

arboricultural impact assessment report – SSDA (RtS)

AIA-02

Revision B, Issued for SSDA – Response to Submissions
18 February 2026



PROJECT

SOCIAL & AFFORDABLE HOUSING

2 Flide Street,
Caringbah, NSW, 2229

CLIENT / PRINCIPAL

HOMES NSW

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Parramatta, NSW, 2150



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Acknowledgements & Qualifications

This document has been prepared by Arterra Design Pty Ltd, using the expertise of our in-house (AQF Level 5), consulting arborists, Robert Smart and/or Chloe Bristow.

Robert Smart is a member of the International Society of Arboriculture (ISA), an accredited member of the Institute of Australian Consulting Arboriculturists (IACA), a Registered Consulting Arborist with Arboriculture Australia (AA) and a licenced Quantified Tree Risk Assessment (QTRA) practitioner. Robert Smart has over 25 years experience in assessing and managing trees in complex development sites. Robert is also a Registered Landscape Architect with over 30 years' experience.



Disclaimer

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i EXECUTIVE SUMMARY

In March 2025, Arterra was engaged by Homes NSW (the client) to undertake an arboricultural assessment of the existing trees at 2 Flide Street, Caringbah, NSW (the site), to inform the design for the construction of social and affordable housing apartments. This report has been updated in February 2026 due to changes that have been made to the building and landscape as a result of response to submissions. From a tree protection and impact perspective, these changes are relatively minor and have not altered the previous recommendations and tree management. There are no changes to the trees to be retained or removed. The minor external changes are benign in terms of tree related impacts and we support the proposed modifications.

We specifically note the relocation of the driveway from Gardere St to Willarong Rd as a positive outcome, as it reduces the amount of surface works required around the prominent *Eucalyptus pilularis* tree (T2) and permits greater provision of soft landscaping and permeable surfaces around the tree's root zone. There is a very minor increase in the nominal incursion from 7% to 8% due to the grading proposed to the north of T2 but this is at the very extremity of the NRZ and on the other side of a pre-existing wall associated with the existing driveway. It is therefore considered to have only negligible further impact to the tree and still well within acceptable limits. The other required landscape retaining walls have been suitably located in areas that do not affect tree roots and the filling around the tree for final landscape is minor and acceptable. The hydrant booster assemblies and their access are located in a lower and pre-existing driveway area and are not expected to impact the tree if surface impacts are appropriately managed and overseen by the Project Consulting Arborist. The proposed levels do not result in any excessive excavations that would impact the tree further.

Application to remove some trees impacted during the demolition phase of the project has also been made via a Part 5 assessment under the NSW Environmental Planning and Assessment Act. A separate Arboricultural Impact Assessment (AIA) report by Arterra, dated 18 June 2025 addresses the tree protection and removal during the demolition phase.

This report assesses the potential impacts of all the construction works that are proposed to occur. A detailed tree assessment and impact schedule was completed for all the existing trees close to the proposed works. (Refer to Appendix 4.2 – Tree Impact Assessment Schedule). The trees were photographed, allocated a unique identification number and plotted onto a scaled survey base plan for referencing and identification throughout the report and for future discussions and co-ordination with all Contractors and relevant stakeholders (Refer to Appendix 4.1 – Tree Plans).



Figure i – Image showing the site from the corner of Gardere Street and Flide Street showing the prominent street tree on the corner of the site fronting the street (T07 *Eucalyptus racemosa* - Scribbly Gum) (Photo: Arterra 20 March 2025)

A total of **40** trees were assessed for this report. Five street trees are adjacent to the site (T05, T07, T21, T34 and T35). The remaining trees are located within the site boundary. These are trees that would be considered 'prescribed trees' under the Sutherland Development Control Plan 2015 (DCP). Small trees (diameter of <100mm measured 500mm above ground level), shrubs (diameter of <100mm measured 500mm above ground level) and dead trees have typically not been included in our assessment.

The following points arise from the impact assessment:

- **9** trees (22%) are to be retained and protected.
- **31** trees (88%) are to be removed.
- Most trees to be removed (**27**) are rated as **low or very low value** trees.

Table i: Ultimate Tree Disposition - Trees to be Retained and Removed

Tree Retention Values	Trees to be retained	Trees to be removed	Total Trees
High	2	1	3
Moderate	6	3	9
Low	1	15	16
Nil /Should Remove	0	12	12
TOTAL	9	31	40

With regard to the **9** trees to be retained and protected and as defined by AS4970-2025 - Protection of Trees on Development Sites:

- **3 trees** have a 'minor encroachment' (< 10%) into their Notional Root Zone (NRZ).
- **No trees** have a 'moderate encroachment' (10%-20%) into their NRZs
- **No trees** have a major encroachment' (> 20%) into their notional NRZs
- **4 trees** will have various levels of canopy pruning required for the construction period scaffold clearances and for the ultimate building clearances. The levels of pruning are considered acceptable. To minimise this pruning, some portions of the building's construction period scaffold need to be maintained at a width of only 1.2m.
- Some trees have some minor surface impacts that will require careful management during the proposed demolition and construction works. This work is shown on the Tree Retention and Removal Plan (T-02) and noted in the schedule. These minor surface impacts to be managed, relate to the demolition of the landscape structures close to the trees or the construction of new landscape pathways and driveways at, or above, existing grades. These are not expected to impact the long-term health of the trees.
- Following demolition and construction of the new basement, the area between the old and new basement is to be carefully backfilled and suitably consolidated. It is assumed the existing basement structures will be permanently buried and remain in place as the tree's roots are likely to be growing hard up against this and relying on it for support. Subject to individual assessment and during finalisation of the works, the upstands near the trees may be sensitively demolished under the direct oversight of the Project Consulting Arborist.

It is the author's opinion that the potential tree impacts can be managed with minimal impact to the retained trees if the proposed tree protection measures and the proposed protocols are strictly implemented and the demolition work and other construction work that occurs immediately around the trees is closely monitored by a suitably qualified (AQF5) Project Consulting Arborist. This report outlines the anticipated tree impacts and how the works are to be managed and mitigated, including the following key items:-

- Installation of the required tree protection measures prior to any works occurring on site;
- Meeting of the contractor and the Project Consulting Arborist on site prior to works to discuss the protection requirements, demolition and construction equipment and methods and the site access.
- Site inductions and regular 'tool box talks' by the Contractor reinforcing tree protection as the highest priority;
- Appropriate propping and retention of the basement retaining wall, where noted, and adjacent to the retained trees in order to protect their roots and maintain tree stability.
- Some small portions of the proposed building's construction period scaffold will need to be maintained at a maximum width of 1.2m to minimise pruning and keep to tolerable levels.

It will be vital to ensure the appointed Contractor ensures that the required tree protection measures are implemented, are then maintained, and that sufficient care is exercised by all its sub-contractors during the works. This document has been prepared by Arterra, using the expertise of our in-house consulting arborist (AQF Level 5), Robert Smart. Robert Smart is a member of the International Society of Arboriculture (ISA), an accredited member of the Institute of Australian Consulting Arboriculturists (IACA), a Registered Consulting Arborist with Arboriculture Australia (AA) and a licenced Quantified Tree Risk Assessment (QTRA) practitioner.



Robert Smart AAILA , ISA, AA, IACA

Director, Registered Landscape Architect (054), AQF5 Registered Consulting Arborist (1804).

1.0 INTRODUCTION

1.1 Background

This Arboricultural Impact Assessment has been prepared by Arterra on behalf of Homes NSW for a State Significant Development Application (SSD-84862461) for construction of a 14 storey residential flat building for social and affordable housing apartments, at 2 Flide Street, Caringbah, NSW (the site).

The purpose of this report is to provide an assessment of the likely tree impacts and arboricultural advice regarding the development proposal for the site and to address the Secretary's Environmental Assessment Requirements (SEARs) for the project which identified the following specific assessment requirements:

Table 1 – SEARs Requirements

Item	Description of Requirement	Section Reference (this report)
14. Trees and Landscaping	If the proposal involves impacts to trees, provide and Arboricultural Impact Assessment that assesses the number, location, condition and significance of trees to be removed including: - any existing canopy coverage to be retained on site - tree root mapping if the proposal involves significant impacts to tree protection zones of retained trees identified as being significant.	Refer: - Section 2.4 Number of Trees - Section 2.9 Existing Canopy Cover - Appendix 4.2 – Detailed Schedule of Trees - Appendix 4.1 – Existing Tree Plans
	Provide a landscape plan, that: - Details the proposed site planting, including location, number and species of plantings, heights of trees at maturity and proposed canopy coverage (as a percentage of the site area) - Provides evidence that opportunities to retain significant trees have been explored and/or informs the plan.	Refer: Separate Landscape Plan / Report by others.

Items listed above relating to the existing trees on the site are addressed directly by Arterra, however, the remaining items listed have been addressed in collaboration with the Project Landscape Architect. Refer to separate landscape related documentation for the site wide landscape plans addressing landscape related matters.

The client has previously sought approval to remove some trees impacted during the demolition phase of the project, via a Part 5 application under the NSW Environmental Planning and Assessment Act. A separate Arboricultural Impact Assessment (AIA) report by Arterra, dated 18 June 2025 addresses the trees removed during the demolition phase. Trees removed subject to the previous Part 5 application are still shown and addressed in this report for clarity. Please note that the demolition report only addresses demolition, while this report addresses the ultimate project and as such addresses further tree removals and impacts that occur as part of the ultimate works.

1.2 The Site

The site, located in the Sutherland Local Government Area (LGA). The site comprises five lots with combined area of approximately 3,597 m². It is legally described as Lots 57-60 and Lot 80 in DP8147 and has frontages to Gardere Street, Flide Street and Willarong Road. It is assumed existing buildings and other infrastructure on the site will be completely demolished and removed pursuant to a separate Part 5 application under the NSW Environmental Planning and Assessment Act.

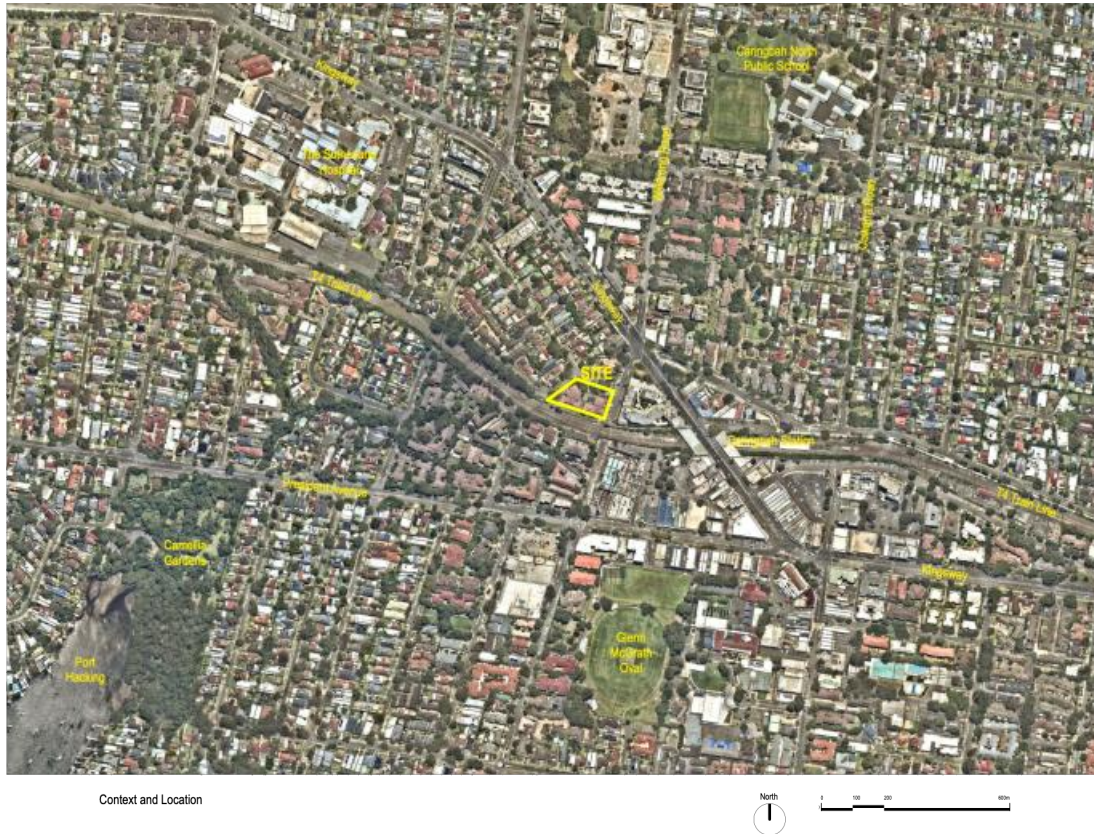


Figure 1.1 – Site context and location – site outline shown in yellow. (Source: Arterra / NearMap)



Figure 1.2 – View of the site from the corner of Gardere Street and Flide Street showing the three-storey brick walk-up residential flat buildings with trees of varying retention value fronting the street. (Photo: Arterra 20 March 2025)

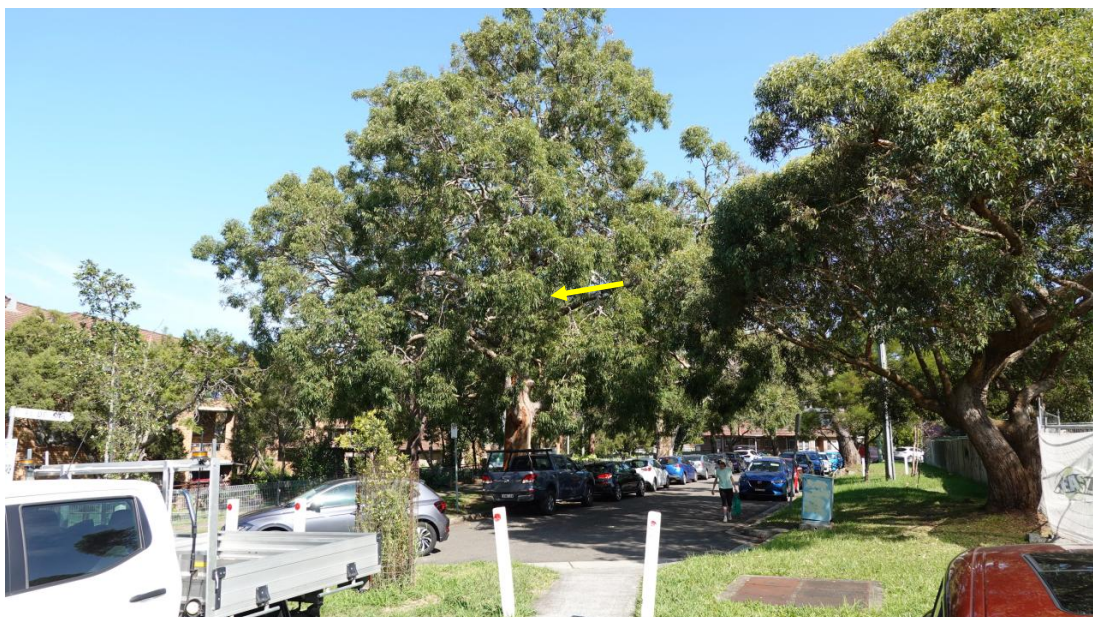


Figure 1.3 – View of the site looking from the far eastern end of Flide Street at the prominent street tree fronting the site (T21 *Angophora costata* Smooth-barked Apple) (shown arrowed). (Photo: Arterra 20 March 2025)

1.3 Aims of this Report

This arboricultural impact assessment has been prepared to identify the trees to be retained and removed as part of the redevelopment project and to assess potential tree impacts. The specific aims of the report are to:

- assess the health and condition of the trees and record all the relevant data for existing trees;
- assess significance, Useful Life Expectancy (ULE) and retention values of the existing trees;
- provide recommendations as to which trees should ideally be retained and protected;
- identify the proposed Tree Protection Zones (TPZ) of the trees being retained;
- identify and assess the likely arboricultural impacts of the development on the trees; and
- provide recommendations on the tree protection measures that will be required during construction to ensure the trees are successfully retained.

The assessment is restricted to the trees within or immediately adjoining the site that are likely to be impacted by the works proposed works. Other trees outside the extent of the proposed works and unlikely to be impacted, are not addressed as part of this report.

All tree plans contained in this report are based on information provided to Arterra, including site survey and architectural drawings. The tree plans should only be used for reference and relating to tree issues and are not suitable for any other purpose.

The following limitations apply to this report's use: -

1. Plans: All plans are based on information provided to Arterra. They should only be used relating to tree issues and are not suitable for any other purpose.
2. Notification of proposed alterations to disturbance within Notional Root Zones (NRZs) or Tree Protection Zones (TPZs): Arterra must be clearly notified of any proposed alterations to the plans or additional disturbance in the NRZs / TPZs, so that we can advise on the implications before any work is undertaken.

1.4 Relevant Controls or Legislation

The site is zoned R4 High Density Residential under the Sutherland Local Environmental Plan 2015 (Sutherland LEP). Residential flat buildings are permitted with consent in the R4 zone. We understand the site is not heritage listed, nor in a heritage conservation area. The site does not appear to be constrained by any natural area or biodiversity mapping.

Following is a summary of the relevant DCP controls for vegetation.

Protected Trees

Trees and Bushland Vegetation are protected under the provisions of Chapter 39 – Natural Resource Management of the Sutherland DCP 2015 (DCP). This section of the DCP sets out the types of vegetation protected under State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (the SEPP). The SEPP applies to land that is zoned for urban purposes or for environmental conservation/ management under SSLEP2015.

