Technology and visualises the important connections we have to water, and the cultural significance of journeys taken by traditional custodians of our land to meeting places, where communities connect with each other around waterways.

The symbolism in the artwork includes:

- *Seven circles representing each of the States and Territories in Australia where we do our work*
- *Blue dots between each circle representing the waterways that connect us*
- *The animals that rely on healthy waterways for their home*
- *Black and white dots representing all the different communities that we visit in our work*

Hands that are for the people we help on our journey

School Name	New High School for Leppington and Denham Court	**Consultancy Name**	Water Technology
School ID Number	**3846**	**Report Status**	Draft
School Address	128-134 Rickard Road, Leppington, NSW 2179	**Report Date**	11 April 2025
School Region	South West	**Contract Number**	DDWO04304/22

Document Status

Version	Doc type	Reviewed by	Approved by	Date issued
1.0	Draft	M. Aberton	M. Aberton	21 November 2024
1.1	Draft 2	C. Radford	M. Aberton	6 December 2024
3.0	Final	C. Radford	M. Aberton	15 January 2025
4.0	Final	J. Kaye	J. Kaye	24 January 2025
5.1	Final	M. Aberton	M. Aberton	3 February 2025
6.2	Final	M. Aberton	M. Aberton	11 April 2025

Project Details

Project Name	New High School for Leppington and Denham Court
Client	Department of Education
Water Technology Project Manager	Caroline Khoo
Water Technology Project Director	Steven Molino
Authors	Cameron Radford
Document Number	REF EA-Leppington HS – WT - DDWO04304/22-V6.2

NSW GOVERNMENT Education

COPYRIGHT

Suite 3, Level 1, 20 Wentworth Street
Parramatta NSW 2150
Telephone (02) 8080 7346
ACN 093 377 283
ABN 60 093 377 283

Certified System Quality ISO 9001 SAI GLOBAL
Certified System Environment ISO 14001 SAI GLOBAL
Certified System OHS ISO 45001 SAI GLOBAL

CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND DEFINITIONS

Acronym	Definition
BC Act	*Biodiversity Conservation Act 2016*
BV	Biodiversity Values
DCP	Development Control Plan
DD	Due Diligence
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matter of National Environmental Significance
PCT	Plant Community Type
EA	Ecological Assessment
SINSW	School Infrastructure NSW
DoE	Department of Education
TEC	Threatened Ecological Community
WM Act	*Water Management Act 2000*

1 EXECUTIVE SUMMARY

An Ecological Assessment has been conducted to identify potential constraints that may impede the future school infrastructure for the New High School for Leppington and Denham Court (the site). This assessment has been prepared to support a Review of Environmental Factors (REF) for an activity that requires approval under Part 5 of the EP&A Act, mitigating any risks during the delivery of the new school. The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP. This report documents the findings of the ecological assessment, identifying potential ecological constraints relevant to the proposed development under the NSW *Biodiversity Conservation Act 2016, Commonwealth Environment Protection and Biodiversity Conservation Act 1999,* and the NSW *Fisheries Management Act 1994*.

The site encompasses an area of approximately 4.1 ha. The northern portion of the site is currently used for residential purposes. The southern portion of the site is used for agricultural purposes, with multiple greenhouses and an existing pond on the property. No Biodiversity Values areas were mapped, however Plant Community Type 3320 Cumberland Shale Plains Woodland was mapped and is occurring on the site. The Grey-headed Flying-fox, Swift Parrot, Large Bent-winged Bat and Cumberland Plain Land Snail had a moderate likelihood of occurrence, but no threatened species were found on site. The site has no Key Fish habitat. 113 trees will require removal to accommodate the new high school, while 22 trees will be retained.

The Ecological Assessment concluded that there will be no significant impacts on the environment. As there were no threatened species or signs of threatened species found, a Test of Significance was not required. Consequently, no referral to the Australian Minister for the Environment under the *Environment Protection and Biodiversity Conservation Act 1999 is* required. The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an Environmental Impact Statement to be prepared and approval to be sought from the Minister for Planning under the *Environment Protection and Biodiversity Conservation Act 1999.*

As the site is within the Western Sydney Parklands growth area and it is biodiversity certified, all biodiversity values have been accounted for and no further assessments regarding biodiversity are required. The only requirements are that when vegetation is being removed that may provide habitat for native fauna, that construction management be used to rescue/relocate fauna.

2 INTRODUCTION

This Ecological Assessment has been prepared to support a Review of Environmental Factors (REF) for an activity that requires approval under Part 5 of the EP&A Act for the Department of Education (DoE). The activity is for a new high school for Leppington and Denham Court (the activity). The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

The proposed activity is for the construction of a new high school located at 128-134 Rickard Road, Leppington, NSW, 2179 (the site).

The purpose of this report is to assess potential biodiversity impacts for the proposed new High School for Leppington and Denham Court, located on biodiversity certified land.

2.1 Determination

- The proposed activity can proceed subject to mitigation measures and/or conditions relayed in this EA.
- The activity is unlikely to be classed as a controlled action under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) so no referral is required.

2.2 Statement of Significance

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed development, it was determined that:

- The site is part of the Sydney South West Growth Area biodiversity certification (see Figure 2-1) and offsets have been made at the time the growth centre was released;
- The extent and nature of potential impacts are low and will not have significant adverse effects on the locality, community, and the environment; and
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal effect on the locality, community.

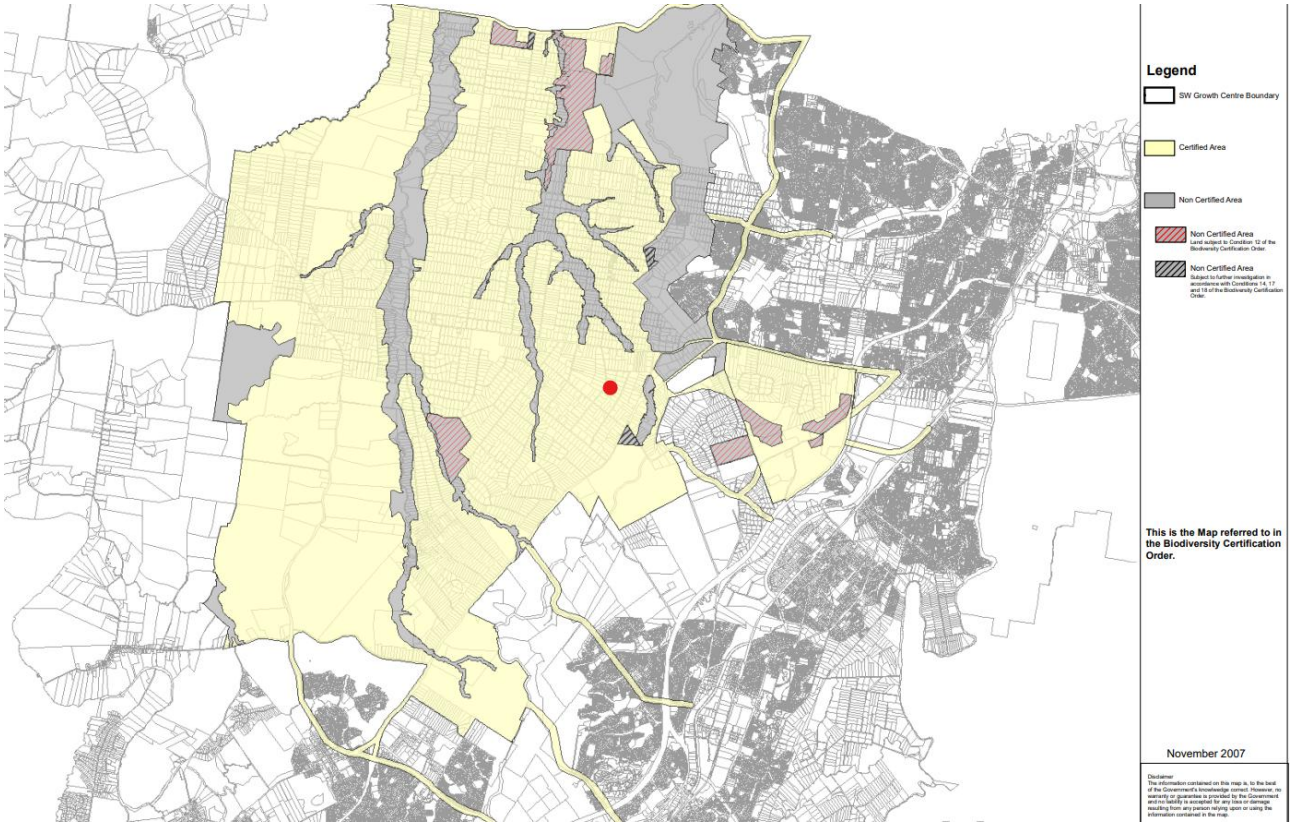


Figure 2-1 Approximate site location within South West Growth Area (biodiversity certified)

3 PROJECT JUSTIFICATION

The proposed New High School for Leppington and Denham Court is part of the NSW Government's plan to rebuild public education in 2024-25. The new school will ensure growing communities get access to public education.

3.1 Options

Option 1 – Do Nothing: The proposed New High School development does not occur and the local community has limited access to public education.

Option 2 – Implement Project Proposal: (Preferred option) Proposed New High School for Leppington and Denham Court enhanced by providing more educational facilities for the local community. By providing enhanced services and spaces, the new proposed New High School for Leppington and Denham Court aims to meet the current and future needs of the community.

3.2 Consideration of Ecologically Sustainable Development

The proposal has been considered against the principles of ecologically sustainable development (ESD) (refer to Table 3-1).

Table 3-1 Consideration of principles of ecologically sustainable development (ESD)

ESD Principle	Consideration in EA
Precautionary principle	The proposal will not result in serious or irreversible environmental damage and there is no scientific uncertainty relating to the proposal.
Intergenerational equity	The proposal will help to meet the needs of future generations by providing education facilities, which can be used for future generations.
Conservation of biological diversity and ecological integrity	The proposal will not significantly impact on biological diversity or impact ecological integrity.
Improved valuation, pricing and incentive mechanisms	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community, environment and with respect to financial cost.

4 SITE DESCRIPTION

4.1 Site Location and Background

The site is known as 128-134 Rickard Road, Leppington, NSW, 2179 and is legally described as Lots A and B in Deposited Plan 411211. The site is located on the eastern side of Rickard Road and is approximately 4.1ha in area. The site is located immediately south of the existing Leppington Public School at 144 Rickard Road and is approximately 700m south of Leppington Train Station. Figure 4-1 below provides an aerial image of the site.

The northern portion of the site is currently used for residential purposes. The southern portion of the site is used for agricultural purposes, with multiple greenhouses and an existing pond on the property.

Figure 4-1 Aerial image of site (source: Near Map)

5 PROPOSED ACTIVITY DESCRIPTION

The proposed activity is for a new high school for Leppington and Denham Court. The new high school will accommodate up to 1,000 students across 3 new buildings that will comprise 48 permanent teaching spaces (PTS), 3 support teaching spaces (STS), 9 specialist labs/workshops/kitchens and a hall. Buildings A, B and C will wrap the western and southern boundaries of the site, with the hall being located in south-east corner. The activity also includes the construction of a sports field in the centre of the site and 3 x multipurpose courts along the northern boundary. The proposed scope of works is illustrated in Figure 5-1 below.

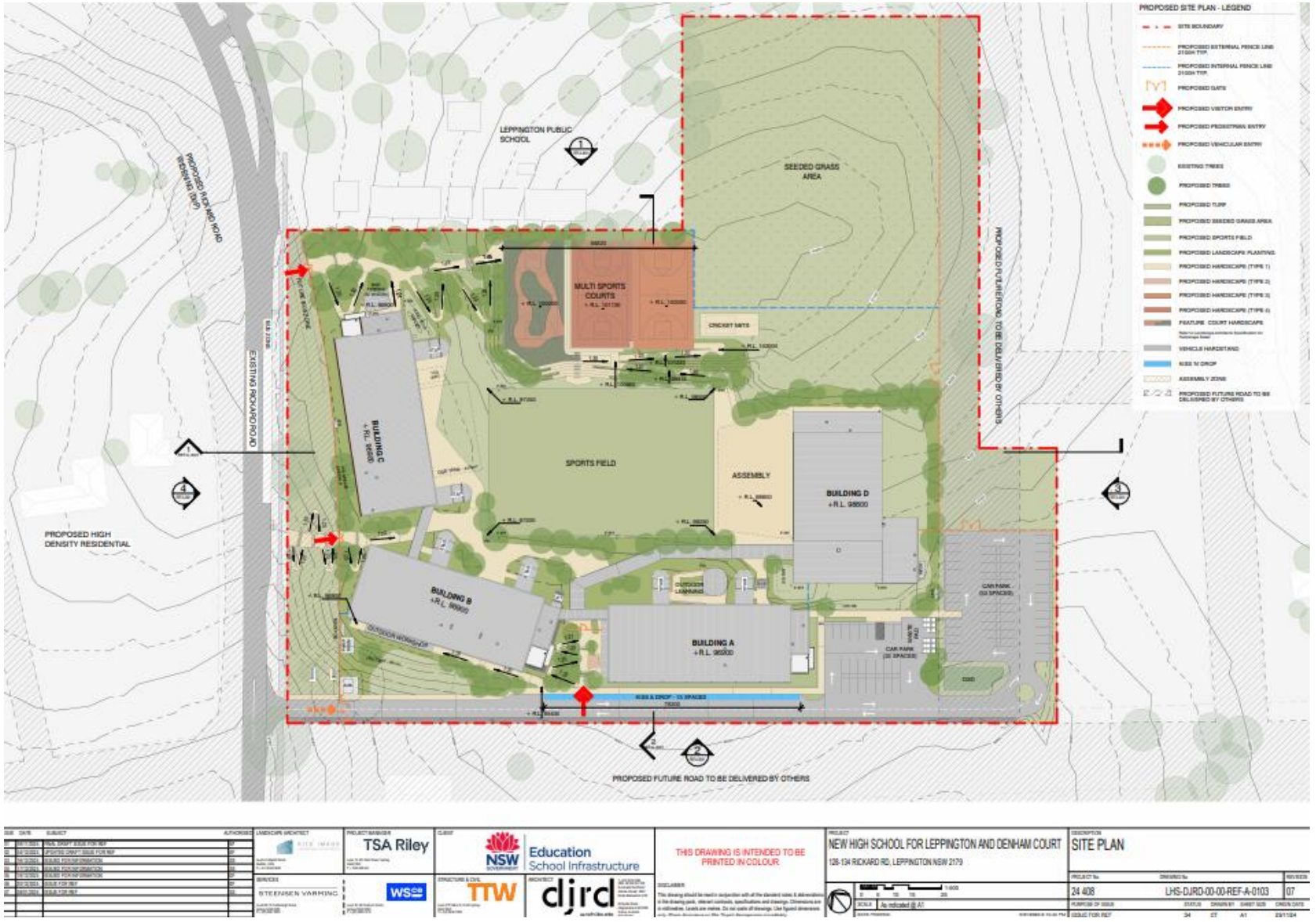


Figure 5-1 New Leppington High School (source: djrd)

6 RELEVANT LEGISLATION

Legislation and policy relevant to the biodiversity component of works within the subject site are outlined below:

6.1 Environmental Planning, Assessment Act 1979 and Local Government Act 1993

Planning and development within NSW is regulated by the Environmental Planning & Assessment Act 1979 (EP&A Act).

The proposed works are permitted without consent under the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP). Where works do not require development consent but require approval of a Government organisation under any legislation, then they are defined as an activity under Part 5 of the EP&A Act. Division 5.1 and Section 5.7 of the EP&A Act requires any such Government body to determine whether the impacts of the activity are likely to be significant. An EA contributes to that determination.

An EA is prepared, to inform a Review of Environmental Factors, to meet the requirements of Clause 171 of the *Environmental Planning and Assessment Regulation 2023*.

6.1.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) provides for the efficient provision of public infrastructure in NSW. The aim of this Policy is to facilitate the effective delivery of infrastructure across the State. Under Part 2.1, Division 27, Section 2.170, the SEPP states with regards to school infrastructure:

(2) Development for the purposes of health services facilities, early education and care facilities and schools is permitted without development consent if all of the following apply—

(a) the development will only be used temporarily in relation to persons displaced as a result of a natural disaster,

(b) the development is carried out by or on behalf of a public authority,

(c) the development is carried out within 5 years of the natural disaster occurring,

(d) the development is carried out on land that—

(i) is supplied with water and electricity, and

(ii) is provided with sewerage and drainage services, and

(iii) has access to communal amenities,

(e) each building is—

(i) erected in a way that does not adversely affect the amenity of the land or the health and safety of persons, including by mitigating the risk of fire, and

(ii) removed within 5 years of being erected or as soon as possible after a permanent building is erected to replace the temporary building, whichever occurs first.

6.2 State Environmental Planning Policy (Precincts – Western Parkland City) 2021

The Precincts – Western Parkland City SEPP includes the former Growth Centres SEPP, which is a planning tool created under the plan making regulations in the EP&A Act. Its purpose is to establish the zoning for land use and controls for development in all land located in the Growth Centres. Consent authorities, like local councils, have to follow the rules and consider the objectives set by the SEPP when making decisions regarding land use in the Growth Centres.

To ensure the long-term protection of this land, the NSW government and a local council are designated as acquisition authorities.

The site is Biodiversity Certified Land within the South West Growth Centre (Figure 2-1). Therefore, the proposed activity is consistent with the relevant biodiversity measure conferred by the biodiversity certification.

Moreover, the Growth Centres SEPP mandates that consent authorities must consider the intended future use of land as described by the Structure Plans and Explanatory Notes when evaluating specific development applications within the Growth Centres. This is to ensure that development proposals made in advance of precinct planning do not impact the future delivery of the Growth Centres.

6.3 Water Management Act 2000

The Water Management Act 2000 (WM Act) provides for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations. The WM Act defines principles of water management, sets out water licensing laws and environmental water provisions.

Section 91 (2) states that: *waterfront land means—…where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance.*

This project is being carried out further than 40 metres so is exempt from requiring a Controlled Activity Approval in accordance with the WM Act.

6.4 Coastal Management Act 2016

The objects of Coastal Management Act 2016 (CM Act) are to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State. The site is not located within the Coastal Use Area or Coastal Environment Area as mapped in the Resilience and Hazards SEPP under the CM Act. Therefore, a CM Act is not considered necessary for the proposed works.

6.5 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act) includes the Biodiversity Offsets Scheme (BOS) that governs how biodiversity offsets will be used to ensure they offset the loss due to development and deliver conservation outcomes. The Act and Regulations also govern the Biodiversity Assessment Method (BAM) as a scientific method that assesses biodiversity losses from impacts at development sites and gains from conserving land at stewardship sites.

Public authorities seeking to undertake an activity under Part 5 of the EP&A Act can voluntarily opt-in to the BOS and BAM scheme, or alternatively can elect to undertake an Assessment of Significance and proceed with a Part 5 approval. It will be required to:

- take serious and irreversible impacts into consideration; and
- determine if there are any additional and appropriate measures that will minimise the impact if the activity is to be carried out or approved.
- The potential ecological impacts of the proposal are discussed in Section 9 of this EA.

6.6 Fisheries Management Act 1994

The provisions of the Fisheries Management Act 1994 relating to project development and approval processes operate similarly to the BC Act. The Act identifies threatened aquatic species, populations and ecological communities, as well as Key Fish Habitat.

Significant impacts trigger the need for a species impact statement for Part 4 and Part 5 projects. The potential ecological impacts of the proposal are discussed in Section 9 of this EA report. It is concluded that the proposal is not likely to have a significant impact on any threatened aquatic species, populations or communities, or Key Fish Habitat.

6.7 Environment Protection and Biodiversity Conservation Act 1999

Under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), Commonwealth approval is required for certain actions. Actions which have or may have or are likely to have a significant impact on Matters of National Environmental Significance (MNES). MNES include nationally threatened species or endangered ecological communities. Under the EPBC Act an assessment of the impact of a proposal on a MNES must be undertaken to determine whether there is likely to be a significant impact. If the assessment concludes there is a significant impact, then it will become a controlled action under the EPBC Act and the proposal must be referred to the Commonwealth. Approval from the relevant Federal Minister is also required for any actions that may have a significant impact on matters of National Environmental Significance, except in circumstances which are set out in the EPBC Act.

Approval from the Commonwealth is in addition to any approvals under NSW legislation.

The potential ecological impacts of the proposal are discussed in Section 9 of this EA. It is concluded that the proposal is not likely to have a significant impact on any EPBC listed threatened species, populations or communities nor is it likely to impact on any MNES and so does not require referral to the Commonwealth under the EPBC Act.

6.8 Camden Growth Centre Precincts Development Control Plan 2023

This DCP applies to Precincts, or parts of Precincts, within Camden Local Government Area where precinct planning has been completed, as listed below:

- The Leppington North Precinct, within Camden Local Government Area, as shown in the Land Application Map in Schedule One.

The Leppington North Precinct includes the Leppington Major Centre Vision and Planning Principles which includes:

- A civic precinct north of Leppington Station with education, cultural, recreation and human services for residents of the Growth Centre, in a vibrant mixed use area that connects Bringelly Road, the train station, Rickard Road and Scalabrini Creek.

7 EXISTING ENVIRONMENT

7.1 Existing Environment

The site encompasses an area of approximately 4.1 ha. The northern portion of the site is currently used for residential purposes. The southern portion of the site is used for agricultural purposes, with multiple greenhouses and an existing pond on the property.

7.1.1 Desktop search

Prior to undertaking the ecological field survey, desktop searches were conducted to provide a context of the surrounding environment.

7.1.2 Biodiversity Values

The Biodiversity Values Map is prepared by the Department of Planning and Environment under Part 7 of the BC Act. It identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. The map forms part of the Biodiversity Offsets Scheme threshold, which is one of the triggers for determining whether the Biodiversity Offset Scheme applies to a clearing or development proposal.

As the land is biodiversity certified, all biodiversity values on the site have been offset.

The subject Site A does not contain any areas mapped as possessing Biodiversity Values (Figure 7-1).

7.1.3 Vegetation communities

A review of the vegetation mapping databases using the SEED portal (NSW Government's central resource for Sharing and Enabling Environmental Data in NSW) was undertaken to identify Plant Community Types (PCTs) present within the area. As indicated in Figure 7-2, one PCT was mapped as being present within the project site:

- PCT 3320 - Cumberland Shale Plains Woodland. This PCT is a part fit to the critically endangered community of the Cumberland Plain Woodland in the Sydney Bioregion. It is recognised as an endangered ecological community under the NSW Biodiversity Conservation Act of 2016, which means that it is legally protected. The type of woodland that is characterised by a mix of eucalyptus trees, shrubs, and grasses. It is also part fit to the endangered community of the Shale Gravel Transition Forest in the Sydney Basin Bioregion. This type of forest is typically found in areas where there is a transition between shale and gravel substrates, and is characterised by a mix of eucalyptus trees, shrubs, and grasses. This PCT under the EPBC Act 1999 is part fit to the critically endangered Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. These woodland types are found in areas with shallow, nutrient-poor soils that are derived from shale and shale-gravel substrates.

