

KANE

TREE PROTECTION MANAGEMENT PLAN

PARRAMATTA EELS CENTRE OF EXCELLENCE



DOCUMENT HISTORY

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1.0 INTRODUCTION

This Tree Protective Management Plan will outline the methodology and protocols to be applied to existing trees and removal of trees at the Hills shire Council of The Parramatta Centre of Excellence facility.

1.1 Overview and Purpose

The purpose of this procedure is to outline Kane's work practices towards Managing tree protection. Kane will maintain all required tree protection measures are in good condition in accordance with the construction site management plan. Kane will also maintain adequate soil grades and will ensure all machinery, builders refuse, spoil and materials will remain outside their protection zone.

2.0 STATUTORY AND CONTRACTUAL OBLIGATIONS

The following statutory obligations of the SSDA Development Consent are setout below.

C4. Protection of Public Infrastructure and Street Trees

Prior to the commencement of works, the Applicant must:

... (c) ensure all street trees directly outside the site not approved for removal are retained and protected in accordance with the applicable Australian Standards.

D.24 Tree Protection

While on site or building work is being carried out, the applicant must maintain all required tree protection measures are in good condition in accordance with the construction site management plan. The relevant requirements of the applicable Australian Standards and the Arboricultural Impact Assessment, prepared by Earthscape Horticultural Services, Dated February 2022.

The following contractual obligations are setout in Principal's project Requirements.

10.31 Tree Protection

The Contractor must take special care to protect existing structures and trees throughout all stages of the Works.

The Contractor is required to provide formal advice from the arborist to the Principal confirming that all tree protection has been installed in accordance with the requirements, prior to works commencing.

All tree protection must be installed in accordance with the relevant standards and be fixed to prevent unauthorised removal during the works. Appropriate signage must be maintained.

The Contractor is responsible for ensuring the Project Arborist is present on Site at the relevant stages of works, and must keep a log of the dates of attendance and the works performed, which is to be presented as a Final Compliance Report, for the approval of the PCA, prior to the issue of any Occupation Certificate.

3.0 TREE PROTECTION ZONES

Tree Protection Zones and Structural Root Zones are radial distance measured from the centre of the trunk of the tree, calculated in accordance with AS 4970-2009 (Protection of Trees on Development Sites).

The intention of the TPZ is to ensure protection of the root system and canopy from the potential

damage from construction works and ensure the long-term health and stability of each tree to be retained. In some instances incursions into the TPZ is allowable in line with the parameters set out in the Arborist Report.

The Structural Root Zone (SRZ) provides the bulk of mechanical support and anchorage for a tree. Incursions into the SRZ are not recommended and may compromise the stability of the tree.

4.0 TREE PROTECTION MEASURES

The tree protection measures should be read in conjunction with the Arboricultural Impact Assessment Report by Earthscape Horticultural Services dated February 2022 (**Arborist Report**).

4.1 Prohibited Activities in Tree Protection Zones

- Excavation and trenching (with exceptions stated in Arborist Report)
- Soil Disturbance, surface grading, compaction, ripping of soil.
- Mechanical removal of vegetation
- Soil level changes including the placement of fill material.
- Movement and storage of plant, equipment, vehicles and site sheds
- Affixing of signage, barricades or hoarding to trees
- Storage of any building materials, waste materials and chemicals
- Stockpiling of any spoil, fill or waste materials
- Any activity likely to cause physical damage to the trunk, root systems and to the tree.

4.2 Fencing & Signage

A temporary chainwire fencing will be installed as a protective barrier around all tree nominated in the Arborist Report.

Signs will be placed on the above tree protection fencing prohibiting unauthorized movement of machinery or equipment and to prevent entry into the protected tree zones.

4.3 Ground Protection

Vehicle movements within TPZs are generally prohibited. Where vehicles, plant or equipment need to traverse the soft landscape area of the TPZ prior approval of the Site Manager is required. 20mm marine ply sheets or truck mats will be placed over the ground surface prior to any vehicle access and works will be fully supervised by the Site Manager.

4.4 Tree Removal

All trees removal will be supervised by a qualified Arborist at the Australian Qualifications Framework Level 5 and follow all NSW Workcover Code of Practice for the Amenity Tree Industry (1998).

Only the trees identified for removal in the Arborist Report will be removed.

5.0 WORKS WITHIN TREE PROTECTION ZONES

Where access or works within the tree protection zones are unavoidable, care will be taken and control outlined the Arborists Report will be implemented.

5.1 Accidental Damage

Care will taken while operating plant and equipment and undertaking construction works in proximity to trees to prevent harm to the tree canopies.

If, for any reason, a tree sustains damage during the construction period, works relating to the damage must immediate cease and the Site Manager notified. A level 5 qualified Arborist will be contacted to inspected inspect the tree and offer advice for mitigating any negative effects.

These recommended actions will implement by the Site Manager to the satisfaction of the arborist. Any advise or instruction from the Arborist should be recorded and confirmed in wring.

5.2 Demolition Works

No mechanical soil cultivation is permitted within TPZs. Where existing turfgrass is proposed to be removed (demolished) the turfgrass shall be first treated with a non-selective herbicide with the active constituent Glyphosate (Round-up ® or equivalent). Once the turfgrass in the affected area is completely dead, any high grass may be slashed/mown close to ground level.

Any residual vegetation (dead grass etc) may then be carefully scraped-off the surface using a small rubber tracked excavator with a broad sand bucket.

Demolition of paved areas (including any temporary road base surface treatment) within the TPZs of trees shall be undertaken under the supervision of a level 5 qualified Arborist.

5.3 Excavation and Trenching Works

Prior to any mechanical excavations for building foundations or pavement sub-grade within the TPZs exploratory excavation using non-destructive techniques shall be taken along the perimeter of the structure or pavement within the TPZ to locate and expose any woody roots prior to any mechanical excavation.

Care will be taken to preserve any root structures identified with the non-destructive excavation and any cutting of tree roots shall follow the recommendations in the Arborists Report.

6.0 ONGOING MONITORING AND REVIEW

Compliance with tree protection measures will be reviewed on a regular basis during safety and environmental walks. Any non-compliance will be recorded on Hammertech and actions closed out promptly.

An arborist will also attend site on a regular basis and confirm compliance with controls identified on the arborist report.

APPENDIX A

**ARBORICULTURE IMPACT
ASSESSMENT REPORT**

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APPENDIX A



EARTHSCAPE HORTICULTURAL SERVICES
Arboricultural, Horticultural and Landscape Consultants

ABN 36 082 126 027

**ARBORICULTURAL IMPACT
ASSESSMENT REPORT**

**PROPOSED CENTRE OF EXCELLENCE
AND COMMUNITY FACILITIES**

KELLYVILLE PARK
6-8 MEMORIAL AVENUE, KELLYVILLE

February 2022

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EXECUTIVE SUMMARY

This report has been prepared to provide an arboricultural assessment of the trees located in the vicinity of the Parramatta Eels Training Facility located in Kellyville Park, Kellyville for a proposed State Significant Development Application (SSDA) for redevelopment of the site to accommodate a new 'Centre of Excellence' (COE) and associated community facilities.

The proposed development will provide state of the art facilities which enable physical recreation opportunities in conjunction with improved facilities for staff, players and existing users of the site. The proposed development will be integrated with the existing recreational landscape of the site and complement the upgrades to the existing playing fields being undertaken by Council. The proposed development is defined as a Recreation facility (major), and includes the following components:

- Construction of high-performance Centre of Excellence in the north east of the site adjacent to Training Field 2:
 - Elite level gymnasium.
 - Medical and rehabilitation facilities.
 - Aquatic recovery and rehabilitation pools.
 - Lecture theatre and meeting rooms.
 - Player education and study areas.
 - Administration offices for the Parramatta Eels.
 - New female facilities including a dedicated female change room, cubicle toilets and showers.
 - Balcony and terrace area.
 - End of Trip Facilities and bicycle parking.
 - Refuse Area.
- Construction of a Community Facility, including a grandstand with approximately 1,500 seats in the centre of the site adjacent to the Main Playing Field 3:
 - Unisex changerooms and amenities.
 - Referee changeroom and amenities.
 - First Aid/Medical room.
 - Community gymnasium.
 - Café/kiosk.
 - Concourse terrace.
 - Multipurpose community function room with kitchen and amenities.
 - Refuse Area.
 - Bicycle parking.
- Solar arrays will be included on the roof of both the Centre of Excellence and Community Facility.
- Additional 40 car parking spaces for the proposed facility to operate in conjunction with existing at grade car parking already constructed by Council.
- Additional landscaping throughout the development footprint.
- Removal of a small number of trees internal to the site, however noting perimeter trees will be retained where not affected by the proposed building footprints.
- Hours of operation for the Centre of Excellence and Community Facility are 5:00am to 12:00am, however the following key times are likely:
 - Centre of Excellence: 7.00am - 7.00pm
 - Community Facility: 7.00am - 10.00pm

A total of twenty (20) trees stand within the subject site. These include a variety of introduced, non-local native and locally indigenous species. All except one of these are protected under The Hills Shire Council's Tree Management Controls. Of the thirteen (13) trees to be removed to accommodate the proposed development, five (5) are classified as low or very low Retention Value, three (3) are classified as moderate Retention Value and five (5) are classified as high Retention Value. The remaining seven (7) trees are proposed to be retained and protected during construction in accordance with the recommended Tree Protection Measures (Section 10) and Tree Protection Plan (Appendix 6) forming part of this report. These trees will not be adversely impacted by the proposed development.

Seven (7) of the subject trees to be removed are considered to be constituents of Shale Plains Woodland, which is listed as a Critically Endangered Ecological Community. However, these trees are within an isolated stand located centrally within the site and are not contiguous with any larger area of indigenous vegetation. There are no feasible options that can be recommended in this instance that would permit these trees to be retained given the desired location of the main COE building and the position of the trees within the site.

The Landscape Concept Plan indicates an area of approximately 2000 square metres set aside for new compensatory (offset) plantings, including forty-eight (48) new locally-indigenous trees, together with a further forty (40) other trees (being a variety of locally-indigenous and non-local native species) to be planted in and around the new facilities, giving a total of eighty-eight (88) new trees. This level of replacement planting will compensate for the loss of amenity incurred from the removal of trees to accommodate the proposed development within the next 10-15 years and result in a net increase in overall canopy coverage. As such, the proposed development will have limited environmental impact.

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1 INTRODUCTION

1.1 Overview

1.1.1 This report was commissioned by HB Arch on behalf of the Parramatta Eels National Rugby League (NRL) Club to assess the health and condition of twenty (20) trees located within or immediately adjacent to the Parramatta Eels Training Facility located within Kellyville Park, Memorial Avenue, Kellyville. The report has been prepared to aid in the assessment of State Significant Development Application (SSD-24452965) for the construction of a new Eels 'Centre of Excellence' and associated community facilities ('Community Sports Hub') within the Park in association with The Hills Shire Council.

1.1.2 The proposed development will provide state of the art facilities which enable physical recreation opportunities in conjunction with improved facilities for staff, players and existing users of the site. The proposed development will be integrated with the existing recreational landscape of the site and complement the upgrades to the existing playing fields being undertaken by Council. The proposed development is defined as a Recreation facility (major), and includes the following components:

- Construction of high-performance Centre of Excellence in the north east of the site adjacent to Training Field 2:
 - Elite level gymnasium.
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- Construction of a Community Facility, including a grandstand with approximately 1,500 seats in the centre of the site adjacent to the Main Playing Field 3:
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 - Bicycle parking.

- Solar arrays will be included on the roof of both the Centre of Excellence and Community Facility.

- Additional 40 car parking spaces for the proposed facility to operate in conjunction with existing at grade car parking already constructed by Council.

- Additional landscaping throughout the development footprint.

- Removal of a small number of trees internal to the site, however noting perimeter trees will be retained where not affected by the proposed building footprints.

- Hours of operation for the Centre of Excellence and Community Facility are 5:00am to 12:00am, however the following key times are likely:

- Centre of Excellence: 7.00am - 7.00pm
- Community Facility: 7.00am - 10.00pm

1.2 Purpose of this Report

- 1.2.1 The purpose of this report is to assess the potential impact of the proposed development on the subject trees, together with recommendations for amendments to the design or construction methodology where necessary to minimise any adverse impact. The report also provides recommended tree protection measures to ensure the long-term preservation of the trees to be retained where appropriate.

1.3 Response to SEARs

- 1.3.1 This Arboricultural Impact Assessment Report forms part of the Environmental Impact Statement (EIS) addressing part of Section 6 (Landscaping and Trees) of the Planning Secretary’s Environmental Assessment Requirements (SEARs). This table identifies the SEARs and relevant reference within this report:-

Table 1 – SEARs and Relevant Reference

SEARs Item	Report Reference
6. Landscaping and Trees	
Details the proposed landscaping and planting, including proposal for native vegetation communities and plant species	Section 11. refer also iScape Landscape Architecture Report
Demonstrates how the development proposes to protect and increase the urban tree canopy	Section 9, 10, 11, Appendix 6 (Tree Protection Plan) refer also iScape Landscape Architecture Report
Includes justification for any tree and vegetation removal	Section 9
Demonstrates how the proposed development maximises opportunities for green infrastructure, consistent with Greener Places	refer to iScape Landscape Architecture Report

1.4 Reporting Standards

- 1.4.1 This report has been prepared in accordance with The Hills Shire Council's guidelines for preparation of Arborists Reports as outlined in Appendix 2 of Council's *Tree Management Guidelines for Trees on Private Land* (November 2014), Part C, Section 3.2 of *The Hills Shire Development Control Plan 2012* and Sections 2.3.2-2.3.5 of the Australian Standard for *Protection of Trees on Development Sites* (AS 4970:2009).