Clause 4.2 (2) of the DCP defines protected 'trees' or bushland as:

- a. A single or multi trunked tree with a diameter of 100mm or more measured at 500mm above ground level.
- b. Any bushland vegetation, including mangroves. Bushland vegetation for the purpose of this clause means vegetation which is either remnant of the natural vegetation of the land or, if altered, is representative of the structure and the floristics of the natural vegetation. For the purposes of this sub-clause, bushland vegetation includes trees of any size, shrubs and all herbaceous species; and
- c. Any tree and/or riparian vegetation growing within 4 metres of a creek or watercourse.

Section 4.3 Species Exempt from this Order, sets out the vegetation that is not protected under the DCP and maybe removed without consent, unless it forms part of a listed heritage item. See Table 2 below, extracted from the DCP.

Table 2 – Exempt Tree Species as per Sutherland Shire DCP 2015

Species Name	Common Name
<i>Ailanthus altissima</i>	Tree of Heaven
<i>Acacia podalyriifolia</i>	Queensland Silver Wattle
<i>Acacia saligna</i>	Golden Wreath Wattle
<i>Acer negundo</i>	Box Elder
<i>Araucaria bidwillii</i>	Bunya Bunya pine
<i>Arundinaria spp</i>	Clumping Bamboo
<i>Chamaecyparis pisifera spp</i>	Sawara Cypress
<i>Cinnamomum camphora</i>	Camphor laurel
<i>Citrus spp</i>	Cumquat, Grape Fruit, Lemon, Lime, Mandarin, Orange (edible species)
<i>Cupressus macrocarpa var brunniana</i>	Brunnings Golden Cypress
<i>Cupressus sempervirens</i>	Pencil Pine or Italian Cypress
<i>Cupressocyparis leylandii</i>	Leyland Cypress (and their cultivars)
<i>Eriobotrya japonica</i>	Loquat
<i>Erythrina X sykesii</i>	Coral Tree
<i>Ficus benjamina</i>	Weeping Fig
<i>Ficus elastica</i>	Rubber Tree
<i>Grevillea robusta</i>	Silky Oak
<i>Ligustrum lucidum</i>	Large Leaf Privet
<i>Ligustrum sinense</i>	Small Leaf Privet
<i>Liquidambar styraciflua</i>	Liquidambar
<i>Morus nigra</i>	Black Mulberry
<i>Olea europaea subsp cuspidata</i>	African Olive
<i>Phoenix canariensis</i>	Canary Island Date Palm
<i>Phyllostachys aurea</i>	Fishpole Bamboo
<i>Phyllostachys nigra</i>	Black Bamboo
<i>Pinus radiata</i>	Radiata Pine or Monterey Pine
<i>Pomme spp</i>	Apple, Crab Apple, Nashi Fruit, Pear, Quince (edible species)
<i>Populus nigra "Italica"</i>	Lombardy Poplar
<i>Prunus spp</i>	Apricot, Cherry, Nectarine, Peach, Plum
<i>Robinia pseudoacacia</i>	Black Locust
<i>Schefflera actinophylla</i>	Umbrella Tree
<i>Syagrus romanzoffiana</i>	Cocos Palm

1.5 Conduct and Author Qualifications

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Furthermore, Mr Smart confirm that he has read and agree to be bound by the NSW Uniform Civil Procedure Rules 2005, Part 31 Division 2 Provisions, Schedule 7 - Expert witness code of conduct.

Aterra provides specialist consulting arborist services only; and does not provide any physical tree services such as climbing, pruning, removal, root investigations or root pruning. Our advice is based on impartial professional assessment, as we do not derive any financial benefit from specifying pruning or other physical arborist services. We do not specify any such activities unless we determine them to be essential to ongoing tree health or stability.

1.6 Key Definitions and Abbreviations

The following abbreviations are used throughout this report.

"NRZ" = Notional Root Zone

This is the area as defined by AS 4970:2025 – "Protection of Trees on Development Sites" and means the typical minimum area above and below ground at a given distance from the trunk to provide for protection of the tree. Most importantly it represents the root zone required to be left undisturbed to maintain a healthy and viable tree. Please note, that roots will usually extend well beyond this zone, so this represents the minimum remaining root zone required, assuming all others are lost or damaged due to construction. It is typically calculated as a circle centred on the trunk unless existing site conditions can be assessed and indicate otherwise.

"TPZ" = Tree Protection Zone

Although based on the NRZ above, this is a consolidated and often more simplified area to be applied during construction for tree protection. This area is often shaped to deal with practical construction realities whilst maintaining appropriate protection of the notional root zone (NRZ) (i.e fencing a nominal circular NRZ can be difficult and impractical. TPZ areas often define a square or rectangular shape which includes the area calculated as the nominal NRZ). It often amalgamates and simplifies tree protection zones, particularly when they are overlapping and can be amended for items such as buildings, walls, pathways and existing fences. It also protects areas that are contiguous to the calculated nominal NRZ, which are to be applied when there is an incursion calculated within the NRZ or the nominal NRZ is not completely circular due to structures potentially impeding root growth.

"SRZ" = Structural Root Zone

This is the area as defined by AS 4970:2025 "Protection of Trees on Development Sites" and means the area immediately around the base of the tree at a given distance from the trunk within which the woody roots and soil cohesion are considered vital to the structural stability of the tree. Disturbance, damage or removal of soil and roots within this area will typically render the tree unstable and require its removal. It is typically calculated as a circle, centred on the trunk, unless existing site conditions can be assessed and indicate otherwise.

"DSH" = Diameter at Standard Height

This is the diameter of the trunk measured at 1.4m above ground level.

"DGL" = Diameter at Ground Level

This is the diameter of the trunk measured at ground level, but just above any root flare.

Non-Destructive Digging

This is the process of safely excavating the ground surface to minimise the risk of damage to existing tree roots. This method is used to map and locate existing tree roots within the TPZ and/or NRZ and helps to guide and inform the installation and/or construction of proposed services and/or structures which are close to retained trees. This is often achieved through hand digging using a shovel, trowel and/or fork with care not to damage the bark and wood of any roots. Dry vacuum extraction is an appropriate non-destructive alternative to hand digging. When this work occurs within a TPZ and/or SRZ of a tree to be retained, a consulting arborist should always be present to monitor the works. Alternatively, services can be installed via under boring at a depth of not less than 1.2m below existing ground levels, when passing the tree(s).

Inclusion or Included Bark Branch Union

Growth of bark at the interface of two or more branches on the inner side of the branch union which is unable to be lost from the tree and accumulates, or is trapped, between the acutely divergent branches. This can form a weakened branch union in some species.

Epicormic Growth

Juvenile shoots produced along branches or trunks from dormant or latent buds concealed beneath bark. Production can be stimulated by fire, pruning, wounding or root damage and may also be an indicator of tree stress or decline.

1.7 Documents Reviewed

The following plans and documents were reviewed as part of this tree impact assessment:

Bates Smart Architects (Including latest digital CAD files issued 16/2/2026)

- Demolition Plan – Basement - A01.100 Rev 2 dated 29/8/2025
- Demolition Plan – Ground Level - A01.101 Rev 2 dated 29/8/2025
- General Arrangement Plans – Basement 01 – DA03.001 Rev 4 dated 6/2/2026
- General Arrangement Plans – Lower Ground Level 00 – DA03.100 Rev 4 dated 6/2/2026
- General Arrangement Plans – Upper Ground Level 01 – DA03.101 Rev 4 dated 6/2/2025
- General Arrangement Plans –Level 02 – DA03.102 Rev 4 dated 6/2/2026
- General Arrangement Plans –Level 3,5,6,8 – DA03.103 Rev 4 dated 6/2/2026
- General Arrangement Plans –Level 4,7 – DA03.104 Rev 4 dated 6/2/2026
- General Arrangement Plans –Level 9-13 – DA03.109 Rev 4 dated 6/2/2026
- Section AA – DA10.001 Rev 3 dated 20/2/2026
- Section BB – DA10.002 Rev 3 dated 20 /2/2026

Moits

- Demolition Work Plan Received 27 May 2025

SLR – Cumberland Ecology

- Biodiversity Development Assessment Report Waiver Request dated 29 August 2025
- Demolition Development Application – Flora and Fauna Assessment dated 24 June 2025

Norton Survey Partners - Surveyors:

- Detail and Levels Survey – Sheets 1 to 5 – Job No. 36313 received 8 April 2025.
- Basement Extent Detail and Levels Survey – Sheets 1 to 5 – Job No. 36313 received 26 May 2025.

ADP Consulting Engineers

- Services Infrastructure Report dated 17 September 2025

Mott Macdonald Engineers

- Engineering Plans – Civil and Stormwater Concept (SK01-05) dated 18 September 2025

Based on review of the above information and the extent of the construction works and proposed services, we believe the works can be achieved in a manner that avoids major trenching or disturbance to the existing trees that are proposed to be retained. It is assumed that the majority of the services needed for the development can be obtained and routed from Willarong Crescent and thereby avoid disturbance to the retained trees. It is assumed that any existing services that are no longer required will be capped off and left in situ, if they are located under trees to be retained and within a designated TPZ.

1.8 Assessment Methodology

Data Collection

On the 20 March 2025, Rob Smart of Arterra carried out a visual inspection of the site. Arterra attended the site to undertake a detailed assessment of the trees within the site and likely to be impacted by the proposed development. The trees' health and condition were assessed via a visual inspection undertaken from the ground only. Requisite tree data (including DBH, DGL, height & canopy spread, condition & proximity to services) were recorded using an Apple iPad and FileMaker Pro database.

The basic health and condition criteria that were inspected for each tree is summarised as follows:

- tree size, broad age-class and general balance of the tree;
- canopy foliage size, colour and density;
- dieback and epicormic growth;
- trunk or branch wounding, branch tear outs and pruning history;
- structural defects such as co-dominant stems, cracks, splits, included bark, decay;
- pests and disease evidence or occurrence;

- above-ground obstructions; and
- evidence of recent site disturbance.

All trees were photographed, given a unique identification number, and plotted onto a scaled base plan for referencing and identification throughout the report and for future discussions and co-ordination. Tree trunk diameters were measured using a metric diameter tape measure. Tree heights were measured using the two-point clinometer function of a Nikon Forestry Pro laser range finder. Canopy spreads were estimated by pacing out distances along the cardinal axis of the canopy and cross-referencing to survey information and aerial photos.

No specialised equipment or methods were employed to test for the extent of decay in any of the trees, apart from a nylon 'sounding' mallet. No plant samples were analysed or independently tested to verify or formally identify any pests or diseases.

Desktop Review and Research

Digital AutoCAD files of the proposed works were imported into Arterra's standard CAD software (ArchiCAD v27) and superimposed over the tree and site survey information. The extent of site disturbance was analysed for the proposed building works, landscaping, services and other site grading. An assessment was made of the likely extent of impacts on the TPZs, taking into account the likely construction impacts depending on the type of work being undertaken (cut or fill, suspended slabs, decks, service trenches). Various area calculations and measurements were made in the CAD software of the likely incursions into the TPZs or NRZs.

Historical aerial photography was gathered from NSW Spatial viewer. More recent aerial imagery was obtained from the NearMap website with aerial photos of the site dating from January 2025 imported into the above software for cross checking and assessment.

Climatic data was obtained from the Bureau of Meteorology using statistics from Sydney Airport AWS which is approximately 11.0km to the north of the site. (<http://www.bom.gov.au/climate/data/> accessed 29 April 2025)

1.9 Pre-Development Tree Assessments – Tree Retention Values

The information gathered in the field was tabulated and the retention value assessed using a combination of techniques commonly used and recognised in the arboricultural industry. The tree life expectancy was established using the Useful Life Expectance (ULE) system. A summary of these systems is provided below.

Useful Life Expectance (ULE)

ULE is a system based on Jeremy Barrell's work developed in 1993. It determines the time a tree may be expected to be retained based on its age, health, condition, and location. This is then moderated by the economics of maintenance or other costs of retaining the tree. A long ULE means the tree is presently expected to live longer than 40 years with minimal intervention and cost. A short ULE indicates a tree that is not expected to live longer than 5 years or may require substantial intervention or costs to retain it. The reference to 'safe' useful life expectancy is generally no longer used in the industry as it implies a certainty that cannot be delivered.

Retention Values

The proposed retention value of the trees was determined based on a considered combination of the size, age, condition and suitability of the tree. Each tree was then ranked according to one of 4 retention categories.

1. **"High" Retention Value** – these are trees that are typically in good or very good condition, large and visually prominent, historically or environmentally important. They may also be lesser quality trees, but part of an important grouping of trees. They should represent a serious physical constraint to the development and their removal avoided where possible and feasible.
2. **"Moderate" Retention Value** – these are trees that are in good to reasonable condition and should be retained where possible and feasible to do so. They may also be lesser trees, but part of an important grouping of trees and therefore warrant retention based on the group's value.
3. **"Low" Retention Value** – these are trees that are in poor condition or have structural defects, are particularly small or commonplace, are not historically, environmentally or socially significant and should not be considered as a constraint to the development. They could be retained only if they are not likely to be impacted by, or constrain potential desirable, development outcomes.
4. **"Should Remove" / Nil Retention Value** – these are trees that are in very poor health, exhibit poor form, or have serious structural defects, are considered weeds or combination of all these, and therefore should be considered for removal regardless of any development.

Consideration has also been given to the relationship of the trees to one another and their proximity to the likely development areas on the site. For example, trees that are part of a closely spaced group, or are likely to be

significantly misshapen or unstable with the removal of surrounding trees and structures are considered with these factors in mind.

1.10 Tree Assessment – Notional Root Zone and Tree Protection Zone Calculations

To ensure the long-term survival and growth of any tree to be retained on the development site, a suitable area is required to be protected around the tree. This area should typically be as large as possible. It should also take into consideration: -

- The size and age of the tree;
- Above and below ground properties;
- The health and condition of the tree;
- The species of tree and its tolerance to disturbance;
- Soil conditions, type, depth and site hydrology and
- Site specific conditions and any existing obstructions to root development

The **Notional Root Zones** (NRZs) have been calculated using the formula and criteria outlined in AS 4970:2025 Protection of Trees on Development Sites. In summary the standard applies the calculation for the radius of the NRZ as $12 \times$ (the tree trunk diameter (in metres) calculated at standard height (DSH)). DSH is taken at 1.4m above ground level.

A maximum NRZ radius will be 15m (unless crown protection is required) while the minimum NRZ radius shall be 2m. The NRZ is typically assumed to be radial and centred on the centre of the tree's trunk unless other site factors or tree canopy size and location dictate an adjustment.

Encroachments of up to **10%** of the NRZ area may be accepted as long as it is also outside of the Structural Root Zone (SRZ). This is known as a "**minor encroachment**".

Encroachments of between **10% to 20%** of the area are known as a "**moderate encroachment**". This level of encroachment needs to be carefully assessed by the Project Consulting Arborist. It may be acceptable within the NRZ as long as it is outside of the Structural Root Zone (SRZ) and relevant factors are considered such as the location and distributions of roots, the trees health and tolerance to disturbance, existence or present or past obstacles that may have affected root development, the nature of the disturbance and tree maintenance and care activities to be applied.

Encroachments greater than **20%**, are known as "**major encroachments**". These will only be accepted with additional and very specific evidence that the tree will not be unduly impacted by the proposed works.

Whenever an encroachment is made into a NRZ, a suitable compensatory area should be made elsewhere and physically contiguous to the remaining TPZ.

The **Structural Root Zone (SRZ)** is the area defined as the minimum area required to retain the **structural stability** of the tree. The formula for calculating the SRZ is outlined in AS 4970 Section 3.5. No encroachments into the SRZ shall typically be warranted or allowed.

2.0 BACKGROUND, OBSERVATIONS & TREE ASSESSMENT

2.1 Site History and Existing Trees

Refer to attached T-01 Tree Retention Value Plan for the locations of the trees currently on, or immediately adjacent to the site. Review of the historical aerial imagery of the site from the 1943 shows the site was predominantly scrubby vegetation with a single large tree on the southern (rail corridor) boundary with a single dwelling and shed in the south-eastern corner. Imagery from 1956 shows the site developed with multiple single dwellings. The large tree remains on the southern street frontage. Imagery from 1970 shows the site largely unchanged. The large tree remains on the southern boundary. Imagery from 1990 however shows the site in its current unit block configuration with two residential flat buildings, and some more established trees along the northern boundary / street frontage. The large tree remains in the middle of the southern boundary and a smaller tree can be seen to the east of this tree. Imagery from 2010 shows the site in its current configuration, the trees along the northern street frontage have grown and the larger tree on the southern boundary has since been removed while the trees to the east have grown substantially. Imagery from 2025 shows the site in its current configuration, little has changed with the most substantial trees now being the street trees on the northern street frontage (Flide Street) and one substantial *Eucalyptus pilularis* (Blackbutt) at the south-western corner of the site which appears to date from the late 1980s.

The following images demonstrate the general development of the site and the ages and periods of tree planting.