While the PCT mapping suggests that there is substantial endemic vegetation on the site, historical imagery of the site suggests that the subject site has been previously cleared of endemic vegetation and any vegetation now present is either regrowth or planted. The notion that the canopy trees present within the site have been regrown and or replanted is supported by Figure 7-2, the earliest historical imagery available from NSW Spatial Services for the site. It is from 1965 and pre-dates the residential properties on the site. It shows many of the currently vegetated areas within the subject site were originally clear patches. (Figure 7-3).

7.1.4 Threatened Species

A search of the DCCEEW BioNet Atlas revealed 208 sightings of 18 listed threatened species previously recorded within 10 km of the site. Analysis of the Protected Matters Search Tool indicates that there are 11 listed threatened ecological communities, 59 listed threatened species, and 17 listed migratory species

previously recorded within 10 km of the site. No World Heritage Properties, National Heritage Places, Protected Marine Areas, nor Wetlands of international importance occurred within 10 km of the site (Appendix A).

The DCCEEW BioNet Atlas mapping identified four endangered or threatened species close within proximity to the site (Figure 7-4). This includes the Swift Parrot (*Lathamus discolor*) which is listed as Endangered under the BC Act and EPBC Act, Grey-headed Flying Fox (*Pteropus poliocephalus*) which is listed Vulnerable under both the EPBC Act and BC Act, Large Bent-winged Bat (*Miniopterus orianae oceanensis*) which is listed as Vulnerable under the BC Act, and Cumberland Plain Land Snail (*Meridolum corneovirens*) which is listed as Endangered under the BC Act. However, there are only a low number of previous sightings of these species in proximity to the subject site, and as such these species' likelihood of occurrence is considered moderate to low. Grey-headed Flying-fox is considered most likely to use the site for foraging purposes. Several other threatened species have previously been recorded within 10 km of the subject site; however, these are not expected to be present within the immediate development site due to a lack of suitable habitat. (Appendix B).

The subject site was not mapped as containing any Key Fish Habitat, nor is it in proximity to significant waterways or waterfront land, thus no further provisions within the FM Act and WM Act are not required for the proposed development.

Due to the cryptic and nocturnal nature of many species, the fauna assessment primarily evaluated the site's potential as habitat. The precautionary principle was adopted, assuming the presence of threatened species if suitable habitat exists.

Figure *7-1* **Biodiversity Values mapping. Site A has been selected for the new school**

Figure 7-2 Plant Community Types – PCT 3320. Site A is the location of the new school

Figure 7-3 Historic Photograph 1965

Figure 7-4 Threatened species map. Site A is the location of the new school.

7.2 Site Visit

An assessment of the site was undertaken on 4th December 2023 by ecologist Caroline Weller. The survey comprised a walkthrough of all the accessible vegetated areas of the site. Flora species were surveyed by stratum, identified, and recorded. The vegetation communities observed were later cross checked with those already mapped for the property.

Considering the threatened Swift Parrot, Grey-headed Flying-fox, Large Bent-winged Bat and the Cumberland Plain Land Snail was previously recorded within close proximity to the site, a dedicated survey targeting their potential habitat was conducted. This includes looking amongst mulched patches for the Cumberland Plain Land Snail, identifying any feed trees or foraging flowering plants for the Grey-headed Flying-fox to utilise. Caves or cave-like areas within buildings were assessed for the Large Bent-winged Bat and flowering trees and plants that could be used for foraging were assessed for the Swift Parrot. This was considered to be a habitat assessment.

A generalised fauna survey was also conducted to include searches for proxy evidence of fauna activity such as tree scratches, scats, and bird nests. As many faunal species likely to occur are cryptic and/or nocturnal, they are unlikely to be physically detected during a short daylight survey. The fauna assessment is, therefore, largely an assessment of the potential of the site as habitat for various fauna species. Apart from species recorded from the recent site survey, there is no certainty as to the presence or absence of the species discussed. Therefore, it is important to adopt the precautionary principle such that it is assumed that any threatened species are likely to occur at the site if suitable habitat exists.

On Wednesday 10th April 2024, Water Tech ecologists Dr Michael Aberton and Caroline Weller conducted another site assessment after the proposed site overlay plans (Figure 5-1) were provided by SINSW. They checked the trees that were on or near the development areas that marked buildings or the sports field that might be cleared, and they looked for habitat and compared it to the retention value from the preliminary arborist report (Allied Trees Consulting Feb 2024). The aim of the second site assessment was to find out if there is any way to reduce or avoid the harm to biodiversity habitat from the proposed development.

7.2.1 Results from site visit 1

The site was largely cleared of native species and consisted mainly of exotic grasses, infrastructure and small patches or isolated examples of native and exotic trees. Native vegetation was relatively sparse, but that which was present on site was largely dominated by canopy species including Forest Red Gum (*Eucalyptus tereticornis)* and Grey Box (*Eucalyptus moluccana).* A large, canopied area could be seen in the south and west corner of the site which is situated on Lot A and includes a mixture of native and exotic species, with the canopy being dominated by native trees and the understorey dominated by exotic species. Generally, there was limited presence of midstorey and understorey species, with these generally found along the outskirts of the site or around the existing domestic buildings, indicating they are planted or retained as regrowth. An extensive amount of the ground surface comprised of paddock grass. The native canopy vegetation on site is representative of the mapped PCT 3320 – Cumberland Shale Plains Woodland. A comprehensive floristics list can be found in 12Appendix D.

The south corner section of vegetation around the water hole consists of Forest Red Gum (*E. tereticornis*) and Ribbon Gum (*E. viminalis*) and will be removed for the future car park. Weed control works could be undertaken here to target the exotic species dominating this area such as Balloon Vine (*Cardiospermum grandiflorum*) and Madeira Vine (*Anredera cordifolia*).

The subject site was found to contain exotic species dominated by Kikuyu (*Pennisetum clandestinum*), Ribwort (*Plantago lanceolata*) and Paddy's Lucerne (*Sida rhombifolia*). Weeds of National Significance (WoNS) found on site include African Boxthorn (*Lycium ferocissimum*), Fireweed (*Senecio madagascariensis*), Common Pear (*Opuntia stricta*) and Madeira Vine (*Anredera cordifolia*). A comprehensive list of weeds found onsite can be found in 12Appendix D

Potential habitat for the threatened species recorded nearby, such as the Swift Parrot, Grey-headed Flying-fox, Large Bent-winged Bat and the Cumberland Plain Land Snail was limited to small sections of the site. The site was considered unsuitable habitat for koala due a lack of previous recordings in the area, no koalas or koala signs being recorded on site, and the disturbed nature of the site being deemed unsuitable for koala inhabitation. Therefore, a Koala Plan of Management for this site is not necessary. Migration to the site for terrestrial and arboreal fauna may be hindered by fencing around the site and there is a lack of connecting canopy cover surrounding the site. However, there was evidence of the site being used as habitat for common native fauna including wetland birds, frogs and fish. There was also a large, mulched patch that could be potential Cumberland Plain Land Snail habitat (Figure 7-5) and multiple abandoned sheds on Lot B which could potentially be used as habitat for Large Bent-winged Bat (Figure 7-6). There was also an abandoned caravan and a water tank with holes in it on Lot A which could also be used as bat habitat (Figure 7-7 and Figure 7-8). A water hole was also found on Lot A which showed signs of high use with multiple water birds utilising the area (Figure 7-9). Other significant habitat found on site includes two small mud nests located in the *E. tereticornis* (Figure 7-10) and mistletoe found in two trees (Figure 7-11). Multiple rubbish and wood piles were found which could be used as habitat by lizards and snakes. These ground dwelling habitats are not significant but special care should be taken when clearing this area so as not to disturb any species potentially utilising these areas. An ecologist should be present when clearing these areas. A comprehensive list of fauna and potential habitat can be found in Appendix D.

Figure *7-5* Mulched ground ideal for the Cumberland Plain Land Snail

Figure 7-6 Example of an abandoned shed that could potential be used as a roosting spot for microbats

Figure 7-7 Abandoned caravan with open access points that could be utilised by microbats

Figure 7-8 Abandoned water tanks with access holes that could be utilised by microbats

Figure 7-9 Water hole found on site being utilised by native waterbirds and possibly fish

Figure 7-10 Example of a mud nest found on site

Figure 7-11 Example of Mistletoe found on site which could be used for foraging when in flower

7.2.2 Results from site visit 2

The Masterplan Survey Overlay (Figure 5-1) includes new buildings, sports courts, and parking areas. A total of 113 trees are marked for removal on the site, and 22 are marked for retention, all assessed in an arborist report (Allied Tree Consultancy, 2025). This excludes any trees that require management for bushfire protection. The full arborist report is included in Appendix E.

The majority of the trees that are marked for removal are Grey Box and Forest Red Gum which are both dominant species of PCT 3320 mapped in some areas of the site.

The canopy trees present within the site occur as either isolated trees, small patches, or thin strips along boundary fence lines. No large, continuous patches of woodland were present. The native canopy vegetation on site is representative of the mapped PCT 3320 – Cumberland Shale Plains Woodland. Analysis of historic images from 1965 indicated that the trees present are most likely planted or have regenerated (Figure 7-3).

A number of planted exotics were present within the site. Native and exotic flora are listed in Appendix D.

The fauna survey found some potential nesting or roosting habitat, such as stick nests or tree hollows within the subject site. No significant landscape features such as caves, culverts, rivers, or waterbodies were present.

The flowering native trees on site may provide potential feeding habitat for Grey-headed Flying-fox. Given the previous recordings of this species near the subject site and the presence of suitable feeding habitat, it is likely that the Grey-headed Flying-fox will utilise the site for foraging. Any potential impacts on Grey-headed Flying-fox are expected to be small and will not require mitigation.

The dam on site also provides potential fauna habitat. Dewatering this dam is part of the proposed works, and should be undertaken in accordance with the mitigation measures detailed in Section 10 of this report.

Since the site is biodiversity certified, all biodiversity values on the site including any fauna habitat or threatened entities have been accounted for and offset under the biodiversity certification.

7.2.3 Site Assessment Limitations

The initial site assessment was undertaken in a single day in Summer to make observations of faunal habitat and opportunistic fauna and flora preliminary assessment. The weather conditions on the 4th of December 2023 was a cloudy humid day, with an approximate temperature range from 16.4°C- 27.8°C during the timing of the site inspection. These conditions may not be favourable for all fauna types assessed. Other limitations include:

- many faunal species are cryptic and/or nocturnal and/or wide-ranging and mobile, they are unlikely to be detected even during seasonal surveys;
- no animal trapping was undertaken;
- no night-time surveys were conducted;
- no Anabat/sound recordings were conducted.

A follow up survey carried out on 10th April 2024 to determine habitat and tree retention. It was not an exhaustive search for threatened species as this is not required when land is biodiversity certified.

8 ENVIRONMENTAL DETERMINATION

Several native fauna species were recorded, however no threatened species were identified during the site inspection. The field survey was restricted to the area of impact of the proposed works

As there were no threatened species found, a Test of Significance was not required. As many faunal species likely to occur within the project area are cryptic and/or nocturnal, or may only visit the site on occasion, they are unlikely to be detected even during seasonal surveys. The fauna assessment is, accordingly, largely an assessment of the potential of the project site as habitat for various fauna species. Therefore, it is important to adopt the precautionary principle such that it is assumed that threatened species may be at the site if suitable habitat exists.

9 POTENTIAL IMPACTS

9.1 Construction Impacts

The following is a summary of the direct and indirect impacts to the biodiversity potentially persisting onsite.

9.1.1 Vegetation

It is expected that up to 113 native trees will be removed as they occur within the design footprint (Appendix E). The majority of the trees that are marked for removal are Grey Box and Forest Red Gum which are both dominant species of PCT 3320 Cumberland Shale Plains Woodland which is a Threatened Ecological Community. The offsets for removing these trees have already been covered within the biodiversity certification for the land, and there are no further offset or assessment requirements for the tree removal.

Some trees may require removal inside the Constraints area. Refer to Figure 5-1 for proposed plans and Appendix C for the Constraints map; if possible the red areas should be avoided to minimise negative impact on biodiversity, and are designated as 'no go' zones. It is important to note that activities are scheduled to take place within the ‘no go’ constraints area and TPZs of the trees designated for retention. The native trees to be retained should be protected to avoid them being damaged.

Some native trees may be impacted as part of the proposed works due to significant encroachments into their Tree Protection Zone (TPZ) or Structural Root Zones (SRZ), which could compromise their stability and health. Trees designated for extraction should be clearly marked prior to the commencement of construction activities. The removal and pruning operations must be conducted by qualified arborists, adhering to relevant codes of practice. It is crucial to take all necessary precautions to avoid damaging trees designated for retention during the extraction process.

A qualified arborist is to attend to the pruning and the removal of any trees. Also, if roots greater than 50mm are encountered or if any trees are to be removed or significantly pruned, an arborist will monitor and evaluate the remaining trees. An arborist will be engaged prior to construction to provide a Tree Protection Plan.

To ensure the effective management and protection of trees during the proposed works, a comprehensive Tree Management Plan (TMP) must be developed and implemented. This plan should be prepared by a Consulting Arborist with a minimum qualification of AQF Level 5. Replacement planting will be carried out to compensate for the removed trees, following the specific landscape plan.

9.1.2 Grey-headed Flying-fox

The noise, light, and increased human presence from construction activities may disrupt the foraging behaviour of the Grey-headed Flying-fox and deter them from using the site. Additionally, any removal of flowering native trees and planted citrus trees, which serve as important feeding habitats, could reduce the availability of food resources, thereby affecting their feeding patterns and overall health.

9.1.3 Nests and Hollows

Prior to the commencement of the construction, all trees and vegetation should be inspected for hollows and nests. If fauna is discovered inhabiting hollows or nests, an ecologist may be required to remove and relocate any fauna if the tree or vegetation is to be removed.

9.1.4 Contractors and Staff Inductions

Induction of all contractors and staff outlining the ecological sensitivity of the site, the need to minimise ecological impact, and all other required mitigation measures is to be undertaken.

9.1.5 Hygiene

Basic hygiene protocols would be implemented for construction personnel and machinery on site to reduce the potential for invasion by plant pathogens including *Phytophthora cinnamomi*, the fungus myrtle rust *Uredo rangelli* and amphibian chytrid fungus.

9.2 Operational Impacts

No operational impacts to fauna are anticipated as a result of the proposal.

10 MITIGATION MEASURES

Measures that will be implemented to address potential pre-construction impacts are listed in Table 10-1 and construction impacts are listed in Table 10-2. Detailed tree mitigation measures during pre-construction and construction should be adhered to.

Table 10-1 Mitigation measures for pre-construction impacts (PI)

EA	Mitigation Measure	Timing
PI1	Inspect all trees for hollows and nests and have an ecologist present during tree removal works. If fauna is discovered an ecologist may be required to remove and relocate any fauna if the tree or vegetation is to be removed.	Pre-construction
PI2	If a threatened species is recorded on the site all works should be put on hold until further instruction from the Project Manager as advised by an ecologist.	Pre-construction
PI3	Plan the works so that night works and works around dusk and dawn can be avoided during the breeding season of the Grey-headed Flying-fox (January-April).	Pre-construction
PI4	Preserve key habitat features which are planned to remain on site on the landscaping plans and Arboricultural report for Grey-headed Flying-fox such as flowering native trees and planted citrus trees to maintain essential feeding resources.	Pre-construction
PI5	Establish buffer zones around known foraging areas planned to remain on site on the landscaping plans and Arboricultural report for Grey-headed Flying-fox to reduce disturbance.	Pre-construction
PI6	Regular monitoring of the site should be conducted to ensure that mitigation measures to protect Grey-headed Flying-fox are effective and to adjust them as necessary.	Pre-construction
PI7	A Tree Management Plan (TMP) must be developed and implemented. This plan should be prepared by a Consulting Arborist with a minimum qualification of AQF Level 5.	Pre-construction
PI8	Outline protocols for any necessary pruning or removal of trees. All tree works must be performed by qualified tree workers (minimum AQF Level 2) under the supervision of the Consulting Arborist, adhering to the NSW Workcover Code of Practice for the Amenity Tree Industry (1998).	Pre-construction
PI9	Tree protection must be approved by a Consulting Arborist AQF Level 5 within a Tree Protection Plan (TPP). No materials, mixing, parking, disposal, repairs, refuelling, fires, stockpiling, or backfilling is allowed near remaining trees. Removal or lopping of trees needs written permission from the Superintendent.	Pre-construction
PI10	All trees to be protected shall be clearly identified and all TPZs and SPZ surveyed.	Pre-construction
P11	Protective fencing around existing trees and within TPZs must be installed before any site work begins. The fence must be 1800mm high chain wire mesh fixed to Galvanised steel posts, enclosing an area to prevent damage as defined in the Tree Protection Plan. No storage inside fenced area.	Pre-construction
P12	Tree protection signage must be attached to tree protection zones before works begin. Signs should be displayed prominently and repeated at 10m intervals or closer when the fence changes direction. Signs must include information about the tree protection zone, access restrictions, developer's contact details, and Site Arborist information.	Pre-construction

EA	Mitigation Measure	Timing
P13	Outline protocols for any necessary pruning or removal of trees. All tree works must be performed by qualified tree workers (minimum AQF Level 2) under the supervision of the Consulting Arborist, adhering to the NSW Workcover Code of Practice for the Amenity Tree Industry (1998).	Pre-construction
P14	Induction of all contractors and staff outlining the ecological sensitivity of the site, no-go areas, the need to minimise ecological impact, and all other required mitigation measures is to be undertaken.	Pre-construction
P15	The Consulting Arborist will conduct regular site inspections to monitor the health and stability of retained trees, ensuring compliance with the TMP. Any signs of stress or damage will be promptly addressed with appropriate remedial actions.	Pre-construction
P16	Water testing is to be undertaken prior to dewatering the dam. If harmful levels of contamination or other are detected, the water should be suitably treated prior to release.	Pre-construction
P17	The water should be released in a manner that does not cause erosion or other negative environmental impacts, e.g. by using holding ponds or otherwise slowing down the flow of the released water.	Pre-construction
P18	An ecologist or other suitably qualified person will supervise the dam dewatering to minimise the risk of harm to any fauna within the dam.	Pre-construction
P19	A Dewatering Management Plan should be prepared and a dewatering permit obtained prior to undertaking the dewatering.	Pre-construction

Table 10-2 Mitigation measures for construction impacts (CI)

EA	Mitigation Measure	Timing
CI1	Tree Protection Zones (TPZs) will be maintained around vegetation to be retained. TPZs will be maintained in accordance with Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970). No activities are to take place within the Structural Root Zones (SRZs) of mature trees. No works, stockpiling of materials, excavation, parking or any other potentially harmful activities will be undertaken within TPZs unless a Level 5 Arborist has provided confirmation that the works will not impact the tree.	Construction
CI2	No pedestrian or plant access is permissible to the TPZ.	Construction
CI3	Avoid storing bulk or harmful materials near trees. Keep spoil from excavations away from TPZs. Ensure wind-blown materials like cement don't harm trees. Contaminants stored properly with spill measures.	Construction
CI4	Protect the tree from harm. Avoid tying ropes, cables, or similar items to trees. No staff members. No plant, machinery, or materials can enter the tree protection fencing.	Construction
CI5	Do not fill or compact soil above tree roots enclosed by protection fencing during construction near trees. Guidelines must be followed to prevent soil compaction in these areas. Protection includes using elevated planks attached to scaffolding to prevent ground compression.	Construction
CI6	Trenching is not allowed in TPZs or tree protection fencing. Approval needed for trenching, must be done by hand with arborist supervision.	Construction
CI7	Contractors are to maintain plants are watered. Apply water at an appropriate rate suitable for the plant species during periods of little or no rainfall.	Construction

EA	Mitigation Measure	Timing
CI8	All site facilities must be located outside of TPZ. Chemicals and contaminants must be stored properly in an enclosed area with a spill bund to prevent runoff in case of accidents.	Construction
CI9	Basic hygiene protocols would be implemented for construction personnel and machinery on site to reduce the potential for invasion by plant pathogens including *Phytophthora cinnamomi*, the fungus myrtle rust *Uredo rangelli* and amphibian chytrid fungus.	Construction
CI10	The Consulting Arborist will conduct regular site inspections on a monthly basis (or at the start and end if the duration is shorter than a month) to monitor the health and stability of retained trees, ensuring compliance with the TMP. Any signs of stress or damage will be promptly addressed with appropriate remedial actions.	Construction
C11	Upon completion of the construction activities, conduct a final health assessment of all retained trees to document any changes in condition. The Consulting Arborist will provide a detailed report with recommendations for any ongoing care or additional mitigation measures needed to support the long-term health of the trees.	Construction

11 CONCLUSION AND RECOMMENDATIONS

The construction project may involve the clearing of up to 113 trees which has already been offset under the biodiversity certification order for the area. Activities within the TPZs will require precautions to avoid damage, with a qualified arborist overseeing the process and providing a Tree Protection Plan. Trees and vegetation will be inspected for hollows and nests, with an ecologist relocating any fauna found. The site should be inspected for Grey-headed Flying Fox habitat. Contractors and staff will be inducted on the site's ecological sensitivity, and basic hygiene protocols will be implemented to prevent plant pathogens and fungi.

Construction impacts to Grey-headed Flying Fox foraging habitat is anticipated. No construction impact to other fauna are anticipated, and mitigation measures will include maintaining TPZs, inspecting trees for fauna, and implementing hygiene protocols. If these mitigation measures are followed, the ecological impact of the construction can be minimised, ensuring the protection of the remaining trees and local wildlife.

This EA for the Proposed New High School for Leppington and Denham Court has assessed the potential environmental impacts of the proposed redevelopment. The assessment, conducted by Water Technology, found no significant biodiversity areas or threatened species on the site that cannot be mitigated. Consequently, the project will not cause significant environmental impacts, and no further referral or Environmental Impact Statement is required. This conclusion supports the progression of the redevelopment project under the current planning and environmental regulations, ensuring that the school infrastructure upgrades can proceed with minimal biodiversity disruption.

Please refer below to the mitigation measures, Table 11-1.

