ArborSafe

TREE SYSTEMS • TREE CONSULTANCY • MAINTENANCE SYSTEMS

Arboricultural Letter of Reply

Multi-Purpose School Hall
Kingswood High School
131 Bringelly Rd Kingswood
NSW 2747

20 February 2019

C91380

ASSESSMENT & LETTER OF REPLY COMMISSIONED BY:

Ray Dawood
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NASR GROUP
PO Box 664
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ASSESSMENT & LETTER OF REPLY PREPARED BY:

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AQF Level 5
Consulting Arborist

ArborSafe

20 February 2019

Ray Dawood
Project Manager
PO Box 664
Parramatta NSW 2150

Ref: NASR GROUP PTY LTD – Kingswood High School Multi-Purpose School Hall

Arboricultural Letter Of Reply for nineteen (19) trees located within the vicinity of proposed project type at Kingswood High School and 131 Bringelly Rd Kingswood, NSW

Dear Ray,

We are pleased to provide you with the following Arboricultural Letter Of Reply for nineteen (19) site trees within the grounds of the Kingswood High School site.

Complete use of this ducument is authorised under the conditions limiting its use as stated in Appendix A Item 7 of *"Arboricultural Reporting Assumptions and Limiting Conditions"*.

Should you have any queries relating to this document, its recommendations, or the options considered please do not hesitate to contact us on 1300 272 671.

Regards

Kane Hollstein

ArborSafe

Table of Contents

1 Introduction

1.1.1 ArborSafe Australia Pty Ltd was engaged by Ray Dawood on behalf of NASR GROUP PTY LTD (the Client) to complete an Arboricultural Letter Of Reply on nineteen (19) trees located within or adjacent to the Kingswood High School at 131 Bringelly Rd Kingswood, NSW 2747.

1.1.2 The document was intended to provide information on site trees and how they may be impacted upon by the proposed development. Findings and recommendations provided are based upon guidance provided within Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*.

1.1.3 Observations and recommendations provided within this document are based upon information provided by the Client and an arborist site visit.

2 Scope

2.1.1 Carry out a visual examination of the nominated trees located within the vicinity of the proposed multi-purpose hall.

2.1.2 Inspect the nominated trees and their growing environment in the context of the proposed development.

2.1.3 Provide an objective appraisal of the subject trees in relation to their species, estimated age, health, structural condition and viability within the landscape.

2.1.4 Based on the findings of this investigation, provide independent recommendations on the retention of the trees in relation to the proposed development works.

2.1.5 Nominate subject trees that can be retained or require removal to facilitate this development.

2.1.6 Review the proposed development in the context of Penrith City Council Development Control Plan (DCP), 2014.

2.1.7 Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.

2.1.8 Provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during construction.

3 Methodology

3.1 Data Collection

3.1.1 Marc Fisher of ArborSafe Australia Pty Ltd carried out a site inspection of the subject trees on 13 February 2019.

3.1.2 Trees that are the subject of this document were identified during discussions with the Client.

3.1.3 The subject trees were inspected from ground level. No foliage or soil samples were taken. No aerial or internal investigations were undertaken.

3.1.4 Tree height and canopy width were estimated and have been provided to the nearest whole metre. Trunk Diameter at Breast Height (DBH) was measured with a diameter tape and provided to the nearest centimetre.

3.1.5 Data collected on site was analysed by Kane Hollstein, collated, and relevant recommendations were formulated.

3.2 Tree Protection Zones

3.2.1 The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) methods have been derived from the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites* (Standards Australia, 2009).

3.2.2 The TPZ is defined as a specified area above and below ground and at a given distance measured radially away from the centre of the tree's trunk and which is set aside for the protection of its roots and crown. It is the area required to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development. The radius of the TPZ is calculated by multiplying its DBH by 12. TPZ radius = DBH × 12. (Note "Breast Height" is nominally measured as 1.4m from ground level).

3.2.3 The SRZ is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. SRZ radius = (D × 50)0.42 × 0.64.

3.3 Images and Site Photographs

3.3.1 All photographs were taken at the time of the site inspection by the inspecting arborist. Photographs have been altered for brightness and/or cropped only. Other images used within this document have been sourced from ArborSite or via the internet. The source of all images has been referenced accordingly.

4 Observations

4.1 Aerial Images

Figure 1. Aerial image showing subject site defined in blue. Red lines delineate the site and area containing the subject trees that are to be impacted by the proposed development. Source: (SEED - NSW Government, 2019)

4.2 Site Details

4.2.1 The site was located within the grounds of Kingswood High School (Figure 1). Specifically, the area designated in this document is located along the eastern property boundary

4.2.2 The site is located within the Penrith City Council Local Government Area (LGA) and is zoned R2 Low Density Residential (Penrith Local Environmental Plan, 2010)

4.2.3 Usage surrounding the site was a mixture of school grounds, residential properties and school buildings. The residential properties of bordered the site to the west, south and east. Smith Street was located north.