Figure 2.1 – Aerial image of the site in 1943 illustrating that the site had been partially cleared. (Source: Arterra / NSW Spatial Services)

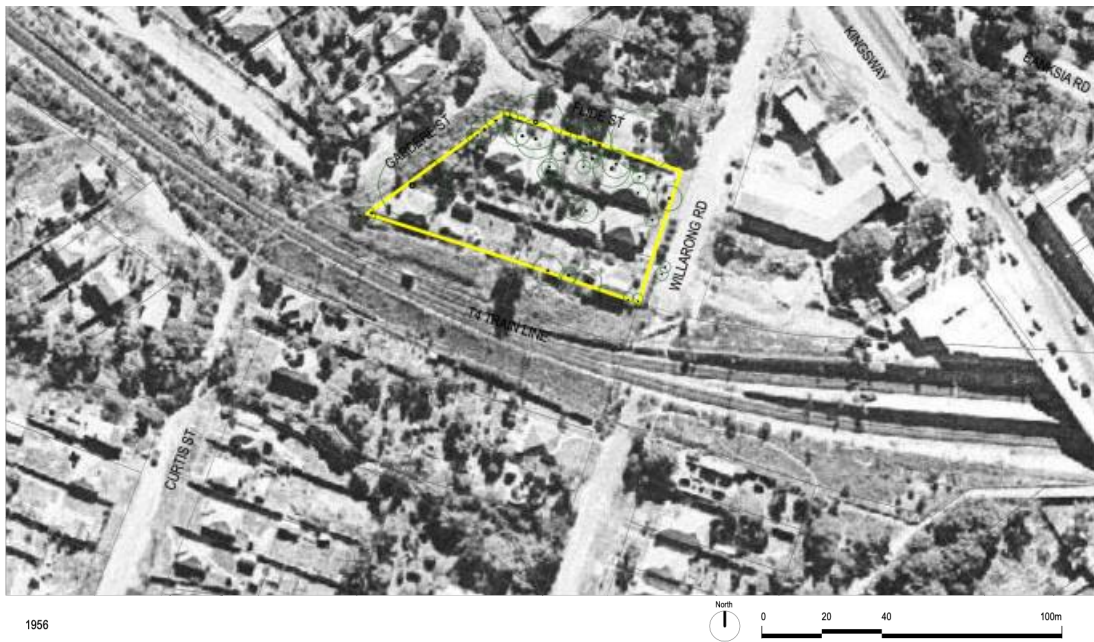


Figure 2.2 – Aerial image of the site in 1956 illustrating the site had been developed for low density residential housing. (Source: Arterra / NSW Spatial Services)

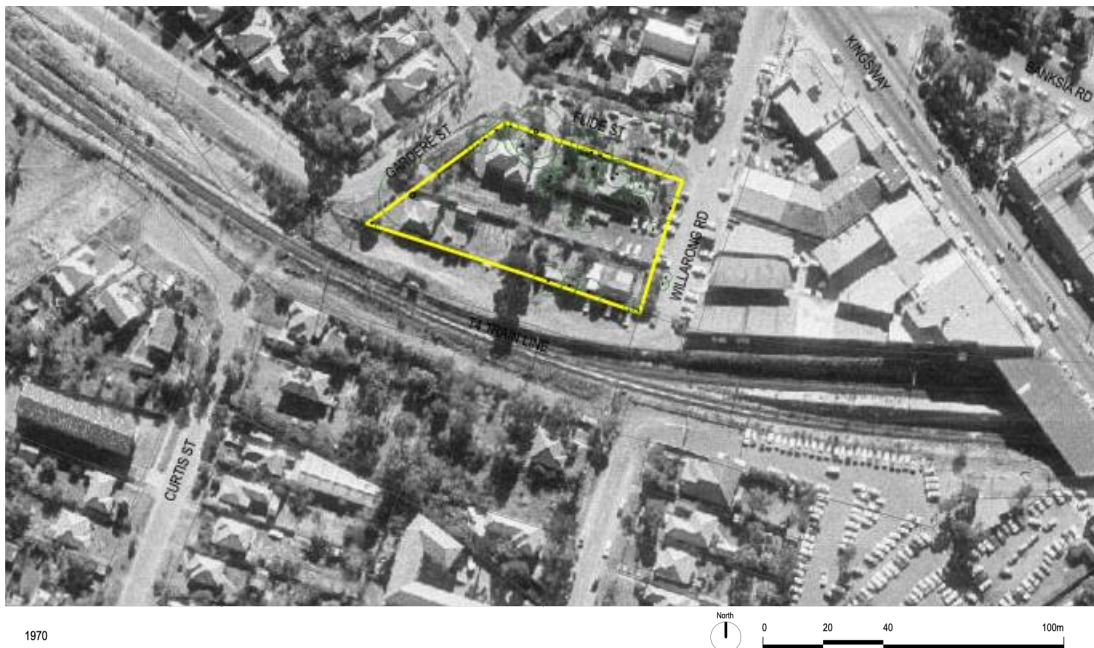


Figure 2.3 – Aerial image of the site in 1970 illustrating the site remained as low density residential housing. (Source: Arterra / NSW Spatial Services)



1990



Figure 2.4 – Aerial image of the site in 1990 illustrating that the site had been redeveloped to medium density residential unit blocks. Substantial street trees are visible along Flide Street however the now substantial Blackbutt (T02) is only just visible as small tree in the south western portion of the site. (Source: Arterra / NearMap)



2010



Figure 2.5 – Aerial image of the site in 2010 illustrating the site as it appears today. Many of the trees have grown, with the canopies expanding much more broadly than shown in 1990. Note T02 is now clearly visible in the southwest corner of the site. (Source: Arterra / NearMap)



Figure 2.6 – Aerial image of the site as it appears today. The most prominent trees are on the site boundary or the adjacent street trees. (Source: Arterra / NearMap)

2.2 Climate and Microclimate

Caringbah is one of Sydney's southern suburbs, and therefore shares the general climate of this region with moderate temperatures, good rainfall and minimal climatic and weather extremes. It is typically described as a temperate climate with hot to warm summers and cool winters, with relatively uniform rainfalls greater than 800mm / year. There is no distinct dry season.

Caringbah is located approximately 18km south of the Sydney CBD, and less than 4km from the coast at Cronulla. It has an approximate average annual rainfall of 1100mm, fairly evenly spread across the year but with a slightly drier period during the late winter and early spring months. The highest rainfall period is usually June with an average of 124mm and the driest month being September with an average of less than 60mm.

Maximum average daily temperatures range from 26.7°C in January and to 17.2°C in July. The minimum average daily temperatures range from a high of 19.2°C in February down to lows of 7.4°C in July. The primary wind direction is from the south to the north-east in the afternoons while it is predominantly from the north-west and west in the mornings. This is common of coastal areas dominated by "sea breeze" affects. Review of climate data indicates that the primary direction for strong winds is from the south or west and in the afternoons. There are no significant microclimatic influences that would be considered unusual for an intensively developed urban area.

2.3 Soils, Landform and Native Vegetation

With regard to the expected naturally occurring soils, mapping indicates the site to be within the Blacktown Soil Landscape Association which occurs extensively throughout much of western Sydney but also as isolated portions in higher plateaus areas in the fringes of the Sydney Basin, such as the Woronora Plateau at Caringbah. These soils are often related to the remnants of highly weathered shales of the Wianamatta Group. This is typically characterised by undulating low and rolling hills located over the Ashfield and Bringelly Shale geological formations which are mostly interbedded shales with very occasional sandstones. Typically, these areas would be shallow to moderately deep Red Podzolic soils, where the boundary between the topsoil and subsoil is relatively clear. These shale based soils are generally of low fertility but with good water holding capacity. They can be subject to waterlogging and are often acidic.

The natural soil conditions are not particularly relevant to this site due to the pre-existing development that will have seen most of the site area excavated and the natural soils removed. The nature of the site and the extensive basement excavations undertaken on the site would indicate that the naturally occurring soils would have been previously removed and extensively disturbed as part of previous development. The more natural clay soils, where they exist will help support the ongoing health and vitality of the adjacent street trees, but may be subject to

detrimental compaction if allowed to be exposed and trafficked when wet. It would also be difficult to excavate soils using non-destructive methods, so new services and other construction activities are to be kept clear of the existing trees to be retained, particularly T02, T07 and T21.

A soil sample was taken close to T21. The auger was refused at 500mm depth due to presence of rock fragments, which appeared to be imported basaltic aggregates or rubble, rather than natural rock. From the sample taken at a 300mm depth, the soil structure was weakly pedal with fine sub angular blocky peds. The soil texture was a light clay with the colour being a mid to dark brown. The soil was mildly acidic with a pH of 6.0.



Figure 2.7 – Topsoil sample / profile, noting the refusal of the auger at 500mm depth due to the presence of rock fragments, which appear to be imported basaltic aggregates or rubble, rather than natural rock. Given this, it is anticipated that the natural soil conditions have been highly disturbed, with much of the site area excavated, and the natural soils removed (Photo: Arterra 20 March 2025)

Prior to European settlement of the Caringbah area, the natural vegetation was Sydney Turpentine Ironbark Forest. Much of this endemic vegetation has now been cleared for timber, then agricultural activities and later urban development. The native vegetation that once characterised the area would have likely been tall-open forest (wet sclerophyll forest) and been dominated by the following representative species.

- *Angophora costata* (Smooth-barked Apple)
- *Eucalyptus pilularis* (Blackbutt)
- *Eucalyptus racemosa* (Narrow-Leaved Scribbly Gum) (incl. sub-variants *E. signata* and *E. sclerophylla*)
- *Syncarpia glomulifera* (Turpentine)
- *Eucalyptus paniculata* (Grey Ironbark)
- *Angophora floribunda* (Rough-barked Apple)
- *Eucalyptus globoidea* (White Stringybark)

2.4 Identification and Assessment of the Existing Trees

The site assessment identified a total of **40** trees. Five street trees are adjacent the site (T05, T07, T21, T34 and T35). The remaining trees are located within the site boundary. Most trees (**28**) have been ranked with 'Low' or 'Very Low/Remove' retention values, due to them being small and insignificant, in poor condition or weed species. These specimens should not be considered a constraint to the development. The following table shows the breakdown of the tree population, by their retention values.

Table 3 - Assessed Tree Population and Their Retention Value

Retention Value	Number of Trees	%
High	3	7%
Moderate	9	23%
Low	16	40%
Very Low / Remove	12	30%
Total trees on site	40	100%

Following are the key observations related to the tree population across this site:

- **5** trees are located outside the site and are street trees. One tree is a 'High' retention value, 2 trees are 'Moderate' retention value, and 2 trees are 'Low' retention value.
- **9** trees are located within the site that are rated with either a 'Moderate' or 'High' retention value.
- **28** trees are located within, or near the site, that are rated with a 'Low' or 'Very Low/Remove' retention value and should not be considered a constraint to the proposed future works.
- The most significant trees on, or adjacent, the site are predominantly on the periphery of the site:
 - 1 tree is located on the eastern corner of the site (T02),
 - 2 trees are located to the north of the site (T07 and T21), and
 - 1 tree is located on the southern boundary (T31).

- Tree T02 ('High' retention value tree) is a *Eucalyptus pilularis* (Blackbutt). It is a highly prominent tree providing significant and excellent canopy coverage fronting Gardere Street. Although not remnant, it is a species naturally endemic to the area and has been a focus for retention and protection.
- Trees T07 and T21 are 'High' and 'Moderate' retention value street trees that are large, prominent mature *Eucalyptus racemosa* (Scribbly Gum) and *Angophora costata* (Smooth-barked Apple). These trees are visually significant from Flide Street and provide significant canopy coverage.
- Tree T31 is a *Casuarina glauca* (Swamp She-Oak) and is adjoining the rail line.
- We specifically note for this site that there is an existing basement carpark. The structures below ground and the associated above ground retaining walls and structures are likely to have acted as a barrier to tree root development, leading to truncated and asymmetric NRZs. NRZs have been adjusted in the tree protection plans to only show the likely extent of root development, due to the retaining walls and other sub-surface structures.

Detailed information on each tree including heights, trunk diameters, canopy spreads, age classes and condition are all provided in Appendix 4.2 - 'Tree Impact Assessment Schedule'.



Figure 2.8 – View to T02 *Eucalyptus pilularis* (Blackbutt) in the south-west portion of the site. This tree overhangs the existing driveway and the TPZ extends well into the site. This is a High Retention Value tree, with excellent street prominence and a spreading canopy. Serious consideration has been given to building setbacks and ground works to retain the expansive canopy and extensive root system. This tree is to be retained and protected. Although not remnant, it is a species naturally endemic to the area. (Photos: Arterra 20/03/25).



Figure 2.9 – View of T21 *Angophora costata* (Smooth-barked Apple) on the Flide street frontage. As shown above, this street tree has an expansive canopy and TPZ that extends well within the site. Consideration has been given to appropriate setbacks to protect this tree. (Photo: Arterra 20/03/25).

2.5 Tree Biology and Tree Care Basics

Trees are dynamic living organisms. Trees can be very susceptible to damage, stress and declining rapidly if overly impacted by construction. Trees take decades to grow but can be injured and killed in a very short time frame. This is particularly due to the irreparable damage to the often shallow, extensive and unseen root systems. It is rarely possible to repair a stressed or damaged tree, after the damage has occurred. Proper protection is the key to minimising construction related impacts. Severing of roots within the Structural Root Zone (SRZ) can also lead to potentially unsafe instability of the tree as a structure.

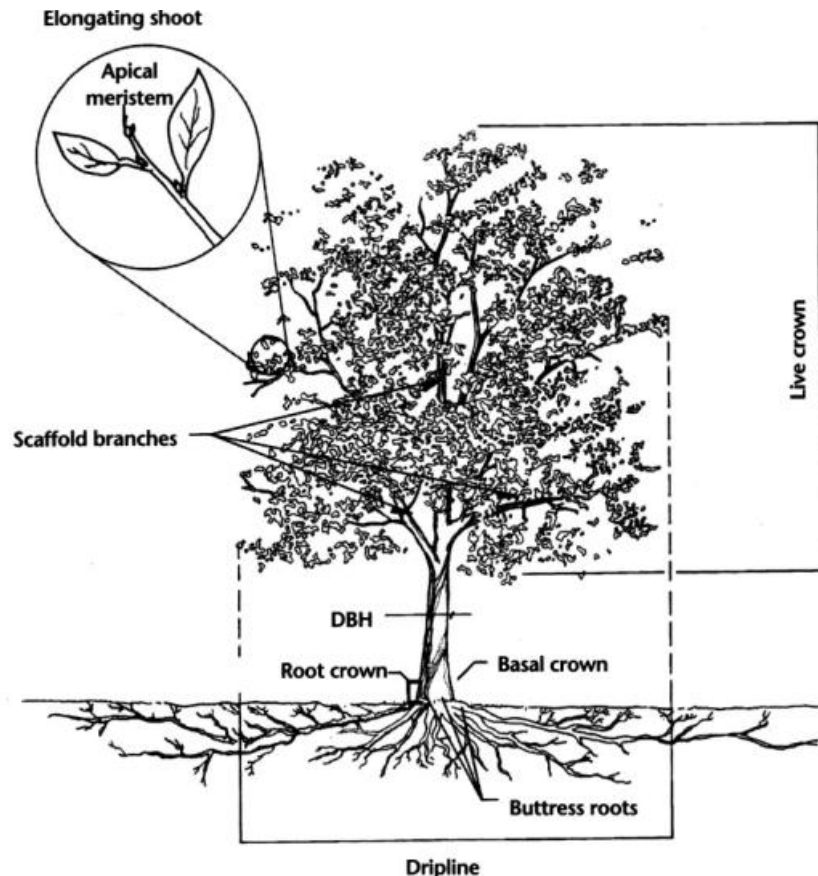


Figure 2.10 – Typical form and structure of a tree illustrating the typical form, location and extent of root growth (Source: Matheny and Clark, 1998)

Basic Tree Needs

As a living organism a tree remains alive by completing the following chemical reaction - Carbon Dioxide and water in combination with chlorophyll and light is converted to Glucose and Oxygen [$\text{CO}_2 + \text{H}_2\text{O} + \text{light} = \text{sugar (C}_6\text{H}_{12}\text{O}_6 \text{ [Glucose]} + \text{O}_2$]

The process ultimately leads to the plant cells 'respiring' and producing energy for survival, a natural requirement for all living cells. Anything that affects a plant's photosynthesis and then cellular respiration will affect the overall plant health. The limiting factors of photosynthesis and respiration will typically be the availability of oxygen, water and nutrients that make up the important chemical molecules and reactions.

Trees therefore have five basic requirements to survive and successfully grow:-

1. Oxygen (and particularly oxygen within the soil);
2. Water (a cellular necessity and primarily taken up by the tree roots);
3. Light & Sufficient Foliage (in order to photosynthesise and create the resources needed for cellular survival);
4. Soil (for physical anchorage and critical chemical nutrients) and
5. Physical Space (both above and below ground to grow).

Importantly, a minimum of 15% soil oxygen is required for active root growth and nutrient uptake. Less than 10% available soil oxygen starts to restrict root extension and growth and a minimum of 3% soil oxygen is required to just maintain root existence. Less than this will result in root death (Harris 1999).

One of the most insidious effects of construction on trees is often that of soil compaction or covering of root zones with impervious surfaces, as it:-

- Reduces infiltration rates of surface water;
- Reduces the availability of water to the roots as they can't naturally extract remaining moisture when soil becomes too dry;
- Reduces air to roots (roots cease to function properly and die without oxygen);
- Increased soil strength caused by compaction mean that roots need more energy to growth through it or can't even physically penetrate the soil;
- Roots are physically broken or crushed and there is increased potential for fungal and pathogen attack. (Harris 1999).

Tree Tolerance

Typically, older and larger trees are less tolerant of construction impacts. Different species also have different tolerance of injury and disturbance. Importantly it needs to be stressed, that a tree does not "heal" from injury as animals do. Typically, any injury made to a tree results in the tree expending considerable energy reserves to create new growth that "seals" and surrounds a wound and then attempting to compensate structurally and physically for any losses. Impacts to trees are therefore cumulative and a series of otherwise small and unrelated impacts can easily result in the death of a tree.

A tree that is already compromised or showing signs of stress is far less likely to tolerate construction impacts due to its lower levels of energy reserves and already weakened state. Therefore, a tree that is only in a fair condition or poor condition is less likely to tolerate construction impacts than a young tree in good or excellent condition.

Weakened or stressed trees are also far less able to combat the myriad of normal environmental stresses and pathogens that are naturally imposed against them such as drought, decay, fungi, bacteria and insect pests.