Table 11-1 Project Stage Design (D) Construction (C) Operation (O)

Project Stage	Mitigation Measures	Relevant Section of Report
D	A Tree Management Plan (TMP) must be developed and implemented. This plan should be prepared by a Consulting Arborist with a minimum qualification of AQF Level 5.	Section 10 Table 10-1
C	Outline protocols for any necessary pruning or removal of trees. All tree works must be performed by qualified tree workers (minimum AQF Level 2) under the supervision of the Consulting Arborist, adhering to the NSW Workcover Code of Practice for the Amenity Tree Industry (1998).	Section 10 Table 10-1
C	Tree protection must be approved by a Consulting Arborist AQF Level 5. No materials, mixing, parking, disposal, repairs, refuelling, fires, stockpiling, or backfilling is allowed near remaining trees. Removal or lopping of trees needs written permission from the Superintendent.	Section 10 Table 10-1
C	All trees to be protected shall be clearly identified and all TPZs surveyed.	Section 10 Table 10-1
C	Protective fencing around existing trees and within TPZs must be installed before any site work begins. The fence must be 1800mm high chain wire mesh fixed to Galvanised steel posts, enclosing an area to prevent damage as defined in the Tree Protection Plan. No storage inside fenced area.	Section 10 Table 10-1

Project Stage	Mitigation Measures	Relevant Section of Report
C	Tree protection signage must be attached to tree protection zones before works begin. Signs should be displayed prominently and repeated at 10m intervals or closer when the fence changes direction. Signs must include information about the tree protection zone, access restrictions, developer's contact details, and Site Arborist information.	Section 10 Table 10-1
C	Inspect all trees for hollows and nests. If fauna is discovered an ecologist may be required to remove and relocate any fauna if the tree or vegetation is to be removed.	Section 10 Table 10-1
C	If a threatened species is recorded on the site all works should be put on hold until further instruction from the Project Manager as advised by an ecologist.	Section 10 Table 10-1
C	Night works and works around dusk and dawn should be avoided during the breeding season of the Grey-headed Flying-fox (January-April).	Section 10 Table 10-1
C	Preserve key habitat features which are planned to remain on site on the landscaping plans and Arboricultural report for Grey-headed Flying-fox such as flowering native trees and planted citrus trees to maintain essential feeding resources.	Section 10 Table 10-1
C	Establish buffer zones around known foraging areas planned to remain on site on the landscaping plans and Arboricultural report for Grey-headed Flying-fox to reduce disturbance.	Section 10 Table 10-1
C	Regular monitoring of the site should be conducted to ensure that mitigation measures to protect Grey-headed Flying-fox are effective and to adjust them as necessary.	Section 10 Table 10-1
C	Induction of all contractors and staff outlining the ecological sensitivity of the site, no-go areas, the need to minimise ecological impact, and all other required mitigation measures is to be undertaken.	Section 10 Table 10-1
C	Tree Protection Zones (TPZs) will be maintained around vegetation to be retained. TPZs will be maintained in accordance with Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970). No activities are to take place within the Structural Root Zones (SRZs) of mature trees. No works, stockpiling of materials, excavation, parking or any other potentially harmful activities will be undertaken within TPZs unless a Level 5 Arborist has provided confirmation that the works will not impact the tree.	Section 10 Table 10-2
C	No pedestrian or plant access is permissible to the TPZ.	Section 10 Table 10-2
C	Avoid storing bulk or harmful materials near trees. Keep spoil from excavations away from TPZs. Ensure wind-blown materials like cement don't harm trees. Contaminants stored properly with spill measures.	Section 10 Table 10-2
C	Protect the tree from harm. Avoid tying ropes, cables, or similar items to trees. No staff members. No plant, machinery, or materials can enter the tree protection fencing.	Section 10 Table 10-2

Project Stage	Mitigation Measures	Relevant Section of Report
C	Do not fill or compact soil above tree roots enclosed by protection fencing during construction near trees. Guidelines must be followed to prevent soil compaction in these areas. Protection includes using elevated planks attached to scaffolding to prevent ground compression.	Section 10 Table 10-2
C	Trenching is not allowed in TPZs or tree protection fencing. Approval needed for trenching, must be done by hand with arborist supervision.	Section 10 Table 10-2
C	Contractors are to maintain plants are watered. Apply water at an appropriate rate suitable for the plant species during periods of little or no rainfall.	Section 10 Table 10-2
C	All site facilities must be located outside of TPZ. Chemicals and contaminants must be stored properly in an enclosed area with a spill bund to prevent runoff in case of accidents.	Section 10 Table 10-2

12 REFERENCES

Allied Tree Consultancy (2025). Arboricultural Impact Assessment Report

Birds Tree Consultancy. Arboricultural Development Impact Assessment Report. 5 December 2019.

DAWE (2023) EPBC Protected Matters Search Tool [Online tool] Accessed 21 October 2024. Available at: https://pmst.awe.gov.au/#/map?lng=131.52832031250003&lat=-28.6905876542507&zoom=5&baseLayers=Imagery

Department of Environment, Climate Change and Water NSW (2009) Commonwealth Advice -. [Online]. Accessed 21 October 2024. Available at: https://www.environment.gov.au/biodiversity/threatened/communities/pubs/112-listing-advice.pdf

Department of Environment, Climate Change and Water NSW (2010b). Sydney Growth Centres Strategic Assessment Program Report. Department of Environment, Climate Change and Water NSW, Sydney.

Ecological Australia. (2023). New Liverpool Primary School Biodiversity Development Assessment Report. CBRE on behalf of Schools Infrastructure NSW.

MetroMap (2023) Spatial satellite imagery dated 05/05/2022. [Online tool] Accessed 21 October 2024. Available at: https://web.metromap.com.au/map?lat=33.41671080587806&lng=149.6053356300763&z=17.459764213268205&layer_id=310

MetroMap (2023) Spatial satellite imagery. [Online tool] Accessed 21 October 2024. Available at: https://web.metromap.com.au/map?lat=-33.41671080587806&lng=149.6053356300763&z=17.459764213268205&layer_id=310

NSW DPE (2023) Biodiversity Values Map [Online tool] Accessed 21 October 2024. Available at: https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

NSW DPE (2023) NSW Planning Portal. [Online tool] Accessed 21 October 2024. Available at: https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address

NSW DPE (2023) State Vegetation Type Map [Online tool] Accessed 21 October 2024. Available at: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map

NSW DPE (Department of Planning and Environment) (2022) Register of biodiversity certification orders. [Online] Accessed 21 October 2024. Available at: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/about-the-biodiversity-offsets-scheme/biodiversity-certification/biodiversity-certification-orders

NSW DPI (2023) Key Fish Habitat Mapping [Online tool] Accessed 21 October 2024. Available at: https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal

NSW OEH (2023) BioNet Atlas of NSW Wildlife [Online tool] Accessed 21 October 2024. Available at: https://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx

NSW OEH (2023) BioNet Vegetation Classification [Online tool] Accessed 21 October 2024. Available at: https://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx

NSW OEH (2023) NSW eSpade [Online tool] Accessed 21 October 2024. Available at: https://www.environment.nsw.gov.au/eSpade2Webapp/

NSW OEH (2023) Threatened biodiversity profile search [Online tool] Accessed 21 October 2024. Available at: https://www.environment.nsw.gov.au/threatenedspeciesapp/

NSW Sixmaps (2022) Spatial area tool. [Online tool] Accessed 21 October 2024. Available at: https://maps.six.nsw.gov.au/

NSW Sixmaps (2023) Spatial area tool. [Online tool] Accessed 21 October 2024. Available at: https://maps.six.nsw.gov.au/

APPENDIX A
PROTECTED MATTERS SEARCH

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 26-Jun-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	48
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pycnoptilus floccosus		
Pilotbird [525]	Vulnerable	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata		
Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
FROG		
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans		
Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
Acacia bynoeana		
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
Acacia pubescens		
Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat likely to occur within area
Allocasuarina glareicola		
[21932]	Endangered	Species or species habitat may occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Genoplesium baueri		
Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat may occur within area
Haloragis exalata subsp. exalata		
Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Persoonia nutans Nodding Geebung [18119]	Endangered	Species or species habitat may occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat known to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat may occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
REPTILE		

Scientific Name	Threatened Category	Presence Text
Delma impar		
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus		
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus		
Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area

Extra Information

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Lyn Parade Extension	2004/1392	Controlled Action	Post-Approval
Not controlled action			
Greenway Park Stage 3 residential subdivision	2004/1622	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Northern Expansion of the Camden Gas Project	2012/6638	Referral Decision	Completed

Bioregional Assessments

SubRegion	BioRegion	Website
Sydney	Sydney Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

APPENDIX B
LIKELIHOOD OF OCCURRENCE

Recorded	The species was observed in the study area during the current survey.
High	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (i.e., for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10km) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the study area and has not been recorded recently in the locality (10km). It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (i.e., for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area, or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded.
None	Suitable habitat is absent from the study area.

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
Hylidae	*Litoria aurea*	Green and Golden Bell Frog	E1, P	V	1	Inhabits marshes, dams, and stream-sides, particularly those containing bullrushes (*Typha spp*.) or spike rushes (*Eleocharis spp*.). Optimum habitat includes waterbodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas. The species is active by day and usually breeds in summer when conditions are warm and wet.	Low

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
Accipitridae	*Circus assimilis*	Spotted Harrier	V, P	-	1	Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland, and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.	Low
	Haliaeetus leucogaster	White bellied Sea Eagle	V, P		3	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or seashore, such as around bays and inlets, beaches, reefs, lagoons, estuaries, and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs, and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as ‘guard roosts. Nests are large structures built from sticks and lined with leaves or grass.	Low

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
	Hieraaetus morphnoides	Little Eagle	V, P	-	7	Occupies open eucalypt forest, woodland, or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Low
Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V, P		2	Forages primarily in the canopy of open Eucalyptus Forest and woodland, yet also finds food in Angophora, Melaleuca, and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g., paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards	Low

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
	Lathamus discolor	Swift Parrot	E1, P	CE	15	Migrates to the Australian south-east mainland between February and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora*. Return to some foraging sites on a cyclic basis depending on food availability.	Moderate

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
Strigidae	*Ninox strenua*	Powerful Owl	V, P,3		1	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species.	Low
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V, P		5	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee, and Acacia woodland.	Low
Phascolarctidae	*Phascolarctos cinereus*	Koala	E1, P	E	2	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	Low

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	V, P	V	33	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths, and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Moderate
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V, P		2	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Low
Molossidae	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V, P		27	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in manufactured structures.	Low
Vespertilionidae	*Myotis macropus*	Southern Myotis	V, P		26	Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Low

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
	Scoteanax rueppellii	Greater Broad-nosed Bat	V, P		9	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	Low
Miniopteridae	*Miniopterus australis*	Little Bent-winged Bat	V, P		3	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests, and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat, and, in winter, the two species may form mixed clusters. In NSW, the largest maternity colony is in close association with a large maternity colony of Eastern Bentwing-bats (*Miniopterus schreibersii*) and appears to depend on the large colony to provide the high temperatures needed to rear its young. Only five nursery sites /maternity colonies are known in Australia.	Low

Family	Scientific Name	Common Name	NSW status	Comm. status	Records	Description	Likelihood
Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V, P	-	24	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings, and other manufactured structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops.	Moderate
Camaenidae	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1		31	Primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands, and the margins of River-flat Eucalypt Forest, which are also listed communities.	Moderate

WATER TECHNOLOGY
WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

APPENDIX C
CONSTRAINTS MAP


Legend
Constraints
Site Boundary
Site A
Site B
Data sources
SIX Maps, SEED Portal
Imagery NSW Imagery Web Service
0
250
SINSW Biodiversity - Leppington South
Constraints Map

APPENDIX D
SPECIES LIST

134 Rickard Road Species List

NATIVE SPECIES Scientific Name	Common Name
Canopy Species	
Acacia sp.	Wattle
Eucalyptus crebra	Narrow-leaved Ironbark, Muggago (D'harawal)
Eucalyptus robusta	Swamp Mahogany
Eucalyptus sideroxylon	Red Ironbark
Eucalyptus terticornis	Forest Red Gum
Eucalyptus viminalis	Ribbon Gum
Ficus obliqua	Illawarra Fig
Midstorey species	
Climbers/Scramblers	
Amyema miquelii	Box Mistletoe
Groundcover species	
Dichondra repens	Kidney Weed

EXOTIC SPECIES Scientific Name	Common Name	WONS Weed (*)
Canopy Species		
Cupressus sp.	Cypress	
Midstorey Species		
Lycium ferocissimum	African Boxthorn	*
Olea europaea subsp. *cuspidata*	African Olive	
Sida rhombifolia	Paddy's Lucerne	
Climbers		
Araujia sericifera	Moth Vine	
Groundcover species		
Avena fatua	Common Wild Oat	
Bidens pilosa	Cobbler's Peg, Farmer's Fiend	
Cirsium vulgare	Spear Thistle	
Conyza bonariensis	Fleabane	
Ehrharta calycina	Veldt Grass	
Hypochaeris radicata	Cat's ear, Flat Weed	

EXOTIC SPECIES Scientific Name	Common Name	WONS Weed (*)
Pennisetum clandestinum	Kikuyu grass	
Plantago lanceolata	Ribwort	
Rumex sp.	Dock	
Senecio madagascariensis	Fireweed	*
Solanum sp.	Nightshade	
Taraxacum officinale	Dandelion	
Trifolium sp.	Clover	

FAUNA SPECIES Scientific Name	Common Name
Scientific Name	**Common Name**
Native Species	
Lampropholis guichenoti	Common Garden Skink
Manorina melanocephala	Noisy Minor
Introduced/Exotic Species	
Acridotheres tristis	Common Myna, Indian Myna

Habitat Found	Location
Shed near house possible habitat for Large Bent-winged Bat and microbats	-33.959988, 150.809767
Shed and rubbish pile near school corner, possible habitat for Large Bent-winged Bat, microbats and snakes.	-33.960313, 150.810614
Mistletoe in Forest Red Gum *E. tereticornis*	-33.960437, 150.810307
Mistletoe in Red Ironbark *E. sideroxylon*	-33.960626, 150.810244

Notes: Mostly paddock grass, old barb wire fence through middle of property, multiple debris piles dotted around.

APPENDIX E ABORIST REPORT

ALLIED TREE
CONSULTANCY
Level 5 and 8 Arboriculturist

Arboricultural Impact Assessment Report

For the site address

Lots A and B; (DP411211)
No. 128-134 Rickard Road,
LEPPINGTON NSW

Prepared for

School Infrastructure NSW
Department of Education

AUTHOR

Greg Penkow, Geoff Beisler
and Warwick Varley

STATUS

Final January 2025

REFERENCE D5312

OFFICE

A PO Box 456, WOLLONGONG NSW 2520
P 1300 767 414
E admin@alliedtrees.com.au
W www.alliedtrees.com.au

DOCUMENT CONTROL

Project: Activity: New High School for Leppington and Denham Court, Aboricultural Impact Assessment Report.

Reference: D5312

Author: Greg Penkow, Geoff Beisler and Warwick Varley

Revision history

Preliminary Arboricultural Report

- Draft, Internal review: 18th January 2024……Greg Penkow
- Draft, Client review: 21st January 2024……Warwick Varley
- Amended, 3rd March 2024 (Plans, Section 5.0 and addition of Section 8.6) ……Warwick Varley
- Amended, 12th March 2024,(Add Document Control, amend LGA; Section 9.0) ……..Warwick Varley

Arboricultural Impact Assessment Report

- Draft, Internal review: 15th October 2024……Geoff Beisler
- Draft, Client review: 21st October 2024……Warwick Varley
- Draft 2, Client review: 28th November 2024……Warwick Varley
- Draft 3, Client review: 10th December 2024……Warwick Varley
- Final, 14th January 2024……Warwick Varley

EXECUTIVE SUMMARY

This Arboricultural Impact Assessment is to support the REF for the New High School in Leppington at No. 128-134 Rickard Road, Leppington. This proposal includes the demolition of existing structures and the construction of a new school, including bulk earthworks, buildings, roadways, and associated infrastructure. One hundred and thirty-five (135) trees are included and are located on and adjacent to the lot. The viability of these trees is based on the proposed works. The trees are a combination of remnant and planted where the majority of trees are remnant and classed as High significance based on the vegetation community to which they form. This community is classed as a Critically Endangered Environmental Community and is protected by commonwealth legislation and is biocertified land under the TSC Act.

In summary, the following trees (Trees No. 1, 4-7, 111-119, 123-127, and 134), twenty (22) in total, being approximately fifteen percent (16%) of all trees included, have the option to be retained based on conditions assigned to the work methodology. The remaining trees (Trees No. 2, 3, 8-23, 26-110, 120-122, 128-133, and 135), one hundred and thirteen (113), approximately eighty-five percent (84%) of all trees included will require removal to accommodate the design. Although trees No. 3 and 8-27 pose some options for retention pending owners' (Camden Council) consent. This tally has not included the non-assessed trees assigned to area E, or management of trees for bushfire protection. A project arborist and an Arboricultural Method Statement (Tree Management Plan) Report shall be assigned and completed to allow for protection of the trees during construction before works proceed.

TABLE OF CONTENTS

THE USE OF THIS REPORT IS RESTRICTED FOR THOSE TREES MENTIONED WITHIN FOR WHICH THE REPORT WAS ISSUED.

COPYRIGHT

1.0 Introduction

1.1 This Arboricultural Impact Assessment Report (AIA) has been prepared to support a Review of Environmental Factors (REF) for the Department of Education (DoE) for the new high school for Leppington and Denham Court (the activity). The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

The proposed activity is for the construction and operation of a new high school located at 128-134 Rickard Road, Leppington, NSW, 2179 (the site).

1.2 The purpose of this report is to determine the viability of the site trees based on the proposed design. This report includes one hundred and thirty-five (135) trees located on and adjacent to the lot. As part of this, the report shall address the:

- species' identification, location, dimensions, and condition;
- SULE (Safe Useful Life Expectancy) and STARS (Significance of a Tree Assessment Rating System) rating;
- discussion and impact of the proposed works on each tree;
- tree protection zones and protection specifications for trees recommended for retention.

2.0 Standards

2.1 Allied Tree Consultancy provides an ethical and unbiased approach to all assignments, possessing no association with private utility arboriculture or organisations that may reflect a conflict of interest.

2.2 It is the responsibility of the Construction Project Manager to provide the requirements outlined in this report relative to the Protection Zones, Measures (Section 7.0) and Specifications (Section 8.0) to all contractors associated with the project before the initiation of work.

2.3 All tree-related work outlined in this report is to be conducted in accordance with the:

- Australian Standard – AS4373; Pruning of Amenity Trees.
- Guide to Managing Risks of Tree Trimming and Removal Work[1].

[1] Safe Work Australia; July 2016; Guide to Managing Risks of Tree Trimming and Removal Work, Australia

- All tree works must be carried out at a tertiary level (minimum Certificate-level 3) qualified and experienced (minimum five years) arboriculturist.
- For any works in the vicinity of electrical lines, the arboriculturist must possess the ISSC26 endorsement (Interim guide for operating cranes and plant in proximity to overhead powerlines).

3.0 Disclosure Statement

Trees are living organisms and, for this reason, possess natural variability. This cannot be controlled. However, risks associated with trees can be managed. An arborist cannot guarantee that a tree will be safe under all circumstances, nor predict the time when 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.

4.0 Methodology

4.1 The following tree assessment was undertaken using criteria based on the guidelines laid down by the International Society of Arboriculture.

4.2 The format of the report is summarised below;

4.2.1 Plan 1; Tree Location Relative to Site: This is an unscaled plan reproduced from the Survey Plan as referenced in Section 4.4.1, depicting the area of assessment.

4.2.2 Table 1; This table compiles the tree species, dimensions**,** brief assessment (history, structure, pest, disease or any other variables subject to the tree), significance, allocation of the zones of protection (i.e., Tree Protection Zone[2] ;TPZ and Structural Root Zone; SRZ) for each tree illustrated in Plan 1, Section 5.0. All measurements are in metres.

4.2.3 Discussion relating to the site assessment and proposed works regarding the trees.

4.2.4 Protection Specification; Section 8.0 details the requirements for that area designated as the Tree Protection Zone (TPZ), for those trees recommended for retention.

4.3 The opinions expressed in this report, and the material, upon which they are based, were obtained from the following process and data supplied:

[2] Australian Standard, 4970; 2009 – Protection of Trees on Development Sites, Australia.

4.3.1 Site assessment on the 11th and 12th January 2024 using the method of the Visual Tree Assessment[3]. This has included a Level 2 risk assessment, being a *Basic Assessment*[4]. The assessment has been conducted by Greg Penkow and[5] Geoff Beisler[6] on behalf of *Allied Tree Consultancy*.

4.3.2 Trees included in this report are those that conform to the description of a prescribed tree by the local government policy.

4.3.3 All measurements, unless specified otherwise are taken from the tree centre.

4.3.4 All trees included in this report have been tagged with round aluminium embossed tags. These are facing the centre of the site or where access is apparent at eye height.

4.3.5 Raw data from the preliminary assessment including the specimen's dimensions was compiled by the use of a diameter tape, height clinometer, angle finder, compass, steel probes, Teflon hammer, binoculars and recording instruments.

4.4 Documentation provided

The following documentation has been provided to Allied Tree Consultancy and utilised within the report.

4.4.1 Surveyor

Drawn by *Project Surveyors*
Date: 28 November 2023
Reference: 5576
Drawing No: 5576-DET-1; 4 Sheets
Note 1: See Section 4.5.1.

4.4.2 Design

Drawn by *DJRD Architects*
Date: 15 January 2025
Reference: 24 408
Drawings: 19 Sheets; Revision 3

[3] Mattheck, C. Breloer, H.,1994, The Body Language of Trees – A handbook for failure analysis The Stationary Office, London.
[4] Dunster J.A., 2013, Tree Risk Assessment Manual, International Society of Arboriculture, 2013, USA
[5] Consulting Arborist, Diploma of Arboriculture (level 5).
[6] Consulting Arborist, Diploma of Arboriculture (level 5).

4.4.3 Design; Bulk Earthworks

Drawn by *TTW*
Date: 14 January 2025
Reference: not referenced
Drawings: 19 Sheets; Revision 3

4.5 Limitations of the assessment/discussion process

4.5.1 Trees No. 14, 26, 28–30, 32, 33, 37, 42, 43, 49, 51, 61, 92, 118 and 124–126 have been omitted from the survey provided. However, require inclusion because they conform to the definition of a prescribed tree within the local government tree policy. The tree location has been plotted onto Plan 1 by *Allied Tree Consultancy*. The tree location was established by measuring from known points and scaling onto the drawing. *Allied Tree Consultancy* is not a registered surveyor; however, the accuracy of the survey is attempted; the true position of the trees may marginally deviate. Any such deviation provides the potential for changing the actual impact (encroachment) provided to a tree.