2 THE SITE

- 2.1.1 The subject property is known as Lot 60 in DP 10702 and Lot 1 in DP 167535, being 8 Memorial Avenue, Kellyville. For the purposes of this report, the subject allotments will be referred to as 'the site'. The present Parramatta Eels Training Facility is located predominantly within Lot 1 in DP 167535. The subject trees are located within or immediately adjacent Lot 60 in DP 10702 to the east of the Training Facility. The site forms part of a large sporting complex known as Kellyville Park. The Park contains a variety of playing fields and sporting fields for baseball, tee ball and Rugby League. The Park is zoned Public Recreation [RE1] under *The Hills Local Environmental Plan 2019* (THLEP).
- 2.1.2 The northern portion of the site is presently occupied by Roads and Maritime Services (RMS) road construction contractor, Daracon. The central portion of the site contains several former hard courts (tennis & basketball), presently used as temporary construction site compounds by Western Earth Moving (WEM). The southern portion of the site contains a grass playing field. The site has a moderate westerly gradient with dilapidated grassed areas and scattered trees, with a fairly typical parkland character. The site contains a number of mature and semi-mature trees. These include a variety of locally-indigenous, non-local native and exotic (introduced) species.
- 2.1.3 The soils of this area are typical of the Blacktown Soil Landscape Group (as classified in the *Soil Landscapes of the Penrith 1:100,000 Sheet*), consisting of shallow to moderately deep (< 1000 mm) hardsetting mottled contrast soils, *Red & Brown Podzolic Soils* on crests, upper slopes and well drained areas, grading to *Yellow Podzolic Soils* on lower slopes and areas of poor drainage or along drainage lines. Soil materials are derived Wianamatta Group Shales.¹ The landscape generally consists of undulating rises with broad rounded crests and ridges with gently inclined slopes with gradients of usually less than 5%.
- 2.1.4 The original vegetation of this area consisted of woodland typical of the Cumberland Plain (Shale Plains Woodland),² most of which has now been cleared for urban development. The dominant locally-indigenous tree species formerly occurring in this area included *Eucalyptus moluccana*, (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus fibrosa ssp. fibrosa* (Broad-leaved Ironbark) & *Eucalyptus crebra* (Narrow-leaved Ironbark). Other species found in this vegetation community may include *Eucalyptus globoidea* (White Stringybark), *Eucalyptus eugenioides* (Narrow-leaved Stringybark), *Eucalyptus longifolia* (Woollybutt), *Corymbia maculata* (Spotted Gum) and *Eucalyptus amplifolia* (Cabbage Gum). *Melaleuca decora* (Paperbark) and *Casuarina glauca* (Swamp Oak) may also be found in low lying areas or along drainage lines.

3 SUBJECT TREES

- 3.1.1 The subject trees were inspected by Earthscape Horticultural Services (EHS) on the 5th May 2021. Each tree has been provided with an identification number for reference purposes denoted on the attached Tree Location Plan (**Appendix 5**), based on the survey prepared by Cardno, Dwg. Ref No. 11930501001 [01] dated 16/03/2021. The numbers used on this plan correlate with the Tree Assessment Schedule (**Appendix 3**). Tree No.s T5 & T6 were not shown on the original survey

and have been plotted on the drawing in their approximate positions by taking offsets from existing features.

4 HEALTH AND CONDITION ASSESSMENT

4.1 Methodology

4.1.1 An assessment of each tree was made using the Visual Tree Assessment (VTA) procedure.³ All of the trees were assessed in view from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment.

4.1.2 The following information was collected for each tree:-

- **Tree Species** (Botanical & Common Name);
- **Approximate height;**
- **Canopy spread** (measured using laser distance measurer in four directions and an average taken);
- **Trunk diameter** (measured with a diameter tape at 1.4 metres from ground level);
- **Live Crown Size** (measured by subtracting the total height of the tree from the lowest point of the crown and multiplying by the average crown spread to give a value in square metres);
- **Maturity Class** - the Maturity Class for each tree has been divided into the following categories:-
 - **OM** Over-mature – greater than 80% of the life expectancy for the species;
 - **M** Mature – 50-80% of the life expectancy for the species;
 - **SM** Semi-mature – 20-50% of the life expectancy for the species;
 - **I** Immature – less than 20% of the life expectancy for the species.
- **Health & vigour** (using foliage size, colour, extension growth, presence of disease or pest infestation, canopy density, presence of deadwood, dieback and epicormic growth as indicators),
- **Condition** (using visible evidence of structural defects, instability, evidence of previous pruning and physical damage as indicators); and
- **Suitability** of the tree to the site and its existing location (in consideration of damage or potential damage to services or structures, available space for future development and nuisance issues).

4.1.3 This information is presented in a tabulated form in **Appendix 3**.

4.2 Safe Useful Life Expectancy (SULE)

4.2.1 The remaining Safe Useful Life Expectancy⁴ of the tree is an estimate of the sustainability of the tree in the landscape, calculated based on an estimate of the average age of the species in an urban area, less its estimated current age. The life expectancy of the tree has been further modified where necessary in consideration of its current health and vigour, condition and suitability to the site. The estimated SULE of each tree is shown in **Appendix 3**.

4.2.2 The following ranges have been allocated to each tree:-

- Greater than 40 years (Long)
- Between 15 and 40 years (Medium)
- Between 5 and 15 years (Short)
- Less than 5 years (Transient)
- Dead or immediately hazardous (defective or unstable)

4.2.1 SULE ratings are intended to provide a general overview of the long-term sustainability of the trees within the site in consideration of these factors. The allocated ranges are not intended to be absolute. This information is useful in guiding future planning by highlighting the probable

lifespan of individual trees, for which a clear pattern may emerge. This information may be helpful in forecasting likely tree senescence and planning for replacement planting to ensure continuity in tree canopy across the site. It should be noted that SULEs *may* be extended or reduced depending on the way trees are managed. Intervention and remedial works may extend the SULE of some trees.

5 LANDSCAPE SIGNIFICANCE

5.1 Methodology for Determining Landscape Significance

5.1.1 The significance of a tree in the landscape is a combination of its environmental, heritage and amenity values. Whilst these values may be fairly subjective and difficult to assess consistently, some measure is necessary to assist in determining the retention value of each tree. To ensure a consistent approach, the assessment criteria shown in **Appendix 1** have been used in this assessment.

5.1.2 A rating has been applied to each tree to give an understanding of the relative significance of each tree in the landscape and to assist in determining priorities for retention, in accordance with the following categories:-

1. **Significant**
2. **Very High**
3. **High**
4. **Moderate**
5. **Low**
6. **Very Low**
7. **Insignificant**

5.2 Environmental Significance

5.2.1 *Tree Management Controls*

A Tree Management Provision (TMP) applies to all land within The Hills Shire Local Government Area (LGA) made pursuant to Clause 9 of the *State Environmental Planning Policy (Vegetation in Non-rural Areas) 2017* (Vegetation SEPP) as detailed in Part C, Section 3, Clause 2.4 of *The Hills Development Control Plan* (THDCP). The TMP generally protects all trees with a height of six (6) metres or greater or crown spread of three (3) metres or greater or with a trunk diameter of 300mm or greater (measured at the base). The following trees are exempt (not protected) under The Hills Council's Tree Management Provision:-

Tree No.	Species	Exemption
T9	<i>Liquidambar styraciflua</i> (Liquidambar)	Undesirable Species

The remainder of the trees are protected under the THDCP.

5.2.2 *Wildlife Habitat*

Eucalyptus tereticornis (Forest Red Gum) [T2 & T16], *Eucalyptus moluccana* (Grey Box) [T15], *Corymbia maculata* (Spotted Gum) [T10] and *Eucalyptus amplifolia* (Cabbage Gum) [T11, T12, T13 & T14] are all locally-indigenous species, representative of the original vegetation of the area and would be of benefit to native wildlife. However, none of the trees contain cavities that would be suitable as nesting hollows for arboreal mammals or birds. There were no other visible signs of wildlife habitation.

5.2.3 *Noxious Plants & Environmental Weeds*

Cinnamomum camphora (Camphor Laurel) [T3 & T4] is scheduled as a potential ‘Biosecurity Risk’ (‘Priority Weed’ – formerly ‘Noxious Weed’) within all of NSW under the provisions of the *Biosecurity Act 2015*. The growth of this plant species must be managed in a manner that continuously inhibits the ability of the plant to spread (so far as is reasonably practicable) and the plant must not be sold, propagated or knowingly distributed. This species is protected under Council’s Tree Management Controls where greater than 10 metres in height. Both of these trees are greater than 10 metres in height and are therefore protected under THDCP.

5.2.4 *Threatened Species & Ecological Communities*

Eucalyptus scoparia (Willow Gum) [T17, T18, T19 & T20] is listed as an Endangered Species under the *Biodiversity Conservation Act 2016* (NSW) and listed as a Vulnerable Species under the *Environment Protection and Biodiversity Conservation Act 1999*. Whilst this species is listed as endangered & vulnerable, it is a commonly planted ornamental tree in parks, gardens and streetscapes. The species is *not* endemic to this area and therefore does *not* have any ecological significance in this context of this site.

The National Parks and Wildlife Service (NPWS) 1:25000 Mapping Series (Native Vegetation of the Cumberland Plain)⁵ indicates that there may be remnants of Shale Plains Woodland (SPW) within the site. SPW is a sub-group of Cumberland Plain Woodland. Cumberland Plain Woodland in the Sydney Basin Bioregion is listed as a Critically Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016* (NSW) and a Critically Endangered Ecological Community under the *Environment Protection and Biodiversity Conservation Act 1999*.

Eucalyptus tereticornis (Forest Red Gum) [T2 & T16] and *Eucalyptus moluccana* (Grey Box) [T15] are both Positive Diagnostic Species of Shale Plains Woodland (SPW).⁶ *Corymbia maculata* (Spotted Gum) [T10] and *Eucalyptus amplifolia* (Cabbage Gum) [T11, T12, T13 & T14] are associated canopy species, occurring less frequently in this vegetation community. Trees T11, T12, T13 & T14 appear to be remnant (refer to **Section 5.3.4**) and are therefore considered to be constituents of this EEC. The remainder of these trees appear to have been planted c. 1980 and are therefore *not* considered to be constituents of this EEC.

It should be noted that The Hills Shire Council Vegetation Communities Map (2008) classifies the vegetation within the site as ‘Gardens/Modified Vegetation Communities’.

None of the other trees are listed as Threatened or Vulnerable Species or form part of Endangered Ecological Communities (EECs) under the provisions of the *Biodiversity Conservation Act 2016* (NSW) or the *Environment Protection and Biodiversity Conservation Act 1999*.

5.2.5 *Biodiversity, Bushfire & Riparian Lands*

The site does *not* contain any areas of ‘Biodiversity’ as indicated on Council’s Natural Resources Biodiversity Map forming part of the THLEP.

The site does *not* contain any Bushfire Prone areas as indicated on Council’s Bushfire Prone Land Map 2018 or 2012.

5.3 **Heritage Significance**

5.3.1 *Heritage Items*

The subject property is *not* listed as an item of Environmental Heritage under Schedule 5, Part 1 of THLEP 2012.

5.3.2 *Heritage Conservation Areas*

The site is *not* located within a Heritage Conservation Area under Schedule 5, Part 2 of THLEP 2012.

5.3.3 *Significant Tree Register*

The Hills Shire Council does *not* currently maintain a Register of Significant Trees.

5.3.4 *General*

The 1943 Aerial Photograph of Sydney indicates that the site was substantially cleared of native vegetation at this time for pastoral use (grazing land) with an orchard visible in the north-eastern corner of the site (corner of Memorial Avenue and Stone Mason Drive). Some scattered copses of trees were still extant in the paddocks. Trees T11, T12, T13 & T14 appear to be extant as mature specimens at this time and are therefore likely to be remnant of the original woodland of this area.

5.4 Amenity Value

5.4.1 Criteria for the assessment of amenity values are incorporated into **Appendix 1**. The amenity value of a tree is a measure of its live crown size, visual appearance (form, habit, crown density), visibility and position in the landscape and contribution to the visual character of an area. Generally the larger and more prominently located the tree, and the better its form and habit, the higher its amenity value.

6 TREE RETENTION VALUES

6.1.1 The Retention Values shown in **Appendix 3** and **Appendix 5** have been determined on the basis of the estimated longevity of the trees and their landscape significance rating, in accordance with **Table 1**. Together with guidelines contained in **Section 7** (Tree Protection Zones) this information should be used to determine the most appropriate position of building footprints and other infrastructure within the site, with due consideration to other site constraints, to minimise the impact on trees considered worthy of preservation.

TABLE 1 – TREE RETENTION VALUES – ASSESSMENT METHODOLOGY

Estimated Life Expectancy	Landscape Significance Rating						
	1	2	3	4	5	6	7
Long - Greater than 40 Years	High Retention Value						
Medium- 15 to 40 Years			Moderate Retention Value				
Short - 5 to 15 years			Low Ret. Value				
Transient - Less than 5 Years				Very Low Retention Value			
Dead or Potentially Hazardous							

6.1.2 The following table describes the implications of the retention values on site layout and design.

TABLE 2 – TREE RETENTION PRIORITIES.

RETENTION VALUE	RECOMMENDED ACTION
“High”	<p>These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority.</p> <p>Proposed site design and placement of buildings and infrastructure should consider the recommended setbacks as discussed in the following section (refer also Appendix 2) to avoid any adverse impact on these trees.</p> <p>In addition to Tree Protection Zones, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.</p>
“Moderate”	<p>The retention of these trees is desirable, but not essential.</p> <p>These trees should be retained as part of any proposed development if possible. However, these trees are considered less critical for retention.</p> <p>If these trees must be removed, replacement planting should be considered in accordance with Council’s Tree Replenishment Policy to compensate for loss of amenity (refer also Section 9).</p>
“Low”	<p>These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE.</p> <p>These trees should not be considered as a constraint to the future development of the site.</p>
“Very Low”	<p>These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds.</p> <p>The removal of these trees is therefore recommended regardless of the implications of any proposed development.</p>

7 TREE PROTECTION ZONES

7.1.1 The Tree Protection Zone (TPZ) is a radial distance measured from the centre of the trunk of the tree as specified in **Appendix 4**. These have been calculated in accordance with AS 4970-2009 (Protection of Trees on Development Sites).⁷

7.1.2 The intention of the TPZ is to ensure protection of the root system and canopy from the potential damage from construction works and ensure the long-term health and stability of each tree to be retained. Incursions to the root zone may occur due to excavations, changes in ground levels, (either lowering or raising the grade), trenching or other forms or soil disturbance such as ripping, grading or inverting the soil profile. Such works may cause damage or loss of part of the root system, leading to an adverse impact on the tree.

7.2 Structural Root Zone (SRZ)

7.2.1 The Structural Root Zone (SRZ) provides the bulk of mechanical support and anchorage for a tree. This is also a radial distance measured from the centre of the trunk as specified in **Appendix 4**. The SRZ has been calculated in accordance with AS 4970-2009 (Protection of Trees on Development Sites).

7.2.2 Incursions within the SRZ are not recommended as they are likely to result in the severance of woody roots which may compromise the stability of the tree or lead to its decline and demise.