2.6 The Proposed Construction Works

The proposed development comprises construction of a new multi-storey residential flat building to accommodate social and affordable housing apartments, communal landscapes and facilities and basement car parking. The project will entail large scale site excavation, tree removal and the associated new landscaping, new tree planting and public domain upgrade works.

The proposed works will result in a major site disturbance which will have potentially significant impacts on the trees within and adjacent to the site. The proposed development will involve:

- Large scale demolition works;
- Use of large scale civil and earthmoving equipment;
- Access to and from the site with large trucks and construction plant;
- Major excavations;
- Large stockpiles of excavated material and demolition waste;
- Stockpiles/ storage of building materials;
- Trenching for major and minor services;
- Major building works involving concreting, painting and general construction;
- Use of large cranes;
- Parking for site personnel and deliveries;
- Paving and retaining walls and;
- Landscaping.

Key Assumptions:

- Any new pedestrian paths or driveways within the identified TPZs shall be constructed at or above the existing surface levels to minimise surface root impacts.
- Temporary battering, stockpiling or grading will not occur within the designated TPZ. Excavations for footings or the basements adjacent to the TPZs will be undertaken using piling or other temporary vertical shoring methods.
- Despite the above, the line of disturbance outside of the building line has been typically estimated at a minimum of 1.2-1.5m from the face of the building to allow for provision of water proofing, services, access and scaffolding around the building during construction.
- All construction access, haulage routes and deliveries are to be away from trees and TPZs as much as possible.
- It is assumed that any new landscape grading within the nominated tree protection areas will be minimal and installed using high quality, imported manufactured topsoil. No cultivation of the existing soils shall be undertaken within the defined TPZ.
- For any retaining walls situated near trees, their footings will be oriented away from the trees (ie footings will extend no further than the face closest to the tree). Other construction approaches and details can be considered, with review and approval from Project Consulting Arborist.

2.7 Tree Impact and Removal Assessment

The intention of this assessment is to clearly illustrate the trees to be retained and removed as part of the proposed works. It is also to determine any incursions into the retained trees' root zones and canopies by the proposed work and evaluate the likely impacts on the existing trees. A detailed listing of the incursions and likely impacts of the proposed works on each tree is shown in Appendix 4.2 - Tree Impact Assessment Schedule and Appendix 4.1 - Tree Plans.

The following points arise from the impact assessment:

- **9** trees (23%) are to be retained and protected.
- **31** trees (77%) are to be removed.
- Most trees (**27**) to be removed are rated as low or very low value trees.

Table 4 - Ultimate Tree Disposition - Trees to be Retained and Removed

Tree Retention Values	Trees to be retained	Trees to be removed	Total Trees
High	2	1	3
Moderate	6	3	9
Low	1	15	16
Nil /Should Remove	0	12	12
TOTAL	9	31	40

Summary of Update due to Response to Submissions (RtS)

This report has been updated in February 2026 due to changes that have been made to the building and landscape as a result of response to submissions. From a tree protection and impact perspective, these changes are relatively minor and have not altered the previous recommendations and tree management. There are no changes to the trees to be retained or removed. The minor external changes are benign in terms of tree related impacts and we support the proposed modifications.

We specifically note the relocation of the driveway from Gardere St to Willarong Rd as a positive outcome, as it reduces the amount of surface works required around the prominent *Eucalyptus pilularis* tree (T2) and permits greater provision of soft landscaping and permeable surfaces around the tree's root zone. There is a very minor increase in the nominal incursion from 7% to 8% due to the grading proposed to the north of T2 but this is at the very extremity of the NRZ and on the other side of a pre-existing wall associated with the existing driveway. It is therefore considered to have only negligible further impact to the tree and still well within acceptable limits. The other required landscape retaining walls have been suitably located in areas that do not affect tree roots and the filling around the tree for final landscape is minor and acceptable. The hydrant booster assemblies and their access are located in a lower and pre-existing driveway area and are not expected to impact the tree if surface impacts are appropriately managed and overseen by the Project Consulting Arborist. The proposed levels do not result in any excessive excavations that would impact the tree further.

With regard to the **9** trees to be retained and protected and as defined by AS4970-2025 - Protection of Trees on Development Sites:

- **3 trees** have a 'minor encroachment' (< 10%) into their Notional Root Zone (NRZ).
- **No trees** have a 'moderate encroachment' (10%-20%) into their NRZs
- **No trees** have a major encroachment' (> 20%) into their notional NRZs
- **4 trees** will have varying levels of canopy pruning required for the construction period scaffold clearances and for the ultimate building clearances. The levels of pruning are considered acceptable. To minimise this pruning, some portions of the building's construction period scaffold need to be maintained at a width of only 1.2m, particularly near tree T02 and T19.
- Some trees have some minor surface impacts that will require careful management during the proposed demolition and new construction works. This work is shown on the Tree Retention and Removal Plan (T-02) and noted in the schedule. These minor surface impacts to be managed, relate to the demolition of the minor landscape structures close to the trees or the construction of new landscape pathways and driveways at, or above, existing grades. These are not expected to result in root loss nor impact the long term health of the trees.
- Following demolition and construction of the new basement, the area between the old and new basement is to be carefully backfilled and suitably consolidated. It is assumed the existing basement structures will be permanently buried and remain in place as the tree's roots are likely to be growing hard up against this and relying on it for support. Subject to individual assessment and during finalisation of the works, the upstands near the trees may be sensitively demolished under the direct oversight of the Project Consulting Arborist.

Table 5 –TPZ Incursions Involving Potential Root Loss (as per AS4970-2025)

Tree ID	Species	NRZ Area	NRZ Incursion	NRZ % Incursion	Comment
T02	<i>Eucalyptus pilularis</i>	391m ²	27m ²	8%	Minor incursion considered acceptable
T19	<i>Angophora costata</i>	97m ²	5m ²	5%	Minor incursion considered acceptable
T21	<i>Angophora costata</i>	437m ²	38m ²	9%	Minor incursion considered acceptable

Table 6 – Proposed Tree Canopy Pruning

Tree ID	Species	Canopy Area	Canopy Area Pruned	% Pruning	Comment
T02	<i>Eucalyptus pilularis</i>	396m ²	45m ²	11%	Moderate pruning considered acceptable – upper branchlets and on non-public side.
T19	<i>Angophora costata</i>	119m ²	35m ²	29%	Major theoretical pruning but considered tolerable due to majority of the tree foliage located on the opposite side of tree towards north which is still retained.
T20	<i>Angophora costata</i>	68m ²	7m ²	10%	Minor pruning considered acceptable
T21	<i>Angophora costata</i>	326m ²	25m ²	8%	Minor pruning considered acceptable

Despite the proximity of the works to some of the existing trees it is the author's opinion that the trees proposed to be retained can be successfully retained and protected. There will need to be very careful oversight during critical periods of demolition and construction. If this is successfully applied, the trees should experience only minor impacts. Prior to commencement of works, the TPZ is to be fully fenced and mulched. The works shall be undertaken with care to protect the adjacent trees including overhead canopy and the existing ground surface within the TPZ. All work must be undertaken sensitively and roots greater than 40mm in diameter are to be retained and protected. Importantly, the Project Consulting Arborist must be present to oversee all works within the TPZ



Figure 2.11 – Tree T02 *Eucalyptus pilularis* (Blackbutt) fronting Gardere Street. This tree is to be retained and protected, with the project consulting arborist present to oversee all proposed demolition and landscape construction works when within the associated TPZ (Photo: Arterra 20 March 25).

2.8 Key Recommendations and the Management of Minor Surface Impacts

It is expected that there will be some minor surface impacts due to the demolition and the removal of the surrounding landscape structures, including minor landscape walls and concrete footpaths. It is anticipated that much of the demolition work will occur above the existing ground surface, with the existing surface levels expected to be retained. The carpark basement and retaining wall along the Flide Street frontage are proposed to be retained, thereby maintaining the existing levels and soil structure around the base of the substantial street trees without the need for battering or other temporary shoring. Some of the trees are growing in very close proximity to these existing structures and may be reliant on these for support.

T07 *Eucalyptus racemosa* (Scribbly Gum), T09 *Eucalyptus pilularis* (Blackbutt), T19 and T20 *Angophora costata* (Smooth-barked Apple)

- These trees are located on the Flide Street frontage, outside of the proposed demolition extent of works and can be retained and protected within minimal impacts expected to their adjusted NRZ.
- Landscape areas to the frontage of Flide St are to be a consolidated TPZ. The TPZ is to be mulched where it is inside the site and not already a garden area.
- All major demolition and construction works are to be avoided within this zone.
- The Project Consulting Arborist is to be on site to oversee the demolition of any landscape pathways and structures requiring removal in this zone.
- Existing carpark structure will have restricted tree root development to the south but portions of the retaining wall and the vent upstands will have to be retained to prevent disturbance and exposure of roots and maintain tree stability.
- Demolition of remaining existing buildings is to be carefully undertaken to the south of the trees but portions of the basement wall and existing surface vent upstands is to be retained and suitably propped during demolition.
- Following demolition and construction of the new basement the area between the old and new basement is to be carefully backfilled and suitably consolidated. It is assumed the existing basement structures will

be permanently buried and remain in place as the trees roost are likely to be growing hard up against this and relying on it for support. Subject to individual assessment during finalisation of the landscape work, the upstands near the trees may be sensitively demolished under the oversight of the Project Consulting Arborist.

- The final landscape levels and topsoiling can then occur to the south of the trees and it is anticipated that the finished levels of new building and landscaping will meet and marry with the levels around the trees. It is envisaged that this will ultimately provide increased rooting opportunity for these trees and generally improved growing conditions. Minimal root or tree impact are expected during this exercise due to the pre-existing basement and the lack of tree roots in this zone to the south of the trees.

T02 *Eucalyptus pilularis* (Blackbutt).

- The landscaped area and adjoining driveway around base of T02 is to be a consolidated tree protection area.
- The existing carpark structure will have restricted root development to the east.
- Demolition of existing building is to be carefully undertaken to the east of the tree and no battering is to occur beyond the existing structures.
- The existing driveway to the north of the tree and portions of the existing building basement structure are expected to be retained in place until final landscaping.
- Minor surface impacts expected to the south of the tree for the removal of existing landscape walls and concrete pavements and the construction of a new landscaping. The finished levels of this new landscaping and the booster assemblies are to be maintained at or above the existing ground levels.
- Project Consulting Arborist (AQF5 arborist) is to be on site to oversee the demolition of all landscape pathways and structures requiring removal in this zone and adjacent to the tree.
- Following demolition and construction of the new basement the area between the old and new basement is to be carefully backfilled and suitably consolidated. It is assumed the existing basement structures will be permanently buried and remain in place as the trees roots are likely to be growing hard up against this and relying on it for support. Subject to individual assessment during finalisation of the work, the upstands near the tree may be sensitively demolished under the oversight of the Project Consulting Arborist.
- The final landscape levels and topsoiling can then occur to the east of the tree and it is anticipated that the finished levels of new building and landscaping will meet and marry with the levels around the tree. It is envisaged that this will ultimately provide increased rooting opportunity for this tree and generally improved growing conditions.

2.9 Existing Canopy Cover and Canopy Retained

Canopy coverage has been calculated as a percentage (%) of the total site area (total site area 3,597m²). This has been calculated using the m² of 'projected' canopy onto the underlying ground surface and only within the site boundary. Overlapping canopy is not counted twice. The table below outlines the existing canopy cover for the site. It would be hoped that the ultimate proposed canopy coverage, once a new development is planned and the new tree planting is undertaken and established, would meet or exceed the existing coverage.

Table 7 - Existing Canopy Cover

Tree Canopy Coverage	Canopy Coverage (m²)	% of Total Site Area
Existing Canopy Coverage – Total	1,150 m ²	32%
Existing Canopy Coverage – Likely to be retained	504 m ²	14%
Existing Canopy Coverage – Likely to be removed	646 m ²	18%
Existing Site/Study Area	3,597 m ²	100%



Figure 2.12 – Overall site plan showing the site and its existing urban canopy cover and relative percentages. (Source: Arterra)

3.0 TREE MANAGEMENT RECOMMENDATIONS

3.1 Potential Tree Related Impacts Needing to be Managed During Demolition

The potential impacts from the proposed construction and activity discussed above can be summarised as tree damage and 'reduced life expectancy' caused by:

- Root loss and disturbance due to inappropriate excavation for the building and services;
- Compaction of the root zone from storage or stockpiling of materials;
- Contamination of the soil from; the preparation of chemicals, wash down/ cleaning of equipment, refuelling of vehicles and dumping of waste;
- Compaction of the root zones from haul roads and the parking or use of vehicles/ plant equipment;
- Root disturbances from unauthorised cut and fill and soil level changes;
- Physical damage to the tree trunks and branches from passing machinery;
- Damage to the tree roots from landscaping and pedestrian pathway construction; and
- Inappropriate or excessive pruning for construction access.

The following sections of this report provides the recommendations and proposed measures that will aim to minimise and avoid these impacts as much as realistically possible.

3.2 Management of Construction Period Tree Impacts

The following recommendations are made to specifically reduce the negative construction impacts on the existing trees identified to be retained.

- The project Arborist must be present to observe and direct all ground level demolition within the defined NRZs / TPZs.
- There shall be no machinery trafficking of the exposed ground surface within the defined NRZ / TPZ during or following the demolition of the ground floor slabs and basement. If trafficking is required, suitable protective boards shall be placed over any exposed roots or TPZs.
- Ensure that all works within the identified TPZs is carried out with appropriate skill and care to limit surface impacts. If roots greater than 40mm Ø are encountered, works shall cease and direction sought from the project arborist before proceeding further.
- Appropriately fence all TPZs outside of the already noted incursions for the duration of all major site construction work. See Appendix 4.1 Tree Plans for locations and extent.
- Carefully control and fence access to and from the construction areas so that movement does not occur through any TPZs other than for the already identified building incursions.
- Canopy of trees requiring pruning is to be undertaken in accordance with plans and the pruning specifications outlined in Section 3.3.
- Ensure all the new above and below ground services are excluded from running through any TPZs beyond any already noted incursions.
- Minimise the re-grading of the ground surface within the identified TPZs, beyond the noted building incursions, to meet and match proposed pathways and other building levels. No excavation below existing levels shall typically be allowed.
- Mulching of the entire TPZ as specified in Tree Plans. This will aid tree health with moisture retention, limit possible compaction from pedestrian traffic, and improve soil conditions within the TPZs.
- Avoid digging into existing root zones for the installation of any proposed new landscaping around the trees and the installation sizes of new plants is to typically be 5L or less to ensure that excavations are less than 200mm in depth. It is recommended to build up soil levels for any new planting areas to a maximum of 200mm to enable the new planting to occur without disturbing existing tree roots.
- Do not allow storage or stockpiling of any materials or site sheds within established TPZs unless it can be demonstrated that this will not impact on the tree retention, and it is specifically approved in writing by the Project Consulting Arborist.

3.3 Canopy Pruning and Pruning Methodology

The proposed building and the construction period scaffold erection will require canopy pruning to **3 trees** to provide building and construction period clearances. All pruning is to be minimised, and wherever possible tree branches are to be pushed out of the way, to the outside of the scaffolding. To ensure the canopy pruning is undertaken adequately and minimised the following is to be implemented:

- Some portions of the building will have to have a special width provision for scaffolding. In certain areas, as shown on the tree plans, the scaffold is to be restricted to a maximum width of 1.2m. The builder is to cater for this and allow for any necessary additional access and egress requirements in areas outside of the canopy areas being protected, to allow for this scaffold narrowing.

- A suitably qualified Tree Contractor/Utility Arborist shall be employed to undertake the pruning and they shall be a member of Arboriculture Australia or equivalent body. They are to be employed, instructed, and directly supervised in their activities by an Arborist with a minimum AQF level 3 qualification in arboriculture.
- The pruning is anticipated to be undertaken using a suitable vehicle mounted Elevated Work Platform between the demolition phase and before the main construction work or piling commences so that suitable access can be provided to the required side of the canopy. Access to the foliage shall be from the ground using equipment with suitable reach to access the required canopy. This is considered possible once demolition is complete or otherwise during placement of the temporary scaffold.
- Only the specified 'selective pruning' is to be undertaken and be overseen and directed by the Project Consulting Arborist. Work shall be done 'incrementally' until the appropriate building or scaffold clearance is achieved. The Tree Contractor shall prune only the parts of trees as directed by the Project Consulting Arborist. The resulting pruning wounds are not to be treated.
- All pruning works are to be completed according to AS4373 Pruning of Amenity Trees.
- The Tree Contractor shall minimise the size and number of wounds resulting from all pruning and ensure the remaining canopy is balanced with appropriate foliage weight and crown distribution. They shall use only clean, sharp pruning implements for all pruning work, ensuring that cuts are made without damage, tearing, or bruising to remaining vascular tissue.
- Where the tree work can result in a danger to other workers on the site, 'spotter' personnel shall be placed to ensure the work is undertaken safely.
- All branches and foliage that is pruned is to be chipped and removed from the site. All chipping activities shall be undertaken within the site boundaries, where feasible.