4.5.2 Area E has a limitation of the assessment exercise: This area is a bog, on the verge of the wetland area; it has dense vegetation consisting of long grass, weed species, vines, and undulating grades. This area has not been assessed. It consists of approximately ten live trees and several dead trees. The species are Eucalyptus; therefore, they are potentially remnant and tentatively rated as 'High' significance, although they were limited in size with stem diameters of up to 0.4m. The trees in this area may warrant inclusion pending management decisions, although a means that can allow for access with reduced risk will be necessary.

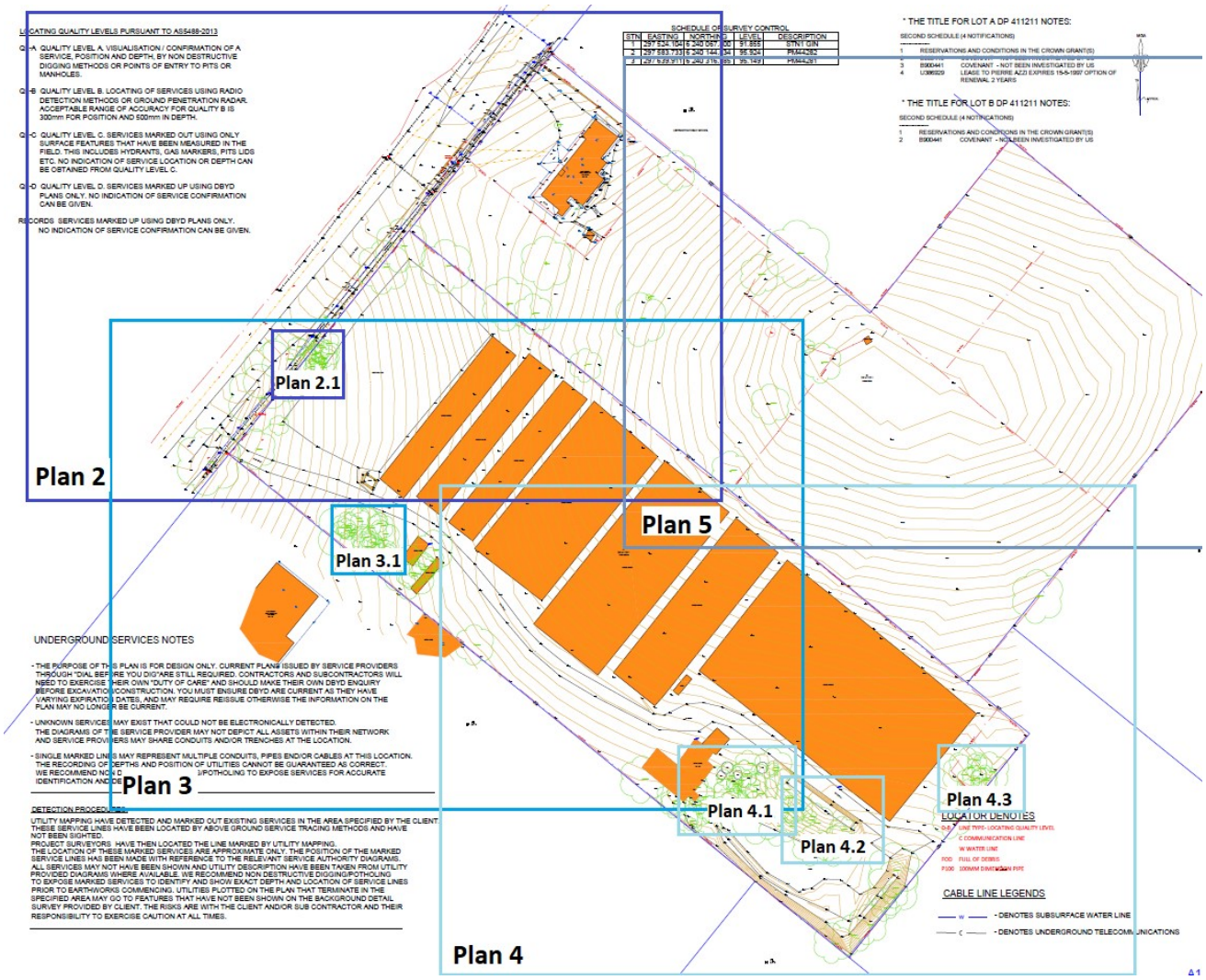
4.5.3 The assessment has considered only those target zones that are apparent to the author and the visually apparent tree conditions, during the time of assessment.

4.5.4 Any tree regardless of apparent defects would fail if the forces applied to exceed the strength of the tree or its parts, for example, extreme storm conditions.

4.5.5 The assessment has been limited to that part of the tree which is visible, existing from the ground level to the crown. Root decay can exist and, in some circumstances,

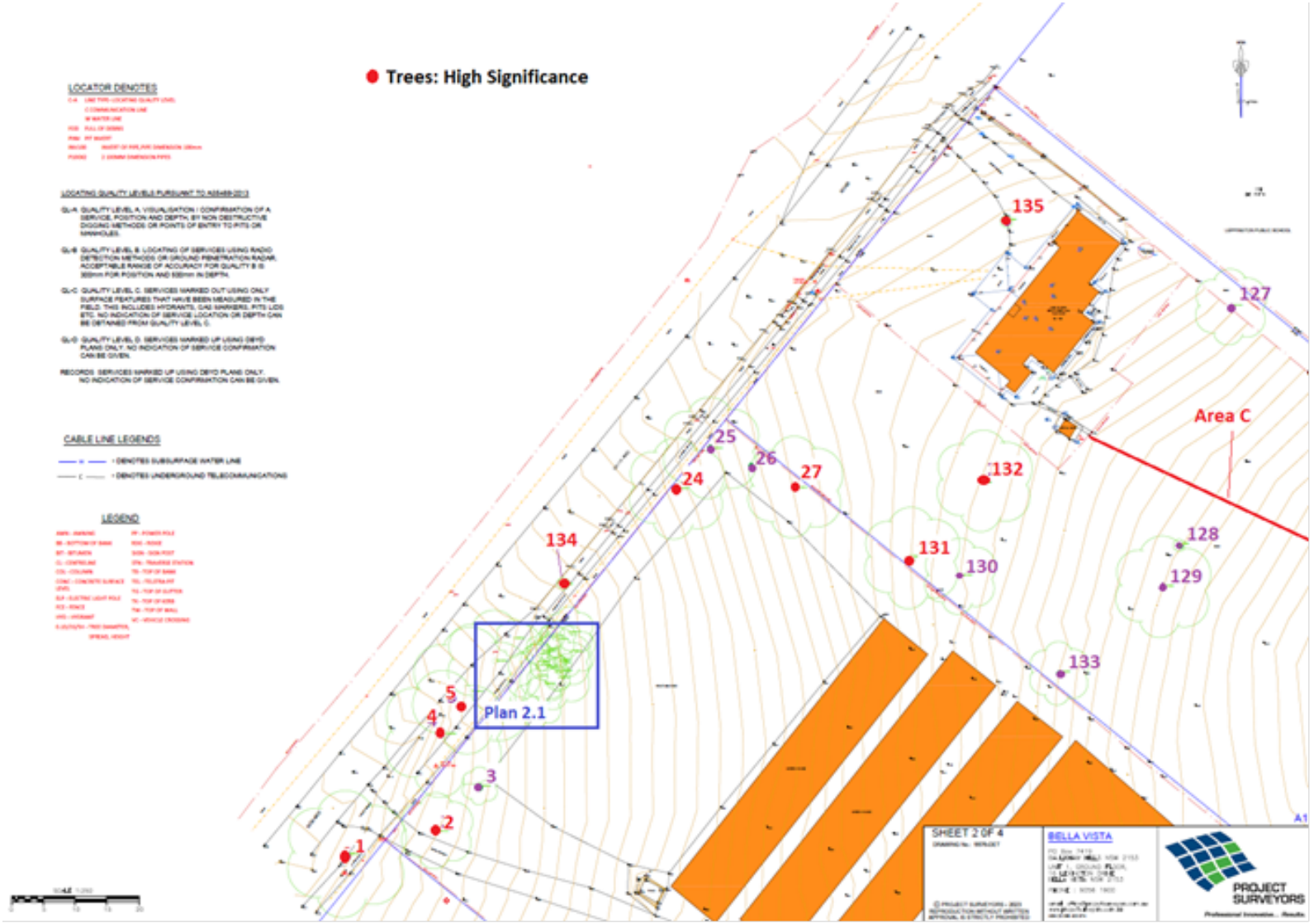
4.5.6 This assessment responds to all the symptoms provided by a tree, however, cannot provide a conclusive recommendation regarding any tree that may have extensive root decay that leads to windthrow without the appropriate symptoms.

5.0 Plan 1; Area of assessment



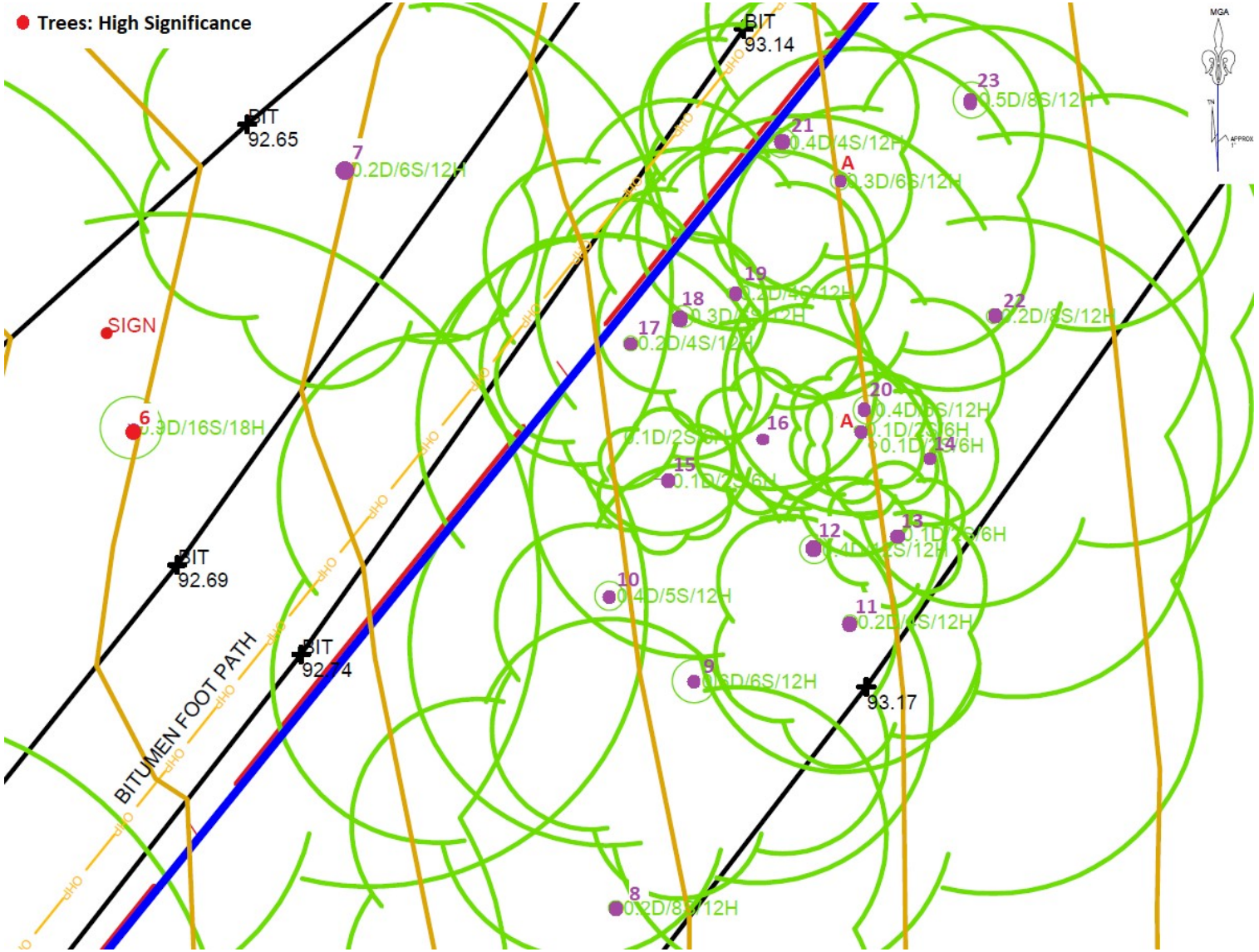
Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.1 Plan 2; Area of assessment including tree location



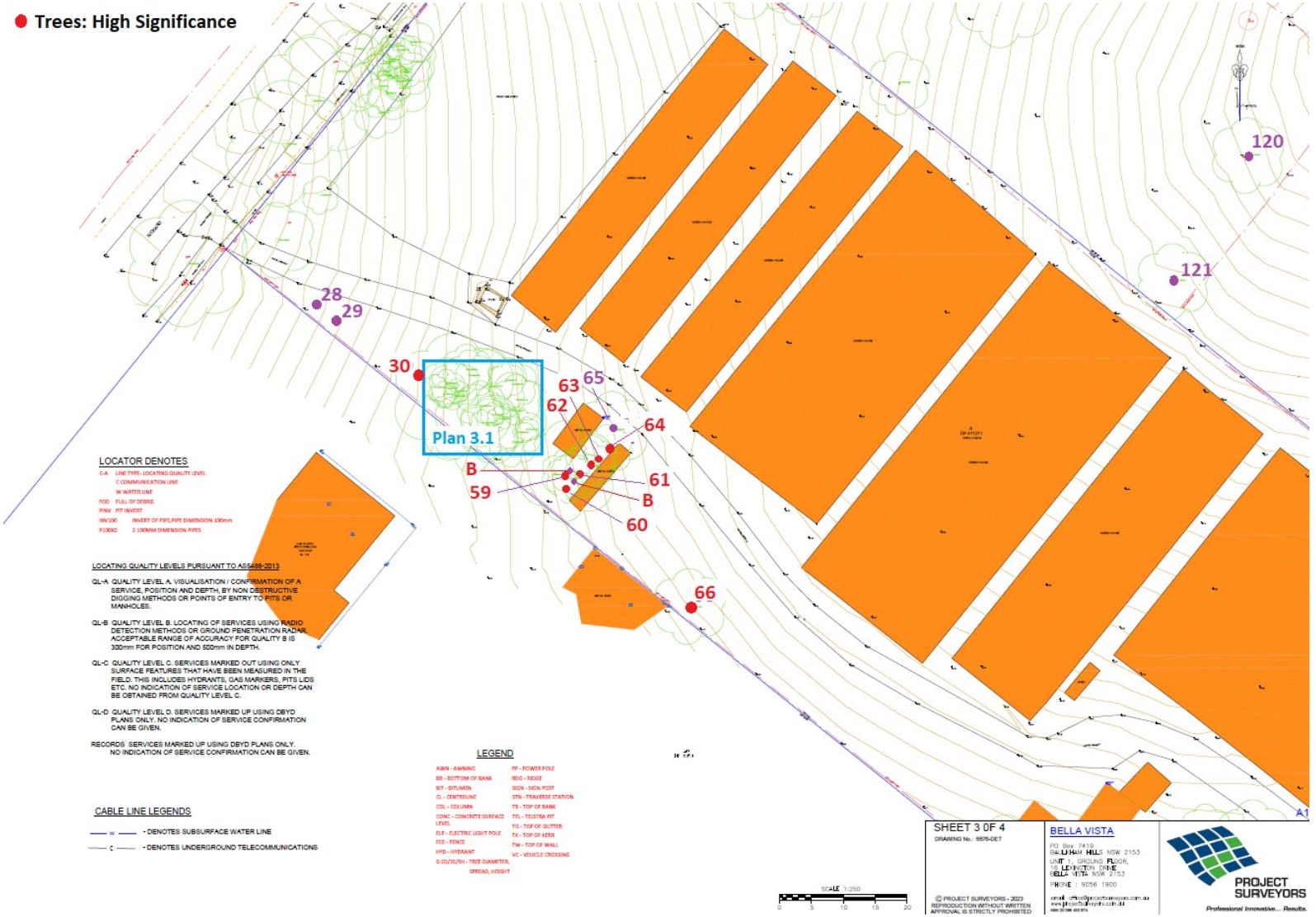
Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.2 Plan 2.1; Area of assessment including tree location



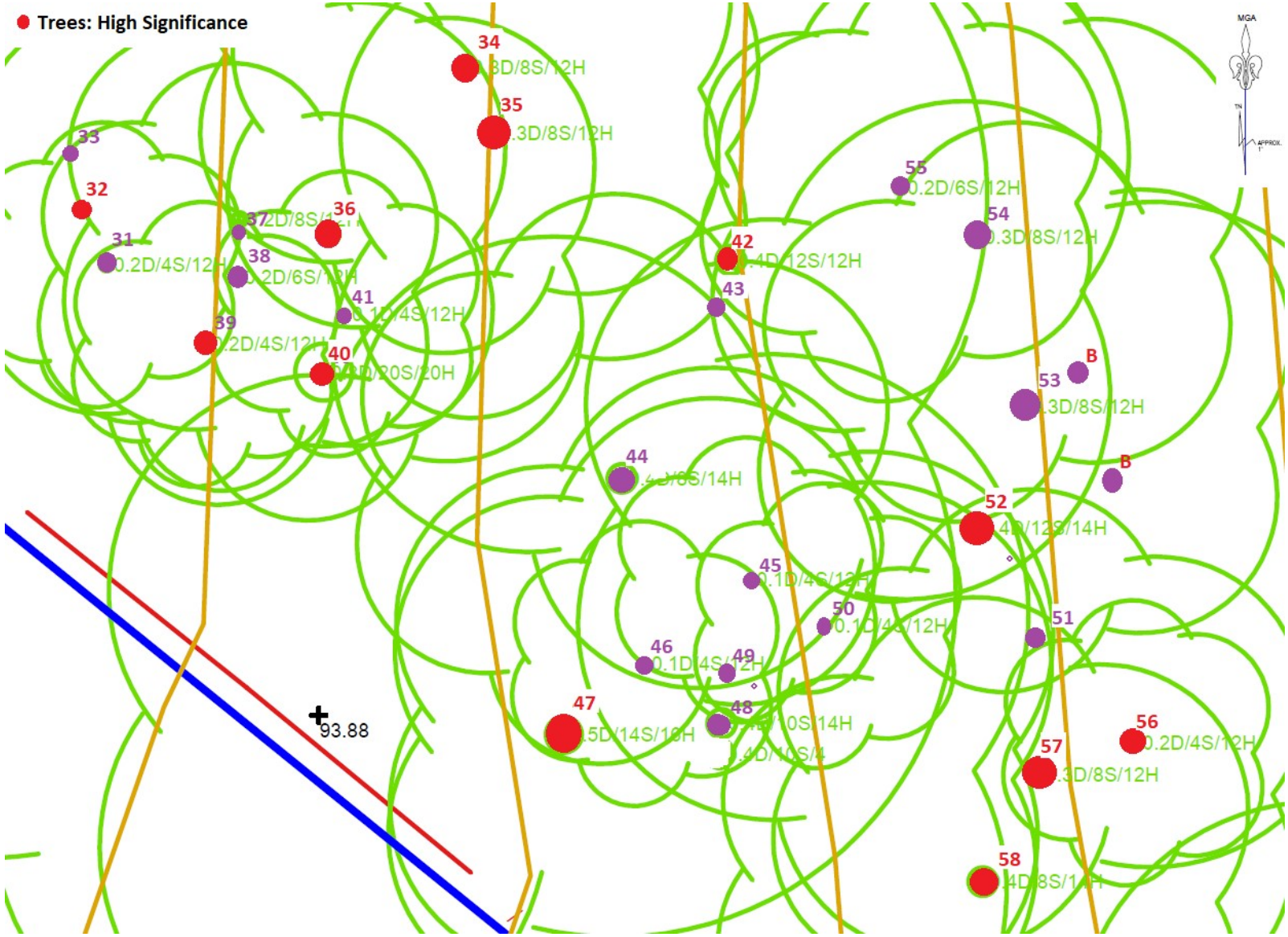
Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.3 Plan 3; Area of assessment including tree location



Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

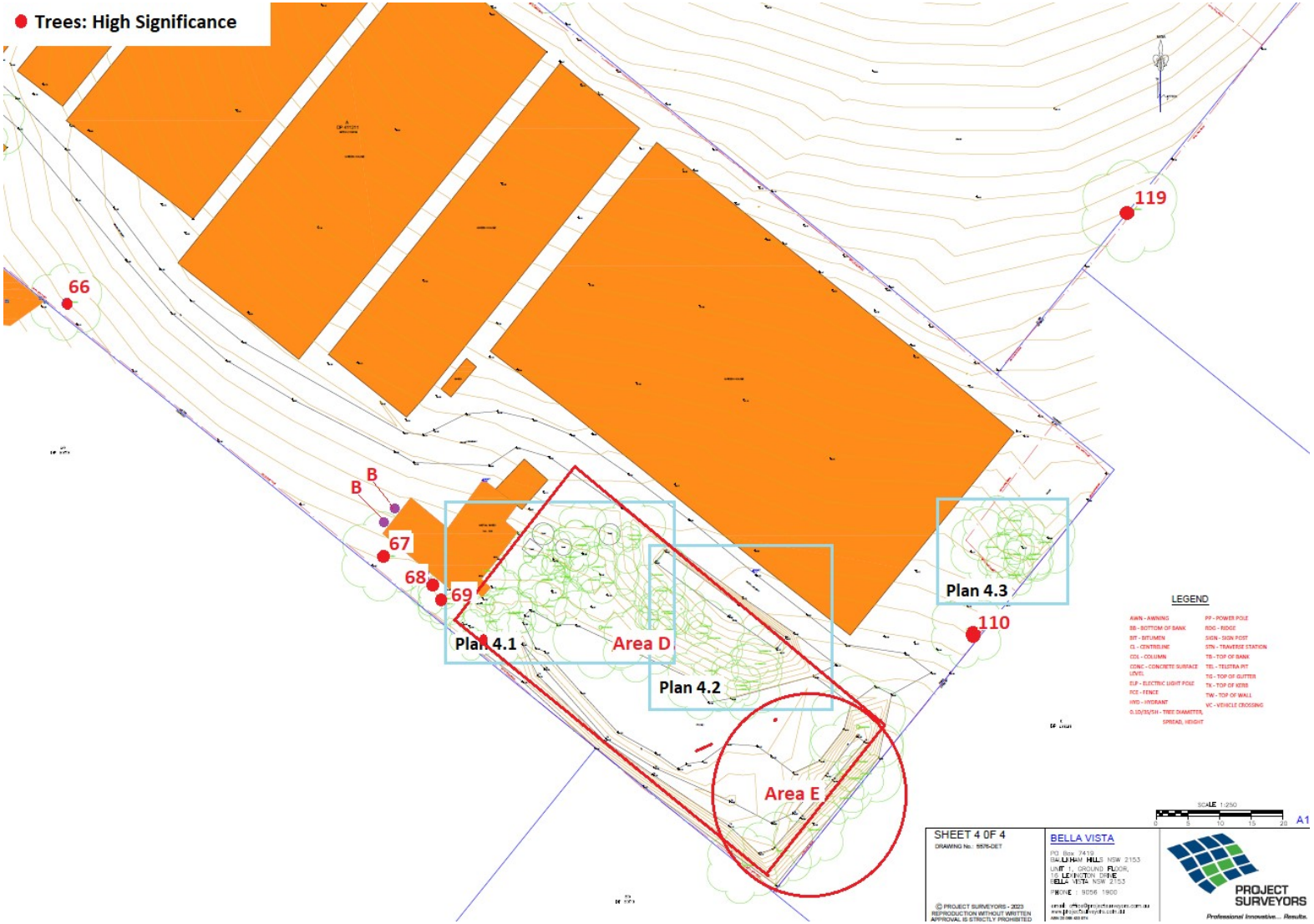
5.4 Plan 3.1; Area of assessment including tree location