4.2.4 Site soils are likely to be disturbed given the sites urban setting and altered from their natural soil profiles.

4.3 Heritage Status

4.3.1 The site is not subject to any known heritage curtilage.

4.4 Proposed Construction

4.4.1 Plans of the existing site (Figure 2) and of the proposed development were provided to ArborSafe on 5 February 2019 and include:

- DA Landscape Plan, 175.19(18)/512, Issue 08.02.19, iScape Landscape Architecture, February 2019
- Landscape Specification, Issue T1, iScape Landscape Architecture, November 2018

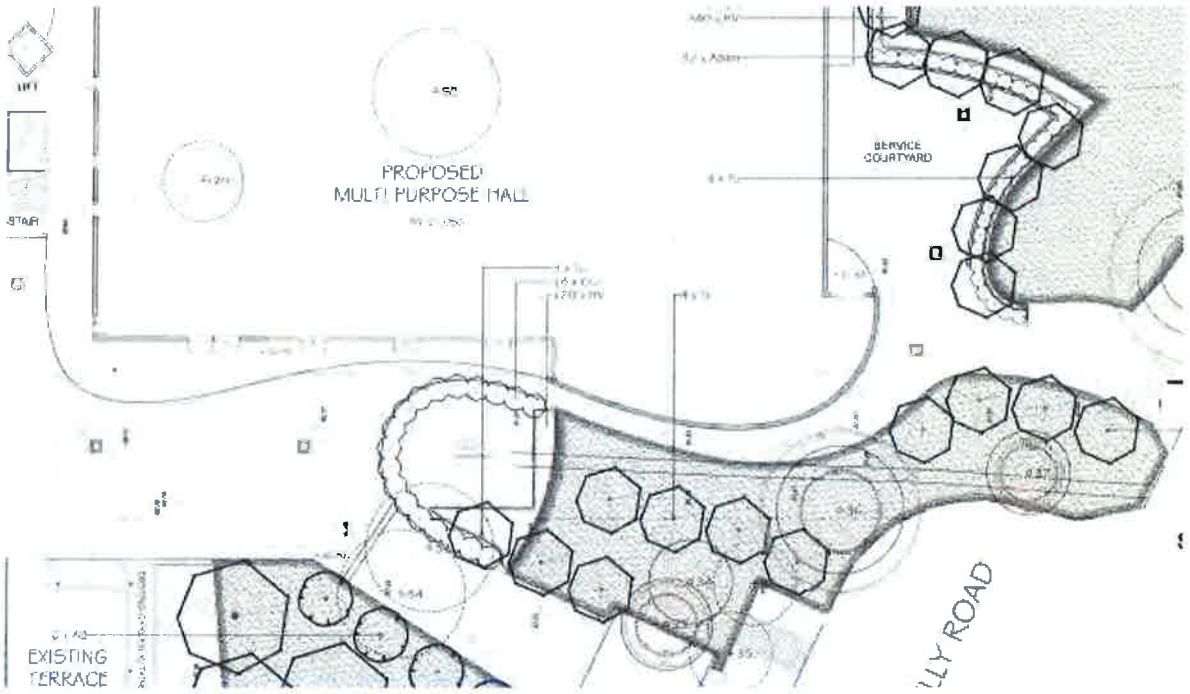


Figure 2. Excerpt from DA Landscape Plan, 175.19(18)/512, Issue 08.02.19, iScape Landscape Architecture, February 2019

4.4.2 The proposed development has been reviewed and in summary consists of the construction of a new multi-purpose hall, resurfacing of an existing driveway, relocation of the existing palisade fence and associated landscape and enabling works.

4.4.3 No proposed underground service locations have been reviewed in the preparation of this document.

4.5 Site Trees

4.5.1 Nineteen (19) trees were inspected and are the subject of this document. Complete attributes for each tree can be found in Appendix C – Tree Assessment Data.

4.5.2 The project scope has been used in conjunction with the Penrith City Council's DCP: Section C2 to identify subject trees within the site that require inclusion into the document.

4.5.3 Pursuant with the Penrith DCP, all site trees above 3m in height or a trunk diameter exceeding 100mm at 1400mm above ground level.

4.5.4 Subject trees were located within the grounds of Kingswood High School.

4.5.5 Subject trees form part of the existing ArborSite Tree Report for the entire Kingswood High School site and as such have been tagged, positioned on aerial imagery and were visually in 2014.

4.5.6 The subject trees have been numbered in line with the existing ArborSite tree numbering system. Trees can be identified on site using white tree tags which are typically located at approximately 2.0m from ground level on the trunk. Trees located on neighbouring properties are not tagged.

4.5.7 As these subject trees form part of a previous survey undertaken for the entire site, trees are numbered between Tree 18 and Tree 129 and are shown in Figure 3.

Figure 3. Site map showing subject trees. Note that icon colour indicates trees current risk rating (not Retention Value). Tree attributes are to be obtained from Appendix C – Tree Assessment Data. Source: ArborSite, 2019

4.5.8 Trees 18, 20, 22, 24, 50 and 129 are a mix of indigenous, native and exotic species being *Eucalyptus moluccana* (Grey Box), *Corymbia citriodora* (Lemon-scented Gum) and *Olea africana* (African Olive).