3.4 Proposed Tree Protection & Construction Activity Sequencing

The following sequence of activities should be followed for this project:

1. A Tree Protection Specification & Plan is to be prepared and issued as part of the construction contract prior to any construction work.
2. The Project Consulting Arborist, Landscape Architect, Civil and Structural Engineers, Client and Contractor Site Foreman are to meet prior to beginning any work on the site to discuss and review all work procedures, construction access routes, stockpiling and tree protection measures (including fence types and locations, access, craneage points, piling methods etc.).
3. Contractors to discuss locations and type of any sediment and erosion controls (if any) and install them with minimal tree impact when within or passing through the TPZ.
4. Trees identified for removal on the Tree Protection and Removal Plan (T-02) are to be identified on site and clearly marked. Removal and clearing of existing trees should be done by qualified arboricultural staff with care not to impact or damage other surrounding trees throughout the process. Stumps are to be ground when near remaining trees to avoid the use of excavators and the like from grubbing out stumps, which may lead to damage of any intertwined roots.
5. Designated TPZs are to be mulched with 75mm of recycled hardwood woodchip mulch to improve soil conditions around tree and remain in place until future final landscaping.
6. Ground protection boards, or equivalent, are to be placed in areas where the Tree Protection Area is not able to be completely fenced or unanticipated access is required.
7. The Construction Phase TPZ is to be clearly defined and fenced off with a 1.8m high metal or plywood temporary fence prior to any further work within the vicinity of the trees as shown on the Tree Plans. Any required rumble boards shall be installed to protect TPZ areas where temporary access is required.
8. Tree pruning, where required, is to be undertaken.
9. Plywood (or similar) is to be placed under any scaffolds or pedestrian works paths when they are running through any identified TPZs.
10. Building works to be completed (external).
11. Contractor to remove the TPZ fencing and only then install final pathways and landscaping within the TPZs under the trees, but only after construction of the building exterior and all civil works are completed.

3.5 Demolition Work Near Trees or within NRZs and TPZs

Demolition of paths and other structures required within a TPZ shall be done with small, tracked equipment or by hand, with care to limit surface damage and disturbance of the root zone. All such work within TPZs shall be supervised and overseen by a qualified project consulting arborist. Paving sections being removed must not be dragged across exposed roots. With existing pavement removed, the ground and roots are to be appropriately protected until new paving is installed and trafficking of the area minimised.

3.6 Tree Protection Fencing & Definition of TPZs

Establish a clearly defined tree protection zone as indicated in Appendix 4.1 Tree Plans. Install a 1.8m high temporary fence with either plywood hoarding or temporary steel mesh or chain wire fencing with adequate lateral bracing. Fencing shall comply with the requirements of AS 4687-2007 Temporary fencing and hoardings. These areas around the trees shall be delineated as a "Tree Protection Zone" during the remaining construction process, via appropriate weatherproof signage at not more than 50m spacing. Access will typically be excluded from these zones and the levels will be left largely at the existing levels except for the installation of the 75mm of mulch where noted. No stockpiling, excavation, trenching, re-fuelling or material storage should be allowed in this area without prior approval from the project consulting arborist.

3.7 Ground Protection within NRZs and TPZs

Vehicular movement and access shall typically not be required or approved through the TPZs. If it is absolutely necessary and it is proposed to create any access or haul road, or similar, within the TPZ of a retained tree, the Contractor shall install rumble strips / boards over the designated TPZ ground surface. No excavation shall be allowed. Contractor shall first place a suitable permeable geotextile to the extent required and then a 100mm thick layer of wood chip mulch or coarse no-fines gravel over the extent to be covered with the rumble strip / boards. Then place hardwood boards (minimum 3600 x 200 x 75mm) on their flat edge, side by side, with a 30 - 50mm gap to form a rumble strip. These boards are to be held together with three galvanised metal bracing straps nailed to each board. The two outer straps are to be approximately 200mm in from the ends of the boards. The third strap is to be along the centre line of the boards.

Another appropriate alternative would be to install HDPE Ground Protection Mats. This mat can be laid as two parallel tracks or a single roadway, linked together with metal connections. These are extremely durable and manoeuvrable and can withstand vehicle weights up to 80 tonnes.



Figure 3.1 – Example of acceptable Tree Protection Area ground protection (Photo: Arterra)



Figure 3.2 – Example of acceptable Tree Protection Area ground protection (Photo: Arterra)

3.8 Trunk and Lower Branch Protection

A trunk barrier is to be erected around the circumference of the tree trunk and root buttress where shown. This barrier will consist of two to three 'rings' of 50mm diameter unsocked ag-line wrapped around tree trunk or branch and the ends cable tied to secure in place. A layer of battens is to be placed over and tight to the ag-lines. The battens are to have a maximum spacing of 50mm. The height of the battens is to be at least 2.4 meters or to the height of the first branches. Lower large branches may require the same protection if likely to be damaged by passing vehicles or equipment. Secure battens in place with galvanised steel bracing straps. Do not nail or screw into or otherwise injure the trunk or bark. Battens may be made from any suitable waste timber of similar sizes and depths. All sharp or protruding edges are to be properly covered with tape or similar padding.



Figure 3.3 – Example of acceptable Trunk Protection batten installation. (Photo: Arterra)

3.9 Provision of Temporary Irrigation

No temporary irrigation system is anticipated for the proposed works. However, if unexpected ground disturbance, other climatic factors or pest and disease dictate, and at the sole discretion of the Project Consulting Arborist, a temporary and automated (battery powered timer is sufficient) watering system may need to be placed within the TPZs to maintain adequate water to the retained trees and help maintain their healthy condition. This can be a surface mounted 'residential-style' soaker hose and/or surface sprinkler systems. It is to be surface visible and spray delivered so that its operation can be easily visible and verified. It should be on a designated supply line, separate from other construction related water supplies to minimise its likelihood of being disconnected.

Typically, during spring and summer months it should be set to run for a minimum of 20 minutes every day, in the early morning. During autumn and winter months it should be set to run for 1 hour once every week. The operation can be suspended temporarily in periods of extensive and/or prolonged rain. The system is to remain in place for the duration of construction, or until the Project Consulting Arborist approves its removal. It may be removed to allow the final landscape treatments to proceed. If accidentally disturbed or damaged by construction activities, it is to be reinstated as soon as practicable.

3.10 Other Tree Protection Measures to be Implemented

The following is a summary of the main measures that will be required during construction. These should be adopted for the Construction Contract and conditioned by Council.

Controlled Construction Access & Parking

Construction access points and stockpiling and storage areas shall be clearly identified and fenced where appropriate. Uncontrolled access points and parking of vehicles outside of designated areas is to be avoided. If temporary access is required through a tree protection zone, ground protection shall be employed to limit soil compaction and root damage and disturbance.

Clearing and Removal of Trees to be Removed

Removal and clearing of existing trees should be done by qualified arboricultural staff with care not to impact or damage other surrounding trees throughout the process. Existing stumps should be grubbed out or ground in a controlled fashion to remove wood that may decay and promote unwanted pathogens.

Communication - Tool Box Meetings and Construction Inductions

All contractors and subcontractors shall be inducted prior to working on the site. All inductions shall include description and identification of the Tree Protection Zones and the restriction on work and activities with regard to trees. The site foreman shall ensure that all new staff and contractors are appropriately inducted and that brief "tool box" meetings are conducted regularly to ensure Tree Protection is maintained at the forefront of all construction workers minds.

3.11 References

- Chapman, G.A and Murphy, C.L 1989, Soil landscapes of the Sydney 1:100 000 Sheet Report, Soil Conservation Service of NSW, Sydney, NSW.
- Harris, R.W, Clark, J.R & Matheny, Nelda P, 1999, *Arboriculture: Integrated management of landscape trees, shrubs and vines*. 3rd Ed. Prentice Hall. New Jersey, US
- Matheny, Nelda P and Clark J.R, 1998, *Trees and development - a technical guide to preservation of trees during land development*, International Society of Arboriculture, Illinois, US.
- Roberts, J. Jackson, N. and Smith, M. 2006. *Tree roots in the built environment. No.8* Research for Amenity Trees, Dept. for Communities and Local Government, London.
- Standards Australia, 2007, *AS 4373-2007 Pruning of amenity trees*. Standards Australia, Sydney.
- Standards Australia, 2025, *AS 4970-2025 Protection of Trees on Development Sites*. Standards Australia, Sydney.
- Standards Australia, 2007, *AS 4687-2007 Temporary fencing and hoardings*. Standards Australia, Sydney.

- End of report -

4.0 APPENDICES

4.1 Tree Plans



Tree Retention Value Legend									
	High Retention value								
	Moderate Retention value								
	Low Retention value (Note: no NRZ's shown for these trees)								
	Nil Retention value (Note: no NRZ's shown for these trees)								
	Notional Root Zone (NRZ) (Some adjusted for subsurface structures)								
	Nominal Structural Root Zone (SRZ)								
	Extent of canopy as verified by site measure and aerial photos								
	Tree Identification Number								

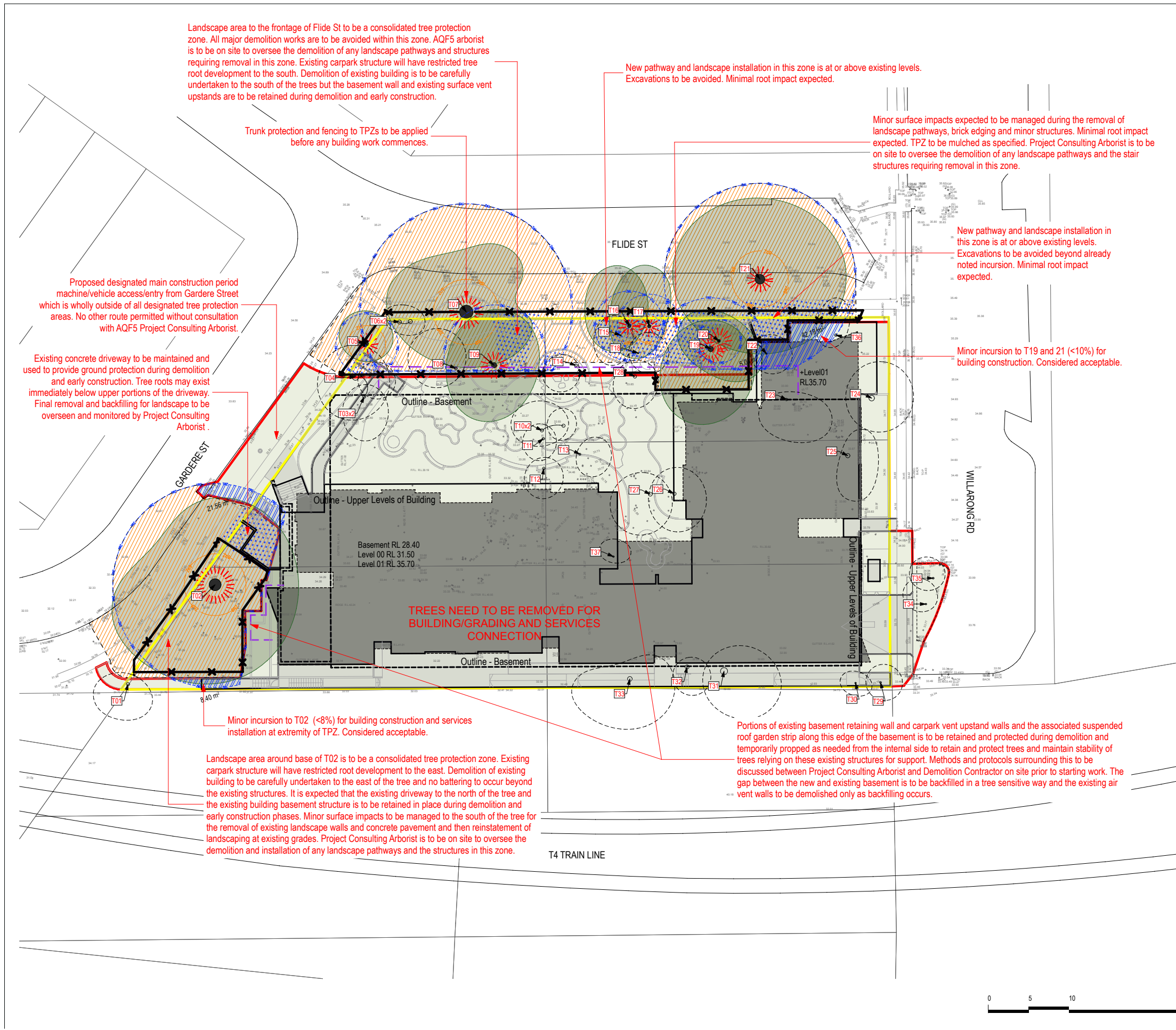
Homes NSW - HAFF2, Caringbah - Tree Assessment Schedule									
Tree ID	Trees in Group	Tree Species	Common Name	Trunk Diameter Standard Height (dsh) (m)	Trunk Diameter at base (dgl) (m)	NRZ radius (m) 12dabh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Retention Value	Recommendation
1	1	<i>Ligustrum lucidum</i>	Broadleaf Privet	0.35	0.40	4.20	2.25	Nil / Remove	Remove
2	1	<i>Eucalyptus pilularis</i>	Blackbutt	1.10	1.42	13.20	3.83	High	Retain
3	2	<i>Callistemon viminalis</i> cv.	Weeping Bottlebrush	0.26	0.35	3.12	2.13	Nil / Remove	Remove
4	1	<i>Allocasuarina torulosa</i>	Forest Oak	0.66	0.81	7.92	3.03	Moderate	Remove
5	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	0.32	0.43	3.84	2.32	Moderate	Retain
6	2	<i>Ligustrum lucidum</i>	Broadleaf Privet	0.29	0.50	3.48	2.47	Nil / Remove	Remove
7	1	<i>Eucalyptus racemosa</i> (incl sub)	Scribbly Gum	1.35	1.62	15.00	4.05	Moderate	Retain
8	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	0.26	0.33	3.12	2.08	Low	Remove
9	1	<i>Eucalyptus pilularis</i>	Blackbutt	0.53	0.60	6.36	2.67	Moderate	Retain
10	2	<i>Ligustrum lucidum</i>	Broadleaf Privet	0.30	0.40	3.60	2.25	Nil / Remove	Remove
11	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	0.27	0.30	3.24	2.00	Nil / Remove	Remove
12	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	0.25	0.32	3.00	2.05	Low	Remove
13	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	0.19	0.25	2.28	1.85	Low	Remove
14	1	<i>Archontophoenix alexandreae</i>	Alexandra Palm	0.23	0.35	2.76	2.13	Low	Remove
15	1	<i>Jacaranda mimosifolia</i>	Jacaranda	0.12	0.17	2.00	1.57	Low	Remove
16	1	<i>Jacaranda mimosifolia</i>	Jacaranda	0.36	0.35	4.32	2.13	Moderate	Retain
17	1	<i>Jacaranda mimosifolia</i>	Jacaranda	0.33	0.35	3.96	2.13	Moderate	Retain
18	1	<i>Pittosporum undulatum</i>	Sweet Pittosporum	0.12	0.15	2.00	1.49	Low	Remove
19	1	<i>Angophora costata</i>	Smooth-barked Apple	0.54	0.62	6.48	2.71	Moderate	Retain
20	1	<i>Angophora costata</i>	Smooth-barked Apple	0.23	0.30	2.76	2.00	Low	Retain
21	1	<i>Angophora costata</i>	Smooth-barked Apple	0.99	1.15	11.88	3.51	High	Retain
22	1	<i>Acacia floribunda</i> ?	Gossamer Wattle	0.15	0.19	2.00	1.65	Low	Remove
23	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	0.28	0.31	3.36	2.02	Low	Remove
24	1	<i>Chamaecyparis obtusa</i> cv.	Hinoki Cypress	0.64	0.69	7.68	2.83	Low	Remove
25	1	<i>Callistemon viminalis</i> cv.	Weeping Bottlebrush	0.40	0.53	4.80	2.53	Nil / Remove	Remove
26	1	<i>Callistemon viminalis</i> cv.	Weeping Bottlebrush	0.25	0.41	3.00	2.28	Low	Remove
27	1	<i>Callistemon viminalis</i> cv.	Weeping Bottlebrush	0.35	0.47	4.20	2.41	Low	Remove
28	1	<i>Schefflera actinophylla</i>	Umbrella Tree	0.41	0.40	4.92	2.25	Nil / Remove	Remove
29	1	<i>Cupaniopsis anacardioides</i>	Tuckeroo	0.18	0.23	2.16	1.79	Moderate	Remove
30	1	<i>Syzygium paniculatum</i>	Magenta Cherry	0.16	0.19	2.00	1.65	Low	Remove
31	1	<i>Casuarina glauca</i>	Swamp She-Oak	0.55	0.88	6.60	3.14	High	Remove
32	1	<i>Ilex aquifolium</i>	English Holly	0.26	0.50	3.12	2.47	Nil / Remove	Remove
33	1	<i>Jacaranda mimosifolia</i>	Jacaranda	0.49	0.58	5.88	2.63	Moderate	Remove
34	1	<i>Acer negundo</i>	Box Elder	0.13	0.19	2.00	1.65	Low	Remove
35	1	<i>Acer negundo</i>	Box Elder	0.15	0.23	2.00	1.79	Low	Remove
36	1	<i>Chamaecyparis obtusa</i> cv.	Hinoki Cypress	0.31	0.32	3.72	2.05	Nil / Remove	Remove
37	1	<i>Rhaphtoelepis indica</i>	Indian Hawthorn	0.16	0.20	2.00	1.68	Low	Remove

TREE RETENTION VALUE NOTES

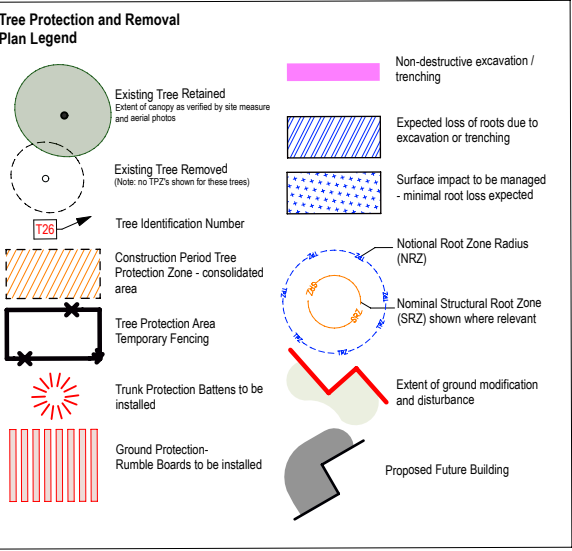
The proposed retention value of the trees was determined based on a considered combination of the size, age, condition and suitability of the tree. Each tree was then ranked according to one of 4 retention categories;