7.3 Acceptable Encroachments to the Tree Protection Zone.

- 7.3.1 Where encroachment to the TPZ is unavoidable, an incursion to the TPZ of not exceeding 10% of the area of the TPZ and outside the SRZ may be acceptable. Examples of acceptable incursions are shown in **Appendix 2**. Greater incursions to the TPZ may result in an adverse impact on the tree.
- 7.3.2 Where incursions greater than 10% of the TPZ are unavoidable, exploratory excavation using non-destructive methods may be required to evaluate the extent of the root system affected and determine whether or not the tree can remain viable

7.4 Acceptable Encroachments to the Canopy

- 7.4.1 The removal of a small portion of the crown (foliage and branches) is generally tolerable provided that the extent of pruning required is less than 10% of the total foliage volume of the tree and the removal of branches does not create large wounds or disfigure the natural form and habit of the tree. All pruning cuts must be undertaken in accordance with AS 4373:2007. This generally involves reduction of the affected branches back to the nearest branch collar at the junction with the parent branch, rather than at an intermediate point. The latter is referred to as “lopping” and is no longer an acceptable arboricultural practice. Generally speaking, the minimum pruning as required to accommodate any proposed works is desirable. Extensive pruning can result in a detrimental impact on tree health and may lead to exposure of remaining branches to wind forces that they were previously sheltered from, leading to a greater risk of branch failure.
- 7.4.2 Clearance to between the building line and canopy should take into account any projecting structures, such as balconies, awnings and the roofline and any requirement for temporary scaffolding to be erected during construction (typically 1-1.5 metres wide). High structures should preferably be located outside the canopy dripline (as shown indicatively on the attached plans) in order to avoid or minimise canopy pruning.

7.5 Legal Protection

- 7.5.1 Notwithstanding the above recommendations, Council may require a greater setback from certain types of structures to ensure the on-going legal protection of the tree (i.e. its legal status under Council’s Tree Management Controls). In the Hills Shire, a tree located within five (5) metres of the wall of a dwelling or ancillary structure (garage, carport etc) is not protected under THDCP. The measurement is taken from the face of the trunk of the tree to the external wall or roofline of the dwelling/building. As such, if a tree is considered worthy of preservation, Council is unlikely to approve the construction of a dwelling or ancillary structure within five (5) metres of the tree (regardless of whether this can be undertaken without having an adverse impact on its health or longevity). Note that an ‘ancillary structure’ includes a garage, carport, studio, shed, workshop, swimming pool, spa or retaining wall with a height of greater than 600mm.

8 PROPOSED DEVELOPMENT

- 8.1.1 The proposed development includes the construction of a new Centre of Excellence and associated community facilities within the property. This includes a new on-grade car parking area, Centre of Excellence building, community ‘Sports Hub’ and grandstand together with associated landscape works.
- 8.1.2 The proposed development will provide state of the art facilities which enable physical recreation opportunities in conjunction with improved facilities for staff, players and existing users of the site. The proposed development will be integrated with the existing recreational landscape of the site and complement the upgrades to the existing playing fields being undertaken by Council. The

proposed development is defined as a Recreation facility (major), and includes the following components:

- Construction of high-performance Centre of Excellence in the north east of the site adjacent to Training Field 2:
 - Elite level gymnasium.
 - Medical and rehabilitation facilities.
 - Aquatic recovery and rehabilitation pools.
 - Lecture theatre and meeting rooms.
 - Player education and study areas.
 - Administration offices for the Parramatta Eels.
 - New female facilities including a dedicated female change room, cubicle toilets and showers.
 - Balcony and terrace area.
 - End of Trip Facilities and bicycle parking.
 - Refuse Area.

- Construction of a Community Facility, including a grandstand with approximately 1,500 seats in the centre of the site adjacent to the Main Playing Field 3:
 - Unisex changerooms and amenities.
 - Referee changeroom and amenities.
 - First Aid/Medical room.
 - Community gymnasium.
 - Café/kiosk.
 - Concourse terrace.
 - Multipurpose community function room with kitchen and amenities.
 - Refuse Area.
 - Bicycle parking.

- Solar arrays will be included on the roof of both the Centre of Excellence and Community Facility.

- Additional 40 car parking spaces for the proposed facility to operate in conjunction with existing at grade car parking already constructed by Council.

- Additional landscaping throughout the development footprint.

- Removal of a small number of trees internal to the site, however noting perimeter trees will be retained where not affected by the proposed building footprints.

- Hours of operation for the Centre of Excellence and Community Facility are 5:00am to 12:00am, however the following key times are likely:
 - Centre of Excellence: 7.00am - 7.00pm
 - Community Facility: 7.00am - 10.00pm

9 IMPACT ASSESSMENT

9.1.1 The intention of this assessment is to determine the incursions to the root zones and canopies created by the proposed development and evaluate the likely impact of the proposed works on the subject trees. Details shown on the following plans were used in this assessment:-

Title	Author	Dwg No.	Date
<i>Site Analysis – Existing / Demolition</i>	HB Arch	A014 [A]	1/12/2021
<i>Site Plan – New Works</i>	HB Arch	A016 [A]	1/12/2021
<i>GA COE Lower Plan</i>	HB Arch	A019 [A]	1/12/2021
<i>GA COE Upper Plan</i>	HB Arch	A020 [A]	1/12/2021
<i>GA COE Roof Plan</i>	HB Arch	A021 [A]	1/12/2021
<i>GA Community Facility Lower Plan</i>	HB Arch	A023 [A]	1/12/2021
<i>GA Community Facility Upper Plan</i>	HB Arch	A024 [A]	1/12/2021
<i>GA Community Facility Roof Plan</i>	HB Arch	A023 [A]	1/12/2021
<i>Elevations West</i>	HB Arch	A027 [A]	1/12/2021
<i>Elevations East</i>	HB Arch	A028 [A]	1/12/2021
<i>Landscape Architecture Report</i>	iScape		01/2022

9.1.2 A summary of the impact of the proposed development on each tree within the site is shown in **Appendix 4**. The following criteria have been examined as part of this assessment:-

- Existing Relative Levels (R.L.);
- Tree Protection Zone (TPZ);
- Structural Root Zone (SRZ);
- Footprint and envelope of the proposed development and temporary structures (scaffolding, hoardings etc);
- Incursions to the TPZ & SRZ, including estimated cut & fill beyond the building footprint;
- Incursions to the tree canopy from the building envelope and temporary structures; and
- Assessment of the likely impact of the works on existing trees.

9.1.3 The proposed development will necessitate the removal of five (5) trees of low and very low retention value. These include Tree No.s T7 (Sasanqua Camellia), T15 (Grey Box) and T18, T19 & T20 (Willow Gum). None of these trees are considered significant or worthy of special measures to ensure their preservation. The removal of these trees to accommodate the proposed development is therefore considered warranted in this instance.

9.1.4 The proposed development will also necessitate the removal of three (3) trees of moderate retention value. These include Tree No.s T8 (Crepe Myrtle), T16 (Forest Red Gum) and T17 (Willow Gum). These trees are not considered significant, but are in good health and condition and make a fair contribution to the amenity of the site and surrounding properties. In order to compensate for loss of amenity resulting from the removal of these trees to accommodate the proposed development, consideration should be given to replacement planting within the site in accordance with **Section 11**.

- 9.1.5 The proposed development will also necessitate the removal of five (5) trees of high retention value. These include Tree No.s T10 (Spotted Gum) and T11, T12, T13 & T14 (Cabbage Gum). Of these, T10 is in good health and condition and makes a positive contribution to the amenity of the site, but has no special ecological or heritage significance. Trees T11, T12, T13 & T14 are in fair health and condition and are remnant of the original vegetation community of this area (Cumberland Plain Woodland) which is classified as an EEC. Whilst having some ecological significance, the trees are in an isolated group located centrally within the site and are not contiguous with any larger stand of vegetation. There are no feasible options that can be recommended in this instance that would permit these trees to be retained given the desired location of the main COE building and the position of the trees within the site without substantial amendments to the site layout and design. It is understood that the level of amendment required (which would essentially require relocation of the main building outside the TPZs of the trees) is not considered acceptable and would overly compromise the site layout. In order to compensate for loss of amenity resulting from the removal of these trees to accommodate the proposed development, consideration should be given to replacement planting within the site in accordance with **Section 11**.
- 9.1.6 A proposed new pathway providing a pedestrian link to Memorial Avenue is located within the TPZ of T1 (Blackbutt). The extent of the encroachment to the root zone is less than 10% of the TPZ, which is considered within acceptable limits under AS 4970:2009. As such, the proposed works will not result in any adverse impact on this tree. In order to avoid any adverse impact on T1, the existing road base surface (temporary carpark) within the TPZ should be demolished in accordance with **Section 10.8** and all excavations for the pavement sub-grade within the TPZ should be undertaken in accordance with **Section 10.9**. Existing ground levels within the remainder of the TPZ should be retained intact (no cut/fill or surface grading).
- 9.1.7 No other trees will be adversely affected by the proposed development, provided that existing ground levels within the TPZs are maintained (i.e. no excavation, filling or surface re-grading is undertaken within the TPZs). In order to avoid any adverse impact on Trees T1, T2 & T9, temporary Tree Protection Fencing should be erected in accordance with **Section 10.5**. Where demolition of the existing temporary construction compound and roadbase surface is required within the TPZs of these trees, such demolition works should be carried out in accordance with **Section 10.8**.

10 RECOMMENDED TREE PROTECTION MEASURES

10.1 Tree Protection Plan

- 10.1.1 The following Tree Protection Measures should be read in accordance with the Tree Protection Plan (**Appendix 6**). The Tree Protection Plan (TPP) indicates the position of tree protection devices and other recommended measures to ensure the protection of trees within the site to be retained as part of the proposed development.

10.2 Prohibited Activities

- 10.2.1 The following activities should be avoided within specified Tree Protection Zones (refer **Appendix 4 & 6** for extent of the TPZ for each tree):-
- Excavations and trenching (with exception of the approved remediation works, underground services, building foundations or pavement sub-grade);
 - Soil disturbance, surface grading, compaction, tyning, ripping or cultivation of soil;
 - Mechanical removal of vegetation, including extraction of tree stumps;
 - Soil level changes including the placement of fill material (excluding imported validated fill for remediation works or placement of fill for approved works)

- Movement and storage of plant, equipment & vehicles (except within defined temporary haul roads, where ground protection has been installed, or within the footprint of existing floor slabs or paved areas);
- Erection of site sheds (except where approved by the site arborist);
- Affixing of signage, barricades or hoardings to trees;
- Storage of building materials, waste and waste receptacles;
- Stockpiling of spoil or fill;
- Stockpiling of bulk materials, such as soil, sand, gravel, roadbase or the like;
- Stockpiling of demolition waste;
- Disposal of waste materials and chemicals including paint, solvents, cement slurry, fuel, oil and other toxic liquids;
- Other physical damage to the trunk or root system; and
- Any other activity likely to cause damage to the tree.

10.3 Tree Damage

10.3.1 Care shall be taken when operating cranes, drilling rigs and similar equipment near trees to avoid damage to tree canopies (foliage and branches). Under no circumstances shall branches be torn-off by construction equipment. Where there is potential conflict between tree canopy and construction activities, the advice of the Site Arborist must be sought.

10.3.2 In the event of any tree becoming damaged for any reason during the construction period a consulting arborist [Australian Qualification Framework Level 5] shall be engaged to inspect and provide advice on any remedial action to minimise any adverse impact. Such remedial action shall be implemented as soon as practicable and certified by the arborist.

10.4 Tree Removal

10.4.1 The removal of Trees [T7, T8, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19 & T20] shall be carried out by an experienced tree surgeon in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). Care shall be taken to avoid damage to other trees during the felling operation.

10.4.2 Stumps located within the TPZs of trees to be retained shall be grubbed-out where required using a mechanical stump grinder (or by hand where less than 150mm in diameter) without damage to the root system of other trees. Where trees to be removed are within the SRZ of any trees to be retained, consideration should be given to cutting the stump close to ground level and retaining the root crown intact. Stumps within the Tree Protection Zone of other trees to be retained shall **not** be pulled out using excavation equipment or similar.

10.5 Tree Protection Fencing

10.5.1 Trees [T1, T2 & T9] shall be protected prior to and during construction from all activities that may result in detrimental impact by erecting a suitable protective fence in the positions as indicated on the Tree Protection Plan (**Appendix 6**). As a minimum, the fence shall consist of temporary chain wire panels of 1.8 metres in height, supported by steel stakes as required and fastened together and supported to prevent sideways movement using corner braces where required. The fence shall be erected prior to the commencement of any work on-site and shall be maintained in good condition for the duration of construction. Where tree protection zones merge together a single fence encompassing the area is deemed to be adequate. Existing site boundary fences may form part of the enclosure.

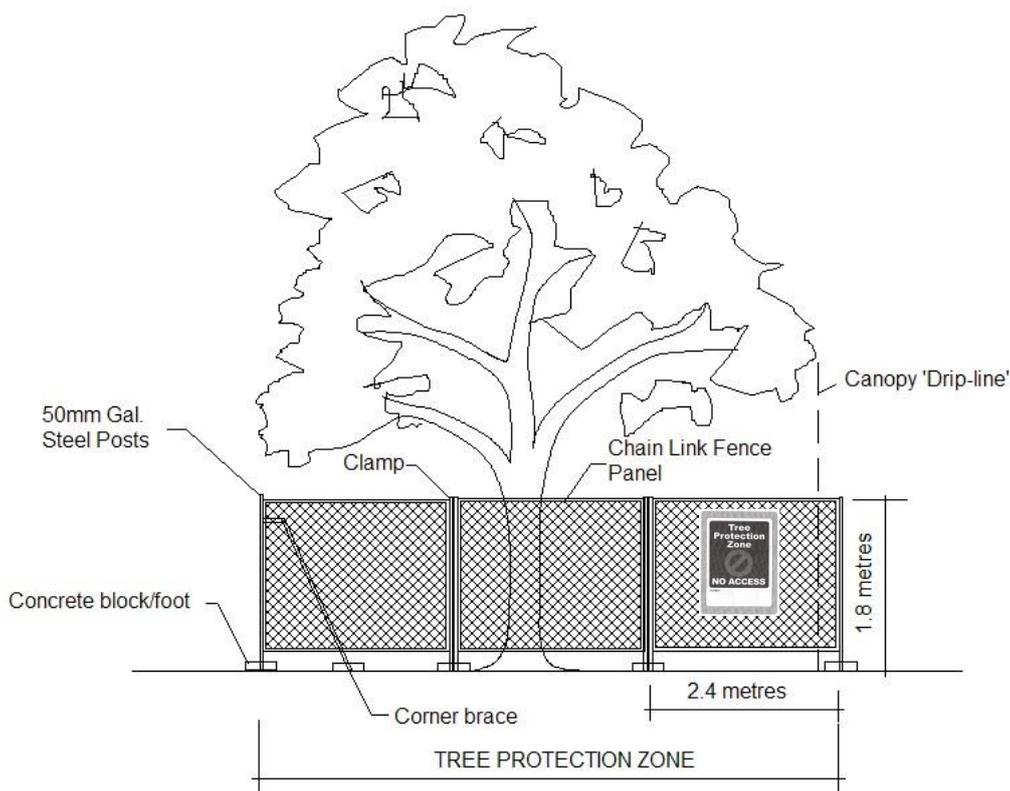


Figure 1 – Detail of Tree Protection Fence

10.6 Tree Protection Signs

10.6.1 Signs shall be installed on the Tree Protection Fence to prevent unauthorised movement of plant and equipment or entry to the Tree Protection Zone. The signs shall be securely attached to the fence using cable ties or equivalent. Signs shall be placed at minimum 10 metre intervals. The wording and layout of the sign shall comply with AS 4970-2009 as shown in **Figure 2**.