4.5.9 In the case of the native and indigenous *Eucalyptus* and *Corymbia* species, these trees (18, 20, 22, 24 and 50) were assessed as High risk and recommended for removal during the 2014 assessment.

4.5.10 Tree 129 is a listed noxious weed species (NSW Department of Primary Industries, 2018).

5 Discussion

5.1 Major and Minor TPZ Encroachment

5.1.1 As per the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*, a major encroachment into the TPZ of any tree is considered to occur when it is beyond 10% of the total TPZ area. A minor encroachment is determined as being less than 10% of the total TPZ area.

5.1.2 The proposed development will significantly impact two (2) site tree (numbered 21 and 53) identified within this document. Trees will require removal if they are located within the development footprint or have major encroachment into their TPZs.

5.1.3 Trees with minor or no encroachment may be retained with specific, generic or no protection requirements throughout the construction stage.

5.1.4 For the purposes of this document trees to be removed or retained have been identified as those:

- Requiring removal due to major encroachment into their TPZ
- Retainable and requiring specific protection requirements throughout construction (i.e. generic requirements plus arborist supervision and careful construction methods within their TPZ)
- Retainable and requiring generic tree protection measures only (i.e. protective fencing and restriction of activities within the TPZ).

5.2 Impact of Proposed Development

5.2.1 Review of the proposed design has been undertaken in the context of tree retention and removal across the site.

5.2.2 Tree 21 has a major encroachment of 24.9% into its total TPZ area. This encroachment is required to facilitate the re-alignment of the existing palisade fence and increase of the existing footpath area. While the fence post uprights may be placed following root sensitive excavation methods, the concrete footpath construction will intrude into the SRZ. This tree will therefore require removal to facilitate the development.

5.2.3 Tree 53 has a major encroachment into its TPZ. This tree would require removal to facilitate the development. Landscape plans propose the loss of all trees on site is offset with thirty-nine (39) replacement trees.

5.2.4 Tree 36 has a minor encroachment of 8.7% into its TPZ provided no over excavation for kerb edging or stormwater is required to facilitate the new driveway. In this instance the tree can be retained with little or no effect on tree health or stability considered likely, providing sensitive construction measures are adhered to during construction.

5.2.5 Tree 41 has a minor encroachment of 9.2% into its TPZ provided no over excavation for kerb edging or stormwater is required to facilitate the driveway entry. In this instance the tree can be retained with little or no effect on tree health or stability considered likely, providing sensitive construction measures are adhered to during construction.

5.3 Landscaping Works Impact

5.3.1 Trees 21, 23, 33, 36, 37, 41, 42, 43, 44, 45, and 85 will have both minor and major encroachments into their TPZ's for landscape and refurbishment works.

5.3.2 The iScape landscape specification plan suggests excavation of between 150mm to 350mm depth, including deep ripping of excavated base, below existing grade for the installation of turf and mass planted areas. This cannot occur as significant tree roots will be severed and/or damaged.

5.3.3 All landscape items must therefore be installed above extant grade within the TPZ of all trees to be retained. Any additional fill should be of a largely sand composition to allow the infiltration of water and air to roots below.

5.3.4 During the construction process and prior to landscaping, all trees to be retained should be protected in accordance with Section 6.4 of this document. Following, fencing can be removed to allow landscaping to occur.

5.3.5 In order to minimise the potential damage to roots of trees to be retained during mass planting, holes within TPZ's of these trees are to be hand dug. Maximum pot size of plants within these zones should not exceed 200m diameter.

5.4 State Environmental Planning Policy (SEPP) (Educational Establishments and Child Care Facilities) 2017

5.4.1 Trees 18, 20, 22, 24 and 50 were assessed as High risk and recommended for removal during the 2014 assessment. The SEPP Educational Establishments and Child Care Facilities S38 (b) provides the following exemptions for education facilities:

5.4.2 *"(b) the removal or pruning of a tree that has been assessed by a Level 5 qualified arborist as posing a risk to human health or safety or of damage to infrastructure, but only if a replacement tree that is capable of achieving a mature height of 3 metres or more is planted within the grounds of the school."*

5.4.3 These trees should therefore be exempt from any development consent consideration with landscape plans demonstrating these tree losses will be offset as required.

5.5 Noxious Weeds

5.5.1 Tree 129 is a listed noxious weed species (NSW Department of Primary Industries, 2018) and should be removed irrespective of any future development.

5.6 Proposed Pruning

5.6.1 No pruning is required to facilitate the development.

5.7 Additional Excavation/Trenching within TPZs

5.7.1 In the event additional excavation is required within the TPZs of retained trees identified within this document, or any other site trees, arborist involvement will be required to ensure works are undertaken in accordance with the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*.

5.7.2 Excavation/trenching within the TPZs of retained trees should be undertaken using sensitive construction methods such as manual excavation, hydro-vac or air spade.

6 Recommendations

6.1 Tree Removal

6.1.1 Two (2) trees would require removal to facilitate this development. These are trees 21 and 53.

6.1.2 Six (6) trees were recommended for removal irrespective of future development on the site. These are trees 18, 20, 22, 24, 50 and 129.