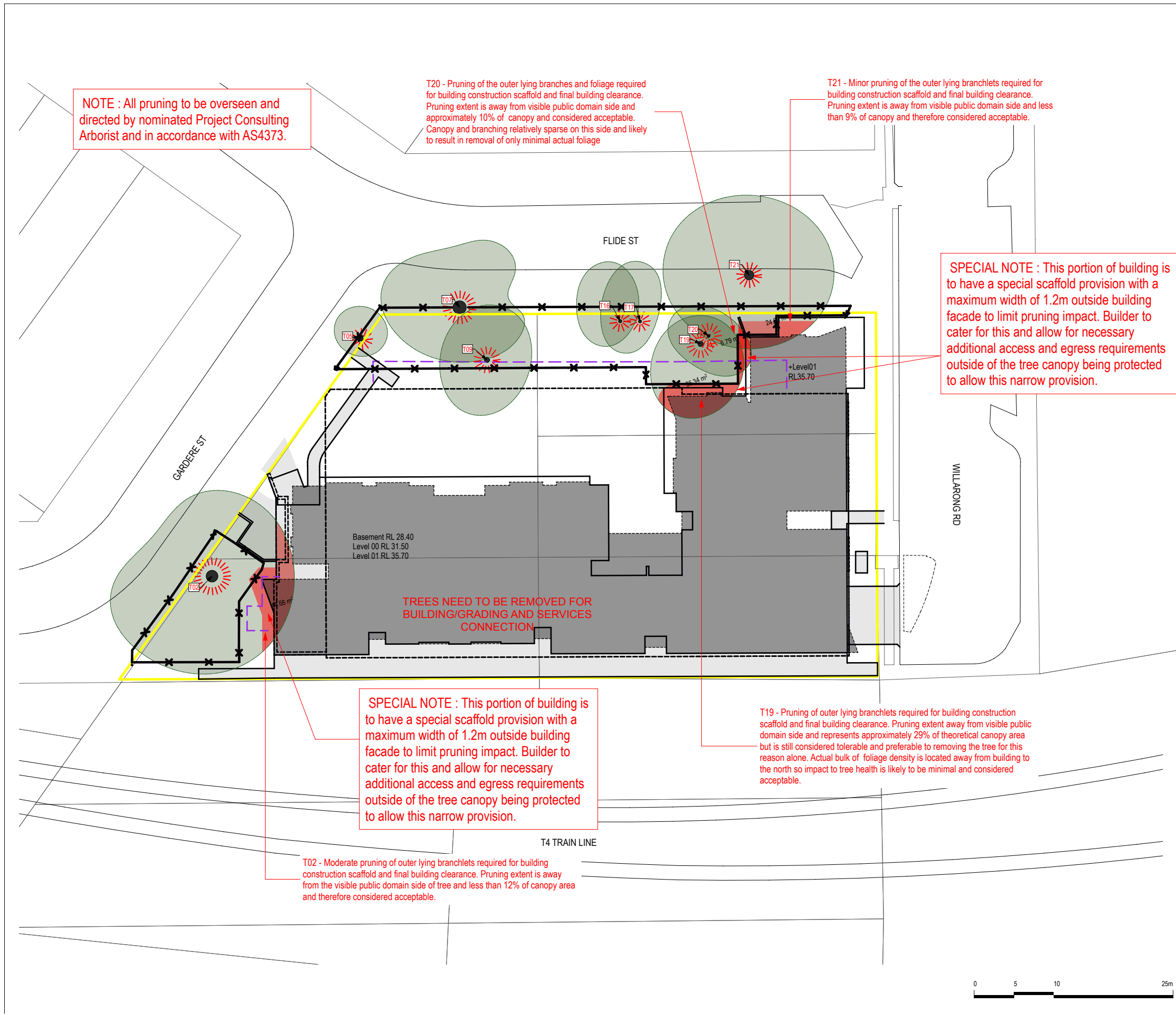
- “High” Retention Value** — these are trees that are typically in good or very good condition, large and visually prominent, historically or environmentally important. They should represent a serious physical constraint to development and their removal avoided where possible and feasible.
- “Moderate” Retention Value** — these are trees that are in good to reasonable condition, with no major structural defects and could be retained where possible and feasible to do so.
- “Low” Retention Value** — these are trees that are of poor condition or have structural defects, are particularly small or common place, are not historically, environmentally or socially significant and should not be considered as a constraint to development. They could be retained only if they are not likely to be impacted by or constrain potentially desirable development outcomes.
- “Nil” Retention Value** — these are trees that are in very poor health, or poor form, or have serious structural defects, are considered weeds or combination of all these, and therefore should be considered for removal regardless of any development.

Consideration has also been given to the relationship of the trees to one another and their proximity to the likely development areas on the site. For example, trees that are part of a closely spaced group, or are likely to be significantly misshapen or unstable with the removal of surrounding trees and structures are considered with these factors in mind.



Homes NSW - HAFF2, Caringbah - Tree Assessment Schedule									
Tree ID	Trees in Group	Tree Species	Common Name	Trunk Diameter Standard Height (dsh) (m)	Trunk Diameter at base (dgl) (m)	NRZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Retention Value	Recommendation
1	1	Ligustrum lucidum	Broadleaf Privet	0.35	0.40	4.20	2.25	Nil / Remove	Remove
2	1	Eucalyptus pilularis	Blackbutt	1.10	1.42	13.20	3.83	High	Retain
3	2	Callistemon viminalis cv.	Weeping Bottlebrush	0.26	0.35	3.12	2.13	Nil / Remove	Remove
4	1	Allocasuarina torulosa	Forest Oak	0.66	0.81	7.92	3.03	Moderate	Remove
5	1	Melaleuca bracteata	Black Tea-Tree	0.32	0.43	3.84	2.32	Moderate	Retain
6	2	Ligustrum lucidum	Broadleaf Privet	0.29	0.50	3.48	2.47	Nil / Remove	Remove
7	1	Eucalyptus racemosa (incl sul)	Scribbly Gum	1.35	1.62	15.00	4.05	Moderate	Retain
8	1	Melaleuca bracteata	Black Tea-Tree	0.26	0.33	3.12	2.08	Low	Remove
9	1	Eucalyptus pilularis	Blackbutt	0.53	0.60	6.36	2.67	Moderate	Retain
10	2	Ligustrum lucidum	Broadleaf Privet	0.30	0.40	3.60	2.25	Nil / Remove	Remove
11	1	Melaleuca bracteata	Black Tea-Tree	0.27	0.30	3.24	2.00	Nil / Remove	Remove
12	1	Melaleuca bracteata	Black Tea-Tree	0.25	0.32	3.00	2.05	Low	Remove
13	1	Melaleuca bracteata	Black Tea-Tree	0.19	0.25	2.28	1.85	Low	Remove
14	1	Archontophoenix alexandrae	Alexandra Palm	0.23	0.35	2.76	2.13	Low	Remove
15	1	Jacaranda mimosifolia	Jacaranda	0.12	0.17	2.00	1.57	Low	Remove
16	1	Jacaranda mimosifolia	Jacaranda	0.36	0.35	4.32	2.13	Moderate	Retain
17	1	Jacaranda mimosifolia	Jacaranda	0.33	0.35	3.96	2.13	Moderate	Retain
18	1	Pittosporum undulatum	Sweet Pittosporum	0.12	0.15	2.00	1.49	Low	Remove
19	1	Angophora costata	Smooth-barked Apple	0.54	0.62	6.48	2.71	Moderate	Retain
20	1	Angophora costata	Smooth-barked Apple	0.23	0.30	2.76	2.00	Low	Retain
21	1	Angophora costata	Smooth-barked Apple	0.99	1.15	11.88	3.61	High	Retain
22	1	Acacia floribunda?	Gossamer Wattle	0.15	0.19	2.00	1.65	Low	Remove
23	1	Melaleuca bracteata	Black Tea-Tree	0.28	0.31	3.36	2.02	Low	Remove
24	1	Chamaecyparis obtusa cv.	Hinoki Cypress	0.64	0.69	7.68	2.83	Low	Remove
25	1	Callistemon viminalis cv.	Weeping Bottlebrush	0.40	0.53	4.80	2.53	Nil / Remove	Remove
26	1	Callistemon viminalis cv.	Weeping Bottlebrush	0.25	0.41	3.00	2.28	Low	Remove
27	1	Callistemon viminalis cv.	Weeping Bottlebrush	0.35	0.47	4.20	2.41	Low	Remove
28	1	Schefflera actinophylla	Umbrella Tree	0.41	0.40	4.92	2.25	Nil / Remove	Remove
29	1	Cupaniopsis anacardioides	Tuckeroo	0.18	0.23	2.16	1.79	Moderate	Remove
30	1	Syzygium paniculatum	Magenta Cherry	0.16	0.19	2.00	1.65	Low	Remove
31	1	Casuarina glauca	Swamp She-Oak	0.55	0.88	6.60	3.14	High	Remove
32	1	Ilex aquifolium	English Holly	0.26	0.50	3.12	2.47	Nil / Remove	Remove
33	1	Jacaranda mimosifolia	Jacaranda	0.49	0.58	5.88	2.63	Moderate	Remove
34	1	Acer negundo	Box Elder	0.13	0.19	2.00	1.65	Low	Remove
35	1	Acer negundo	Box Elder	0.15	0.23	2.00	1.79	Low	Remove
36	1	Chamaecyparis obtusa cv.	Hinoki Cypress	0.31	0.32	3.72	2.05	Nil / Remove	Remove
37	1	Raphiopholis indica	Indian Hawthorn	0.16	0.20	2.00	1.68	Low	Remove





NOTE : All pruning to be overseen and directed by nominated Project Consulting Arborist and in accordance with AS4373.

T20 - Pruning of the outer lying branches and foliage required for building construction scaffold and final building clearance. Pruning extent is away from visible public domain side and approximately 10% of canopy and considered acceptable. Canopy and branching relatively sparse on this side and likely to result in removal of only minimal actual foliage

T21 - Minor pruning of the outer lying branchlets required for building construction scaffold and final building clearance. Pruning extent is away from visible public domain side and less than 9% of canopy and therefore considered acceptable.

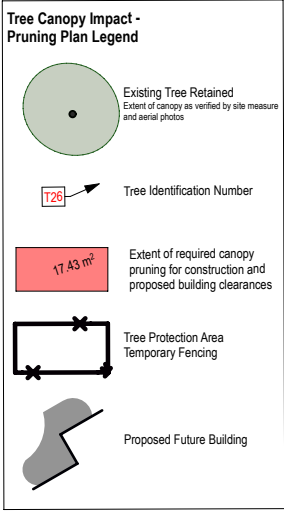
SPECIAL NOTE : This portion of building is to have a special scaffold provision with a maximum width of 1.2m outside building facade to limit pruning impact. Builder to cater for this and allow for necessary additional access and egress requirements outside of the tree canopy being protected to allow this narrow provision.

SPECIAL NOTE : This portion of building is to have a special scaffold provision with a maximum width of 1.2m outside building facade to limit pruning impact. Builder to cater for this and allow for necessary additional access and egress requirements outside of the tree canopy being protected to allow this narrow provision.

T19 - Pruning of outer lying branchlets required for building construction scaffold and final building clearance. Pruning extent away from visible public domain side and represents approximately 29% of theoretical canopy area but is still considered tolerable and preferable to removing the tree for this reason alone. Actual bulk of foliage density is located away from building to the north so impact to tree health is likely to be minimal and considered acceptable.

T02 - Moderate pruning of outer lying branchlets required for building construction scaffold and final building clearance. Pruning extent is away from the visible public domain side of tree and less than 12% of canopy area and therefore considered acceptable.

Homes NSW - HAFF2, Caringbah - Tree Assessment Schedule									
Tree ID	Trees in Group	Tree Species	Common Name	Trunk Diameter Standard Height (dsh) (m)	Trunk Diameter at base (dgl) (m)	NRZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Retention Value	Recommendation
1	1	Ligustrum lucidum	Broadleaf Privet	0.35	0.40	4.20	2.25	Nil / Remove	Remove
2	1	Eucalyptus pilularis	Blackbutt	1.10	1.42	13.20	3.83	High	Retain
3	2	Callistemon viminalis cv.	Weeping Bottlebrush	0.26	0.35	3.12	2.13	Nil / Remove	Remove
4	1	Allocasuarina torulosa	Forest Oak	0.66	0.81	7.92	3.03	Moderate	Remove
5	1	Melaleuca bracteata	Black Tea-Tree	0.32	0.43	3.84	2.32	Moderate	Retain
6	2	Ligustrum lucidum	Broadleaf Privet	0.29	0.50	3.48	2.47	Nil / Remove	Remove
7	1	Eucalyptus racemosa (incl subsp.)	Scribbly Gum	1.35	1.62	15.00	4.05	Moderate	Retain
8	1	Melaleuca bracteata	Black Tea-Tree	0.26	0.33	3.12	2.08	Low	Remove
9	1	Eucalyptus pilularis	Blackbutt	0.53	0.60	6.36	2.67	Moderate	Retain
10	2	Ligustrum lucidum	Broadleaf Privet	0.30	0.40	3.60	2.25	Nil / Remove	Remove
11	1	Melaleuca bracteata	Black Tea-Tree	0.27	0.30	3.24	2.00	Nil / Remove	Remove
12	1	Melaleuca bracteata	Black Tea-Tree	0.25	0.32	3.00	2.05	Low	Remove
13	1	Melaleuca bracteata	Black Tea-Tree	0.19	0.25	2.28	1.85	Low	Remove
14	1	Archontophoenix alexandrae	Alexandra Palm	0.23	0.35	2.76	2.13	Low	Remove
15	1	Jacaranda mimosifolia	Jacaranda	0.12	0.17	2.00	1.57	Low	Remove
16	1	Jacaranda mimosifolia	Jacaranda	0.36	0.35	4.32	2.13	Moderate	Retain
17	1	Jacaranda mimosifolia	Jacaranda	0.33	0.35	3.96	2.13	Moderate	Retain
18	1	Pittosporum undulatum	Sweet Pittosporum	0.12	0.15	2.00	1.49	Low	Remove
19	1	Angophora costata	Smooth-barked Apple	0.54	0.62	6.48	2.71	Moderate	Retain
20	1	Angophora costata	Smooth-barked Apple	0.23	0.30	2.76	2.00	Low	Retain
21	1	Angophora costata	Smooth-barked Apple	0.99	1.15	11.88	3.61	High	Retain
22	1	Acacia floribunda?	Gossamer Wattle	0.15	0.19	2.00	1.65	Low	Remove
23	1	Melaleuca bracteata	Black Tea-Tree	0.28	0.31	3.36	2.02	Low	Remove
24	1	Chamaecyparis obtusa cv.	Hinoki Cypress	0.64	0.69	7.68	2.83	Low	Remove
25	1	Callistemon viminalis cv.	Weeping Bottlebrush	0.40	0.53	4.80	2.53	Nil / Remove	Remove
26	1	Callistemon viminalis cv.	Weeping Bottlebrush	0.25	0.41	3.00	2.28	Low	Remove
27	1	Callistemon viminalis cv.	Weeping Bottlebrush	0.35	0.47	4.20	2.41	Low	Remove
28	1	Schefflera actinophylla	Umbrella Tree	0.41	0.40	4.92	2.25	Nil / Remove	Remove
29	1	Cupaniopsis anacardioides	Tuckeroo	0.18	0.23	2.16	1.79	Moderate	Remove
30	1	Syzygium paniculatum	Magenta Cherry	0.16	0.19	2.00	1.65	Low	Remove
31	1	Casuarina glauca	Swamp She-Oak	0.55	0.88	6.60	3.14	High	Remove
32	1	Ilex aquifolium	English Holly	0.26	0.50	3.12	2.47	Nil / Remove	Remove
33	1	Jacaranda mimosifolia	Jacaranda	0.49	0.58	5.88	2.63	Moderate	Remove
34	1	Acer negundo	Box Elder	0.13	0.19	2.00	1.65	Low	Remove
35	1	Acer negundo	Box Elder	0.15	0.23	2.00	1.79	Low	Remove
36	1	Chamaecyparis obtusa cv.	Hinoki Cypress	0.31	0.32	3.72	2.05	Nil / Remove	Remove
37	1	Rhaphtolepis indica	Indian Hawthorn	0.16	0.20	2.00	1.68	Low	Remove



TREE PROTECTION SPECIFICATIONS

1. Tree Protection Measures and Protocols.

All work around existing trees to be retained shall be in accordance with AS 4970-2025 Protection of trees on development sites with the clear establishment of the required Tree Protection Zones (TPZ's). If the scope of work allowed within or the extent of the Tree Protection Zones of existing trees is not clear, please refer to the Contract Manager or Project Consulting Arborist for clarification.

Before any site works commence tree protection zones and other measures must be established and conveyed to those all working on the site. The Contractor shall ensure all subcontractors are inducted prior to working on the site. All inductions shall include description and identification of the Tree Protection Zones and the restriction on work and activities with regard to trees.