Figure 2 – Detail of Tree Protection Sign

10.7 Ground Protection

10.7.1 Construction haul routes shall be confined to existing paved areas wherever possible. Where this is not feasible and construction haul routes or access for plant and equipment must traverse soft landscape areas within TPZs of [**any tree nominated for retention**], 20mm thick marine ply sheets or truck mats (such as Envirex Versadeck® access mats) (refer **Figure 4** shall be placed over the top of the ground surface to minimise compaction and disturbance of the underlying soil profile and root zone.



Figure 4 – Showing typical detail for truck mats.

10.7.2 Ground protection shall be installed prior to any site works and maintained in good condition for the duration of the construction period. On completion of the works, ground protection shall be removed without damage or disturbance to the underlying soil profile.

10.8 Demolition Works within Tree Protection Zones

10.8.1 Existing Turfgrass

No mechanical soil cultivation (using ripping tynes, rotary hoes or the like) is permitted within Tree Protection Zones (TPZs). Where existing turfgrass is proposed to be removed (demolished) within the TPZs of Trees [T1, T2 & T9], the turfgrass shall be first treated with a non-selective herbicide with the active constituent Glyphosate (Round-up ® or equivalent) at the manufacturers recommended rate and allowed to dehisce. Once the turfgrass in the effected area is completely dead, any high grass may be slashed/mown close to ground level.

Any residual vegetation (dead grass etc) may then be carefully scraped-off the surface using a small rubber tracked excavator with a broad sand bucket (i.e. without tynes/teeth), taking care to remove the minimum topsoil necessary (no more than 20mm deep) (refer to **Figure 1**). An observer shall be used to ensure that no woody surface roots of any trees are damaged during this process.



Figure 1 – Showing method for removal of residual surface vegetation from Tree Protection Zones following herbicide treatment and slashing.

10.8.2 Paved Areas

Demolition of paved areas (including any temporary road base surface treatment) within the Tree Protection Zones (TPZs) of trees [T1 & T2] shall be undertaken under the supervision of a qualified Arborist [Australian Qualification Framework (AQF) Level 5].

Concrete pavements shall be demolished by breaking the slab into manageable sections (using a rock hammer or similar) and asphalt pavements shall be removed by breaking the topcoat into manageable pieces. The broken sections shall be carefully lifted and folded over the remaining paved surface to minimise disturbance and compaction of the underlying soil profile (refer to **Figure 2**). Special care shall be taken where underlying woody roots have lifted or displaced the pavement. Any plant or equipment used in demolition work shall operate within the footprint of existing paved areas and avoid traversing soft landscape areas. Where this is unavoidable, suitable ground protection shall first be installed in accordance with **Section 10.7**.



Figure 2 – Showing method for removal of concrete pavement, by carefully lifting sections and folding over the remaining paved surface.

The pavement sub-base within the TPZ shall be gradually removed (where required) in layers of no greater than 50mm thick using a small rubber tracked excavator or alternative approved method to avoid excessive disturbance and compaction of the underlying soil profile and damage to underlying roots and minimise. The machine shall work within the footprint of the existing path footprint to avoid compaction of the underlying soil. The final layer of sub-base material shall be removed using hand tools were required to avoid compaction of the underlying soil profile and avoid damage to any underlying woody roots.

Following removal of the pavement surface and sub-base, clean, friable topsoil shall be used to fill in the excavated area and bring flush with surrounding levels within new landscape areas. Soil shall only be imported and spread when the underlying soil conditions are dry to avoid compaction of the soil profile. Where there is insufficient recovered site topsoil for this purpose, any imported material shall be free of rocks, vegetation, heavy clay or other extraneous matter complying with AS 4419:2003 (*Soils for Landscaping and Garden Use*). Any imported soil material should be similar in texture to the existing site topsoil.

10.9 Excavations within Tree Protection Zones

10.9.1 Prior to any mechanical excavations for building foundations or pavement sub-grade within the TPZs of Trees [T1, T2 & T9] exploratory excavation using non-destructive techniques shall be taken along the perimeter of the structure or pavement within the TPZ. Non-destructive excavation techniques may include the use of hand-held implements, air pressure (using an Air-spade® device) or water pressure (hydro-excavation in combination with a vacuum extraction unit). The exploratory excavation shall be undertaken along the perimeter of the foundation or pavement (within the TPZ) to the depth of the foundation or to a maximum of 800mm from surface levels, to locate and expose any woody roots prior to any mechanical excavation.

10.9.2 All care shall be undertaken to preserve woody roots intact and undamaged during exploratory excavation. Any roots encountered of less than 40mm in diameter may be cleanly severed with clean sharp pruning implements at the face of the excavation. The root zone in the vicinity of the excavation shall be kept moist following excavation for the duration of construction to minimise moisture stress on the tree. Where large woody roots (greater than 40mm diameter) are

encountered during exploratory excavations, further advice from a qualified arborist shall be sought prior to severance.

10.10 Alternative Construction Methods

10.10.1 Where necessary, (to avoid severing large woody roots) consideration should be given to the installation of an elevated structure (e.g. pier and beam footing, suspended slab or floor supported on piers, cantilevered slab, up-turned edge beam etc) in preference to structures requiring a deep edge beam or continuous perimeter strip footing. The beam section of any pier and beam footing should be placed **above** grade to avoid excavation within the SRZ. Pier footings intersecting large woody roots should be slightly offset where necessary to avoid root severance.

10.10.2 For masonry walls or fences it may be acceptable to delete continuous concrete strip footings and replace with suspended in-fill panels (e.g. steel or timber pickets, lattice etc) fixed to pillars. For paved areas, consideration should be given to raising the proposed pavement level and using a porous fill material in preference to excavation where large woody roots are found within the sub-base.

10.11 Underground Services

10.11.1 All proposed stormwater lines and other underground services should be located outside TPZs of trees proposed to be retained wherever possible or installed by alternative measures. Alternative measures include suspending pipelines beneath the floor of a building or structure (to avoid excavation with the TPZ), non-destructive excavation methods or Horizontal Directional Drilling (HDD). Where the installation of service lines within TPZs is unavoidable, the pipelines or conduits should be installed as follows.

10.11.2 Trenching for underground services and stormwater pipes within the TPZs of Trees [**any tree nominated for retention**], shall be undertaken using non-destructive excavation in accordance with **Section 10.6**. Where large woody roots are encountered during excavation or trenching (root diameter greater than 40mm), these shall be retained intact wherever possible (e.g. by tunnelling beneath roots and inserting the pipeline or conduit beneath or re-routing the service etc). Where this is not practical and root pruning is the only alternative, proposed root pruning should be assessed by a qualified arborist [AQF 5] to evaluate the potential impact on the health and stability of the subject tree.

10.11.3 Installation of underground services and stormwater pipes within the SRZs of Trees [**any tree nominated for retention**], shall only be undertaken by Horizontal Directional Drilling (HDD) (also referred to as sub-surface boring or Micro-tunnelling for large diameter pipes). The Invert Level of the pipe, plus the pipe diameter, must be lower than the estimated root zone depth as specified. At this site a minimum depth of 1 metre to the invert level of the pipe is specified.

10.12 Root Pruning

10.12.1 Where root pruning of [**any tree nominated for retention**] is required to facilitate construction, roots shall be severed with clean, sharp pruning implements and retained in a moist condition during the construction phase using Hessian material or mulch where practical. Severed roots shall be treated with a suitable root growth hormone containing the active constituents Indol-3-yl-Butric Acid (IBA) and 1-Naphthylacetic Acid (NAA) to stimulate rapid regeneration of the root system.

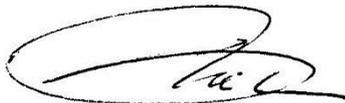
10.12.2 Any required root pruning shall be carried out in accordance with Australian Standard 4373-2007 – *Pruning of Amenity Trees* by a qualified and experienced arborist or tree surgeon [Australian Qualification Framework Level 3] in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). No roots of greater than 40mm in diameter should be removed

or pruned without further advice from a Consulting Arborist [Australian Qualification Framework Level 5].

11 REPLACEMENT PLANTING

11.1.1 The overall landscape concept plan prepared by iScape indicates a landscape area of approximately 2,000 m² located to the north and east of the proposed new car park dedicated for compensatory (offset) planting with a range of locally-indigenous tree species. This area is adequate to support the proposed 48 new trees capable of similar mature dimensions to those being removed (providing at least 40 m³ soil volume per tree) in addition to sub-canopy trees and shrub and groundcover plantings. In addition, 40 new trees (a variety of locally indigenous and non-local native species) are proposed to be planted in other areas of the site surrounding the proposed facilities as part of the overall development (a total of 88 new trees).

11.1.2 iScape estimates that the proposed development will result in loss of approximately 800m² of canopy coverage (which includes a variety of introduced, non-local native and locally indigenous tree species), with the proposed total replacement plantings achieving an estimated canopy coverage of 4,210 m² at maturity. As such, the proposed level of replacement planting will compensate for loss of amenity in the short term (next 10-15 years) and is therefore considered acceptable and compliant with the recommendations of this report.



Andrew Morton
EARTHSCAPE HORTICULTURAL SERVICES
1st March 2022

REFERENCES

¹ Bannerman S.M. & Hazelton P.A. (1990)

Soil Landscapes of the Penrith 1:100,000 Sheet

Soil Conservation Service of NSW, Sydney.

² Benson, Doug & Howell, Jocelyn (1990)

Taken for Granted: the Bushland of Sydney and its Suburbs.

Kangaroo Press & The Royal Botanic Gardens, Sydney, NSW

³ Mattheck, Dr. Claus & Breloer, Helge (1994) – Sixth Edition (2001)

The Body Language of Trees – A Handbook for Failure Analysis

The Stationery Office, London, England

⁴ Barrell, Jeremy (1996)

Pre-development Tree Assessment

Proceedings of the International Conference on Trees and Building Sites (Chicago)

International Society of arboriculture, Illinois, USA

⁵ National Parks and Wildlife Service of NSW (October 2002)

Native Vegetation of the Cumberland Plain - 1:25000 Mapping Series (Map 10 of 16)

NPWS, Sydney NSW

⁶ Tozer, Mark (2003)

The Native Vegetation of the Cumberland Plain, Western Sydney: Systematic Classification and Field Identification of Communities

Cunninghamia 8 (1) 2003, (Journal of Plant Ecology for Eastern Australia)

National Herbarium of NSW, Botanic Gardens Trust, Sydney

⁷ Council of Standards Australia (August 2009)