Not to scale

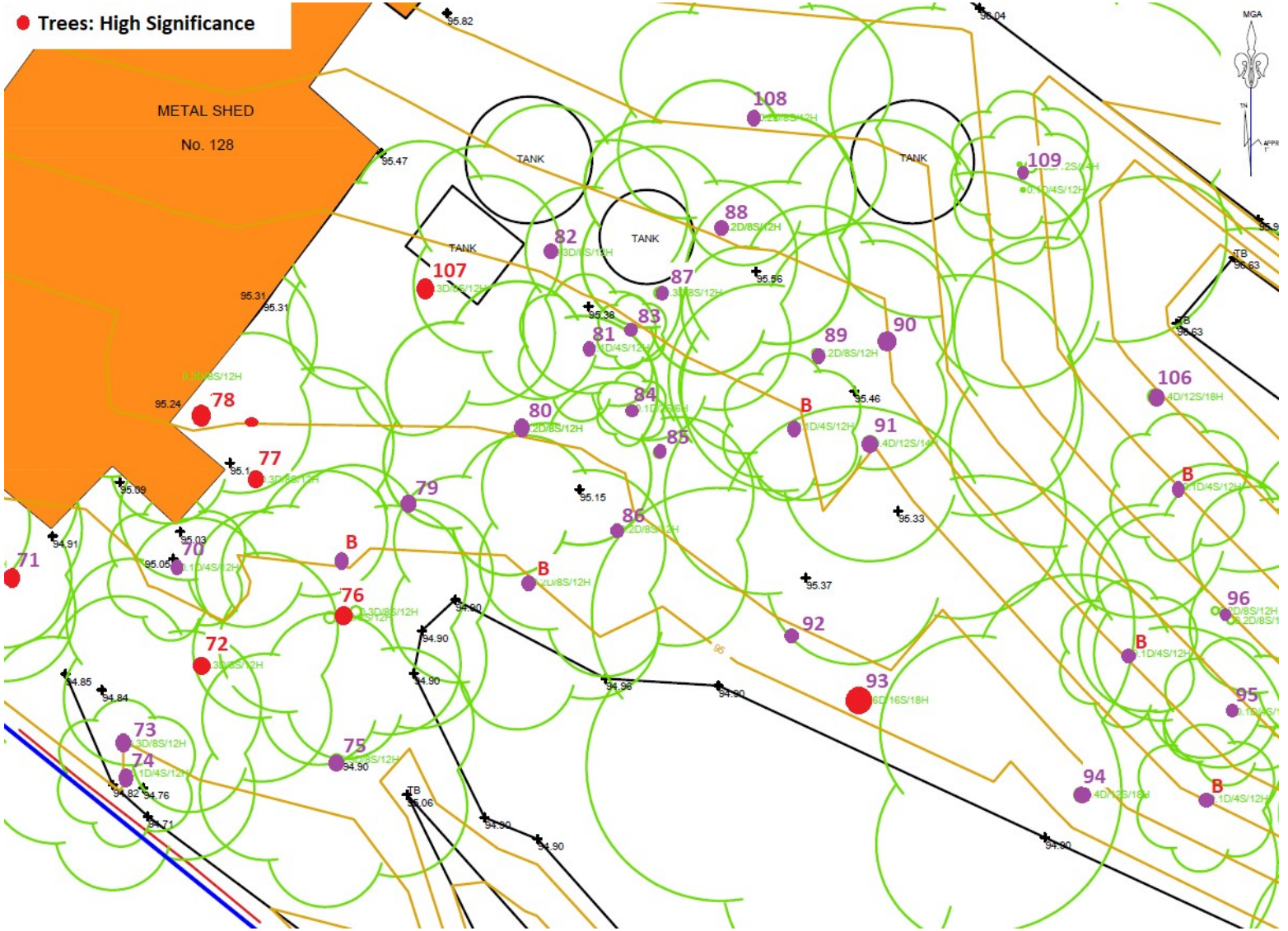
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.5 Plan 4; Area of assessment including tree location



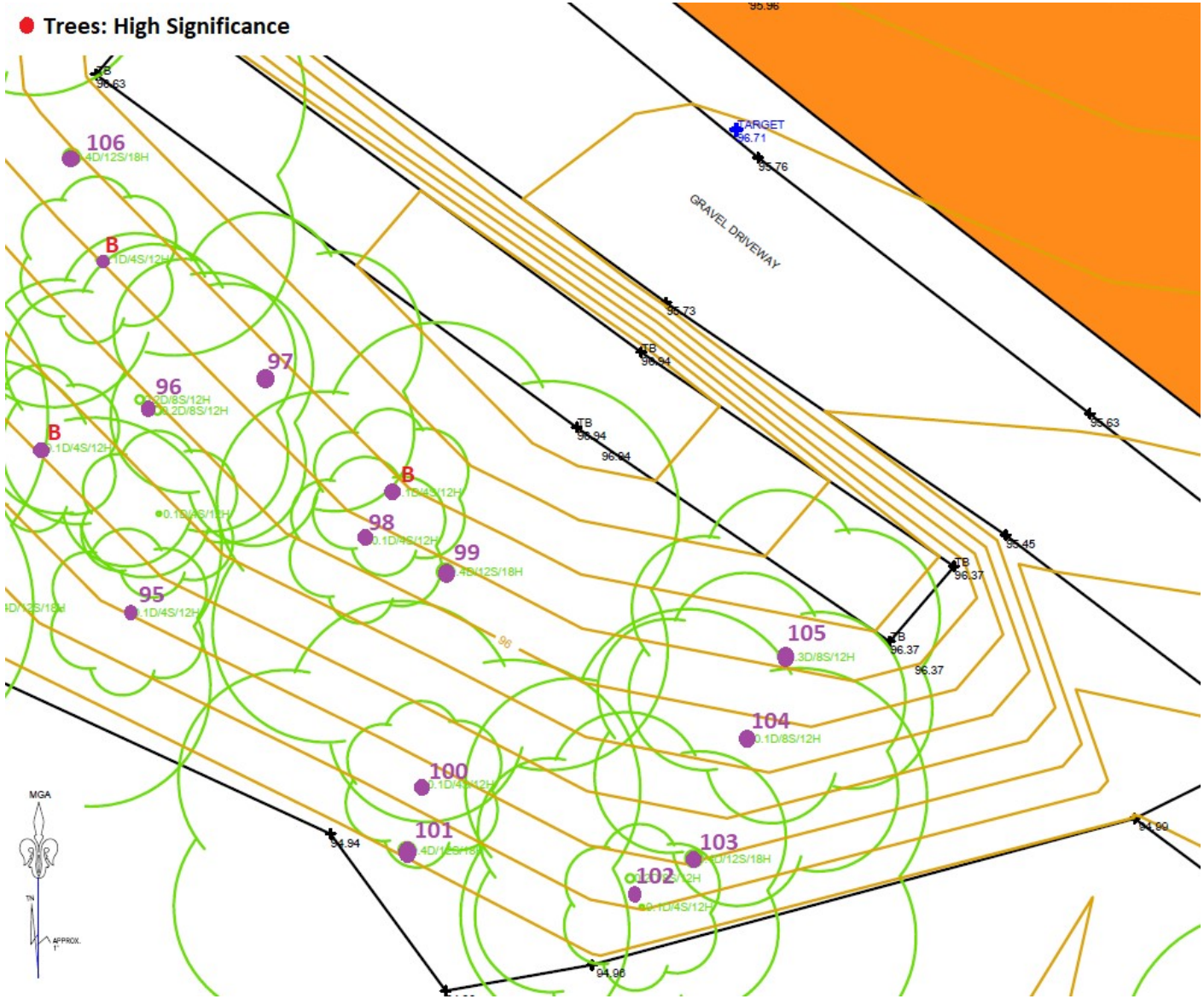
Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.6 Plan 4.1; Area of assessment including tree location



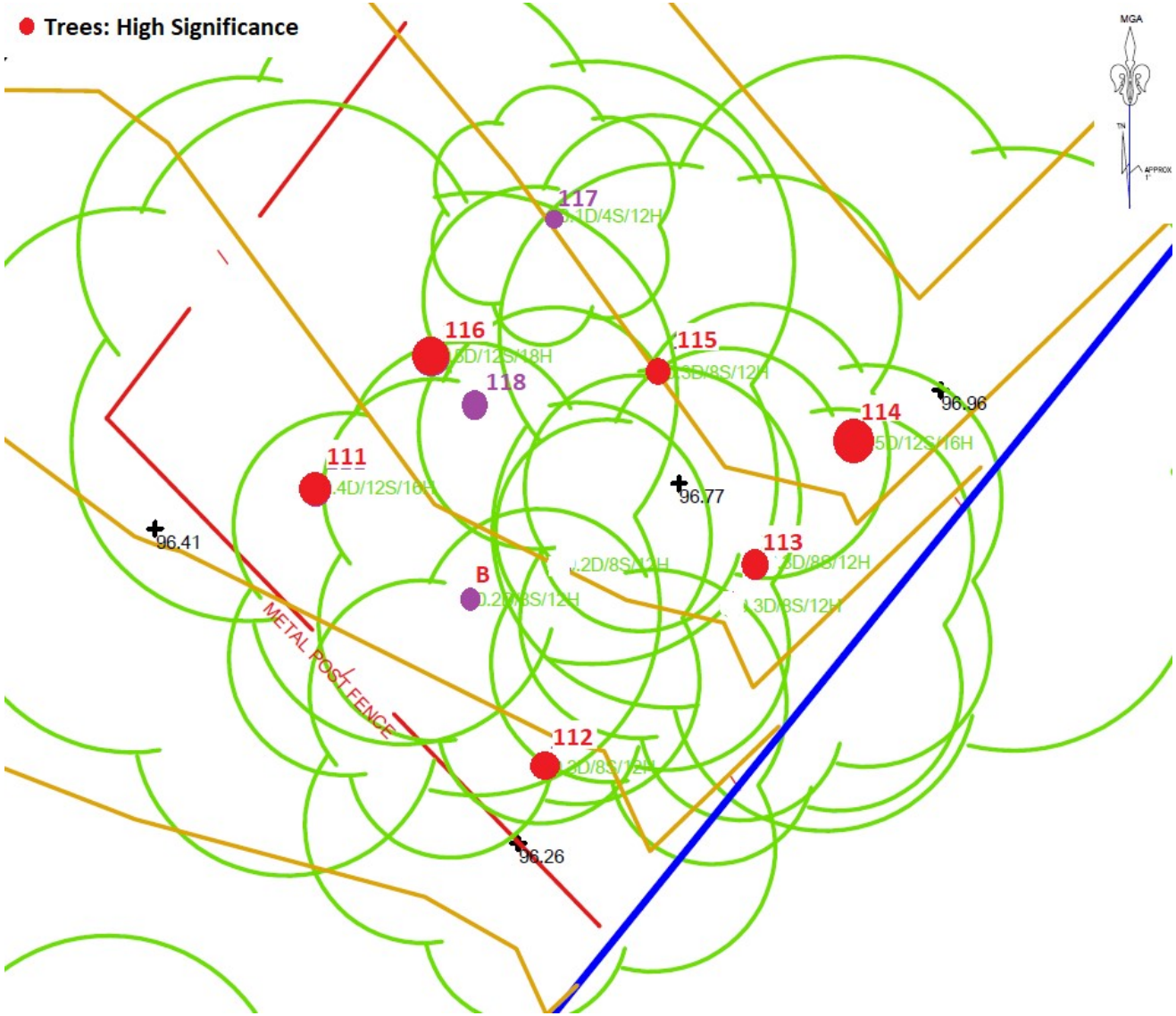
Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.7 Plan 4.2; Area of assessment including tree location



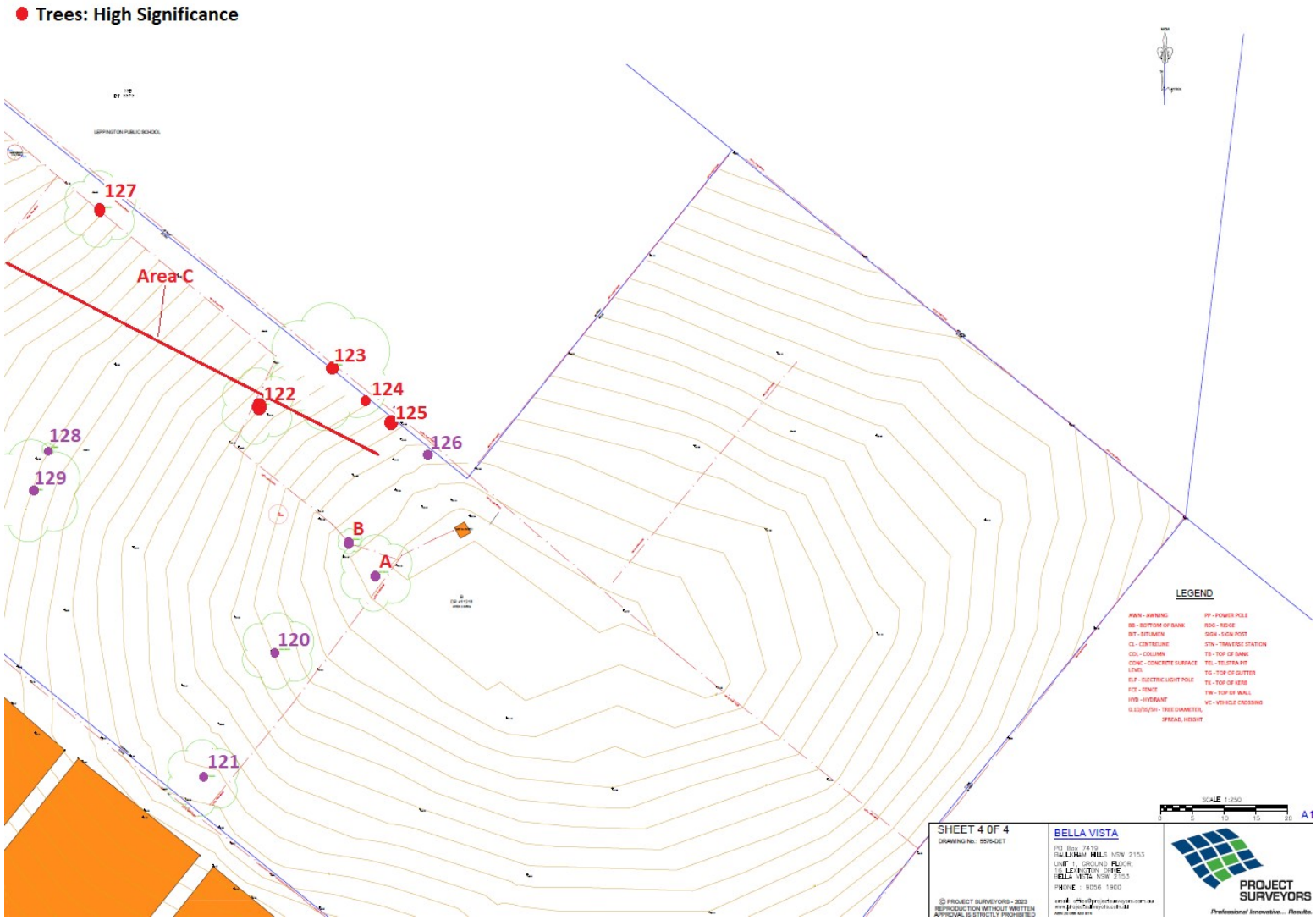
Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.8 Plan 4.3; Area of assessment including tree location



Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

5.9 Plan 5; Area of assessment including tree location



Not to scale
Source: Adapted from *Project Surveyors P/L*, see Section 4.4.1

6.0 Table 1 – Tree Species Data

Terminology/references provided in Appendix A.

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
1	*Eucalyptus moluccana* Grey Box	18	0.76	13 x 13	M	D	Sym	A	**1A**	**High**	**9.12**	**2.95**
Assessment Trees This tree presents as typical of its species. The tree appears to be located on public land owned by Liverpool City Council.											**Activity Impact** See Section 7.1.4	
2	*Eucalyptus tereticornis* Forest Red Gum	20	0.68	12 x 12	M	D	Sym	A	**1A**	**High**	**8.16**	**2.81**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
3	*Eucalyptus moluccana* Grey Box	9	0.24	5 x 5	M	C	Sym	A	**2A**	**Medium**	**2.88**	**1.82**
Assessment This tree presents as typical of its species however is codominant at 3m.											**Activity Impact** See Section 7.1.2	
4	*Eucalyptus moluccana* Grey Box	20	1.10[C,B]	14 x 14	M	D	Sym	A	**2A**	**High**	**13.20**	**3.44**
Assessment This tree presents as typical of its species however is codominant at 3m. The tree appears to be located on public land owned by Liverpool City Council.											**Activity Impact** See Section 7.1.4	
5	*Eucalyptus moluccana* Grey Box	20	0.78	14 x 14	M	C	Sym	A	**2A**	**High**	**9.36**	**2.98**
Assessment This tree presents as typical of its species. The tree appears to be located on public land owned by Liverpool City Council.											**Activity Impact** See Section 7.1.4	
6	*Eucalyptus tereticornis* Forest Red Gum	20	0.65	11 x 10	M	C	N	A	**2A**	**High**	**7.80**	**2.76**
Assessment This tree presents as typical of its species. The tree appears to be located on public land owned by Liverpool City Council.											**Activity Impact** See Section 7.1.4	
7	*Eucalyptus tereticornis* Forest Red Gum	10	0.33	5 x 5	M	C	Sym	A	**2A**	**Medium**	**3.96**	**2.08**
Assessment											**Activity Impact**	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
This tree presents as typical of its species. The tree appears to be located on public land owned by Liverpool City Council.											See Section 7.1.1	
8	*Eucalyptus moluccana* Grey Box	6	0.21	4 x 4	M	C	Sym	A	**2A**	**Medium**	**2.52**	**1.72**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
9	*Eucalyptus moluccana* Grey Box	5	0.12	3 x 3	Y	C	Sym	A	**2A**	**Medium**	**1.44**	**1.36**
Assessment This tree presents as typical of its species. In addition to this a small Forest Redgum under 3m in height exist directly next to this tree on the north side.											**Activity Impact** See Section 7.1.2	
10	*Eucalyptus moluccana* Grey Box	7	0.13	2 x 2	Y	C	Sym	A	**2A**	**Medium**	**1.56**	**1.40**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
11	*Eucalyptus tereticornis* Forest Red Gum	7	0.18	2 x 2	Y	C	W	A	**2A**	**Medium**	**2.16**	**1.61**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
12	*Eucalyptus tereticornis* Forest Red Gum	12	0.55	7 x 7	M	C	Sym	A	**2D**[E]	**Medium**[E]	**6.60**	**2.57**
Assessment This tree divides into multiple leaders at 3m. The northern leader 240mm diameter has died.											**Activity Impact** See Section 7.1.2	
13	*Eucalyptus tereticornis* Forest Red Gum	6	0.15	2 x 2	Y	C	NE	B	**2A**	**Medium**	**1.80**	**1.49**
Assessment This tree has a small dead leader on the south side of the stem.											**Activity Impact** See Section 7.1.2	
14	*Eucalyptus tereticornis* Forest Red Gum	6	0.11	1 x 1	Y	I	NE	B	**2A**	**Low**	**1.32**	**1.31**
Assessment This tree is overcrowded by other trees and has narrow stem tapper.											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
15	*Eucalyptus moluccana* Grey Box	5	0.12	2 x 2	Y	S	Sym	A	**2A**	**Medium**	**1.44**	**1.36**
Assessment This tree is overcrowded by other trees.											**Activity Impact** See Section 7.1.2	
16	*Eucalyptus moluccana* Grey Box	5	0.11	2 x 2	Y	S	Sym	A	**2A**	**Medium**	**1.32**	**1.31**
Assessment This tree is overcrowded by other trees.											**Activity Impact** See Section 7.1.2	
17	*Eucalyptus moluccana* Grey Box	9	0.18	3 x 3	M	C	W	A	**2A**	**Medium**	**2.16**	**1.61**
Assessment This tree is overcrowded by other trees.											**Activity Impact** See Section 7.1.2	
18	*Eucalyptus tereticornis* Forest Red Gum	7	0.10	1 x 1	Y	I	Sym	B	**4A**	**Low**	**1.20**	**1.26**
Assessment Presents with excessive crown decline.											**Activity Impact** See Section 7.1.2	
19	*Eucalyptus moluccana* Grey Box	12	0.22	4 x 4	M	I	Sym	A	**2A**	**Medium**	**2.64**	**1.75**
Assessment This tree is overcrowded by other trees and has narrow stem tapper.											**Activity Impact** See Section 7.1.2	
20	*Eucalyptus tereticornis* Forest Red Gum	6	0.14	2 x 2	Y	I	N	A	**2A**	**Medium**	**1.68**	**1.45**
Assessment This tree is overcrowded by other trees.											**Activity Impact** See Section 7.1.2	
21	*Eucalyptus tereticornis* Forest Red Gum	12	0.26	4 x 4	M	C	Sym	A	**2A**	**Medium**	**3.12**	**1.88**
Assessment This tree is overcrowded by other trees.											**Activity Impact** See Section 7.1.2	
22	*Eucalyptus tereticornis* Forest Red Gum	10	0.40 0.24	3 x 3	M	C	Sym	A	**2A**	**Medium**	**5.60**	**2.40**