Damage to roots or degradation of the soil through compaction and/or excavation within TPZ's is likely to cause serious damage to the tree. Any work operations required within TPA's must be carried out with extreme care. All trees, palms and other shrubs within TPZ's are to be retained unless shown otherwise on the Tree Protection Plan(s). Trees marked for retention shall not be used to display signage, or as fence or cable supports for any reason. No materials stockpiling, chemicals or washout areas are permitted immediately upslope of or within the Tree Protection Area. The washing down of wheel barrows, paint cans/brushes, acids and the like shall not to be done near existing trees as the runoff is very harmful to tree roots.

No fuel powered pumps or generators or air compressors are to be placed within TPZ's. No fuel or chemicals shall be stored and no equipment or vehicles shall be serviced or re-fuelled within a TPZ.

2. Controlled Construction Access

Construction access points, stockpiling and storage areas shall be clearly identified on site and fenced off where appropriate. Uncontrolled access and parking of vehicles inside TPZ's shall be avoided. If access is required through a tree protection area, the access way shall be treated with ground protection.

3. Tree Protection Fencing & Signage

The Tree Protection Plan(s) shows the extent of areas to be fenced and protected. Protection measures shall be certified as adequate by the Project Consulting Arborist. This fencing may form part of the general construction site fencing, where practical. It shall remain in place as long as possible and typically not be removed until the final landscape installation in those areas begins.

All tree protection fencing shall be 1800mm high galvanised chain wire or welded steel mesh. Fencing must be bolted together and secured with the necessary back stays and bracing.

Star pickets with bunting or danger tape shall not constitute acceptable tree protection fencing.

Suitable signage as defined by AS 4970-2025 Appendix C shall be affixed to the external side of the fencing at a spacing of not less than 1 sign per 50 lineal metres of fence, with at least one sign per designated area.

If fence locations conflict with the proposed works, contact the Project Consulting Arborist and Contract Manager for resolution. No new services (unless under-bored) shall be located within or through the Tree Protection Area.

4. Trunk and Lower Branch Protection

A trunk barrier is to be erected around the circumference of the tree trunk and root buttress where shown. This barrier will consist of two to three 'rings' of 50mm diameter socked ag-line wrapped around tree trunk or branch and the ends cable tied to secure in place. A layer of battens is to be placed over and tight to the ag-lines. The battens are to have a maximum spacing of 50mm. The height of the battens is to be 2 metres or to the height of the first branches. Lower large branches may require the same protection if likely to be damaged by passing vehicles or equipment. Secure battens in place with galvanised steel bracing straps. Do not nail into or otherwise injure the trunk or bark. Battens may be made from any suitable waste timber of similar sizes and depths. All sharp or protruding edges are to be properly covered with tape or similar padding.

5. Works within the TPZ's

All work within the root zone of existing trees shall be undertaken with the utmost care. If by necessity a tree requires removal of branches for building or access, pruning shall be done in strict accordance with accepted arboriculture techniques and AS 4373-2007. No rubbish, spoil or new materials shall be placed on the root zone of any existing tree or against their trunks.

6. Ground Protection

If it is proposed to create any access route, or similar, within the TPZ of a retained tree, the Contractor shall install rumble boards over the TPA ground surface. No excavation shall be allowed. Contractor shall first place a suitable permeable geotextile to the extent required and then a 100mm thick layer of wood chip mulch or coarse no-fines gravel over the extent to be covered. Then place hardwood boards (minimum 3600 x 200 x 75mm) on their flat edge, side by side, with a 30 - 50mm gap to form a rumble strip. These boards are to be held together with three galvanised metal bracing straps nailed to each board. The two outer straps are to be approximately 200mm in from the ends of the boards. The third strap is to be along the centre line of the boards. Suitably robust and proprietary ground protection mats or boards manufactured for ground protection and heavy vehicle access may also be used.

7. Provision of Temporary Irrigation

No temporary irrigation requirement is anticipated for this project. However if accidental damage or other weather extremes dictate and the Project Consulting Arborist considers one is necessary it shall be installed as per the following. A temporary and automated (battery powered timer is sufficient) watering system to be placed within the specified TPZs of the trees nominated to maintain adequate water to the retained trees and help maintain their healthy condition. This shall be a surface mounted 'residential-style' soaker hose and/or similar surface sprinkler systems. It is to be surface visible and spray delivered so that is operation can be easily visible and verified. It should be on a designated supply line, separate from other construction related water supplies to minimise its likelihood of being disconnected.

Typically, during spring and summer months it should be set to run for a minimum of 30 minutes every day, in the early morning. During, autumn and winter months it should be set to run for 1 hour once every week. The operation can be suspended temporarily in periods of extensive and prolonged rain. The system is to remain in place for the duration of construction, or until the Project Consulting Arborist approves it's removal. It may be removed to allow final landscape treatments to proceed. If accidentally disturbed or damaged by construction activities, it is to be reinstated as soon as practicable.

8. Structural Demolition Within TPZ's

Project Consulting Arborist shall be on site during all demolition work within the TPZ's to monitor and advise on tree protection. Secateurs and a handsaw shall be available to deal with and cleanly cut any exposed roots that have to be cut. Machines with a long reach may be used if they can work from outside TPZ's or from protected areas within TPZ's. They shall not encroach onto unprotected soil in TPZ's.

Debris to be removed from TPZ's must be moved across existing hard surfacing or temporary ground protection in a way that prevents compaction and disturbance of soil. Alternatively, it can be lifted out by machines provided this does not disturb TPZ's or damage the canopy. If appropriate, leave below ground structures such as footings and disused pipes in place if their removal will cause excessive root disturbance.

When pulling up existing paving the Contractor shall work backwards, lifting demolished paving back onto the existing paving. Roots may be found growing under the pavement and should not be trafficked. Roots growing into existing sub-base should be left and new surface finishes placed over the top without disturbance.

9. Excavations or Trenching within TPZ's

Excavation within TPA's shall not be allowed using mechanical equipment such as excavators or backhoes. Excavation within TPZ's shall only be carried out carefully by hand taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air (air spade), or water vacuum extraction shall be an appropriate alternative to hand digging and is the preferred method.

Exposed roots to be removed shall be cut cleanly with a sharp saw or secateurs at the face of the excavation. Roots temporarily exposed must be protected by appropriate covering with damp hessian or sand. Roots greater than 50mm in diameter are to be retained and shall only be cut in exceptional circumstances and only after consultation with the Project Consulting Arborist. Roots greater than 100mm in diameter shall typically not be allowed to be cut and must be worked around.

10. Soft Landscaping Installation

Final trimming and planting shall be judiciously undertaken around trees. All soft landscaping within the tree protection zones will be installed with care to avoid root disturbance from irrigation trenching, lighting installation and the planting of larger plants. Permanent irrigation (if used) shall be installed as spray heads located outside of TPZ's and spraying inwards. All other services such as small-scale electrical services shall also be designed and installed to avoid any excavation or trenching around the trees.

No significant excavation or cultivation, especially by rotary hoes or excavators, shall occur within TPZ's. Where new designs require the levels to be increased, good quality and permeable top soil shall be used. It should be firmed into place but not over compacted. All areas close to tree trunks shall be kept at the original ground level. Where turf is to be installed tree trunks shall have mulched rings applied rather than grass laid up to the trunk.

The size of the installed plants shall typically be less than 5L pots so that the maximum depth of the new root balls is less than 200mm. Any planting proposed that is larger than this shall be only installed outside of the SRZ and with care to not injure roots while digging planting holes.

11. Canopy Pruning

The Contractor shall prune branches of protected trees only as directed by the Project Consulting Arborist. Pruning is only to be undertaken by a qualified arborist (under the supervision of a person with AQF Level 4 or above). The Project Consulting Arborist is to be present at all times during the pruning work. Work is to be in strict accordance with AS4373 Pruning of Amenity Trees. Do not treat wounds.

12. Root Pruning

Pruning of roots of protected trees shall only be as directed the Project Consulting Arborist. The Tree Contractor shall use only a qualified arborist (AQF Level 4 or above). The Project Consulting Arborist is to be present at all times during the root pruning.

Roots are not to be cut using normal excavation machinery of any sort. This usually results in splitting and massive disturbance well past the intended line of cut. When required to cut roots, use hand methods and sharp hand tools (e.g. secateurs, hand saw) such that the remaining root systems are preserved intact and undamaged. Roots are to be cut back by hand square to the direction of the root travel (or edge of the excavation). Do not cut any tree roots exceeding 40mm diameter unless permitted. Excavations within root zones should be kept open for as short a period as possible. Any excavated face containing roots is to be temporarily supported, where necessary, to prevent soil loss from around the other retained roots.

13. Accidental Tree Damage

Should a tree be accidentally damaged, the Contractor shall immediately notify the Project Consulting Arborist. Timing can be of the essence, particularly with bark injuries, trunk damage or chemical contaminations.

If a branch has been broken, it shall be removed and the damaged end pruned to a suitable branch collar. If the branch has been torn out of the trunk, assessment shall be made and the damage cleaned up by as much as possible without further damage to the tree.

If roots are accidentally disturbed or excavated, any broken, crushed and torn sections shall be exposed and pruned leaving clean cuts to minimise risk of infection by fungal pathogens and promote good conditions for new root growth.

Example image of acceptable tree protection fencing measures to be applied. (1.8m high chainlink fencing with posts driven into ground)



Example image of acceptable tree protection fencing measures to be applied. (1.8m high rigid metal fencing with appropriate lateral bracing)



Example image of acceptable trunk protection battens



Example image of acceptable ground protection rumble boards



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ABN 40 069 552 610



A	SSDA Lodgement	RWS	19/9/25
REVISION	DESCRIPTION	CHKD	DATE

PROJECT & CLIENT

2 Flide St, Caringbah

Homes NSW

DRAWING TITLE

Tree Protection Specifications



Project No :24.20
Designed : RWS
Drawn : RWS
Scale :N/A

DRAWING NUMBER
T-04

REVISION
A

Plotted at : 2:06pm 18/9/2025

4.2 Tree Impact Assessment Schedule

Homes NSW - HAFF2, Caringbah - Tree Assessment Schedule																			
Tree ID	Trees in Group	Tree Species	Common Name	Height (m)	Spread Average (m)	Trunk Diameter Standard Height (dsh) (m)	Trunk Diameter at base (dgl) (m)	NRZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Age Class	Current Vigour	Current Form	Tree Origin	Noted Defects	SULE Rating	Retention Value	General Comments and Notes	Incursion and Impact	Recommendation
1	1	<i>Ligustrum lucidum</i>	Broadleaf Privet	6.0	6.0	0.35	0.40	4.20	2.25	Mature	Good	Poor	Weed	Very Asymmetric Form	Remove (<5 years)	Nil / Remove		Weed	Remove
2	1	<i>Eucalyptus pilularis</i>	Blackbutt	23.0	22.0	1.10	1.42	13.20	3.83	Mature	Good	Excellent	Endemic	Branch Tearouts, Deadwood-Minor, Root Impacts	Long (>40 years)	High	Major previous branch failures evident on lower trunk but otherwise excellent endemic tree worthy of retention. Very close to existing driveway building and basement structures that would prevent root development to the east, north-east.	Minor incursion (8%) into notional root zone due to excavations for hydrant booter and services connections to the south-west and north-east. These incursions at the extremity of TPZ. Minor surface impacts from pavement demolition and new landscape construction to be managed but expected to result in minimal root impact. Minor canopy pruning for building clearance but only 11% and considered acceptable.	Retain
3	2	<i>Callistemon viminalis cv.</i>	Weeping Bottlebrush	9.0	5.0	0.26	0.35	3.12	2.13	Mature	Moribund	Poor	Native	Very Asymmetric Form	Medium (15-40 years)	Nil / Remove	Second smaller specimen nearby in better condition but still very asymmetric form. Larger specimen dimensions given.	Within building and regrading footprint	Remove
4	1	<i>Allocasuarina torulosa</i>	Forest Oak	15.0	9.0	0.66	0.81	7.92	3.03	Mature	Fair	Average	Endemic	Major Wounding, Branch Tearouts	Medium (15-40 years)	Moderate		Within building and regrading footprint	Remove
5	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	10.0	7.0	0.32	0.43	3.84	2.32	Mature	Good	Average	Native	Very Asymmetric Form	Medium (15-40 years)	Moderate	Basal cavity, mostly now occluded. Asymmetric canopy to north-west.	No expected incursions into notional root zone due to excavations that would involve root loss. Existing basement walling below ground to be retained and backfilled in a tree sensitive way to allow tree to be retained and levels to meet and match with existing levels around tree.	Retain
6	2	<i>Ligustrum lucidum</i>	Broadleaf Privet	9.0	5.0	0.29	0.50	3.48	2.47	Mature	Good	Average	Weed	Deadwood-Major, Branch Tearouts, Epicormic Growth, Co-dominant Stems, Decay-Minor	Remove (<5 years)	Nil / Remove	Multi trunked from base	Weed	Remove
7	1	<i>Eucalyptus racemosa</i> (incl sub variant <i>E. sclerophylla</i> and <i>E. signata</i>)	Scribbly Gum	19.0	18.0	1.35	1.62	15.00	4.05	Mature	Fair	Average	Endemic	Tip Dieback, Deadwood-Minor, Branch Tearouts, Pest/Disease, Co-dominant Stems	Medium (15-40 years)	Moderate	Borer exit holes evident on western side. Sparse canopy and epicormic growth.	Nil impacts expected. Minor pruning of larger deadwood recommended at completion of project.	Retain
8	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	7.0	9.0	0.26	0.33	3.12	2.08	Mature	Fair	Average	Native	Very Asymmetric Form, Root Impacts	Medium (15-40 years)	Low	Effectively growing on structure, root development all to one side. Very asymmetric form. Existing carpark structure would prevent roots spreading to south.	Poor quality tree. Recommend removal	Remove
9	1	<i>Eucalyptus pilularis</i>	Blackbutt	17.0	13.0	0.53	0.60	6.36	2.67	Mature	Good	Average	Endemic		Long (>40 years)	Moderate	Existing carpark structure would prevent roots spreading to south.	No expected incursions into notional root zone due to excavations that would involve root loss. Minor surface impacts from pavement demolition and new construction to be managed but expected to result in minimal root impact. Existing basement walling below ground to be retained and backfilled in a tree sensitive way to allow tree to be retained and levels to meet and match with existing levels around tree.	Retain
10	2	<i>Ligustrum lucidum</i>	Broadleaf Privet	11.0	6.0	0.30	0.40	3.60	2.25	Mature	Good	Average	Weed	Epicormic Growth	Remove (<5 years)	Nil / Remove		Weed	Remove
11	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	9.0	5.0	0.27	0.30	3.24	2.00	Mature	Poor	Poor	Native	Root Impacts, Deadwood-Major, Tip Dieback, Inclusions	Short (5-15 years)	Nil / Remove	Root impacts, major dieback and up against basement wall. Existing carpark structure would prevent roots spreading to east.	Within building and regrading footprint	Remove
12	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	9.0	5.0	0.25	0.32	3.00	2.05	Mature	Fair	Average	Native	Root Impacts	Medium (15-40 years)	Low	Up against basement wall, effectively on structure. Existing carpark structure would prevent roots spreading to east.	Within building and regrading footprint	Remove
13	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	6.0	5.0	0.19	0.25	2.28	1.85	Mature	Fair	Average	Native	Root Impacts	Medium (15-40 years)	Low	Existing carpark structure would prevent roots spreading to west.	Within building and regrading footprint	Remove
14	1	<i>Archontophoenix alexandrae</i>	Alexandra Palm	4.0	6.0	0.23	0.35	2.76	2.13	Mature	Good	Poor	Native		Medium (15-40 years)	Low	Growing on-structure. Very deformed and unnatural trunk habit.	Within building and regrading footprint	Remove
15	1	<i>Jacaranda mimosifolia</i>	Jacaranda	8.0	4.0	0.12	0.17	2.00	1.57	Semi-mature	Good	Average	Native		Replaceable (Small/Young)	Low		Small tree - remove for the betterment of two larger specimens	Remove
16	1	<i>Jacaranda mimosifolia</i>	Jacaranda	10.0	10.0	0.36	0.35	4.32	2.13	Mature	Good	Average	Native	Very Asymmetric Form	Long (>40 years)	Moderate	Asymmetric canopy towards street.	Nil impacts expected. Minor surface impacts from pavement demolition and new landscape construction to be managed but expected to result in minimal root impact.	Retain
17	1	<i>Jacaranda mimosifolia</i>	Jacaranda	11.0	12.0	0.33	0.35	3.96	2.13	Mature	Good	Average	Native	Very Asymmetric Form, Co-dominant Stems, Decay-Minor	Long (>40 years)	Moderate	Pruned for powerlines clearances.	Nil impacts expected. Minor surface impacts from pavement demolition and new landscape construction to be managed but expected to result in minimal root impact.	Retain
18	1	<i>Pittosporum undulatum</i>	Sweet Pittosporum	5.0	6.0	0.12	0.15	2.00	1.49	Semi-mature	Fair	Average	Endemic		Replaceable (Small/Young)	Low		Small tree - remove for the betterment of two larger specimens	Remove