AS 4970 – 2009 – Protection of Trees on Development Sites

Standards Australia, Sydney

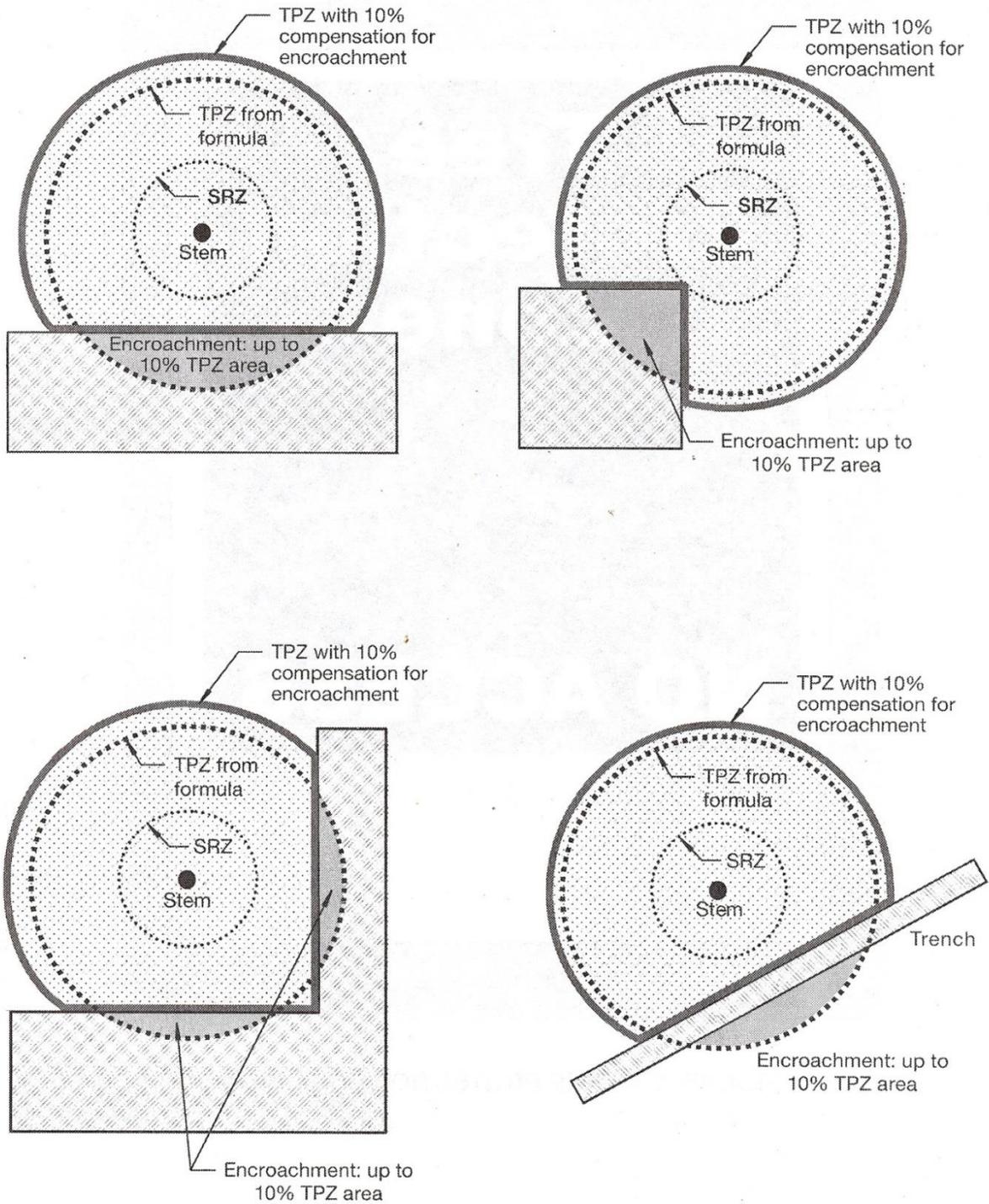
APPENDIX 1 - CRITERIA FOR ASSESSMENT OF LANDSCAPE SIGNIFICANCE

RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register	The subject tree is scheduled as a Threatened or Vulnerable Species as defined under the provisions of the <i>Biodiversity Conservation Act 2016</i> (NSW) or the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .	The subject tree has a very large live crown size exceeding 300m ² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has a known or documented association with that item	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m ² ; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value	The subject tree has a large live crown size exceeding 100m ² ; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of the local or state planning controls (Development Control Plan etc).	The subject tree has a medium live crown size exceeding 40m ² ; the tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal); and
			The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item	The subject tree is scheduled as exempt (not protected) under the provisions of the local or state planning controls (DCP etc) due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 40m ² and can be replaced within the short term (5-10 years) with new tree planting
6. VERY LOW	The subject tree is causing significant damage to a heritage Item.	The subject tree is listed as an Environment Weed Species in the relevant Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).
7. INSIGNIFICANT	The tree is completely dead and has no known heritage value (or any habitat value)	The tree is scheduled as a potential 'Biosecurity Risk' ('Priority Weed' – formerly 'Noxious Weed') within NSW or within the relevant Local Government Area under the provisions of the <i>Biosecurity Act 2015</i>	The tree is completely dead and represents a potential hazard.

Ref:- Morton, A (2006) **Determining the Retention Value of Trees on Development Sites**

TreeNet - Proceedings of the 7th National Street Tree Symposium 2006 Government of South Australia Department for Transport, Energy and Infrastructure

APPENDIX 2 – ACCEPTABLE INCURSIONS TO THE TREE PROTECTION ZONE (TPZ)



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

REF:- Council of Standards Australia (August 2009)
AS 4970 – 2009 – Protection of Trees on Development Sites
 Standards Australia, Sydney

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm) at 1.4 metres	Live Crown Size (m ²)	Maturity Class	Condition	Previous Pruning	Health		Remaining Safe Useful Life Expectancy (SULE)	Landscape Significance Rating	Retention Value	Location
									Vigour	Pest & Disease				
1	<i>Eucalyptus pilularis</i> (Blackbutt)	15	13	650	117	M	Appears stable with sound branching structure. Exhibits a large dead PL (170mmØ) at 3 metres.	No evidence	Very Good	No Evidence	Long - more than 40 years	3	High	On-site
2	<i>Eucalyptus tereticornis</i> (Forest Red Gum)	18	14	600	224	M	Appears stable with sound branching structure. Exhibits a prominent lean to the north-east (self-corrected).	No evidence	Good	No Evidence	Long - more than 40 years	3	High	On-site
3	<i>Cinnamomum camphora</i> (Camphor Laurel)	10	10	275x2	80	SM	Appears stable with poor branching structure. Exhibits a high bark inclusion at junction of co-dominant PLs at 0.5 metres. Multiple wounds/broken branch stubs due previous branch loss and wounds to trunk due to mechanical injury.	No evidence	.Fair	No Evidence	Medium 15-40 Years	7	Very Low	On-site
4	<i>Cinnamomum camphora</i> (Camphor Laurel)	11	12	490	108	SM	Appears stable with fair branching structure. Exhibits a high bark inclusion at junction of PL at 0.5 metres	No evidence	Good	No Evidence	Long - more than 40 years	7	Very Low	On-site
5	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	7	5	180+ 170 + 150	20	M	Appears stable with fair branching structure. Exhibits multiple moderate wounds and broken branch stubs to lower trunk and at 2 metres due previous mechanical injury. Crown suppress on the south-west side due to overshadowing. Multiple high bark inclusions at junctions of PLs at 0.5 and 0.8 metres.	No evidence	Fair with slightly thinning crown	No Evidence	Short 5-15 Years	5	Low	On-site
6	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	5	4	125 + 145 + 120	12	SM	Appears stable with sound branching structure. Exhibits multiple high bark inclusions at junctions of co-dominant PLs at GL. Crown suppressed north east side due to overshadowing.	No evidence	Fair with thinning crown	No Evidence	Short 5-15 Years	5	Low	On-site
7	<i>Camellia sasanqua</i> (Sasanqua Camellia)	4	5	150 + 80x4	15	SM	Appears stable with fair branching structure. Exhibits multiple moderate bark inclusions at junctions of PLs at GL.	Crown lifted to 2 metres	Good	No Evidence	Medium 15-40 Years	5	Low	On-site
8	<i>Lagerstroemia indica</i> (Crepe Myrtle)	6	9	150x5	36	M	Appears stable with sound branching structure. Wisteria vine throughout crown.	No evidence	.Fair	Severe vine infestation (Wisteria)	Medium 15-40 Years	4	Moderate	On-site

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm) at 1.4 metres	Live Crown Size (m ²)	Maturity Class	Condition	Previous Pruning	Health		Remaining Safe Useful Life Expectancy (SULE)	Landscape Significance Rating	Retention Value	Location
									Vigour	Pest & Disease				
9	<i>Liquidambar styraciflua</i> (Liquidambar)	5.5	5	213	27.5	I	Appears stable with fair branching structure.	No evidence	Good	No Evidence	Medium 15-40 Years	6	Low	On-site
10	<i>Corymbia maculata</i> (Spotted Gum)	20	11	561	165	M	Appears stable with sound branching structure. Temporary construction haul road to west (within TPZ). Exhibits multiple axial striations and small wounds on lower trunk with exudate (kino) emanating from wounds.	No evidence	Very Good	No Evidence	Long - more than 40 years	3	High	On-site
11	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	23	15	400 + 625 + 650	315	M	Appears stable with fair branching structure. Exhibits multiple axial wounds with decay at 2 to 4 metres on northern most trunk. Some dieback in upper crown north side. Moderate occluded wound at 0.5-1.5 metres.	No evidence	Fair with thinning crown	Bracket Fungus (Phellinus sp.) infection at 2.5 metres (northern trunk)	Short 5-15 Years	1	High	On-site
12	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	21	12	580x2 + 450x2	228	M	Appears stable with fair branching structure. Exhibits a large axial wound a 1 to 3.5 metres with decay evident + PL at 7 to 10 metres (suspected previous lightning damage). Crown suppressed west side due to crowding. Moderate wound (broken stub) due branch loss at 6 metres (PL, 250mmØ). 15% epicormic growth. Located close to existing asphalt paved area.	No evidence	Good	Low borer infestation	Medium 15-40 Years	1	High	On-site
13	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	23	8	717	144	M	Appears stable with sound branching structure. Prominent lean to the east (self-corrected).	No evidence	Good	Low borer infestation	Medium 15-40 Years	1	High	On-site
14	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	18	16	460 + 685	208	M	Appears stable with fair branching structure. Exhibits a large dead PL (250mmØ). Large axial wound on tree at 2 to 4 metres due previous borer damage. Multiple moderate wounds at 1 to 2 metres + 4 to 5 metres. Hi bark inclusion at junction aof PL at 3.5 metres.	No evidence	Fair with slightly thinning crown	Moderate borer infestation	Short 5-15 Years	1	High	On-site

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm) at 1.4 metres	Live Crown Size (m ²)	Maturity Class	Condition	Previous Pruning	Health		Remaining Safe Useful Life Expectancy (SULE)	Landscape Significance Rating	Retention Value	Location
									Vigour	Pest & Disease				
15	<i>Eucalyptus moluccana</i> (Grey Box)	17	10	525	130	SM	Appears stable with fair branching structure. Exhibits a moderate axial wound at 5 to 6 metres with decay evident. Large basal wound due to extensive borer damage.	No evidence	Fair with slightly thinning crown	Severe borer infestation (Longicorn Beetle). Bracket Fungus (<i>Phellinus</i> sp.) infection at 5-6 metres	Transient (less than 5 years)	3	Low	On-site
16	<i>Eucalyptus tereticornis</i> (Forest Red Gum)	13	8	395	72	SM	Appears stable with sound branching structure. Crown suppressed on the east side due to crowding.	No evidence	Very Good	No Evidence	Long - more than 40 years	4	Moderate	On-site
17	<i>Eucalyptus scoparia</i> (Willow Gum)	15	16	1064	192	M	Appears stable with fair branching structure. Exhibits a moderate wound and cavity in trunk at 1.5 metres with some decay evident. Moderate wound and cavity in PL at 7 metres. Multiple moderate wounds (broken branch stubs - SLs - to 200mmØ) due to previous storm damage. 30% epicormic growth.	No evidence	Fair with slightly thinning crown	No Evidence	Short 5-15 Years	3	Moderate	On-site
18	<i>Eucalyptus scoparia</i> (Willow Gum)	5	4	100x6	20	M	Appears stable with poor branching structure. Comprised of multiple elite epicormics arising from old stump due previous pruning.	Previously cut to stump (<1metre)	Good	No Evidence	Transient (less than 5 years)	5	Very Low	On-site
19	<i>Eucalyptus scoparia</i> (Willow Gum)	5	4	100x6	20	M	Appears stable with poor branching structure. Comprised of multiple elite epicormics arising from old stump due previous pruning.	Previously cut to stump (<1metre)	Good	No Evidence	Transient (less than 5 years)	5	Very Low	On-site
20	<i>Eucalyptus scoparia</i> (Willow Gum)	4	4	100x6	16	M	Appears stable with poor branching structure. Comprised of multiple elite epicormics arising from old stump due previous pruning.	Previously cut to stump (<1metre)	Good	No Evidence	Transient (less than 5 years)	5	Very Low	On-site

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	Minimum Setback to root plate	TPZ (m ²)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
1	<i>Eucalyptus pilularis</i> (Blackbutt)	P	7.8	2.9	5.3	191.0	Proposed pedestrian pathway offset 5.6 metres south-west at RL? (assumed close to existing grade). Excavations for pathway sub-grade within TPZ. Encroachment to TPZ = 9%.	Extent of encroachment to the root zone is less than 10% of the TPZ, which is considered within acceptable limits under AS 4970:2009. No adverse impact.	Retain in accordance with recommended Tree Protection Measures (Section 10). Maintain existing ground levels within TPZ. Demolish existing road base (temporary carpark/compound surface) within TPZ (where required) in accordance with Section 10.8. Undertake all excavations for the new pavement sub-grade within the TPZ in accordance with Section 10.9.
2	<i>Eucalyptus tereticornis</i> (Forest Red Gum)	P	7.2	2.8	4.9	162.8	No proposed works within TPZ.	No adverse impact.	Retain in accordance with recommended Tree Protection Measures (Section 10). Maintain existing ground levels within TPZ. Demolish existing road base (temporary car park/compound surface) within TPZ (where required) in accordance with Section 10.8.
3	<i>Cinnamomum camphora</i> (Camphor Laurel)	M	4.8	2.3	3.3	72.3	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
4	<i>Cinnamomum camphora</i> (Camphor Laurel)	M	5.9	2.7	4.0	108.8	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
5	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	M	3.6	2.1	2.4	40.7	No proposed works within TPZ.	No adverse impact.	Consider removal - poor specimen.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