6.2 Tree Retention

6.2.1 Eleven (11) trees, numbered 23, 33, 36, 37, 41, 42, 43, 44, 45, 55 and 85 are recommended for retention and require specific and/or generic protection measures during construction to ensure it remains viable following the completion of works.

6.2.2 Excavation is to be carried out only under arborist supervision. No excavation should occur within the SRZ of these trees. It is recommended that the proposed excavation commence at the outer extent of the TPZ and move inwards to minimise root damage to the trees.

6.2.3 Works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

- Excavation using a high-pressure water jet and vacuum truck
- Excavation using an Air Spade with vacuum truck
- Excavation by hand.

6.2.4 Machine excavation should be prohibited within the TPZs of retained trees unless undertaken at the direct consent from the project arborist.

6.2.5 Roots discovered are to be treated with care and minor roots (<40mm diameter) pruned with a sharp, clean handsaw or secateurs. All significant roots (>40mm diameter) are to be recorded, photographed and reported to the project arborist.

6.2.6 Other proposed surfacing within the TPZ is to be installed above existing grade and be of a permeable nature to allow the passage of air and moisture. If the surfacing is to be load bearing, then it is suggested that a geogrid/web or similar is incorporated to ensure the rooting area below does not become compacted.

6.3 Landscape Works

6.3.1 All landscape items are to be installed above extant grade within the TPZ of all trees to be retained. Any additional fill required should be of a largely sand composition to allow the infiltration of water and air to roots below.

6.3.2 During the construction process and prior to landscaping, all trees to be retained should be protected in accordance with Section 6.4 of this document. Following, fencing can be removed to enable these works.

6.3.3 In order to minimise the potential damage to roots of trees to be retained during mass planting, holes within TPZ's of these trees are to be hand dug. Maximum pot size of plants within these zones should not exceed 200mm diameter.

6.4 Protection and Reporting Measures During Construction

6.4.1 All trees to be retained require protection during the construction stage. Tree protection measures include a range of:

- Activities restricted within the TPZ
- Protective fencing
- Trunk and ground protection
- Tree protection signage
- Involvement from the project arborist
- Project milestones
- Compliance reporting

6.5 Activities Prohibited within the TPZ

1. Machine excavation including trenching
2. Storage
3. Preparation of chemicals, including cement products
4. Parking of vehicles and plant
5. Refuelling
6. Dumping of waste
7. Wash down and cleaning of equipment
8. Placement of fill
9. Lighting of fires
10. Soil level changes
11. Temporary or permanent installation of utilities and signs
12. Physical damage to the tree

6.6 Protective Fencing Specification

6.6.1 Protective fencing is to be installed as far as practicable from the trunk of any retained trees. Fencing should be erected as per the image below before any machinery or materials are brought to site and before commencement of works (including demolition).

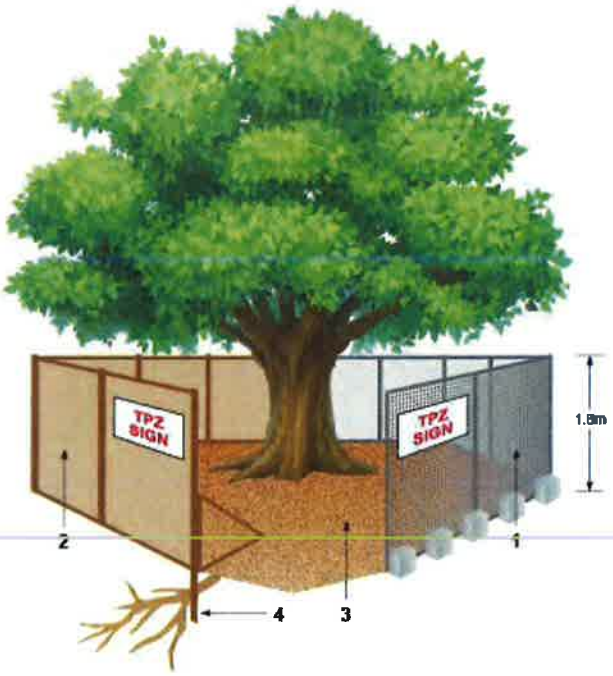
6.6.2 In some areas of the site (i.e. protection of trees on neighbouring properties) existing boundary fencing may be used as an alternative to protective fencing.

6.6.3 Once erected, protective fencing must not be removed or altered without approval from the project arborist. The TPZ fencing should be secured to restrict access.

6.6.4 TPZ fencing is to be a minimum of 1.8m high and mesh or wire between posts must be highly visible – an example is shown in Figure 4. Fence posts and supports should have a diameter greater than 20mm and should ideally be freestanding, otherwise be located clear of the roots. See image below.

6.6.5 Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after their conclusion. The temporary dismantling of tree protection fencing must only be done with the authorisation of a consulting arborist and/or the responsible authority.

6.6.6 The subject trees themselves must also not to be used as a billboard to support advertising material. Affixing nails or screws into the trunks of trees to display signs of any type is not a recommended practice in the successful retention of trees.