Tree ID	Trees in Group	Tree Species	Common Name	Height (m)	Spread Average (m)	Trunk Diameter Standard Height (dsh) (m)	Trunk Diameter at base (dgl) (m)	NRZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Age Class	Current Vigour	Current Form	Tree Origin	Noted Defects	SULE Rating	Retention Value	General Comments and Notes	Incursion and Impact	Recommendation
19	1	<i>Angophora costata</i>	Smooth-barked Apple	13.0	12.0	0.54	0.62	6.48	2.71	Mature	Good	Average	Native	Hangers, Branch Tearouts	Long (>40 years)	Moderate	Large hanging branch, from storm damage in upper canopy otherwise good tree. Very close to wall and path. Existing carpark structure would prevent roots spreading to south.	Minor incursion (5%) into notional root zone due to excavations that would involve root loss. Minor surface impacts from pavement demolition and new construction to be managed but expected to result in minimal root impact. Existing basment walling below ground to be retained and backfilled in a tree sensitive way to allow tree to be retained and levels to meet and match with existng levels around tree. Moderate to major canopy pruning (29%) for building clearance to south but considered tolerable with most foliage actually biased towards north.	Retain
20	1	<i>Angophora costata</i>	Smooth-barked Apple	9.0	9.0	0.23	0.30	2.76	2.00	Mature	Fair	Suppressed	Native	Very Asymmetric Form, Root Impacts	Medium (15-40 years)	Low	Very asymmetric form to north-west. Very close to wall and path	Nil impacts expected apart from minor canopy pruning (10%) for building clearance but considered tolerable due to existing sparse branching and canopy and the actual foliage loss is likely to be tolerable.	Retain
21	1	<i>Angophora costata</i>	Smooth-barked Apple	15.0	21.0	0.99	1.15	11.88	3.51	Mature	Excellent	Excellent	Endemic	Deadwood-Minor	Long (>40 years)	High	Very prominent street tree, quite low branching. Very impressive tree. Close proximity to kerb.	Minor incursion (<10%) into notional root zone due to excavations that would involve root loss. Minor surface impacts from pavement demolition and new construction to be managed but expected to result in minimal root impact. Existing basement walling below ground to be retained and backfilled in a tree sensitive way to allow tree to be retained and levels to meet and match with existing levels around tree. Minor canopy pruning (8%) for building clearances but considered acceptable.	Retain
22	1	<i>Acacia floribunda?</i>	Gossamer Wattle	7.0	5.0	0.15	0.19	2.00	1.65	Mature	Fair	Average	Native	Pest/Disease	Short (5-15 years)	Low		Within building and regrading footprint	Remove
23	1	<i>Melaleuca bracteata</i>	Black Tea-Tree	10.0	7.0	0.28	0.31	3.36	2.02	Mature	Good	Poor	Native	Lean-Major, Root Impacts	Medium (15-40 years)	Low	Existing carpark structure would prevent roots spreading to east. Major lean and very close to existing building.	Within building and regrading footprint	Remove
24	1	<i>Chamaecyparis obtusa cv.</i>	Hinoki Cypress	10.5	8.0	0.64	0.69	7.68	2.83	Over-mature	Fair	Average	Native	Major Wounding, Tip Dieback	Short (5-15 years)	Low	Generally poor form and condition.	Within building and regrading footprint	Remove
25	1	<i>Callistemon viminalis cv.</i>	Weeping Bottlebrush	12.0	5.0	0.40	0.53	4.80	2.53	Mature	Moribund	Poor	Native	Co-dominant Stems, Deadwood-Major, Epicormic Growth	Medium (15-40 years)	Nil / Remove		Within building and regrading footprint	Remove
26	1	<i>Callistemon viminalis cv.</i>	Weeping Bottlebrush	8.0	8.0	0.25	0.41	3.00	2.28	Mature	Good	Average	Native	Co-dominant Stems	Medium (15-40 years)	Low	Growing over basement carpark.	Within building and regrading footprint	Remove
27	1	<i>Callistemon viminalis cv.</i>	Weeping Bottlebrush	8.0	8.0	0.35	0.47	4.20	2.41	Mature	Good	Average	Native	Co-dominant Stems, Inclusions	Medium (15-40 years)	Low	Growing over basement carpark.	Within building and regrading footprint	Remove
28	1	<i>Schefflera actinophylla</i>	Umbrella Tree	8.0	5.0	0.41	0.40	4.92	2.25	Mature	Fair	Average	Exotic	Root Impacts, Epicormic Growth	Medium (15-40 years)	Nil / Remove	Effectively growing on structure. Existing carpark structure would prevent roots spreading to north. Invasive undesirable species.	Within building and regrading footprint	Remove
29	1	<i>Cupaniopsis anacardioides</i>	Tuckeroo	6.0	4.0	0.18	0.23	2.16	1.79	Mature	Good	Average	Native		Long (>40 years)	Moderate		Within building and regrading footprint	Remove
30	1	<i>Syzygium paniculatum</i>	Magenta Cherry	6.0	3.0	0.16	0.19	2.00	1.65	Semi-mature	Fair	Poor	Native	Co-dominant Stems, Inclusions	Replaceable (Small/Young)	Low	Poor include branch structure at major branch junction.	Within building and regrading footprint	Remove
31	1	<i>Casuarina glauca</i>	Swamp She-Oak	15.5	9.0	0.55	0.88	6.60	3.14	Mature	Good	Excellent	Native	Deadwood-Minor	Long (>40 years)	High	Good tree.	Within building and regrading footprint	Remove
32	1	<i>Ilex aquifolium</i>	English Holly	8.0	5.0	0.26	0.50	3.12	2.47	Mature	Good	Average	Exotic	Deadwood-Major, Decay-Major, Co-dominant Stems, Inclusions	Short (5-15 years)	Nil / Remove		Within building and regrading footprint	Remove
33	1	<i>Jacaranda mimosifolia</i>	Jacaranda	15.0	10.0	0.49	0.58	5.88	2.63	Mature	Good	Average	Native	Epicormic Growth	Long (>40 years)	Moderate		Within building and regrading footprint	Remove
34	1	<i>Acer negundo</i>	Box Elder	6.0	4.0	0.13	0.19	2.00	1.65	Semi-mature	Fair	Poor	Native		Medium (15-40 years)	Low	Street tree, with poor form.	Poor quality tree. Recommend removing and replacing as part or the development	Remove
35	1	<i>Acer negundo</i>	Box Elder	6.0	4.0	0.15	0.23	2.00	1.79	Semi-mature	Fair	Poor	Native		Medium (15-40 years)	Low	Street tree, with poor form.	Poor quality tree. Recommend removing and replacing as part or the development	Remove
36	1	<i>Chamaecyparis obtusa cv.</i>	Hinoki Cypress	6.0	4.0	0.31	0.32	3.72	2.05	Over-mature	Moribund	Poor	Native	Tip Dieback, Deadwood-Major, Cavity	Remove (<5 years)	Nil / Remove		Very poor quality tree.	Remove
37	1	<i>Rhaphiolepis indica</i>	Indian Hawthorn	3.5	3.0	0.16	0.20	2.00	1.68	Mature	Good	Average	Exotic	Root Impacts	Replaceable (Small/Young)	Low	Located in an on-structure environment in small raised bed. Very close to existing building.	Within building and regrading footprint	Remove

4.3 Tree Data Summary Sheets

ID # 001

Species: Ligustrum lucidum

Common: Broadleaf Privet

Height: 6.0

DBH: 0.35 DGL: 0.40

TPZ: 4.2 SRZ: 2.25

Current Form: Poor

Current Vigour: Good

Age Class: Mature

SULE: Remove (<5 years)

Retention

Value: Nil / Remove

Comments



ID # 004

Species: Allocasuarina torulosa

Common: Forest Oak

Height: 15.0

DBH: 0.66 DGL: 0.81

TPZ: 7.92 SRZ: 3.03

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Moderate

Comments



ID # 002

Species: Eucalyptus pilularis

Common: Blackbutt

Height: 23.0

DBH: 1.10 DGL: 1.42

TPZ: 13.2 SRZ: 3.83

Current Form: Excellent

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: High

Comments

Major previous branch failures evident on lower trunk but otherwise excellent endemic tree worthy of retention. Very close to existing driveway building and basement structures that would prevent root



ID # 005

Species: Melaleuca bracteata

Common: Black Tea-Tree

Height: 10.0

DBH: 0.32 DGL: 0.43

TPZ: 3.84 SRZ: 2.32

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Moderate

Comments

Basal cavity, mostly now occluded. Asymmetric canopy to north-west.



ID # 003

Species: Callistemon viminalis
cv.

Common: Weeping Bottlebrush

Height: 9.0

DBH: 0.26 DGL: 0.35

TPZ: 3.12 SRZ: 2.13

Current Form: Poor

Current Vigour: Moribund

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Nil / Remove

Comments

Second smaller specimen nearby in better condition but still very asymmetric form. Larger specimen dimensions given.



ID # 006

Species: Ligustrum lucidum

Common: Broadleaf Privet

Height: 9.0

DBH: 0.29 DGL: 0.50

TPZ: 3.48 SRZ: 2.47

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Remove (<5 years)

Retention

Value: Nil / Remove

Comments

Multi trunked from base



ID # 007

Species: Eucalyptus racemosa

Common: Scribbly Gum

Height: 19.0

DBH: 1.35 DGL: 1.62

TPZ: 15 SRZ: 4.05

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Moderate

Comments

Borer exit holes evident on western side. Sparse canopy and epicormic growth.



ID # 010

Species: Ligustrum lucidum

Common: Broadleaf Privet

Height: 11.0

DBH: 0.30 DGL: 0.40

TPZ: 3.6 SRZ: 2.25

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Remove (<5 years)

Retention

Value: Nil / Remove

Comments



ID # 008

Species: Melaleuca bracteata

Common: Black Tea-Tree

Height: 7.0

DBH: 0.26 DGL: 0.33

TPZ: 3.12 SRZ: 2.08

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Effectively growing on structure, root development all to one side. Very asymmetric form. Existing carpark structure would prevent roots spreading to south.



ID # 011

Species: Melaleuca bracteata

Common: Black Tea-Tree

Height: 9.0

DBH: 0.27 DGL: 0.30

TPZ: 3.24 SRZ: 2

Current Form: Poor

Current Vigour: Poor

Age Class: Mature

SULE: Short (5-15 years)

Retention

Value: Nil / Remove

Comments

Root impacts, major dieback and up against basement wall. Existing carpark structure would prevent roots spreading to east.



ID # 009

Species: Eucalyptus pilularis

Common: Blackbutt

Height: 17.0

DBH: 0.53 DGL: 0.60

TPZ: 6.36 SRZ: 2.67

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: Moderate

Comments

Existing carpark structure would prevent roots spreading to south.



ID # 012

Species: Melaleuca bracteata

Common: Black Tea-Tree

Height: 9.0

DBH: 0.25 DGL: 0.32

TPZ: 3 SRZ: 2.05

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Up against basement wall, effectively on structure. Existing carpark structure would prevent roots spreading to east.



ID # 013

Species: *Melaleuca bracteata*

Common: Black Tea-Tree

Height: 6.0

DBH: 0.19 DGL: 0.25

TPZ: 2.28 SRZ: 1.85

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Existing carpark structure would prevent roots spreading to west.



ID # 016

Species: *Jacaranda mimosifolia*

Common: Jacaranda

Height: 10.0

DBH: 0.36 DGL: 0.35

TPZ: 4.32 SRZ: 2.13

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: Moderate

Comments

Asymmetric canopy towards street.



ID # 014

Species: *Archontophoenix alexandrae*

Common: Alexandra Palm

Height: 4.0

DBH: 0.23 DGL: 0.35

TPZ: 2.76 SRZ: 2.13

Current Form: Poor

Current Vigour: Good

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Growing on-structure. Very deformed and unnatural trunk habit.



ID # 017

Species: *Jacaranda mimosifolia*

Common: Jacaranda

Height: 11.0

DBH: 0.33 DGL: 0.35

TPZ: 3.96 SRZ: 2.13

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: Moderate

Comments

Pruned for powerlines clearances.



ID # 015

Species: *Jacaranda mimosifolia*

Common: Jacaranda

Height: 8.0

DBH: 0.12 DGL: 0.17

TPZ: 2 SRZ: 1.57

Current Form: Average

Current Vigour: Good

Age Class: Semi-mature

SULE: Replaceable

Retention

Value: Low

Comments



ID # 018

Species: *Pittosporum undulatum*

Common: Sweet Pittosporum

Height: 5.0

DBH: 0.12 DGL: 0.15

TPZ: 2 SRZ: 1.5

Current Form: Average

Current Vigour: Fair

Age Class: Semi-mature

SULE: Replaceable

Retention

Value: Low

Comments



ID # 019

Species: *Angophora costata*

Common: Smooth-barked Apple

Height: 13.0

DBH: 0.54 DGL: 0.62

TPZ: 6.48 SRZ: 2.71

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: Moderate

Comments

Large hanging branch, from storm damage in upper canopy otherwise good tree. Very close to wall and path. Existing carpark structure would prevent roots spreading to south.



ID # 022

Species: *Acacia floribunda?*

Common: Gossamer Wattle

Height: 7.0

DBH: 0.15 DGL: 0.19

TPZ: 2 SRZ: 1.65

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Short (5-15 years)

Retention

Value: Low

Comments



ID # 020

Species: *Angophora costata*

Common: Smooth-barked Apple

Height: 9.0

DBH: 0.23 DGL: 0.30

TPZ: 2.76 SRZ: 2

Current Form: Suppressed

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Very asymmetric form to north-west. Very close to wall and path



ID # 023

Species: *Melaleuca bracteata*

Common: Black Tea-Tree

Height: 10.0

DBH: 0.28 DGL: 0.31

TPZ: 3.36 SRZ: 2.02

Current Form: Poor

Current Vigour: Good

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Existing carpark structure would prevent roots spreading to east. Major lean and very close to existing building.



ID # 021

Species: *Angophora costata*

Common: Smooth-barked Apple

Height: 15.0

DBH: 0.99 DGL: 1.15

TPZ: 11.88 SRZ: 3.51

Current Form: Excellent

Current Vigour: Excellent

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: High

Comments

Very prominent street tree, quite low branching. Very impressive tree. Close proximity to kerb.



ID # 024

Species: *Chamaecyparis obtusa* cv.

Common: Hinoki Cypress

Height: 10.50

DBH: 0.64 DGL: 0.69

TPZ: 7.68 SRZ: 2.83

Current Form: Average

Current Vigour: Fair

Age Class: Over-mature

SULE: Short (5-15 years)

Retention

Value: Low

Comments

Generally poor form and condition.



ID # 025

Species: Callistemon viminalis cv.

Common: Weeping Bottlebrush

Height: 12.0

DBH: 0.40 DGL: 0.53

TPZ: 4.8 SRZ: 2.53

Current Form: Poor

Current Vigour: Moribund

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Nil / Remove

Comments



ID # 028

Species: Schefflera actinophylla

Common: Umbrella Tree

Height: 8.0

DBH: 0.41 DGL: 0.40

TPZ: 4.92 SRZ: 2.25

Current Form: Average

Current Vigour: Fair

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Nil / Remove

Comments

Effectively growing on structure. Existing carpark structure would prevent roots spreading to north. Invasive undesirable species.



ID # 026

Species: Callistemon viminalis cv.

Common: Weeping Bottlebrush

Height: 8.0

DBH: 0.25 DGL: 0.41

TPZ: 3 SRZ: 2.28

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Growing over basement carpark.



ID # 029

Species: Cupaniopsis anacardioides

Common: Tuckeroo

Height: 6.0

DBH: 0.18 DGL: 0.23

TPZ: 2.16 SRZ: 1.79

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention

Value: Moderate

Comments



ID # 027

Species: Callistemon viminalis cv.

Common: Weeping Bottlebrush

Height: 8.0

DBH: 0.35 DGL: 0.47

TPZ: 4.2 SRZ: 2.41

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Medium (15-40 years)

Retention

Value: Low

Comments

Growing over basement carpark.



ID # 030

Species: Syzygium paniculatum

Common: Magenta Cherry

Height: 6.0

DBH: 0.16 DGL: 0.19

TPZ: 2 SRZ: 1.65

Current Form: Poor

Current Vigour: Fair

Age Class: Semi-mature

SULE: Replaceable

Retention

Value: Low

Comments

Poor include branch structure at major branch junction.



ID # 031

Species: Casuarina glauca

Common: Swamp She-Oak

Height: 15.5

DBH: 0.55 DGL: 0.88

TPZ: 6.6 SRZ: 3.14

Current Form: Excellent

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention
Value: High

Comments

Good tree.



ID # 034

Species: Acer negundo

Common: Box Elder

Height: 6.0

DBH: 0.13 DGL: 0.19

TPZ: 2 SRZ: 1.65

Current Form: Poor

Current Vigour: Fair

Age Class: Semi-mature

SULE: Medium (15-40 years)

Retention
Value: Low

Comments

Street tree, with poor form.



ID # 032

Species: Ilex aquifolium

Common: English Holly

Height: 8.0

DBH: 0.26 DGL: 0.50

TPZ: 3.12 SRZ: 2.47

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Short (5-15 years)

Retention
Value: Nil / Remove

Comments



ID # 035

Species: Acer negundo

Common: Box Elder

Height: 6.0

DBH: 0.15 DGL: 0.23

TPZ: 2 SRZ: 1.79

Current Form: Poor

Current Vigour: Fair

Age Class: Semi-mature

SULE: Medium (15-40 years)

Retention
Value: Low

Comments

Street tree, with poor form.



ID # 033

Species: Jacaranda mimosifolia

Common: Jacaranda

Height: 15.0

DBH: 0.49 DGL: 0.58

TPZ: 5.88 SRZ: 2.63

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Long (>40 years)

Retention
Value: Moderate

Comments



ID # 036

Species: Chamaecyparis obtusa cv.

Common: Hinoki Cypress

Height: 6.0

DBH: 0.31 DGL: 0.32

TPZ: 3.72 SRZ: 2.05

Current Form: Poor

Current Vigour: Moribund

Age Class: Over-mature

SULE: Remove (<5 years)

Retention
Value: Nil / Remove

Comments



ID # 037

Species: *Rhaphiolepis indica*

Common: Indian Hawthorn

Height: 3.5

DBH: 0.16 DGL: 0.20

TPZ: 2 SRZ: 1.68

Current Form: Average

Current Vigour: Good

Age Class: Mature

SULE: Replaceable

Retention

Value: Low



Comments

Located in an on-structure environment in small raised bed. Very close to existing building.