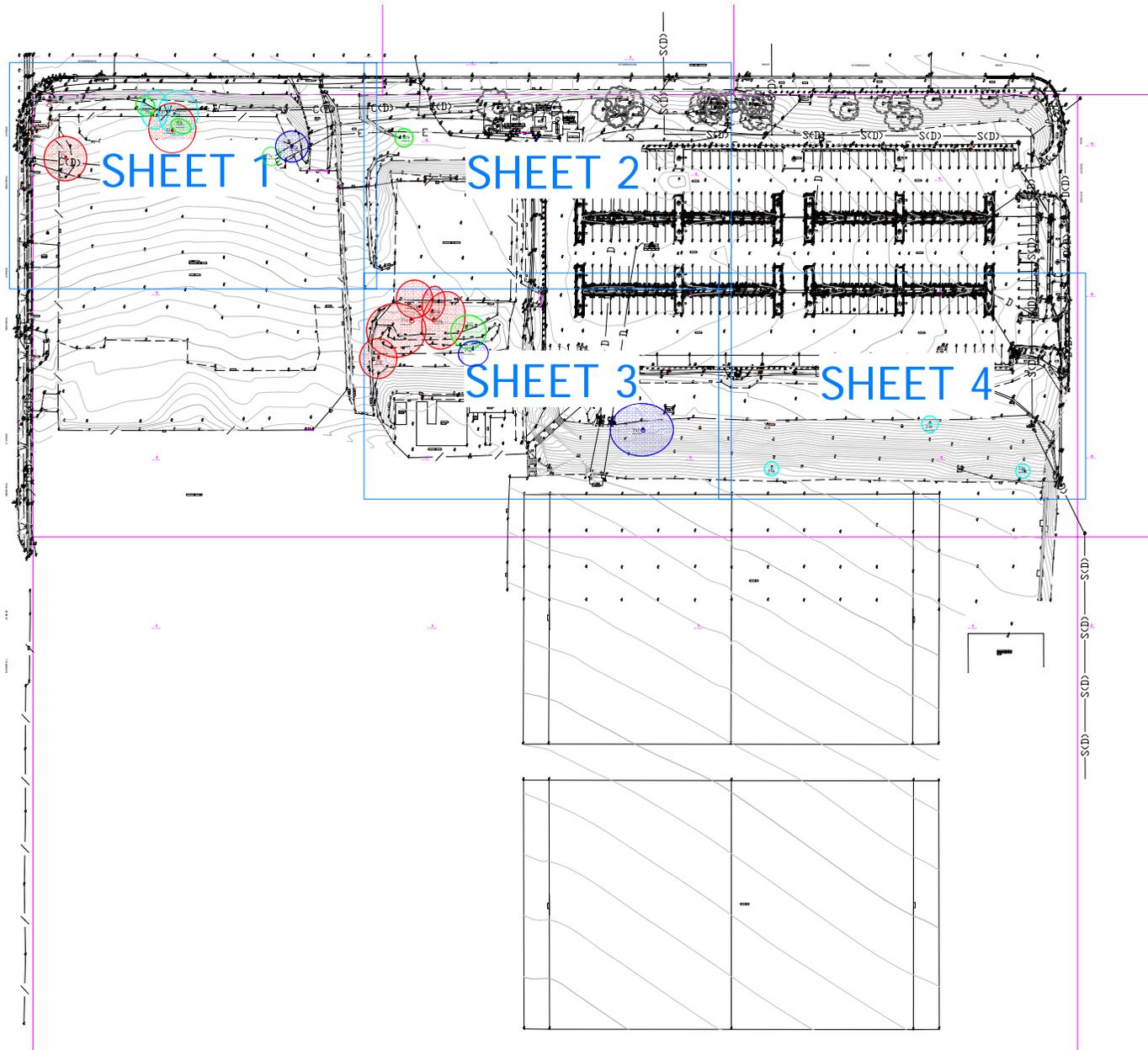
Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	Minimum Setback to root plate	TPZ (m ²)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
6	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	M	3.6	2.1	2.4	40.7	No proposed works within TPZ.	No adverse impact.	Consider removal - poor specimen.
7	<i>Camellia sasanqua</i> (Sasanqua Camellia)	M	2.4	1.8	1.6	18.1	Located within footprint of proposed footpath.	Proposed works will necessitate removal.	Remove tree.
8	<i>Lagerstroemia indica</i> (Crepe Myrtle)	M	5.4	2.5	3.7	91.6	Located within footprint of proposed new car park.	Proposed works will necessitate removal.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
9	<i>Liquidambar styraciflua</i> (Liquidambar)	M	2.6	1.9	1.7	20.6	No proposed works within TPZ.	No adverse impact.	Retain in accordance with recommended Tree Protection Measures (Section 10). Maintain existing ground levels within TPZ. Install temporary Tree Protection Fence in accordance with Section 10.5.
10	<i>Corymbia maculata</i> (Spotted Gum)	P	6.7	2.7	4.6	142.1	Located within footprint of proposed new building (Centre of Excellence).	Proposed works will necessitate removal (High Retention Value). There are no feasible options that can be recommended in this instance that would permit this tree to be retained given the desired location of the main building.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
11	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	P	13.2	3.7	9.0	547.1	Located within footprint of proposed new building (Centre of Excellence).	Proposed works will necessitate removal (High Retention Value). There are no feasible options that can be recommended in this instance that would permit this tree to be retained given the desired location of the main building.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	Minimum Setback Distance (tangent to root plate)	TPZ (m ²)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
12	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	P	13.2	3.7	9.0	547.1	Located within footprint of proposed new building (Centre of Excellence).	Proposed works will necessitate removal (High Retention Value). There are no feasible options that can be recommended in this instance that would permit this tree to be retained given the desired location of the main building.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
13	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	P	8.6	2.9	5.8	232.2	Located within footprint of proposed new building (Centre of Excellence).	Proposed works will necessitate removal (High Retention Value). There are no feasible options that can be recommended in this instance that would permit this tree to be retained given the desired location of the main building.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
14	<i>Eucalyptus amplifolia</i> (Cabbage Gum)	P	10.8	3.3	7.3	366.2	Located within footprint of proposed new building (Centre of Excellence).	Proposed works will necessitate removal (High Retention Value). There are no feasible options that can be recommended in this instance that would permit this tree to be retained given the desired location of the main building.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
15	<i>Eucalyptus moluccana</i> (Grey Box)	P	6.3	2.7	4.3	124.9	Located within footprint of proposed new building (Centre of Excellence).	Proposed works will necessitate removal.	Remove tree.
16	<i>Eucalyptus tereticornis</i> (Forest Red Gum)	P	4.7	2.4	3.2	70.5	Located within footprint of proposed new building.	Proposed works will necessitate removal.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	Minimum Setback Distance (tangent to root plate)	TPZ (m ²)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
17	<i>Eucalyptus scoparia</i> (Willow Gum)	P	12.8	3.4	8.7	511.6	Located within footprint of proposed new grandstand	Proposed works will necessitate removal.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
18	<i>Eucalyptus scoparia</i> (Willow Gum)	P	4.8	3.6	3.3	72.3	Located within footprint of proposed new grandstand	Proposed works will necessitate removal.	Remove tree.
19	<i>Eucalyptus scoparia</i> (Willow Gum)	P	4.8	3.6	3.3	72.3	Located within footprint of proposed new paved area.	Proposed works will necessitate removal.	Remove tree.
20	<i>Eucalyptus scoparia</i> (Willow Gum)	P	4.8	3.6	3.3	72.3	Located within footprint of proposed new pedestrian ramp associated with the new grandstand	Proposed works will necessitate removal.	Remove tree.



APPENDIX 5
 TREE LOCATION PLAN SHOWING
 TREE RETENTION VALUES
 Parramatta Eels Training Facility
 Memorial Avenue, KELLYVILLE, NSW



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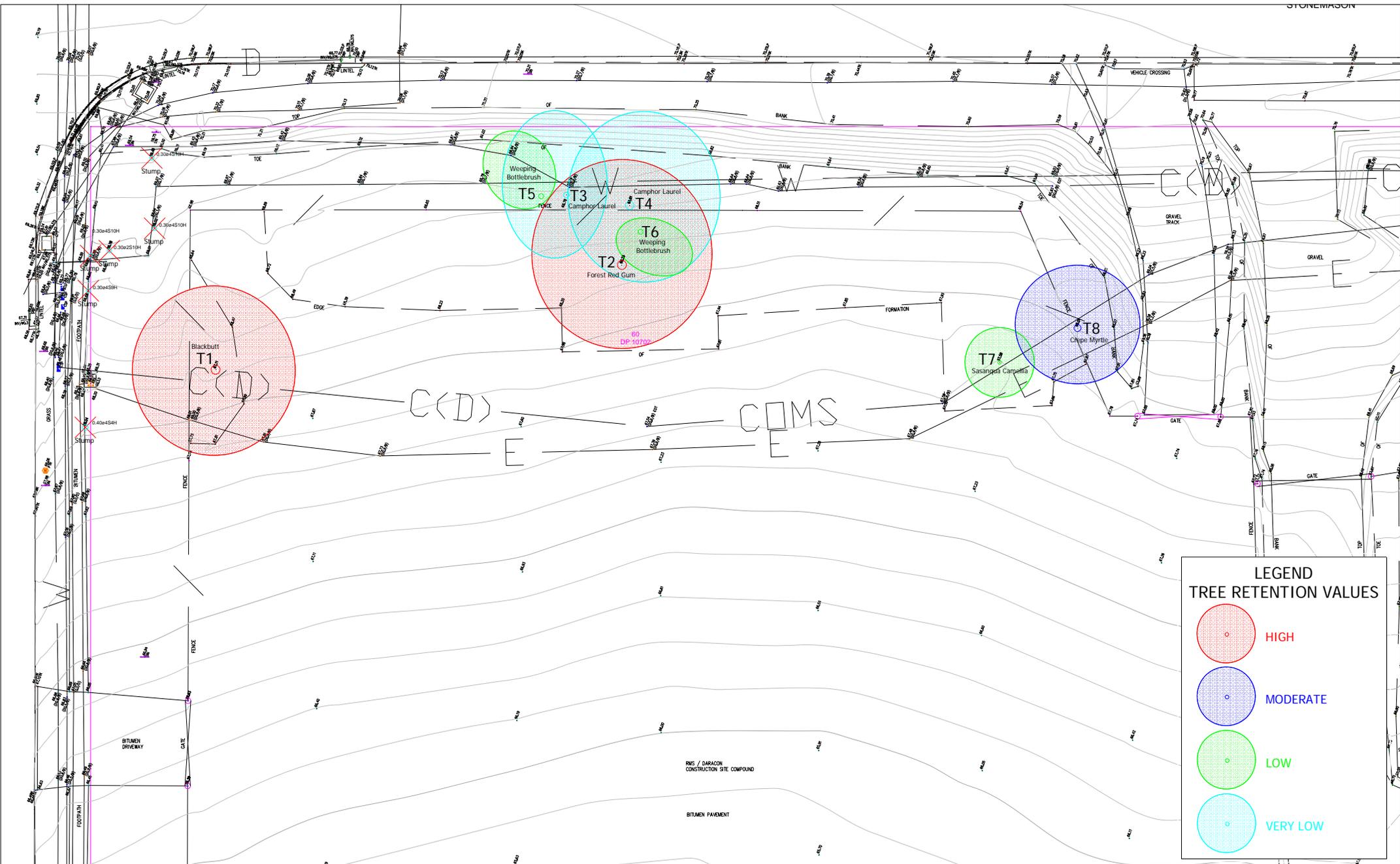
Based on the Survey Drawing
 prepared by Cardno
 Dwg Ref No. 11930501001 [01]
 Dated 16/03/2021



DWG No. T21-0507/01 [A]

KEY PLAN

DATE: 07/05/2021



LEGEND
TREE RETENTION VALUES

-  HIGH
-  MODERATE
-  LOW
-  VERY LOW

APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Parramatta Eels Training Facility
Memorial Avenue, KELLYVILLE, NSW

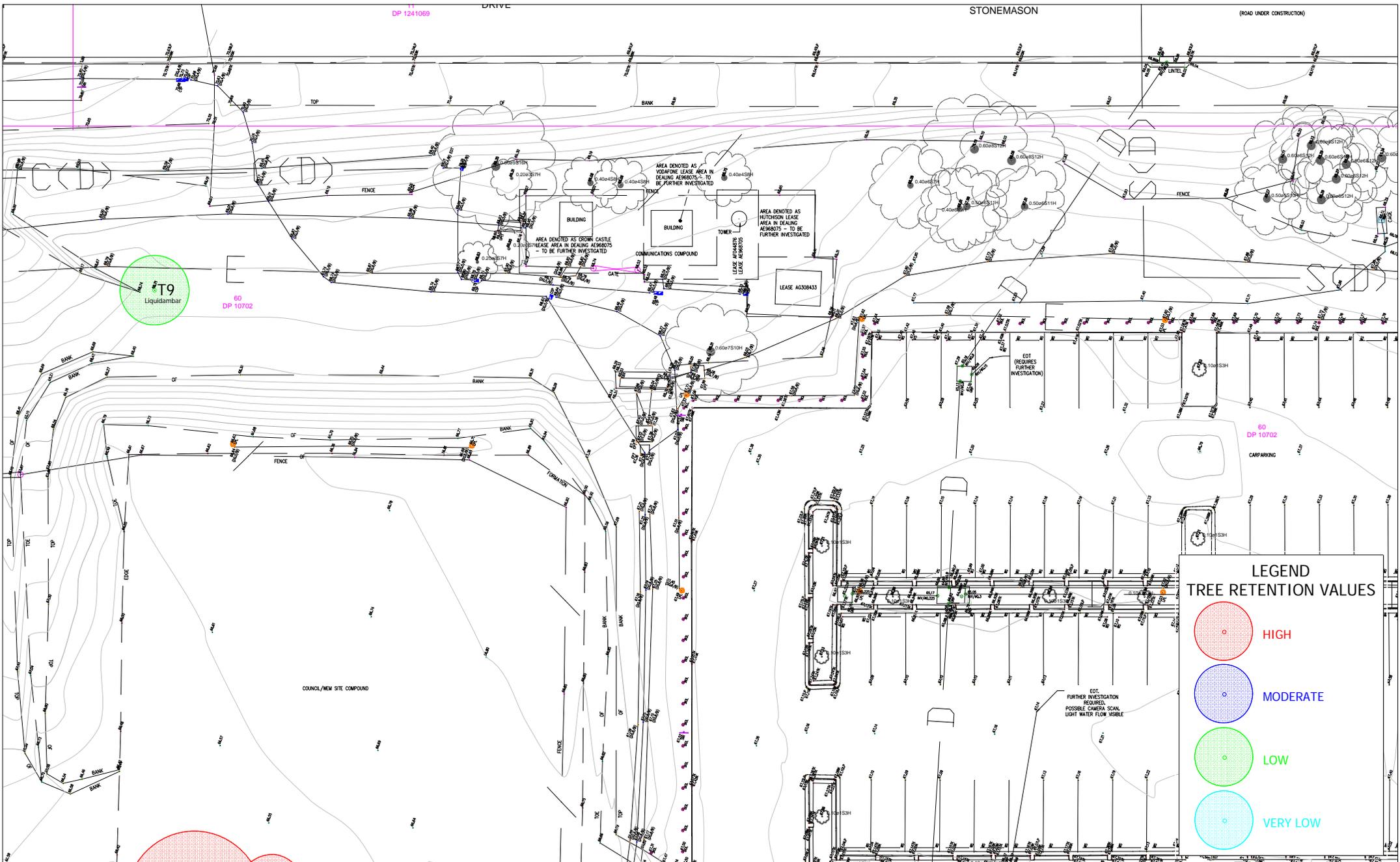


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SHEET 1
DATE: 07/05/2021



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TREE RETENTION VALUES
 Parramatta Eels Training Facility
 Memorial Avenue, KELLYVILLE, NSW