Legend:

1. Chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet
2. Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ
3. Mulch installation across surface of TPZ (at discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage materials of any kind are permitted within the TPZ
4. Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

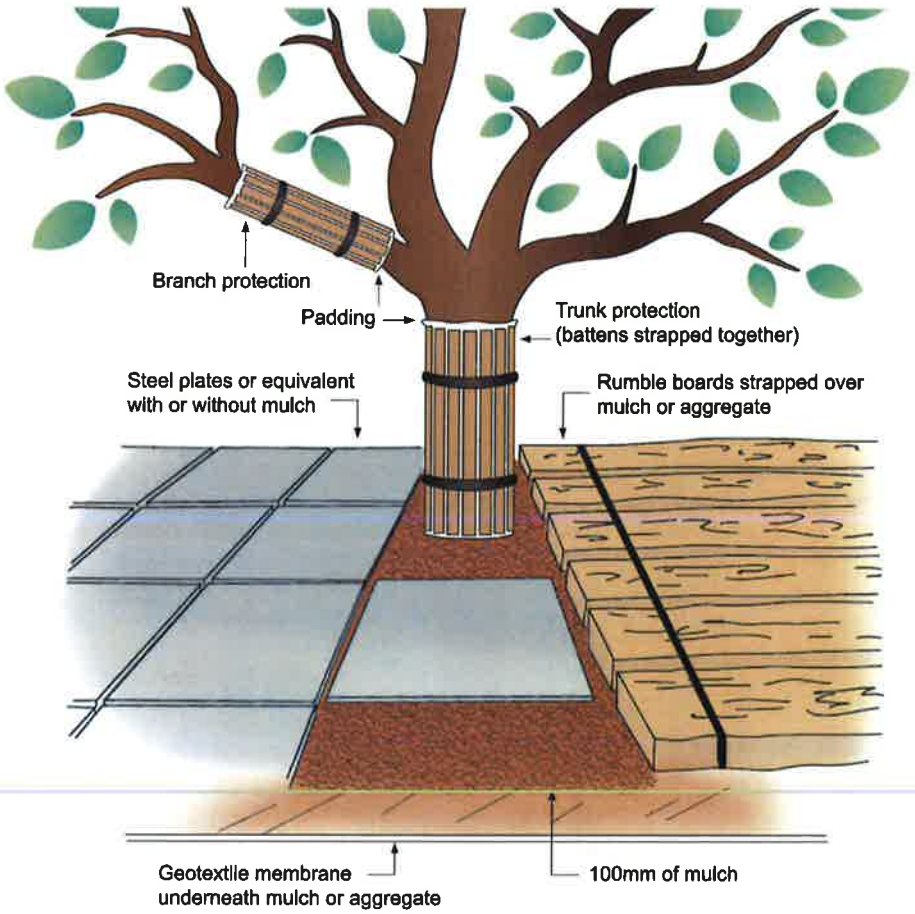
Figure 4. Depicts standard fencing techniques. Source: AS 4970–2009

6.7 Trunk and Ground Protection

6.7.1 Given that proposed works are often within the TPZs of retained trees, standard protective fencing may not always be a viable method of protection. In these areas trunk protection and ground protection should be installed prior to the commencement of works and remain in place until after construction works have been completed.

6.7.2 Where construction access into the TPZ of retained trees cannot be avoided, the root zone of each tree must be protected using either steel plates or rumble board strapped over mulch/aggregate until such a time as permanent above ground surfacing (cellular confinement system or similar) is to be installed as shown in Figure 5.

6.7.3 Trunk and ground protection should be undertaken in line with the Australian Standard AS 4790–2009: *Protection of Trees on Development Sites* as per the image below:



Notes:

1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 5. Depicts trunk and ground protection techniques. Source: AS 4970–2009

6.8 Tree Protection Signs

6.8.1 Signs identifying the TPZ should be placed at 10m intervals around the edge of the TPZ and should be visible from within the development site. An example is shown below in Figure 6.

Figure 6. Depicts standard fencing techniques. Source: AS 4970–2009

6.9 Project Arborist

6.9.1 An official "Project Arborist" must be commissioned to oversee the tree protection, any works within the TPZ's and complete regular monitoring compliance certification.

6.9.2 Whenever there is work planned to be performed within the TPZ's contractor is to provide a minimum of five (5) days advance notice for such visits.

6.9.3 The project arborist must have minimum five (5) years industry experience in the field of arboriculture, horticulture with relevant demonstrated experience in tree management on construction sites, and Diploma level qualifications in arboriculture – AQF Level 5.

6.9.4 Inspections are to be conducted by the project arborist at several key points during the construction in order to ensure that protection measures are being adhered to during construction stages and decline in tree health or additional remediation measures can be identified.

6.10 Project Milestones

6.10.1 The following visits and milestones were recommended as to when on-site tree inspection by the project arborist is required:

Item	Purpose of Visit	Timing of Visit(s)	Prerequisites
1	Pre-start induction	Following sign off from Item 1. Contractor to provide a minimum of five days advance notice for this visit.	Prior to commencement of works. All parties involved in the project to attend.
2	Supervision of works in TPZ's including all regrading and excavations	Whenever there is work planned to be performed within the TPZ's. Contractor to provide a minimum of five days advance notice for such visits.	
3	Regular site inspections	Minimum frequency quarterly for the duration of the project.	The checklist must be completed by the Project Arborist at each site inspection and signed by both parties.
4	Final sign off	Following completion of works.	Practical completion of works and prior to tree protection removal.