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
23	*Eucalyptus tereticornis* Forest Red Gum	12	0.36 0.39[B,C]	6 x 6	M	D	Sym	A	**2A**[C]	**Medium**	**6.37**	**2.54**
Assessment This tree presents as typical of its species however is codominant at 2m up.											**Activity Impact** See Section 7.1.2	
24	*Melaleuca styphelioides* Prickly Leaved Paperbark	6	0.50[B,C]	7 x 7	M	D	Sym	A	**2A**	**High**	**6.00**	**2.47**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.4	
25	*Melaleuca styphelioides* Prickly Leaved Paperbark	6	0.60[B,C]	5 x 5	M	C	Sym	A	**2A**	**Medium**	**7.20**	**2.67**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.4	
26	*Melaleuca styphelioides* Prickly Leaved Paperbark	6	0.50[B,C]	7 x 7	M	C	Sym	A	**2A**	**Medium**	**6.00**	**2.47**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
27	*Melaleuca styphelioides* Prickly Leaved Paperbark	8	0.60	7 x 7	M	C	Sym	A	**2A**	**High**	**7.20**	**2.67**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
28	*Eucalyptus moluccana* Grey Box	18	0.76	12 x 11	M	D	Sym	A	**2D**[E]	**Medium**	**9.12**	**2.95**
Assessment The eastern leader of this tree has recently failed. The failure pattern suggest that the cause is symptomatic of a wind generated branch tear out. At 11m on the western side of the crown a secondary leader presents with significant swelling. An											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
aerial assessment is required to allow for further comment on the tree in relation to the proposed activity.												
29	*Eucalyptus moluccana* Grey Box	9	0.27	5 x 5	M	C	Sym	A	**2A**	**Medium**	**3.24**	**1.91**
Assessment This tree is overcrowded by other trees.											**Activity Impact** See Section 7.1.2	
30	*Melaleuca styphelioides* Prickly Leaved Paperbark	5	0.40[B,C]	5 x 5	M	D	Sym	A	**2A**	**High**	**4.80**	**2.25**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
31	*Eucalyptus moluccana* Grey Box	7	0.25	4 x 4	M	C	SW	A	**2A**	**Medium**	**3.00**	**1.85**
Assessment This tree presents as typical of its species and has a natural growth progression to the southwest.											**Activity Impact** See Section 7.1.2	
32	*Eucalyptus moluccana* Grey Box	16	0.28 0.29	6 x 7	M	I	W	A	**2B**	**High**	**4.84**	**2.26**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
33	*Eucalyptus moluccana* Grey Box	16	0.40	8 x 8	M	C	NW	B	**2A**	**Medium**	**4.80**	**2.25**
Assessment This tree presents as typical of its species however presents with significant crown decline.											**Activity Impact** See Section 7.1.2	
34	*Eucalyptus moluccana* Grey Box	16	0.37	8 x 6	M	C	N	A	**2A**	**High**	**4.44**	**2.18**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
35	*Eucalyptus moluccana* Grey Box	18	0.32	5 x 5	M	I	Sym	A	**2A**	**High**	**3.84**	**2.05**
Assessment This tree presents as typical of its species however is codominant at 8m.											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
36	*Eucalyptus moluccana* Grey Box	18	0.34	6 x 6	M	I	S	A	**2A**	**High**	**4.08**	**2.10**
Assessment This tree presents as typical of its species however is codominant at 5m.											**Activity Impact** See Section 7.1.2	
37	*Eucalyptus moluccana* Grey Box	9	0.23	3 x 3	M	C	SW	A	**2A**	**Medium**	**2.76**	**1.79**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
38	*Eucalyptus moluccana* Grey Box	9	0.25	4 x 3	M	C	S	A	**2A**	**Medium**	**3.00**	**1.85**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
39	*Eucalyptus moluccana* Grey Box	12	0.26	7 x 5	M	C	S	A	**2A**	**High**	**3.12**	**1.88**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
40	*Eucalyptus moluccana* Grey Box	18	0.28	6 x 6	M	F	Sym	A	**2A**	**High**	**3.36**	**1.94**
Assessment This tree presents as typical of its species however is codominant at 7m.											**Activity Impact** See Section 7.1.2	
41	*Eucalyptus moluccana* Grey Box	10	0.16	2 x 2	Y	I	Sym	B	**2A**	**Medium**	**1.92**	**1.53**
Assessment This tree presents as typical of its species however the western leader has died.											**Activity Impact** See Section 7.1.2	
42	*Eucalyptus moluccana* Grey Box	20	0.49	12 x 10	M	C	Sym	A	**1B**	**High**	**5.88**	**2.45**
Assessment This tree presents as typical of its species however is codominant at 6m.											**Activity Impact** See Section 7.1.2	
43	*Eucalyptus moluccana* Grey Box	6	0.12[C]	3 x 3	Y	C	SE	B	**2D**	**Medium**	**1.44**	**1.36**
Assessment											**Activity Impact**	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
This tree presents as typical of its species however presents with some twiggy decline.											See Section 7.1.2	
44	*Eucalyptus moluccana* Grey Box	8	0.13	1 x 1	Y	I	Sym	A	**2A**	**Medium**	**1.56**	**1.40**
Assessment This tree presents as typical of its species however presents with some twiggy decline.											**Activity Impact** See Section 7.1.2	
45	*Eucalyptus moluccana* Grey Box	5	0.10	2 x 2	M	C	Sym	A	**2A**	**Medium**	**1.20**	**1.26**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
46	*Eucalyptus moluccana* Grey Box	7	0.13	3 x 3	Y	C	NE	A	**2A**	**Medium**	**1.56**	**1.40**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
47	*Eucalyptus moluccana* Grey Box	20	0.60	12 x 12	Y	C	Sym	A	**1B**[E]	**High**[E]	**7.20**	**2.67**
Assessment This tree presents as typical of its species however is codominant with significant swelling at 6m. An aerial assessment is required to allow for further comment on the tree in relation to the proposed activity.											**Activity Impact** See Section 7.1.2	
48	*Eucalyptus moluccana* Grey Box	5	0.14 0.10	3 x 2	Y	C	S	A	**2A**	**Medium**	**2.06**	**1.58**
Assessment This consist of two trees sharing same root mass.											**Activity Impact** See Section 7.1.2	
49	*Eucalyptus moluccana* Grey Box	9	0.16	3 x 3	M	C	SW	A	**2A**	**Medium**	**1.92**	**1.53**
Assessment This tree presents as tall with a small crown mass.											**Activity Impact** See Section 7.1.2	
50	*Eucalyptus moluccana* Grey Box	8	0.13	3 x 3	Y	C	Sym	A	**2A**	**Medium**	**1.56**	**1.40**
Assessment This tree presents as tall with a small crown mass.											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
51	*Eucalyptus moluccana* Grey Box	5	0.12 0.10	3 x 3	Y	C	NE	A	**2A**	**Medium**	**1.87**	**1.52**
Assessment This tree is experiencing branch conflict with other trees.											**Activity Impact** See Section 7.1.2	
52	*Eucalyptus moluccana* Grey Box	20	0.40	7 x 7	M	F	Sym	A	**1B**	**High**	**4.80**	**2.25**
Assessment This tree presents as typical of its species however is codominant at 15m.											**Activity Impact** See Section 7.1.2	
53	*Eucalyptus moluccana* Grey Box	12	0.30	7 x 5	M	C	N	A	**2A**[C]	**Medium**[C]	**3.60**	**2.00**
Assessment The crown has a northern bias and is appears to be heavily covered in vine.											**Activity Impact** See Section 7.1.2	
54	*Eucalyptus moluccana* Grey Box	12	0.20[C]	3 x 3	M	I	NE	B	**2A**[C]	**Medium**[C]	**2.40**	**1.68**
Assessment The crown appears to be heavily covered in vine.											**Activity Impact** See Section 7.1.2	
55	*Eucalyptus moluccana* Grey Box	10	0.20[C]	3 x 3	M	C	NE	B	**2D**[C]	**Medium**[C]	**2.40**	**1.68**
Assessment This tree presents as typical of its species however there is some decline developing throughout the crown.											**Activity Impact** See Section 7.1.2	
56	*Eucalyptus moluccana* Grey Box	10	0.25[C]	6 x 5	M	C	E	A	**2A**[C]	**High**[C]	**3.00**	**1.85**
Assessment This tree presents as typical of its species however.											**Activity Impact** See Section 7.1.2	
57	*Eucalyptus moluccana* Grey Box	18	0.34[C]	6 x 6	M	C	Sym	A	**2A**	**High**	**4.08**	**2.10**
Assessment This tree presents as typical of its species however is codominant at 7m.											**Activity Impact** See Section 7.1.2	
58	*Eucalyptus moluccana* Grey Box	17	0.44[E]	8 x 8	M	C	Sym	A	**2A**[E]	**High**[E]	**5.28**	**2.34**
Assessment											**Activity Impact**	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
This tree presents as typical of its species however is codominant with swelling in the stem at 4m. This would require an internal diagnostic assessment to allow for further comment on the tree in relation to the proposed activity.											See Section 7.1.2	
59	*Eucalyptus moluccana* Grey Box	10	0.29	6 x 6	M	C	E	A	**2A**	**High**	**3.48**	**1.97**
Assessment This tree presents as typical of its species however is codominant at 4m.											**Activity Impact** See Section 7.1.2	
60	*Eucalyptus moluccana* Grey Box	12	0.27	5 x 5	M	C	S	A	**2A**	**High**	**3.24**	**1.91**
Assessment This tree presents as typical of its species however is codominant at 4m.											**Activity Impact** See Section 7.1.2	
61	*Eucalyptus moluccana* Grey Box	14	0.30	5 x 6	M	C	Sym	A	**2A**	**High**	**3.60**	**2.00**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
62	*Eucalyptus moluccana* Grey Box	23	0.41[C]	7 x 7	M	F	Sym	A	**1B**[C]	**High**[C]	**4.92**	**2.28**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
63	*Eucalyptus moluccana* Grey Box	9	0.21	4 x 4	M	C	Sym	A	**2A**[C]	**High**[C]	**2.52**	**1.72**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
64	*Eucalyptus moluccana* Grey Box	16	0.46[C]	8 x 9	M	C	NW	B	**2A**[C]	**High**[C]	**5.52**	**2.39**
Assessment This tree presents as typical of its species however there is some decline on the south side of crown. A shipping container has been placed on the ground close to the tree.											**Activity Impact** See Section 7.1.2	
65	*Eucalyptus moluccana* Grey Box	18	0.50	10 x 10	M	C	N	B	**2D**	**Medium**	**6.00**	**2.47**
Assessment This tree presents with excessive twiggy decline. A shipping container has been placed on the ground close to the tree. There											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
is a pile of mixed debris and rubbish under tree.												
66	*Melaleuca styphelioides* Prickly-leaved Paperbark	8	0.60[B,C]	8 x 8	M	D	Sym	A	**2A**	**High**	**7.20**	**2.67**
Assessment This tree presents with excessive twiggy decline.											**Activity Impact** See Section 7.1.2	
67	*Eucalyptus tereticornis* Forest Red Gum	20	0.84	15 x 15	M	D	Sym	A	**2A**	**High**	**10.08**	**3.08**
Assessment This tree presents as typical of its species however is codominant at 3m and some twiggy decline has exists within the crown.											**Activity Impact** See Section 7.1.2	
68	*Eucalyptus moluccana* Grey Box	11	0.25	3 x 3	M	D	Sym	A	**2A**	**High**	**3.00**	**1.85**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
69	*Eucalyptus moluccana* Grey Box	11	0.35	5 x 5	M	C	Sym	A	**2A**	**High**	**4.20**	**2.13**
Assessment This tree presents as typical of its species however is codominant at 2m.											**Activity Impact** See Section 7.1.2	
70	*Eucalyptus moluccana* Grey Box	7	0.20[C]	3 x 3	M	I	Sym	B	**2D**[E,C]	**Medium**[C]	**2.40**	**1.68**
Assessment This tree presents as typical of its species however some twiggy decline exists throughout the crown.											**Activity Impact** See Section 7.1.2	
71	*Eucalyptus tereticornis* Forest Red Gum	7	0.26[C]	2 x 2	M	C	SW	A	**2A**[C]	**High**[C]	**3.12**	**1.88**
Assessment This tree presents as typical of its species however is codominant at 2m.											**Activity Impact** See Section 7.1.2	
72	*Eucalyptus tereticornis* Forest Red Gum	13	0.30[C]	4 x 4	M	F	Sym	A	**1B**[C]	**High**[C]	**3.60**	**2.00**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
73	*Eucalyptus tereticornis*	10	0.30	4 x 3	M	C	Sym	B	**2A**	**Medium**	**3.60**	**2.00**

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
	Forest Red Gum											
Assessment This tree presents as typical of its species however there is some twiggy decline exists throughout the crown.											**Activity Impact** See Section 7.1.2	
74	*Eucalyptus moluccana* Grey Box	5	0.14	3 x 3	M	C	Sym	B	**3A**	**Medium**	**1.68**	**1.45**
Assessment This tree presents as typical of its species however some twiggy decline exists throughout the crown.											**Activity Impact** See Section 7.1.2	
75	*Eucalyptus moluccana* Grey Box	13	0.30	5 x 5	M	C	Sym	B	**2A**[C]	**Medium**[C]	**3.60**	**2.00**
Assessment This tree presents as typical of its species however some twiggy decline exists throughout the crown.											**Activity Impact** See Section 7.1.2	
76	*Eucalyptus tereticornis* Forest Red Gum	13	0.30 0.30	6 x 7	M	F	Sym	A	**2A**	**High**	**5.09**	**2.31**
Assessment This is two trees sharing the same root mass. The trees present as typical of the species.											**Activity Impact** See Section 7.1.2	
77	*Eucalyptus moluccana* Grey Box[A]	13	0.27[C]	5 x 5	M	C	Sym	A	**2A**[C]	**High**[C]	**3.24**	**1.91**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
78	*Eucalyptus moluccana* Grey Box[A]	13	0.32[C]	6 x 6	M	C	Sym	A	**2A**[C]	**High**[C]	**3.84**	**2.05**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
79	*Eucalyptus moluccana* Grey Box	11	0.24[C]	3 x 3	M	F	Sym	-	**4C**	**Low**	**2.88**	**1.82**
Assessment This tree is dead and therefore requires to be removed.											**Activity Impact** See Section 7.1.2	
80	*Eucalyptus moluccana* Grey Box	13	0.25[C]	5 x 4	M	C	Sym	B	**2A**[C]	**Medium**	**3.00**	**1.85**
Assessment This tree presents as typical of its species however epicormic growth has formed on some branches and some twiggy dieback											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
exists throughout the crown.												
81	*Eucalyptus moluccana* Grey Box	11	0.14[C]	2 x 2	M	I	Sym	B	**4A**[C]	**Medium**[C]	**1.68**	**1.45**
Assessment The tree has excessive amounts of epicormic growth on the stem and branches. The crown presents with some decline.											**Activity Impact** See Section 7.1.2	
82	*Eucalyptus moluccana* Grey Box	12	0.34[C]	5 x 6	M	C	SW	B	**2A**[C]	**Medium**[C]	**4.08**	**2.10**
Assessment This tree presents as typical of its species however some twiggy dieback exists throughout the crown.											**Activity Impact** See Section 7.1.2	
83	*Eucalyptus moluccana* Grey Box	5	0.12[C]	3 x 3	Y	C	W	-	**4C**	**Low**	**1.44**	**1.36**
Assessment This tree is dead and therefore requires to be removed.											**Activity Impact** See Section 7.1.2	
84	*Eucalyptus tereticornis* Forest Red Gum	6	0.15[C]	3 x 2	M	C	Sym	C	**4A**[C]	**Low**[C]	**1.80**	**1.49**
Assessment The tree appears to be in irreversible decline.											**Activity Impact** See Section 7.1.2	
85	*Eucalyptus tereticornis* Forest Red Gum	13	0.35[C]	5 x 5	M	C	Sym	C	**2A**[C]	**Medium**[C]	**4.20**	**2.13**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
86	*Eucalyptus tereticornis* Forest Red Gum	9	0.24[C]	3 x 4	M	C	S	C	**4A**[C]	**Low**[C]	**2.88**	**1.82**
Assessment The tree appears to be in irreversible decline.											**Activity Impact** See Section 7.1.2	
87	*Eucalyptus moluccana* Grey Box	13	0.27[C]	6 x 4	M	I	Sym	B	**2A**[C]	**Medium**[C]	**3.24**	**1.91**
Assessment The stem of this tree has been charred and burnt. The crown of the tree presents with some decline.											**Activity Impact** See Section 7.1.2	
88	*Eucalyptus moluccana* Grey Box	7	0.30[C,B]	5 x 5	M	C	Sym	-	**4A**[C]	**Low**[C]	**3.60**	**2.00**

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
Assessment This tree is dead and therefore requires to be removed.											**Activity Impact** See Section 7.1.2	
89	*Eucalyptus tereticornis* Forest Red Gum	11	0.29[C]	5 x 5	M	C	Sym	B	**3A**[C]	**Medium**[C]	**3.48**	**1.97**
Assessment This tree presents as typical of its species however some twiggy dieback exists throughout the crown.											**Activity Impact** See Section 7.1.2	
90	*Eucalyptus tereticornis* Forest Red Gum	18	0.45[C]	11 x 12	M	C	N	A	**2A**[C]	**Medium**[C]	**5.40**	**2.37**
Assessment This tree presents as typical of its species however the stem has been charred and burnt.											**Activity Impact** See Section 7.1.2	
91	*Eucalyptus tereticornis* Forest Red Gum	18	0.40[C]	5 x 5	M	C	Sym	C	**3A**[C]	**Medium**[C]	**4.80**	**2.25**
Assessment This tree presents as typical of its species however some twiggy dieback is developing throughout the crown.											**Activity Impact** See Section 7.1.2	
92	*Eucalyptus tereticornis* Forest Red Gum	6	0.15[C]	4 x 3	Y	C	Sym	C	**4A**[C]	**Low**[C]	**1.80**	**1.49**
Assessment This tree presents as typical of its species however some twiggy dieback developing throughout the crown.											**Activity Impact** See Section 7.1.2	
93	*Eucalyptus tereticornis* Forest Red Gum	18	0.70[B,C]	10 x 10	M	C	Sym	A	**2A**[C]	**High**[C]	**8.40**	**2.85**
Assessment This tree presents as typical of its species however is codominant at 2m. The lower portion of the stem has been charred and burnt.											**Activity Impact** See Section 7.1.2	
94	*Eucalyptus tereticornis* Forest Red Gum	17	0.50[C]	7 x 7	M	C	NE	A	**2A**[C,E]	**Medium**[C,E]	**6.00**	**2.47**
Assessment This tree presents as typical of its species however part of the stem has been charred and burnt.											**Activity Impact** See Section 7.1.2	
95	*Eucalyptus tereticornis* Forest Red Gum	7	0.16[C]	5 x 5	Y	C	Sym	C	**4A**[C]	**Low**[C]	**1.92**	**1.53**
Assessment The tree is senescing and appears to be in irreversible decline.											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
96	*Eucalyptus tereticornis* Forest Red Gum	12	0.23 0.23[C]	5 x 6	M	C	Sym	B	**3A**[C]	**Low**[C]	**3.90**	**2.06**
Assessment This is two stems sharing the same root base. Much of the stem of this tree has been charred and burnt.											**Activity Impact** See Section 7.1.2	
97	*Eucalyptus tereticornis* Forest Red Gum	15	0.35	7 x 8	M	C	NE	B	**3A**[C]	**Medium**[C]	**4.20**	**2.13**
Assessment An excessive amount soil and rubbish has been built up around the base of the tree. The crown has formed excessive amounts of epicormic growth on branches.											**Activity Impact** See Section 7.1.2	
98	*Eucalyptus tereticornis* Forest Red Gum	9	0.14[C]	2 x 2	M	C	Sym	A	**2A**[C]	**Medium**[C]	**1.68**	**1.45**
Assessment This tree presents as typical of its species however part of the stem has been charred and burnt.											**Activity Impact** See Section 7.1.2	
99	*Eucalyptus tereticornis* Forest Red Gum	12	0.20 0.35[C]	6 x 7	M	C	N	B	**2A**[C]	**Medium**[C]	**4.84**	**2.26**
Assessment This tree presents with a significant crown decline. An excessive amount soil and rubbish has been built up around the base of the tree.											**Activity Impact** See Section 7.1.2	
100	*Eucalyptus tereticornis* Forest Red Gum	8	0.22[C]	3 x 3	M	C	W	A	**2A**[C]	**Medium**[C]	**2.64**	**1.75**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
101	*Eucalyptus tereticornis* Forest Red Gum	12	0.36[C]	8 x 8	Y	C	Sym	A	**2A**[C]	**Medium**[C]	**4.32**	**2.15**
Assessment This tree presents as typical of its species however is codominant at 5m.											**Activity Impact** See Section 7.1.2	
102	*Eucalyptus tereticornis* Forest Red Gum	14	0.30[C]	7 x 6	M	C	Sym	A	**2A**[C]	**High**[C]	**3.60**	**2.00**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
103	*Eucalyptus tereticornis*	14	0.50[C,B]	6 x 6	M	C	Sym	B	**2A**	**Medium**	**6.00**	**2.47**