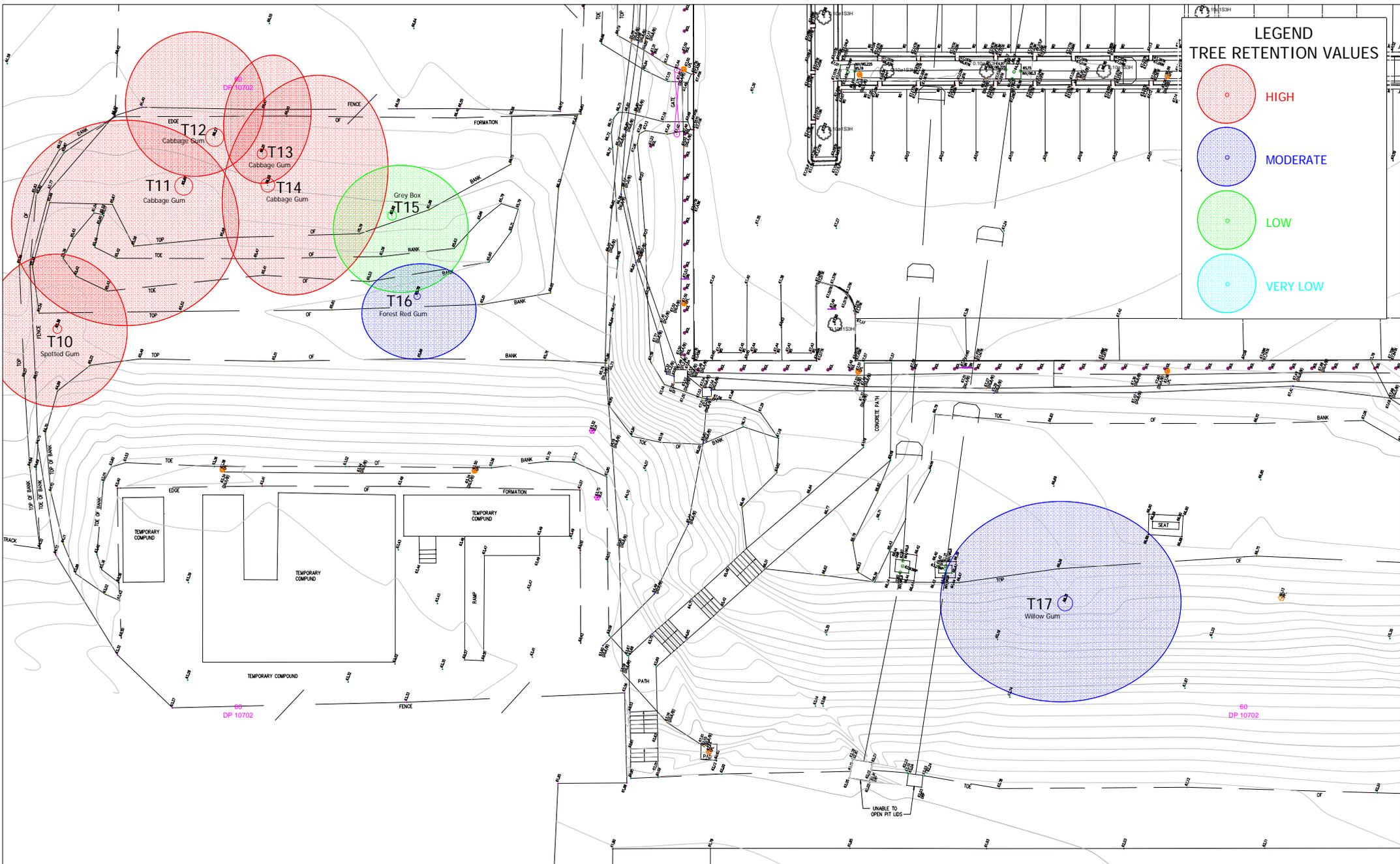


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DWG No. T21-0507/01 [A]
SHEET 2
 DATE: 07/05/2021



APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
 Parramatta Eels Training Facility
 Memorial Avenue, KELLYVILLE, NSW

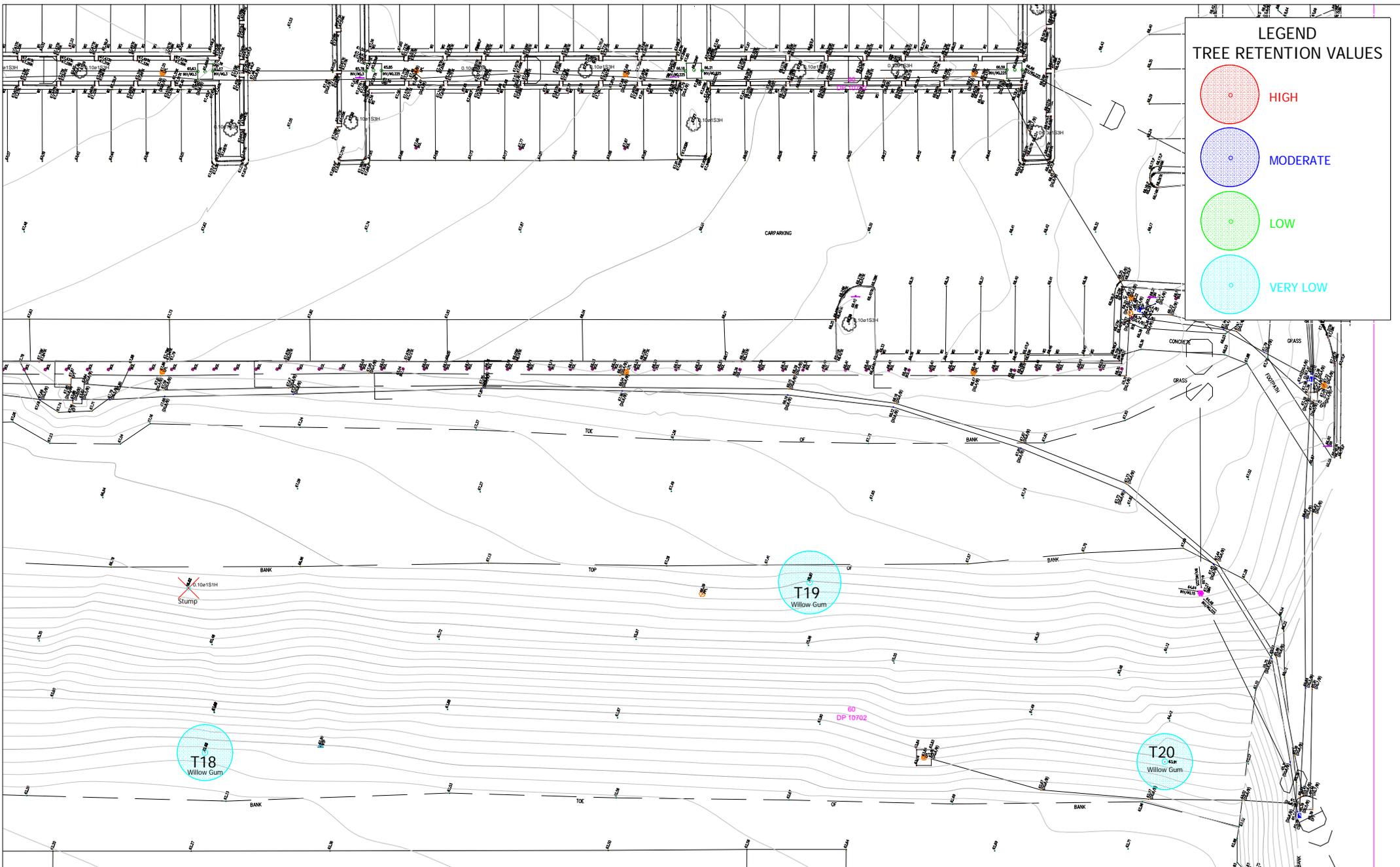


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DWG No. T21-0507/01 [A]
SHEET 3
 DATE: 07/05/2021



LEGEND
TREE RETENTION VALUES

-  HIGH
-  MODERATE
-  LOW
-  VERY LOW

APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Parramatta Eels Training Facility
Memorial Avenue, KELLYVILLE, NSW

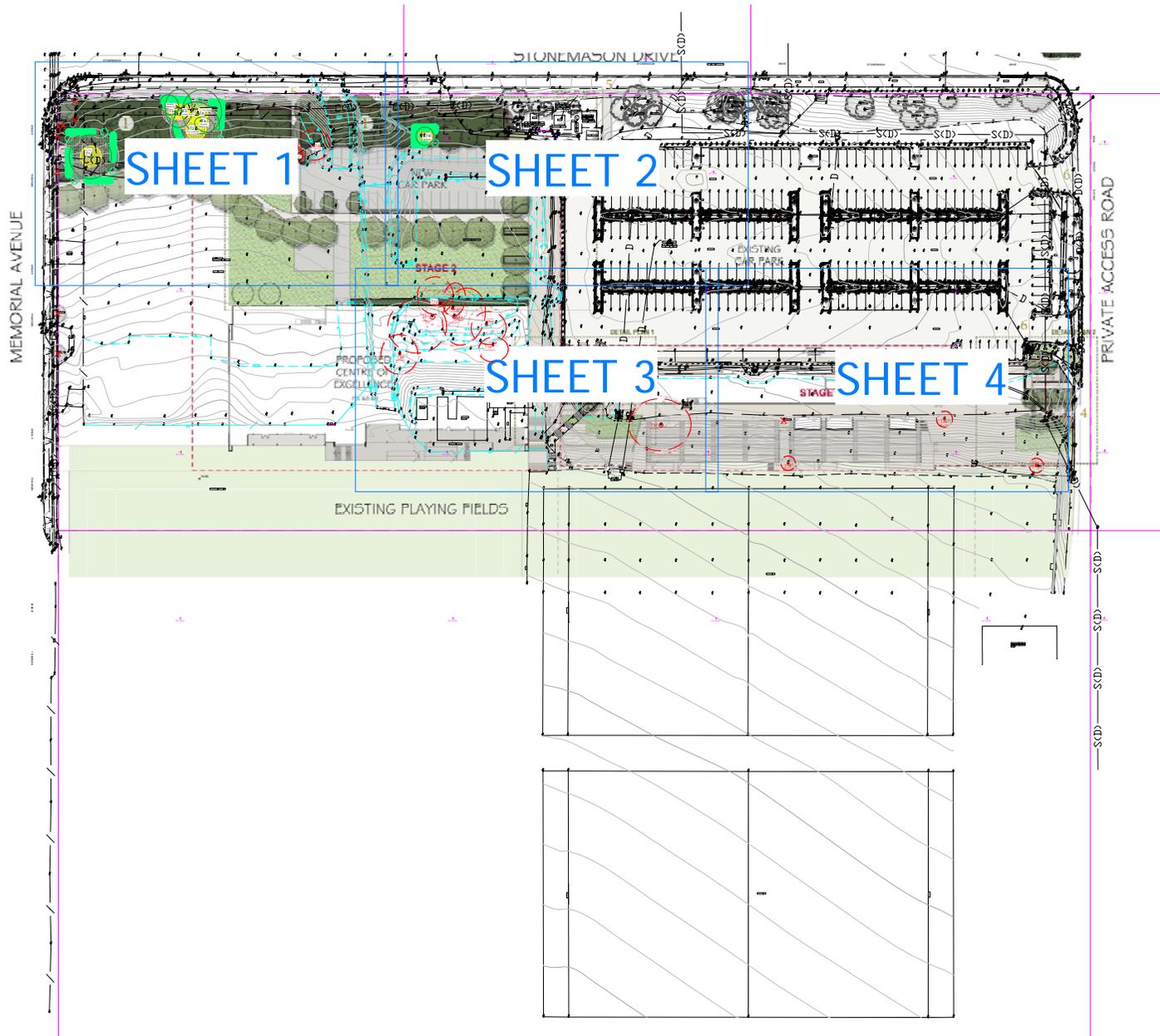


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DWG No. T21-0507/01 [A]
SHEET 4
DATE: 07/05/2021



APPENDIX 6
TREE PROTECTION PLAN

KELLYVILLE PARK
6-8 Memorial Avenue, KELLYVILLE, NSW



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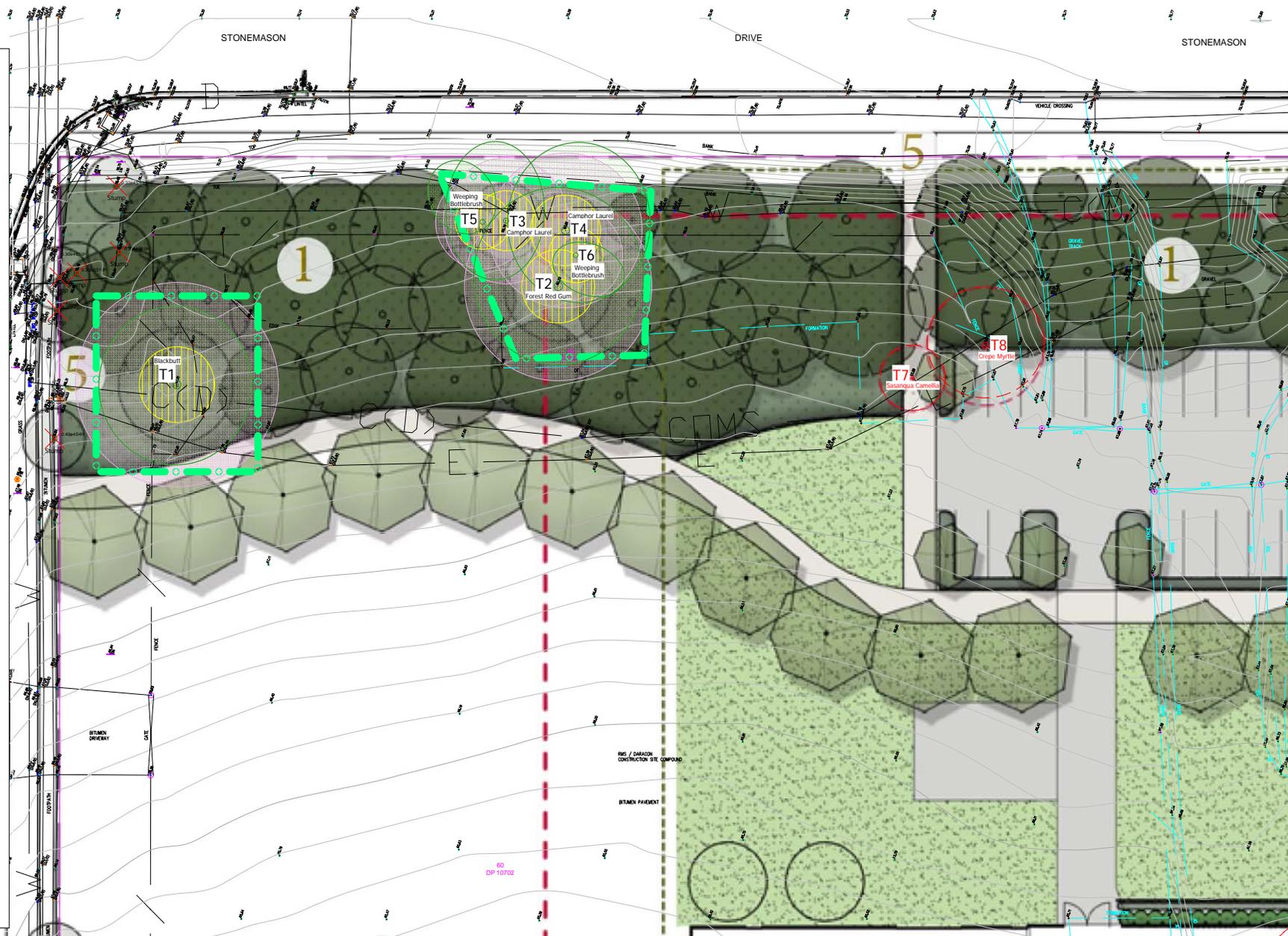
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Dwg Ref No. 11930501001 [01]
Dated 16/03/2021