6.11 Compliance Reporting

6.11.1 Following each inspection, the project arborist shall prepare a report detailing the condition of the trees. These reports should certify whether or not the works have been completed in compliance with the consent relating to tree protection.

6.11.2 These reports should contain photographic evidence where required to demonstrate that the work has been carried out as specified.

6.11.3 Matters to be monitored and included in these reports should include tree condition, tree protection measures and impact of site works which may arise from changes to the approved plans.

6.11.4 The reports and Compliance Statements shall be submitted to the Project Manager (as well as the Clients' nominated representative) following each inspection.

6.11.5 The reports and any Non-Compliance Statements shall be submitted to the Project Manager (as well as the Clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

6.12 Offset Tree Planting

6.12.1 Offset planting should reflect the number of trees removed and the initial loss of amenity and biomass. New trees should be of long-term potential and sourced from a reputable supplier.

6.12.2 Replacement tree species must suit their location on the site in terms of their potential physical size and their tolerance(s) to the surrounding environmental conditions. To avoid unethical or unprofessional tree selection and/or their placement within the landscape, replacement tree species must be selected in consultation with a consulting arborist, who can also assist in implementing successful tree establishment techniques.

6.12.3 Replacement tree species must have the genetic potential to reach a mature size potential of those trees removed to facilitate the development. As a guide, potential height will be a minimum of 10m (or more) and produce a spreading canopy so as they may provide amenity value to the property and contribute to the tree canopy of the surrounding area in the future.

6.13 Trenching for Installation of Underground Services

6.13.1 Where excavation or trenching is required to facilitate installation of underground services within the TPZs of any site trees arborist supervision is required. Works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

1. Excavation by hand
2. Excavation using a high-pressure water jet and vacuum truck
3. Excavation using an Air Spade with vacuum truck.

6.13.2 Machine excavation should be prohibited within the TPZs of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

7 References

- NSW Department of Primary Industries, 2018. *NSW WeedWise.* [Online] Available at: https://weeds.dpi.nsw.gov.au/Weeds/AfricanOlive [Accessed 14 February 2019].
- Penrith Local Environmental Plan, 2010. *Penrith Local Environmental Plan.* s.l.:s.n.
- SEED - NSW Government, 2019. *SEED - Sharing and Enabling Environmental Data.* [Online] Available at: https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU
- Standards Australia, 2007. *AS 4373–2007 Pruning of Amenity Trees,* Sydney: Standards Australia.
- Standards Australia, 2009. *AS4970 - 2009 Protection of Trees on Development Sites,* Sydney: Standards Australia.
- The British Standards Institution, 2012. *BS 5837:2012 - Trees in relation to design, demolition and construction,* London: BSI Standards Limited.

8 Appendices

8.1 Appendix A – Arboricultural Reporting Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. Any titles and ownership of any property are assumed to be good. No responsibility is assumed for matters legal in character.
2. It is assumed that any property/project is not in violation of any applicable codes, ordinances, statutes or other government regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified in so far as possible, however, the consultant can neither guarantee nor be responsible for the accuracy of the information provided by others.
4. The consultant shall not be required to give testimony or to attend court by reason of this document unless subsequent contractual arrangements are made, including payment of an additional fee for such services.
5. Loss or alteration of any part of this document invalidates the entire document.
6. Possession of this document or a copy thereof does not imply right of publication or use for any purpose by anyone but the person to whom it is addressed, without the prior written consent of the consultant.
7. Neither all nor any part of the contents of this document, nor any copy thereof, shall be used for any purpose by anyone but the person to whom it is addressed, without the written consent of the consultant. Nor shall it be conveyed by anyone, including the Client, to the public through advertising, public relations, news, sales or other media, without the written consent of the consultant.
8. This document and any values expressed herein represent the opinion of the consultant and the consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs and photographs in this document, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys unless expressed otherwise.
10. Information contained in this document covers only those items that were examined and reflect the condition of those items at the time of inspection.
11. Inspection is limited to visual examination of accessible components without dissection, excavation or probing. There is no warranty or guarantee expressed or implied that the problems or deficiencies of the plants or property in question may not arise in the future.

8.2 Appendix B – Explanation of Tree Assessment Terms

Tree name: Provides the botanic name, (Genus, species, sub-species, variety and cultivar where applicable) in accordance with the International Code of Botanical Nomenclature (ICBN), and an accepted common name.

Age: Refers to the life cycle of the tree

Category	Description
Young	Newly planted tree not fully established may be capable of being transplanted or easily replaced.
Juvenile	Tree is small in terms of its potential physical size and has not reached its full reproductive ability.
Semi-mature	Tree in active growth phase of life cycle and has not yet attained an expected maximum physical size for its species and/or its location.
Mature	Tree has reached an expected maximum physical size for the species and/or location and is showing a reduction in the rate of seasonal extension growth.
Senescent	Tree is approaching the end of its life cycle and is exhibiting a reduction in vigour often evidenced by natural deterioration in health and structure.