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
	Forest Red Gum											
Assessment This tree presents as typical of its species however some twiggy dieback exist within the lower portion of the crown.											**Activity Impact** See Section 7.1.2	
104	*Eucalyptus tereticornis* Forest Red Gum	9	0.24[C]	3 x 3	M	C	Sym	B	**2A**[C]	**Medium**[C]	**2.88**	**1.82**
Assessment This tree presents as typical of its species however some twiggy dieback exist within the lower portion of the crown.											**Activity Impact** See Section 7.1.2	
105	*Eucalyptus tereticornis* Forest Red Gum	12	0.30[C]	7 x 7	M	C	N	A	**2A**[C]	**Medium**[C]	**3.60**	**2.00**
Assessment An excessive amount soil and rubbish has been built up around the base of the tree.											**Activity Impact** See Section 7.1.2	
106	*Eucalyptus tereticornis* Forest Red Gum	14	0.30[C]	7 x 7	M	C	N	B	**2A**[C]	**Medium**[C]	**3.60**	**2.00**
Assessment An excessive amount soil and rubbish has been built up around the base of the tree.											**Activity Impact** See Section 7.1.2	
107	*Eucalyptus moluccana* Grey Box	16	0.30[C]	7 x 7	M	C	N	A	**2A**[C]	**High**[C]	**3.60**	**2.00**
Assessment This tree presents as typical of its species however part of the stem has been charred and burnt.											**Activity Impact** See Section 7.1.2	
108	*Eucalyptus moluccana* Grey Box[C]	13	0.25	3 x 3	M	C	Sym	-	**4A**	**LOW**	**3.00**	**1.85**
Assessment This tree presents as typical of its species however the stem has been charred and burnt.											**Activity Impact** See Section 7.1.2	
109	*Eucalyptus tereticornis* Forest Red Gum	12	0.29	6 x 7	M	C	Sym	B	**3A**[C]	**Medium**[C]	**3.48**	**1.97**
Assessment An excessive amount soil and rubbish has been built up around the base of the tree. The crown area of this tree appears to be declining.											**Activity Impact** See Section 7.1.2	
110	*Eucalyptus moluccana* Grey Box	15	0.40[C]	7 x 7	M	D	Sym	A	**2A**[C]	**High**[C]	**4.80**	**2.25**
Assessment											**Activity Impact**	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
This tree presents as typical of its species however.											See Section 7.1.2	
111	*Eucalyptus moluccana* Grey Box	16	0.48[C]	9 x 8	M	C	SW	A	**1B**	**High**	**5.76**	**2.43**
Assessment This tree presents as typical of its species however											**Activity Impact** See Section 7.1.4	
112	*Eucalyptus tereticornis* Forest Red Gum	16	0.35	6 x 6	M	C	Sym	A	**1B**	**High**	**4.20**	**2.13**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.4	
113	*Eucalyptus moluccana* Grey Box	16	0.48 0.50	12 x 11	M	C	Sym	A	**1B**	**High**	**8.32**	**2.84**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.3	
114	*Eucalyptus moluccana* Grey Box	11	1.10[C]	12 x 11	M	C	NE	A	**1B**[E]	**High**[E]	**13.20**	**3.44**
Assessment This tree presents as typical of its species however has developed a wound on west side of bole at 2m. This would require an Internal diagnostic assessment to allow for further comment on the tree in relation to the proposed activity.											**Activity Impact** See Section 7.1.4	
115	*Eucalyptus moluccana* Grey Box	11	0.35	7 x 7	M	C	Sym	A	**2A**	**High**	**4.20**	**2.13**
Assessment This tree presents as typical of its species however is codominant at 4m.											**Activity Impact** See Section 7.1.1	
116	*Eucalyptus moluccana* Grey Box	16	0.50	10 x 11	M	C	N	A	**2A**	**High**	**6.00**	**2.47**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.1	
117	*Eucalyptus moluccana* Grey Box	7	0.17	4 x 3	Y	C	Sym	C	**3A**	**Medium**	**2.04**	**1.57**
Assessment This tree presents as typical of its species however seems to be experiencing some branch conflict with other trees.											**Activity Impact** See Section 7.1.1	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
118	*Eucalyptus moluccana* Grey Box	7	0.20[B,C]	4 x 4	M	S	Sym	A	**3A**	**Medium**	**2.40**	**1.68**
Assessment This tree presents as typical of its species however seems to be experiencing some branch conflict with other trees.											**Activity Impact** See Section 7.1.1	
119	*Eucalyptus moluccana* Grey Box	15	0.76[B]	12 x 12	M	D	Sym	A	**1B**[E]	**High**[E]	**9.12**	**2.95**
Assessment There is a vertical wound on the west side of the bole. The tree is codominant at 3m. This would require an Internal diagnostic assessment to allow for further comment on the tree in relation to the proposed activity.											**Activity Impact** See Section 7.1.1	
120	*Eucalyptus tereticornis* Forest Red Gum	11	0.30[C]	6 x 6	M	D	Sym	B	**2A**	**Medium**	**3.60**	**2.00**
Assessment This tree presents as typical of its species however there is some twiggy dieback is evident in the upper portion of the crown.											**Activity Impact** See Section 7.1.2	
121	*Eucalyptus paniculata* Grey Ironbark[A]	10	0.42[C]	7 x 7	M	D	Sym	B	**2A**	**Medium**	**5.04**	**2.30**
Assessment There is some swelling in the stem surrounding a wound at 2m. This would require an internal diagnostic assessment to allow for further comment on the tree in relation to the proposed activity.											**Activity Impact** See Section 7.1.2	
122	*Eucalyptus tereticornis* Forest Red Gum	14	0.46[B,C]	8 x 8	M	D	Sym	A	**2A**	**High**	**5.52**	**2.39**
Assessment This tree presents as typical of its species however is codominant at 6m.											**Activity Impact** See Section 7.1.2	
123	*Eucalyptus microcorys* Tallowwood[A]	16	0.57	12 x 12	M	C	Sym	A	**1B**	**High**	**6.84**	**2.61**
Assessment This tree presents as typical of its species however appears to be experiencing some branch conflict with the adjacent tree.											**Activity Impact** See Section 7.1.4	
124	*Corymbia maculata* Spotted Gum	10	0.28	7 x 6	M	C	Sym	A	**2A**	**High**	**3.36**	**1.94**
Assessment This tree presents as typical of its species however appears to be experiencing some branch conflict with other trees.											**Activity Impact** See Section 7.1.3	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
125	*Corymbia maculata* Spotted Gum[A]	16	0.52[C]	12 x 12	M	C	Sym	A	**1B**	**High**	**6.24**	**2.51**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.4	
126	*Eucalyptus tereticornis* Forest Red Gum[A]	11	0.28[C]	5 x 5	M	C	Sym	B	**2A**	**Medium**	**3.36**	**1.94**
Assessment This tree presents as typical of its species however there is some twiggy dieback within the crown.											**Activity Impact** See Section 7.1.3	
127	*Eucalyptus robusta* Swamp Mahogany[A]	10	0.47	9 x 8	M	D	Sym	A	**2A**	**High**	**5.64**	**2.41**
Assessment This tree presents as typical of its species however is codominant at 3m.											**Activity Impact** See Section 7.1.1	
128	*Eucalyptus tereticornis* Forest Red Gum[A]	5	0.14	2 x 2	M	C	Sym	A	**2A**	**Medium**	**1.68**	**1.45**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	
129	*Eucalyptus tereticornis* Forest Red Gum[A]	10	0.59	8 x 8	M	D	Sym	B	**2A**	**Medium**	**7.08**	**2.65**
Assessment This tree presents as typical of its species however is codominant at 4m.											**Activity Impact** See Section 7.1.2	
130	*Eucalyptus punctata* Grey Gum	10	0.30[C,B]	5 x 5	Y	D	Sym	A	**2A**	**Medium**	**3.60**	**2.00**
Assessment This is three stems sharing the same root base.											**Activity Impact** See Section 7.1.2	
131	*Eucalyptus punctata* Grey Gum	15	0.59	12 x 12	M	D	Sym	A	**2A**[E]	**High**[E]	**7.08**	**2.65**
Assessment This tree presents as typical of its species however is codominant at 3m. There is an open wound surrounded by swelling on the western side of the stem. This would require an internal diagnostic assessment to allow for further comment on the tree in relation to the proposed activity.											**Activity Impact** See Section 7.1.2	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
132	*Eucalyptus punctata* Grey Gum	15	0.70	13 x 13	M	D	Sym	A	**2A**[E]	**High**[E]	**8.40**	**2.85**
Assessment This tree has a large canker on the stem. The canker may be prone to infection. An active codominant crack is visible at 3m up. This would require an aerial assessment to allow for further comment on the tree in relation to the proposed activity.											**Activity Impact** See Section 7.1.2	
133	*Acacia spp.* [A] Wattle	4	0.30[B,C]	4 x 4	M	C	Sym	B	**3A**	**Low**	**3.60**	**2.00**
Assessment This is a grove of four *Acacia*. The trees within the grove present as typical of the species however are generally known to have short life expectancy.											**Activity Impact** See Section 7.1.2	
134	*Eucalyptus punctata* Grey Gum[A]	7	0.17	2 x 2	Y	I	Sym	A	**2A**	**High**	**2.04**	**1.57**
Assessment This tree presents as typical of its species. The tree appears to be located on public land owned by Liverpool City Council.											**Activity Impact** See Section 7.1.1	
135	*Cupressus leylandii* Leyland Cypress [A]	5	0.20[B,C]	3 x 3	Y	C	Sym	A	**1B**	**High**	**2.40**	**1.68**
Assessment This tree presents as typical of its species.											**Activity Impact** See Section 7.1.2	

[A]. Incomplete identification of species due to insufficiently available plant material

[B]. Diameter taken below 1.4m due to low stem bifurcation

[C]. Estimate due to the overgrown area and/or limited access

[D]. Deciduous species, void of foliage at the time of assessment

[E]. Level 3 assessment required to determine the accurate rating.

7.0 Site Assessment

The site is known as 128-134 Rickard Road, Leppington, NSW, 2179 and is legally described as Lots A and B in Deposited Plan 411211. The site is located on the eastern side of Rickard Road and is approximately 4.1ha in area. The site is located immediately south of the existing Leppington Public School at 144 Rickard Road and is approximately 700m south of Leppington Train Station. The northern portion of the site is currently used for residential purposes. The southern portion of the site is used for agricultural purposes, with multiple greenhouses and an existing pond on the property. Figure 1 below provides an aerial image of the site.

Figure 1: Aerial image of site
Source: Nearmap

The trees are predominately remnant trees, with several deliberate plantings, being a combination of exotic and native species and predominately remnant trees. The site forms part of the South West Growth Area and is biodiversity certified. The planted trees are of similar age and likely related to the school construction.

Most of the trees are remnant and form part of the vegetation assembly of the Cumberlands Plain Woodland. This vegetation community is classed as a Critically Endangered Environmental Community (CEEC) and protected under Biosecurity Act, 2015 and under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). None of the trees contained in this report are endangered species, and do not warrant legislative protection other than the vegetation community for which they belong. The significance

for this planting, relative to the vegetation community, is beyond the scope of an arborist and should be based on the recommendations of the Ecology report.

7.0.1 Exempt trees

The trees labeled as A and B, which have been included on the survey drawing (Plan 1), however, are excluded from this report because of the failure to conform to the description of a prescribed tree based on the Camden Council's Development Control Plan.

Tree A: Trees that occur and are exempt species.

Tree B: Dead trees

7.0.2 Areas of risk

Within the area of assessment, and as a duty of care, two areas of high risk regarding future site access are included. These areas are illustrated in the Plans, Section 5.0.

Area C: Electrical wires are routed between poles, which at the lowest point between the poles are approximately 2m above ground and within access of persons and vehicles. It is unknown if these wires are active. Caution is required within this area.

Area D: This area contains remnant trees and appears to be a natural wetland /drainage pond (possible dam). The area has been used as a dumping ground for chemical-based storage containers. These containers are a combination of empty and partially full. The chemical component is classed as toxic, where labels range up to Grade 6 chemicals exist. Many are leaching and carry deposits of dried chemicals. Allied staff experienced skin irritation where dust from one container came into contact with a staff member and fumes (likely acerbated by the hot day), which caused respiratory irritation and prompted masks to be worn to allow continued assessment of the surrounding trees. Fire has recently moved through this area, where some of the chemical containers appear to have been bundled and burnt.

7.0.3 Areas of not assessed

Area E: This area is a bog and on the verge of a wetland area. It has dense vegetation consisting of long grass, weed species, vines, and undulating grades. This area has not been assessed, see Section 4.5.2. It consists of approximately ten live trees and several dead trees. The species are Eucalyptus; therefore, they are potentially remnant and tentatively rated as 'High' significance, although they were limited in size with stem diameters of up to 0.4m.

7.1 Proposed Activity Description

The proposed activity is for a new high school for Leppington and Denham Court. The new high school will accommodate up to 1,000 students across 3

new buildings that will comprise 48 permanent teaching spaces (PTS), 3 support teaching spaces (STS), 9 specialist labs/workshops/kitchens and a hall. Buildings A, B and C will wrap the western and southern boundaries of the site, with the hall being located in south-east corner. The activity also includes the construction of a sports field in the centre of the site and 3 x multipurpose courts along the northern boundary. The proposed scope of works is illustrated in Figure 2 below.

Figure 2: New High School for Leppington and Denham Court
Source: DJRD Architects

This report discusses the impact of the proposed design on the trees. One hundred and thirty-five (135) trees have been listed within this report based on the vicinity of the proposed works. Twenty-seven (27) trees are located within the road corridor, and the remaining one hundred and eight (108) trees occur within the lots proposed for the activity[7]. This includes any tree where any part of the zones of protection, such as the Tree Protection Zone (TPZ) and Structural Root Zone (SRZ), encroach into the area proposed for work. Recommendations based on the tree significance and condition, together with the impact on these trees regarding the proposed activity (based on the documents contained in Section 4.4) and mitigation where available follow.

7.1.1 Trees and zones of protection (TPZ/SRZ) outside of the proposed design

Trees No. 7, 115-119, 127, and 134.

None of the proposed work conflict with the location of these trees or respective zones of protection. These trees can be retained without impact by the proposed design.

[7] This is an estimate because the survey does not delineate the two defined areas unlike other drawings that do not offer all trees.

7.1.2 Trees directly conflicting with the design

Trees No. 2, 3, 8-23, 26-110, 120-122, 128-133 and 135.

These trees are located in the footprint of the proposed design and would require removal based on this premise alone. The conflict is a combination of numerous design features, including buildings, roads, and stormwater infrastructure. However, the bulk earthworks form the primary impact where all trees occur within cut and fill areas. This is based on the drawing: LHS-TTW-01-00-DR-C-03101-3, see Section 4.4.3.

Trees No. 2, 3, and 8-27 occur within the road reserve and are referred for removal based on future road widening works. In relation to the proposed design, the impact (other than tree No. 2) is based on increased grades to accommodate drainage patterns. However, accounting for the small proportion of increase to the grades adjacent to these trees, the impact can be negligible and can allow for tree retention. Allowing for a high significance rating to be applied to the majority of these trees, any opportunity to retain these trees should be considered. These trees will require confirmation and consent from Camden Council for removal.

7.1.3 Trees subject to a minor encroachment

Trees No. 113, 124, and 126.

These trees are not directly located in the footprint of the proposed design; however, they are subject to a *minor encroachment*. That is, the proportion (<10%) of encroachment provided by design will not adversely impact on the tree. These trees could be retained relative to the design.

7.1.4 Trees subject to a major encroachment

Trees No. 1, 4-6, 24, 25, 111, 112, 114, 123, 125 and Area E[8].

These trees are not directly located in the footprint of the proposed design; however, they are located close and adjacent to the design footprint and subject to a *major encroachment*, that is, in excess of 10% of the TPZ. Table 2 discusses the proportion and type of encroachment for each tree implications and mitigation.

Table 2; Summary of major encroachments

Tree No.	Encroachment (%)	Encroachment Type	Comments
1	Approximately 40% Inside SRZ	Crossover (36%) Headwall (5%)	Note 1
4	33% Inside SRZ	Minor fill (<0.5m)	Note 2
5	20% Outside SRZ	Minor fill (<0.5m)	Note 2
6	16%	Minor fill (<0.5m)	Note 2

[8] See Section 7.0.3.

Tree No.	Encroachment (%)	Encroachment Type	Comments
	Outside SRZ		
24	50% Inside SRZ	Minor fill (<0.5m)	Note 4
25	50% Inside SRZ	Minor fill (<0.5m)	Note 4
111	14% Outside SRZ	Cut (<1.2m)	Note 3
112	12% Outside SRZ	Cut (<1.2m)	Note 3
114	21% Outside SRZ	Cut (<1.2m)	Note 3
123	28% Inside SRZ	Minor fill (<0.5m)	Note 4
125	25% Inside SRZ	Minor fill (<0.5m)	Note 4
Area E	Estimated <20%	Cut (<1.2m)	Note 5

Notes

Note 1: Public tree; the encroachment consists of the cross-over where some expected cut would likely be required; however, the extent of this is unknown. In addition is the headwall, where a note on the civil drawings suggests amending the design for the tree. Further detail would be required for the cross-over to determine the impact. The tree caters to High significance. However, future road widening work may also impact or require the removal of this tree. This tree should be protected and retained based on the significance and mitigation measures in place to limit the impacts. Based on the design feature forming the impact, this could be catered for during construction. However will require feedback from Camden Council regarding intended future road works.

Note 2: Public tree; the encroachment consists of fill material to establish grades for drainage. The encroachment is on the edge of the fill, suggesting a battered fill, therefore, minimal depth that is minimal impact to the root system. Although the excavator compaction could offer increasing impact. These trees can be retained, and the proposed work will offer some, yet minor, impact. This can be limited more so via the restricted mass of the machine involved with this work and should be determined by the project arborist. The tree caters to High significance. However, future road widening work may also impact or require the removal of these trees. This tree should be protected and retained based on the significance and mitigation measures in place to limit the impacts. Based on the impact, this could be catered for during construction. However, will require feedback from Camden Council regarding intended future road works.

Note 3: these trees are subject to a cut, and a retaining wall is likely required to accommodate this, although has not been illustrated on the

drawing set. Therefore, any overcut required for drainage/foundations has not been allowed for in the calculations and could increase the encroachment calculation. Trees No. 111 and 112 are sustainable without impact; although tree No. 114 can be retained, some impact on health in the short term may occur.

Note 4: The encroachment consists of fill material to establish grades for drainage and the sports courts. The encroachment is on the edge of the fill, suggesting a battered fill, therefore, minimal depth that is minimal impact to the root system. However, the excavator compaction could offer increasing impact. These trees can be retained, and the proposed work will offer some, yet minor, impact. This can be limited more so via the restricted mass of the machine involved with this work and should be determined by the project arborist. This tree should be protected and retained based on the significance and mitigation measures in place to limit the impacts. Based on the impact, this could be catered for during construction.

Note 5: these trees have not been assessed[9]. Accounting for the tree size and respective estimated zones of protection (TPZ/SRZ), are subject to a cut, and a retaining wall is likely required to accommodate this. These trees could likely be retained; however, allowing for the environment and restricted area for work; additional encroachment may occur, which will limit the opportunity for tree retention. This area will require further consultation based on the results of an assessment to determine the viability of tree retention.

7.2 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities, other than stormwater. Any trenching, other than what has been allowed for should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is restricted to an area that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

7.3 Mitigation Measures

The following measures are required to avoid, minimise and offer options for rectification to reduce or eliminate any adverse environmental impacts of a Division 5.1 activity. These are summarised in Section 7.3.1, Table 3; Environmental Mitigation.

[9] See Section 4.5.2.

7.3.1 Table 3: Environmental Mitigation

Activity Type	Hold Point	Mitigation Measure	Reason for mitigation
Tree retention/removal Trees No. 3, and 8-27	Before start of work	Consideration in association with the tree owner for retention of these trees based on high significance. Consent from tree owner	Clarify tree retention/removal
Tree retention/removal Trees No. 2, 3, and 8-27	Before start of work	These trees will require confirmation and consent from Camden Council for removal.	Consent from tree owner
Tree management	Before start of work	A project arborist (conforms to the AS 4970) is required to be nominated before works start, and they are to be provided with all related site documents.	Protection of trees
Demolition	Before start of work	As a minimum requirement, all trees recommended for retention in this report must have removed all dead, diseased, and crossing limbs and branch stubs to be pruned to the branch collar. This work must comply with the Section 2.3.	Reduce risk related to retained trees
Demolition/Construction	Before start of work	A Tree Management Plan (Arboricultural Method Statement) is prepared and issued to the entity responsible for the demolition/construction.	Protection of trees
Tree protection	Before start of work	Installation of tree protection measures as per Tree Management Plan (Arboricultural Method Statement)	Protection of trees
Retention of trees No. 1, and 4-6.	Before start of work	Pending feedback from Camden Council regarding the future viability of these trees. Based on the outcome, mitigation at the time of work is required. This requires feedback from the project arborist.	Reduce tree impact/Retain trees
Retention of trees No.	Before start of work	Mitigation at the time of work is required. This requires	Reduce tree impact/Retain

Activity Type	Hold Point	Mitigation Measure	Reason for mitigation
111, 112, 114, 123, and 125.		feedback from the project arborist.	trees
Retention/removal of trees; Area E	Before start of work	Area E requires access to assess trees and determine the viability of retention during site works. This requires feedback from the project arborist.	Reduce tree impact/Retain trees
Tree removal	Demolition	Trees are identified and marked for removal	Avoid incorrect tree removal.
Tree removal	Demolition	Native wildlife habitats are identified to avoid injury to animals. A licensed wildlife handler[10] supervises the tree removal. Tree removal shall avoid nesting season. Refer to the biodiversity report for additional guidance.	Protection of native fauna.
Tree protection	Demolition/Construction stages	Site induction; All workers must be briefed about the conditions outlined in Tree Management Plan before the initiation of work. This is required as part of the site induction process.	Protection of trees
Subsurface utilities not been included in the design	Construction stages	Trenching, shall avoid the TPZ's. Proposed routes shall be re-routed outside of the TPZ. Underboring required if unable reroute. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.	Protection of trees intended for retention
Demolition/Construction Methods	Demolition/Construction stages	Work-related to demolition/construction, e.g. stockpiling, site sheds, and scaffolding, shall avoid the TPZs. Any activity within a TPZ must be authorised and conditioned by the project arborist.	Protection of trees intended for retention

[10] NSW National Parks and Wildlife Act 1074

Activity Type	Hold Point	Mitigation Measure	Reason for mitigation
Demolition/Construction Methods	Demolition/Construction stages	Measures/Conditions outlines in Section 8.0; Protection Specification.	Protection of trees intended for retention
Environmental Impact Tree loss; ecological impact	Project outcome	Planting of advanced specimens of the same species in groups.	Compensation for the loss of protected flora and related fauna habitats.
Environmental Impact Tree loss; amenity impact	Project outcome	Planting of advanced specimens of the same species in areas that offer visual/noise screening.	Compensation for the loss of amenity value.

7.4 Protection measures

Tree protection measures will be required during the demolition and construction stage. However, the design of these will be pending the work methodology and final design. The project arborist[11] shall be contracted after the completion/confirmation of design work for the instruction of the protection measures implementation, that is the Arboricultural Method Statement. Examples of the protection measures are contained in Appendix B.

8.0 Protection Specification

The retention and protection of these trees requires the remaining Tree Protection Zone (TPZ) not subject to encroachment to conform to the conditions outlined below. These conditions provide the limitations of work permitted within the area of the Tree Protection Zone (TPZ) and must be adhered to unless otherwise stated.

Any engineering drawings issued as part of the construction certificate must conform with these requirements.

1. Foundation/footing types should not be strip type, but utilise footing types that are sympathetic towards retaining root system that is, screw, pier, etc. Slab on the ground can be accommodated in some circumstances and will be nominated by the project arborist. The extent of encroachment will be dependent upon the tree species, soil type (texture and profile) and gradients.

2. Subsurface utilities can extend through the TPZ and Structural Root Zone (SRZ), however, are limited to the method of installation. That is under boring is permitted, however trenching is limited and depends on the proposed route within the TPZ. No trenching is permitted within the area of the TPZ unless stipulated by the project arborist.