DWG No. T21-0507/02 [E]

KEY PLAN

DATE: 24/01/2022



LEGEND

-  Tree to be retained and protected in accordance with Tree Protection Measures (Section 10)
-  Tree to be removed in accordance with Section 10.4
-  Tree Protection Zone (TPZ) [refer Section 7]
-  Canopy "Drip-line"
-  Structural Root Zone (SRZ)
-  Existing buildings & structures to be demolished. Demolition works within TPZ's to be undertaken in accordance with Section 10.8
-  New development. All excavations for building foundations within TPZ's to be undertaken in accordance with Section 10.9
-  Excavations in these areas for footings and services to be undertaken in accordance with Section 10.9
-  Proposed stormwater infrastructure to be installed in accordance with Section 10.11
-  Tree Protection Fence to be erected in accordance with Section 10.5
-  Install Ground Protection in Accordance with Section 10.7

APPENDIX 6
TREE PROTECTION PLAN
 KELLYVILLE PARK
 6-8 Memorial Avenue, KELLYVILLE, NSW

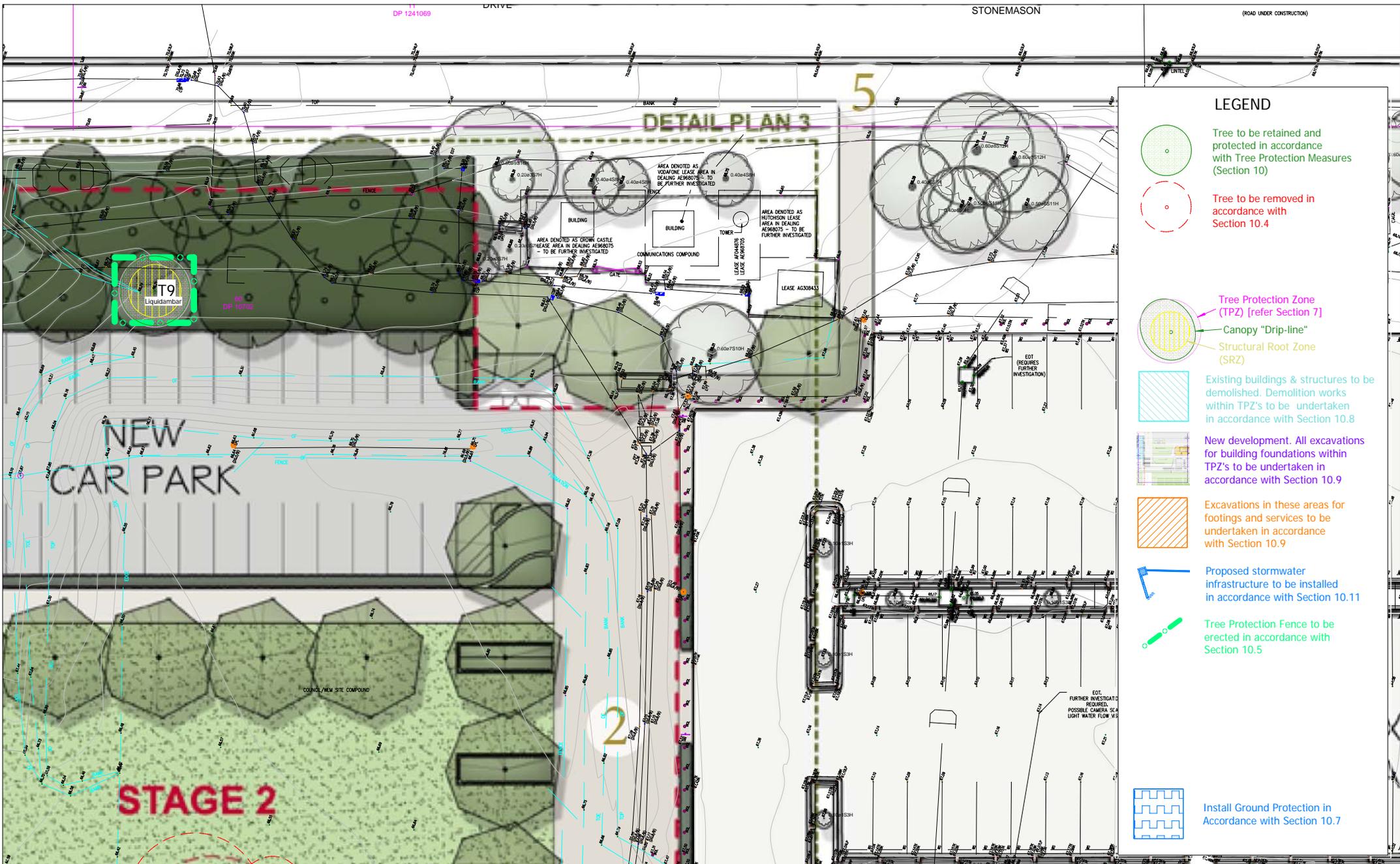


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 DATE: 24/01/2022



APPENDIX 6
TREE PROTECTION PLAN
 KELLYVILLE PARK
 6-8 Memorial Avenue, KELLYVILLE, NSW

 Earthscape Horticultural Services
 Arboricultural and Horticultural Consultants
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 BEROWRA NSW 2081
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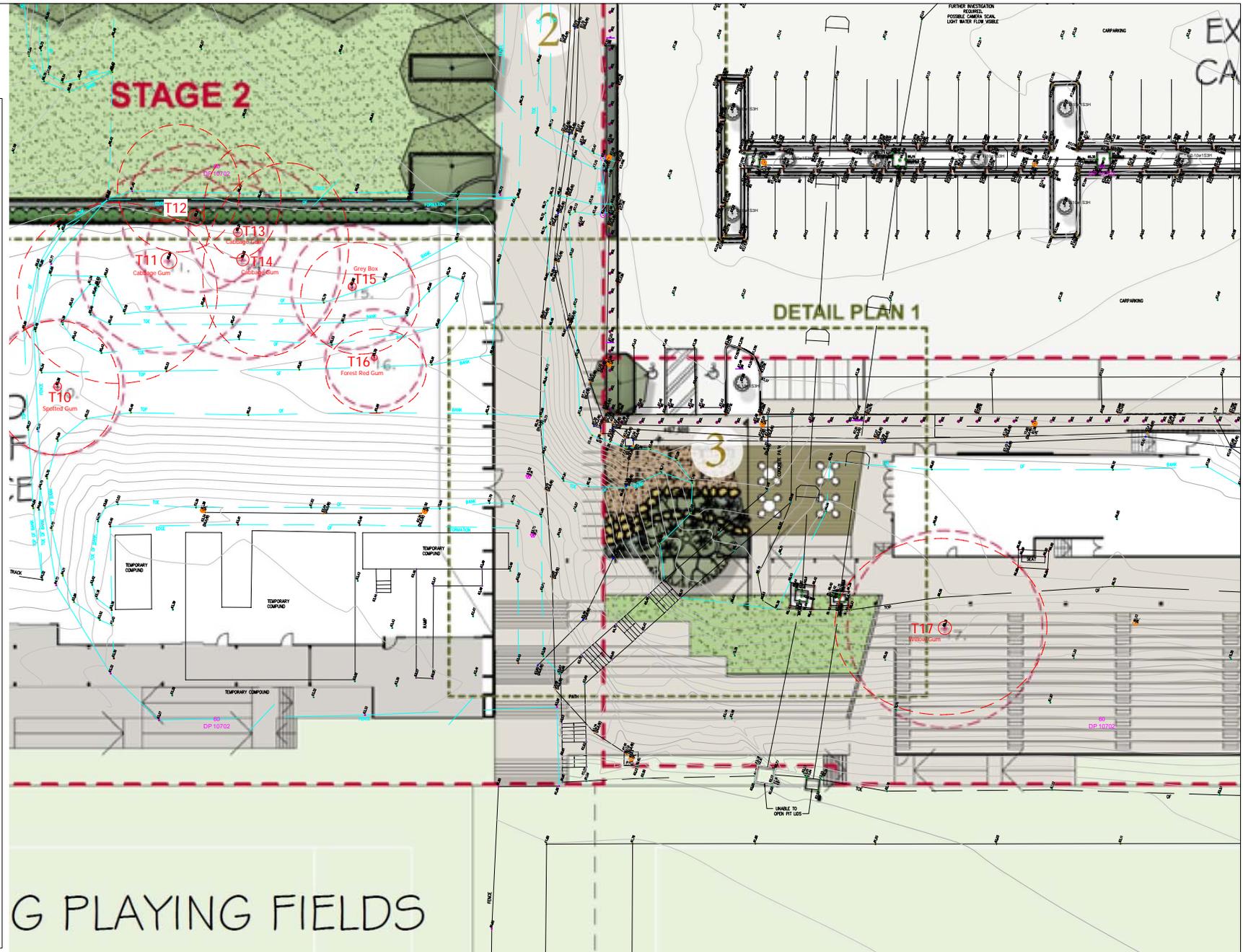
Based on the Survey Drawing
 prepared by Cardno
 Dwg Ref No. 11930501001 [01]
 Dated 16/03/2021



DWG No. T21-0507/02 [E]
SHEET 2
 DATE: 24/01/2022

LEGEND

-  Tree to be retained and protected in accordance with Tree Protection Measures (Section 10)
-  Tree to be removed in accordance with Section 10.4
-  Tree Protection Zone (TPZ) [refer Section 7]
-  Canopy "Drip-line"
-  Structural Root Zone (SRZ)
-  Existing buildings & structures to be demolished. Demolition works within TPZ's to be undertaken in accordance with Section 10.8
-  New development. All excavations for building foundations within TPZ's to be undertaken in accordance with Section 10.9
-  Excavations in these areas for footings and services to be undertaken in accordance with Section 10.9
-  Proposed stormwater infrastructure to be installed in accordance with Section 10.11
-  Tree Protection Fence to be erected in accordance with Section 10.5
-  Install Ground Protection in Accordance with Section 10.7



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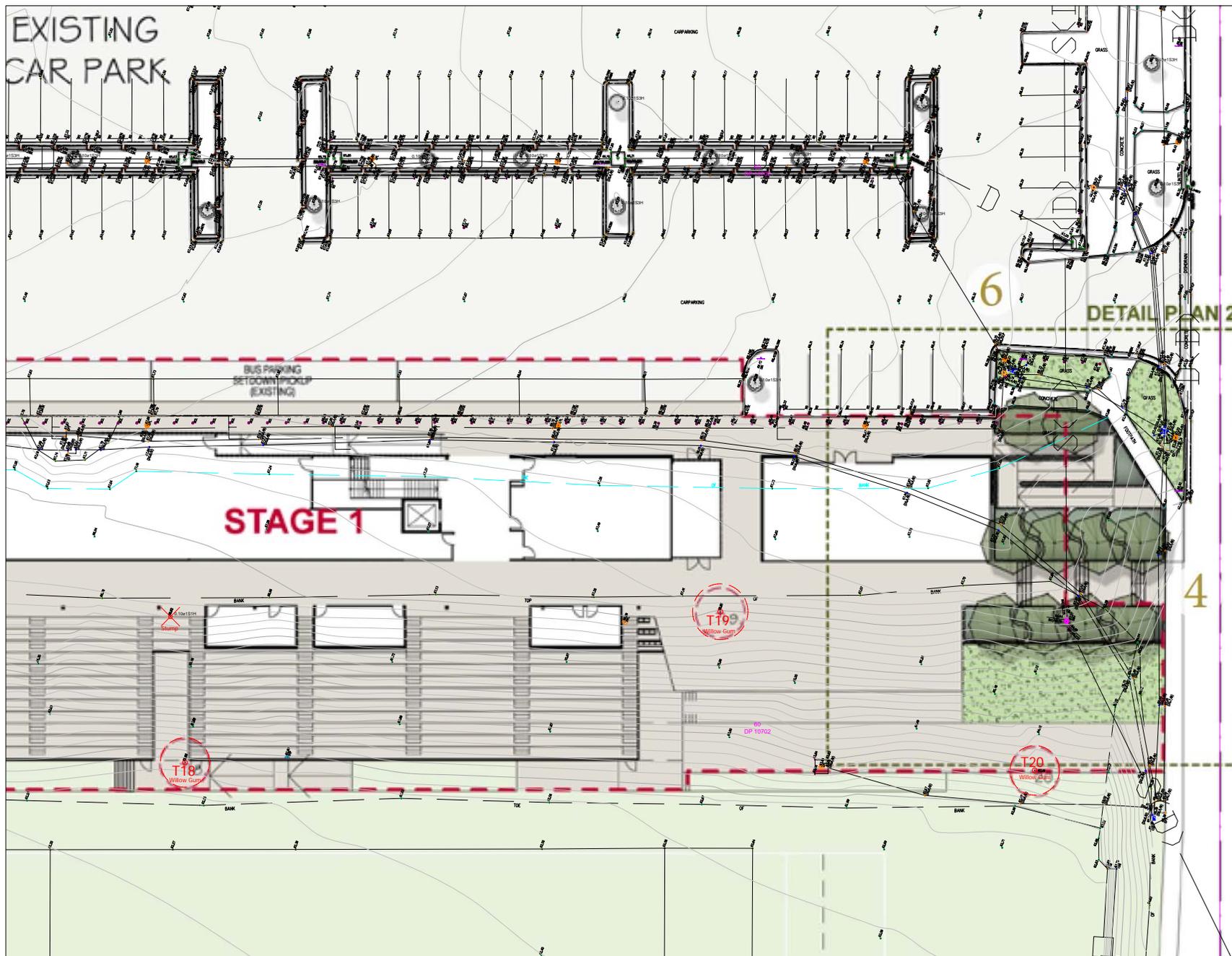


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 SHEET 3
 DATE: 24/01/2022



LEGEND

-  Tree to be retained and protected in accordance with Tree Protection Measures (Section 10)
-  Tree to be removed in accordance with Section 10.4
-  Tree Protection Zone (TPZ) [refer Section 7]
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-  Structural Root Zone (SRZ)
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SHEET 4
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