Health: Summarises the health and vigour of the tree

Category	Description
Excellent	Canopy full with dense foliage coverage throughout, leaves are entire and are of an excellent size and colour for the species with no visible pathogen damage. Excellent growth indicators, e.g. seasonal extension growth.
Good	Canopy full with minor variations in foliage density throughout, leaves are entire and are of good size and colour for the species with minimal or no visible pathogen damage. Good growth indicators.
Fair	Canopy with moderate variations in foliage density throughout, leaves not entire with reduced size and/or atypical in colour, moderate pathogen damage. Reduced growth indicators, visible amounts of deadwood/dieback, and epicormic growth.
Poor	Canopy density significantly reduced throughout, leaves are not entire, are significantly reduced in size and/or are discoloured, significant pathogen damage. Significant amounts of deadwood and/or epicormic growth, noticeable dieback of branch tips, possibly extensive.
Dead	No live plant material observed throughout the canopy, bark may be visibly delaminating from the trunk and/or branches.

Table 1. ArborSafe Structure Descriptors

Structure: Summarises the structure of the tree from roots to crown

Category	Description
Good	Good form and branching habit. Minor structural defects that are insignificant and typical or common within the species. e.g. included bark, co-dominant stems. No fungal pathogens present. No visible wounds to the trunk and/or root plate.
Fair	Moderate structural defects present that impact longevity e.g. apical leaders sharing common union(s). Minor damage to structural roots. Small wounds present where decay could begin. No fungal pathogens present. A fair representation of the species.
Poor	Significant structural defects present that have a significant impact on longevity and result in a poor representation of the species e.g. Branch/stems with included bark with failure likely within 0–5 years. Wounding evident with cavities and/or decay present. Damage to structural roots.
Hazardous	Serious structural defects with failure determined to be imminent (<12 months). Defects may include active splits and/or partial branch or root plate failures. Tree requires immediate arboricultural works to alleviate the associated risk.

Useful Life Expectancy (ULE): Useful Life Expectancy refers to an expected period of time the tree can be retained within the landscape before its amenity value declines to a point where it may detract from the appearance of the landscape and/or becomes potentially hazardous to people and/or property. ULE values consider tree species, current age, health, structure and location. ULE values are based on the tree at the time of assessment and do not consider future changes to the tree's location and environment which may influence the ULE value.

Category:
0–5 Years
5–10 Years
10–20 Years
20–30 Years
30–50 Years
>50 Years

8.3 Appendix C – Tree Assessment Data

Tree no.	Botanical Name	Common Name	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	TLE (Yrs.)	Defects	Significance	Action (irrespective of development)	Arborist comments	Recommendation
18	*Eucalyptus moluccana*	Grey Box	39	59	**4.7**	68.81	**2.7**	10-15	5-10	Poor	Poor	Senescent	<5	Cavity(s), Co-dominant stems, Deadwood/stubs > 30mm, Decay, Dieback, Epicormic growth, Excessive thinning, Fungal fruiting body(s), Wound(s),	Amenity value/shade	Removal,	- 28-02-2014 : alexnswdoe : Tree health in decline, Significant basal wound with cavity has compromised structural integrity,	Remove tree irrespective of future development.
20	*Eucalyptus moluccana*	Grey Box	34	51	**4.1**	52.30	**2.5**	15-20	5-10	Poor	Poor	Senescent	<5	Deadwood/stubs > 30mm, Dieback, Epicormic growth, Excessive thinning, Wound(s),	Amenity value/shade	Removal,	- 28-02-2014 : alexnswdoe : Tree in advanced decline with significant basal wound,	Remove tree irrespective of future development.
21	*Eucalyptus moluccana*	Grey Box	39	58	**4.7**	68.81	**2.6**	15-20	5-10	Fair	Fair	Mature	15-25	Deadwood/stubs > 30mm, Dieback, Epicormic growth, Excessive thinning, Pests/Insects, Resin exudation/Kino, Wound(s),	Amenity value/shade	Removal,	- 28-02-2014 : alexnswdoe : Monitor health following recent psyllid infestation,	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
22	*Eucalyptus moluccana*	Grey Box	66	86	**7.9**	197.06	**3.1**	15-20	10-15	Fair	Poor	Mature	15-25	Cavity(s), Co-dominant stems, Deadwood/stubs > 30mm, Dieback, Epicormic growth, Excessive thinning, Included bark, Pests/Insects, Wound(s),	Amenity value/shade	Removal,	- 28-02-2014 : alexnswdoe : Significant basal wound with cavity has compromised structural integrity, Fibre buckling at ground level on northern stem,	Remove tree irrespective of future development.
23	*Eucalyptus moluccana*	Grey Box	26	32	**3.1**	30.58	**2.1**	5-10	5-10	Fair	Fair	Semi-Mature	15-25	Dieback, Epicormic growth, Excessive thinning, Pests/Insects,	Amenity value/shade	Monitor,	- 28-02-2014 : alexnswdoe : Monitor health following recent psyllid infestation,	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
24	*Corymbia citriodora*	Lemon-scented Gum	29	37	**3.5**	38.05	**2.2**	10-15	5-10	Fair	Poor	Semi-Mature	<5	Crack(s)/Split(s), Deadwood/stubs > 30mm, Excessive end weight, Resin exudation/Kino, Wound(s),	Amenity value/shade	Removal,	- 28-02-2014 : alexnswdoe : Tree has elongated branches and poor trunk taper, Cracking visible on upper trunk,	Remove tree irrespective of future development.
33	*Eucalyptus moluccana*	Grey Box	26	40	**3.1**	30.58	**2.3**	10-15	5-10	Fair	Fair	Mature	15-25	Co-dominant stems, Dieback, Epicormic growth,	Amenity value/shade	Monitor,	- 28-02-2014 : alexnswdoe : Monitor health following recent psyllid infestation,	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
36	*Eucalyptus moluccana*	Grey Box	50	79	**6.0**	113.10	**3.0**	10-15	5-10	Fair	Good	Mature	15-25	Deadwood/stubs > 30mm, Dieback, Epicormic growth, Hanger(s), Suppressed, Wound(s),	Amenity value/shade	Monitor, Remove all deadwood/stubs, Remove hanging limb(s),	- 28-02-2014 : alexnswdoe : Monitor health following recent psyllid infestation,	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
37	*Corymbia maculata*	Spotted Gum	21	33	**2.5**	19.95	**2.1**	5-10	<5	Good	Fair	Semi-Mature	>50	Resin exudation/Kino, Wound(s),	Amenity value/shade			Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
41	*Eucalyptus tereticornis*	Forest Red Gum	58	78	**7.0**	152.18	**3.0**	10-15	10-15	Good	Fair	Mature	15-25	Co-dominant stems, Deadwood/stubs > 30mm, Dieback, Poor pruning, Wound(s),	Amenity value/shade	Monitor, Remove all deadwood/stubs,	- 28-02-2014 : alexnswdoe : Monitor basal unions for cracks or splits,	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).