3. Soil levels within the TPZ must remain the same. Any excavation within the TPZ must have been previously specified and allowed for by the project arborist:

   a) So it does not alter the drainage to the tree.

   b) Under specified circumstances,

      - Added fill soil does not exceed 100mm in depth over the natural grade. Construction methodologies exist that can allow grade increases in excess of 100mm, via the use of an impervious cover, an approved

[11] Project Arborist: person nominated as responsible for the provision of the tree assessment, arborist report, consultation with stakeholders, and certification for the development project. This person will be adequately experienced and qualified with a minimum of a level 5 (AQF); Diploma in Horticulture (Arboriculture).

permeable material or permanent aeration system or other approved methods.

- Excavation cannot exceed a depth of more than 50mm within the area of the TPZ, not including the SRZ. The grade within the SRZ cannot be reduced without the consent from a project arborist.

4. No form of material or structure, solid or liquid, is to be stored or disposed of within the TPZ.

5. No lighting of fires is permitted within the TPZ.

6. All drainage runoff, sediment, concrete, mortar slurry, paints, washings, toilet effluent, petroleum products, and any other toxic wastes must be prevented from entering the TPZ.

7. No activity that will cause excessive soil compaction is permitted within the TPZ. That is, machinery, excavators, etc. must refrain from entering the area of the TPZ unless measures have been taken, in consultation with the project arborist.

8. No site sheds, amenities or similar site structures are permitted to be located or extend into the area of the TPZ unless the project arborist provides prior consent.

9. No form of construction work or related activity such as the mixing of concrete, cutting, grinding, generator storage or cleaning of tools is permitted within the TPZ.

10. No part of any tree may be used as an anchorage point, nor should any noticeboard, telephone cable, rope, guy, framework, etc. be attached to any part of a tree.

11. (a) All excavation work within the TPZ will utilise methods to preserve root systems intact and undamaged. Examples of methods permitted are by hand tools, hydraulic, or pneumatic air excavation technology.

(b) Any root unearthed which is less than 50mm in diameter must be cleanly cut and dusted with a fungicide, and not allowed to dry out, with minimum exposure to the air as possible.

(c) Any root unearthed which is greater than 50mm in diameter must be located regarding their directional spread and potential impact. A project arborist will be required to assess the situation and determine future action regarding retaining the tree in a healthy state.

9.0 Summary of tree impact by design

Based on the design supplied, the following summary provides the impacts imposed on the trees included in this report.

9.1 Trees to be retained

Trees No. 7, 24, 25, 113, 115-119, 124, 126, 127, and 134

These trees are not adversely impacted by the design, that is, they conform to an acceptable encroachment based on the nominated zones of protection (TPZ, SRZ) and the requirements of the Protection Specification, Section 8.0. The proposed design does not adversely affect these trees.

9.2 Trees nominated for removal based on conflict

Trees No. 2, 3, 8-23, 26-110, 120-122, 128-133 and 135.

The proposed design will impact adversely on these trees and are unable to be retained based on the design.

Trees No. 2, 3, and 8-27

These trees occur within the road reserve and are referred for removal based on future road widening works. However, the impact can be negligible and can allow for tree retention. Allowing for the high significance rating, any opportunity to retain these trees should be considered. These trees will require consent from Camden Council for removal.

9.3 Trees to be retained with design/work method mitigation

Trees No. Trees No. 1, 4-6, 111, 112, 114, 123, and 125.

These trees are subject to a major encroachmnet, although design and work methodology can accommodate the tree and allow for retention.

Trees No. 1, and 4-6

These trees are public assets and the viability of future road works based on feedback from Camden Council shall determine the outcome and whether mitigation at the time of work is required to retain these trees or otherwise.

9.4 Area E

This area has not been assessed based on risk, and requires access to assess trees and determine the viability of retention during site works.

9.5 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities, other than stormwater. Any trenching, other than what has been allowed for should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is

restricted to an area that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

9.6 Protection measures

Tree Protection during the proposed activity

A project arborist (conforms to the AS 4970) is required to be nominated before works start, and they are to be provided with all related site documents.

A Tree Management Plan (Arboricultural Method Statement) is prepared and issued to the entity responsible for the demolition/construction.

Protection measures are required to be implemented for the trees nominated for retention (referenced in Section 9.1) and installed before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified.

All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work.

The opinions expressed in this report by the author have been provided within the capacity of a Consulting Arborist. Any further explanation or details can be provided by contacting the author.

Assessed and Prepared by Geoff Beisler and Greg Penkow
Consulting Arborist
Level 5 Arborist
ISA Tree Risk Assessment Qualification

Prepared and checked by Warwick Varley
Consulting Arborist; Principal
Level 5 and 8; Arborist
ISA Tree Risk Assessment Qualification
IACA and ISA Member

Accredited member of INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS

REGISTERED HORTICULTURIST 0032 AIH

10.0 Appendix A- Terminology Defined

Height

Is a measure of the vertical distance from the average ground level around the root crown to the top surface of the crown, and on palms - to the apical growth point.

DBH

Diameter at Breast Height – being the stem diameter in meters, measured at 1.4m from ground level, including the thickness of the bark.; Mult. refers to multiple stems, that is in excess of 4 stems.

Crown Spread

A two-dimension linear measurement (in metres) of the crown plan. The first figure is the north-south span, the second being the east-west measurement.

Age

Is the estimate of the specimen's age based upon the expected lifespan of the species. This is divided into three stages.

Young (Y)	Trees less than 20% of life expectancy.
Mature (M)	Trees aged between 20% to 80% life expectancy.
Over-mature (O)	Trees aged over 80% of life expectancy with probable symptoms of senescence.

Crown Aspect

In relation to the root crown, this refers to the aspect the majority of the crown resides in. This will be either termed Symmetrical (Sym.) where the centre of the crown resides over the root crown or the cardinal direction the centre of the crown is biased towards, being either North (N), South (S), East (E) or West (W).

Vitality Rating

Is a rating of the health of the tree, irrespective and independent of the structural integrity, and defined by the 'ability for a tree to sustain its life processes' ((Draper, Richards, 2009). This is divided between three variables, and based on the assessment of symptoms including, but not limited to; leaf size, colour, crown density, woundwood development, adaptive growth formation, and epicormic growth.

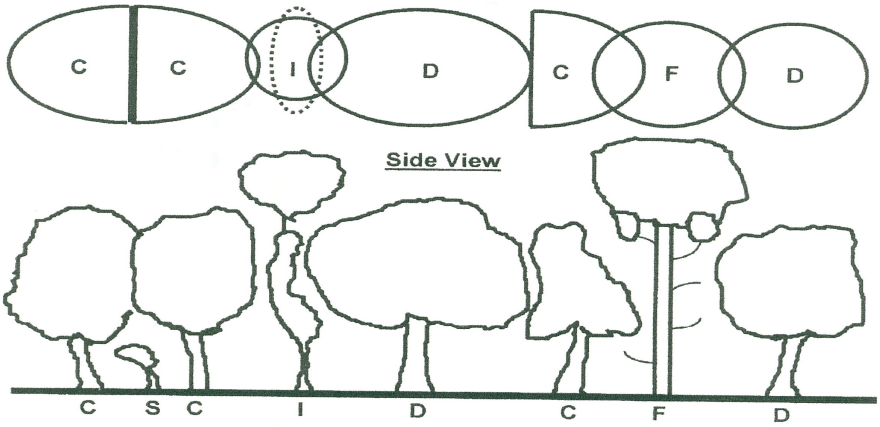
A: Normal vitality, typical for the species
B: Below average vitality, possibly temporary loss of health, partial symptoms.
C: Poor vitality; obvious decline, potentially irreversible

Crown Class

Is the differing crown habits as influenced by the external variables within the surrounding environment. They are:

D	– *Dominant*	Crown is receiving uninterrupted light from above and sides, also known as emergent.
C	– *Codominant*	Crown is receiving light from above and one side of the crown.
I	– *Intermediate*	Crown is receiving light from above but not the sides of the crown.
S	– *Suppressed*	Crown has been shadowed by the surrounding elements and receives no light from above or sides.
F	– *Forest*	Characterised by an erect, straight stem (usually excurrent) with little stem taper and virtually no branching over the majority of the stem except for the top of the tree which has a small concentrated branch structure making up the crown.

Top View



D C, I & S, and side view, after (Matheny, N. & Clark, J. R. 1998, Trees Development, Published by International Society of Arboriculture, P.O. Box 3129, Champaign IL 61826-3129 USA, p.20, adapted from the Hazard Tree Assessment Program, Recreation and Park Department, City of San Francisco, California).

Levels of assessment

Level 1: Limited visual: a visual tree assessment to manage large populations of trees within a limited period and in order to identify obvious faults which would be considered imminent.

Level 2: Basic assessment: a standard performed assessment providing for a detailed visual assessment including all parts of the tree and surrounding environment and via the use of simple tools.

Level 3: Advanced assessment: specific type assessments conducted by either arborist who specialise with specific areas of assessment or via the use of specialised equipment. For example, aerial assessment by use of an EWP or rope/harness, or decay detection equipment.

TPZ; Tree Protection Zone

Is an area of protection required for maintaining the trees vitality and long-term viability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

The size of the Tree Protection Zone (TPZ) has been calculated from the *Australian Standard, 4970; 2009* – Protection of Trees on Development Sites

The TPZ does not provide the limit of root extension, however, offers an area of the root zone that requires predominate protection from development works. The allocated TPZ can be modified by some circumstances; however will require compensation equivalent to the area loss, elsewhere and adjacent to the TPZ.

SRZ; Structural Root Zone

Is the area around the tree containing the woody roots necessary for stability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

Protection Measures

These are required for the protection of trees during demolition/construction activities.
Protective barriers are required to be installed before the initiation of demolition and/or construction and are to be maintained up to the time of landscaping. Samples of the recommended protection measures are illustrated in Appendix C.

All other definitions are referenced from;

Draper D.B., Richards P.A., 2009, Dictionary for Managing Trees in Urban Environments
CSIRO Pub., Australia

Significance Rating, Significance of a Tree Assessment Rating System (S.T.A.R.S), IACA, 2010[12]

Tree Significance – Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vitality;
- 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 vitality;
- 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 vitality;
- 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,

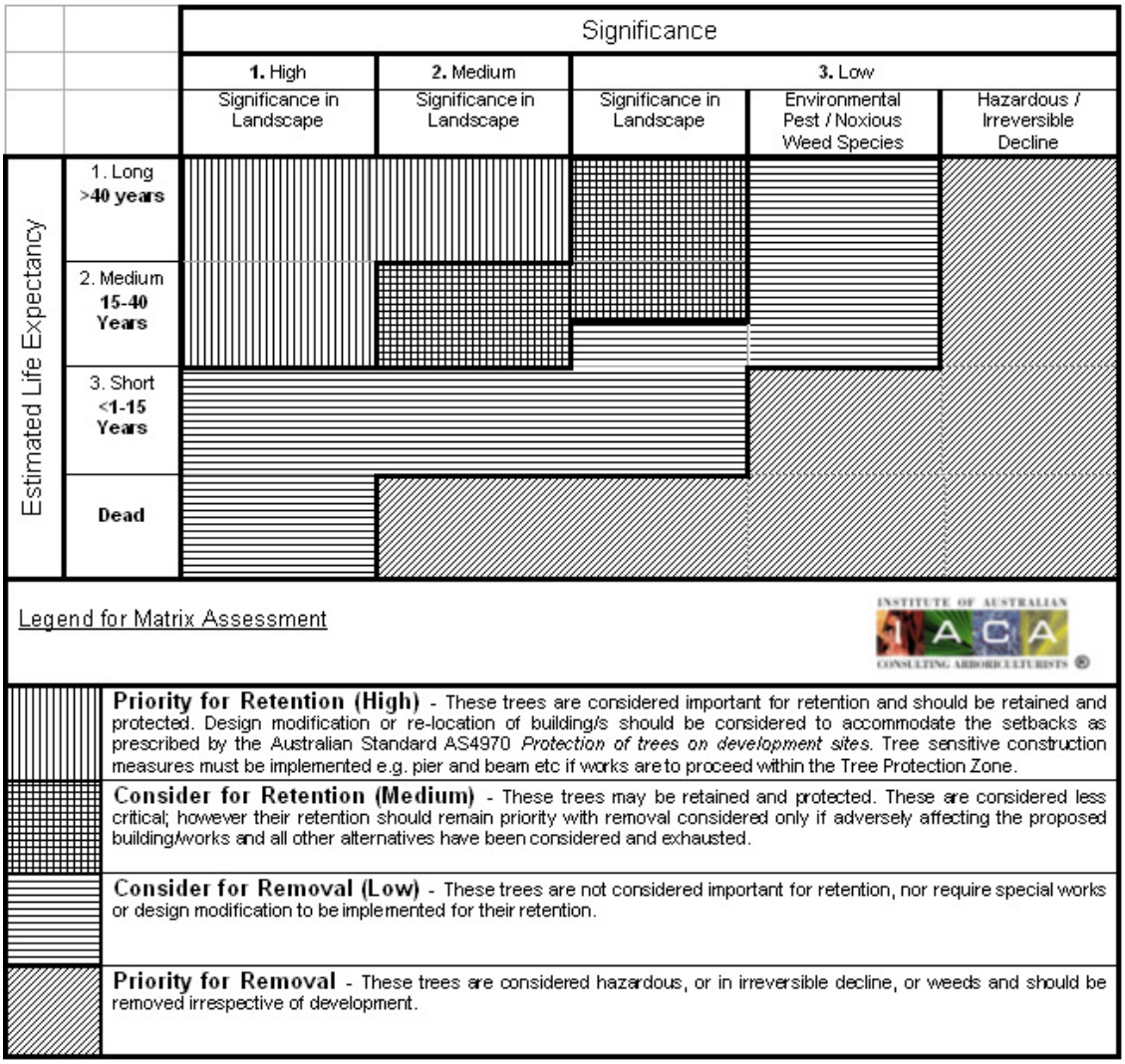
[12] IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

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.

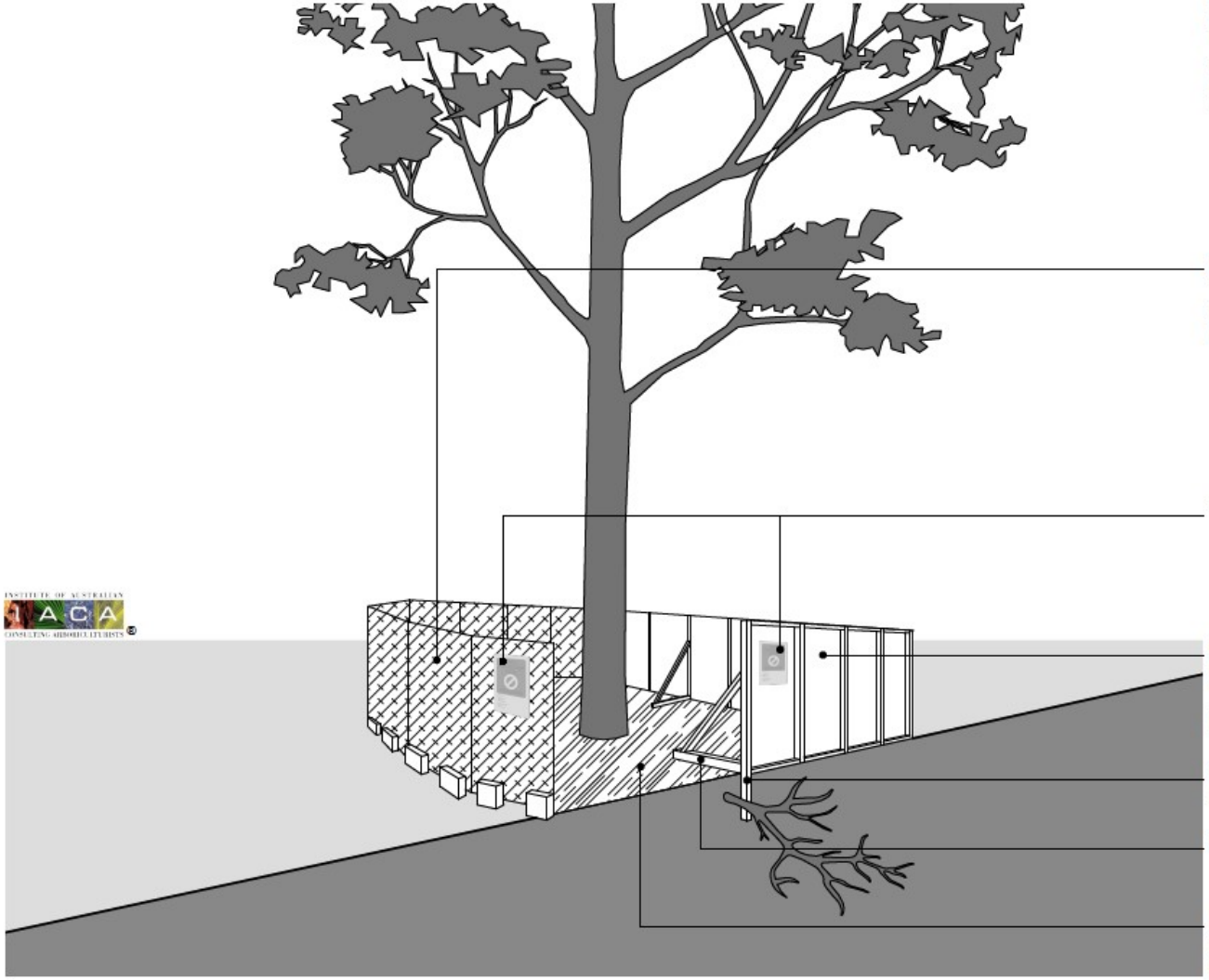
Table 3; Tree Retention Value – Priority Matrix.



Safe Useful Life Expectancy – S.U.L.E (Barell 1995)

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or Replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 – 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 – 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years.	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability on recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in heights
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	
G				Trees that will become dangerous after removal of other trees for reasons given in (A) to (F).	

Appendix B- Protection measures;
Protective fence



Note:
No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

Option 1 - Fencing
1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

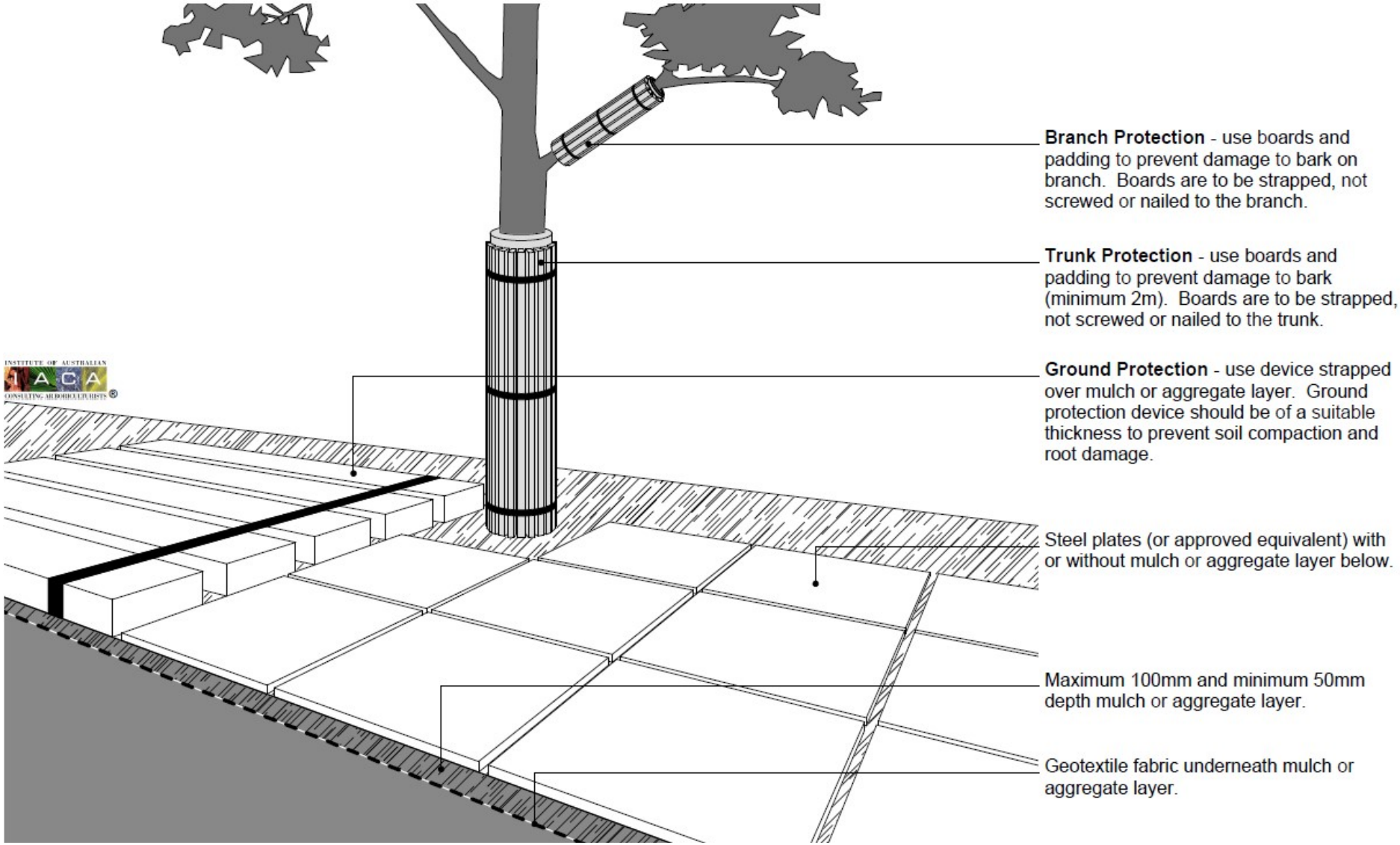
Option 2 - Fencing
Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer installed across surface of TPZ.

Stem and Ground protection



Melbourne

15 Business Park Drive
Notting Hill VIC 3168
Telephone (03) 8526 0800

Sydney

Suite 3, Level 1, 20 Wentworth Street
Parramatta NSW 2150
Telephone (02) 9354 0300

Brisbane

Level 5, 43 Peel Street
South Brisbane QLD 4101
Telephone (07) 3105 1460

Adelaide

1/198 Greenhill Road
Eastwood SA 5063
Telephone (08) 8378 8000

Perth

Level 1, 21 Adelaide Street
Fremantle WA 6160
Telephone (08) 6555 0105

New Zealand

7/3 Empire Street
Cambridge New Zealand 3434
Telephone +64 27 777 0989

Wangaratta

First Floor, 40 Rowan Street
Wangaratta VIC 3677
Telephone (03) 5721 2650

Geelong

51 Little Fyans Street
Geelong VIC 3220
Telephone (03) 8526 0800

Wimmera

597 Joel South Road
Stawell VIC 3380
Telephone 0438 510 240

Gold Coast

Suite 37, Level 4, 194 Varsity Parade
Varsity Lakes QLD 4227
Telephone (07) 5676 7602

watertech.com.au