Tree no.	Botanical Name	Common Name	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	ULE (Yrs.)	Defects	Significance	Action (irrespective of development)	Arborist comments	Recommendation
42	*Casuarina glauca*	Swamp she-oak	14	27	2.0	12.57	1.9	5-10	<5	Good	Good	Semi-Mature	25-50		Amenity value/shade			Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
43	*Casuarina glauca*	Swamp she-oak	24	36	2.9	26.06	2.2	10-15	<5	Good	Fair	Semi-Mature	25-50	Co-dominant stems.	Amenity value/shade			Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
44	*Casuarina glauca*	Swamp she-oak	28	39	3.4	35.47	2.2	10-15	<5	Good	Fair	Semi-Mature	25-50	Suppressed.	Amenity value/shade			Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
45	*Corymbia maculata*	Spotted Gum	67	97	8.0	203.08	3.3	15-20	10-15	Good	Good	Mature	>50		Amenity value/shade, Attractive landscape feature, Significant due to age/size			Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
50	*Eucalyptus tereticornis*	Forest Red Gum	52	63	6.2	122.33	2.7	15-20	10-15	Good	Poor	Mature	5-10	Co-dominant stems, Crack(s)/Split(s), Included bark, Pests/Insects, Previous failure(s), Weak union(s), Wound(s).	Amenity value/shade	Removal.	- 28-02-2014 : alexnswdoe : Tree has multiple significant defects. Previous failures have resulted in poor structure. Structure of remaining canopy is poor with a likely probability of failure. Management of defects is not viable management option.	Remove tree irrespective of future development.
53	*Eucalyptus moluccana*	Grey Box	68	96	8.2	209.18	3.3	15-20	10-15	Fair	Fair	Mature	15-25	Co-dominant stems, Deadwood/stubs > 30mm, Dieback, Epicormic growth, Excessive thinning, Soil compaction, Wound(s).	Amenity value/shade	Monitor, Mulching, Remove all deadwood/stubs,	- 28-02-2014 : alexnswdoe : Monitor basal union for cracks or splits. - 28-02-2014 : alexnswdoe : Monitor health following recent psyllid infestation. Mulch to 2m around trunk to improve growing conditions.	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
55	*Eucalyptus tereticornis*	Forest Red Gum	31	43	3.7	43.47	2.3	5-10	5-10	Good	Good	Semi-Mature	>50	Suckers.	Amenity value/shade	Trim suckers.	- 28-02-2014 : alexnswdoe : Remove basal sucker	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
85	*Eucalyptus tereticornis*	Forest Red Gum	34	38	4.1	52.30	2.2	10-15	5-10	Good	Fair	Semi-Mature	15-25	Deadwood/stubs > 30mm, Soil grade changes.	Amenity value/shade	Monitor, Remove all deadwood/stubs,	- 04-03-2014 : alexnswdoe : Monitor tree health and for root plate movement.	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
129	*Olea africana*	African Olive	16	18	2.0	12.57	1.6	5-10	5-10	Good	Good	Mature	15-25	Damaging infrastructure, Inappropriate location, Suckers, Undesirable species.	Amenity value/shade	Removal.	- 04-03-2014 : alexnswdoe : Clear from fence.	Remove tree irrespective of future development.